

Appendix A
Building 811 Project Final Status Survey Analytical
Results

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Case Narrative

**Case Narrative
for
Brookhaven National Laboratory (310464)
SDG: 37801
Work Order: 398677**

June 29, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 03, 2016 and June 06, 2016 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. The client was notified that two of the three containers for sample 398677016(37801-017), sample 398677020(37801-016), and all samples from location B811-SU-2 were not received on June 3, 2016. The missing samples were received on June 6, 2016. Since the lab cannot log sample 398677016(37801-017) with two separate dates and times of receipt, all 3 containers will show a receipt date and time of June 3, 2016.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
398677001	37801-001
398677002	37801-002
398677003	37801-003
398677004	37801-004
398677005	37801-005
398677006	37801-006
398677007	37801-007
398677008	37801-008
398677009	37801-009
398677010	37801-010
398677011	37801-011
398677012	37801-012
398677013	37801-013
398677014	37801-014
398677015	37801-015
398677016	37801-017
398677017	37801-018
398677018	37801-019
398677019	37801-020
398677020	37801-016
398677021	37801-021
398677022	37801-022
398677023	37801-023
398677024	37801-024
398677025	37801-025

398677026	37801-026
398677027	37801-027
398677028	37801-028
398677029	37801-029
398677030	37801-030
398677031	37801-031
398677032	37801-032
398677033	37801-033
398677034	37801-034
398677035	37801-035
398677036	37801-036
398677037	37801-037
398677038	37801-038
398677039	37801-039
398677040	37801-040

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.



Kaitlyn Stone for
Edith Kent
Project Manager

Chain of Custody

☒ Requires EDD

Analytical Laboratory		Sampling Contractor	
Name: W. Dorsch	Name: P.W. Grosser Consulting	Name: GEL	
Life No: 21133	Contact: Andy Lockwood	Address:	
Ext: ES	Phone: 631-589-6353	City:	St.
Acct. No: 20802/20804	Email/Fax: andy@pwgrosser.com	Contact:	Zip:
Dep't: Email Reports To:	Sampler: A. Lockwood	Phone:	
11W Dorsch	B. Barath	Email/Fax:	
2 A. Lockwood			
Project Name:	Project Manager:		
Bldg 511 - FSS Sampling	A. Lockwood		
Comments:			
			Field Engineer: B. Barath

Handcopy to John Bucke

Type		Sample Information				Additional Sample Information				Preservative	
UID	Smp Col	Site ID/Bldg/Life #	Depth/RWP	Date	Time	Matrix	Name/Description	Cont. Vol./Unit	Cont. Type	# of Cont.	Preservative
001	E	B811-SU-2-7	0-0.5'	5/11/16	1000	S	Bldg 811 FSS Soil Sampling	500 ml	CG	1	W
002			-2		1005						
003			-3		1010						
004			-4		1015						
005			-5		1019						
006	C	B811-SU-2-Comp1			1024						
007	G		-6		1030						
008			-7		1035						
009			-8		1040						
010			-9		1050						
011			-10		1055						
012			-11		1100						
013	C	B811-SU-2-Comp2			1103						
014	G	B811-SU-2-12			1110						

[illegible]

1 Relinquished By/Date/Time		2 Relinquished By/Date/Time		3 Relinquished By/Date/Time	
Print	Andrew Lockwood	Print	Travis	Print	R. Moore
Signature	<i>[Signature]</i>	Signature	<i>[Signature]</i>	Signature	<i>[Signature]</i>
Received By/Date/Time		Received By/Date/Time		Received By/Date/Time	
Print	Travis	Print	R. Moore	Print	newdeade
Signature	<i>[Signature]</i>	Signature	<i>[Signature]</i>	Signature	<i>[Signature]</i>
Received By/Date/Time		Received By/Date/Time		Received By/Date/Time	
Print	5-11-16	Print	6/2/16	Print	6/2/16
Signature	<i>[Signature]</i>	Signature	10:30	Signature	10:30
Received By/Date/Time		Received By/Date/Time		Received By/Date/Time	
Print	5-11-16	Print	6/2/16	Print	6/2/16
Signature	<i>[Signature]</i>	Signature	10:30	Signature	10:30
Received By/Date/Time		Received By/Date/Time		Received By/Date/Time	

Contractor Lab Sample Disposal:
☐ Return To Client
☒ Archive For _____ Months
☒ Disposal by Lab

Data Package: ☒ Full ☐ Summary

Turn-Around Time Required:
☒ Rush (1 Day)
☐ 14 Days
☐ 7 Days
☒ Other () ☒ 30 Days

SAMPLING CHAIN OF CUSTODY

Comments:[illegible]

Contractor Lab Sample Disposal:

☐ Return To Client ☒ Disposal by Lab
☐ Archive For _____ Month

Data Package: ☒ Full ☐ Summary

Turn-Around Time Required:

☐ Rush (1 Day) ☐ 14 Days ☒ 30 Days
☐ 7 Days ☐ Other ()

Requires EDD ☒



P.O. #

Chain of Custody No.

37801

SAMPLING CHAIN OF CUSTODY

Analysis Requested By		Sampling Contractor		Analytical Laboratory	
Name:		Name:		Name:	
Life No:		Contact:		Address:	
Acc No:		Phone:		City:	
		Email/Fax:		State:	
		Sampler:		Contact:	
				Phone:	
				Email/Fax:	
Project Name:		Project Manager:		Field Engineer:	

Comments:

Type	Site ID/Bldg/Life #	Sample Information	Depth/RVP	Date	Time	Name/Description	Core Vol/Units	Core Type	Preservative
0291EG	B811-SU-2-8	0-0.5	511/16	1445	5	Bldg 811 PSS Soil Sampling	500ml	P	721
030	-9			1440					
031	-10 (W/MSD)			1510					
032	-11			1505					
033	B811-SU-2-Comp 5			1575					
034	B811-SU-2-12			1500					
035	-13			1535					
036	-14			1530					
037	-15			1525					
038	-16			1520					
039	B811-SU-2-Comp 6			1540					
040	B811-SU-2-FDZ			0000					

Analysis Requested	
Alpha/Beta	
Tritium	
Gamma	
Strontium	
524.2	
624	
Nucleide-specific Alpha	
PCBs	
Metals	

1 Relinquished By/Date/Time		2 Relinquished By/Date/Time		3 Relinquished By/Date/Time	
Print	Signature	Print	Signature	Print	Signature
Andrew Lickney	11/16/16	6-2-16	10:30	R. Mier	6/2/16
Received By/Date/Time	Signature	Received By/Date/Time	Signature	Received By/Date/Time	Signature
11/16/16	11/16/16	11/16/16	11/16/16	11/16/16	11/16/16
Print	Signature	Print	Signature	Print	Signature
11/16/16	11/16/16	11/16/16	11/16/16	11/16/16	11/16/16

Contractor Lab Sample Disposal:

☐ Return To Client ☒ Disposal by Lab

☐ Archive For ☐ Month ☐ Summary

Data Package: ☒ Full ☐ Summary

Turn-Around Time Required:

☐ Rush (1 Day) ☐ 14 Days ☒ 30 Days

☐ 7 Days ☐ Other ()

SAMPLE RECEIPT & REVIEW FORM

Client: <u>BREL</u>		SDG/AR/COC/Work Order: <u>37801</u>
Received By: <u>cey</u>		Date Received: <u>06/03/16</u>
Suspected Hazard Information	Yes ☐ No ☒	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?	☒	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): <u>0cpm</u>
Classified Radioactive II or III by RSO?	☒	If yes, Were swipes taken of sample containers < action levels?
COC/Samples marked containing PCBs?	☒	
Package, COC, and/or Samples marked as beryllium or asbestos containing?	☒	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group
Shipped as a DOT Hazardous?	☒	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?	☒	

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	☒			Preservation Method: Ice bags Blue ice Dry ice <u>None</u> Other (describe) *all temperatures are recorded in Celsius <u>22°C</u>
2a Daily check performed and passed on IR temperature gun?	☒			Temperature Device Serial #: <u>E5102009184</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	☒			<u>copy of COC (NOT original)</u>
4 Sample containers intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	☒			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	☒			Sample ID's and containers affected:
7 VOA vials contain acid preservation?	☒			(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	☒			Sample ID's and containers affected:
9 Are Encore containers present?	☒			(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	☒			ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	☒			Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	☒			Sample ID's affected:
13 Number of containers received match number indicated on COC?	☒			Sample ID's affected: <u>see continuation form</u>
14 Are sample containers identifiable as GEL provided?	☒			
15 COC form is properly signed in relinquished/received sections?	☒			
16 Carrier and tracking number.				Circle Applicable: FedEx Air <u> </u> FedEx Ground <u> </u> UPS <u> </u> Field Services <u> </u> Courier <u> </u> Other <u> </u> <u>6583 1847 8194</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials

Date

6/3/16

Page

of

2

Client: BKRL Received By: cay Date Received: 06/03/16 SDG/AR/COC/Work Order: 37801

Containers Received on 06/03/16:

B811-SU-1-1

B811-SU-1-2

B811-SU-1-3

B811-SU-1-4

B811-SU-1-5

B811-SU-1-comp1

B811-SU-1-6

B811-SU-1-7

B811-SU-1-8

B811-SU-1-9

B811-SU-1-10

B811-SU-1-11

B811-SU-1-comp2

B811-SU-1-12

B811-SU-1-13

B811-SU-1-15

B811-SU-1-16

B811-SU-1-comp3

B811-SU-1-FD1

PM (or PMA) review: Initials EM Date 6/3/16 Page 2 of 2



SAMPLING CHAIN OF CUSTODY

398677

 Requires EDD

Analysis Requested By						Sampling Contractor			Analytical Laboratory
Name:	W. Dorsch			Name:	P.W. Grosser Consulting		Name:	GEL	
Life No:	21133		Ext.	Contact:	Andy Lockwood		Address:		
Acct. No:	20802/20804		Dept.	Phone:	631-589-6353		City:	Sr Zip:	
			Email Reports To:	Email/Fax:	andy@pwgrosser.com		Contact:		
	ILW Dorsch			Sampler:	A. Lockwood		Phone:		
	A. Lockwood				B. Barath		Email/Fax:		
	Project Name:			Project Manager:			Field Engineer:		
	Bldg #11-FSS Sampling				A. Lockwood			B. Barath	

Time	Comments
	Hardcopy to John Burke

Type			Sample Information			Additional Sample Information		
UID	Site ID/Bldg/Life #	Depth/RVP	Date	Time	Name/Description	Cont. Vol./Units	Cont. Type	Preservative
001E6	B811-SU-7-7	0-0.5'	5/11/16	1000	S	Bldg 811 FSS Soil Sampling	500ml	CG
002	-2			1005				
003	-3			1010				
004	-4			1015				
005	-5			1019				
006	B811-SU-7-Comp1			1024				
007	-6			1030				
008	-7			1035				
009	-8			1040				
010	-9			1050				
011	-10			1055				
012	-11			1100				
013	B811-SU-7-Comp2			1103				
014	B811-SU-7-12			1110				

[illegible]

1 Relinquished By/Date/Time	2 Relinquished By/Date/Time	3 Relinquished By/Date/Time
Print Andrew Lockwood	Print T. R. R. 6-2-16	Print R. M. R. 6/2/16
Signature [Signature]	Signature [Signature] 10:30	Signature [Signature] 13:30
1 Relinquished By/Date/Time	2 Relinquished By/Date/Time	3 Relinquished By/Date/Time
Print T. R. R. 5-11-16	Print R. M. R. 6/2/16	Print T. R. R. 6/6/16
Signature [Signature] 14:00	Signature [Signature] 10:30	Signature [Signature] 9:15

Contractor Lab Sample Disposal:	
☐ Return To Client	☒ Disposal by Lab
☐ Archive For _____ Months	

Data Package:	
☒ Full	☐ Summary

Turn-Around Time Required:	
☐ Rush (1 Day)	☒ 14 Days
☐ 7 Days	☐ Other ()

Requires EDD ☒

SAMPLING CHAIN OF CUSTODY

Analysis Requested By				Sampling Contractor				Analytical Laboratory			
Name:				Name:				Name:			
Life: No:				Contact:				Address:			
Ext:				Phone:				City:			
Dept:				Email/Fax:				St:			
Acct. No:				Sampler:				Zip:			
1				Project Name:				Project Manager:			
2				Field Engineer:							

Comments:

Type	Site ID/Log/Life #	Depth/RWP	Date	Time	Name/Description	Cont. Vol/Units	Cont. Type	Preservative
015	E6 B811-SU-1-13	0-0.5	5/11/16	1115	S Bldg 811 FSS Soil Sampling	500 ml	66	71
016	-14			1120				71
017	-15 (MS/MSD)			1125				71
018	-16			1135				71
019	C B811-SU-1-Comp3			1140				71
020	C B811-SU-1-FD 7			0000				71
021	B811-SU-2-1			1430				71
022	-2			1420				71
023	-3			1410				71
024	-4			1357				71
125	-5			1351				71
026	C B811-SU-2-Comp4			1435				71
027	C B811-SU-2-6			1455				71
028	-7			1450				71

1 Relinquished By/Date/Time		2 Relinquished By/Date/Time		3 Relinquished By/Date/Time	
Print	Signature	Print	Signature	Print	Signature
Relinquished by: [Signature]	[Signature]	Relinquished by: [Signature]	[Signature]	Relinquished by: [Signature]	[Signature]
Received By/Date/Time	Received By/Date/Time	Received By/Date/Time	Received By/Date/Time	Received By/Date/Time	Received By/Date/Time
12/14/015	12/14/015	6/2/16	6/2/16	6/2/16	6/2/16
Signature	Signature	Signature	Signature	Signature	Signature
[Signature]	[Signature]	[Signature]	[Signature]	[Signature]	[Signature]

Contractor Lab Sample Disposal:	
☐ Return To Client	☒ Disposal by Lab
☐ Archive For	Month
Data Package: ☒ Full ☐ Summary	
Turn-Around Time Required:	
☐ Rush (1 Day)	☐ 14 Days
☐ 7 Days	☒ 30 Days

Chain of Custody No.

~~Requires EDD~~

SAMPLING CHAIN OF CUSTODY

Analysis Requested By		Sampling Contractor		Analytical Laboratory	
Name:		Name:		Name:	
Life: No:	Ext:	Contact:		Address:	
Acct No:	Dept:	Phone:		City:	St: Zip:
	Email Reports To:	Email/Fax:		Contact:	
1		Sampler:		Phone:	
2				Email/Fax:	
Project Name:		Project Manager:		Field Engineer:	

Comments:

Type		Sample Information				Additional Sample Information				
UID	Smp Col	Site ID/Btgr/Life #	Depth/RVP	Date	Time	Metric	Name/Description	Cont. Vol/Units	Cont. Type	Preservative
0291	F6	B811-SV-2-8	0-0.5	5/11/16	1445	S	Bldg 811 Pss Soil Sampling	500ml	P	Z1
0300		-9			1440					Z1
0301		-10 (4/4/150)			1510					Z1
0302		-11			1505					Z1
0303		B811-SV-2-Comp 5			1515					Z1
0304		B811-SV-2-12			1500					
0305		-13			1535					
0306		-14			1530					
0307		-15			1525					
0308		-16			1520					
0309		B811-SV-2-Comp 6			1540					
0340		B811-SV-2-FDZ			0000					

[illegible]

Relinquished By/Date/Time	Relinquished By/Date/Time	Relinquished By/Date/Time	Relinquished By/Date/Time
Print Andrew Lukens	Print 11/16/16	Print K. Mer 6/2/16	Print
Signature [Signature]	Signature 11/16/16	Signature [Signature]	Signature
Relinquished By/Date/Time	Relinquished By/Date/Time	Relinquished By/Date/Time	Relinquished By/Date/Time
Print 11/16/16	Print R. Mer 6/2/16	Print Joe Vorshman 6/2/16	Print
Signature [Signature]	Signature [Signature]	Signature [Signature]	Signature

Contractor Lab Sample Disposal:

☒ Return To Client ☒ Disposal by Lab

☐ Archive For _____ Months

Data Package: ☒ Full ☐ Summary

Turn-Around Time Required:

☐ Rush (1 Day) ☐ 14 Days ☒ 30 Days

☐ 7 Days ☐ Other (_____)

SAMPLE RECEIPT & REVIEW FORM

Client: BRKL			SDG/AR/COC/Work Order:		
Received By: Zhu			Date Received: 6/6/16		
Suspected Hazard Information		Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
COC/Samples marked as radioactive?			☒	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0cpm	
Classified Radioactive II or III by RSO?			☒	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?			☒		
Package, COC, and/or Samples marked as beryllium or asbestos containing?			☒	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?			☒	Hazard Class Shipped: UN#:	
Samples identified as Foreign Soil?			☒		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*			☒	Preservation Method: Ice bags Blue ice Dry ice <u>(None)</u> Other (describe) 21°C *all temperatures are recorded in Celsius
2a Daily check performed and passed on IR temperature gun?	☒			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): E5032015030
3 Chain of custody documents included with shipment?	☒			
4 Sample containers intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?			☒	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?			☒	Sample ID's and containers affected:
7 VOA vials contain acid preservation?			☒	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?			☒	Sample ID's and containers affected:
9 Are Encore containers present?			☒	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	☒			ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	☒			Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	☒			Sample ID's affected:
13 Number of containers received match number indicated on COC?			☒	Sample ID's affected: Rec'd Missing Samples on Friday 6/3 See note from SRR from 6/3 for list.
14 Are sample containers identifiable as GEL provided?			☒	
15 COC form is properly signed in relinquished/received sections?	☒			
16 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 6503 4047 8209

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials **ENK** Date **6/7/16** Page **1** of **1**

Subject: Re: Missing Cooler - 37801

From: Edie Kent <emk@gel.com>

Date: 6/6/2016 10:23 AM

To: "Burke, John" <jburke@bnl.gov>, "team.kent" <team.kent@gel.com>, "Lettieri, Lawrence L" <llettieri@bnl.gov>, "Lagattolla, Richard" <rlagattolla@bnl.gov>, Jim Milligan <milligan@bnl.gov>, "Metz, Robert" <bmetz@bnl.gov>, Andy Lockwood <lockwood@bnl.gov>

Additionally, two of the three containers for sample B8110SU-1-15 were in the missing cooler. Since we cannot log that one sample with two separate dates and times of receipt, all 3 containers will show a receipt date and time of June 3, 2016. The missing cooler was received today. All other samples in the missing cooler will show a receipt date and time of today.

Edie

On 6/3/2016 12:55 PM, Edie Kent wrote:

We are missing the following samples from COC 37801:

B811-SU-1-14

B811-SU-2 - all samples

We should receive the missing cooler either tomorrow or Monday.

Edie

--

Edith M. Kent
Project Manager
GEL Laboratories, LLC
2040 Savage Road
Charleston, SC (USA) 29407
Direct: 843.769.7385
Main: 843.556.8171 x4453
Fax: 843.766.1178
E-mail: emk@gel.com
Team E-mail: team.kent@gel.com
Web: www.gel.com

Work Order Containers

Sample ID: 398677001
Client Sample ID: 37801-001
Description: B811-SU-1-1 Soil

Label: 398677001.01	Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677001.01.01	Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677001.01.02	Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677002
Client Sample ID: 37801-002
Description: B811-SU-1-2 Soil

Label: 398677002.01	Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677002.01.01	Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677002.01.02	Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Work Order Containers

Sample ID: 398677003
Client Sample ID: 37801-003
Description: B811-SU-1-3 Soil

Label: 398677003.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677003.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677003.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Sample ID: 398677004
Client Sample ID: 37801-004
Description: B811-SU-1-4 Soil

Label: 398677004.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677004.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677004.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Work Order Containers

Sample ID: 398677005
Client Sample ID: 37801-005
Description: B811-SU-1-5 Soil

Label: 398677005.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle		Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill		Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill		Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter		Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause		Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677005.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps		Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps		Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677005.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell		Transferred custody to batch 1575830
24-JUN-16 12:05:06	Kelli Dorrell		Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677006
Client Sample ID: 37801-006
Description: B811-SU-1-Comp1 Soil

Label: 398677006.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle		Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill		Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill		Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter		Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause		Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677006.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps		Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps		Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677006.01.02		Type: Dried Other	
20-JUN-16 12:02:22	John Poretto		Transferred custody to batch 1572839
20-JUN-16 12:02:22	John Poretto		Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory
20-JUN-16 12:06:36	John Poretto		Transferred custody to batch 1572840
24-JUN-16 12:05:06	Kelli Dorrell		Transferred custody to batch 1575830

Work Order Containers

Sample ID: 398677007
Client Sample ID: 37801-007
Description: B811-SU-1-6 Soil

Label: 398677007.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677007.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677007.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Sample ID: 398677008
Client Sample ID: 37801-008
Description: B811-SU-1-7 Soil

Label: 398677008.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677008.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677008.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Work Order Containers

Sample ID: 398677009
Client Sample ID: 37801-009
Description: B811-SU-1-8 Soil

Label: 398677009.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677009.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677009.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Sample ID: 398677010
Client Sample ID: 37801-010
Description: B811-SU-1-9 Soil

Label: 398677010.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677010.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677010.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Work Order Containers

Sample ID: 398677011
Client Sample ID: 37801-011
Description: B811-SU-1-10 Soil

Label: 398677011.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677011.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677011.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Sample ID: 398677012
Client Sample ID: 37801-012
Description: B811-SU-1-11 Soil

Label: 398677012.01		Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204	
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677012.01.01		Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231	
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677012.01.02		Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830	
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Work Order Containers

Sample ID: 398677013
Client Sample ID: 37801-013
Description: B811-SU-1-Comp2 Soil

Label: 398677013.01	Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677013.01.01	Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677013.01.02	Type: Dried Other	
20-JUN-16 12:02:36	John Poretto	Transferred custody to batch 1572839
20-JUN-16 12:02:36	John Poretto	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory
20-JUN-16 12:06:36	John Poretto	Transferred custody to batch 1572840
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830

Sample ID: 398677014
Client Sample ID: 37801-014
Description: B811-SU-1-12 Soil

Label: 398677014.01	Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677014.01.01	Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677014.01.02	Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Work Order Containers

Sample ID: 398677015
 Client Sample ID: 37801-015
 Description: B811-SU-1-13 Soil

Label: 398677015.01	Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677015.01.01	Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677015.01.02	Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677016
 Client Sample ID: 37801-017
 Description: B811-SU-1-15 (MS/MSD) Soil

Label: 398677016.01	Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677016.01.01	Type: Gamma Can	
08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677016.01.02	Type: Dried Other	
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory
Label: 398677016.02	Type: Glass 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:49	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler

Work Order Containers

Sample ID: 398677016
Client Sample ID: 37801-017
Description: B811-SU-1-15 (MS/MSD) Soil

Label: 398677016.03 **Type:** Glass 500 ml

06-JUN-16 11:14:49 Zachary Worsham

Preservative: 4C (no chemical preservation)

Changed sample location from Barcode Generated to Main Cooler

Sample ID: 398677017
Client Sample ID: 37801-018
Description: B811-SU-1-16 Soil

Label: 398677017.01 **Type:** Glass 500 ml

03-JUN-16 13:49:30 Chelsea Seagle

06-JUN-16 02:19:56 Lisa Trill

06-JUN-16 02:19:56 Lisa Trill

06-JUN-16 09:51:46 Christine Carter

06-JUN-16 12:09:42 Caroline Gause

Preservative: 4C (no chemical preservation)

Changed sample location from Barcode Generated to Main Cooler

Transferred custody to batch 1572204

Changed sample location from Main Cooler to Radiochemistry Soil Preparation

Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples

Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Label: 398677017.01.01 **Type:** Gamma Can

08-JUN-16 11:28:49 Maggie Stamps

08-JUN-16 11:28:49 Maggie Stamps

Transferred custody to batch 1572231

Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677017.01.02 **Type:** Dried Other

24-JUN-16 12:05:06 Kelli Dorrell

24-JUN-16 12:05:06 Kelli Dorrell

Transferred custody to batch 1575830

Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677018
Client Sample ID: 37801-019
Description: B811-SU-1-Comp3 Soil

Label: 398677018.01 **Type:** Glass 500 ml

03-JUN-16 13:49:30 Chelsea Seagle

06-JUN-16 02:19:56 Lisa Trill

06-JUN-16 02:19:56 Lisa Trill

06-JUN-16 09:51:46 Christine Carter

06-JUN-16 12:09:42 Caroline Gause

Preservative: 4C (no chemical preservation)

Changed sample location from Barcode Generated to Main Cooler

Transferred custody to batch 1572204

Changed sample location from Main Cooler to Radiochemistry Soil Preparation

Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples

Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Label: 398677018.01.01 **Type:** Gamma Can

08-JUN-16 11:28:49 Maggie Stamps

08-JUN-16 11:28:49 Maggie Stamps

Transferred custody to batch 1572231

Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Work Order Containers

Sample ID: 398677018
Client Sample ID: 37801-019
Description: B811-SU-1-Comp3 Soil

Label: 398677018.01.02 **Type:** Dried Other

20-JUN-16 12:02:48	John Poretto	Transferred custody to batch 1572839
20-JUN-16 12:02:48	John Poretto	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory
20-JUN-16 12:06:36	John Poretto	Transferred custody to batch 1572840
24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830

Sample ID: 398677019
Client Sample ID: 37801-020
Description: B811-SU-1-FD1 Soil

Label: 398677019.01 **Type:** Glass 500 ml

Preservative: 4C (no chemical preservation)

03-JUN-16 13:49:30	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:19:56	Lisa Trill	Transferred custody to batch 1572204
06-JUN-16 02:19:56	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Label: 398677019.01.01 **Type:** Gamma Can

08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677019.01.02 **Type:** Dried Other

24-JUN-16 12:05:06	Kelli Dorrell	Transferred custody to batch 1575830
24-JUN-16 12:05:06	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677020
Client Sample ID: 37801-016
Description: B811-SU-1-14 Soil

Label: 398677020.01 **Type:** Glass 500 ml

Preservative: 4C (no chemical preservation)

06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Work Order Containers

Sample ID: 398677020
Client Sample ID: 37801-016
Description: B811-SU-1-14 Soil

Label: 398677020.01.01 **Type: Gamma Can**

08-JUN-16 11:28:49	Maggie Stamps	Transferred custody to batch 1572231
08-JUN-16 11:28:49	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677020.01.02 **Type: Dried Other**

24-JUN-16 12:05:07	Kelli Dorrell	Transferred custody to batch 1575830
24-JUN-16 12:05:07	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677021
Client Sample ID: 37801-021
Description: B811-SU-2-1 Soil

Label: 398677021.01 **Type: Plastic 500 ml** **Preservative: 4C (no chemical preservation)**

06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Label: 398677021.01.01 **Type: Gamma Can**

08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677021.01.02 **Type: Dried Other**

24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677022
Client Sample ID: 37801-022
Description: B811-SU-2-2 Soil

Label: 398677022.01 **Type: Plastic 500 ml** **Preservative: 4C (no chemical preservation)**

06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Work Order Containers

Sample ID: 398677022
Client Sample ID: 37801-022
Description: B811-SU-2-2 Soil

Label: 398677022.01.01 Type: Gamma Can

08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677022.01.02 Type: Dried Other

24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677023
Client Sample ID: 37801-023
Description: B811-SU-2-3 Soil

Label: 398677023.01 Type: Plastic 500 ml Preservative: 4C (no chemical preservation)

06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Label: 398677023.01.01 Type: Gamma Can

08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677023.01.02 Type: Dried Other

24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677024
Client Sample ID: 37801-024
Description: B811-SU-2-4 Soil

Label: 398677024.01 Type: Plastic 500 ml Preservative: 4C (no chemical preservation)

06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Work Order Containers

Sample ID: 398677024
Client Sample ID: 37801-024
Description: B811-SU-2-4 Soil

Label: 398677024.01.01 Type: Gamma Can

08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677024.01.02 Type: Dried Other

24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677025
Client Sample ID: 37801-025
Description: B811-SU-2-5 Soil

Label: 398677025.01 Type: Plastic 500 ml Preservative: 4C (no chemical preservation)

06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Label: 398677025.01.01 Type: Gamma Can

08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room

Label: 398677025.01.02 Type: Dried Other

24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677026
Client Sample ID: 37801-026
Description: B811-SU-2-Comp4 Soil

Label: 398677026.01 Type: Plastic 500 ml Preservative: 4C (no chemical preservation)

06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler

Work Order Containers

Sample ID: 398677026
Client Sample ID: 37801-026
Description: B811-SU-2-Comp4 Soil

Label: 398677026.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677026.01.02	Type: Dried Other	
20-JUN-16 12:02:55	John Poretto	Transferred custody to batch 1572839
20-JUN-16 12:02:55	John Poretto	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory
20-JUN-16 12:06:36	John Poretto	Transferred custody to batch 1572840
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872

Sample ID: 398677027
Client Sample ID: 37801-027
Description: B811-SU-2-6 Soil

Label: 398677027.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677027.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677027.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677028
Client Sample ID: 37801-028
Description: B811-SU-2-7 Soil

Label: 398677028.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation

Work Order Containers

Sample ID: 398677028
Client Sample ID: 37801-028
Description: B811-SU-2-7 Soil

Label: 398677028.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677028.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677028.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677029
Client Sample ID: 37801-029
Description: B811-SU-2-8 Soil

Label: 398677029.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677029.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677029.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677030
Client Sample ID: 37801-030
Description: B811-SU-2-9 Soil

Label: 398677030.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469

Work Order Containers

Sample ID: 398677030
Client Sample ID: 37801-030
Description: B811-SU-2-9 Soil

Label: 398677030.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677030.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677030.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677031
Client Sample ID: 37801-031
Description: B811-SU-2-10(MS/MSD) Soil

Label: 398677031.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677031.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677031.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory
Label: 398677031.02	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
Label: 398677031.03	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler

Work Order Containers

Sample ID: 398677032
Client Sample ID: 37801-032
Description: B811-SU-2-11 Soil

Label: 398677032.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469	
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677032.01.01		Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486	
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677032.01.02		Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872	
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Sample ID: 398677033
Client Sample ID: 37801-033
Description: B811-SU-2-Comp5 Soil

Label: 398677033.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469	
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677033.01.01		Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486	
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677033.01.02		Type: Dried Other	
20-JUN-16 12:03:41	John Poretto	Transferred custody to batch 1572839	
20-JUN-16 12:03:41	John Poretto	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	
20-JUN-16 12:06:36	John Poretto	Transferred custody to batch 1572840	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872	

Work Order Containers

Sample ID: 398677034
Client Sample ID: 37801-034
Description: B811-SU-2-12 Soil

Label: 398677034.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677034.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677034.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677035
Client Sample ID: 37801-035
Description: B811-SU-2-13 Soil

Label: 398677035.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677035.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677035.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Work Order Containers

Sample ID: 398677036
Client Sample ID: 37801-036
Description: B811-SU-2-14 Soil

Label: 398677036.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469	
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677036.01.01		Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486	
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677036.01.02		Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872	
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Sample ID: 398677037
Client Sample ID: 37801-037
Description: B811-SU-2-15 Soil

Label: 398677037.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469	
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677037.01.01		Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486	
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677037.01.02		Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872	
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Work Order Containers

Sample ID: 398677038
Client Sample ID: 37801-038
Description: B811-SU-2-16 Soil

Label: 398677038.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677038.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677038.01.02	Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398677039
Client Sample ID: 37801-039
Description: B811-SU-2-Comp6 Soil

Label: 398677039.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:07:19	Christine Carter	Transferred custody to batch 1572469
06-JUN-16 14:07:19	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398677039.01.01	Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398677039.01.02	Type: Dried Other	
20-JUN-16 12:03:51	John Poretto	Transferred custody to batch 1572839
20-JUN-16 12:03:51	John Poretto	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory
20-JUN-16 12:06:36	John Poretto	Transferred custody to batch 1572840
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872

Work Order Containers

Sample ID: 398677040
Client Sample ID: 37801-040
Description: B811-SU-2-FD2 Soil

Label: 398677040.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:14:10	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 14:09:35	Christine Carter	Transferred custody to batch 1572470	
06-JUN-16 14:09:35	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398677040.01.01		Type: Gamma Can	
08-JUN-16 13:02:58	Maggie Stamps	Transferred custody to batch 1572486	
08-JUN-16 13:02:58	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398677040.01.02		Type: Dried Other	
24-JUN-16 12:06:36	Kelli Dorrell	Transferred custody to batch 1575872	
24-JUN-16 12:06:36	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory	

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: BRKL

Qualifier	Qualifier Definition	Department	Fraction
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.		
J	Value is estimated		
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The target analyte was detected in the associated blank.	Organics	
E	Concentration of the target analyte exceeds the instrument calibration range	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Metals--The Matrix spike sample recovery is not within specified control limits	Inorganics	
*	A quality control analyte recovery is outside of specified acceptance criteria		
N	Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor	Organics	Semi-Volatile
H	Analytical holding time was exceeded		
**	Analyte is a surrogate compound	Organics	
<	Result is less than value reported		
>	Result is greater than value reported		
UI	Gamma Spectroscopy--Uncertain identification	Radiological	
BD	Results are either below the MDC or tracer recovery is low	Radiological	
h	Preparation or preservation holding time was exceeded		
R	Sample results are rejected		
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.	General Chemistry	General Chem
d	5-day BOD--The 2:1 depletion requirement was not met for this sample	General Chemistry	
B	Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL	Inorganics	Metals
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.		
D	Results are reported from a diluted aliquot of the sample	Organics	
N/A	RPD or %Recovery limits do not apply.		
ND	Analyte concentration is not detected above the detection limit		
E	%difference of sample and SD is >10%. Sample concentration must meet flagging criteria	Inorganics	Metals
M	M if above MDC and less than LLD	Radiological	
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
FA	Failed analysis.	Radiological	Bioassay
M	REMP Result > MDC/CL and < RDL	Radiological	
E	General Chemistry--Concentration of the target analyte exceeds the instrument calibration range	General Chemistry	General Chem
JNX	Non Calibrated Compound	Organics	Volatile

Project Specific Qualifier Definitions for GEL Client Code: **BRKL**

Qualifier	Qualifier Definition	Department	Fraction
UJ	Compound cannot be extracted	Organics	Semi-Volatile
UJ	Gamma Spectroscopy--Uncertain identification	Radiological	Rad
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.		
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.	Radiological	
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.	Radiological	
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.	Radiological	
FB	Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies	Inorganics	Metals
N1	See case narrative		
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.	Inorganics	
Y	QC Samples were not spiked with this compound	Organics	
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.	General Chemistry	General Chem
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.	Radiological	Rad
**	Analyte is a Tracer compound	Radiological	
B	The target analyte was detected in the associated blank.	General Chemistry	
N	Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor	Organics	Volatile
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes	General Chemistry	General Chem

Data Review Qualifier Definitions

Qualifier Explanation

*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

- P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Laboratory Certifications

List of current GEL Certifications as of 29 June 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
Brookhaven National Laboratory (BRKL)
SDG #: 37801
Work Order #: 398677**

Method/Analysis Information

Product: Alphaspec Pu, Solid

Analytical Method: DOE EML HASL-300, Pu-11-RC Modified

Prep Method: Dry Soil Prep

Analytical Batch Number: 1572839

Prep Batch Number: 1572204

Sample ID	Client ID
398677006	37801-006
398677013	37801-013
398677018	37801-019
398677026	37801-026
398677033	37801-033
398677039	37801-039
1203562981	Method Blank (MB)
1203562983	Laboratory Control Sample (LCS)
1203562982	398677006(37801-006) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398677006 (37801-006).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 398677006 (37801-006) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Alphaspec U, Solid
Analytical Method:	DOE EML HASL-300, U-02-RC Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1572840
Prep Batch Number:	1572204

Sample ID	Client ID
398677006	37801-006
398677013	37801-013
398677018	37801-019
398677026	37801-026
398677033	37801-033
398677039	37801-039
1203562984	Method Blank (MB)
1203562986	Laboratory Control Sample (LCS)
1203562985	398677006(37801-006) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-011 REV# 26.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398677006 (37801-006).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

Sample 1203562986 (LCS) was recounted due to a peak shift. The recount is reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	Gammasec, Gamma, Solid
Analytical Method:	DOE HASL 300, 4.5.2.3/Ga-01-R
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1572231
Prep Batch Number:	1572204

Sample ID	Client ID
398677001	37801-001
398677002	37801-002
398677003	37801-003
398677004	37801-004
398677005	37801-005
398677006	37801-006
398677007	37801-007
398677008	37801-008
398677009	37801-009
398677010	37801-010
398677011	37801-011
398677012	37801-012
398677013	37801-013
398677014	37801-014
398677015	37801-015
398677016	37801-017
398677017	37801-018

398677018	37801-019
398677019	37801-020
398677020	37801-016
1203561373	Method Blank (MB)
1203561375	Laboratory Control Sample (LCS)
1203561374	398677016(37801-017) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398677016 (37801-017).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to low abundance.	Radium-226	398677002	37801-002
			398677018	37801-019

Method/Analysis Information

Product:	Gammasec, Gamma, Solid
Analytical Method:	DOE HASL 300, 4.5.2.3/Ga-01-R
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1572486
Prep Batch Number:	1572469

Sample ID	Client ID
398677021	37801-021
398677022	37801-022
398677023	37801-023
398677024	37801-024
398677025	37801-025
398677026	37801-026
398677027	37801-027
398677028	37801-028
398677029	37801-029
398677030	37801-030
398677031	37801-031
398677032	37801-032
398677033	37801-033
398677034	37801-034
398677035	37801-035
398677036	37801-036
398677037	37801-037
398677038	37801-038
398677039	37801-039
398677040	37801-040

1203561990	Method Blank (MB)
1203561992	Laboratory Control Sample (LCS)
1203561991	398677031(37801-031) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the duplicate, 1203561991 (37801-031DUP) and 398677021 (37801-021), did not meet the relative percent difference requirement for K-40; however, they do meet the relative error ratio requirement with a value of 1.74

Designated QC

The following sample was used for QC: 398677031 (37801-031).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	GFPC, Sr90, solid
Analytical Method:	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
Prep Method:	Dry Soil Prep
Analytical Batch Number:	1575872
Prep Batch Number:	1572469

Sample ID	Client ID
398677021	37801-021
398677022	37801-022
398677023	37801-023
398677024	37801-024
398677025	37801-025
398677026	37801-026
398677027	37801-027
398677028	37801-028
398677029	37801-029
398677030	37801-030
398677031	37801-031
398677032	37801-032
398677033	37801-033
398677034	37801-034
398677035	37801-035
398677036	37801-036
398677037	37801-037
398677038	37801-038
398677039	37801-039
398677040	37801-040
1203570890	Method Blank (MB)
1203570894	Laboratory Control Sample (LCS)
1203570891	398677031(37801-031) Sample Duplicate (DUP)
1203570892	398677031(37801-031) Matrix Spike (MS)
1203570893	398677031(37801-031) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398677031 (37801-031).

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

Sample 398677023 (37801-023) was recounted due to high MDC. The recount is reported. Samples 398677027 (37801-027) and 398677040 (37801-040) were recounted due to results more negative than the three sigma TPU. The second counts are reported. Sample 398677030 (37801-030) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, solid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Prep Method: Dry Soil Prep

Analytical Batch Number: 1578836

Prep Batch Number: 1572204

Sample ID	Client ID
398677001	37801-001
398677002	37801-002
398677003	37801-003
398677004	37801-004
398677005	37801-005
398677006	37801-006
398677007	37801-007
398677008	37801-008
398677009	37801-009
398677010	37801-010
398677011	37801-011
398677012	37801-012
398677013	37801-013
398677014	37801-014
398677015	37801-015
398677016	37801-017
398677017	37801-018
398677018	37801-019
398677019	37801-020
398677020	37801-016
1203578113	Method Blank (MB)
1203578117	Laboratory Control Sample (LCS)
1203578114	398677016(37801-017) Sample Duplicate (DUP)
1203578115	398677016(37801-017) Matrix Spike (MS)
1203578116	398677016(37801-017) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398677016 (37801-017).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

Samples were re-prepped due to high relative percent difference/relative error ratio. The re-analysis is being reported.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

Samples 398677012 (37801-012) and 398677016 (37801-017) were recounted due to a suspected false positive. The recounts are reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: LSC, Tritium Dist, Solid

Analytical Method: EPA 906.0 Modified

Analytical Batch Number: 1578004

Sample ID	Client ID
398677006	37801-006
398677013	37801-013
398677018	37801-019
398677026	37801-026
398677033	37801-033
398677039	37801-039
1203576084	Method Blank (MB)
1203576087	Laboratory Control Sample (LCS)
1203576085	398677006(37801-006) Sample Duplicate (DUP)
1203576086	398677006(37801-006) Matrix Spike (MS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-002 REV# 21.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:**Blank Information**

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398677006 (37801-006).

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

BRKL007 Brookhaven National Laboratory (310464)

Client SDG: 37801 GEL Work Order: 398677

The Qualifiers in this report are defined as follows:

J Estimated value; the result was greater than the MDA but less than the required detection limit.

U Undetected; sample result < MDA

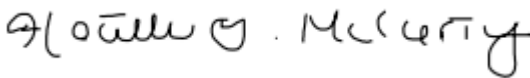
UI Uncertain identification for gamma spectroscopy.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature:



Name: Heather McCarty

Date: 05 JUL 2016

Title: Analyst II

Moisture LogBook

Batch: 1572204

Analyst: CXC1

Date/Time: 06-JUN-2016

Procedure Code ____PREPD

Procedure Description Dry Soil Prep GL-RAD-A-021

Lab Sop: GL-RAD-A-021

Sample St

Sample Id

Rpd(%)

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
398677001	SAMPLE		SP-39020004	09:13	13.162	463.69	436.206	450.528	423.044	6.1
398677002	SAMPLE		SP-39020004	09:13	13.2	406.1	385.721	392.9	372.521	5.186
398677003	SAMPLE		SP-39020004	09:13	13.199	493.11	469.462	479.911	456.263	4.927
398677004	SAMPLE		SP-39020004	09:13	13.215	480.97	450.289	467.755	437.074	6.559
398677005	SAMPLE		SP-39020004	09:13	13.272	408.68	384.611	395.408	371.339	6.087
398677006	SAMPLE		SP-39020004	09:13	13.197	403.77	384.347	390.573	371.15	4.972
398677007	SAMPLE		SP-39020004	09:13	13.273	542.48	512.08	529.207	498.807	5.744
398677008	SAMPLE		SP-39020004	09:13	13.215	474.3	449.95	461.085	436.735	5.281
398677009	SAMPLE		SP-39020004	09:13	13.225	513.45	492.69	500.225	479.465	4.15
398677010	SAMPLE		SP-39020004	09:13	13.203	492.033	466.54	478.83	453.337	5.324
398677011	SAMPLE		SP-39020004	09:13	13.181	513.85	492.39	500.669	479.209	4.286
398677012	SAMPLE		SP-39020004	09:13	13.235	441.87	416.17	428.635	402.935	5.995
398677013	SAMPLE		SP-39020004	09:13	13.223	509.81	489.22	496.587	475.997	4.146
398677014	SAMPLE		SP-39020004	09:13	13.199	451.52	429.03	438.321	415.831	5.13
398677015	SAMPLE		SP-39020004	09:13	13.168	517.38	492.91	504.212	479.742	4.853
398677016	SAMPLE		SP-39020004	09:13	13.187	525.42	504.87	512.233	491.683	4.011
398677017	SAMPLE		SP-39020004	09:13	13.165	495.52	464.39	482.355	451.225	6.453
398677018	SAMPLE		SP-39020004	09:13	13.195	511.56	490.5	498.365	477.305	4.225
398677019	SAMPLE		SP-39020004	09:13	13.217	461.32	434.21	448.103	420.993	6.049

Comments:

A) Result = (Net Initial - Net Final) /Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Moisture LogBook

Batch: 1572469
Analyst: CXC1
Date/Time: 06-JUN-2016
Procedure Code ____PREPD
Procedure Description Dry Soil Prep GL-RAD-A-021
Lab Sop: GL-RAD-A-021

Sample St	Sample Id	Rpd(%)

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
398677020	SAMPLE		SP-39020004	14:16	13.198	545.5	520.69	532.302	507.492	4.66
398677021	SAMPLE		SP-39020004	14:16	13.168	504.39	475.97	491.222	462.802	5.785
398677022	SAMPLE		SP-39020004	14:16	13.187	462.91	443.51	449.723	430.323	4.313
398677023	SAMPLE		SP-39020004	14:16	13.192	549.34	441.35	536.148	428.158	20.141
398677024	SAMPLE		SP-39020004	14:16	13.185	532.28	500.92	519.095	487.735	6.041
398677025	SAMPLE		SP-39020004	14:16	13.175	478.43	454.79	465.255	441.615	5.081
398677026	SAMPLE		SP-39020004	14:16	13.169	442.07	416.63	428.901	403.461	5.931
398677027	SAMPLE		SP-39020004	14:16	13.179	409.06	390.86	395.881	377.681	4.597
398677028	SAMPLE		SP-39020004	14:16	13.166	641.13	587.94	627.964	574.774	8.47
398677029	SAMPLE		SP-39020004	14:16	13.168	474.77	450.1	461.602	436.932	5.344
398677030	SAMPLE		SP-39020004	14:16	13.138	388.02	374.7	374.882	361.562	3.553
398677031	SAMPLE		SP-39020004	14:16	13.19	416.76	398.67	403.57	385.48	4.482
398677032	SAMPLE		SP-39020004	14:16	13.163	364.22	343.27	351.057	330.107	5.967
398677033	SAMPLE		SP-39020004	14:16	13.15	401.08	384.95	387.93	371.8	4.157
398677034	SAMPLE		SP-39020004	14:16	13.184	337.15	320.88	323.966	307.696	5.022
398677035	SAMPLE		SP-39020004	14:16	13.174	500.71	477.84	487.536	464.666	4.69
398677036	SAMPLE		SP-39020004	14:16	13.191	481.64	462.09	468.449	448.899	4.173
398677037	SAMPLE		SP-39020004	14:16	13.188	468.33	445.3	455.142	432.112	5.059
398677038	SAMPLE		SP-39020004	14:16	13.207	473	404.71	459.793	391.503	14.852
398677039	SAMPLE		SP-39020004	14:16	13.242	429.32	410.94	416.078	397.698	4.417

Comments:

A) Result = (Net Initial - Net Final) /Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Moisture LogBook

Batch: 1572470
Analyst: CXC1
Date/Time: 06-JUN-2016
Procedure Code ____PREPD
Procedure Description Dry Soil Prep GL-RAD-A-021
Lab Sop: GL-RAD-A-021

Sample St Sample Id Rpd(%)

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
398677040	SAMPLE		SP-39020004	14:26	13.198	428.168	404.443	414.97	391.245	5.717
398732001	SAMPLE		SP-39020004	14:26	13.194	397.144	375.247	383.95	362.053	5.703
398732002	SAMPLE		SP-39020004	14:26	13.191	421.885	408.055	408.694	394.864	3.383
398732003	SAMPLE		SP-39020004	14:26	13.157	432.455	413.483	419.298	400.326	4.524

Comments:

A) $\text{Result} = (\text{Net Initial} - \text{Net Final}) / \text{Net Initial} * 100$

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-001	Project:	BRKL00701
Sample ID:	398677001	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:00	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.255	+/-0.395	0.823	0.100	pCi/g		MXR1	06/28/16	1311	1572231	1
Cesium-137		0.201	+/-0.047	0.0475		pCi/g						
Cobalt-57	U	0.00164	+/-0.0192	0.0372		pCi/g						
Cobalt-60	U	-0.00486	+/-0.030	0.0572		pCi/g						
Manganese-54	U	0.0312	+/-0.029	0.0653		pCi/g						
Potassium-40		4.95	+/-0.911	0.633		pCi/g						
Radium-226		0.472	+/-0.118	0.0996		pCi/g						
Sodium-22	U	-0.0382	+/-0.0325	0.0481		pCi/g						
Thorium-228		0.672	+/-0.095	0.0788		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.369	+/-0.716	1.28	2.00	pCi/g	KSD1	07/05/16	1033	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			82.8	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000
Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-002	Project:	BRKL00701
Sample ID:	398677002	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:05	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.0916	+/-0.514	1.02	0.100	pCi/g		MXR1	06/28/16	1250	1572231	1
Cesium-137		0.312	+/-0.0935	0.0729		pCi/g						
Cobalt-57	U	0.00573	+/-0.0221	0.0427		pCi/g						
Cobalt-60	U	0.00345	+/-0.038	0.0786		pCi/g						
Manganese-54	U	-0.0293	+/-0.0395	0.0558		pCi/g						
Potassium-40		4.81	+/-1.01	0.637		pCi/g						
Radium-226	UI	0.334	+/-0.124	0.239		pCi/g						
Sodium-22	U	0.0122	+/-0.0456	0.0941		pCi/g						
Thorium-228		0.703	+/-0.104	0.0898		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.724	+/-0.809	1.35	2.00	pCi/g	KSD1	07/05/16	1033	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-003	Project:	BRKL00701
Sample ID:	398677003	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:10	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-3
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.332	+/-0.449	0.941	0.100	pCi/g		MXR1	06/28/16	1251	1572231	1
Cesium-137		0.668	+/-0.0977	0.0572		pCi/g						
Cobalt-57	U	0.021	+/-0.0221	0.0471		pCi/g						
Cobalt-60	U	-0.0179	+/-0.034	0.0614		pCi/g						
Manganese-54	U	-0.0184	+/-0.0375	0.0677		pCi/g						
Potassium-40		4.61	+/-1.02	0.729		pCi/g						
Radium-226		0.373	+/-0.122	0.121		pCi/g						
Sodium-22	U	0.00341	+/-0.0357	0.0735		pCi/g						
Thorium-228		0.589	+/-0.101	0.101		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.0135	+/-0.805	1.54	2.00	pCi/g	KSD1	07/05/16	1033	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			84.2	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-004	Project:	BRKL00701
Sample ID:	398677004	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:15	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.112	+/-0.914	1.45	0.100	pCi/g	MXR1	06/28/16	1307	1572231		1
Cesium-137		7.33	+/-0.272	0.0593		pCi/g						
Cobalt-57	U	-0.0112	+/-0.0267	0.0487		pCi/g						
Cobalt-60	U	0.0418	+/-0.0372	0.0859		pCi/g						
Manganese-54	U	0.016	+/-0.031	0.065		pCi/g						
Potassium-40		6.01	+/-1.03	0.577		pCi/g						
Radium-226		0.542	+/-0.155	0.159		pCi/g						
Sodium-22	U	-0.0219	+/-0.0367	0.0649		pCi/g						
Thorium-228		0.778	+/-0.147	0.132		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.58	+/-0.801	1.61	2.00	pCi/g	KSD1	07/05/16	1042	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			84.2	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-005	Project:	BRKL00701
Sample ID:	398677005	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:19	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-5
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.182	+/-0.923	1.71	0.100	pCi/g	MXR1	06/28/16	1307	1572231		1
Cesium-137		5.14	+/-0.263	0.0869		pCi/g						
Cobalt-57	U	0.0436	+/-0.0405	0.0719		pCi/g						
Cobalt-60	U	0.000984	+/-0.0478	0.092		pCi/g						
Manganese-54	U	-0.0292	+/-0.0501	0.0896		pCi/g						
Potassium-40		7.60	+/-1.15	0.663		pCi/g						
Radium-226		0.590	+/-0.215	0.195		pCi/g						
Sodium-22	U	-0.00553	+/-0.0521	0.0974		pCi/g						
Thorium-228		1.09	+/-0.144	0.141		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.196	+/-0.598	1.11	2.00	pCi/g	KSD1	07/05/16	1042	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			93.7	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-006	Project:	BRKL00701
Sample ID:	398677006	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:24	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-Comp1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0328	+/-0.145	0.379	1.00	pCi/g		KXB2	06/24/16	0857	1572839	1
Plutonium-239/240	U	0.00	+/-0.138	0.205	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U	0.179	+/-0.307	0.269	0.900	pCi/g		KXB2	06/23/16	0843	1572840	2
Uranium-238	J	0.511	+/-0.433	0.478	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammasspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.409	+/-0.660	1.30		pCi/g		MXR1	06/28/16	1308	1572231	3
Cesium-137		2.61	+/-0.170	0.0628	0.100	pCi/g						
Cobalt-57	U	-0.0034	+/-0.0283	0.0547		pCi/g						
Cobalt-60	U	0.0558	+/-0.0388	0.0642		pCi/g						
Manganese-54	U	-0.00729	+/-0.0337	0.0533		pCi/g						
Potassium-40		6.32	+/-0.959	0.582		pCi/g						
Radium-226		0.436	+/-0.118	0.136		pCi/g						
Sodium-22	U	-0.00293	+/-0.0416	0.0622		pCi/g						
Thorium-228		0.765	+/-0.113	0.111		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Sr90, solid "Dry Weight Corrected"												
Strontium-90	U	-0.178	+/-0.864	1.57	2.00	pCi/g		KSD1	07/05/16	1042	1578836	4
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	19.0	+/-74.6	131	300	pCi/g		CXS7	06/30/16	2116	1578004	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Contact: Upton, New York 11973--5000
Project: Mr. John Burke
Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID: 37801-006
Sample ID: 398677006

Project: BRKL00701
Client ID: BRKL007
37801
Samp Recv.:
Client Desc.: B811-SU-1-Comp1
Vol. Recv.:

The following Analytical Methods were performed:

Method	Description	Analyst Comments			
1	DOE EML HASL-300, Pu-11-RC Modified				
2	DOE EML HASL-300, U-02-RC Modified				
3	DOE HASL 300, 4.5.2.3/Ga-01-R				
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified				
5	EPA 906.0 Modified				
Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			87.6	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			99.4	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			84.2	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-007	Project:	BRKL00701
Sample ID:	398677007	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:30	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-6
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.199	+/-0.954	1.80		pCi/g		MXR1	06/28/16	1308	1572231	1
Cesium-137		2.47	+/-0.227	0.0879	0.100	pCi/g						
Cobalt-57	U	0.0329	+/-0.0334	0.0678		pCi/g						
Cobalt-60	U	0.0241	+/-0.0535	0.119		pCi/g						
Manganese-54	U	-0.0159	+/-0.0493	0.092		pCi/g						
Potassium-40		4.05	+/-1.28	1.05		pCi/g						
Radium-226		0.658	+/-0.236	0.232		pCi/g						
Sodium-22	U	-0.036	+/-0.0538	0.0935		pCi/g						
Thorium-228		0.747	+/-0.156	0.139		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.137	+/-0.567	1.18	2.00	pCi/g		KSD1	07/05/16	1042	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-008	Project:	BRKL00701
Sample ID:	398677008	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:35	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-7
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.141	+/-0.419	0.826	0.100	pCi/g		MXR1	06/28/16	1308	1572231	1
Cesium-137		0.414	+/-0.0884	0.0625		pCi/g						
Cobalt-57	U	0.00124	+/-0.0217	0.0415		pCi/g						
Cobalt-60	U	0.0189	+/-0.034	0.0744		pCi/g						
Manganese-54	U	-0.00457	+/-0.0348	0.0655		pCi/g						
Potassium-40		4.10	+/-0.947	0.630		pCi/g						
Radium-226		0.466	+/-0.103	0.100		pCi/g						
Sodium-22	U	-0.042	+/-0.0325	0.0469		pCi/g						
Thorium-228		0.681	+/-0.103	0.093		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	1.00	+/-0.881	1.41	2.00	pCi/g	KSD1	07/05/16	1042	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			84.2	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-009	Project:	BRKL00701
Sample ID:	398677009	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:40	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-8
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.183	+/-0.400	0.807	0.100	pCi/g		MXR1	06/28/16	1435	1572231	1
Cesium-137		0.255	+/-0.0726	0.0517		pCi/g						
Cobalt-57	U	0.00606	+/-0.021	0.0407		pCi/g						
Cobalt-60	U	-0.0143	+/-0.0299	0.0555		pCi/g						
Manganese-54	U	-0.00864	+/-0.0305	0.0573		pCi/g						
Potassium-40		5.45	+/-0.956	0.583		pCi/g						
Radium-226		0.319	+/-0.125	0.129		pCi/g						
Sodium-22	U	-0.00563	+/-0.0309	0.0613		pCi/g						
Thorium-228		0.646	+/-0.103	0.0883		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.212	+/-0.600	1.31	2.00	pCi/g	KSD1	07/05/16	1042	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			85.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-010	Project:	BRKL00701
Sample ID:	398677010	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:50	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-9
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.181	+/-0.431	0.773		pCi/g		MXR1	06/28/16	1435	1572231	1
Cesium-137		0.347	+/-0.0756	0.0612	0.100	pCi/g						
Cobalt-57	U	0.00384	+/-0.021	0.0409		pCi/g						
Cobalt-60	U	-0.00833	+/-0.030	0.0573		pCi/g						
Manganese-54	U	0.026	+/-0.0304	0.0662		pCi/g						
Potassium-40		5.93	+/-0.916	0.0991		pCi/g						
Radium-226		0.313	+/-0.142	0.120		pCi/g						
Sodium-22	U	0.0128	+/-0.0362	0.0755		pCi/g						
Thorium-228		0.638	+/-0.103	0.0969		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.233	+/-0.634	1.16	2.00	pCi/g		KSD1	07/05/16	1042	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-011	Project:	BRKL00701
Sample ID:	398677011	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 10:55	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-10
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.326	+/-0.544	1.13		pCi/g		MXR1	06/28/16	1435	1572231	1
Cesium-137	U	0.0664	+/-0.0768	0.0905	0.100	pCi/g						
Cobalt-57	U	0.0222	+/-0.0249	0.0506		pCi/g						
Cobalt-60	U	-0.0206	+/-0.0508	0.0955		pCi/g						
Manganese-54	U	0.00244	+/-0.0443	0.0885		pCi/g						
Potassium-40		5.84	+/-1.21	0.633		pCi/g						
Radium-226		0.389	+/-0.229	0.150		pCi/g						
Sodium-22	U	0.0366	+/-0.0509	0.114		pCi/g						
Thorium-228		0.709	+/-0.168	0.107		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.388	+/-0.998	1.90	2.00	pCi/g		KSD1	07/05/16	1042	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			93.7	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

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Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-012	Project:	BRKL00701
Sample ID:	398677012	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:00	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-11
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.317	+/-0.510	1.04	0.100	pCi/g		MXR1	06/28/16	1436	1572231	1
Cesium-137		0.359	+/-0.0829	0.0668		pCi/g						
Cobalt-57	U	0.00504	+/-0.0256	0.0502		pCi/g						
Cobalt-60	U	0.00413	+/-0.0319	0.066		pCi/g						
Manganese-54	U	0.00285	+/-0.039	0.0771		pCi/g						
Potassium-40		3.82	+/-1.19	0.787		pCi/g						
Radium-226		0.234	+/-0.190	0.153		pCi/g						
Sodium-22	U	0.0207	+/-0.0367	0.0794		pCi/g						
Thorium-228		0.675	+/-0.103	0.0984		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.37	+/-0.421	0.982	2.00	pCi/g		KSD1	07/05/16	1327	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			96.4	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-013	Project:	BRKL00701
Sample ID:	398677013	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:03	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-Comp2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0598	+/-0.181	0.507	1.00	pCi/g		KXB2	06/22/16	1442	1572839	1
Plutonium-239/240	U	-0.0797	+/-0.185	0.547	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U	0.107	+/-0.300	0.320	0.900	pCi/g		KXB2	06/23/16	0843	1572840	2
Uranium-238	U	0.328	+/-0.426	0.605	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammasspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.684	+/-0.774	0.747		pCi/g		MXR1	06/28/16	1436	1572231	3
Cesium-137		0.461	+/-0.109	0.0664	0.100	pCi/g						
Cobalt-57	U	0.00967	+/-0.0198	0.0381		pCi/g						
Cobalt-60	U	-0.00116	+/-0.0314	0.0636		pCi/g						
Manganese-54	U	0.0263	+/-0.0292	0.063		pCi/g						
Potassium-40		5.32	+/-1.05	0.698		pCi/g						
Radium-226		0.285	+/-0.159	0.124		pCi/g						
Sodium-22	U	-0.0201	+/-0.0384	0.0695		pCi/g						
Thorium-228		0.609	+/-0.0926	0.0861		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Sr90, solid "Dry Weight Corrected"												
Strontium-90	U	1.09	+/-0.851	1.33	2.00	pCi/g		KSD1	07/05/16	1117	1578836	4
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	60.4	+/-104	178	300	pCi/g		CXS7	06/30/16	2147	1578004	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000
Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID: 37801-013

Sample ID: 398677013

Project: BRKL00701

Client ID: BRKL007
37801

Samp Recv.:

Client Desc.: B811-SU-1-Comp2

Vol. Recv.:

The following Analytical Methods were performed:

Method	Description	Analyst Comments			
1	DOE EML HASL-300, Pu-11-RC Modified				
2	DOE EML HASL-300, U-02-RC Modified				
3	DOE HASL 300, 4.5.2.3/Ga-01-R				
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified				
5	EPA 906.0 Modified				
Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			88.3	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			83.9	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			77.4	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-014	Project:	BRKL00701
Sample ID:	398677014	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:10	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.183	+/-0.505	0.813	0.100	pCi/g		MXR1	06/28/16	1436	1572231	1
Cesium-137		0.937	+/-0.0954	0.0507		pCi/g						
Cobalt-57	U	0.00891	+/-0.025	0.0428		pCi/g						
Cobalt-60	U	-0.0109	+/-0.030	0.0555		pCi/g						
Manganese-54	U	0.0336	+/-0.0342	0.0652		pCi/g						
Potassium-40		5.28	+/-0.857	0.501		pCi/g						
Radium-226		0.323	+/-0.119	0.122		pCi/g						
Sodium-22	U	-0.0264	+/-0.0295	0.0481		pCi/g						
Thorium-228		0.557	+/-0.123	0.120		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.0624	+/-1.05	1.94	2.00	pCi/g	KSD1	07/05/16	1117	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			81.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-015	Project:	BRKL00701
Sample ID:	398677015	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:15	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-13
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.293	+/-0.516	1.04	0.100	pCi/g		MXR1	06/28/16	1437	1572231	1
Cesium-137		0.510	+/-0.0855	0.0669		pCi/g						
Cobalt-57	U	0.0117	+/-0.0257	0.0517		pCi/g						
Cobalt-60	U	-0.00628	+/-0.0344	0.0609		pCi/g						
Manganese-54	U	0.0391	+/-0.0335	0.0647		pCi/g						
Potassium-40		5.32	+/-0.923	0.443		pCi/g						
Radium-226		0.439	+/-0.132	0.128		pCi/g						
Sodium-22	U	-0.00999	+/-0.0416	0.0773		pCi/g						
Thorium-228		0.670	+/-0.104	0.0979		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.603	+/-0.865	1.49	2.00	pCi/g	KSD1	07/05/16	1117	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			85.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-017	Project:	BRKL00701
Sample ID:	398677016	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:25	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-15 (MS/MSD)
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.0415	+/-0.563	1.07	0.100	pCi/g	MXR1	06/28/16	1250	1572231		1
Cesium-137		3.02	+/-0.165	0.0646		pCi/g						
Cobalt-57	U	-0.018	+/-0.0236	0.0413		pCi/g						
Cobalt-60	U	0.0214	+/-0.0431	0.0796		pCi/g						
Manganese-54	U	0.026	+/-0.0303	0.0646		pCi/g						
Potassium-40		4.87	+/-0.936	0.548		pCi/g	KSD1	07/05/16	1330	1578836		2
Radium-226		0.279	+/-0.111	0.111		pCi/g						
Sodium-22	U	0.000214	+/-0.0323	0.0635		pCi/g						
Thorium-228		0.712	+/-0.110	0.0956		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.678	+/-0.571	0.898	2.00	pCi/g	KSD1	07/05/16	1330	1578836		2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-018	Project:	BRKL00701
Sample ID:	398677017	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:35	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-16
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time Batch	Method
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid "Dry Weight Corrected"											
Beryllium-7	U	0.554	+/-1.54	2.45	0.100	pCi/g	MXR1	06/28/16	1437	1572231	1
Cesium-137		30.6	+/-0.544	0.0911		pCi/g					
Cobalt-57	U	-0.0266	+/-0.0478	0.0854		pCi/g					
Cobalt-60	U	0.00174	+/-0.0386	0.0744		pCi/g					
Manganese-54	U	-6.07E-05	+/-0.033	0.0646		pCi/g					
Potassium-40		6.32	+/-0.998	0.527	0.192	pCi/g	KSD1	07/05/16	1117	1578836	2
Radium-226		0.552	+/-0.164	0.192		pCi/g					
Sodium-22	U	-0.00316	+/-0.035	0.067		pCi/g					
Thorium-228		0.658	+/-0.216	0.218		pCi/g					

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.915	+/-0.800	1.27	2.00	pCi/g	KSD1	07/05/16	1117	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-019	Project:	BRKL00701
Sample ID:	398677018	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:40	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-Comp3
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	0.00	+/-0.163	0.243	1.00	pCi/g		KXB2	06/22/16	1442	1572839	1
Plutonium-239/240	U	-0.0389	+/-0.172	0.449	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U	0.00	+/-0.241	0.359	0.900	pCi/g		KXB2	06/23/16	0843	1572840	2
Uranium-238		0.290	+/-0.382	0.290	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammasspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.147	+/-0.769	1.42		pCi/g		MXR1	06/28/16	1438	1572231	3
Cesium-137		1.75	+/-0.194	0.101	0.100	pCi/g						
Cobalt-57	U	-0.0034	+/-0.0316	0.060		pCi/g						
Cobalt-60	U	0.0126	+/-0.0447	0.0993		pCi/g						
Manganese-54	U	-0.0677	+/-0.0593	0.0935		pCi/g						
Potassium-40		5.51	+/-1.28	1.00		pCi/g						
Radium-226	UI	0.585	+/-0.196	0.361		pCi/g						
Sodium-22	U	-0.0234	+/-0.0538	0.0993		pCi/g						
Thorium-228		0.645	+/-0.195	0.144		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Sr90, solid "Dry Weight Corrected"												
Strontium-90	U	0.190	+/-0.588	1.09	2.00	pCi/g		KSD1	07/05/16	1138	1578836	4
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	16.2	+/-70.9	124	300	pCi/g		CXS7	06/30/16	2219	1578004	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000
Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID: 37801-019
Sample ID: 398677018

Project: BRKL00701
Client ID: BRKL007
37801
Samp Recv.:
Client Desc.: B811-SU-1-Comp3
Vol. Recv.:

The following Analytical Methods were performed:

Method	Description	Analyst Comments			
1	DOE EML HASL-300, Pu-11-RC Modified				
2	DOE EML HASL-300, U-02-RC Modified				
3	DOE HASL 300, 4.5.2.3/Ga-01-R				
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified				
5	EPA 906.0 Modified				
Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			88.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			72.4	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			86.9	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-020	Project:	BRKL00701
Sample ID:	398677019	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 00:00	Samp Recv.:	
Receive Date:	03-JUN-16 12:00	Client Desc.:	B811-SU-1-FD1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.184	+/-0.684	1.33	0.100	pCi/g		MXR1	06/28/16	1438	1572231	1
Cesium-137		1.97	+/-0.156	0.070		pCi/g						
Cobalt-57	U	0.00836	+/-0.0308	0.0603		pCi/g						
Cobalt-60	U	0.0118	+/-0.0295	0.0673		pCi/g						
Manganese-54	U	0.00769	+/-0.0359	0.0716		pCi/g						
Potassium-40		5.46	+/-0.998	0.570		pCi/g						
Radium-226		0.497	+/-0.147	0.145		pCi/g						
Sodium-22	U	-0.0102	+/-0.0417	0.0796		pCi/g						
Thorium-228		0.737	+/-0.115	0.128		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.0909	+/-0.601	1.14	2.00	pCi/g	KSD1	07/05/16	1138	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0913	1572204

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			80.1	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-016	Project:	BRKL00701
Sample ID:	398677020	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 11:20	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-1-14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.118	+/-0.467	0.862	0.100	pCi/g		MXR1	06/28/16	1438	1572231	1
Cesium-137		0.726	+/-0.105	0.0663		pCi/g						
Cobalt-57	U	0.00559	+/-0.0269	0.0514		pCi/g						
Cobalt-60	U	0.0267	+/-0.0315	0.0752		pCi/g						
Manganese-54	U	-0.00906	+/-0.0342	0.0647		pCi/g						
Potassium-40		5.70	+/-0.983	0.483		pCi/g						
Radium-226		0.470	+/-0.150	0.136		pCi/g						
Sodium-22	U	-0.0179	+/-0.0266	0.0477		pCi/g						
Thorium-228		0.678	+/-0.105	0.0987		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.315	+/-0.707	1.26	2.00	pCi/g	KSD1	07/05/16	1138	1578836	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			85.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-021	Project:	BRKL00701
Sample ID:	398677021	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:30	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.0332	+/-0.960	1.73		pCi/g		MXR1	06/28/16	1136	1572486	1
Cesium-137		7.80	+/-0.315	0.0756	0.100	pCi/g						
Cobalt-57	U	0.0266	+/-0.0409	0.0734		pCi/g						
Cobalt-60	U	-0.000973	+/-0.0354	0.0731		pCi/g						
Manganese-54	U	-0.0116	+/-0.0391	0.0732		pCi/g						
Potassium-40		4.81	+/-1.08	0.665		pCi/g						
Radium-226		0.590	+/-0.141	0.136		pCi/g						
Sodium-22	U	-0.00515	+/-0.0388	0.0777		pCi/g						
Thorium-228		0.942	+/-0.142	0.147		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	1.16	+/-0.883	1.39	2.00	pCi/g		KSD1	06/27/16	1719	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			93.7	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-022	Project:	BRKL00701
Sample ID:	398677022	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:20	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.537	+/-0.818	1.62	0.100	pCi/g	MXR1	06/28/16	1136	1572486		1
Cesium-137		3.93	+/-0.229	0.0746		pCi/g						
Cobalt-57	U	-0.0242	+/-0.0304	0.057		pCi/g						
Cobalt-60	U	-0.00321	+/-0.0385	0.0756		pCi/g						
Manganese-54	U	0.0109	+/-0.0406	0.0831		pCi/g						
Potassium-40		5.93	+/-1.13	0.830		pCi/g						
Radium-226		0.709	+/-0.178	0.182		pCi/g						
Sodium-22	U	-0.000912	+/-0.0346	0.0705		pCi/g						
Thorium-228		0.494	+/-0.192	0.162		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.963	+/-1.11	1.87	2.00	pCi/g	KSD1	06/27/16	1719	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			81.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-023	Project:	BRKL00701
Sample ID:	398677023	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:10	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-3
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	1.06	+/-1.05	2.02	0.100	pCi/g		MXR1	06/28/16	1137	1572486	1
Cesium-137		9.22	+/-0.338	0.0875		pCi/g						
Cobalt-57	U	0.00841	+/-0.0382	0.0722		pCi/g						
Cobalt-60	U	-0.00491	+/-0.0378	0.0756		pCi/g						
Manganese-54	U	0.0346	+/-0.0455	0.0958		pCi/g						
Potassium-40		10.2	+/-1.34	0.611		pCi/g						
Radium-226		0.696	+/-0.220	0.190		pCi/g						
Sodium-22	U	-0.00263	+/-0.0525	0.0982		pCi/g						
Thorium-228		0.954	+/-0.181	0.159		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.297	+/-0.792	1.42	2.00	pCi/g	KSD1	06/28/16	1128	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			91	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-024	Project:	BRKL00701
Sample ID:	398677024	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 13:57	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.0597	+/-0.576	1.05		pCi/g		MXR1	06/28/16	1137	1572486	1
Cesium-137		1.21	+/-0.127	0.0617	0.100	pCi/g						
Cobalt-57	U	-0.00299	+/-0.0276	0.0501		pCi/g						
Cobalt-60	U	0.000447	+/-0.0211	0.0483		pCi/g						
Manganese-54	U	0.0244	+/-0.0414	0.0777		pCi/g						
Potassium-40		6.44	+/-1.12	0.586		pCi/g						
Radium-226		0.599	+/-0.138	0.130		pCi/g						
Sodium-22	U	-0.0046	+/-0.034	0.068		pCi/g						
Thorium-228		0.822	+/-0.110	0.104		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.298	+/-0.658	1.41	2.00	pCi/g		KSD1	06/27/16	1719	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			77.4	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-025	Project:	BRKL00701
Sample ID:	398677025	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 13:51	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-5
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	1.22	+/-1.00	2.02	0.100	pCi/g	MXR1	06/28/16	1138	1572486		1
Cesium-137		3.10	+/-0.239	0.102		pCi/g						
Cobalt-57	U	0.0223	+/-0.0323	0.0623		pCi/g						
Cobalt-60	U	0.0154	+/-0.051	0.110		pCi/g						
Manganese-54	U	0.0736	+/-0.0361	0.100		pCi/g						
Potassium-40		6.07	+/-1.22	0.752		pCi/g						
Radium-226		0.435	+/-0.202	0.215		pCi/g						
Sodium-22	U	-0.0257	+/-0.0503	0.0929		pCi/g						
Thorium-228		0.862	+/-0.152	0.146		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.151	+/-0.691	1.38	2.00	pCi/g	KSD1	06/27/16	1719	1575872		2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-026	Project:	BRKL00701
Sample ID:	398677026	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:35	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-Comp4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0604	+/-0.182	0.513	1.00	pCi/g		KXB2	06/22/16	1442	1572839	1
Plutonium-239/240	U	-0.0604	+/-0.182	0.512	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U	-0.105	+/-0.199	0.614	0.900	pCi/g		KXB2	06/23/16	0843	1572840	2
Uranium-238	U	0.563	+/-0.542	0.795	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammasspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.449	+/-0.734	1.45		pCi/g		MXR1	06/28/16	1138	1572486	3
Cesium-137		3.70	+/-0.211	0.0691	0.100	pCi/g						
Cobalt-57	U	0.00385	+/-0.0328	0.0613		pCi/g						
Cobalt-60	U	-0.0115	+/-0.037	0.0705		pCi/g						
Manganese-54	U	0.00128	+/-0.0346	0.0676		pCi/g						
Potassium-40		5.46	+/-0.965	0.499		pCi/g						
Radium-226		0.552	+/-0.179	0.133		pCi/g						
Sodium-22	U	0.0049	+/-0.0394	0.0808		pCi/g						
Thorium-228		0.632	+/-0.126	0.136		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Sr90, solid "Dry Weight Corrected"												
Strontium-90	U	-0.0802	+/-0.640	1.25	2.00	pCi/g		KSD1	06/27/16	1719	1575872	4
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	-18.2	+/-64.9	118	300	pCi/g		CXS7	06/30/16	2251	1578004	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000
Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID: 37801-026
Sample ID: 398677026

Project: BRKL00701
Client ID: BRKL007
37801
Samp Recv.:
Client Desc.: B811-SU-2-Comp4
Vol. Recv.:

The following Analytical Methods were performed:

Method	Description	Analyst Comments			
1	DOE EML HASL-300, Pu-11-RC Modified				
2	DOE EML HASL-300, U-02-RC Modified				
3	DOE HASL 300, 4.5.2.3/Ga-01-R				
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified				
5	EPA 906.0 Modified				
Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			86.4	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			99.6	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			86.9	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-027	Project:	BRKL00701
Sample ID:	398677027	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:55	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-6
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.146	+/-0.754	1.44	0.100	pCi/g		MXR1	06/28/16	1138	1572486	1
Cesium-137		2.71	+/-0.199	0.0824		pCi/g						
Cobalt-57	U	-0.00118	+/-0.029	0.0549		pCi/g						
Cobalt-60	U	0.00994	+/-0.0308	0.0718		pCi/g						
Manganese-54	U	0.00133	+/-0.0414	0.083		pCi/g						
Potassium-40		5.48	+/-1.06	0.471		pCi/g						
Radium-226		0.534	+/-0.208	0.170		pCi/g						
Sodium-22	U	-0.00472	+/-0.0518	0.0997		pCi/g						
Thorium-228		0.787	+/-0.153	0.142		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.655	+/-0.755	1.27	2.00	pCi/g	KSD1	06/28/16	1128	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-028	Project:	BRKL00701
Sample ID:	398677028	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:50	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-7
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.357	+/-0.657	1.16		pCi/g		MXR1	06/28/16	1139	1572486	1
Cesium-137		1.85	+/-0.164	0.0714	0.100	pCi/g						
Cobalt-57	U	4.77E-05	+/-0.0305	0.0588		pCi/g						
Cobalt-60	U	-0.00342	+/-0.0426	0.0834		pCi/g						
Manganese-54	U	0.0118	+/-0.0477	0.0825		pCi/g						
Potassium-40		5.94	+/-1.21	0.909		pCi/g						
Radium-226		0.527	+/-0.197	0.132		pCi/g						
Sodium-22	U	-0.0356	+/-0.0401	0.0656		pCi/g						
Thorium-228		0.855	+/-0.167	0.164		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.511	+/-0.728	1.52	2.00	pCi/g		KSD1	06/27/16	1722	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			91	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-029	Project:	BRKL00701
Sample ID:	398677029	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:45	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-8
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.292	+/-0.696	1.33	0.100	pCi/g		MXR1	06/28/16	1214	1572486	1
Cesium-137		3.00	+/-0.192	0.0735		pCi/g						
Cobalt-57	U	0.000632	+/-0.0277	0.0527		pCi/g						
Cobalt-60	U	0.00265	+/-0.0325	0.0693		pCi/g						
Manganese-54	U	-0.00344	+/-0.0406	0.0777		pCi/g						
Potassium-40		5.33	+/-1.05	0.542	2.00	pCi/g		KSD1	06/27/16	1722	1575872	2
Radium-226		0.376	+/-0.170	0.150		pCi/g						
Sodium-22	U	-0.0273	+/-0.0432	0.0764		pCi/g						
Thorium-228		0.763	+/-0.124	0.112		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.355	+/-0.642	1.32	2.00	pCi/g	KSD1	06/27/16	1722	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			95	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-030	Project:	BRKL00701
Sample ID:	398677030	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 14:40	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-9
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.357	+/-0.670	1.26	0.100	pCi/g	MXR1	06/28/16	1214	1572486		1
Cesium-137		4.54	+/-0.215	0.0723		pCi/g						
Cobalt-57	U	0.0133	+/-0.0255	0.0484		pCi/g						
Cobalt-60	U	0.0162	+/-0.0317	0.069		pCi/g						
Manganese-54	U	0.0123	+/-0.039	0.0711		pCi/g						
Potassium-40		3.85	+/-0.897	0.677		pCi/g	KSD1	06/28/16	1128	1575872		2
Radium-226		0.456	+/-0.136	0.142		pCi/g						
Sodium-22	U	0.00531	+/-0.030	0.0626		pCi/g						
Thorium-228		0.717	+/-0.130	0.131		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.275	+/-0.521	0.928	2.00	pCi/g	KSD1	06/28/16	1128	1575872		2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-031	Project:	BRKL00701
Sample ID:	398677031	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:10	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-10(MS/MSD)
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.0582	+/-0.824	1.35	0.100	pCi/g	MXR1	06/28/16	1142	1572486		1
Cesium-137		2.89	+/-0.199	0.091		pCi/g						
Cobalt-57	U	-0.00897	+/-0.0355	0.063		pCi/g						
Cobalt-60	U	-0.00135	+/-0.0468	0.0906		pCi/g						
Manganese-54	U	-0.0073	+/-0.0421	0.0776		pCi/g						
Potassium-40		6.79	+/-1.18	0.651		pCi/g	KSD1	06/27/16	1722	1575872		2
Radium-226		0.460	+/-0.162	0.161		pCi/g						
Sodium-22	U	-0.00612	+/-0.0443	0.0848		pCi/g						
Thorium-228		0.901	+/-0.137	0.141		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.119	+/-0.627	1.26	2.00	pCi/g	KSD1	06/27/16	1722	1575872		2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			89.6	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-032	Project:	BRKL00701
Sample ID:	398677032	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:05	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-11
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.133	+/-0.756	1.35	0.100	pCi/g	MXR1	06/28/16	1244	1572486		1
Cesium-137		2.40	+/-0.203	0.0763		pCi/g						
Cobalt-57	U	0.00942	+/-0.0371	0.0642		pCi/g						
Cobalt-60	U	-0.0168	+/-0.0416	0.0788		pCi/g						
Manganese-54	U	0.0094	+/-0.0558	0.0958		pCi/g						
Potassium-40		6.15	+/-1.12	0.681		pCi/g	KSD1	06/27/16	1722	1575872		2
Radium-226		0.583	+/-0.166	0.141		pCi/g						
Sodium-22	U	-0.00631	+/-0.0427	0.0852		pCi/g						
Thorium-228		0.688	+/-0.144	0.142		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.704	+/-0.729	1.20	2.00	pCi/g	KSD1	06/27/16	1722	1575872		2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			91	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-033	Project:	BRKL00701
Sample ID:	398677033	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:15	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-Comp5
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0832	+/-0.158	0.486	1.00	pCi/g		KXB2	06/22/16	1442	1572839	1
Plutonium-239/240	U	-0.0665	+/-0.154	0.456	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U	0.00	+/-0.211	0.313	0.900	pCi/g		KXB2	06/23/16	0843	1572840	2
Uranium-238	U	0.385	+/-0.451	0.625	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammasspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.176	+/-0.708	1.37		pCi/g		MXR1	06/28/16	1244	1572486	3
Cesium-137		2.86	+/-0.188	0.083	0.100	pCi/g						
Cobalt-57	U	-0.00396	+/-0.0328	0.0589		pCi/g						
Cobalt-60	U	0.00337	+/-0.034	0.0712		pCi/g						
Manganese-54	U	-0.0161	+/-0.0461	0.0821		pCi/g						
Potassium-40		5.50	+/-1.12	0.688		pCi/g						
Radium-226		0.521	+/-0.169	0.150		pCi/g						
Sodium-22	U	-0.0157	+/-0.0441	0.0808		pCi/g						
Thorium-228		0.764	+/-0.125	0.129		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Sr90, solid "Dry Weight Corrected"												
Strontium-90	U	-0.645	+/-0.668	1.42	2.00	pCi/g		KSD1	06/27/16	1722	1575872	4
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	31.6	+/-60.9	105	300	pCi/g		CXS7	06/30/16	2322	1578004	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Contact: Upton, New York 11973--5000
Project: Mr. John Burke
Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID: 37801-033

Sample ID: 398677033

Project: BRKL00701

Client ID: BRKL007
37801

Samp Recv.:

Client Desc.: B811-SU-2-Comp5

Vol. Recv.:

The following Analytical Methods were performed:

Method	Description	Analyst Comments			
1	DOE EML HASL-300, Pu-11-RC Modified				
2	DOE EML HASL-300, U-02-RC Modified				
3	DOE HASL 300, 4.5.2.3/Ga-01-R				
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified				
5	EPA 906.0 Modified				
Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			104	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			86.6	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-034	Project:	BRKL00701
Sample ID:	398677034	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:00	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-12
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.562	+/-0.979	1.49		pCi/g		MXR1	06/28/16	1245	1572486	1
Cesium-137		2.45	+/-0.199	0.0785	0.100	pCi/g						
Cobalt-57	U	0.000445	+/-0.0329	0.0635		pCi/g						
Cobalt-60	U	-0.00303	+/-0.0411	0.0812		pCi/g						
Manganese-54	U	0.0229	+/-0.0468	0.0972		pCi/g						
Potassium-40		5.22	+/-1.18	0.708		pCi/g						
Radium-226		0.846	+/-0.168	0.137		pCi/g						
Sodium-22	U	-0.0272	+/-0.0561	0.0986		pCi/g						
Thorium-228		0.808	+/-0.144	0.143		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.379	+/-0.431	1.02	2.00	pCi/g		KSD1	06/27/16	1722	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-035	Project:	BRKL00701
Sample ID:	398677035	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:35	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-13
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time Batch	Method
Rad Gamma Spec Analysis											
Gammascpec, Gamma, Solid "Dry Weight Corrected"											
Beryllium-7	U	0.268	+/-0.538	1.08	0.100	pCi/g	MXR1	06/28/16	1245	1572486	1
Cesium-137		1.45	+/-0.128	0.0706		pCi/g					
Cobalt-57	U	-0.0126	+/-0.0245	0.0461		pCi/g					
Cobalt-60	U	0.00892	+/-0.0258	0.0595		pCi/g					
Manganese-54	U	-0.00205	+/-0.0332	0.0654		pCi/g					
Potassium-40		6.22	+/-1.01	0.516	0.112	pCi/g	KSD1	06/27/16	1723	1575872	2
Radium-226		0.584	+/-0.135	0.112		pCi/g					
Sodium-22	U	0.0246	+/-0.049	0.0733		pCi/g					
Thorium-228		0.822	+/-0.111	0.098		pCi/g					

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.649	+/-0.634	1.38	2.00	pCi/g	KSD1	06/27/16	1723	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			91	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-036	Project:	BRKL00701
Sample ID:	398677036	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:30	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time Batch	Method
Rad Gamma Spec Analysis											
Gammascpec, Gamma, Solid "Dry Weight Corrected"											
Beryllium-7	U	-0.312	+/-0.573	1.00	0.100	pCi/g	MXR1	06/28/16	1245	1572486	1
Cesium-137		2.25	+/-0.161	0.0631		pCi/g					
Cobalt-57	U	0.0181	+/-0.0497	0.0449		pCi/g					
Cobalt-60	U	-0.0121	+/-0.033	0.0622		pCi/g					
Manganese-54	U	0.00814	+/-0.037	0.0657		pCi/g					
Potassium-40		4.88	+/-0.870	0.108		pCi/g					
Radium-226		0.485	+/-0.131	0.135		pCi/g					
Sodium-22	U	-0.00403	+/-0.0403	0.0707		pCi/g					
Thorium-228		0.706	+/-0.109	0.114		pCi/g					

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.619	+/-0.786	1.34	2.00	pCi/g	KSD1	06/27/16	1723	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			93.7	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

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Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-037	Project:	BRKL00701
Sample ID:	398677037	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:25	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-15
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.145	+/-0.471	0.941	0.100	pCi/g		MXR1	06/28/16	1247	1572486	1
Cesium-137		0.206	+/-0.081	0.0729		pCi/g						
Cobalt-57	U	-0.0173	+/-0.0504	0.0555		pCi/g						
Cobalt-60	U	-0.0122	+/-0.0383	0.0718		pCi/g						
Manganese-54	U	-0.00979	+/-0.0408	0.0778		pCi/g						
Potassium-40		5.91	+/-1.02	0.689		pCi/g						
Radium-226		0.582	+/-0.132	0.132		pCi/g						
Sodium-22	U	0.0055	+/-0.0305	0.0653		pCi/g						
Thorium-228		0.756	+/-0.115	0.105		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.114	+/-0.645	1.27	2.00	pCi/g	KSD1	06/27/16	1723	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

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Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-038	Project:	BRKL00701
Sample ID:	398677038	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:20	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-16
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.416	+/-0.847	1.57	0.100	pCi/g	MXR1	06/28/16	1246	1572486		1
Cesium-137		5.11	+/-0.250	0.0626		pCi/g						
Cobalt-57	U	0.00767	+/-0.0312	0.0577		pCi/g						
Cobalt-60	U	0.00103	+/-0.032	0.0667		pCi/g						
Manganese-54	U	0.0261	+/-0.0385	0.0806		pCi/g						
Potassium-40		6.39	+/-1.04	0.665		pCi/g	KSD1	06/27/16	1723	1575872		2
Radium-226		0.644	+/-0.179	0.161		pCi/g						
Sodium-22	U	0.00771	+/-0.0347	0.0739		pCi/g						
Thorium-228		1.02	+/-0.161	0.151		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.971	+/-0.776	1.23	2.00	pCi/g	KSD1	06/27/16	1723	1575872		2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			95	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-039	Project:	BRKL00701
Sample ID:	398677039	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 15:40	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-Comp6
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Alpha Spec Analysis												
Alphaspec Pu, Solid "Dry Weight Corrected"												
Plutonium-238	U	-0.0203	+/-0.175	0.406	1.00	pCi/g		KXB2	06/22/16	1442	1572839	1
Plutonium-239/240	U	-0.0779	+/-0.263	0.684	1.00	pCi/g						
Alphaspec U, Solid "Dry Weight Corrected"												
Uranium-235/236	U	0.0966	+/-0.272	0.290	0.900	pCi/g		KXB2	06/23/16	0843	1572840	2
Uranium-238	J	0.606	+/-0.462	0.375	0.900	pCi/g						
Rad Gamma Spec Analysis												
Gammasspec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	-0.222	+/-0.896	1.62		pCi/g		MXR1	06/28/16	1247	1572486	3
Cesium-137		1.62	+/-0.185	0.101	0.100	pCi/g						
Cobalt-57	U	0.0109	+/-0.0327	0.0617		pCi/g						
Cobalt-60	U	-0.0158	+/-0.0516	0.0993		pCi/g						
Manganese-54	U	0.028	+/-0.033	0.103		pCi/g						
Potassium-40		6.17	+/-1.23	1.04		pCi/g						
Radium-226		0.601	+/-0.190	0.196		pCi/g						
Sodium-22	U	-0.0129	+/-0.0505	0.0986		pCi/g						
Thorium-228		0.854	+/-0.148	0.130		pCi/g						
Rad Gas Flow Proportional Counting												
GFPC, Sr90, solid "Dry Weight Corrected"												
Strontium-90	U	-0.82	+/-0.804	1.67	2.00	pCi/g		KSD1	06/27/16	1723	1575872	4
Rad Liquid Scintillation Analysis												
LSC, Tritium Dist, Solid "As Received"												
Tritium	U	8.55	+/-86.5	153	300	pCi/g		CXS7	06/30/16	2354	1578004	5

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1416	1572469

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Contact: Upton, New York 11973--5000
Project: Mr. John Burke
Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID: 37801-039

Sample ID: 398677039

Project: BRKL00701

Client ID: BRKL007
37801

Samp Recv.:

Client Desc.: B811-SU-2-Comp6

Vol. Recv.:

The following Analytical Methods were performed:

Method	Description	Analyst Comments			
1	DOE EML HASL-300, Pu-11-RC Modified				
2	DOE EML HASL-300, U-02-RC Modified				
3	DOE HASL 300, 4.5.2.3/Ga-01-R				
4	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified				
5	EPA 906.0 Modified				
Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Plutonium-242 Tracer	Alphaspec Pu, Solid "Dry Weight Corrected"			96.8	(15%-125%)
Uranium-232 Tracer	Alphaspec U, Solid "Dry Weight Corrected"			95.9	(15%-125%)
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			92.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Summary

Client Sample ID:	37801-040	Project:	BRKL00701
Sample ID:	398677040	Client ID:	BRKL007
Matrix:	S	COC:	37801
Collect Date:	11-MAY-16 00:00	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-SU-2-FD2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammascpec, Gamma, Solid "Dry Weight Corrected"												
Beryllium-7	U	0.130	+/-0.854	1.59		pCi/g		MXR1	06/28/16	1248	1572486	1
Cesium-137		6.91	+/-0.269	0.0633	0.100	pCi/g						
Cobalt-57	U	-0.0119	+/-0.0264	0.0471		pCi/g						
Cobalt-60	U	0.0145	+/-0.0306	0.0679		pCi/g						
Manganese-54	U	-0.0214	+/-0.0334	0.0595		pCi/g						
Potassium-40		6.64	+/-0.981	0.434		pCi/g						
Radium-226		0.576	+/-0.139	0.143		pCi/g						
Sodium-22	U	0.0103	+/-0.0291	0.0616		pCi/g						
Thorium-228		0.763	+/-0.120	0.127		pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.275	+/-0.736	1.41	2.00	pCi/g		KSD1	06/28/16	1128	1575872	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1426	1572470

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			86.9	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 5, 2016

Page 1 of 5

Brookhaven National Laboratory
Building 462
Upton, New York

Contact: Mr. John Burke

Workorder: 398677

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Alpha Spec											
Batch	1572839										
QC1203562982	398677006	DUP									
Plutonium-238	U	-0.0328	U	0.0033	pCi/g	N/A		N/A	KXB2	06/22/16	14:42
	Uncertainty	+/-0.145		+/-0.244							
Plutonium-239/240	U	0.00	U	0.270	pCi/g	N/A		N/A			
	Uncertainty	+/-0.138		+/-0.369							
QC1203562983	LCS										
Plutonium-238			U	0.0382	pCi/g			(75%-125%)		06/22/16	14:42
	Uncertainty			+/-0.212							
Plutonium-239/240	19.0			19.4	pCi/g		102	(75%-125%)			
	Uncertainty			+/-2.35							
QC1203562981	MB										
Plutonium-238			U	0.125	pCi/g					06/22/16	14:42
	Uncertainty			+/-0.247							
Plutonium-239/240			U	0.0912	pCi/g						
	Uncertainty			+/-0.251							
Batch	1572840										
QC1203562985	398677006	DUP									
Uranium-235/236	U	0.179	U	0.00	pCi/g	N/A		N/A	KXB2	06/23/16	08:43
	Uncertainty	+/-0.307		+/-0.239							
Uranium-238	J	0.511	U	0.529	pCi/g	3.84		(0% - 100%)			
	Uncertainty	+/-0.433		+/-0.503							
QC1203562986	LCS										
Uranium-235/236				1.85	pCi/g					06/25/16	10:37
	Uncertainty			+/-0.921							
Uranium-238	25.9			26.3	pCi/g		102	(75%-125%)			
	Uncertainty			+/-3.01							
QC1203562984	MB										
Uranium-235/236			U	-0.0277	pCi/g					06/23/16	08:43
	Uncertainty			+/-0.239							
Uranium-238			U	-0.135	pCi/g						
	Uncertainty			+/-0.217							
Rad Gamma Spec											
Batch	1572231										
QC1203561374	398677016	DUP									
Beryllium-7	U	-0.0415	U	0.218	pCi/g	N/A		N/A	MXR1	06/28/16	14:39
	Uncertainty	+/-0.563		+/-0.699							
Cesium-137		3.02		3.16	pCi/g	4.5		(0%-20%)			
	Uncertainty	+/-0.165		+/-0.208							
Cobalt-57	U	-0.018	U	-0.0165	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0236		+/-0.0326							
Cobalt-60	U	0.0214	U	0.0376	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0431		+/-0.0398							

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QC Summary

Workorder: 398677

Page 2 of 5

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572231										
Manganese-54	U	0.026	U	0.00054	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0303		+/-0.0355							
Potassium-40		4.87		5.43	pCi/g	11		(0%-20%)	MXR1	06/28/16	14:39
	Uncertainty	+/-0.936		+/-1.19							
Radium-226		0.279		0.410	pCi/g	37.8		(0% - 100%)			
	Uncertainty	+/-0.111		+/-0.148							
Sodium-22	U	0.000214	U	-0.00163	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0323		+/-0.0343							
Thorium-228		0.712		0.695	pCi/g	2.42		(0%-20%)			
	Uncertainty	+/-0.110		+/-0.137							
QC1203561375	LCS										
Americium-241	489			535	pCi/g		109	(75%-125%)		06/28/16	12:54
	Uncertainty			+/-9.45							
Beryllium-7			U	-0.475	pCi/g						
	Uncertainty			+/-7.22							
Cesium-137	180			179	pCi/g		99.4	(75%-125%)			
	Uncertainty			+/-3.06							
Cobalt-57				1.88	pCi/g						
	Uncertainty			+/-0.583							
Cobalt-60	167			158	pCi/g		94.3	(75%-125%)			
	Uncertainty			+/-3.36							
Manganese-54			U	0.226	pCi/g						
	Uncertainty			+/-0.722							
Potassium-40			U	3.35	pCi/g						
	Uncertainty			+/-2.54							
Radium-226			U	0.433	pCi/g						
	Uncertainty			+/-1.34							
Sodium-22			U	-0.0479	pCi/g						
	Uncertainty			+/-0.462							
Thorium-228			U	-0.107	pCi/g						
	Uncertainty			+/-0.823							
QC1203561373	MB										
Beryllium-7			U	0.0338	pCi/g					06/28/16	14:38
	Uncertainty			+/-0.238							
Cesium-137			U	0.00427	pCi/g						
	Uncertainty			+/-0.0268							
Cobalt-57			U	0.00465	pCi/g						
	Uncertainty			+/-0.012							
Cobalt-60			U	0.00427	pCi/g						
	Uncertainty			+/-0.0216							
Manganese-54			U	0.00321	pCi/g						
	Uncertainty			+/-0.0301							
Potassium-40			U	0.255	pCi/g						
	Uncertainty			+/-0.331							
Radium-226			U	-0.0117	pCi/g						

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QC Summary

Workorder: 398677

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572231										
		Uncertainty		+/-0.0726							
Sodium-22			U	0.0136	pCi/g				MXR1	06/28/16	14:38
		Uncertainty		+/-0.0245							
Thorium-228			U	0.0409	pCi/g						
		Uncertainty		+/-0.0595							
Batch	1572486										
QC1203561991 398677031 DUP											
Beryllium-7		U	-0.0582	U	0.616	pCi/g	N/A		N/A MXR1	06/28/16	12:49
		Uncertainty	+/-0.824		+/-0.666						
Cesium-137			2.89		2.78	pCi/g	4.02	(0%-20%)			
		Uncertainty	+/-0.199		+/-0.188						
Cobalt-57		U	-0.00897	U	-0.0331	pCi/g	N/A		N/A		
		Uncertainty	+/-0.0355		+/-0.0297						
Cobalt-60		U	-0.00135	U	-0.00465	pCi/g	N/A		N/A		
		Uncertainty	+/-0.0468		+/-0.0376						
Manganese-54		U	-0.0073	U	0.0174	pCi/g	N/A		N/A		
		Uncertainty	+/-0.0421		+/-0.0349						
Potassium-40			6.79		5.26	pCi/g	25.3*	(0%-20%)			
		Uncertainty	+/-1.18		+/-1.07						
Radium-226			0.460		0.575	pCi/g	22.2	(0% - 100%)			
		Uncertainty	+/-0.162		+/-0.152						
Sodium-22		U	-0.00612	U	-0.0142	pCi/g	N/A		N/A		
		Uncertainty	+/-0.0443		+/-0.0323						
Thorium-228			0.901		0.752	pCi/g	18.1	(0%-20%)			
		Uncertainty	+/-0.137		+/-0.121						
QC1203561992 LCS											
Americium-241			489		521	pCi/g		106	(75%-125%)		06/28/16 12:36
		Uncertainty			+/-7.78						
Beryllium-7				U	3.55	pCi/g					
		Uncertainty			+/-7.77						
Cesium-137			180		182	pCi/g		101	(75%-125%)		
		Uncertainty			+/-3.10						
Cobalt-57					1.43	pCi/g					
		Uncertainty			+/-0.557						
Cobalt-60			167		158	pCi/g		94.6	(75%-125%)		
		Uncertainty			+/-3.32						
Manganese-54				U	-0.027	pCi/g					
		Uncertainty			+/-0.786						
Potassium-40				U	0.814	pCi/g					
		Uncertainty			+/-2.60						
Radium-226				U	-0.116	pCi/g					
		Uncertainty			+/-1.09						
Sodium-22				U	-0.0806	pCi/g					
		Uncertainty			+/-0.371						

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QC Summary

Workorder: 398677

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572486										
Thorium-228			U	0.242	pCi/g				MXR1	06/28/16	12:36
	Uncertainty			+/-0.792							
QC1203561990 MB											
Beryllium-7			U	0.277	pCi/g					06/28/16	12:48
	Uncertainty			+/-0.279							
Cesium-137			U	-0.00432	pCi/g						
	Uncertainty			+/-0.0218							
Cobalt-57			U	-0.00553	pCi/g						
	Uncertainty			+/-0.0165							
Cobalt-60			U	0.00038	pCi/g						
	Uncertainty			+/-0.0206							
Manganese-54			U	0.0327	pCi/g						
	Uncertainty			+/-0.0231							
Potassium-40			U	0.185	pCi/g						
	Uncertainty			+/-0.309							
Radium-226			U	-0.0356	pCi/g						
	Uncertainty			+/-0.0491							
Sodium-22			U	-0.00583	pCi/g						
	Uncertainty			+/-0.0244							
Thorium-228			U	-0.0209	pCi/g						
	Uncertainty			+/-0.0404							
Rad Gas Flow											
Batch	1575872										
QC1203570891 398677031 DUP											
Strontium-90	U	-0.119	U	-0.0717	pCi/g	N/A			N/A KSD1	06/27/16	17:22
	Uncertainty	+/-0.627		+/-0.666							
QC1203570894 LCS											
Strontium-90	58.1			56.5	pCi/g		97.3	(75%-125%)		06/27/16	17:26
	Uncertainty			+/-3.22							
QC1203570890 MB											
Strontium-90			U	0.131	pCi/g					06/27/16	17:22
	Uncertainty			+/-0.639							
QC1203570892 398677031 MS											
Strontium-90	68.4 U	-0.119		69.1	pCi/g		101	(75%-125%)		06/27/16	17:26
	Uncertainty	+/-0.627		+/-3.87							
QC1203570893 398677031 MSD											
Strontium-90	62.4 U	-0.119		64.2	pCi/g	7.41	103	(0%-35%)		06/27/16	17:26
	Uncertainty	+/-0.627		+/-3.63							
Batch	1578836										
QC1203578114 398677016 DUP											
Strontium-90	U	0.678	U	0.198	pCi/g	N/A			N/A KSD1	07/05/16	11:41
	Uncertainty	+/-0.571		+/-0.638							
QC1203578117 LCS											
Strontium-90	52.5			60.1	pCi/g		115	(75%-125%)		07/05/16	10:34

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QC Summary

Workorder: 398677

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1578836										
				Uncertainty		+/-3.55					
QC1203578113	MB										
Strontium-90			U	-0.0106	pCi/g				KSD1	07/05/16	11:41
	Uncertainty			+/-0.479							
QC1203578115	398677016	MS									
Strontium-90				59.8	U	0.678					
				Uncertainty		+/-0.571					07/05/16 10:33
				Uncertainty		+/-0.571					
QC1203578116	398677016	MSD									
Strontium-90				60.3	U	0.678					07/05/16 10:33
				Uncertainty		+/-0.571					
Rad Liquid Scintillation											
Batch	1578004										
QC1203576085	398677006	DUP									
Tritium			U	19.0	U	9.25	pCi/g	N/A	N/A	CXS7	07/01/16 00:57
	Uncertainty			+/-74.6							
				Uncertainty		+/-82.8					
QC1203576087	LCS										
Tritium				612		608	pCi/g		99.4	(75%-125%)	07/01/16 01:29
	Uncertainty			+/-88.9							
QC1203576084	MB										
Tritium			U	-38.6	pCi/g						07/01/16 00:26
	Uncertainty			+/-55.4							
QC1203576086	398677006	MS									
Tritium				781	U	19.0	pCi/g		99.2	(75%-125%)	07/01/16 02:01
	Uncertainty			+/-74.6							

- Notes:**
- Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).
- The Qualifiers in this report are defined as follows:
- DL Failed required detection limit.
 - H Holding time exceeded
 - J Estimated value; the result was greater than the MDA but less than the required detection limit.
 - JN Presumptive evidence of the analyte at an estimated quantity.
 - R The data are unusable (radionuclide may or may not be present).
 - U Undetected; sample result < MDA
 - UI Uncertain identification for gamma spectroscopy.

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Alpha Spectroscopy Raw Data

Batch# 1572839 Product: Pu Date: 6/27/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			na
Samples have been blank corrected (if required). Blank correction reported included (if required).			na
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			na
Smears Taken for Radioactive batches.			na
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			na
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			na
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			na
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			na
Aliquot Correction completed if required.			na
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Joshua 6/27/16

Secondary Review Performed By: M. Anderson 6/28/16

7/3

BRKL

Plutonium Queue Sheet

20-JUN-16

Batch #: 1572839 Analyst: KXB2 First Client Due Date: 03-JUL-16 Internal Due Date: 28-JUN-16
 Tracer Isotope(s): Pu-242/Pu-236 Tracer Code: 1719-A Expiration Date: 5-2-17 Vol: 0.1 Analyzed Sequentially with:
 LCS Isotope(s): Pu-239/Pu-238 LCS Code: 0338-MM Expiration Date: 7-27-16 Vol: 0.1 U: 1572840
 Spike Isotope(s): Pu-239/Pu-238 Spike Code: — Expiration Date: — Vol: — Am: —
 Prep Date: 11-21-16 Initials: KB Pipet ID: 13500299 Balance ID: 13500299 Witness: JPB 6/24/16

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g/1/f)	Pu Det #
398677006-1	37801-006	SAMPLE		1 pCi/g	SOIL	BRKL007	11-MAY-16	1	1	0.103	252 95
398677013-1	37801-013	SAMPLE		1 pCi/g	SOIL	BRKL007	11-MAY-16	2	2	0.100	253
398677018-1	37801-019	SAMPLE		1 pCi/g	SOIL	BRKL007	11-MAY-16	3	3	0.104	254
398677026-1	37801-026	SAMPLE		1 pCi/g	SOIL	BRKL007	11-MAY-16	4	4	0.102	255
398677033-1	37801-033	SAMPLE		1 pCi/g	SOIL	BRKL007	11-MAY-16	5	5	0.101	256
398677039-1	37801-039	SAMPLE		1 pCi/g	SOIL	BRKL007	11-MAY-16	6	6	0.100	215
1203562981-1	MB for batch 1572839	MB		1 pCi/g	SOIL	QC ACCOUNT		7	7	0.104	251
1203562982-1	37801-006(398677006DUP)	DUP		1 pCi/g	SOIL	QC ACCOUNT	11-MAY-16	8	8	0.102	216
1203562983-1	LCS for batch 1572839	LCS		1 pCi/g	SOIL	QC ACCOUNT		9	9	0.104	203

Choose SOP Used: GL-RAD-A-011/ GL-RAD-A-036, Solid Sample Dissolution by: LEACH of DIGESTION

GL-RAD-A-053

GEL Laboratories LLC, , Radiochemistry Division

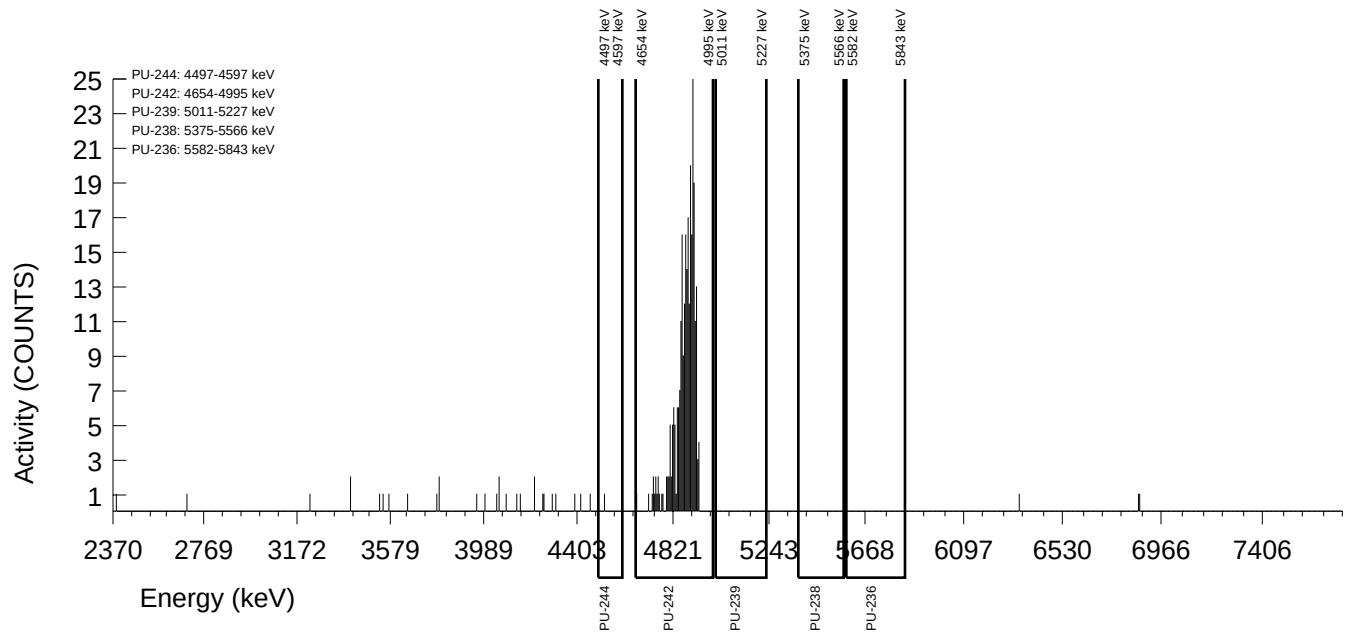
Circle One

Page: 1 of 1

Data Reviewed By: JPB 6/27/16

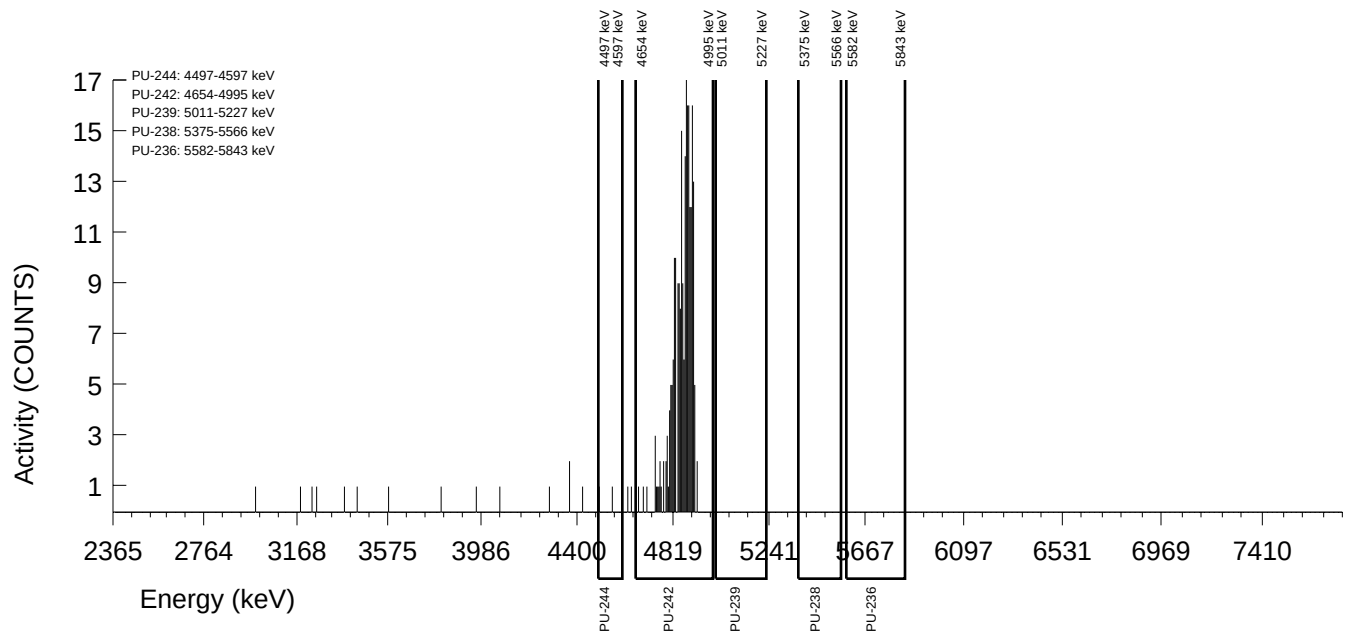
BATCH NUMBER : 1572839 SAMPLE ID : S0398677006_PU SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 87.6 +/-6.307 %	CHAMBER : 095 DETECTOR S/N : 38626 AVERAGE %EFFICIENCY : 30.4926 AVERAGE %EFF ERROR : 0.5885 COUNT DATE : 24-Jun-2016 08:57:53 ELAPSED LIVE TIME(SEC) : 14399.99	LIB FILE : PU BKG FILE : B095.CNF;1378 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 59999.99 EFF FILE : W095.CNF;402 CAL DATE : 06-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 3.8332E+00 dpm		

NUCLIDE ACTIVITY SUMMARY											1.96-sigma			1.96-sigma
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	TPU pCi/G	MDA pCi/G	Lc pCi/G		cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-1.200	1.200	1.0954	100.000	-8.43E-02	1.60E-01	4.93E-01	1.41E-01		1.60E-01
PU-238	5486.00	5470.36	0.000	0.000	-0.480	0.480	0.6928	99.900	-3.28E-02	1.45E-01	3.79E-01	8.68E-02		1.45E-01
PU-239	5155.00	5118.70	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	1.38E-01	2.05E-01	0.00E+00		1.38E-01
PU-242	4890.00	4876.25	63.331	281.000	280.520	0.480	0.6928	100.000	1.91E+01	3.36E+00	3.78E-01	8.66E-02		2.25E+00
PU-244	4589.00	4522.98	4.967	1.000	0.760	0.240	0.4899	99.900	5.19E-02	1.95E-01	3.27E-01	6.13E-02		1.95E-01



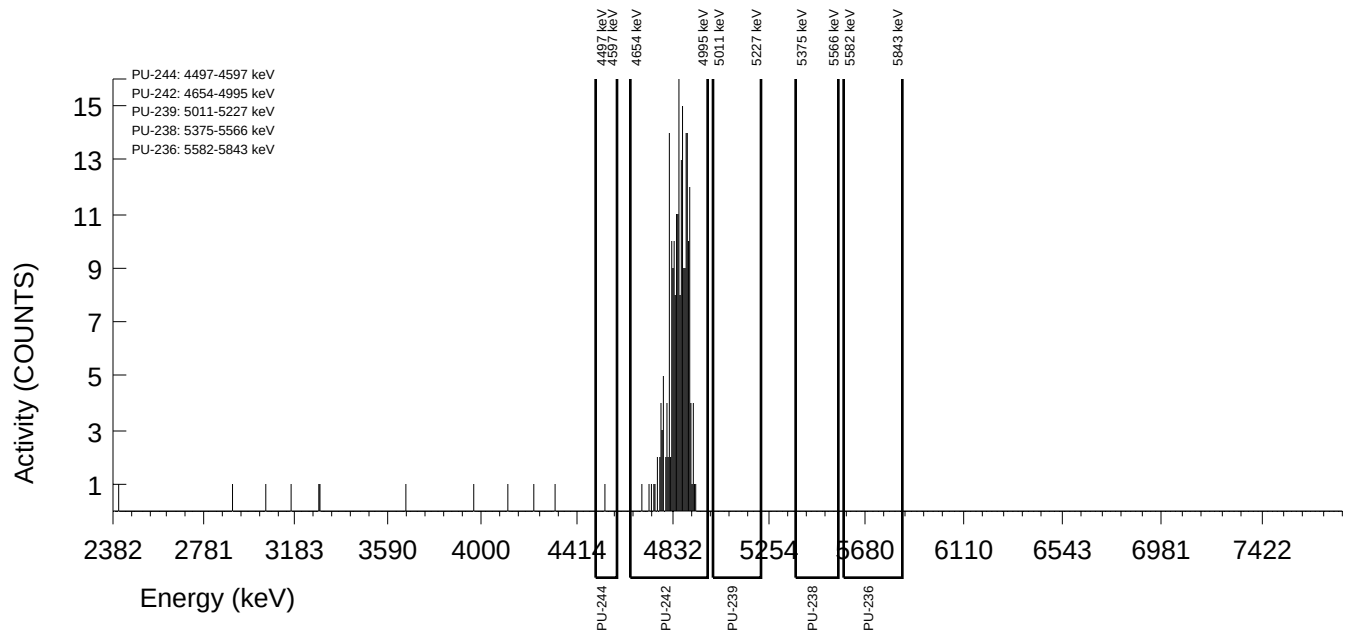
BATCH NUMBER : 1572839 SAMPLE ID : S0398677013_PU SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 88.3 +/-6.815 %	CHAMBER : 253 DETECTOR S/N : 87941 AVERAGE %EFFICIENCY : 25.6510 AVERAGE %EFF ERROR : 0.4970 COUNT DATE : 22-Jun-2016 14:42:28 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B253.CNF;431 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W253.CNF;106 CAL DATE : 17-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 3.8628E+00 dpm		

NUCLIDE ACTIVITY SUMMARY											1.96-sigma			1.96-sigma
NUCLIDE	LIBRARY	PEAK	PEAK	GROSS	NET	BKG	BKG	%ABUN	ACTIVITY		TPU	MDA	Lc	
	ENERGY	ENERGY	FWHM	AREA	AREA	AREA	StDev		pCi/G		pCi/G	pCi/G	pCi/G	cnt Unc
PU-236	5749.00	5712.27	0.000	0.000	-0.240	0.240	0.4899	100.000	-2.05E-02		1.77E-01	4.09E-01	7.65E-02	1.77E-01
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-5.98E-02		1.81E-01	5.07E-01	1.29E-01	1.81E-01
PU-239	5155.00	5118.70	0.000	0.000	-0.960	0.960	0.9798	99.900	-7.97E-02		1.85E-01	5.47E-01	1.49E-01	1.85E-01
PU-242	4890.00	4863.71	84.133	239.000	237.800	1.200	1.0954	100.000	1.97E+01		3.74E+00	5.81E-01	1.66E-01	2.52E+00
PU-244	4589.00	4527.96	0.000	2.000	2.000	0.000	0.0000	99.900	1.66E-01		2.85E-01	2.49E-01	0.00E+00	2.84E-01



BATCH NUMBER : 1572839 SAMPLE ID : S0398677018_PU SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 88.8 +/-6.855 %	CHAMBER : 254 DETECTOR S/N : 87942 AVERAGE %EFFICIENCY : 25.1209 AVERAGE %EFF ERROR : 0.4870 COUNT DATE : 22-Jun-2016 14:42:31 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B254.CNF;430 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W254.CNF;110 CAL DATE : 17-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 3.8859E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.27	0.000	0.000	-0.240	0.240	0.4899	100.000	-2.00E-02	1.73E-01	3.99E-01	7.47E-02	1.72E-01
PU-238	5486.00	5470.35	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	1.64E-01	2.43E-01	0.00E+00	1.63E-01
PU-239	5155.00	5118.70	0.000	0.000	-0.480	0.480	0.6928	99.900	-3.89E-02	1.72E-01	4.49E-01	1.03E-01	1.72E-01
PU-242	4890.00	4861.42	89.248	235.000	234.280	0.720	0.8485	100.000	1.90E+01	3.62E+00	4.94E-01	1.26E-01	2.44E+00
PU-244	4589.00	4539.24	4.958	1.000	0.760	0.240	0.4899	99.900	6.16E-02	2.31E-01	3.88E-01	7.27E-02	2.31E-01

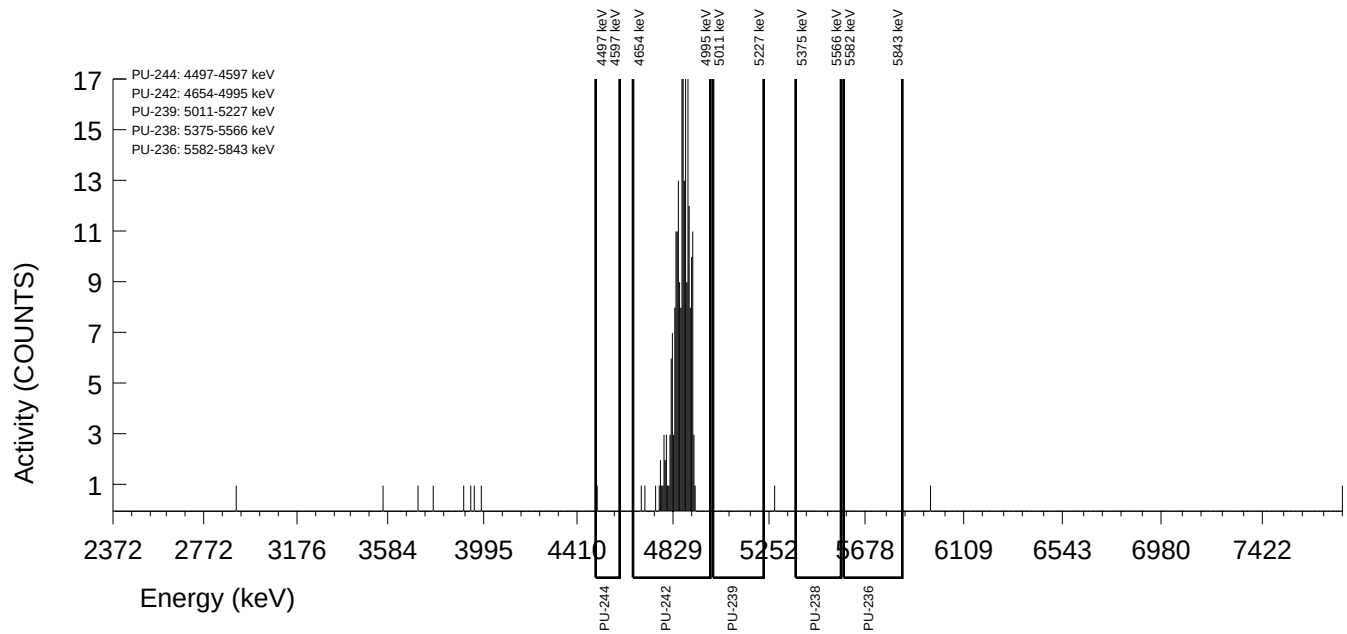


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

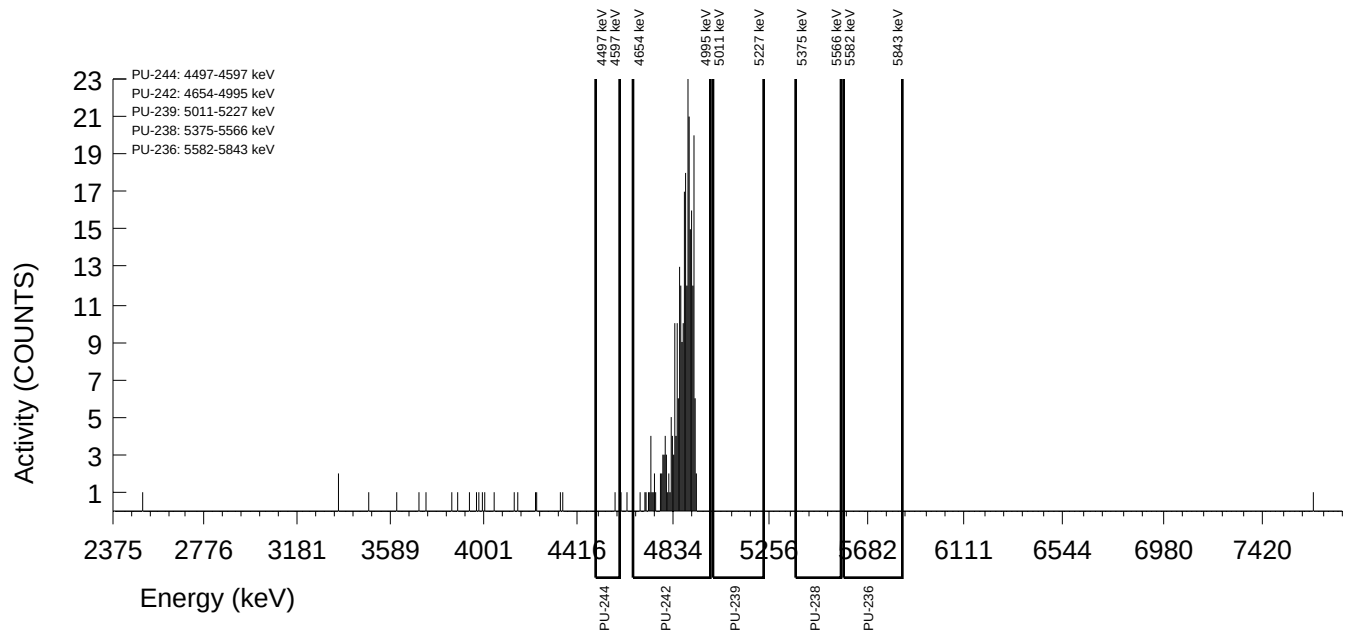
BATCH NUMBER : 1572839 SAMPLE ID : S0398677026_PU SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 86.4 +/-6.910 %	CHAMBER : 255 DETECTOR S/N : 87943 AVERAGE %EFFICIENCY : 25.4175 AVERAGE %EFF ERROR : 0.4926 COUNT DATE : 22-Jun-2016 14:42:33 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B255.CNF;432 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W255.CNF;112 CAL DATE : 17-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 3.7835E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.28	0.000	0.000	-0.960	0.960	0.9798	100.000	-8.27E-02	1.92E-01	5.68E-01	1.55E-01	1.92E-01
PU-238	5486.00	5470.36	0.000	0.000	-0.720	0.720	0.8485	99.900	-6.04E-02	1.83E-01	5.13E-01	1.30E-01	1.82E-01
PU-239	5155.00	5118.70	0.000	0.000	-0.720	0.720	0.8485	99.900	-6.04E-02	1.83E-01	5.12E-01	1.30E-01	1.82E-01
PU-242	4890.00	4868.55	75.369	232.000	230.800	1.200	1.0954	100.000	1.93E+01	3.72E+00	5.87E-01	1.68E-01	2.51E+00
PU-244	4589.00	4498.96	0.000	1.000	0.760	0.240	0.4899	99.900	6.37E-02	2.39E-01	4.02E-01	7.52E-02	2.39E-01



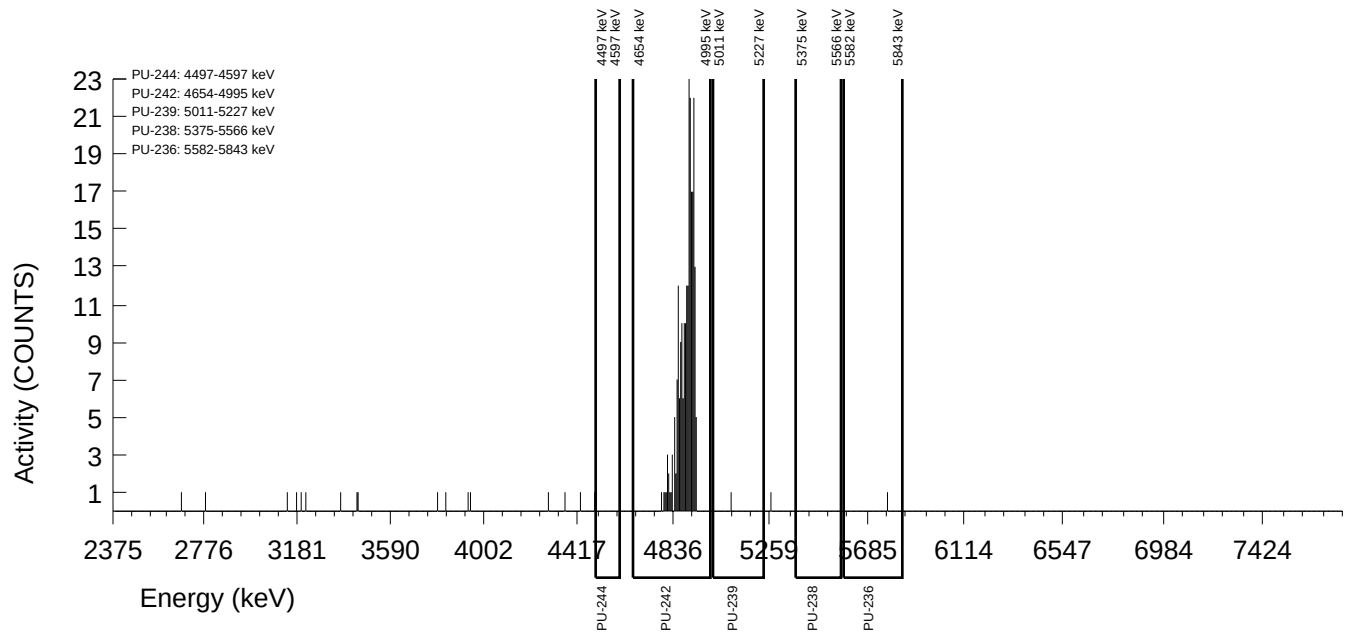
BATCH NUMBER : 1572839 SAMPLE ID : S0398677033_PU SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 104 +/-6.299 %	CHAMBER : 256 DETECTOR S/N : 87944 AVERAGE %EFFICIENCY : 25.8078 AVERAGE %EFF ERROR : 0.5000 COUNT DATE : 22-Jun-2016 14:42:36 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B256.CNF;432 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W256.CNF;108 CAL DATE : 17-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 4.5535E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5712.29	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.71E-02	1.48E-01	3.41E-01	6.39E-02	1.47E-01
PU-238	5486.00	5470.36	0.000	0.000	-1.200	1.200	1.0954	99.900	-8.32E-02	1.58E-01	4.86E-01	1.39E-01	1.58E-01
PU-239	5155.00	5118.71	0.000	0.000	-0.960	0.960	0.9798	99.900	-6.65E-02	1.54E-01	4.56E-01	1.24E-01	1.54E-01
PU-242	4890.00	4872.45	63.993	283.000	282.040	0.960	0.9798	100.000	1.95E+01	3.43E+00	4.56E-01	1.24E-01	2.29E+00
PU-244	4589.00	4577.53	4.991	1.000	1.000	0.000	0.0000	99.900	6.93E-02	1.95E-01	2.08E-01	0.00E+00	1.95E-01



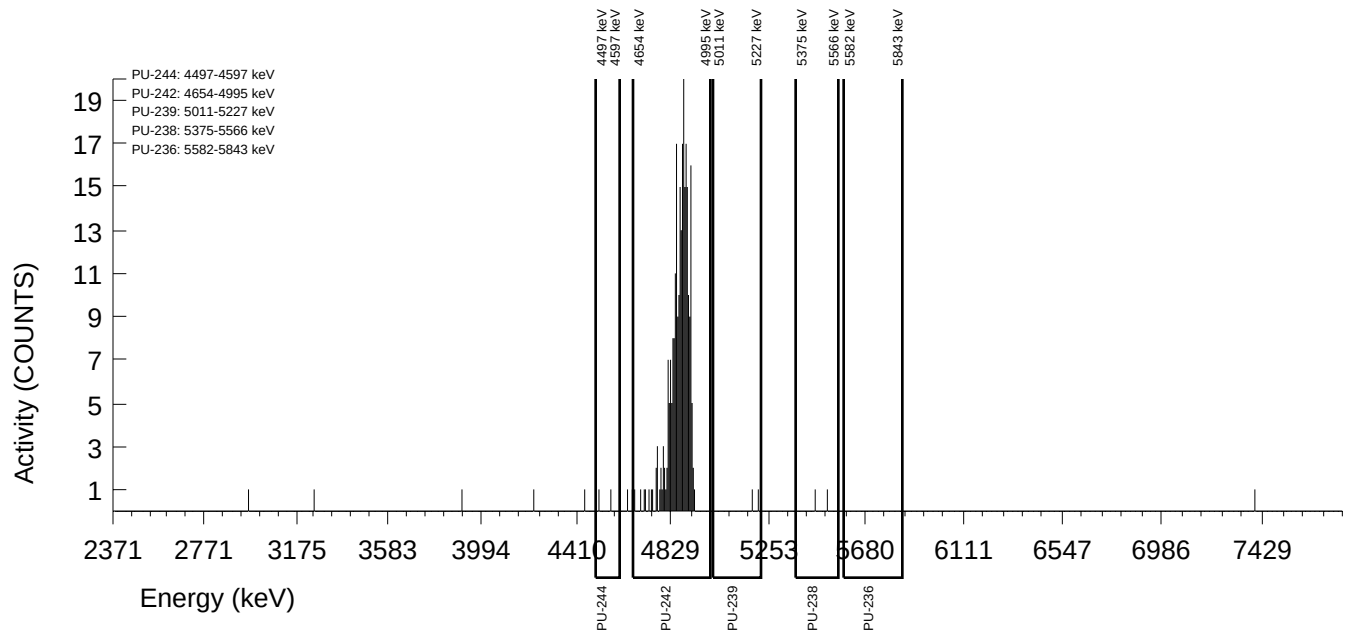
BATCH NUMBER : 1572839 SAMPLE ID : S0398677039_PU SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 96.8 +/-6.877 %	CHAMBER : 215 DETECTOR S/N : 87903 AVERAGE %EFFICIENCY : 22.9275 AVERAGE %EFF ERROR : 0.4455 COUNT DATE : 22-Jun-2016 14:42:38 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B215.CNF;428 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W215.CNF;119 CAL DATE : 16-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 4.2351E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5775.76	4.996	1.000	-0.200	1.200	1.0954	100.000	-1.74E-02	2.62E-01	6.10E-01	1.75E-01	2.61E-01
PU-238	5486.00	5470.36	0.000	0.000	-0.240	0.240	0.4899	99.900	-2.03E-02	1.76E-01	4.06E-01	7.61E-02	1.75E-01
PU-239	5155.00	5089.24	4.996	1.000	-0.920	1.920	1.3856	99.900	-7.79E-02	2.64E-01	6.84E-01	2.15E-01	2.63E-01
PU-242	4890.00	4892.83	71.375	234.000	233.040	0.960	0.9798	100.000	1.97E+01	3.77E+00	5.57E-01	1.52E-01	2.54E+00
PU-244	4589.00	4546.97	0.000	0.000	0.000	0.000	0.0000	99.900	0.00E+00	1.71E-01	2.54E-01	0.00E+00	1.71E-01



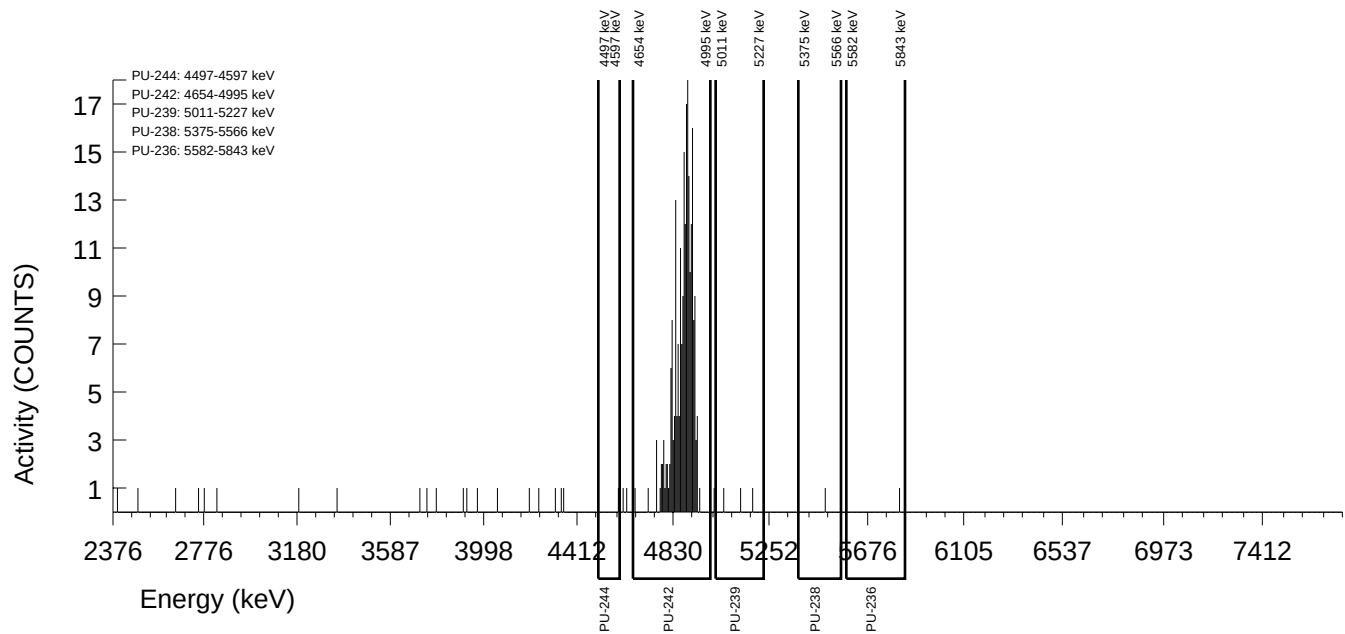
BATCH NUMBER : 1572839 SAMPLE ID : S1203562981_PU SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 21-Jun-2016 00:00:00 ANALYST : KXB2 % YIELD : 97.3 +/-6.463 %	CHAMBER : 251 DETECTOR S/N : 87939 AVERAGE %EFFICIENCY : 26.0660 AVERAGE %EFF ERROR : 0.5049 COUNT DATE : 22-Jun-2016 14:42:41 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B251.CNF;430 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W251.CNF;108 CAL DATE : 17-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 4.2565E+00 dpm		

NUCLIDE ACTIVITY SUMMARY											1.96-sigma			1.96-sigma
NUCLIDE	LIBRARY	PEAK	PEAK	GROSS	NET	BKG	BKG	%ABUN	ACTIVITY		TPU	MDA	Lc	
	ENERGY	ENERGY	FWHM	AREA	AREA	AREA	StDev		pCi/G	pCi/G	pCi/G	pCi/G	pCi/G	cnt Unc
PU-236	5749.00	5712.27	0.000	0.000	-0.240	0.240	0.4899	100.000	-1.71E-02	1.48E-01	3.42E-01	6.40E-02	1.48E-01	
PU-238	5486.00	5487.40	54.724	2.000	1.760	0.240	0.4899	99.900	1.25E-01	2.47E-01	3.42E-01	6.39E-02	2.47E-01	
PU-239	5155.00	5197.06	29.849	2.000	1.280	0.720	0.8485	99.900	9.12E-02	2.51E-01	4.35E-01	1.11E-01	2.51E-01	
PU-242	4890.00	4862.16	69.045	267.000	266.280	0.720	0.8485	100.000	1.90E+01	3.41E+00	4.35E-01	1.11E-01	2.29E+00	
PU-244	4589.00	4535.36	54.724	2.000	1.760	0.240	0.4899	99.900	1.25E-01	2.47E-01	3.42E-01	6.39E-02	2.47E-01	



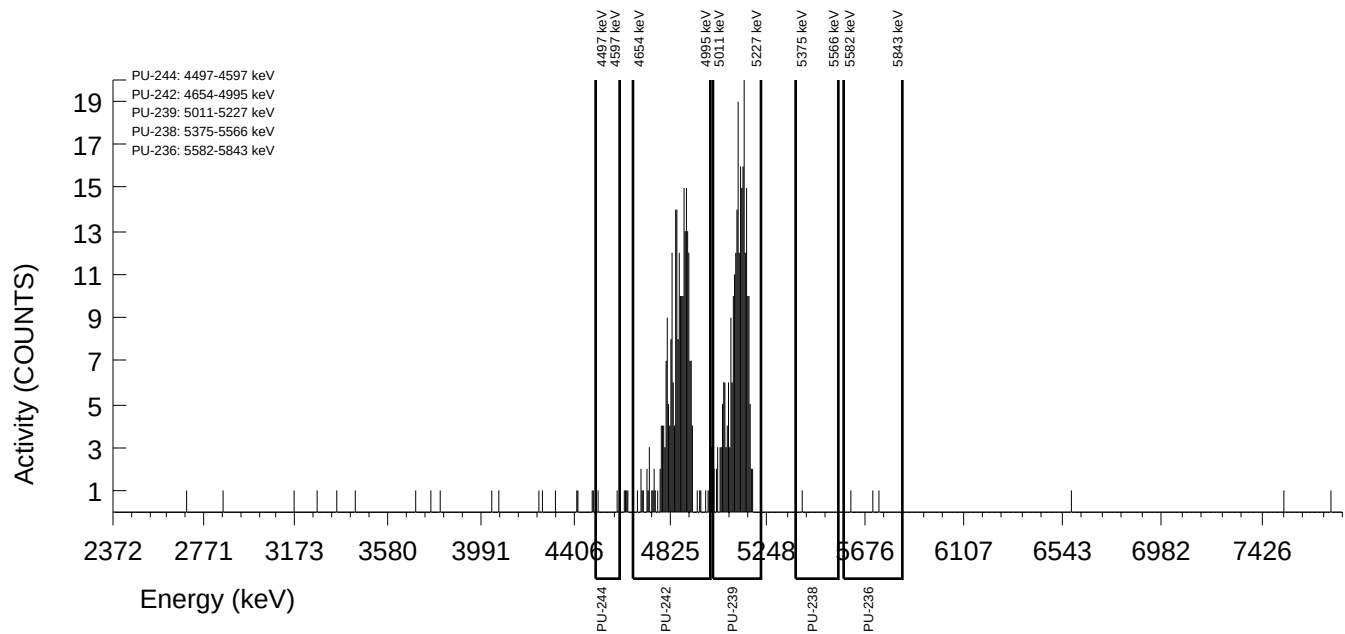
BATCH NUMBER : 1572839 SAMPLE ID : S1203562982_PU SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 91.3 +/-6.849 %	CHAMBER : 216 DETECTOR S/N : 87904 AVERAGE %EFFICIENCY : 24.5099 AVERAGE %EFF ERROR : 0.4756 COUNT DATE : 22-Jun-2016 14:42:43 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B216.CNF;428 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W216.CNF;122 CAL DATE : 16-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 3.9957E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
PU-236	5749.00	5820.71	4.981	1.000	0.280	0.720	0.8485	100.000	2.37E-02	2.48E-01	5.17E-01	1.31E-01	2.48E-01
PU-238	5486.00	5495.44	4.981	1.000	0.040	0.960	0.9798	99.900	3.30E-03	2.45E-01	5.43E-01	1.48E-01	2.44E-01
PU-239	5155.00	5090.42	0.000	4.000	3.280	0.720	0.8485	99.900	2.70E-01	3.71E-01	5.03E-01	1.28E-01	3.69E-01
PU-242	4890.00	4872.83	76.302	236.000	235.040	0.960	0.9798	100.000	1.93E+01	3.68E+00	5.42E-01	1.48E-01	2.48E+00
PU-244	4589.00	4589.33	4.981	1.000	1.000	0.000	0.0000	99.900	8.23E-02	2.32E-01	2.47E-01	0.00E+00	2.31E-01



BATCH NUMBER : 1572839 SAMPLE ID : S1203562983_PU SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 21-Jun-2016 00:00:00 ANALYST : KXB2 % YIELD : 94.3 +/-6.560 %	CHAMBER : 203 DETECTOR S/N : 78905 AVERAGE %EFFICIENCY : 26.0417 AVERAGE %EFF ERROR : 0.5044 COUNT DATE : 22-Jun-2016 14:42:44 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : PU BKG FILE : B203.CNF;772 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W203.CNF;219 CAL DATE : 14-Jun-2016
TRACER ID : 1769-A NUCLIDE : PU-242 NOMINAL : 4.3765E+00 dpm RESULTS : 4.1286E+00 dpm	LCS ID 0338-MM NUCLIDE PU-239 NOMINAL (pCi/G) 1.9001E+01 % RECOVERY 101.891	

NUCLIDE ACTIVITY SUMMARY										1.96-sigma			1.96-sigma
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	TPU pCi/G	MDA pCi/G	Lc pCi/G	cnt Unc pCi/G
PU-236	5749.00	5690.09	118.938	3.000	0.840	2.160	1.4697	100.000	6.18E-02	3.09E-01	6.17E-01	1.98E-01	3.08E-01
PU-238	5486.00	5402.89	4.956	1.000	0.520	0.480	0.6928	99.900	3.82E-02	2.13E-01	4.07E-01	9.33E-02	2.12E-01
PU-239	5155.00	5119.20	59.469	264.000	263.280	0.720	0.8485	99.900	1.94E+01	3.52E+00	4.49E-01	1.14E-01	2.35E+00
PU-242	4890.00	4853.74	97.381	259.000	258.040	0.960	0.9798	100.000	1.90E+01	3.46E+00	4.84E-01	1.32E-01	2.32E+00
PU-244	4589.00	4547.14	84.248	2.000	1.760	0.240	0.4899	99.900	1.29E-01	2.55E-01	3.53E-01	6.60E-02	2.54E-01



Batch# 1572840 Product: LL Date: 6/27/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5x MDA/ MDC, then RPD is 100% or less, If greater 5x MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	/		
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.	/		NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stated.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)	/		NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.	/		NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: _____

[Signature] 6/27/16

Secondary Review Performed By: _____

[Signature] 6/28/16

7/3

BRRL

Uranium Que Sheet

21-JUN-16

Batch #: 1572840 Analyst: KXB2 First Client Due Date: 03-JUL-16 Internal Due Date: 29-JUN-16
 Tracer Isotope: U-232 U-236 Tracer Code: 1564 - I Expiration Date: 11/23/16 Vol: 0.1 Analyzed Sequentially with Pu Analyzed Sequentially with:
 LCS Isotope: U-238 LCS Code: 1601E Expiration Date: 7/24/16 Vol: 0.1 Pu-236 ID: — Pu: 1572839
 Spike Isotope: U-238 Spike Code: — Expiration Date: — Vol: — Am: — Witness: JP 6/21/16
 Prep Date: 6/21/16 Initials: KB Pipet ID: 1540022 Balance ID: 18550299

Sample ID	Client Description	Type	Hazard Code	Min CRDL	Matrix	Client	Collection Date	Pos.	Label #	Wet/Dry Aliquot (g N/f)	U Det #
398677006-1	37801-006	SAMPLE		.9 pCi/g	SOIL	BRKL007	11-MAY-16	1		0.103	126
398677013-1	37801-013	SAMPLE		.9 pCi/g	SOIL	BRKL007	11-MAY-16	2		0.100	128
398677018-1	37801-019	SAMPLE		.9 pCi/g	SOIL	BRKL007	11-MAY-16	4		0.104	131
398677026-1	37801-026	SAMPLE		.9 pCi/g	SOIL	BRKL007	11-MAY-16	5		0.102	132
398677033-1	37801-033	SAMPLE		.9 pCi/g	SOIL	BRKL007	11-MAY-16	6		0.101	133
398677039-1	37801-039	SAMPLE		.9 pCi/g	SOIL	BRKL007	11-MAY-16	7		0.100	134
1203562984-1	MB for batch 1572840	MB		.9 pCi/g	SOIL	QC ACCOUNT		8		0.104	140
1203562985-1	37801-006(398677006DUP)	DUP		.9 pCi/g	SOIL	QC ACCOUNT	11-MAY-16	9		0.102	141
1203562986-1	LCS for batch 1572840	LCS		.9 pCi/g	SOIL	QC ACCOUNT		10		0.104	142

6/21/16

Choose SOP used: GL-RAD-A-011

Solid Sample Dissolution by: LEACH or DIGESTION
 Circle One

Data Reviewed By:

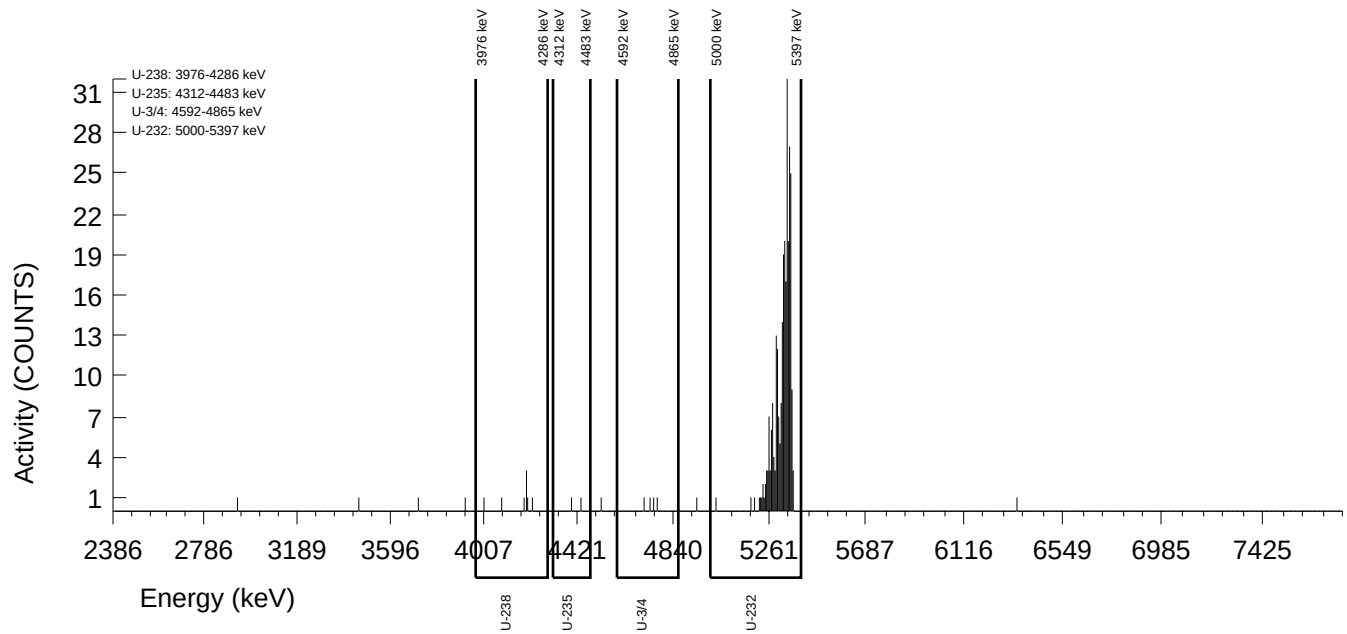
[Signature]

GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1572840 SAMPLE ID : S0398677006_UU SAMPLE QTY : 0.103 G +/-0.971 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 99.4 +/-6.769 %	CHAMBER : 126 DETECTOR S/N : 75548 AVERAGE %EFFICIENCY : 25.2726 AVERAGE %EFF ERROR : 0.4898 COUNT DATE : 23-Jun-2016 08:43:06 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : UU BKG FILE : B126.CNF;1136 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W126.CNF;332 CAL DATE : 07-Jun-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6341E+00 dpm RESULTS : 4.6053E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5320.42	35.626	279.000	279.000	0.000	0.0000	100.000	2.03E+01	3.69E+00	2.18E-01	0.00E+00	2.38E+00
U-3/4	4763.02	4745.17	59.688	4.000	2.080	1.920	1.3856	100.000	1.51E-01	3.35E-01	5.86E-01	1.84E-01	3.34E-01
U-235	4391.00	4416.26	44.766	2.000	2.000	0.000	0.0000	80.900	1.79E-01	3.08E-01	2.69E-01	0.00E+00	3.07E-01
U-238	4184.73	4163.95	6.217	8.000	7.040	0.960	0.9798	100.000	5.11E-01	4.39E-01	4.78E-01	1.30E-01	4.33E-01

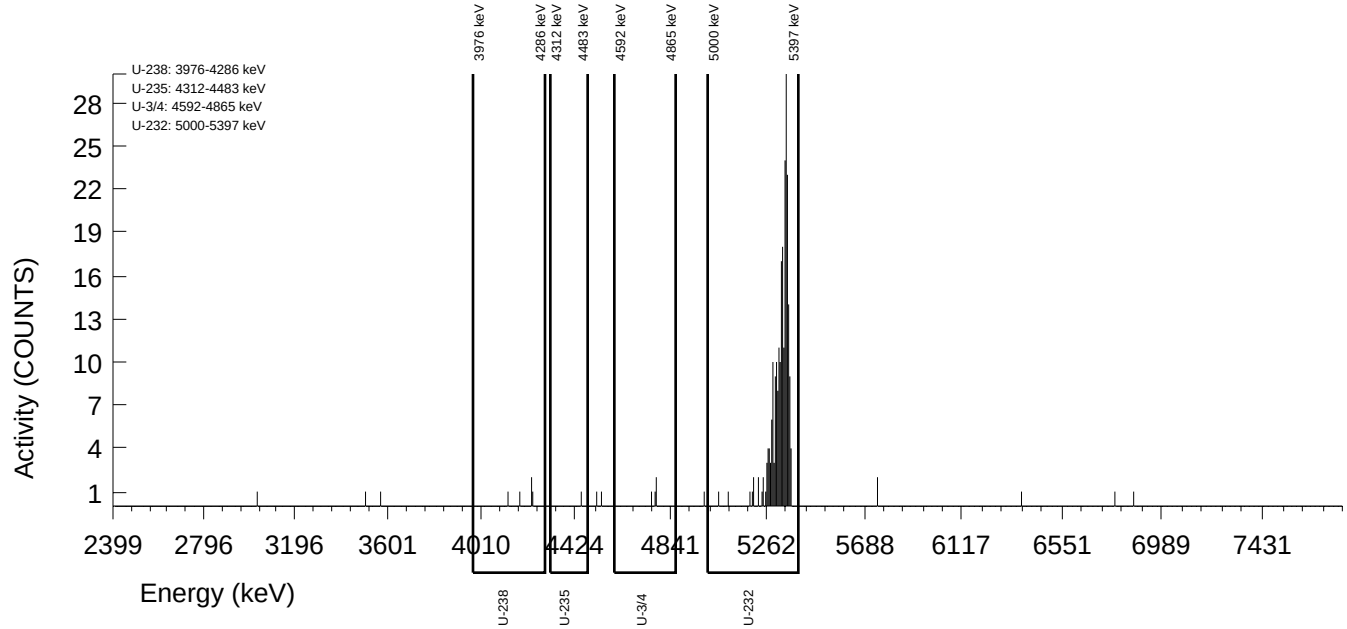


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

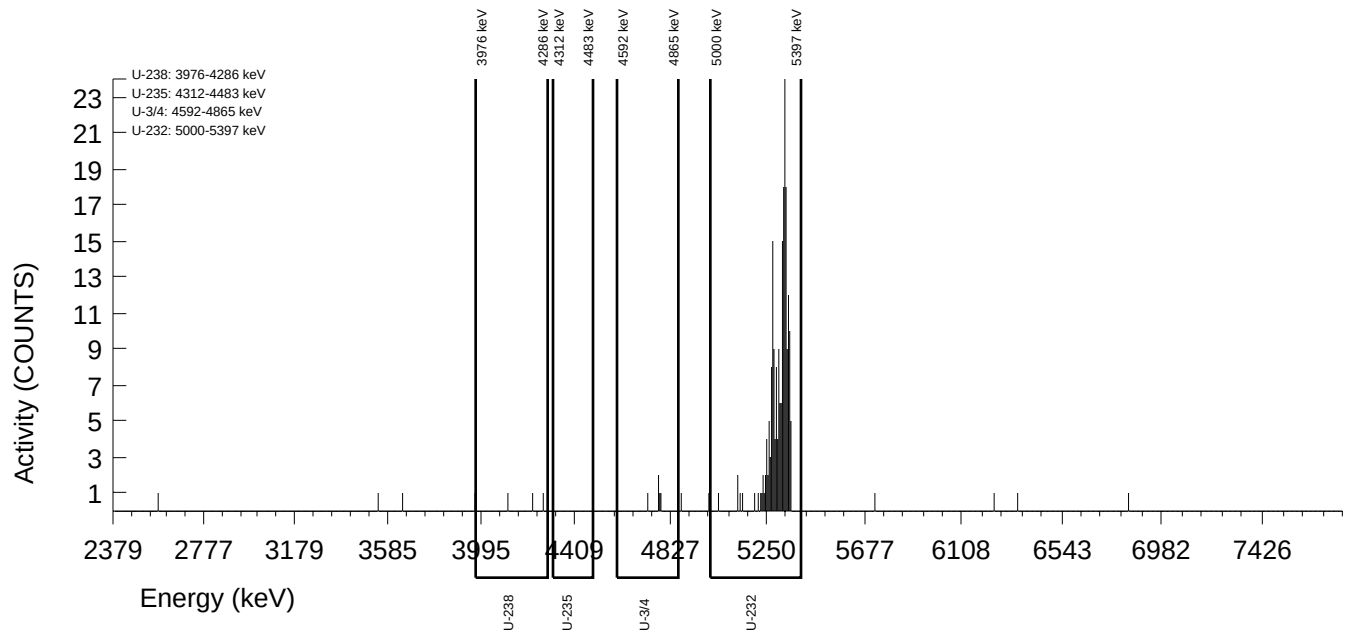
BATCH NUMBER : 1572840 SAMPLE ID : S0398677013_UU SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 83.9 +/-7.186 %		CHAMBER : 128 DETECTOR S/N : 75549 AVERAGE %EFFICIENCY : 25.9419 AVERAGE %EFF ERROR : 0.5025 COUNT DATE : 23-Jun-2016 08:43:09 ELAPSED LIVE TIME(SEC) : 14400.00		LIB FILE : UU BKG FILE : B128.CNF;1143 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W128.CNF;318 CAL DATE : 07-Jun-2016	
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6341E+00 dpm RESULTS : 3.8883E+00 dpm					

NUCLIDE ACTIVITY SUMMARY												1.96-sigma	
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5321.68	30.449	243.000	241.800	1.200	1.0954	100.000	2.09E+01	4.05E+00	6.05E-01	1.73E-01	2.64E+00
U-3/4	4763.02	4771.39	7.397	4.000	3.520	0.480	0.6928	100.000	3.04E-01	3.87E-01	4.78E-01	1.09E-01	3.84E-01
U-235	4391.00	4449.47	4.931	1.000	1.000	0.000	0.0000	80.900	1.07E-01	3.00E-01	3.20E-01	0.00E+00	3.00E-01
U-238	4184.73	4201.96	7.397	5.000	3.800	1.200	1.0954	100.000	3.28E-01	4.28E-01	6.05E-01	1.73E-01	4.26E-01



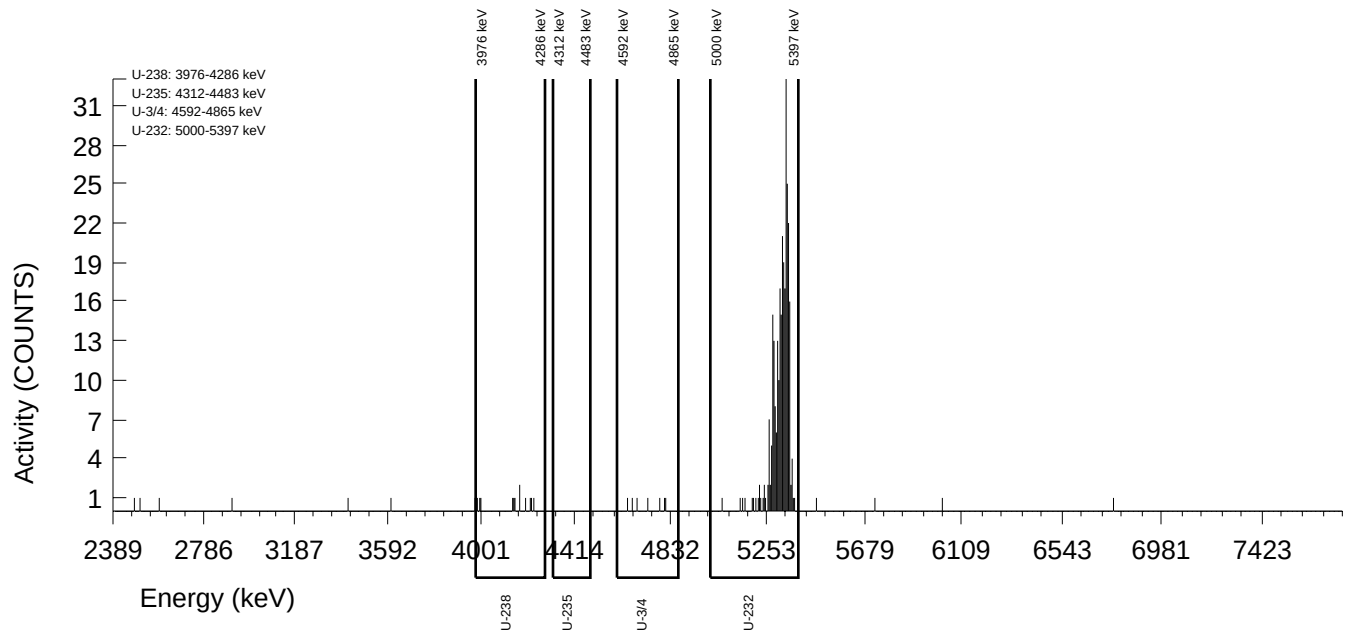
BATCH NUMBER : 1572840 SAMPLE ID : S0398677018_UU SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 72.4 +/-7.659 %	CHAMBER : 131 DETECTOR S/N : 80008 AVERAGE %EFFICIENCY : 25.7528 AVERAGE %EFF ERROR : 0.4990 COUNT DATE : 23-Jun-2016 08:43:11 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : UU BKG FILE : B131.CNF;1134 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W131.CNF;313 CAL DATE : 07-Jun-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6341E+00 dpm RESULTS : 3.3538E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5304.35	59.791	208.000	207.040	0.960	0.9798	100.000	2.01E+01	4.17E+00	6.39E-01	1.74E-01	2.75E+00
U-3/4	4763.02	4768.57	7.415	5.000	4.280	0.720	0.8485	100.000	4.14E-01	4.78E-01	5.91E-01	1.51E-01	4.74E-01
U-235	4391.00	4397.18	0.000	0.000	0.000	0.000	0.0000	80.900	0.00E+00	2.42E-01	3.59E-01	0.00E+00	2.41E-01
U-238	4184.73	4201.27	153.244	3.000	3.000	0.000	0.0000	100.000	2.90E-01	3.85E-01	2.90E-01	0.00E+00	3.82E-01



BATCH NUMBER : 1572840 SAMPLE ID : S0398677026_UU SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 99.6 +/-6.681 %	CHAMBER : 132 DETECTOR S/N : 67579 AVERAGE %EFFICIENCY : 26.0958 AVERAGE %EFF ERROR : 0.5054 COUNT DATE : 23-Jun-2016 08:43:13 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : UU BKG FILE : B132.CNF;1130 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W132.CNF;318 CAL DATE : 07-Jun-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6341E+00 dpm RESULTS : 4.6161E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5314.45	39.408	289.000	288.760	0.240	0.4899	100.000	2.05E+01	3.68E+00	3.40E-01	6.36E-02	2.37E+00
U-3/4	4763.02	4748.46	0.000	8.000	5.360	2.640	1.6248	100.000	3.79E-01	4.35E-01	6.34E-01	2.11E-01	4.32E-01
U-235	4391.00	4397.18	0.000	0.000	-1.200	1.200	1.0954	80.900	-1.05E-01	1.99E-01	6.14E-01	1.76E-01	1.99E-01
U-238	4184.73	4123.21	4.933	13.000	7.960	5.040	2.2450	100.000	5.63E-01	5.48E-01	7.95E-01	2.91E-01	5.42E-01

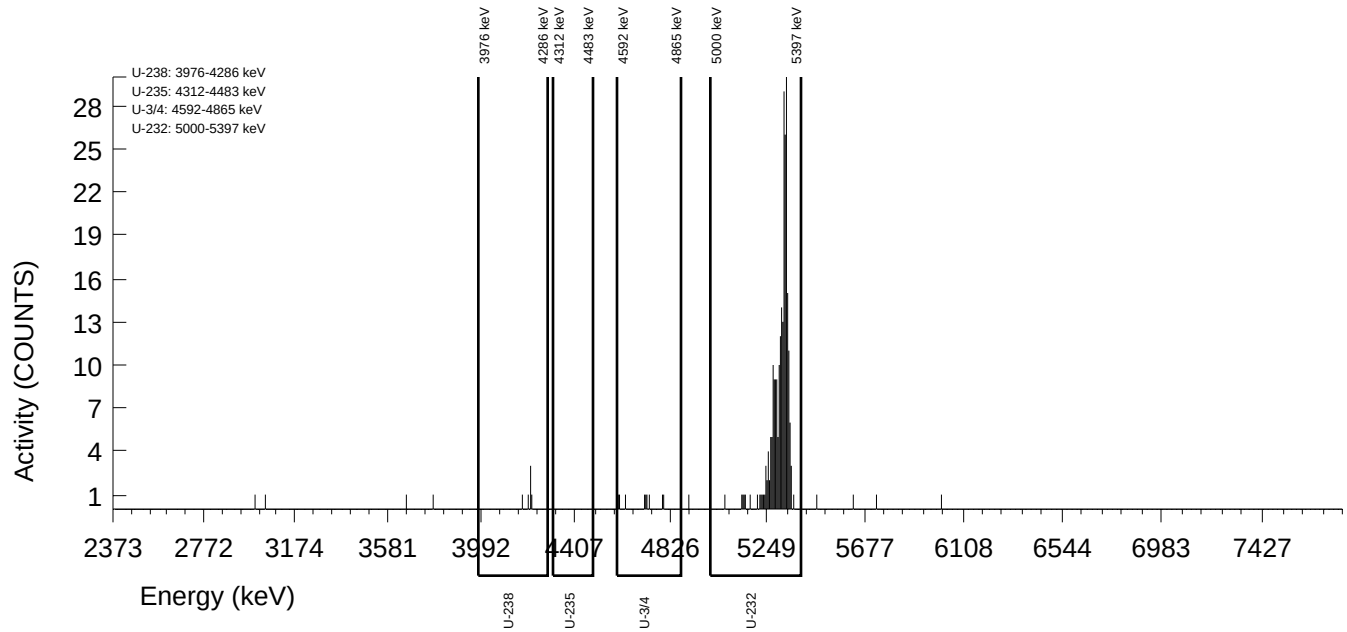


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

BATCH NUMBER : 1572840 SAMPLE ID : S0398677033_UU SAMPLE QTY : 0.101 G +/-0.990 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 86.6 +/-7.149 %		CHAMBER : 133 DETECTOR S/N : 76229 AVERAGE %EFFICIENCY : 25.3887 AVERAGE %EFF ERROR : 0.4920 COUNT DATE : 23-Jun-2016 08:43:16 ELAPSED LIVE TIME(SEC) : 14400.00		LIB FILE : UU BKG FILE : B133.CNF;1127 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W133.CNF;353 CAL DATE : 07-Jun-2016	
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6341E+00 dpm RESULTS : 4.0138E+00 dpm					

NUCLIDE ACTIVITY SUMMARY												1.96-sigma	
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5307.22	19.205	245.000	244.280	0.720	0.8485	100.000	2.07E+01	3.99E+00	5.17E-01	1.32E-01	2.60E+00
U-3/4	4763.02	4698.30	193.291	9.000	8.280	0.720	0.8485	100.000	7.00E-01	5.40E-01	5.16E-01	1.31E-01	5.30E-01
U-235	4391.00	4397.19	0.000	0.000	0.000	0.000	0.0000	80.900	0.00E+00	2.11E-01	3.13E-01	0.00E+00	2.11E-01
U-238	4184.73	4202.56	6.195	6.000	4.560	1.440	1.2000	100.000	3.85E-01	4.54E-01	6.25E-01	1.86E-01	4.51E-01

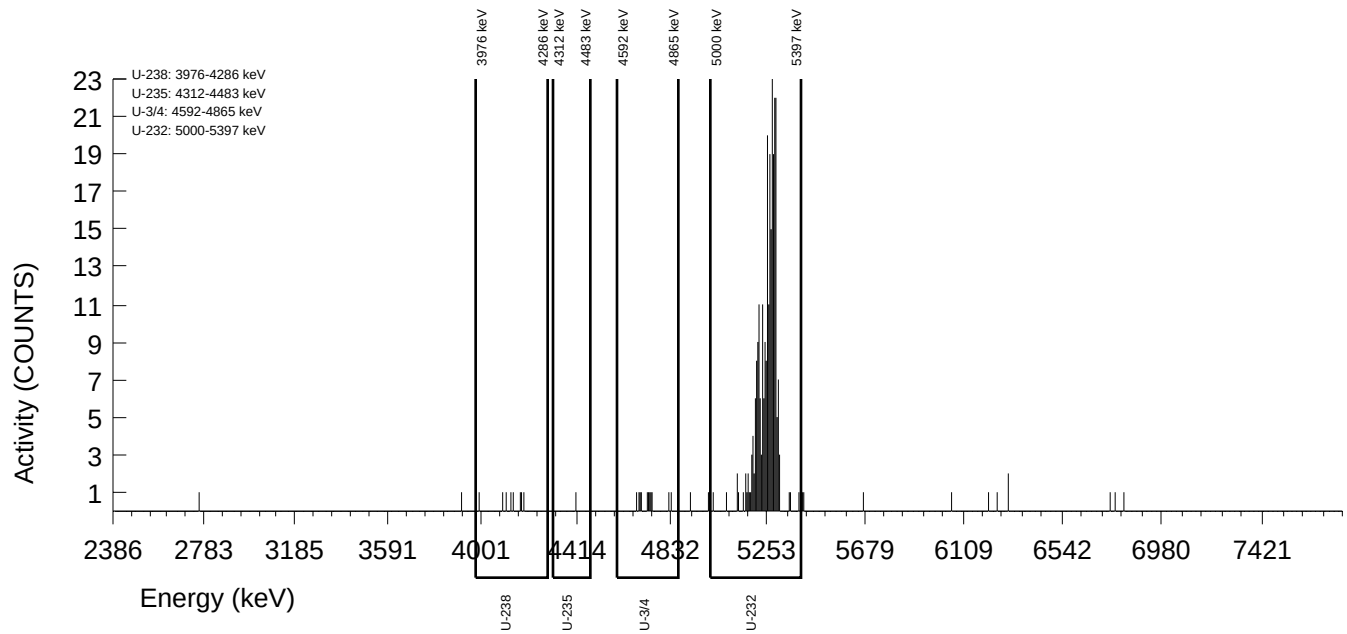


GEL Laboratories LLC
ALPHA SPECTROSCOPY REPORT

Instrument SOP: GL-RAD-I-009
Analytical SOP: GL-RAD-A-011

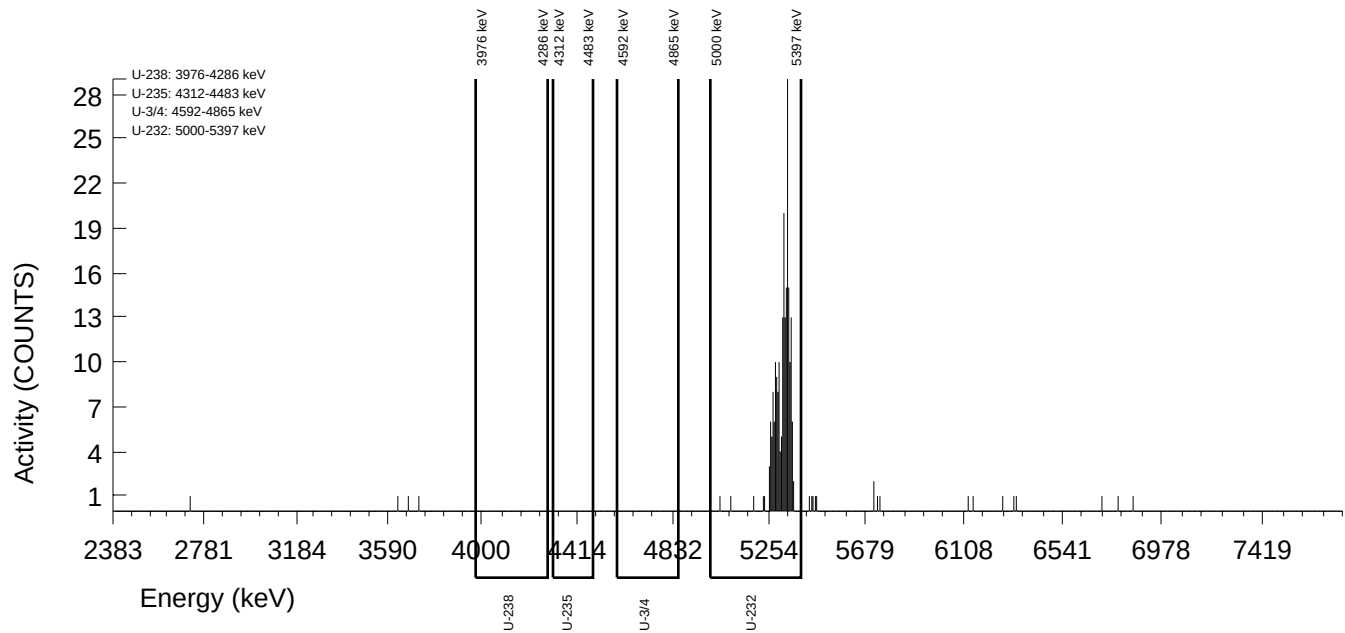
BATCH NUMBER : 1572840 SAMPLE ID : S0398677039_UU SAMPLE QTY : 0.100 G +/-1.000 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 95.9 +/-6.906 %		CHAMBER : 134 DETECTOR S/N : 76230 AVERAGE %EFFICIENCY : 25.0386 AVERAGE %EFF ERROR : 0.4854 COUNT DATE : 23-Jun-2016 08:43:18 ELAPSED LIVE TIME(SEC) : 14400.00		LIB FILE : UU BKG FILE : B134.CNF;1123 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W134.CNF;324 CAL DATE : 07-Jun-2016	
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6341E+00 dpm RESULTS : 4.4451E+00 dpm					

NUCLIDE ACTIVITY SUMMARY												1.96-sigma	
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5252.37	41.184	268.000	266.800	1.200	1.0954	100.000	2.09E+01	3.89E+00	5.49E-01	1.57E-01	2.52E+00
U-3/4	4763.02	4737.02	148.393	11.000	9.560	1.440	1.2000	100.000	7.47E-01	5.50E-01	5.78E-01	1.72E-01	5.39E-01
U-235	4391.00	4414.18	4.946	1.000	1.000	0.000	0.0000	80.900	9.66E-02	2.72E-01	2.90E-01	0.00E+00	2.72E-01
U-238	4184.73	4124.20	192.911	8.000	7.760	0.240	0.4899	100.000	6.06E-01	4.70E-01	3.75E-01	7.01E-02	4.62E-01



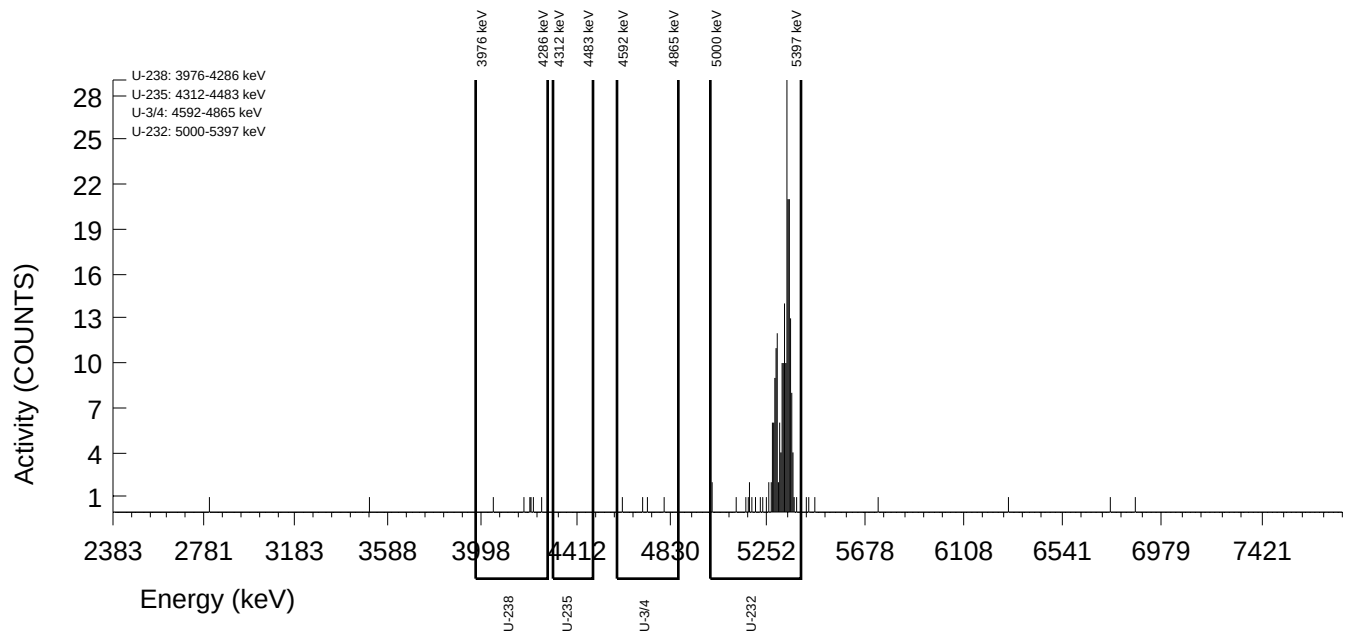
BATCH NUMBER : 1572840 SAMPLE ID : S1203562984_UU SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 21-Jun-2016 00:00:00 ANALYST : KXB2 % YIELD : 74.1 +/-7.538 %	CHAMBER : 140 DETECTOR S/N : 78771 AVERAGE %EFFICIENCY : 26.0678 AVERAGE %EFF ERROR : 0.5049 COUNT DATE : 23-Jun-2016 08:43:20 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : UU BKG FILE : B140.CNF;1074 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W140.CNF;277 CAL DATE : 08-Jun-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6289E+00 dpm RESULTS : 3.4291E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5315.34	24.228	215.000	214.520	0.480	0.6928	100.000	2.00E+01	4.09E+00	5.18E-01	1.19E-01	2.69E+00
U-3/4	4763.02	4728.38	0.000	0.000	-1.440	1.440	1.2000	100.000	-1.35E-01	2.17E-01	6.91E-01	2.05E-01	2.17E-01
U-235	4391.00	4397.19	0.000	0.000	-0.240	0.240	0.4899	80.900	-2.77E-02	2.40E-01	5.54E-01	1.04E-01	2.39E-01
U-238	4184.73	4130.84	0.000	0.000	-1.440	1.440	1.2000	100.000	-1.35E-01	2.17E-01	6.91E-01	2.05E-01	2.17E-01



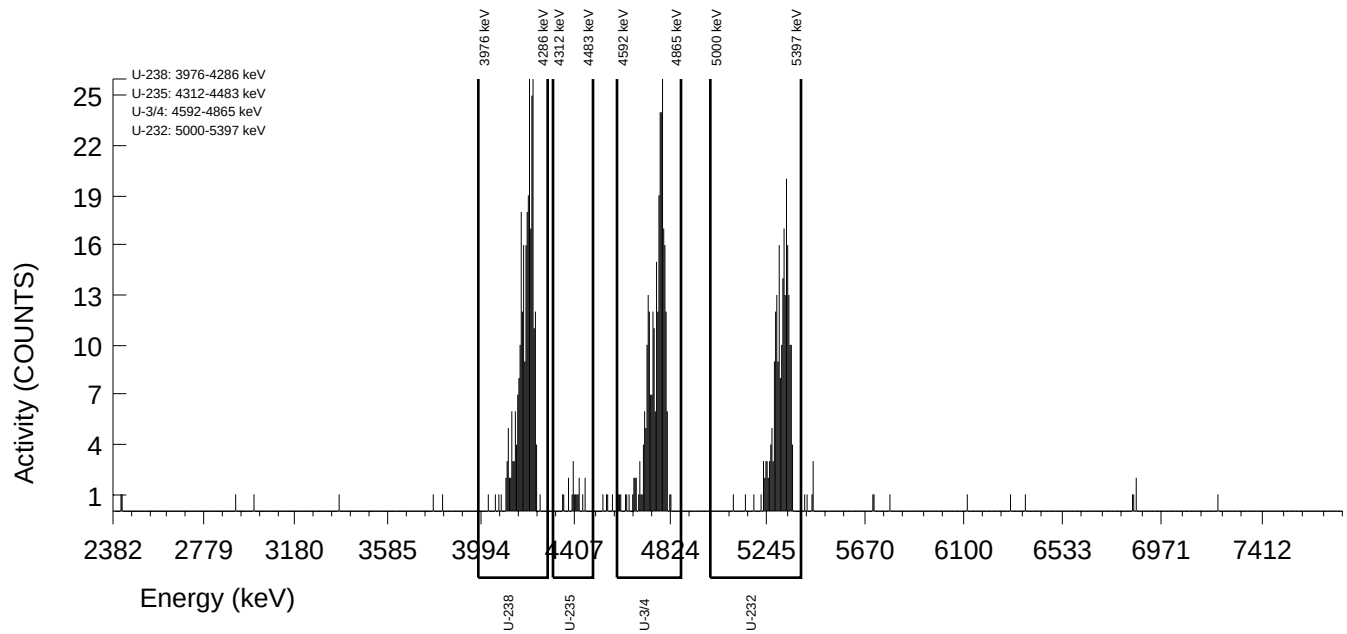
BATCH NUMBER : 1572840 SAMPLE ID : S1203562985_UU SAMPLE QTY : 0.102 G +/-0.980 % SAMPLE DATE : 11-May-2016 00:00:00 ANALYST : KXB2 % YIELD : 75.4 +/-7.561 %	CHAMBER : 141 DETECTOR S/N : 76232 AVERAGE %EFFICIENCY : 25.4522 AVERAGE %EFF ERROR : 0.4934 COUNT DATE : 23-Jun-2016 08:43:23 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : UU BKG FILE : B141.CNF;1101 BKG DATE : 17-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W141.CNF;313 CAL DATE : 08-Jun-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6341E+00 dpm RESULTS : 3.4957E+00 dpm		

NUCLIDE ACTIVITY SUMMARY													
NUCLIDE	LIBRARY ENERGY	PEAK ENERGY	PEAK FWHM	GROSS AREA	NET AREA	BKG AREA	BKG StDev	%ABUN	ACTIVITY pCi/G	1.96-sigma TPU pCi/G	MDA pCi/G	Lc pCi/G	1.96-sigma cnt Unc pCi/G
U-232	5302.10	5314.53	17.697	214.000	213.280	0.720	0.8485	100.000	2.05E+01	4.19E+00	5.86E-01	1.49E-01	2.76E+00
U-3/4	4763.02	4710.86	178.178	4.000	3.520	0.480	0.6928	100.000	3.37E-01	4.30E-01	5.31E-01	1.22E-01	4.27E-01
U-235	4391.00	4397.19	0.000	0.000	0.000	0.000	0.0000	80.900	0.00E+00	2.39E-01	3.55E-01	0.00E+00	2.39E-01
U-238	4184.73	4191.01	207.875	6.000	5.520	0.480	0.6928	100.000	5.29E-01	5.10E-01	5.31E-01	1.22E-01	5.03E-01



BATCH NUMBER : 1572840 SAMPLE ID : S1203562986_UU SAMPLE QTY : 0.104 G +/-0.962 % SAMPLE DATE : 21-Jun-2016 00:00:00 ANALYST : KXB2 % YIELD : 77.7 +/-7.412 %	CHAMBER : 157 DETECTOR S/N : 75555 AVERAGE %EFFICIENCY : 26.0053 AVERAGE %EFF ERROR : 0.5036 COUNT DATE : 25-Jun-2016 10:37:06 ELAPSED LIVE TIME(SEC) : 14400.00	LIB FILE : UU BKG FILE : B157.CNF;1074 BKG DATE : 24-Jun-2016 BKG LIVE TIME(SEC) : 60000.00 EFF FILE : W157.CNF;278 CAL DATE : 08-Jun-2016
TRACER ID : 1564-I NUCLIDE : U-232 NOMINAL : 4.6289E+00 dpm RESULTS : 3.5984E+00 dpm	LCS ID1600-E NUCLIDEU-238 NOMINAL (pCi/G)2.5898E+01 % RECOVERY101.603	

NUCLIDE ACTIVITY SUMMARY										1.96-sigma			1.96-sigma
NUCLIDE	LIBRARY	PEAK	PEAK	GROSS	NET	BKG	BKG	%ABUN	ACTIVITY	TPU	MDA	Lc	cnt Unc
	ENERGY	ENERGY	FWHM	AREA	AREA	AREA	StDev		pCi/G	pCi/G	pCi/G	pCi/G	pCi/G
U-232	5302.10	5305.76	62.494	226.000	224.560	1.440	1.2000	100.000	2.00E+01	4.02E+00	6.60E-01	1.96E-01	2.64E+00
U-3/4	4763.02	4758.31	39.333	285.000	284.040	0.960	0.9798	100.000	2.54E+01	4.85E+00	5.88E-01	1.60E-01	2.96E+00
U-235	4391.00	4403.32	71.540	17.000	16.760	0.240	0.4899	80.900	1.85E+00	9.62E-01	5.29E-01	9.90E-02	9.21E-01
U-238	4184.73	4187.42	56.697	295.000	294.760	0.240	0.4899	100.000	2.63E+01	4.99E+00	4.28E-01	8.01E-02	3.01E+00



Continuing Calibration Data

Review of Alpha Spectrometer QA results (Daily checks) 22-JUN-2016 09:09:02.10

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag
	-----	-----	-----
22-JUN-2016	1	PSFWHM-5000	Below
22-JUN-2016	1	PSENERGY-5000	Above
22-JUN-2016	1	PSCENTRD-5000	Above
22-JUN-2016	1	PSCTSS-5000	Below
22-JUN-2016	2	PSCENTRD-5000	Below
22-JUN-2016	6	PSFWHM-5000	Above
22-JUN-2016	6	PSENERGY-5000	Above
22-JUN-2016	19	PSFWHM-5000	Below
22-JUN-2016	19	PSCTSS-5000	Below
22-JUN-2016	39	PSFWHM-5000	Above
22-JUN-2016	74	PSFWHM-5000	Above
22-JUN-2016	76	PSFWHM-5000	Below
22-JUN-2016	76	PSENERGY-5000	Below
22-JUN-2016	76	PSCTSS-5000	Below
22-JUN-2016	78	PSFWHM-5000	Above
22-JUN-2016	94	PSFWHM-5000	Below
22-JUN-2016	94	PSCTSS-5000	Below
22-JUN-2016	101	PSFWHM-5000	Above
22-JUN-2016	101	PSENERGY-5000	Above
22-JUN-2016	101	PSCENTRD-5000	Above
22-JUN-2016	102	PSENERGY-5000	Below
22-JUN-2016	102	PSCENTRD-5000	Below
22-JUN-2016	114	PSFWHM-5000	Above
22-JUN-2016	125	PSFWHM-5000	Above
22-JUN-2016	130	PSFWHM-5000	Above
22-JUN-2016	138	PSFWHM-5000	Above
22-JUN-2016	144	PSFWHM-5000	Above
22-JUN-2016	151	PSFWHM-5000	Above
22-JUN-2016	161	PSFWHM-5000	Above

22-JUN-2016	166	PSFWHM-5000	Above
22-JUN-2016	167	PSFWHM-5000	Below
22-JUN-2016	167	PSENERGY-5000	Above
22-JUN-2016	167	PSCENTRD-5000	Below
22-JUN-2016	167	PSCTSS-5000	Below
22-JUN-2016	173	PSFWHM-5000	Above
22-JUN-2016	183	PSFWHM-5000	Below
22-JUN-2016	183	PSCENTRD-5000	Below
22-JUN-2016	183	PSCTSS-5000	Below
22-JUN-2016	198	PSFWHM-5000	Above
22-JUN-2016	211	PSFWHM-5000	Above
22-JUN-2016	218	PSENERGY-5000	Below
22-JUN-2016	224	PSFWHM-5000	Below
22-JUN-2016	224	PSENERGY-5000	Above
22-JUN-2016	224	PSCENTRD-5000	Above
22-JUN-2016	224	PSCTSS-5000	Below
22-JUN-2016	227	PSFWHM-5000	Above
22-JUN-2016	231	PSENERGY-5000	Above
22-JUN-2016	231	PSCENTRD-5000	Above
22-JUN-2016	232	PSENERGY-5000	Above
22-JUN-2016	232	PSCENTRD-5000	Above
22-JUN-2016	237	PSENERGY-5000	Above
22-JUN-2016	237	PSCENTRD-5000	Above
22-JUN-2016	240	PSFWHM-5000	Above
22-JUN-2016	241	PSFWHM-5000	Above
22-JUN-2016	241	PSCTSS-5000	Below

All QA parameters have been transferred since 22-JUN-2016

APPROVAL DATE: 6/22/16

APPROVAL TIME: 9:30

APPROVED BY: 

PROCEDURE # GL-RAD-I-009

Report completed at 22-JUN-2016 09:12:04.22

Review of Alpha Spectrometer QA results (Daily checks) 23-JUN-2016 08:29:26.62

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag
	-----	-----	-----
23-JUN-2016	1	PSFWHM-5000	Below
23-JUN-2016	1	PSENERGY-5000	Above
23-JUN-2016	1	PSCENTRD-5000	Above
23-JUN-2016	1	PSCTSS-5000	Below
23-JUN-2016	2	PSCENTRD-5000	Below
23-JUN-2016	6	PSFWHM-5000	Above
23-JUN-2016	6	PSENERGY-5000	Above
23-JUN-2016	19	PSFWHM-5000	Below
23-JUN-2016	19	PSCTSS-5000	Below
23-JUN-2016	39	PSFWHM-5000	Above
23-JUN-2016	74	PSFWHM-5000	Above
23-JUN-2016	76	PSENERGY-5000	Above
23-JUN-2016	76	PSCENTRD-5000	Above
23-JUN-2016	76	PSCTSS-5000	Below
23-JUN-2016	78	PSFWHM-5000	Above
23-JUN-2016	94	PSFWHM-5000	Below
23-JUN-2016	94	PSCTSS-5000	Below
23-JUN-2016	101	PSFWHM-5000	Above
23-JUN-2016	101	PSENERGY-5000	Above
23-JUN-2016	101	PSCENTRD-5000	Above
23-JUN-2016	102	PSENERGY-5000	Below
23-JUN-2016	102	PSCENTRD-5000	Below
23-JUN-2016	114	PSFWHM-5000	Above
23-JUN-2016	125	PSFWHM-5000	Above
23-JUN-2016	130	PSFWHM-5000	Above
23-JUN-2016	144	PSFWHM-5000	Above
23-JUN-2016	151	PSFWHM-5000	Above
23-JUN-2016	153	PSFWHM-5000	Above
23-JUN-2016	161	PSFWHM-5000	Above

23-JUN-2016	164	PSFWHM-5000	Above
23-JUN-2016	166	PSFWHM-5000	Below
23-JUN-2016	166	PSCTSS-5000	Below
23-JUN-2016	167	PSENERGY-5000	Above
23-JUN-2016	167	PSCENTRD-5000	Below
23-JUN-2016	167	PSCTSS-5000	Below
23-JUN-2016	173	PSFWHM-5000	Above
23-JUN-2016	183	PSFWHM-5000	Above
23-JUN-2016	183	PSENERGY-5000	Above
23-JUN-2016	183	PSCENTRD-5000	Below
23-JUN-2016	183	PSCTSS-5000	Below
23-JUN-2016	198	PSFWHM-5000	Above
23-JUN-2016	211	PSFWHM-5000	Above
23-JUN-2016	218	PSENERGY-5000	Below
23-JUN-2016	224	PSFWHM-5000	Below
23-JUN-2016	224	PSENERGY-5000	Above
23-JUN-2016	224	PSCENTRD-5000	Above
23-JUN-2016	224	PSCTSS-5000	Below
23-JUN-2016	227	PSFWHM-5000	Above
23-JUN-2016	231	PSENERGY-5000	Above
23-JUN-2016	231	PSCENTRD-5000	Above
23-JUN-2016	232	PSENERGY-5000	Above
23-JUN-2016	232	PSCENTRD-5000	Above
23-JUN-2016	237	PSENERGY-5000	Above
23-JUN-2016	237	PSCENTRD-5000	Above
23-JUN-2016	240	PSFWHM-5000	Above
23-JUN-2016	241	PSFWHM-5000	Above

All QA parameters have been transferred since 23-JUN-2016

APPROVAL DATE:

6/23/16

APPROVAL TIME:

8:00

APPROVED BY:



PROCEDURE # GL-RAD-I-009

Report completed at 23-JUN-2016 08:32:32.35

Review of Alpha Spectrometer QA results (Daily checks) 24-JUN-2016 15:04:41.43

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag
	-----	-----	-----
24-JUN-2016	1	PSFWHM-5000	Below
24-JUN-2016	1	PSENERGY-5000	Above
24-JUN-2016	1	PSCENTRD-5000	Above
24-JUN-2016	1	PSCTSS-5000	Below
24-JUN-2016	2	PSCENTRD-5000	Below
24-JUN-2016	6	PSFWHM-5000	Above
24-JUN-2016	6	PSENERGY-5000	Above
24-JUN-2016	19	PSFWHM-5000	Below
24-JUN-2016	19	PSCTSS-5000	Below
24-JUN-2016	39	PSFWHM-5000	Above
24-JUN-2016	74	PSFWHM-5000	Above
24-JUN-2016	76	PSCTSS-5000	Below
24-JUN-2016	78	PSFWHM-5000	Above
24-JUN-2016	94	PSFWHM-5000	Below
24-JUN-2016	94	PSCTSS-5000	Below
24-JUN-2016	101	PSFWHM-5000	Above
24-JUN-2016	101	PSENERGY-5000	Above
24-JUN-2016	101	PSCENTRD-5000	Above
24-JUN-2016	102	PSENERGY-5000	Below
24-JUN-2016	102	PSCENTRD-5000	Below
24-JUN-2016	130	PSFWHM-5000	Above
24-JUN-2016	144	PSFWHM-5000	Above
24-JUN-2016	151	PSFWHM-5000	Above
24-JUN-2016	161	PSFWHM-5000	Above
24-JUN-2016	161	PSCTSS-5000	Below
24-JUN-2016	166	PSFWHM-5000	Below
24-JUN-2016	166	PSCTSS-5000	Below
24-JUN-2016	167	PSFWHM-5000	Below
24-JUN-2016	167	PSENERGY-5000	Above
24-JUN-2016	167	PSCENTRD-5000	Below
24-JUN-2016	167	PSCTSS-5000	Below

24-JUN-2016	173	PSFWHM-5000	Above
24-JUN-2016	183	PSENERGY-5000	Above
24-JUN-2016	183	PSCTSS-5000	Below
24-JUN-2016	198	PSFWHM-5000	Above
24-JUN-2016	211	PSFWHM-5000	Above
24-JUN-2016	218	PSENERGY-5000	Below
24-JUN-2016	224	PSFWHM-5000	Below
24-JUN-2016	224	PSENERGY-5000	Above
24-JUN-2016	224	PSCENTRD-5000	Above
24-JUN-2016	224	PSCTSS-5000	Below
24-JUN-2016	227	PSFWHM-5000	Above
24-JUN-2016	231	PSENERGY-5000	Above
24-JUN-2016	231	PSCENTRD-5000	Above
24-JUN-2016	232	PSENERGY-5000	Above
24-JUN-2016	232	PSCENTRD-5000	Above
24-JUN-2016	237	PSENERGY-5000	Above
24-JUN-2016	237	PSCENTRD-5000	Above
24-JUN-2016	240	PSFWHM-5000	Above
24-JUN-2016	241	PSFWHM-5000	Above

All QA parameters have been transfered since 24-JUN-2016

APPROVAL DATE: 6/24/16 APPROVAL TIME: 15:10

APPROVED BY:  PROCEDURE # GL-RAD-I-009

Report completed at 24-JUN-2016 15:08:03.30

Review of Alpha Spectrometer QA results (Daily checks) 25-JUN-2016 09:31:18.81

Bank 1 through bank 29 (detectors 1 through 256)

DETECTORS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

	Detector	Parameter	Flag
	-----	-----	-----
25-JUN-2016	1	PSFWHM-5000	Below
25-JUN-2016	1	PSENERGY-5000	Above
25-JUN-2016	1	PSCENTRD-5000	Above
25-JUN-2016	1	PSCTSS-5000	Below
25-JUN-2016	2	PSCENTRD-5000	Below
25-JUN-2016	6	PSFWHM-5000	Above
25-JUN-2016	6	PSENERGY-5000	Above
25-JUN-2016	19	PSFWHM-5000	Below
25-JUN-2016	19	PSCTSS-5000	Below
25-JUN-2016	39	PSFWHM-5000	Above
25-JUN-2016	74	PSFWHM-5000	Above
25-JUN-2016	76	PSFWHM-5000	Below
25-JUN-2016	76	PSENERGY-5000	Below
25-JUN-2016	76	PSCTSS-5000	Below
25-JUN-2016	78	PSFWHM-5000	Above
25-JUN-2016	78	PSCTSS-5000	Below
25-JUN-2016	94	PSFWHM-5000	Below
25-JUN-2016	94	PSCTSS-5000	Below
25-JUN-2016	101	PSFWHM-5000	Above
25-JUN-2016	101	PSENERGY-5000	Above
25-JUN-2016	101	PSCENTRD-5000	Above
25-JUN-2016	102	PSENERGY-5000	Below
25-JUN-2016	102	PSCENTRD-5000	Below
25-JUN-2016	144	PSFWHM-5000	Above
25-JUN-2016	151	PSFWHM-5000	Above
25-JUN-2016	161	PSFWHM-5000	Above
25-JUN-2016	166	PSFWHM-5000	Above
25-JUN-2016	167	PSFWHM-5000	Below
25-JUN-2016	167	PSCENTRD-5000	Below
25-JUN-2016	167	PSCTSS-5000	Below
25-JUN-2016	183	PSFWHM-5000	Below

25-JUN-2016	183	PSENERGY-5000	Below
25-JUN-2016	183	PSCENTRD-5000	Below
25-JUN-2016	183	PSCTSS-5000	Below
25-JUN-2016	198	PSFWHM-5000	Above
25-JUN-2016	211	PSFWHM-5000	Above
25-JUN-2016	218	PSENERGY-5000	Below
25-JUN-2016	224	PSFWHM-5000	Below
25-JUN-2016	224	PSCTSS-5000	Below
25-JUN-2016	227	PSENERGY-5000	Above
25-JUN-2016	231	PSENERGY-5000	Above
25-JUN-2016	231	PSCENTRD-5000	Above
25-JUN-2016	232	PSENERGY-5000	Above
25-JUN-2016	232	PSCENTRD-5000	Above
25-JUN-2016	237	PSENERGY-5000	Above
25-JUN-2016	237	PSCENTRD-5000	Above
25-JUN-2016	241	PSFWHM-5000	Above

The following detectors that may not have properly transferred to the QA file

147 may not have run since 25-JUN-2016

148 may not have run since 25-JUN-2016

APPROVAL DATE: 6/25/16

APPROVAL TIME: 9:42

APPROVED BY: 

PROCEDURE # GL-RAD-I-009

Report completed at 25-JUN-2016 09:34:19.22

Runlogs

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1572839

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398677013	SAMPLE	KXB2	1253	JUN-22-16 14:42:28	DONE		17-JUN-16 13:30
398677018	SAMPLE	KXB2	1254	JUN-22-16 14:42:31	DONE		17-JUN-16 16:13
398677026	SAMPLE	KXB2	1255	JUN-22-16 14:42:33	DONE		17-JUN-16 16:05
398677033	SAMPLE	KXB2	1256	JUN-22-16 14:42:36	DONE		17-JUN-16 13:32
398677039	SAMPLE	KXB2	1215	JUN-22-16 14:42:38	DONE		16-JUN-16 10:31
1203562981	MB	KXB2	1251	JUN-22-16 14:42:41	DONE		17-JUN-16 13:30
1203562982	DUP	KXB2	1216	JUN-22-16 14:42:43	DONE		16-JUN-16 14:11
1203562983	LCS	KXB2	1203	JUN-22-16 14:42:44	DONE		14-JUN-16 18:11
398677006	SAMPLE	KXB2	1095	JUN-24-16 08:57:53	DONE		06-JUN-16 16:23

Instrument Run Log

Instrument Type: ALPHA SPECTROMETER

Batch ID: 1572840

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398677006	SAMPLE	KXB2	1126	JUN-23-16 08:43:06	DONE		07-JUN-16 11:23
398677013	SAMPLE	KXB2	1128	JUN-23-16 08:43:09	DONE		07-JUN-16 11:23
398677018	SAMPLE	KXB2	1131	JUN-23-16 08:43:11	DONE		07-JUN-16 11:24
398677026	SAMPLE	KXB2	1132	JUN-23-16 08:43:13	DONE		07-JUN-16 11:24
398677033	SAMPLE	KXB2	1133	JUN-23-16 08:43:16	DONE		07-JUN-16 11:25
398677039	SAMPLE	KXB2	1134	JUN-23-16 08:43:18	DONE		07-JUN-16 15:35
1203562984	MB	KXB2	1140	JUN-23-16 08:43:20	DONE		08-JUN-16 09:50
1203562985	DUP	KXB2	1141	JUN-23-16 08:43:23	DONE		08-JUN-16 09:50
1203562986	LCS	KXB2	1142	JUN-23-16 08:43:26	DUSE		08-JUN-16 09:50
1203562986	LCS	KXB2	1157	JUN-25-16 10:37:06	DONE		08-JUN-16 09:52

Gamma Spectroscopy Raw Data

Batch# 1572486 Product: 8 solid Date: 6/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required). Blank correction reported included (if required).			N/A
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/MDC, error is 40% or less. If below the MDA/MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		CASE NARRATIVE
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			N/A
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	/		
Sample was run within hold time.	/		
Sample was correctly preserved if required.			N/A
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			N/A
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly statused.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.			N/A
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			N/A
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)			N/A

Primary Review Performed By: [Signature] 6/29/16

Secondary Review Performed By: [Signature] 6/29/16

Gamma Spec Queue Sheet

06/08/2016

Batch #: 1572486 Analyst: MXRJ First Client Due Date: 07/03/2016 Internal Due Date: 06/29/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 10
 Initials: MS. Prep Date: 6/7/16 Library: SOLID Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Weight (g)	Detector	Sealing Date/Time (if Applicable)
398677021-1	37801-021	SAMPLE	BRKL007	SOIL	11-MAY-16 14:30:00	W5	CAN	155.43 g	1	6/7/16
398677022-1	37801-022	SAMPLE	BRKL007	SOIL	11-MAY-16 14:20:00	W5		154.63 g	8	
398677023-1	37801-023	SAMPLE	BRKL007	SOIL	11-MAY-16 14:10:00	W5		131.21 g	9	
398677024-1	37801-024	SAMPLE	BRKL007	SOIL	11-MAY-16 13:57:00	W5		132.24 g	14	
398677025-1	37801-025	SAMPLE	BRKL007	SOIL	11-MAY-16 13:51:00	W5		141.1 g	17	
398677026-1	37801-026	SAMPLE	BRKL007	SOIL	11-MAY-16 14:35:00	W5		142.64 g	32	
398677027-1	37801-027	SAMPLE	BRKL007	SOIL	11-MAY-16 14:55:00	W5		145.4 g	41	
398677028-1	37801-028	SAMPLE	BRKL007	SOIL	11-MAY-16 14:50:00	W5		148.55 g	43	
398677029-1	37801-029	SAMPLE	BRKL007	SOIL	11-MAY-16 14:45:00	W5		148.19 g	6	
398677030-1	37801-030	SAMPLE	BRKL007	SOIL	11-MAY-16 14:40:00	W5		150.39 g	24	
398677031-1	37801-031	SAMPLE	BRKL007	SOIL	11-MAY-16 15:10:00	W5		142.06 g	2	
398677032-1	37801-032	SAMPLE	BRKL007	SOIL	11-MAY-16 15:05:00	W5		134.54 g	1	
398677033-1	37801-033	SAMPLE	BRKL007	SOIL	11-MAY-16 15:15:00	W5		142.96 g	2	
398677034-1	37801-034	SAMPLE	BRKL007	SOIL	11-MAY-16 15:35:00	W5		135.52 g	8	
398677035-1	37801-035	SAMPLE	BRKL007	SOIL	11-MAY-16 15:30:00	W5		156.48 g	9	
398677036-1	37801-036	SAMPLE	BRKL007	SOIL	11-MAY-16 15:25:00	W5		141.15 g	11	
398677037-1	37801-037	SAMPLE	BRKL007	SOIL	11-MAY-16 15:20:00	W5		157.24 g	12	
398677038-1	37801-038	SAMPLE	BRKL007	SOIL	11-MAY-16 15:40:00	W5		133.53 g	14	
398677039-1	37801-039	SAMPLE	BRKL007	SOIL	11-MAY-16 00:00:00	W5		141.53 g	17	
398677040-1	37801-040	SAMPLE	BRKL007	SOIL	11-MAY-16 00:00:00	W5		164.249 g	25	
1203561990-1	MB	MB	QC ACCOUNT	SOIL	6/7/16	MS		164.249	32	
1203561991-1	DUP 37801-031(398677031)	DUP	QC ACCOUNT	SOIL	11-MAY-16 15:10:00	W5		142.06	33	
1203561992-1	LCS	LCS	QC ACCOUNT	SOIL	6/7/16	MS		115	30	

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: B. Smith 6/29/16 Page 1 of 1

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:37:08.25

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677021.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM01.CNF;388
Background date    : 26-JUN-2016 12:03:28
Sample date       : 11-MAY-2016 14:30:00 Acquisition date : 28-JUN-2016 11:36:35
Sample ID        : G398677021 Sample quantity : 1.55430E+02 GRAM
Detector name    : GAM01 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572486 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	34.99*	41	24	1.40	70.70	67	17	1.15E-02	38.6	3.28E+00
2	3	36.86*	33	58	1.28	74.44	67	17	9.14E-03	53.7	
3	0	63.75*	56	344	4.34	128.21	122	17	1.56E-02	77.5	
4	3	74.82*	104	210	1.49	150.35	143	17	2.90E-02	27.6	2.00E+00
5	3	77.19*	96	177	1.17	155.09	143	17	2.66E-02	24.7	
6	0	87.24	49	159	1.34	175.19	172	7	1.36E-02	45.0	
7	0	92.91*	36	230	1.58	186.52	182	9	9.91E-03	82.4	
8	0	113.40	71	207	2.50	227.50	221	13	1.98E-02	43.5	
9	0	118.02*	36	97	1.17	236.74	234	7	9.90E-03	49.7	
10	0	186.24*	49	203	1.07	373.15	369	10	1.36E-02	58.5	
11	0	195.40	37	95	1.08	391.48	389	6	1.02E-02	45.0	
12	2	238.73*	325	103	1.22	478.13	473	19	9.03E-02	7.7	1.29E+00
13	2	241.90	62	121	1.58	484.45	473	19	1.71E-02	36.4	
14	0	269.26	69	200	3.77	539.16	531	16	1.92E-02	47.4	
15	0	295.37*	95	116	1.74	591.37	587	10	2.65E-02	23.6	
16	0	339.15*	34	148	0.98	678.92	674	11	9.52E-03	72.0	
17	0	352.13*	134	110	1.18	704.88	699	10	3.72E-02	17.2	
18	0	372.33	27	71	1.77	745.27	742	7	7.43E-03	56.3	
19	0	381.92	28	119	3.37	764.45	758	12	7.81E-03	80.0	
20	0	456.90	41	91	1.24	914.37	909	11	1.13E-02	47.9	
21	0	510.88*	71	83	1.68	1022.30	1015	14	1.98E-02	32.3	
22	0	583.37*	79	46	1.42	1167.26	1163	12	2.19E-02	21.1	
23	1	609.78*	109	23	1.70	1220.06	1214	24	3.03E-02	12.2	6.25E+00
24	1	614.85	19	13	1.70	1230.20	1214	24	5.40E-03	49.9	
25	0	637.94	4	23	0.45	1276.36	1271	9	1.06E-03	231.0	
26	0	647.02	10	13	1.32	1294.51	1291	7	2.69E-03	71.2	
27	0	661.80	2540	41	1.49	1324.08	1317	15	7.06E-01	2.1	
28	0	726.83*	31	2	3.17	1454.10	1449	10	8.53E-03	21.5	
29	0	736.39*	11	11	4.18	1473.22	1465	12	3.14E-03	70.3	
30	0	752.68	23	7	4.60	1505.79	1498	13	6.51E-03	30.5	
31	0	795.12	25	9	1.65	1590.64	1586	9	7.05E-03	29.0	
32	0	904.29	22	5	1.65	1808.92	1803	12	6.03E-03	30.9	
33	0	911.34*	71	0	2.04	1823.01	1815	16	1.97E-02	12.4	
34	2	965.11	22	8	2.07	1930.52	1925	18	6.20E-03	25.9	1.40E+00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	2	969.16	42	3	1.78	1938.62	1925	18	1.18E-02	17.3	
36	0	1061.08	8	6	0.65	2122.40	2114	11	2.08E-03	70.7	
37	0	1120.55*	31	3	1.18	2241.30	2236	12	8.54E-03	21.9	
38	0	1155.70	7	8	0.77	2311.56	2304	9	1.87E-03	88.2	
39	0	1266.51	12	2	1.49	2533.11	2528	10	3.25E-03	38.4	
40	0	1368.83	3	9	1.39	2737.67	2731	9	8.33E-04	189.3	
41	0	1402.26	7	3	1.85	2804.50	2797	10	1.99E-03	56.4	
42	0	1460.76*	110	9	1.40	2921.43	2914	13	3.05E-02	11.5	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:37:10

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677021.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:30:00 Acquisition date : 28-JUN-2016 11:36:35
Sample ID        : G398677021 Sample quantity  : 155.43 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA1 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.002E+00	4.807E+00	4.807E+00	22.97	OK
CD-109	88.03	3.70*	4.668E+00	1.073E+00	1.153E+00	151.52	OK
SN-126	64.28	9.60	2.396E+00	1.565E+00	1.565E+00	155.03	OK
	86.94	8.90	4.668E+00	4.462E-01	4.462E-01	151.52	OK
	87.57	37.00*	4.668E+00	1.073E-01	1.073E-01	151.52	OK
CS-135	268.22	16.00*	4.104E+00	5.897E-01	5.897E-01	94.77	OK
BA-137M	661.66	89.90*	1.963E+00	7.357E+00	7.380E+00	4.12	OK
CS-137	661.66	85.10*	1.963E+00	7.772E+00	7.796E+00	4.12	OK
TL-208	277.37	6.60	4.009E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.178E+00	2.203E-01	2.203E-01	42.25	OK
	860.56	12.50	1.579E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.606E+00	1.354E+00	1.354E+00	73.94	OK
	77.11	17.10	3.838E+00	9.210E-01	9.210E-01	49.50	OK
	238.63	43.60*	4.495E+00	9.418E-01	9.418E-01	15.37	OK
	300.09	3.30	3.765E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46	OK
	1120.29	14.92	1.262E+00	7.867E-01	7.867E-01	43.71	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	3.607E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.838E+00	1.624E+00	1.624E+00	49.50	OK
	87.09	3.41	4.658E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.451E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.814E+00	7.540E-01	7.540E-01	47.28	OK
	351.93	35.60*	3.305E+00	6.214E-01	6.214E-01	34.46	OK
RN-222	609.32	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46	OK
	1120.29	14.92	1.262E+00	7.867E-01	7.867E-01	43.71	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	4.452E+00	5.776E-01	5.776E-01	264.67	OK
RA-226	609.32	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46	OK
	1120.29	14.92	1.262E+00	7.867E-01	7.867E-01	43.71	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	5.561E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.408E+00	4.892E-01	4.892E-01	144.03	OK
	794.95	4.25	1.687E+00	1.774E+00	1.774E+00	58.04	OK
	835.71	1.61	1.619E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.505E+00	9.028E-01	9.028E-01	24.88	OK
	968.97	15.80	1.429E+00	9.219E-01	9.219E-01	34.65	OK
RA-228	105.21	1.10	5.561E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.408E+00	4.892E-01	4.892E-01	144.03	OK
	794.95	4.25	1.687E+00	1.774E+00	1.774E+00	58.04	OK
	835.71	1.61	1.619E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.505E+00	9.028E-01	9.028E-01	24.88	OK
	968.97	15.80	1.429E+00	9.219E-01	9.219E-01	34.65	OK
TH-228	74.82	10.28	3.606E+00	1.354E+00	1.354E+00	73.94	OK
	77.11	17.10	3.838E+00	9.210E-01	9.210E-01	49.50	OK
	238.63	43.60*	4.495E+00	9.418E-01	9.418E-01	15.37	OK
	300.09	3.30	3.765E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46	OK
	1120.29	14.92	1.262E+00	7.867E-01	7.867E-01	43.71	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
	105.21	1.10	5.561E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.408E+00	4.892E-01	4.892E-01	144.03	OK
	835.71	1.61	1.619E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.505E+00	9.028E-01	9.028E-01	24.88	OK
TH-234	968.97	15.80	1.429E+00	9.219E-01	9.219E-01	34.65	OK
	63.29	3.70*	2.396E+00	4.061E+00	4.061E+00	155.03	OK
	92.59	4.23	5.027E+00	1.041E+00	1.041E+00	164.72	OK
U-234	609.32	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46	OK
	1120.29	14.92	1.262E+00	7.867E-01	7.867E-01	43.71	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	2.396E+00	4.061E+00	4.061E+00	155.03	OK
	92.59	4.23	5.027E+00	1.041E+00	1.041E+00	164.72	OK
	43.53	5.90	4.117E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	3.606E+00	2.072E-01	2.072E-01	73.94	OK
	511.00	100.00*	2.430E+00	1.543E-01	1.543E-01	64.70	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677021.CNF;1  *
* Acquisition date   : 28-JUN-2016 11:36:35 Sensitivity      : 3.000          *
* Detector ID        : GAM01 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 01:00:00.53 Half life ratio : *****          *
* Sample date        : 11-MAY-2016 14:30:00 Analyst initials: MXR1          *
* Sample ID          : G398677021 Sample Quantity : 1.5543E+02 GRAM          *
* Batch Number       : 1572486 Wet Weight : 0.00000          *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-JUL-2015 10:39:03 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;8          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.807E+00	1.082E+00	6.654E-01
CD-109	1.153E+00	1.713E+00	2.070E+00
SN-126	1.073E-01	1.594E-01	2.143E-01
CS-135	5.897E-01	5.476E-01	4.061E-01
BA-137M	7.380E+00	2.979E-01	7.156E-02
CS-137	7.796E+00	3.147E-01	7.559E-02
TL-208	2.203E-01	9.123E-02	9.374E-02
PB-212	9.418E-01	1.418E-01	1.469E-01
BI-214	5.899E-01	1.414E-01	1.356E-01
PB-214	6.214E-01	2.099E-01	2.150E-01
RN-222	5.899E-01	1.414E-01	1.356E-01
RA-224	5.776E-01	1.498E+00	1.574E+00
RA-226	5.899E-01	1.414E-01	1.356E-01
AC-228	9.028E-01	2.202E-01	1.881E-01
RA-228	9.028E-01	2.202E-01	1.881E-01
TH-228	9.418E-01	1.418E-01	1.469E-01
TH-230	5.899E-01	1.414E-01	1.356E-01
TH-232	9.028E-01	2.202E-01	1.881E-01
TH-234	4.061E+00	6.170E+00	3.704E+00
U-234	5.899E-01	1.414E-01	1.356E-01
U-238	4.061E+00	6.170E+00	3.704E+00
AM-243	2.072E-01	1.501E-01	1.318E-01
ANH-511	1.543E-01	9.782E-02	8.354E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.320E-02	9.595E-01	1.731E+00	NOT IDENT.
NA-22	-5.154E-03	3.882E-02	7.767E-02	NOT IDENT.
NA-24	0.000E+00	5.824E+21	0.000E+00	SHORT HLIF
AL-26	1.148E-02	3.624E-02	8.239E-02	NOT IDENT.
SC-46	-3.801E-02	4.512E-02	7.580E-02	FAIL ABUN
V-48	-6.237E-02	2.187E-01	4.195E-01	NOT IDENT.
CR-51	9.466E-01	1.290E+00	2.501E+00	NOT IDENT.

MN-54	-1.156E-02	3.909E-02	7.318E-02	NOT IDENT.
CO-56	1.590E-02	4.394E-02	9.375E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.663E-02	4.089E-02	7.339E-02	NOT IDENT.
CO-58	-2.097E-02	5.840E-02	1.081E-01	NOT IDENT.
FE-59	-9.448E-03	1.332E-01	2.590E-01	NOT IDENT.
CO-60	-9.731E-04	3.537E-02	7.313E-02	NOT IDENT.
ZN-65	4.745E-03	7.612E-02	1.366E-01	NOT IDENT.
GE-68	3.053E-01	1.130E+00	2.376E+00	NOT IDENT.
AS-73	1.163E+00	1.847E+00	3.635E+00	NOT IDENT.
AS-74	8.836E-02	4.291E-01	8.442E-01	NOT IDENT.
SE-75	1.341E-02	8.789E-02	1.462E-01	NOT IDENT.
BR-77	0.000E+00	3.124E+05	0.000E+00	SHORT HLIF
SR-82	-6.117E-01	8.065E-01	1.407E+00	NOT IDENT.
RB-83	2.296E-02	1.498E-01	2.754E-01	NOT IDENT.
KR-85	1.575E+01	1.234E+01	2.228E+01	NOT IDENT.
SR-85	1.176E-01	9.229E-02	1.666E-01	NOT IDENT.
RB-86	2.826E-01	2.141E+00	4.417E+00	NOT IDENT.
Y-88	1.402E-03	4.708E-02	1.087E-01	NOT IDENT.
Y-91	-1.041E+01	2.977E+01	5.370E+01	NOT IDENT.
NB-94	9.106E-03	3.320E-02	6.742E-02	NOT IDENT.
NB-95	-3.590E-03	5.901E-02	1.144E-01	NOT IDENT.
NB-95M	-7.847E-02	2.755E-01	4.438E-01	NOT IDENT.
ZR-95	7.079E-02	1.026E-01	2.034E-01	NOT IDENT.
NB-97	0.000E+00	1.120E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.141E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.308E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.569E+41	0.000E+00	SHORT HLIF
RH-101	-5.607E-03	4.250E-02	8.191E-02	NOT IDENT.
RH-102	-1.100E-02	7.366E-02	1.275E-01	NOT IDENT.
RU-103	-4.583E-02	1.233E-01	2.163E-01	FAIL ABUN
RH-106	-3.802E-01	4.462E-01	6.916E-01	NOT IDENT.
RU-106	-3.802E-01	4.462E-01	6.916E-01	NOT IDENT.
AG-108M	-3.431E-02	5.625E-02	9.757E-02	FAIL ABUN
AG-110M	1.057E-02	5.139E-02	1.049E-01	NOT IDENT.
SN-113	-5.806E-02	8.870E-02	1.547E-01	NOT IDENT.
CD-115	0.000E+00	4.724E+05	0.000E+00	SHORT HLIF
SN-117M	1.287E-01	3.780E-01	7.374E-01	NOT IDENT.
TE-123M	8.261E-03	4.381E-02	8.494E-02	NOT IDENT.
SB-124	5.852E-02	1.401E-01	3.167E-01	FAIL ABUN
SB-125	-1.001E-01	1.805E-01	3.146E-01	NOT IDENT.
TE-125M	2.269E+00	2.116E+01	3.688E+01	NOT IDENT.
I-126	-1.538E-01	1.374E+00	2.317E+00	FAIL ABUN
SB-126	9.317E-01	8.710E-01	1.839E+00	NOT IDENT.
SB-127	0.000E+00	4.180E+02	0.000E+00	SHORT HLIF
I-131	1.189E+00	3.258E+00	6.128E+00	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.176E+03	0.000E+00	SHORT HLIF
BA-133	5.504E-04	7.755E-02	1.249E-01	NOT IDENT.
I-133	0.000E+00	2.080E+15	0.000E+00	SHORT HLIF
CS-134	9.219E-02	5.243E-02	1.074E-01	FAIL ABUN
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	9.372E-02	5.781E-01	1.161E+00	FAIL ABUN
CE-139	-1.214E-02	4.546E-02	8.585E-02	NOT IDENT.
BA-140	5.871E-02	2.215E+00	4.281E+00	NOT IDENT.
LA-140	-4.159E-01	4.946E-01	8.133E-01	NOT IDENT.
CE-141	1.350E-01	1.632E-01	3.267E-01	NOT IDENT.
CE-143	0.000E+00	3.206E+09	0.000E+00	SHORT HLIF
CE-144	-4.612E-03	2.791E-01	5.400E-01	NOT IDENT.
PM-144	-2.362E-02	3.872E-02	6.981E-02	NOT IDENT.
PR-144	-1.781E+00	2.950E+00	5.324E+00	NOT IDENT.
PM-146	-8.351E-02	1.019E-01	1.478E-01	FAIL ABUN
ND-147	-6.327E-01	6.397E+00	1.222E+01	NOT IDENT.
PM-147	-1.505E+02	1.112E+03	1.896E+03	NOT IDENT.
PM-149	0.000E+00	3.978E+06	0.000E+00	SHORT HLIF
EU-150	2.103E-02	4.731E-02	7.959E-02	FAIL ABUN
EU-152	1.732E-01	1.677E-01	2.973E-01	FAIL ABUN
GD-153	7.060E-02	1.430E-01	2.421E-01	NOT IDENT.
EU-154	1.238E-02	1.056E-01	2.179E-01	NOT IDENT.
EU-155	-3.123E-02	1.512E-01	2.723E-01	FAIL ABUN
TB-160	1.050E-01	1.717E-01	3.710E-01	FAIL ABUN
HO-166M	2.616E-05	5.347E-02	1.067E-01	FAIL ABUN
TM-171	-1.484E+01	3.118E+01	5.740E+01	NOT IDENT.
HF-172	-1.170E-01	2.630E-01	4.994E-01	FAIL ABUN
LU-172	4.567E-03	5.813E-02	1.166E-01	FAIL ABUN
LU-176	-1.100E-02	3.998E-02	7.290E-02	FAIL ABUN
HF-181	-1.446E-01	1.342E-01	2.217E-01	NOT IDENT.
TA-182	-1.243E-01	1.741E-01	2.896E-01	FAIL ABUN

RE-183	-8.170E-02	4.989E-01	8.264E-01	NOT IDENT.
RE-184	4.745E-01	2.875E-01	5.725E-01	FAIL ABUN
W-188	1.342E+01	1.653E+01	2.887E+01	FAIL ABUN
IR-192	4.579E-03	7.117E-02	1.326E-01	FAIL ABUN
HG-203	-5.412E-02	9.397E-02	1.688E-01	NOT IDENT.
BI-207	-1.042E-02	6.552E-02	1.050E-01	FAIL ABUN
PB-210	2.938E+00	5.843E+00	1.151E+01	NOT IDENT.
BI-211	0.000E+00	5.783E-01	8.677E-01	FAIL ABUN
PB-211	-7.850E-01	1.295E+00	2.258E+00	NOT IDENT.
BI-212	0.000E+00	5.411E-01	1.243E+00	FAIL ABUN
RN-219	5.980E-01	7.081E-01	1.362E+00	NOT IDENT.
RA-223	1.848E-01	1.003E+00	1.875E+00	FAIL ABUN
AC-227	1.670E-01	3.604E-01	6.936E-01	NOT IDENT.
TH-227	1.670E-01	3.604E-01	6.936E-01	NOT IDENT.
TH-229	2.160E-01	8.400E-01	1.424E+00	FAIL ABUN
PA-231	-3.465E-01	7.403E-01	1.225E+00	NOT IDENT.
TH-231	1.848E-01	1.003E+00	1.875E+00	FAIL ABUN
PA-233	-5.656E-02	9.329E-02	1.662E-01	FAIL ABUN
PA-234	3.927E-02	3.082E-01	6.128E-01	NOT IDENT.
PA-234M	2.347E-01	4.969E+00	9.986E+00	NOT IDENT.
U-235	-1.915E-01	2.658E-01	4.953E-01	FAIL ABUN
NP-237	-5.656E-02	9.329E-02	1.662E-01	FAIL ABUN
NP-238	0.000E+00	7.251E+05	0.000E+00	SHORT HLIF
NP-239	4.670E-01	4.546E-01	6.477E-01	FAIL ABUN
PU-239	1.671E+02	4.388E+02	8.665E+02	NOT IDENT.
AM-241	2.135E-01	2.562E-01	4.590E-01	NOT IDENT.
CM-243	7.586E-02	1.512E-01	2.842E-01	NOT IDENT.
BK-247	-4.760E-02	1.334E-01	2.122E-01	NOT IDENT.
CM-247	5.542E-02	6.470E-02	1.246E-01	NOT IDENT.
CF-249	6.434E-02	6.306E-02	1.211E-01	NOT IDENT.
CF-251	6.163E-02	1.793E-01	3.465E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	106	10.66*	1.002E+00	4.807E+00	4.807E+00	22.97
CD-109	88.03	63	3.70*	4.668E+00	1.768E+00	1.900E+00	90.08
SN-126	64.28	75	9.60	2.396E+00	1.565E+00	1.565E+00	155.03
	86.94	63	8.90	4.668E+00	7.351E-01	7.351E-01	90.08
	87.57	63	37.00*	4.668E+00	1.768E-01	1.768E-01	90.08
CS-135	268.22	80	16.00*	4.104E+00	5.897E-01	5.897E-01	94.77
BA-137M	661.66	2689	89.90*	1.963E+00	7.357E+00	7.380E+00	4.12
CS-137	661.66	2689	85.10*	1.963E+00	7.772E+00	7.796E+00	4.12
TL-208	277.37	-----	6.60	4.009E+00	-----	Line Not Found	-----
	583.19	84	85.00*	2.178E+00	2.203E-01	2.203E-01	42.25
	860.56	-----	12.50	1.579E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.407E+00	-----	Line Not Found	-----
	351.06	151	12.92*	3.305E+00	1.712E+00	1.712E+00	34.46
PB-212	74.82	137	10.28	3.606E+00	1.780E+00	1.780E+00	55.12
	77.11	125	17.10	3.838E+00	9.210E-01	9.210E-01	49.50
	238.63	382	43.60*	4.495E+00	9.418E-01	9.418E-01	15.37
	300.09	-----	3.30	3.765E+00	-----	Line Not Found	-----
BI-214	609.32	117	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46
	1120.29	31	14.92	1.262E+00	7.867E-01	7.867E-01	43.71
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
PB-214	74.82	137	5.80	3.606E+00	3.154E+00	3.154E+00	55.12
	77.11	125	9.70	3.838E+00	1.624E+00	1.624E+00	49.50
	87.09	63	3.41	4.668E+00	1.919E+00	1.919E+00	90.08
	242.00	72	7.25	4.452E+00	1.081E+00	1.081E+00	72.89
	295.22	110	18.42	3.814E+00	7.540E-01	7.540E-01	47.28
	351.93	151	35.60*	3.305E+00	6.214E-01	6.214E-01	34.46
RN-222	609.32	117	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46
	1120.29	31	14.92	1.262E+00	7.867E-01	7.867E-01	43.71
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
RA-224	240.99	72	4.10*	4.452E+00	1.911E+00	1.911E+00	72.89
RA-226	609.32	117	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46
	1120.29	31	14.92	1.262E+00	7.867E-01	7.867E-01	43.71
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	5.561E+00	-----	Line Not Found	-----
	338.32	39	11.27	3.408E+00	4.892E-01	4.892E-01	144.03
	794.95	26	4.25	1.687E+00	1.774E+00	1.774E+00	58.04
	835.71	-----	1.61	1.619E+00	-----	Line Not Found	-----
	911.20	73	25.80*	1.505E+00	9.028E-01	9.028E-01	24.88
	968.97	43	15.80	1.429E+00	9.219E-01	9.219E-01	34.65
RA-228	105.21	-----	1.10	5.561E+00	-----	Line Not Found	-----
	338.32	39	11.27	3.408E+00	4.892E-01	4.892E-01	144.03
	794.95	26	4.25	1.687E+00	1.774E+00	1.774E+00	58.04
	835.71	-----	1.61	1.619E+00	-----	Line Not Found	-----
	911.20	73	25.80*	1.505E+00	9.028E-01	9.028E-01	24.88
	968.97	43	15.80	1.429E+00	9.219E-01	9.219E-01	34.65
TH-228	74.82	137	10.28	3.606E+00	1.780E+00	1.780E+00	55.12
	77.11	125	17.10	3.838E+00	9.210E-01	9.210E-01	49.50

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	382	43.60*	4.495E+00	9.418E-01	9.418E-01	15.37
	300.09	-----	3.30	3.765E+00	-----	Line Not Found	-----
TH-230	609.32	117	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46
	1120.29	31	14.92	1.262E+00	7.867E-01	7.867E-01	43.71
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
TH-232	105.21	-----	1.10	5.561E+00	-----	Line Not Found	-----
	338.32	39	11.27	3.408E+00	4.892E-01	4.892E-01	144.03
	835.71	-----	1.61	1.619E+00	-----	Line Not Found	-----
	911.20	73	25.80*	1.505E+00	9.028E-01	9.028E-01	24.88
	968.97	43	15.80	1.429E+00	9.219E-01	9.219E-01	34.65
TH-234	63.29	75	3.70*	2.396E+00	4.061E+00	4.061E+00	155.03
	92.59	46	4.23	5.027E+00	1.041E+00	1.041E+00	164.72
U-234	609.32	117	45.49*	2.100E+00	5.899E-01	5.899E-01	24.46
	1120.29	31	14.92	1.262E+00	7.867E-01	7.867E-01	43.71
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
U-238	63.29	75	3.70*	2.396E+00	4.061E+00	4.061E+00	155.03
	92.59	46	4.23	5.027E+00	1.041E+00	1.041E+00	164.72
AM-243	43.53	-----	5.90	4.117E-01	-----	Line Not Found	-----
	74.66	137	67.20*	3.606E+00	2.722E-01	2.722E-01	55.12
ANH-511	511.00	78	100.00*	2.430E+00	1.543E-01	1.543E-01	64.70

Flag: "*" = Keyline

Total number of lines in spectrum 42
Number of unidentified lines 9
Number of lines tentatively identified by NID 33 78.57%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.807E+00	4.807E+00	1.104E+00	22.97	
CD-109	461.40D	1.07	1.768E+00	1.900E+00	1.712E+00	90.08	
SN-126	2.30E+05Y	1.00	1.768E-01	1.768E-01	1.593E-01	90.08	
CS-135	2.30E+06Y	1.00	5.897E-01	5.897E-01	5.588E-01	94.77	
BA-137M	30.08Y	1.00	7.357E+00	7.380E+00	0.304E+00	4.12	
CS-137	30.08Y	1.00	7.772E+00	7.796E+00	0.321E+00	4.12	
TL-208	1.41E+10Y	1.00	2.203E-01	2.203E-01	0.931E-01	42.25	
BI-211	7.04E+08Y	1.00	1.712E+00	1.712E+00	0.590E+00	34.46	
PB-212	1.41E+10Y	1.00	9.418E-01	9.418E-01	1.447E-01	15.37	
BI-214	1600.00Y	1.00	5.899E-01	5.899E-01	1.443E-01	24.46	
PB-214	1600.00Y	1.00	6.214E-01	6.214E-01	2.142E-01	34.46	
RN-222	1600.00Y	1.00	5.899E-01	5.899E-01	1.443E-01	24.46	
RA-224	1.41E+10Y	1.00	1.911E+00	1.911E+00	1.393E+00	72.89	
RA-226	1600.00Y	1.00	5.899E-01	5.899E-01	1.443E-01	24.46	
AC-228	1.41E+10Y	1.00	9.028E-01	9.028E-01	2.247E-01	24.88	
RA-228	1.41E+10Y	1.00	9.028E-01	9.028E-01	2.247E-01	24.88	
TH-228	1.41E+10Y	1.00	9.418E-01	9.418E-01	1.447E-01	15.37	
TH-230	7.54E+04Y	1.00	5.899E-01	5.899E-01	1.443E-01	24.46	
TH-232	1.41E+10Y	1.00	9.028E-01	9.028E-01	2.247E-01	24.88	
TH-234	4.47E+09Y	1.00	4.061E+00	4.061E+00	6.296E+00	155.03	
U-234	2.45E+05Y	1.00	5.899E-01	5.899E-01	1.443E-01	24.46	
U-238	4.47E+09Y	1.00	4.061E+00	4.061E+00	6.296E+00	155.03	
AM-243	7370.00Y	1.00	2.722E-01	2.722E-01	1.500E-01	55.12	
ANH-511	1.00E+09Y	1.00	1.543E-01	1.543E-01	0.998E-01	64.70	
Total Activity :			4.303E+01	4.320E+01			

Grand Total Activity : 4.303E+01 4.320E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	34.99	58	34	1.40	70.70	67	17	1.15E-02	77.1	7.65E-02	
3	36.86	46	81	1.28	74.44	67	17	9.14E-03	****	1.21E-01	
0	113.40	90	261	2.50	227.50	221	13	1.98E-02	87.0	5.76E+00	T
0	118.02	45	122	1.17	236.74	234	7	9.90E-03	99.3	5.83E+00	T
0	186.24	59	245	1.07	373.15	369	10	1.36E-02	****	5.29E+00	T
0	195.40	44	114	1.08	391.48	389	6	1.02E-02	89.9	5.14E+00	
0	372.33	30	80	1.77	745.27	742	7	7.43E-03	****	3.16E+00	T
0	381.92	32	133	3.37	764.45	758	12	7.81E-03	****	3.09E+00	
0	456.90	45	100	1.24	914.37	909	11	1.13E-02	95.7	2.66E+00	
1	614.85	21	14	1.70	1230.20	1214	24	5.40E-03	99.8	2.09E+00	T
0	637.94	4	25	0.45	1276.36	1271	9	1.06E-03	****	2.02E+00	T
0	647.02	10	14	1.32	1294.51	1291	7	2.69E-03	****	2.00E+00	T
0	726.83	32	3	3.17	1454.10	1449	10	8.53E-03	43.1	1.82E+00	T
0	736.39	12	12	4.18	1473.22	1465	12	3.14E-03	****	1.80E+00	T
0	752.68	24	7	4.60	1505.79	1498	13	6.51E-03	61.0	1.77E+00	T
0	904.29	22	5	1.65	1808.92	1803	12	6.03E-03	61.8	1.52E+00	T
2	965.11	23	9	2.07	1930.52	1925	18	6.20E-03	51.9	1.43E+00	T
0	1061.08	8	6	0.65	2122.40	2114	11	2.08E-03	****	1.32E+00	
0	1155.70	7	8	0.77	2311.56	2304	9	1.87E-03	****	1.23E+00	
0	1266.51	12	2	1.49	2533.11	2528	10	3.25E-03	76.8	1.14E+00	
0	1368.83	3	9	1.39	2737.67	2731	9	8.33E-04	****	1.06E+00	T
0	1402.26	7	3	1.85	2804.50	2797	10	1.99E-03	****	1.04E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677021.CNF;1  *
* Acquisition date   : 28-JUN-2016 11:36:35 Sensitivity      : 3.000          *
* Detector ID        : GAM01 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000        *
* Elapsed real time  : 0 01:00:00.53 Half life ratio  : *****         *
* Sample date        : 11-MAY-2016 14:30:00 Nuclide Library : SOLID          *
* Sample ID          : G398677021 Analyst initials: MXR1           *
* Batch Number       : 1572486 Sample Quantity : 1.5543E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-JUL-2015 10:39:03 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;8          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.710E-01
CD-109	9.918E-01
SN-126	1.031E-01
CS-135	1.927E-01
BA-137M	3.196E-02
CS-137	3.377E-02
TL-208	4.324E-02
PB-212	6.994E-02
BI-214	6.076E-02
PB-214	1.018E-01
RN-222	6.076E-02
RA-224	7.496E-01
RA-226	6.076E-02
AC-228	7.688E-02
RA-228	7.688E-02
TH-228	6.994E-02
TH-230	6.076E-02
TH-232	7.688E-02
TH-234	1.771E+00
U-234	6.076E-02
U-238	1.771E+00
AM-243	6.296E-02
ANH-511	3.900E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.187E-01	NOT IDENT.
NA-22	3.277E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.330E-02	NOT IDENT.
SC-46	3.144E-02	FAIL ABUN
V-48	1.720E-01	NOT IDENT.
CR-51	1.187E+00	NOT IDENT.
MN-54	3.200E-02	NOT IDENT.

CO-56	4.046E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.513E-02	NOT IDENT.
CO-58	4.759E-02	NOT IDENT.
FE-59	1.102E-01	NOT IDENT.
CO-60	3.038E-02	NOT IDENT.
ZN-65	5.643E-02	NOT IDENT.
GE-68	1.010E+00	NOT IDENT.
AS-73	1.733E+00	NOT IDENT.
AS-74	3.876E-01	NOT IDENT.
SE-75	6.942E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.077E-01	NOT IDENT.
RB-83	1.285E-01	NOT IDENT.
KR-85	1.050E+01	NOT IDENT.
SR-85	7.848E-02	NOT IDENT.
RB-86	1.859E+00	NOT IDENT.
Y-88	4.338E-02	NOT IDENT.
Y-91	2.307E+01	NOT IDENT.
NB-94	3.011E-02	NOT IDENT.
NB-95	5.072E-02	NOT IDENT.
NB-95M	2.117E-01	NOT IDENT.
ZR-95	8.996E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.917E-02	NOT IDENT.
RH-102	5.772E-02	NOT IDENT.
RU-103	1.012E-01	FAIL ABUN
RH-106	3.100E-01	NOT IDENT.
RU-106	3.100E-01	NOT IDENT.
AG-108M	4.610E-02	FAIL ABUN
AG-110M	4.568E-02	NOT IDENT.
SN-113	7.276E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.526E-01	NOT IDENT.
TE-123M	4.056E-02	NOT IDENT.
SB-124	1.312E-01	FAIL ABUN
SB-125	1.490E-01	NOT IDENT.
TE-125M	1.763E+01	NOT IDENT.
I-126	1.022E+00	FAIL ABUN
SB-126	8.194E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.902E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.907E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.888E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	5.033E-01	FAIL ABUN
CE-139	4.096E-02	NOT IDENT.
BA-140	1.980E+00	NOT IDENT.
LA-140	3.061E-01	NOT IDENT.
CE-141	1.565E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.581E-01	NOT IDENT.
PM-144	3.098E-02	NOT IDENT.
PR-144	2.363E+00	NOT IDENT.
PM-146	6.998E-02	FAIL ABUN
ND-147	5.661E+00	NOT IDENT.
PM-147	9.046E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.774E-02	FAIL ABUN
EU-152	1.410E-01	FAIL ABUN
GD-153	1.158E-01	NOT IDENT.
EU-154	9.207E-02	NOT IDENT.
EU-155	1.301E-01	FAIL ABUN
TB-160	1.629E-01	FAIL ABUN
HO-166M	4.666E-02	FAIL ABUN
TM-171	2.730E+01	NOT IDENT.
HF-172	2.387E-01	FAIL ABUN
LU-172	4.971E-02	FAIL ABUN
LU-176	3.448E-02	FAIL ABUN
HF-181	1.037E-01	NOT IDENT.
TA-182	1.168E-01	FAIL ABUN
RE-183	3.940E-01	NOT IDENT.

RE-184	2.568E-01	FAIL ABUN
W-188	1.373E+01	FAIL ABUN
IR-192	6.272E-02	FAIL ABUN
HG-203	8.013E-02	NOT IDENT.
BI-207	4.572E-02	FAIL ABUN
PB-210	5.484E+00	NOT IDENT.
BI-211	4.181E-01	FAIL ABUN
PB-211	1.068E+00	NOT IDENT.
BI-212	5.664E-01	FAIL ABUN
RN-219	6.465E-01	NOT IDENT.
RA-223	8.895E-01	FAIL ABUN
AC-227	3.299E-01	NOT IDENT.
TH-227	3.299E-01	NOT IDENT.
TH-229	6.820E-01	FAIL ABUN
PA-231	5.787E-01	NOT IDENT.
TH-231	8.895E-01	FAIL ABUN
PA-233	7.826E-02	FAIL ABUN
PA-234	2.684E-01	NOT IDENT.
PA-234M	4.424E+00	NOT IDENT.
U-235	2.368E-01	FAIL ABUN
NP-237	7.826E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	3.088E-01	FAIL ABUN
PU-239	4.146E+02	NOT IDENT.
AM-241	2.192E-01	NOT IDENT.
CM-243	1.360E-01	NOT IDENT.
BK-247	1.006E-01	NOT IDENT.
CM-247	5.912E-02	NOT IDENT.
CF-249	5.719E-02	NOT IDENT.
CF-251	1.659E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677021.CNF;1
Acquisition date : 28-JUN-2016 11:36:35 Sensitivity : 3.000
Detector ID : GAM01 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.53 Half life ratio : *****
Sample date : 11-MAY-2016 14:30:00 Nuclide Library : SOLID
Sample ID : G398677021 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5543E+02 GRAM
Quantity Err(%) : 1.2868E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUL-2015 10:39:03 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;8

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.807E+00	1.186E+00	1.186E+00
CD-109	1.153E+00	1.721E+00	1.721E+00
SN-126	1.073E-01	1.600E-01	1.600E-01
CS-135	5.897E-01	5.501E-01	5.501E-01
BA-137M	7.380E+00	6.691E-01	6.691E-01
CS-137	7.796E+00	7.064E-01	7.064E-01
TL-208	2.203E-01	9.307E-02	9.307E-02
PB-212	9.418E-01	1.601E-01	1.601E-01
BI-214	5.899E-01	1.496E-01	1.496E-01
PB-214	6.214E-01	2.152E-01	2.152E-01
RN-222	5.899E-01	1.496E-01	1.496E-01
RA-224	5.776E-01	1.506E+00	1.506E+00
RA-226	5.899E-01	1.496E-01	1.496E-01
AC-228	9.028E-01	2.459E-01	2.459E-01
RA-228	9.028E-01	2.459E-01	2.459E-01
TH-228	9.418E-01	1.601E-01	1.601E-01
TH-230	5.899E-01	1.496E-01	1.496E-01
TH-232	9.028E-01	2.459E-01	2.459E-01
TH-234	4.061E+00	6.238E+00	6.238E+00
U-234	5.899E-01	1.496E-01	1.496E-01
U-238	4.061E+00	6.238E+00	6.238E+00
AM-243	2.072E-01	1.514E-01	1.514E-01
ANH-511	1.543E-01	9.866E-02	9.866E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.320E-02	9.595E-01	9.596E-01	NOT IDENT.
NA-22	-5.154E-03	3.882E-02	3.889E-02	NOT IDENT.
NA-24	1.570E+21	5.827E+21	0.000E+00	SHORT HLIF
AL-26	1.148E-02	3.625E-02	3.662E-02	NOT IDENT.
SC-46	-3.801E-02	4.532E-02	4.845E-02	FAIL ABUN
V-48	-6.237E-02	2.189E-01	2.207E-01	NOT IDENT.
CR-51	9.466E-01	1.292E+00	1.361E+00	NOT IDENT.

MN-54	-1.156E-02	3.911E-02	3.945E-02	NOT IDENT.
CO-56	1.590E-02	4.397E-02	4.455E-02	NOT IDENT.
MN-56	1.000E+41	2.796E+41	0.000E+00	SHORT HLIF
CO-57	2.663E-02	4.094E-02	4.266E-02	NOT IDENT.
CO-58	-2.097E-02	5.844E-02	5.920E-02	NOT IDENT.
FE-59	-9.448E-03	1.332E-01	1.332E-01	NOT IDENT.
CO-60	-9.731E-04	3.537E-02	3.538E-02	NOT IDENT.
ZN-65	4.745E-03	7.613E-02	7.616E-02	NOT IDENT.
GE-68	3.053E-01	1.131E+00	1.140E+00	NOT IDENT.
AS-73	1.163E+00	1.863E+00	1.935E+00	NOT IDENT.
AS-74	8.836E-02	4.292E-01	4.311E-01	NOT IDENT.
SE-75	1.341E-02	8.789E-02	8.810E-02	NOT IDENT.
BR-77	2.075E+06	2.889E+06	3.037E+06	SHORT HLIF
SR-82	-6.117E-01	8.087E-01	8.544E-01	NOT IDENT.
RB-83	2.296E-02	1.499E-01	1.502E-01	NOT IDENT.
KR-85	1.575E+01	1.241E+01	1.430E+01	NOT IDENT.
SR-85	1.176E-01	9.280E-02	1.069E-01	NOT IDENT.
RB-86	2.826E-01	2.141E+00	2.145E+00	NOT IDENT.
Y-88	1.402E-03	4.708E-02	4.709E-02	NOT IDENT.
Y-91	-1.041E+01	2.978E+01	3.015E+01	NOT IDENT.
NB-94	9.106E-03	3.321E-02	3.346E-02	NOT IDENT.
NB-95	-3.590E-03	5.901E-02	5.903E-02	NOT IDENT.
NB-95M	-7.847E-02	2.756E-01	2.779E-01	NOT IDENT.
ZR-95	7.079E-02	1.028E-01	1.077E-01	NOT IDENT.
NB-97	1.000E+41	1.123E+41	0.000E+00	SHORT HLIF
ZR-97	2.863E+20	3.150E+20	0.000E+00	SHORT HLIF
MO-99	6.794E+03	4.309E+04	4.319E+04	SHORT HLIF
TC-99M	1.000E+41	1.574E+41	0.000E+00	SHORT HLIF
RH-101	-5.607E-03	4.251E-02	4.259E-02	NOT IDENT.
RH-102	-1.100E-02	7.367E-02	7.383E-02	NOT IDENT.
RU-103	-4.583E-02	1.234E-01	1.251E-01	FAIL ABUN
RH-106	-3.802E-01	4.476E-01	4.793E-01	NOT IDENT.
RU-106	-3.802E-01	4.476E-01	4.793E-01	NOT IDENT.
AG-108M	-3.431E-02	5.632E-02	5.841E-02	FAIL ABUN
AG-110M	1.057E-02	5.141E-02	5.163E-02	NOT IDENT.
SN-113	-5.806E-02	8.881E-02	9.259E-02	NOT IDENT.
CD-115	2.495E+05	4.730E+05	4.862E+05	SHORT HLIF
SN-117M	1.287E-01	3.781E-01	3.825E-01	NOT IDENT.
TE-123M	8.261E-03	4.382E-02	4.398E-02	NOT IDENT.
SB-124	5.852E-02	1.402E-01	1.427E-01	FAIL ABUN
SB-125	-1.001E-01	1.807E-01	1.863E-01	NOT IDENT.
TE-125M	2.269E+00	2.116E+01	2.119E+01	NOT IDENT.
I-126	-1.538E-01	1.374E+00	1.376E+00	FAIL ABUN
SB-126	9.317E-01	8.790E-01	9.742E-01	NOT IDENT.
SB-127	-9.093E+01	4.185E+02	4.205E+02	SHORT HLIF
I-131	1.189E+00	3.259E+00	3.303E+00	FAIL ABUN
I-132	-1.000E+41	4.952E+41	0.000E+00	SHORT HLIF
TE-132	8.531E+01	1.176E+03	1.176E+03	SHORT HLIF
BA-133	5.504E-04	7.755E-02	7.755E-02	NOT IDENT.
I-133	-5.519E+14	2.086E+15	2.101E+15	SHORT HLIF
CS-134	9.219E-02	5.322E-02	6.753E-02	FAIL ABUN
I-135	1.000E+41	3.829E+41	0.000E+00	SHORT HLIF
CS-136	9.372E-02	5.783E-01	5.799E-01	FAIL ABUN
CE-139	-1.214E-02	4.554E-02	4.586E-02	NOT IDENT.
BA-140	5.871E-02	2.215E+00	2.215E+00	NOT IDENT.
LA-140	-4.159E-01	4.960E-01	5.303E-01	NOT IDENT.
CE-141	1.350E-01	1.635E-01	1.745E-01	NOT IDENT.
CE-143	2.361E+09	3.211E+09	3.383E+09	SHORT HLIF
CE-144	-4.612E-03	2.791E-01	2.791E-01	NOT IDENT.
PM-144	-2.362E-02	3.877E-02	4.020E-02	NOT IDENT.
PR-144	-1.781E+00	2.954E+00	3.061E+00	NOT IDENT.
PM-146	-8.351E-02	1.023E-01	1.090E-01	FAIL ABUN
ND-147	-6.327E-01	6.397E+00	6.404E+00	NOT IDENT.
PM-147	-1.505E+02	1.112E+03	1.114E+03	NOT IDENT.
PM-149	-3.261E+06	4.007E+06	4.268E+06	SHORT HLIF
EU-150	2.103E-02	4.733E-02	4.827E-02	FAIL ABUN
EU-152	1.732E-01	1.684E-01	1.856E-01	FAIL ABUN
GD-153	7.060E-02	1.431E-01	1.466E-01	NOT IDENT.
EU-154	1.238E-02	1.056E-01	1.058E-01	NOT IDENT.
EU-155	-3.123E-02	1.512E-01	1.519E-01	FAIL ABUN
TB-160	1.050E-01	1.721E-01	1.785E-01	FAIL ABUN
HO-166M	2.616E-05	5.347E-02	5.347E-02	FAIL ABUN
TM-171	-1.484E+01	3.121E+01	3.192E+01	NOT IDENT.
HF-172	-1.170E-01	2.638E-01	2.690E-01	FAIL ABUN
LU-172	4.567E-03	5.814E-02	5.817E-02	FAIL ABUN
LU-176	-1.100E-02	3.999E-02	4.029E-02	FAIL ABUN
HF-181	-1.446E-01	1.348E-01	1.497E-01	NOT IDENT.
TA-182	-1.243E-01	1.745E-01	1.833E-01	FAIL ABUN

RE-183	-8.170E-02	4.990E-01	5.004E-01	NOT IDENT.
RE-184	4.745E-01	2.946E-01	3.641E-01	FAIL ABUN
W-188	1.342E+01	1.662E+01	1.768E+01	FAIL ABUN
IR-192	4.579E-03	7.117E-02	7.120E-02	FAIL ABUN
HG-203	-5.412E-02	9.406E-02	9.717E-02	NOT IDENT.
BI-207	-1.042E-02	6.554E-02	6.571E-02	FAIL ABUN
PB-210	2.938E+00	5.849E+00	5.997E+00	NOT IDENT.
BI-211	1.712E+00	5.937E-01	9.738E-01	FAIL ABUN
PB-211	-7.850E-01	1.296E+00	1.344E+00	NOT IDENT.
BI-212	1.282E+00	5.543E-01	8.008E-01	FAIL ABUN
RN-219	5.980E-01	7.132E-01	7.624E-01	NOT IDENT.
RA-223	1.848E-01	1.003E+00	1.007E+00	FAIL ABUN
AC-227	1.670E-01	3.612E-01	3.690E-01	NOT IDENT.
TH-227	1.670E-01	3.612E-01	3.690E-01	NOT IDENT.
TH-229	2.160E-01	8.402E-01	8.458E-01	FAIL ABUN
PA-231	-3.465E-01	7.443E-01	7.605E-01	NOT IDENT.
TH-231	1.848E-01	1.003E+00	1.007E+00	FAIL ABUN
PA-233	-5.656E-02	9.339E-02	9.681E-02	FAIL ABUN
PA-234	3.927E-02	3.115E-01	3.120E-01	NOT IDENT.
PA-234M	2.347E-01	4.969E+00	4.970E+00	NOT IDENT.
U-235	-1.915E-01	2.662E-01	2.799E-01	FAIL ABUN
NP-237	-5.656E-02	9.339E-02	9.681E-02	FAIL ABUN
NP-238	-3.859E+04	7.251E+05	7.253E+05	SHORT HLIF
NP-239	4.670E-01	4.569E-01	5.030E-01	FAIL ABUN
PU-239	1.671E+02	4.390E+02	4.454E+02	NOT IDENT.
AM-241	2.135E-01	2.567E-01	2.742E-01	NOT IDENT.
CM-243	7.586E-02	1.514E-01	1.552E-01	NOT IDENT.
BK-247	-4.760E-02	1.338E-01	1.355E-01	NOT IDENT.
CM-247	5.542E-02	6.547E-02	7.008E-02	NOT IDENT.
CF-249	6.434E-02	6.343E-02	6.974E-02	NOT IDENT.
CF-251	6.163E-02	1.795E-01	1.816E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	125.0665	87.09	205.3748	136.47	167.8005
45.60	108.3759	87.57	215.0863	140.51	0.0000
46.54	112.8595	88.03	174.7709	143.76	175.2891
49.72	0.0000	88.34	161.1250	144.24	167.1880
51.35	127.9015	88.47	161.1508	145.44	145.5383
51.87	130.1837	89.96	175.1833	152.43	141.8677
52.39	142.2415	1093.63	199.3918	153.25	160.2881
52.97	134.7710	91.11	199.5051	323.87	171.4219
53.44	120.7361	92.59	187.2243	156.02	145.9825
54.07	108.8844	93.35	158.6521	158.56	146.3003
57.36	0.0000	94.56	143.3363	159.00	142.6730
57.53	149.7892	94.65	143.3515	162.33	143.9994
57.98	146.2794	94.67	143.3553	162.66	138.4987
59.27	118.5779	94.87	157.2095	163.33	145.0434
59.32	118.5872	97.43	140.3515	165.86	152.7552
59.54	118.6279	98.43	160.7520	176.31	152.1907
60.96	142.0051	98.44	160.7534	176.60	155.9611
61.17	145.3542	99.53	173.6916	177.52	153.2720
62.93	155.6798	100.11	155.2667	181.07	0.0000
63.29	155.7641	102.03	156.7653	181.52	171.0056
63.58	155.8315	103.18	146.5020	184.41	168.3842
64.28	155.9943	103.37	146.5334	143.76	162.5339
66.73	156.5560	105.21	159.6515	193.51	158.9586
67.24	155.0054	105.31	159.6689	197.03	151.7871
125.81	155.1041	106.12	170.3096	198.01	157.9728
67.75	157.8989	106.47	170.0415	201.83	171.3647
69.67	160.5630	109.28	151.6983	203.43	157.2681
70.83	120.6189	111.00	149.1641	205.31	174.6620
72.81	153.4289	111.76	0.0000	210.85	137.0268
72.87	153.4414	114.06	151.0591	215.65	134.6071
74.66	153.8177	116.30	0.0000	222.11	127.4843
74.82	153.8512	116.74	92.0212	227.09	114.3503
74.97	153.8818	119.76	160.4712	227.38	116.3113
77.11	154.3250	121.12	155.0043	228.16	0.0000
78.74	155.7870	121.22	150.7531	228.18	126.0724
79.69	166.1533	121.78	142.3004	116.74	126.0724
80.12	164.5504	122.06	142.3401	235.69	152.8259
80.19	164.5652	122.92	147.2122	235.96	152.8534
80.57	178.2257	123.07	147.2342	238.63	132.8104
81.00	191.9117	265.00	151.7367	238.98	0.0000
81.07	191.9290	125.81	172.3405	240.99	133.0148
81.75	197.1970	127.23	164.5327	242.00	133.1020
83.79	148.2834	127.91	151.2209	244.70	116.0794
84.00	148.3226	129.30	150.5286	252.40	0.0000
85.43	152.0052	131.20	158.8844	252.80	123.1842
86.55	179.5827	133.02	156.4635	254.15	0.0000
86.79	205.2979	133.52	155.6382	256.23	112.5858
86.94	205.3372	136.00	157.8074	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	112.7766	355.39	0.0000	584.27	52.3896
264.80	112.7870	356.01	101.9054	595.83	38.7608
265.00	123.9221	364.49	96.4655	427.87	29.5813
268.22	114.4157	366.42	0.0000	602.52	0.0000
269.46	114.4999	372.51	92.6339	604.72	35.4864
270.03	114.5403	375.05	78.6953	607.14	32.4280
271.23	111.6326	377.52	92.8595	609.32	25.0350
273.65	126.1686	356.01	94.8350	610.33	25.0436
276.40	119.9762	388.16	69.0900	614.28	25.0778
277.37	91.0347	388.63	94.4131	618.01	24.7995
277.60	101.0524	391.69	100.9230	620.36	29.4733
278.00	115.0877	264.66	103.4799	621.93	39.9097
279.20	134.1963	401.81	91.7936	630.19	0.0000
279.54	130.2162	402.40	90.7509	631.29	33.3636
279.70	130.2301	404.85	120.7815	633.25	26.4864
280.46	118.2611	410.95	117.9039	634.78	32.7347
283.69	91.3735	413.71	112.6856	635.95	28.0693
284.31	94.4203	414.70	117.0300	636.99	31.8235
285.41	117.5981	423.72	109.9579	645.85	28.1624
285.90	0.0000	427.09	117.6803	657.76	32.9851
287.50	123.7789	427.87	123.1219	657.90	0.0000
290.67	98.3982	433.94	115.8704	661.66	23.5907
293.27	0.0000	439.40	82.4965	664.57	0.0000
351.93	117.2532	453.88	134.5658	666.33	20.4765
295.96	118.1117	463.37	116.5549	666.50	20.4775
879.38	81.0181	468.07	120.8647	667.71	0.0000
299.98	113.5159	473.00	0.0000	677.62	13.2792
300.09	113.5227	475.06	112.3998	685.70	0.0000
300.13	113.5244	476.78	101.4518	695.00	22.8896
301.36	110.8982	477.60	100.3824	696.49	26.7176
302.85	113.6987	482.18	97.2557	696.51	26.7176
256.23	102.6259	487.02	65.3334	697.00	26.7217
304.85	102.6459	492.35	0.0000	697.30	26.7244
306.78	109.8787	497.08	80.0508	697.49	25.7713
308.46	99.7974	505.52	69.6097	702.65	20.0766
311.90	103.0466	507.63	0.0000	706.68	24.8879
316.51	100.2371	511.00	65.9591	711.68	16.2982
319.41	98.3467	514.00	53.7246	720.70	9.6138
320.08	94.2826	514.00	53.7246	721.93	0.0000
321.04	113.8133	520.40	61.7122	722.78	17.6364
323.87	107.8246	520.69	0.0000	722.91	17.6373
325.23	113.0397	522.65	0.0000	723.31	17.6391
328.76	112.2233	527.90	0.0000	724.19	19.2480
333.37	103.2074	528.26	56.7215	727.33	13.4866
333.97	97.4580	529.59	62.1556	733.00	12.0624
334.37	95.8260	529.87	0.0000	735.93	11.2682
338.28	115.8879	531.02	54.9789	333.97	12.8838
338.32	115.8914	537.26	50.5914	739.50	0.0000
311.90	102.7617	546.56	0.0000	747.24	14.5367
340.48	102.7617	552.55	53.6070	748.06	16.1560
340.55	102.7647	563.25	53.8188	752.31	19.4116
344.28	81.3740	569.33	64.9088	753.82	17.8020
345.93	114.2683	946.00	64.9123	756.73	11.3383
351.06	96.8613	569.70	64.9175	756.80	11.3385
351.93	103.3641	583.19	47.4688	884.68	26.2960

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.4382	1274.44	14.5031	1620.50	1.9555
766.42	16.5688	1001.03	14.5199	1621.92	5.8679
766.84	18.5204	1002.74	13.4881	1678.03	0.0000
772.60	0.0000	1004.73	13.4948	1690.97	4.9459
776.52	22.4823	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.0024
778.90	9.7817	1028.54	0.0000	1063.66	18.0308
783.70	0.0000	1037.84	11.5086	1771.35	8.0150
785.37	15.6801	1038.76	0.0000	1791.20	0.0000
792.07	21.2742	631.29	13.6291	1808.65	4.0308
794.95	17.6884	1048.07	12.5848	1810.72	0.0000
795.86	16.3826	1049.04	12.5877	1836.06	2.0238
810.06	21.7121	1050.41	12.5918		
810.29	23.6877	1063.66	17.5423		
344.28	23.6883	1077.00	8.4461		
810.76	22.7035	1077.34	8.4469		
815.77	22.7355	1085.87	9.5212		
1048.07	10.8818	1093.63	10.5977		
832.01	21.8453	1099.45	11.6725		
834.85	19.8750	1112.07	12.7699		
835.71	18.8854	1112.84	13.0082		
836.80	0.0000	1115.54	7.0996		
846.75	0.0000	1120.29	8.8839		
846.77	9.9700	1120.55	7.4631		
856.80	21.9936	1221.41	5.3315		
860.56	11.0081	1129.67	9.6148		
871.09	5.0177	1131.51	0.0000		
873.19	13.0533	1147.95	0.0000		
875.33	0.0000	1173.23	16.1763		
879.38	11.0634	1177.95	10.7954		
880.51	16.0969	1189.05	12.9850		
883.24	15.1018	1204.77	16.2847		
884.68	13.0933	1221.41	11.9840		
889.28	16.1344	1231.02	21.8320		
894.76	11.1082	1235.36	19.6664		
898.04	8.4226	1238.28	14.2124		
900.72	15.1714	1260.41	0.0000		
903.28	16.8681	1271.87	11.0073		
911.20	6.7611	1274.44	9.0108		
912.08	6.7627	1274.54	11.0132		
923.98	0.0000	1291.59	6.4463		
926.50	11.1998	1298.22	0.0000		
929.11	10.1882	1312.11	9.2464		
937.49	15.3149	1332.49	8.3551		
944.13	19.4314	1362.66	0.0000		
946.00	15.3479	1365.19	4.8045		
949.00	12.2877	1368.63	0.0000		
667.71	0.0000	1384.29	8.4382		
962.31	15.4105	1408.01	7.5342		
964.08	11.9911	1457.56	0.0000		
966.17	10.2834	1460.82	6.5209		
911.20	8.5754	1489.16	6.6907		
968.97	8.5754	1505.03	5.7512		
983.53	9.2947	1584.12	10.6894		
984.45	0.0000	1596.21	8.7638		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:37:57.98

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677022.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;306
Background date    : 26-JUN-2016 12:04:02
Sample date       : 11-MAY-2016 14:20:00 Acquisition date : 28-JUN-2016 11:36:57
Sample ID        : G398677022 Sample quantity : 1.54630E+02 GRAM
Detector name     : GAM08 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.65 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.20*	49	129	1.67	126.64	122	10	1.37E-02	46.7	
2	3	74.69	71	124	1.06	149.63	146	14	1.96E-02	26.7	1.20E+00
3	3	76.92*	102	134	1.21	154.10	146	14	2.83E-02	22.4	
4	0	87.40	46	126	1.43	175.07	172	7	1.28E-02	43.0	
5	0	92.31*	23	177	1.42	184.89	180	10	6.35E-03	118.4	
6	0	186.04*	20	181	1.39	372.44	366	11	5.49E-03	138.4	
7	0	197.87*	18	88	1.31	396.11	393	7	5.14E-03	90.4	
8	0	209.32	37	78	1.47	419.02	416	8	1.01E-02	44.7	
9	0	238.78*	153	198	1.07	477.97	472	11	4.26E-02	19.8	
10	0	260.56	41	250	8.15	521.54	500	27	1.15E-02	107.2	
11	0	294.87	98	94	1.19	590.20	583	13	2.72E-02	22.8	
12	1	300.13	29	54	1.55	600.72	597	16	7.98E-03	44.8	1.26E+00
13	1	303.63	24	56	1.56	607.72	597	16	6.64E-03	61.9	
14	0	338.93*	59	93	2.40	678.35	671	14	1.63E-02	37.8	
15	0	352.28*	120	123	1.46	705.05	698	14	3.33E-02	21.8	
16	0	511.37*	18	55	3.21	1023.37	1016	13	4.91E-03	103.1	
17	0	563.76	29	11	2.27	1128.18	1122	14	8.14E-03	32.2	
18	0	579.35	11	22	0.89	1159.37	1152	9	2.93E-03	89.4	
19	0	583.42*	112	19	1.73	1167.51	1161	15	3.12E-02	12.9	
20	0	609.70	128	29	1.47	1220.10	1213	15	3.57E-02	12.8	
21	0	621.27	8	31	4.09	1243.24	1232	13	2.33E-03	143.6	
22	0	627.64	13	9	1.27	1256.00	1250	8	3.71E-03	46.1	
23	0	631.44	9	21	1.66	1263.60	1257	9	2.40E-03	104.0	
24	0	661.72	1258	32	1.57	1324.19	1319	14	3.49E-01	3.0	
25	0	728.31*	19	13	1.94	1457.41	1449	13	5.39E-03	45.7	
26	0	807.12	24	22	4.29	1615.08	1604	28	6.72E-03	57.4	
27	0	860.94	12	12	1.40	1722.75	1719	12	3.33E-03	64.5	
28	5	911.34*	38	9	1.89	1823.59	1818	15	1.05E-02	23.6	1.60E+00
29	5	914.60	8	3	1.81	1830.10	1818	15	2.29E-03	43.2	
30	0	930.00*	10	3	0.98	1860.91	1857	10	2.77E-03	49.6	
31	0	970.03	32	25	1.12	1940.99	1931	18	8.92E-03	41.6	
32	0	1025.38	7	7	1.38	2051.74	2044	10	1.87E-03	85.2	
33	0	1067.85	17	0	0.73	2136.71	2130	14	4.72E-03	24.3	
34	0	1095.76	11	2	0.81	2192.54	2187	10	2.93E-03	41.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1120.12	19	3	0.58	2241.26	2234	13	5.20E-03	30.5	
36	0	1460.88	130	6	2.26	2922.96	2915	14	3.61E-02	9.7	
37	0	1589.10	7	6	3.79	3179.45	3170	12	1.97E-03	78.7	
38	0	1765.07*	12	5	1.91	3531.46	3526	10	3.36E-03	46.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:37:59

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677022.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:20:00 Acquisition date : 28-JUN-2016 11:36:57
Sample ID         : G398677022 Sample quantity   : 154.63 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA8 Detector geometry   : CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.65 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated : No Systematic Error      : 0.00 %
Efficiency type   : Empirical Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	9.651E-01	5.933E+00	5.933E+00	19.50	OK
RH-106	621.93	9.93*	2.033E+00	2.142E-01	2.343E-01	287.30	OK
	1050.41	1.56	1.301E+00	----- Line	Not Found	-----	Absent
RU-106	621.93	9.93*	2.033E+00	2.142E-01	2.343E-01	287.30	OK
	1050.41	1.56	1.301E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	4.577E+00	9.223E-01	9.912E-01	163.67	OK
SN-126	64.28	9.60	2.134E+00	1.548E+00	1.548E+00	93.40	OK
	86.94	8.90	4.577E+00	3.834E-01	3.834E-01	163.67	OK
	87.57	37.00*	4.577E+00	9.223E-02	9.223E-02	163.67	OK
BA-137M	661.66	89.90*	1.935E+00	3.709E+00	3.721E+00	5.95	OK
CS-137	661.66	85.10*	1.935E+00	3.919E+00	3.930E+00	5.95	OK
TL-208	277.37	6.60	3.646E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.133E+00	3.220E-01	3.220E-01	25.80	OK
	860.56	12.50	1.555E+00	3.078E-01	3.078E-01	129.10	OK
PB-212	74.82	10.28	3.470E+00	7.757E-01	7.757E-01	90.99	OK
	77.11	17.10	3.698E+00	1.017E+00	1.017E+00	44.84	OK
	238.63	43.60*	4.056E+00	4.939E-01	4.939E-01	39.61	OK
	300.09	3.30	3.446E+00	1.405E+00	1.405E+00	89.68	OK
BI-214	609.32	45.49*	2.063E+00	7.088E-01	7.089E-01	25.55	OK
	1120.29	14.92	1.227E+00	4.949E-01	4.949E-01	61.02	OK
	1764.49	15.30	8.332E-01	4.364E-01	4.364E-01	93.65	OK
PB-214	74.82	5.80	3.484E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.698E+00	1.793E+00	1.793E+00	44.84	OK
	87.09	3.41	4.556E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.018E+00	----- Line	Not Found	-----	Absent
	295.22	18.42	3.490E+00	8.495E-01	8.496E-01	45.59	OK
	351.93	35.60*	3.073E+00	6.003E-01	6.003E-01	43.58	OK
RN-222	609.32	45.49*	2.063E+00	7.088E-01	7.089E-01	25.55	OK
	1120.29	14.92	1.227E+00	4.949E-01	4.949E-01	61.02	OK
	1764.49	15.30	8.332E-01	4.364E-01	4.364E-01	93.65	OK
RA-226	609.32	45.49*	2.063E+00	7.088E-01	7.089E-01	25.55	OK
	1120.29	14.92	1.227E+00	4.949E-01	4.949E-01	61.02	OK
	1764.49	15.30	8.332E-01	4.364E-01	4.364E-01	93.65	OK
AC-228	105.21	1.10	5.374E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.159E+00	9.049E-01	9.049E-01	75.65	OK
	794.95	4.25	1.666E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.596E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.480E+00	4.912E-01	4.912E-01	47.19	OK
	968.97	15.80	1.399E+00	7.147E-01	7.147E-01	83.23	OK
RA-228	105.21	1.10	5.374E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.159E+00	9.049E-01	9.049E-01	75.65	OK
	794.95	4.25	1.666E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.596E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.480E+00	4.912E-01	4.912E-01	47.19	OK
	968.97	15.80	1.399E+00	7.147E-01	7.147E-01	83.23	OK
TH-228	74.82	10.28	3.470E+00	7.757E-01	7.757E-01	90.99	OK
	77.11	17.10	3.698E+00	1.017E+00	1.017E+00	44.84	OK
	238.63	43.60*	4.056E+00	4.939E-01	4.939E-01	39.61	OK
	300.09	3.30	3.446E+00	1.405E+00	1.405E+00	89.68	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.063E+00	7.088E-01	7.088E-01	25.55	OK
	1120.29	14.92	1.227E+00	4.949E-01	4.949E-01	61.02	OK
	1764.49	15.30	8.332E-01	4.364E-01	4.364E-01	93.65	OK
PA-231	283.69	1.70	3.588E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.446E+00	8.669E-01	8.669E-01	89.68	OK
TH-232	105.21	1.10	5.374E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.159E+00	9.049E-01	9.049E-01	75.65	OK
	835.71	1.61	1.596E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.480E+00	4.912E-01	4.912E-01	47.19	OK
	968.97	15.80	1.399E+00	7.147E-01	7.147E-01	83.23	OK
TH-234	63.29	3.70*	2.134E+00	4.017E+00	4.017E+00	93.40	OK
	92.59	4.23	4.877E+00	6.889E-01	6.889E-01	236.71	OK
U-234	609.32	45.49*	2.063E+00	7.088E-01	7.088E-01	25.55	OK
	1120.29	14.92	1.227E+00	4.949E-01	4.949E-01	61.02	OK
	1764.49	15.30	8.332E-01	4.364E-01	4.364E-01	93.65	OK
U-238	63.29	3.70*	2.134E+00	4.017E+00	4.017E+00	93.40	OK
	92.59	4.23	4.877E+00	6.889E-01	6.889E-01	236.71	OK
AM-243	43.53	5.90	2.544E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.470E+00	1.187E-01	1.187E-01	90.99	OK
ANH-511	511.00	100.00*	2.353E+00	3.961E-02	3.961E-02	206.12	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677022.CNF;1
Acquisition date : 28-JUN-2016 11:36:57 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.65 Half life ratio : *****
Sample date : 11-MAY-2016 14:20:00 Analyst initials: MXR1
Sample ID : G398677022 Sample Quantity : 1.5463E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.933E+00	1.134E+00	8.295E-01
RH-106	2.343E-01	6.596E-01	7.132E-01
RU-106	2.343E-01	6.596E-01	7.132E-01
CD-109	9.912E-01	1.590E+00	1.723E+00
SN-126	9.223E-02	1.479E-01	1.873E-01
BA-137M	3.721E+00	2.170E-01	7.061E-02
CS-137	3.930E+00	2.292E-01	7.459E-02
TL-208	3.220E-01	8.141E-02	6.989E-02
PB-212	4.939E-01	1.917E-01	1.616E-01
BI-214	7.089E-01	1.775E-01	1.817E-01
PB-214	6.003E-01	2.564E-01	2.116E-01
RN-222	7.089E-01	1.775E-01	1.817E-01
RA-226	7.089E-01	1.775E-01	1.817E-01
AC-228	4.912E-01	2.272E-01	2.221E-01
RA-228	4.912E-01	2.272E-01	2.221E-01
TH-228	4.939E-01	1.917E-01	1.616E-01
TH-230	7.088E-01	1.775E-01	1.817E-01
PA-231	8.669E-01	7.619E-01	1.126E+00
TH-232	4.912E-01	2.272E-01	2.221E-01
TH-234	4.017E+00	3.677E+00	3.380E+00
U-234	7.088E-01	1.775E-01	1.817E-01
U-238	4.017E+00	3.677E+00	3.380E+00
AM-243	1.187E-01	1.058E-01	1.229E-01
ANH-511	3.961E-02	8.002E-02	7.852E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.372E-01	8.180E-01	1.618E+00	NOT IDENT.
NA-22	-9.120E-04	3.464E-02	7.052E-02	NOT IDENT.
NA-24	0.000E+00	4.926E+21	0.000E+00	SHORT HLIF
AL-26	1.124E-02	3.718E-02	8.387E-02	NOT IDENT.
SC-46	8.468E-03	5.302E-02	1.060E-01	FAIL ABUN
V-48	-2.277E-02	2.829E-01	5.564E-01	NOT IDENT.

CR-51	-3.072E-01	1.212E+00	2.191E+00	NOT IDENT.
MN-54	1.094E-02	4.055E-02	8.306E-02	NOT IDENT.
CO-56	3.116E-02	4.610E-02	1.031E-01	NOT IDENT.
MN-56	0.000E+00	1.472E+41	0.000E+00	SHORT HLIF
CO-57	-2.415E-02	3.036E-02	5.699E-02	NOT IDENT.
CO-58	2.343E-02	5.095E-02	1.091E-01	NOT IDENT.
FE-59	-3.043E-02	1.466E-01	2.382E-01	NOT IDENT.
CO-60	-3.206E-03	3.849E-02	7.556E-02	NOT IDENT.
ZN-65	-6.479E-03	1.075E-01	1.781E-01	NOT IDENT.
GE-68	-1.103E-01	9.602E-01	1.952E+00	NOT IDENT.
AS-73	-2.225E-01	2.069E+00	3.963E+00	NOT IDENT.
AS-74	-2.835E-01	3.663E-01	6.339E-01	NOT IDENT.
SE-75	-1.336E-02	8.503E-02	1.369E-01	NOT IDENT.
BR-77	0.000E+00	4.232E+05	0.000E+00	SHORT HLIF
SR-82	4.545E-01	8.798E-01	1.798E+00	NOT IDENT.
RB-83	1.651E-02	1.194E-01	2.312E-01	NOT IDENT.
KR-85	1.773E+01	1.145E+01	2.199E+01	NOT IDENT.
SR-85	1.324E-01	8.565E-02	1.644E-01	NOT IDENT.
RB-86	-3.031E-01	1.993E+00	3.897E+00	NOT IDENT.
Y-88	-5.250E-04	3.277E-02	7.653E-02	NOT IDENT.
Y-91	-6.133E+00	3.079E+01	5.770E+01	NOT IDENT.
NB-94	-8.588E-03	3.465E-02	6.393E-02	NOT IDENT.
NB-95	-1.219E-02	6.424E-02	1.182E-01	NOT IDENT.
NB-95M	2.866E-02	2.630E-01	4.365E-01	NOT IDENT.
ZR-95	7.532E-03	1.063E-01	2.054E-01	NOT IDENT.
NB-97	0.000E+00	5.082E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.617E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.342E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.680E-02	3.926E-02	7.856E-02	FAIL ABUN
RH-102	4.058E-02	8.272E-02	1.429E-01	FAIL ABUN
RU-103	-8.087E-02	9.336E-02	1.633E-01	FAIL ABUN
AG-108M	6.152E-03	4.777E-02	9.155E-02	NOT IDENT.
AG-110M	-5.817E-02	4.775E-02	7.450E-02	FAIL ABUN
SN-113	-1.047E-02	7.820E-02	1.488E-01	NOT IDENT.
CD-115	0.000E+00	4.106E+05	0.000E+00	SHORT HLIF
SN-117M	-1.455E-02	3.509E-01	6.761E-01	NOT IDENT.
TE-123M	5.379E-02	3.984E-02	8.326E-02	NOT IDENT.
SB-124	2.026E-02	1.460E-01	3.111E-01	NOT IDENT.
SB-125	4.425E-02	1.407E-01	2.747E-01	NOT IDENT.
TE-125M	1.701E-01	1.911E+01	3.513E+01	NOT IDENT.
I-126	7.146E-01	1.249E+00	2.386E+00	NOT IDENT.
SB-126	-4.028E-01	1.010E+00	1.526E+00	NOT IDENT.
SB-127	0.000E+00	4.550E+02	0.000E+00	SHORT HLIF
I-131	-8.736E-01	3.029E+00	5.395E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.176E+03	0.000E+00	SHORT HLIF
BA-133	3.052E-02	6.862E-02	1.155E-01	FAIL ABUN
I-133	0.000E+00	1.874E+15	0.000E+00	SHORT HLIF
CS-134	1.069E-02	3.770E-02	7.799E-02	FAIL ABUN
CS-135	-4.235E-02	2.206E-01	4.051E-01	NOT IDENT.
I-135	0.000E+00	1.486E+41	0.000E+00	SHORT HLIF
CS-136	4.277E-01	5.728E-01	1.271E+00	NOT IDENT.
CE-139	3.147E-02	4.098E-02	8.281E-02	NOT IDENT.
BA-140	1.294E+00	1.912E+00	3.924E+00	FAIL ABUN
LA-140	-4.580E-01	5.051E-01	7.245E-01	NOT IDENT.
CE-141	-2.680E-02	1.548E-01	2.948E-01	NOT IDENT.
CE-143	0.000E+00	2.954E+09	0.000E+00	SHORT HLIF
CE-144	-8.882E-04	2.591E-01	5.056E-01	NOT IDENT.
PM-144	-1.341E-02	3.620E-02	6.580E-02	NOT IDENT.
PR-144	-1.021E+00	2.756E+00	5.009E+00	NOT IDENT.
PM-146	7.568E-03	6.808E-02	1.301E-01	NOT IDENT.
ND-147	3.065E+00	5.814E+00	1.165E+01	FAIL ABUN
PM-147	-8.996E+02	8.405E+02	1.549E+03	NOT IDENT.
PM-149	0.000E+00	3.528E+06	0.000E+00	SHORT HLIF
EU-150	6.323E-03	4.396E-02	7.175E-02	FAIL ABUN
EU-152	-6.760E-02	1.748E-01	2.669E-01	NOT IDENT.
GD-153	-5.208E-02	1.222E-01	2.096E-01	NOT IDENT.
EU-154	5.187E-03	9.848E-02	2.032E-01	NOT IDENT.
EU-155	-4.468E-02	1.397E-01	2.521E-01	FAIL ABUN
TB-160	-2.187E-02	1.560E-01	3.100E-01	FAIL ABUN
HO-166M	-1.309E-02	6.977E-02	1.289E-01	NOT IDENT.
TM-171	2.024E+01	3.353E+01	6.757E+01	NOT IDENT.
HF-172	1.545E-01	2.336E-01	4.745E-01	FAIL ABUN
LU-172	4.252E-02	7.493E-02	1.435E-01	FAIL ABUN
LU-176	-3.100E-03	3.944E-02	6.357E-02	FAIL ABUN
HF-181	-3.040E-02	1.179E-01	2.184E-01	NOT IDENT.
TA-182	-3.404E-02	1.856E-01	3.565E-01	FAIL ABUN

RE-183	1.274E-01	4.497E-01	8.429E-01	NOT IDENT.
RE-184	2.106E-01	2.760E-01	5.743E-01	NOT IDENT.
W-188	-2.096E+00	1.473E+01	2.364E+01	FAIL ABUN
IR-192	-9.688E-03	7.139E-02	1.301E-01	FAIL ABUN
HG-203	-3.085E-02	8.799E-02	1.594E-01	NOT IDENT.
BI-207	2.113E-02	4.759E-02	9.375E-02	FAIL ABUN
PB-210	-7.998E-01	7.169E+00	1.389E+01	NOT IDENT.
BI-211	0.000E+00	7.064E-01	8.906E-01	FAIL ABUN
PB-211	-4.032E-01	1.042E+00	1.939E+00	NOT IDENT.
BI-212	8.246E-01	7.388E-01	1.241E+00	FAIL ABUN
RN-219	7.886E-02	5.759E-01	1.117E+00	NOT IDENT.
RA-223	-7.252E-01	9.504E-01	1.642E+00	FAIL ABUN
RA-224	0.000E+00	1.071E+00	2.022E+00	NOT IDENT.
AC-227	2.491E-02	3.375E-01	6.362E-01	FAIL ABUN
TH-227	2.491E-02	3.375E-01	6.362E-01	FAIL ABUN
TH-229	-2.463E-01	7.363E-01	1.197E+00	FAIL ABUN
TH-231	-7.252E-01	9.504E-01	1.642E+00	FAIL ABUN
PA-233	5.662E-03	9.352E-02	1.736E-01	FAIL ABUN
PA-234	-1.427E-01	2.997E-01	5.503E-01	NOT IDENT.
PA-234M	1.530E-01	4.743E+00	9.581E+00	NOT IDENT.
U-235	-3.583E-02	2.518E-01	4.804E-01	FAIL ABUN
NP-237	5.662E-03	9.352E-02	1.736E-01	FAIL ABUN
NP-238	0.000E+00	9.291E+05	0.000E+00	SHORT HLIF
NP-239	3.742E-02	3.193E-01	5.925E-01	NOT IDENT.
PU-239	1.844E+02	4.046E+02	8.111E+02	NOT IDENT.
AM-241	-4.719E-02	2.495E-01	4.214E-01	NOT IDENT.
CM-243	6.154E-02	1.372E-01	2.609E-01	NOT IDENT.
BK-247	-4.768E-02	1.297E-01	2.041E-01	NOT IDENT.
CM-247	-6.000E-04	5.364E-02	1.028E-01	NOT IDENT.
CF-249	3.272E-02	5.611E-02	1.127E-01	NOT IDENT.
CF-251	-1.328E-02	1.619E-01	3.088E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	126	10.66*	9.651E-01	5.933E+00	5.933E+00	19.50
RH-106	621.93	9	9.93*	2.033E+00	2.142E-01	2.343E-01	287.30
	1050.41	-----	1.56	1.301E+00	-----	Line Not Found	-----
RU-106	621.93	9	9.93*	2.033E+00	2.142E-01	2.343E-01	287.30
	1050.41	-----	1.56	1.301E+00	-----	Line Not Found	-----
CD-109	88.03	59	3.70*	4.577E+00	1.705E+00	1.833E+00	86.02
SN-126	64.28	65	9.60	2.134E+00	1.548E+00	1.548E+00	93.40
	86.94	59	8.90	4.577E+00	7.089E-01	7.089E-01	86.02
	87.57	59	37.00*	4.577E+00	1.705E-01	1.705E-01	86.02
BA-137M	661.66	1329	89.90*	1.935E+00	3.709E+00	3.721E+00	5.95
CS-137	661.66	1329	85.10*	1.935E+00	3.919E+00	3.930E+00	5.95
TL-208	277.37	-----	6.60	3.646E+00	-----	Line Not Found	-----
	583.19	120	85.00*	2.133E+00	3.220E-01	3.220E-01	25.80
	860.56	12	12.50	1.555E+00	3.078E-01	3.078E-01	129.10
BI-211	72.87	-----	1.23	3.274E+00	-----	Line Not Found	-----
	351.06	135	12.92*	3.073E+00	1.654E+00	1.654E+00	43.58
PB-212	74.82	92	10.28	3.470E+00	1.255E+00	1.255E+00	53.48
	77.11	132	17.10	3.698E+00	1.017E+00	1.017E+00	44.84
	238.63	180	43.60*	4.056E+00	4.939E-01	4.939E-01	39.61
	300.09	33	3.30	3.446E+00	1.405E+00	1.405E+00	89.68
BI-214	609.32	137	45.49*	2.063E+00	7.088E-01	7.089E-01	25.55
	1120.29	19	14.92	1.227E+00	4.949E-01	4.949E-01	61.02
	1764.49	11	15.30	8.332E-01	4.364E-01	4.364E-01	93.65
PB-214	74.82	92	5.80	3.470E+00	2.224E+00	2.225E+00	53.48
	77.11	132	9.70	3.698E+00	1.793E+00	1.793E+00	44.84
	87.09	59	3.41	4.577E+00	1.850E+00	1.850E+00	86.02
	242.00	-----	7.25	4.018E+00	-----	Line Not Found	-----
	295.22	112	18.42	3.490E+00	8.495E-01	8.496E-01	45.59
	351.93	135	35.60*	3.073E+00	6.003E-01	6.003E-01	43.58
RN-222	609.32	137	45.49*	2.063E+00	7.088E-01	7.089E-01	25.55
	1120.29	19	14.92	1.227E+00	4.949E-01	4.949E-01	61.02
	1764.49	11	15.30	8.332E-01	4.364E-01	4.364E-01	93.65
RA-226	609.32	137	45.49*	2.063E+00	7.088E-01	7.089E-01	25.55
	1120.29	19	14.92	1.227E+00	4.949E-01	4.949E-01	61.02
	1764.49	11	15.30	8.332E-01	4.364E-01	4.364E-01	93.65
AC-228	105.21	-----	1.10	5.374E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.159E+00	9.049E-01	9.049E-01	75.65
	794.95	-----	4.25	1.666E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.596E+00	-----	Line Not Found	-----
	911.20	39	25.80*	1.480E+00	4.912E-01	4.912E-01	47.19
	968.97	33	15.80	1.399E+00	7.147E-01	7.147E-01	83.23
RA-228	105.21	-----	1.10	5.374E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.159E+00	9.049E-01	9.049E-01	75.65
	794.95	-----	4.25	1.666E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.596E+00	-----	Line Not Found	-----
	911.20	39	25.80*	1.480E+00	4.912E-01	4.912E-01	47.19
	968.97	33	15.80	1.399E+00	7.147E-01	7.147E-01	83.23

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	92	10.28	3.470E+00	1.255E+00	1.255E+00	53.48
	77.11	132	17.10	3.698E+00	1.017E+00	1.017E+00	44.84
	238.63	180	43.60*	4.056E+00	4.939E-01	4.939E-01	39.61
	300.09	33	3.30	3.446E+00	1.405E+00	1.405E+00	89.68
TH-230	609.32	137	45.49*	2.063E+00	7.088E-01	7.088E-01	25.55
	1120.29	19	14.92	1.227E+00	4.949E-01	4.949E-01	61.02
	1764.49	11	15.30	8.332E-01	4.364E-01	4.364E-01	93.65
PA-231	283.69	-----	1.70	3.588E+00	-----	Line Not Found	-----
	301.36	33	5.35*	3.446E+00	8.669E-01	8.669E-01	89.68
TH-232	105.21	-----	1.10	5.374E+00	-----	Line Not Found	-----
	338.32	66	11.27	3.159E+00	9.049E-01	9.049E-01	75.65
	835.71	-----	1.61	1.596E+00	-----	Line Not Found	-----
	911.20	39	25.80*	1.480E+00	4.912E-01	4.912E-01	47.19
	968.97	33	15.80	1.399E+00	7.147E-01	7.147E-01	83.23
TH-234	63.29	65	3.70*	2.134E+00	4.017E+00	4.017E+00	93.40
	92.59	29	4.23	4.877E+00	6.889E-01	6.889E-01	236.71
U-234	609.32	137	45.49*	2.063E+00	7.088E-01	7.088E-01	25.55
	1120.29	19	14.92	1.227E+00	4.949E-01	4.949E-01	61.02
	1764.49	11	15.30	8.332E-01	4.364E-01	4.364E-01	93.65
U-238	63.29	65	3.70*	2.134E+00	4.017E+00	4.017E+00	93.40
	92.59	29	4.23	4.877E+00	6.889E-01	6.889E-01	236.71
AM-243	43.53	-----	5.90	2.544E-01	-----	Line Not Found	-----
	74.66	92	67.20*	3.470E+00	1.920E-01	1.920E-01	53.48
ANH-511	511.00	19	100.00*	2.353E+00	3.961E-02	3.961E-02	206.12

Flag: "*" = Keyline

Total number of lines in spectrum 38
Number of unidentified lines 8
Number of lines tentatively identified by NID 30 78.95%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.933E+00	5.933E+00	1.157E+00	19.50	
RH-106	371.80D	1.09	2.142E-01	2.343E-01	6.730E-01	287.30	
RU-106	371.80D	1.09	2.142E-01	2.343E-01	6.730E-01	287.30	
CD-109	461.40D	1.07	1.705E+00	1.833E+00	1.576E+00	86.02	
SN-126	2.30E+05Y	1.00	1.705E-01	1.705E-01	1.467E-01	86.02	
BA-137M	30.08Y	1.00	3.709E+00	3.721E+00	0.221E+00	5.95	
CS-137	30.08Y	1.00	3.919E+00	3.930E+00	0.234E+00	5.95	
TL-208	1.41E+10Y	1.00	3.220E-01	3.220E-01	0.831E-01	25.80	
BI-211	7.04E+08Y	1.00	1.654E+00	1.654E+00	0.721E+00	43.58	
PB-212	1.41E+10Y	1.00	4.939E-01	4.939E-01	1.956E-01	39.61	
BI-214	1600.00Y	1.00	7.088E-01	7.089E-01	1.811E-01	25.55	
PB-214	1600.00Y	1.00	6.003E-01	6.003E-01	2.616E-01	43.58	
RN-222	1600.00Y	1.00	7.088E-01	7.089E-01	1.811E-01	25.55	
RA-226	1600.00Y	1.00	7.088E-01	7.089E-01	1.811E-01	25.55	
AC-228	1.41E+10Y	1.00	4.912E-01	4.912E-01	2.318E-01	47.19	
RA-228	1.41E+10Y	1.00	4.912E-01	4.912E-01	2.318E-01	47.19	
TH-228	1.41E+10Y	1.00	4.939E-01	4.939E-01	1.956E-01	39.61	
TH-230	7.54E+04Y	1.00	7.088E-01	7.088E-01	1.811E-01	25.55	
PA-231	7.04E+08Y	1.00	8.669E-01	8.669E-01	7.775E-01	89.68	
TH-232	1.41E+10Y	1.00	4.912E-01	4.912E-01	2.318E-01	47.19	
TH-234	4.47E+09Y	1.00	4.017E+00	4.017E+00	3.752E+00	93.40	
U-234	2.45E+05Y	1.00	7.088E-01	7.088E-01	1.811E-01	25.55	
U-238	4.47E+09Y	1.00	4.017E+00	4.017E+00	3.752E+00	93.40	
AM-243	7370.00Y	1.00	1.920E-01	1.920E-01	1.027E-01	53.48	
ANH-511	1.00E+09Y	1.00	3.961E-02	3.961E-02	8.165E-02	206.12	
Total Activity :			3.358E+01	3.377E+01			

Grand Total Activity : 3.358E+01 3.377E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	186.04	24	218	1.39	372.44	366	11	5.49E-03	****	4.79E+00	T
0	197.87	22	104	1.31	396.11	393	7	5.14E-03	****	4.61E+00	T
0	209.32	43	92	1.47	419.02	416	8	1.01E-02	89.4	4.44E+00	
0	260.56	48	290	8.15	521.54	500	27	1.15E-02	****	3.81E+00	T
1	303.63	27	64	1.56	607.72	597	16	6.64E-03	****	3.42E+00	T
0	563.76	32	12	2.27	1128.18	1122	14	8.14E-03	64.4	2.19E+00	T
0	579.35	11	24	0.89	1159.37	1152	9	2.93E-03	****	2.14E+00	
0	627.64	14	9	1.27	1256.00	1250	8	3.71E-03	92.3	2.02E+00	
0	631.44	9	23	1.66	1263.60	1257	9	2.40E-03	****	2.01E+00	T
0	728.31	20	13	1.94	1457.41	1449	13	5.39E-03	91.4	1.79E+00	T
0	807.12	25	23	4.29	1615.08	1604	28	6.72E-03	****	1.64E+00	
5	914.60	8	3	1.81	1830.10	1818	15	2.29E-03	86.4	1.47E+00	
0	930.00	10	3	0.98	1860.91	1857	10	2.77E-03	99.3	1.45E+00	T
0	1025.38	7	7	1.38	2051.74	2044	10	1.87E-03	****	1.33E+00	T
0	1067.85	17	0	0.73	2136.71	2130	14	4.72E-03	48.5	1.28E+00	
0	1095.76	11	2	0.81	2192.54	2187	10	2.93E-03	83.3	1.25E+00	
0	1589.10	7	6	3.79	3179.45	3170	12	1.97E-03	****	9.00E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677022.CNF;1
Acquisition date : 28-JUN-2016 11:36:57 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.65 Half life ratio : *****
Sample date : 11-MAY-2016 14:20:00 Nuclide Library : SOLID
Sample ID : G398677022 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5463E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.505E-01
RH-106	3.200E-01
RU-106	3.200E-01
CD-109	8.171E-01
SN-126	8.949E-02
BA-137M	3.141E-02
CS-137	3.319E-02
TL-208	3.121E-02
PB-212	7.690E-02
BI-214	8.365E-02
PB-214	9.955E-02
RN-222	8.365E-02
RA-226	8.365E-02
AC-228	9.350E-02
RA-228	9.350E-02
TH-228	7.690E-02
TH-230	8.364E-02
PA-231	5.258E-01
TH-232	9.350E-02
TH-234	1.600E+00
U-234	8.364E-02
U-238	1.600E+00
AM-243	5.842E-02
ANH-511	3.638E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.602E-01	NOT IDENT.
NA-22	2.894E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.390E-02	NOT IDENT.
SC-46	4.639E-02	FAIL ABUN
V-48	2.395E-01	NOT IDENT.
CR-51	1.026E+00	NOT IDENT.

MN-54	3.686E-02	NOT IDENT.
CO-56	4.500E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.683E-02	NOT IDENT.
CO-58	4.797E-02	NOT IDENT.
FE-59	9.918E-02	NOT IDENT.
CO-60	3.133E-02	NOT IDENT.
ZN-65	7.683E-02	NOT IDENT.
GE-68	7.918E-01	NOT IDENT.
AS-73	1.878E+00	NOT IDENT.
AS-74	2.816E-01	NOT IDENT.
SE-75	6.436E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	8.019E-01	NOT IDENT.
RB-83	1.061E-01	NOT IDENT.
KR-85	1.032E+01	NOT IDENT.
SR-85	7.719E-02	NOT IDENT.
RB-86	1.588E+00	NOT IDENT.
Y-88	2.711E-02	NOT IDENT.
Y-91	2.492E+01	NOT IDENT.
NB-94	2.831E-02	NOT IDENT.
NB-95	5.252E-02	NOT IDENT.
NB-95M	2.069E-01	NOT IDENT.
ZR-95	9.072E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.738E-02	FAIL ABUN
RH-102	6.531E-02	FAIL ABUN
RU-103	7.444E-02	FAIL ABUN
AG-108M	4.294E-02	NOT IDENT.
AG-110M	3.031E-02	FAIL ABUN
SN-113	6.951E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.203E-01	NOT IDENT.
TE-123M	3.953E-02	NOT IDENT.
SB-124	1.275E-01	NOT IDENT.
SB-125	1.285E-01	NOT IDENT.
TE-125M	1.671E+01	NOT IDENT.
I-126	1.054E+00	NOT IDENT.
SB-126	6.609E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.523E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.411E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.406E-02	FAIL ABUN
CS-135	1.910E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.558E-01	NOT IDENT.
CE-139	3.924E-02	NOT IDENT.
BA-140	1.796E+00	FAIL ABUN
LA-140	2.578E-01	NOT IDENT.
CE-141	1.400E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.400E-01	NOT IDENT.
PM-144	2.890E-02	NOT IDENT.
PR-144	2.200E+00	NOT IDENT.
PM-146	6.089E-02	NOT IDENT.
ND-147	5.362E+00	FAIL ABUN
PM-147	7.288E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.364E-02	FAIL ABUN
EU-152	1.252E-01	NOT IDENT.
GD-153	9.935E-02	NOT IDENT.
EU-154	8.400E-02	NOT IDENT.
EU-155	1.198E-01	FAIL ABUN
TB-160	1.319E-01	FAIL ABUN
HO-166M	5.761E-02	NOT IDENT.
TM-171	3.202E+01	NOT IDENT.
HF-172	2.256E-01	FAIL ABUN
LU-172	6.292E-02	FAIL ABUN
LU-176	2.962E-02	FAIL ABUN
HF-181	1.017E-01	NOT IDENT.
TA-182	1.492E-01	FAIL ABUN
RE-183	3.993E-01	NOT IDENT.

RE-184	2.571E-01	NOT IDENT.
W-188	1.104E+01	FAIL ABUN
IR-192	6.114E-02	FAIL ABUN
HG-203	7.495E-02	NOT IDENT.
BI-207	3.991E-02	FAIL ABUN
PB-210	6.548E+00	NOT IDENT.
BI-211	4.282E-01	FAIL ABUN
PB-211	9.050E-01	NOT IDENT.
BI-212	5.645E-01	FAIL ABUN
RN-219	5.218E-01	NOT IDENT.
RA-223	7.686E-01	FAIL ABUN
RA-224	9.693E-01	NOT IDENT.
AC-227	2.993E-01	FAIL ABUN
TH-227	2.993E-01	FAIL ABUN
TH-229	5.650E-01	FAIL ABUN
TH-231	7.686E-01	FAIL ABUN
PA-233	8.149E-02	FAIL ABUN
PA-234	2.362E-01	NOT IDENT.
PA-234M	4.206E+00	NOT IDENT.
U-235	2.285E-01	FAIL ABUN
NP-237	8.149E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.803E-01	NOT IDENT.
PU-239	3.856E+02	NOT IDENT.
AM-241	1.990E-01	NOT IDENT.
CM-243	1.241E-01	NOT IDENT.
BK-247	9.595E-02	NOT IDENT.
CM-247	4.803E-02	NOT IDENT.
CF-249	5.273E-02	NOT IDENT.
CF-251	1.462E-01	NOT IDENT.

GEL Laboratories LLC
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Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677022.CNF;1
Acquisition date : 28-JUN-2016 11:36:57 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.65 Half life ratio : *****
Sample date : 11-MAY-2016 14:20:00 Nuclide Library : SOLID
Sample ID : G398677022 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5463E+02 GRAM
Quantity Err(%) : 1.2934E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.933E+00	1.241E+00	1.241E+00
RH-106	2.343E-01	6.600E-01	6.600E-01
RU-106	2.343E-01	6.600E-01	6.600E-01
CD-109	9.912E-01	1.598E+00	1.598E+00
SN-126	9.223E-02	1.487E-01	1.487E-01
BA-137M	3.721E+00	3.998E-01	3.998E-01
CS-137	3.930E+00	4.222E-01	4.222E-01
TL-208	3.220E-01	8.633E-02	8.633E-02
PB-212	4.939E-01	1.969E-01	1.969E-01
BI-214	7.089E-01	1.886E-01	1.886E-01
PB-214	6.003E-01	2.619E-01	2.619E-01
RN-222	7.089E-01	1.886E-01	1.886E-01
RA-226	7.089E-01	1.886E-01	1.886E-01
AC-228	4.912E-01	2.393E-01	2.393E-01
RA-228	4.912E-01	2.393E-01	2.393E-01
TH-228	4.939E-01	1.969E-01	1.969E-01
TH-230	7.088E-01	1.886E-01	1.886E-01
PA-231	8.669E-01	7.876E-01	7.876E-01
TH-232	4.912E-01	2.393E-01	2.393E-01
TH-234	4.017E+00	3.791E+00	3.791E+00
U-234	7.088E-01	1.886E-01	1.886E-01
U-238	4.017E+00	3.791E+00	3.791E+00
AM-243	1.187E-01	1.069E-01	1.069E-01
ANH-511	3.961E-02	8.009E-02	8.009E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.372E-01	8.192E-01	8.543E-01	NOT IDENT.
NA-22	-9.120E-04	3.464E-02	3.464E-02	NOT IDENT.
NA-24	-3.079E+21	4.936E+21	0.000E+00	SHORT HLIF
AL-26	1.124E-02	3.719E-02	3.753E-02	NOT IDENT.
SC-46	8.468E-03	5.303E-02	5.317E-02	FAIL ABUN
V-48	-2.277E-02	2.829E-01	2.831E-01	NOT IDENT.

CR-51	-3.072E-01	1.212E+00	1.220E+00	NOT IDENT.
MN-54	1.094E-02	4.058E-02	4.088E-02	NOT IDENT.
CO-56	3.116E-02	4.629E-02	4.838E-02	NOT IDENT.
MN-56	1.000E+41	1.478E+41	0.000E+00	SHORT HLIF
CO-57	-2.415E-02	3.045E-02	3.234E-02	NOT IDENT.
CO-58	2.343E-02	5.104E-02	5.212E-02	NOT IDENT.
FE-59	-3.043E-02	1.467E-01	1.473E-01	NOT IDENT.
CO-60	-3.206E-03	3.849E-02	3.852E-02	NOT IDENT.
ZN-65	-6.479E-03	1.075E-01	1.075E-01	NOT IDENT.
GE-68	-1.103E-01	9.604E-01	9.617E-01	NOT IDENT.
AS-73	-2.225E-01	2.070E+00	2.072E+00	NOT IDENT.
AS-74	-2.835E-01	3.677E-01	3.892E-01	NOT IDENT.
SE-75	-1.336E-02	8.504E-02	8.526E-02	NOT IDENT.
BR-77	1.090E+06	1.569E+06	1.644E+06	SHORT HLIF
SR-82	4.545E-01	8.814E-01	9.049E-01	NOT IDENT.
RB-83	1.651E-02	1.194E-01	1.196E-01	NOT IDENT.
KR-85	1.773E+01	1.156E+01	1.405E+01	NOT IDENT.
SR-85	1.324E-01	8.641E-02	1.050E-01	NOT IDENT.
RB-86	-3.031E-01	1.994E+00	1.998E+00	NOT IDENT.
Y-88	-5.250E-04	3.277E-02	3.277E-02	NOT IDENT.
Y-91	-6.133E+00	3.080E+01	3.092E+01	NOT IDENT.
NB-94	-8.588E-03	3.466E-02	3.488E-02	NOT IDENT.
NB-95	-1.219E-02	6.426E-02	6.449E-02	NOT IDENT.
NB-95M	2.866E-02	2.630E-01	2.633E-01	NOT IDENT.
ZR-95	7.532E-03	1.063E-01	1.063E-01	NOT IDENT.
NB-97	1.000E+41	5.162E+40	0.000E+00	SHORT HLIF
ZR-97	2.367E+20	2.625E+20	0.000E+00	SHORT HLIF
MO-99	-4.866E+04	4.377E+04	4.896E+04	SHORT HLIF
TC-99M	-1.000E+41	2.898E+41	0.000E+00	SHORT HLIF
RH-101	1.680E-02	3.940E-02	4.012E-02	FAIL ABUN
RH-102	4.058E-02	8.285E-02	8.485E-02	FAIL ABUN
RU-103	-8.087E-02	9.364E-02	1.005E-01	FAIL ABUN
AG-108M	6.152E-03	4.778E-02	4.786E-02	NOT IDENT.
AG-110M	-5.817E-02	4.851E-02	5.515E-02	FAIL ABUN
SN-113	-1.047E-02	7.820E-02	7.835E-02	NOT IDENT.
CD-115	6.848E+03	4.106E+05	4.107E+05	SHORT HLIF
SN-117M	-1.455E-02	3.509E-01	3.509E-01	NOT IDENT.
TE-123M	5.379E-02	4.003E-02	4.680E-02	NOT IDENT.
SB-124	2.026E-02	1.460E-01	1.463E-01	NOT IDENT.
SB-125	4.425E-02	1.408E-01	1.422E-01	NOT IDENT.
TE-125M	1.701E-01	1.911E+01	1.911E+01	NOT IDENT.
I-126	7.146E-01	1.252E+00	1.292E+00	NOT IDENT.
SB-126	-4.028E-01	1.011E+00	1.027E+00	NOT IDENT.
SB-127	1.936E+02	4.573E+02	4.656E+02	SHORT HLIF
I-131	-8.736E-01	3.030E+00	3.055E+00	NOT IDENT.
I-132	-1.000E+41	4.750E+41	0.000E+00	SHORT HLIF
TE-132	-3.032E+02	1.177E+03	1.185E+03	SHORT HLIF
BA-133	3.052E-02	6.867E-02	7.004E-02	FAIL ABUN
I-133	1.979E+15	1.969E+15	2.162E+15	SHORT HLIF
CS-134	1.069E-02	3.773E-02	3.803E-02	FAIL ABUN
CS-135	-4.235E-02	2.207E-01	2.215E-01	NOT IDENT.
I-135	-1.000E+41	1.842E+41	0.000E+00	SHORT HLIF
CS-136	4.277E-01	5.789E-01	6.101E-01	NOT IDENT.
CE-139	3.147E-02	4.150E-02	4.386E-02	NOT IDENT.
BA-140	1.294E+00	1.915E+00	2.002E+00	FAIL ABUN
LA-140	-4.580E-01	5.063E-01	5.468E-01	NOT IDENT.
CE-141	-2.680E-02	1.548E-01	1.553E-01	NOT IDENT.
CE-143	6.358E+09	3.023E+09	4.166E+09	SHORT HLIF
CE-144	-8.882E-04	2.591E-01	2.591E-01	NOT IDENT.
PM-144	-1.341E-02	3.623E-02	3.673E-02	NOT IDENT.
PR-144	-1.021E+00	2.758E+00	2.796E+00	NOT IDENT.
PM-146	7.568E-03	6.808E-02	6.817E-02	NOT IDENT.
ND-147	3.065E+00	5.820E+00	5.982E+00	FAIL ABUN
PM-147	-8.996E+02	8.446E+02	9.369E+02	NOT IDENT.
PM-149	-1.480E+06	3.536E+06	3.598E+06	SHORT HLIF
EU-150	6.323E-03	4.397E-02	4.406E-02	FAIL ABUN
EU-152	-6.760E-02	1.749E-01	1.775E-01	NOT IDENT.
GD-153	-5.208E-02	1.223E-01	1.245E-01	NOT IDENT.
EU-154	5.187E-03	9.848E-02	9.850E-02	NOT IDENT.
EU-155	-4.468E-02	1.398E-01	1.412E-01	FAIL ABUN
TB-160	-2.187E-02	1.560E-01	1.563E-01	FAIL ABUN
HO-166M	-1.309E-02	6.978E-02	7.003E-02	NOT IDENT.
TM-171	2.024E+01	3.362E+01	3.483E+01	NOT IDENT.
HF-172	1.545E-01	2.352E-01	2.453E-01	FAIL ABUN
LU-172	4.252E-02	7.548E-02	7.787E-02	FAIL ABUN
LU-176	-3.100E-03	3.944E-02	3.946E-02	FAIL ABUN
HF-181	-3.040E-02	1.180E-01	1.188E-01	NOT IDENT.
TA-182	-3.404E-02	1.856E-01	1.863E-01	FAIL ABUN

RE-183	1.274E-01	4.500E-01	4.536E-01	NOT IDENT.
RE-184	2.106E-01	2.782E-01	2.939E-01	NOT IDENT.
W-188	-2.096E+00	1.473E+01	1.476E+01	FAIL ABUN
IR-192	-9.688E-03	7.139E-02	7.153E-02	FAIL ABUN
HG-203	-3.085E-02	8.805E-02	8.914E-02	NOT IDENT.
BI-207	2.113E-02	4.775E-02	4.869E-02	FAIL ABUN
PB-210	-7.998E-01	7.169E+00	7.178E+00	NOT IDENT.
BI-211	1.654E+00	7.221E-01	1.038E+00	FAIL ABUN
PB-211	-4.032E-01	1.043E+00	1.059E+00	NOT IDENT.
BI-212	8.246E-01	7.441E-01	8.318E-01	FAIL ABUN
RN-219	7.886E-02	5.760E-01	5.771E-01	NOT IDENT.
RA-223	-7.252E-01	9.534E-01	1.008E+00	FAIL ABUN
RA-224	2.251E+00	1.091E+00	1.490E+00	NOT IDENT.
AC-227	2.491E-02	3.376E-01	3.377E-01	FAIL ABUN
TH-227	2.491E-02	3.376E-01	3.377E-01	FAIL ABUN
TH-229	-2.463E-01	7.365E-01	7.448E-01	FAIL ABUN
TH-231	-7.252E-01	9.534E-01	1.008E+00	FAIL ABUN
PA-233	5.662E-03	9.352E-02	9.356E-02	FAIL ABUN
PA-234	-1.427E-01	3.420E-01	3.480E-01	NOT IDENT.
PA-234M	1.530E-01	4.743E+00	4.744E+00	NOT IDENT.
U-235	-3.583E-02	2.518E-01	2.523E-01	FAIL ABUN
NP-237	5.662E-03	9.352E-02	9.356E-02	FAIL ABUN
NP-238	-2.174E+05	9.298E+05	9.349E+05	SHORT HLIF
NP-239	3.742E-02	3.193E-01	3.198E-01	NOT IDENT.
PU-239	1.844E+02	4.049E+02	4.134E+02	NOT IDENT.
AM-241	-4.719E-02	2.495E-01	2.504E-01	NOT IDENT.
CM-243	6.154E-02	1.374E-01	1.402E-01	NOT IDENT.
BK-247	-4.768E-02	1.301E-01	1.319E-01	NOT IDENT.
CM-247	-6.000E-04	5.364E-02	5.365E-02	NOT IDENT.
CF-249	3.272E-02	5.622E-02	5.812E-02	NOT IDENT.
CF-251	-1.328E-02	1.619E-01	1.621E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	101.4716	87.09	158.6023	136.47	130.6328
45.60	88.0759	87.57	153.7850	140.51	0.0000
46.54	88.3135	88.03	112.5425	143.76	121.1022
49.72	0.0000	88.34	112.6084	144.24	116.6592
51.35	103.7305	88.47	112.6359	145.44	114.1298
51.87	90.6355	89.96	112.9492	152.43	114.2702
52.39	92.8000	1093.63	113.0919	153.25	104.3249
52.97	93.9630	91.11	109.8606	323.87	109.0349
53.44	107.3723	92.59	121.8419	156.02	132.2479
54.07	105.4995	93.35	122.0101	158.56	109.6405
57.36	0.0000	94.56	118.9268	159.00	81.1237
57.53	103.3300	94.65	118.9458	162.33	117.5636
57.98	99.3071	94.67	118.9501	162.66	118.5381
59.27	101.1789	94.87	118.9929	163.33	116.7821
59.32	101.1913	97.43	118.5245	165.86	88.3239
59.54	101.2456	98.43	109.0628	176.31	102.6133
60.96	95.3411	98.44	109.0648	176.60	103.5899
61.17	95.3891	99.53	112.6516	177.52	109.3571
62.93	105.7328	100.11	126.2962	181.07	0.0000
63.29	105.8218	102.03	128.9760	181.52	113.6517
63.58	105.8935	103.18	111.0909	184.41	118.5872
64.28	118.1427	103.37	113.3947	143.76	118.9537
66.73	134.6471	105.21	129.6700	193.51	104.4371
67.24	137.9739	105.31	129.6915	197.03	112.5458
125.81	122.2353	106.12	135.5625	198.01	115.7520
67.75	123.8424	106.47	115.1240	201.83	114.6765
69.67	127.5604	109.28	128.2530	203.43	116.4230
70.83	123.0877	111.00	136.6489	205.31	105.7661
72.81	131.6403	111.76	0.0000	210.85	107.9414
72.87	131.6572	114.06	108.4695	215.65	101.2005
74.66	122.4870	116.30	0.0000	222.11	90.9801
74.82	122.5282	116.74	99.6562	227.09	104.3463
74.97	122.5665	119.76	80.3301	227.38	104.3760
77.11	123.1115	121.12	114.3288	228.16	0.0000
78.74	121.8967	121.22	112.8878	228.18	104.4569
79.69	122.1308	121.78	112.1079	116.74	104.4569
80.12	122.2361	122.06	107.7742	235.69	105.8151
80.19	122.2532	122.92	107.9140	235.96	105.8425
80.57	125.6085	123.07	107.9380	238.63	129.6230
81.00	132.2473	265.00	109.7937	238.98	0.0000
81.07	132.2659	125.81	104.8554	240.99	103.1227
81.75	158.6056	127.23	115.6699	242.00	93.5427
83.79	128.0503	127.91	121.0893	244.70	117.7996
84.00	128.1021	129.30	110.7061	252.40	0.0000
85.43	128.4567	131.20	135.8769	252.80	82.4615
86.55	138.6347	133.02	117.5333	254.15	0.0000
86.79	163.4642	133.52	116.7258	256.23	82.7158
86.94	163.5118	136.00	112.6638	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	87.2443	355.39	0.0000	584.27	23.5173
264.80	87.2546	356.01	61.8704	595.83	32.4305
265.00	93.8566	364.49	76.6837	427.87	36.5660
268.22	97.0092	366.42	0.0000	602.52	0.0000
269.46	87.8145	372.51	81.5747	604.72	35.6195
270.03	83.7228	375.05	72.7600	607.14	44.1501
271.23	86.9134	377.52	68.3960	609.32	45.3277
273.65	114.0518	356.01	71.1617	610.33	45.3494
276.40	73.7864	388.16	58.7174	614.28	25.5554
277.37	70.7268	388.63	63.2538	618.01	27.3060
277.60	69.7005	391.69	69.7192	620.36	20.5015
278.00	74.9268	264.66	65.5708	621.93	25.6458
279.20	92.7115	401.81	63.7964	630.19	0.0000
279.54	98.9907	402.40	67.4681	631.29	29.1890
279.70	101.0880	404.85	73.9649	633.25	18.9036
280.46	98.0247	410.95	72.4183	634.78	22.3559
283.69	64.8287	413.71	66.1157	635.95	17.2058
284.31	71.1387	414.70	77.1832	636.99	21.8043
285.41	72.2502	423.72	74.8439	645.85	20.7388
285.90	0.0000	427.09	69.4427	657.76	34.7461
287.50	76.9208	427.87	63.9177	657.90	0.0000
290.67	70.6699	433.94	73.4511	661.66	21.9275
293.27	0.0000	439.40	57.8351	664.57	0.0000
351.93	65.8649	453.88	69.6216	666.33	12.2067
295.96	67.5938	463.37	70.0046	666.50	12.2076
879.38	67.7363	468.07	70.1934	667.71	0.0000
299.98	72.0497	473.00	0.0000	677.62	16.8219
300.09	72.0560	475.06	75.2332	685.70	0.0000
300.13	72.0591	476.78	57.1948	695.00	14.8278
301.36	66.1886	477.60	61.9896	696.49	22.2556
302.85	66.2676	482.18	66.9290	696.51	22.2556
256.23	66.3533	487.02	65.1918	697.00	22.2602
304.85	66.3724	492.35	0.0000	697.30	23.3234
306.78	64.7679	497.08	51.0921	697.49	23.3250
308.46	66.5599	505.52	50.0344	702.65	23.3755
311.90	77.0054	507.63	0.0000	706.68	26.6071
316.51	84.7922	511.00	53.4192	711.68	26.6620
319.41	73.1475	514.00	42.1548	720.70	19.6246
320.08	78.5661	514.00	42.1548	721.93	0.0000
321.04	81.8540	520.40	39.0439	722.78	24.9979
323.87	90.6638	520.69	0.0000	722.91	24.9990
325.23	61.5853	522.65	0.0000	723.31	21.4312
328.76	75.8308	527.90	0.0000	724.19	21.4390
333.37	59.1323	528.26	41.1643	727.33	13.9531
333.97	71.3386	529.59	31.3852	733.00	5.3788
334.37	69.6191	529.87	0.0000	735.93	8.6162
338.28	79.6366	531.02	35.3347	333.97	14.0099
338.32	79.6388	537.26	28.5554	739.50	0.0000
311.90	71.6779	546.56	0.0000	747.24	17.3102
340.48	71.6779	552.55	34.7317	748.06	21.6445
340.55	71.6819	563.25	29.9290	752.31	18.4290
344.28	87.6526	569.33	26.6829	753.82	10.8469
345.93	78.9807	946.00	31.6883	756.73	18.4609
351.06	84.7745	569.70	31.6914	756.80	18.4614
351.93	84.8274	583.19	23.5054	884.68	29.4027

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.9750	1274.44	18.6954	1620.50	9.8860
766.42	18.5307	1001.03	13.7961	1621.92	4.9444
766.84	18.5336	1002.74	9.8596	1678.03	0.0000
772.60	0.0000	1004.73	16.7717	1690.97	6.0184
776.52	16.4143	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.0535
778.90	20.8105	1028.54	0.0000	1063.66	7.1328
783.70	0.0000	1037.84	9.9666	1771.35	20.3836
785.37	15.3720	1038.76	0.0000	1791.20	0.0000
792.07	20.1810	631.29	7.9945	1808.65	4.1063
794.95	14.6930	1048.07	8.9978	1810.72	0.0000
795.86	13.0277	1049.04	12.0005	1836.06	2.0638
810.06	12.9290	1050.41	20.0090		
810.29	12.9302	1063.66	6.8876		
344.28	12.9310	1077.00	7.7007		
810.76	12.9325	1077.34	7.0595		
815.77	14.2785	1085.87	7.0772		
1048.07	12.7048	1093.63	10.4226		
832.01	23.2742	1099.45	10.4406		
834.85	17.7066	1112.07	9.1685		
835.71	14.9157	1112.84	10.4807		
836.80	0.0000	1115.54	13.9849		
846.75	0.0000	1120.29	8.7524		
846.77	9.3593	1120.55	8.7531		
856.80	12.8817	1221.41	14.0084		
860.56	25.7974	1129.67	10.2384		
871.09	16.0485	1131.51	0.0000		
873.19	13.2261	1147.95	0.0000		
875.33	0.0000	1173.23	15.5457		
879.38	12.3078	1177.95	13.4904		
880.51	11.3655	1189.05	12.4902		
883.24	13.2723	1204.77	15.6793		
884.68	18.0212	1221.41	10.4993		
889.28	14.2499	1231.02	11.5787		
894.76	16.1803	1235.36	12.6460		
898.04	27.6330	1238.28	13.7099		
900.72	18.1210	1260.41	0.0000		
903.28	14.8910	1271.87	9.5746		
911.20	9.5711	1274.44	6.3875		
912.08	9.5740	1274.54	6.3875		
923.98	0.0000	1291.59	7.4845		
926.50	6.5968	1298.22	0.0000		
929.11	11.5544	1312.11	5.3739		
937.49	12.8738	1332.49	8.6419		
944.13	16.4501	1362.66	0.0000		
946.00	17.4283	1365.19	5.6001		
949.00	8.7228	1368.63	0.0000		
667.71	0.0000	1384.29	8.4388		
962.31	16.6867	1408.01	7.5435		
964.08	15.0268	1457.56	0.0000		
966.17	23.3906	1460.82	10.0232		
911.20	14.6323	1489.16	4.8038		
968.97	14.6323	1505.03	9.6418		
983.53	13.7203	1584.12	3.4335		
984.45	0.0000	1596.21	8.0322		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:38:48.70

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677023.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;321
Background date  : 26-JUN-2016 12:04:07
Sample date      : 11-MAY-2016 14:10:00 Acquisition date : 28-JUN-2016 11:37:18
Sample ID        : G398677023 Sample quantity : 1.31210E+02 GRAM
Detector name     : GAM09 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.75 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	74.84	94	139	1.03	149.36	143	19	2.61E-02	22.6	2.17E+00
2	2	77.17	169	137	1.03	154.02	143	19	4.69E-02	13.4	
3	0	92.66*	23	222	1.18	185.01	181	8	6.43E-03	119.1	
4	0	140.52*	9	158	1.19	280.78	277	7	2.62E-03	225.6	3.11E+00
5	0	186.00*	78	231	1.30	371.78	365	11	2.17E-02	40.4	
6	0	200.15	35	136	1.02	400.09	397	7	9.67E-03	58.6	
7	0	208.70	73	163	1.63	417.20	413	10	2.03E-02	34.8	1.41E+00
8	0	238.51*	328	203	0.80	476.83	472	9	9.11E-02	9.7	
9	0	241.74	78	133	1.55	483.29	481	7	2.18E-02	27.6	
10	0	295.42*	136	144	1.38	590.71	586	10	3.79E-02	18.8	1.41E+00
11	0	299.91	58	100	1.18	599.68	596	9	1.62E-02	33.4	
12	1	323.99	22	33	1.18	647.87	646	11	6.16E-03	38.6	
13	1	326.43	51	91	1.31	652.76	646	11	1.43E-02	34.1	1.41E+00
14	0	338.38	71	147	0.95	676.67	672	11	1.97E-02	35.3	
15	0	351.83*	154	173	1.29	703.57	698	11	4.27E-02	18.5	
16	0	375.72	27	102	0.78	751.37	747	9	7.57E-03	69.3	1.41E+00
17	0	454.71	17	159	2.82	909.43	904	12	4.66E-03	152.4	
18	0	479.71	35	154	3.31	959.45	949	13	9.60E-03	76.9	
19	0	510.26*	2	129	1.00	1020.58	1015	11	6.81E-04	983.7	1.41E+00
20	0	573.80	18	60	5.36	1147.71	1140	14	5.08E-03	92.5	
21	0	583.35*	94	70	1.20	1166.83	1160	14	2.60E-02	21.8	
22	0	609.41*	125	68	1.19	1218.97	1213	12	3.48E-02	16.1	1.41E+00
23	3	661.47	2923	23	1.37	1323.14	1316	19	8.12E-01	1.9	
24	3	665.59	20	4	1.78	1331.38	1316	19	5.51E-03	38.7	
25	0	726.68	45	24	1.18	1453.61	1447	14	1.26E-02	27.4	1.41E+00
26	0	776.90	19	29	5.44	1554.10	1539	20	5.24E-03	74.5	
27	0	795.72	20	18	0.73	1591.77	1584	13	5.67E-03	49.4	
28	0	809.12	10	4	0.98	1618.58	1616	7	2.64E-03	46.0	1.41E+00
29	0	816.03	11	7	1.41	1632.41	1624	14	3.06E-03	59.3	
30	0	859.56*	24	0	1.75	1719.50	1714	11	6.70E-03	21.7	
31	0	911.17*	78	16	1.07	1822.78	1817	10	2.16E-02	15.0	1.41E+00
32	0	969.35	43	25	1.42	1939.20	1931	12	1.20E-02	27.4	
33	0	981.06	9	4	1.45	1962.62	1959	6	2.46E-03	50.2	
34	0	1098.70	10	8	0.79	2198.03	2191	11	2.73E-03	64.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1106.62	6	9	0.87	2213.86	2204	12	1.74E-03	103.4	
36	0	1119.19	46	7	1.55	2239.03	2233	13	1.29E-02	18.6	
37	0	1168.42	10	2	0.85	2337.52	2334	8	2.71E-03	41.0	
38	0	1172.31	12	2	1.82	2345.32	2342	7	3.46E-03	33.1	
39	0	1177.05	6	6	1.45	2354.80	2351	8	1.60E-03	85.2	
40	0	1230.48	8	13	0.57	2461.72	2457	11	2.15E-03	99.1	
41	0	1238.71	19	20	2.05	2478.18	2468	16	5.32E-03	57.0	
42	0	1300.86	15	3	2.87	2602.54	2596	11	4.19E-03	33.5	
43	0	1324.15	9	3	0.88	2649.16	2642	12	2.59E-03	49.1	
44	0	1378.05	11	4	2.27	2757.00	2752	8	3.06E-03	43.6	
45	0	1460.35*	228	0	1.82	2921.70	2916	12	6.34E-02	6.7	
46	0	1518.87	10	0	0.83	3038.80	3032	12	2.78E-03	31.6	
47	0	1764.31*	16	9	1.06	3529.94	3525	9	4.41E-03	43.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:38:50

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677023.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:10:00 Acquisition date : 28-JUN-2016 11:37:18
Sample ID        : G398677023 Sample quantity  : 131.21 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA9 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.75 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.146E+00	1.018E+01	1.018E+01	13.41	OK
SR-82	776.52	15.08*	1.903E+00	3.755E-01	1.392E+00	149.10	OK
BA-137M	661.66	89.90*	2.157E+00	8.705E+00	8.732E+00	3.74	OK
CS-137	661.66	85.10*	2.157E+00	9.196E+00	9.224E+00	3.74	OK
TL-208	277.37	6.60	4.352E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.381E+00	2.693E-01	2.693E-01	43.57	OK
	860.56	12.50	1.760E+00	6.213E-01	6.213E-01	43.47	OK
PB-212	74.82	10.28	3.671E+00	1.043E+00	1.043E+00	75.37	OK
	77.11	17.10	3.924E+00	1.674E+00	1.674E+00	26.77	OK
	238.63	43.60*	4.884E+00	9.536E-01	9.536E-01	19.37	OK
	300.09	3.30	4.089E+00	2.641E+00	2.641E+00	66.79	OK
BI-214	609.32	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21	OK
	1120.29	14.92	1.430E+00	1.208E+00	1.209E+00	37.14	OK
	1764.49	15.30	9.657E-01	5.783E-01	5.783E-01	87.12	OK
PB-214	74.82	5.80	3.669E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.924E+00	2.951E+00	2.951E+00	26.77	OK
	87.09	3.41	4.849E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.832E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.139E+00	1.093E+00	1.093E+00	37.69	OK
	351.93	35.60*	3.589E+00	7.266E-01	7.267E-01	36.99	OK
RN-222	609.32	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21	OK
	1120.29	14.92	1.430E+00	1.208E+00	1.209E+00	37.14	OK
	1764.49	15.30	9.657E-01	5.783E-01	5.783E-01	87.12	OK
RA-224	240.99	4.10*	4.836E+00	5.164E-01	5.164E-01	297.13	OK
RA-226	609.32	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21	OK
	1120.29	14.92	1.430E+00	1.208E+00	1.209E+00	37.14	OK
	1764.49	15.30	9.657E-01	5.783E-01	5.783E-01	87.12	OK
AC-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.027E+00	1.027E+00	70.58	OK
	794.95	4.25	1.868E+00	1.464E+00	1.464E+00	98.74	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.013E+00	1.013E+00	29.92	OK
	968.97	15.80	1.602E+00	9.585E-01	9.585E-01	54.81	OK
RA-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.027E+00	1.027E+00	70.58	OK
	794.95	4.25	1.868E+00	1.464E+00	1.464E+00	98.74	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.013E+00	1.013E+00	29.92	OK
	968.97	15.80	1.602E+00	9.585E-01	9.585E-01	54.81	OK
TH-228	74.82	10.28	3.671E+00	1.043E+00	1.043E+00	75.37	OK
	77.11	17.10	3.924E+00	1.674E+00	1.674E+00	26.77	OK
	238.63	43.60*	4.884E+00	9.536E-01	9.536E-01	19.37	OK
	300.09	3.30	4.089E+00	2.641E+00	2.641E+00	66.79	OK
TH-230	609.32	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21	OK
	1120.29	14.92	1.430E+00	1.208E+00	1.208E+00	37.14	OK
	1764.49	15.30	9.657E-01	5.783E-01	5.783E-01	87.12	OK
PA-231	283.69	1.70	4.275E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.089E+00	1.629E+00	1.629E+00	66.79	OK
TH-232	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	338.32	11.27	3.706E+00	1.027E+00	1.027E+00	70.58	OK
	835.71	1.61	1.799E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.013E+00	1.013E+00	29.92	OK
	968.97	15.80	1.602E+00	9.585E-01	9.585E-01	54.81	OK
U-234	609.32	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21	OK
	1120.29	14.92	1.430E+00	1.208E+00	1.208E+00	37.14	OK
	1764.49	15.30	9.657E-01	5.783E-01	5.783E-01	87.12	OK
AM-243	43.53	5.90	1.969E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.671E+00	1.595E-01	1.595E-01	75.37	OK
ANH-511	511.00	100.00*	2.649E+00	5.441E-03	5.441E-03	1967.40	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677023.CNF;1
Acquisition date : 28-JUN-2016 11:37:18 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.75 Half life ratio : *****
Sample date : 11-MAY-2016 14:10:00 Analyst initials: MXR1
Sample ID : G398677023 Sample Quantity : 1.3121E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.018E+01	1.338E+00	6.110E-01
SR-82	1.392E+00	2.034E+00	2.034E+00
BA-137M	8.732E+00	3.200E-01	8.279E-02
CS-137	9.224E+00	3.380E-01	8.746E-02
TL-208	2.693E-01	1.150E-01	9.680E-02
PB-212	9.536E-01	1.810E-01	1.590E-01
BI-214	6.957E-01	2.196E-01	1.903E-01
PB-214	7.267E-01	2.634E-01	2.329E-01
RN-222	6.957E-01	2.196E-01	1.903E-01
RA-224	5.164E-01	1.504E+00	1.956E+00
RA-226	6.957E-01	2.196E-01	1.903E-01
AC-228	1.013E+00	2.971E-01	2.978E-01
RA-228	1.013E+00	2.971E-01	2.978E-01
TH-228	9.536E-01	1.810E-01	1.590E-01
TH-230	6.957E-01	2.196E-01	1.903E-01
PA-231	1.629E+00	1.066E+00	1.281E+00
TH-232	1.013E+00	2.971E-01	2.978E-01
U-234	6.957E-01	2.196E-01	1.903E-01
AM-243	1.595E-01	1.178E-01	1.379E-01
ANH-511	5.441E-03	1.049E-01	1.001E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.059E+00	1.053E+00	2.022E+00	NOT IDENT.
NA-22	-2.633E-03	5.254E-02	9.815E-02	NOT IDENT.
NA-24	0.000E+00	4.465E+21	0.000E+00	SHORT HLIF
AL-26	-1.954E-02	3.661E-02	6.529E-02	NOT IDENT.
SC-46	3.204E-04	4.657E-02	9.320E-02	FAIL ABUN
V-48	2.180E-02	3.620E-01	6.169E-01	NOT IDENT.
CR-51	9.912E-01	1.488E+00	2.605E+00	NOT IDENT.
MN-54	3.458E-02	4.545E-02	9.578E-02	NOT IDENT.
CO-56	1.388E-02	5.528E-02	1.122E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF

CO-57	8.410E-03	3.822E-02	7.215E-02	NOT IDENT.
CO-58	2.190E-02	7.441E-02	1.008E-01	NOT IDENT.
FE-59	1.409E-01	1.791E-01	3.015E-01	FAIL ABUN
CO-60	-4.908E-03	3.775E-02	7.557E-02	FAIL ABUN
ZN-65	6.848E-02	1.134E-01	2.125E-01	NOT IDENT.
GE-68	2.031E-01	1.266E+00	2.563E+00	NOT IDENT.
AS-73	1.037E+00	2.401E+00	4.420E+00	NOT IDENT.
AS-74	-2.792E-02	4.794E-01	8.789E-01	NOT IDENT.
SE-75	8.144E-03	8.780E-02	1.561E-01	NOT IDENT.
BR-77	0.000E+00	4.004E+05	0.000E+00	SHORT HLIF
RB-83	1.698E-02	1.564E-01	2.883E-01	NOT IDENT.
KR-85	1.699E+00	1.384E+01	2.232E+01	NOT IDENT.
SR-85	1.246E-02	1.035E-01	1.669E-01	NOT IDENT.
RB-86	-1.290E-01	2.368E+00	4.644E+00	NOT IDENT.
Y-88	-1.904E-02	5.383E-02	1.015E-01	NOT IDENT.
Y-91	9.746E+00	3.098E+01	6.211E+01	NOT IDENT.
NB-94	3.330E-03	3.619E-02	6.833E-02	NOT IDENT.
NB-95	-9.144E-03	7.641E-02	1.267E-01	NOT IDENT.
NB-95M	-1.463E-01	2.842E-01	4.309E-01	NOT IDENT.
ZR-95	5.232E-02	1.116E-01	2.312E-01	NOT IDENT.
NB-97	0.000E+00	8.219E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.517E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.021E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.713E-04	4.341E-02	8.085E-02	FAIL ABUN
RH-102	2.139E-02	7.546E-02	1.434E-01	NOT IDENT.
RU-103	-3.779E-02	1.276E-01	2.274E-01	FAIL ABUN
RH-106	-1.648E-02	4.879E-01	8.891E-01	NOT IDENT.
RU-106	-1.648E-02	4.879E-01	8.891E-01	NOT IDENT.
AG-108M	5.024E-02	5.731E-02	1.106E-01	NOT IDENT.
CD-109	8.776E-01	1.251E+00	2.357E+00	NOT IDENT.
AG-110M	1.950E-03	4.722E-02	9.564E-02	NOT IDENT.
SN-113	-7.085E-02	9.747E-02	1.715E-01	NOT IDENT.
CD-115	0.000E+00	4.856E+05	0.000E+00	SHORT HLIF
SN-117M	-2.230E-02	3.606E-01	6.618E-01	NOT IDENT.
TE-123M	1.458E-02	4.305E-02	8.091E-02	NOT IDENT.
SB-124	2.776E-02	1.253E-01	2.799E-01	NOT IDENT.
SB-125	1.914E-01	1.772E-01	3.464E-01	NOT IDENT.
TE-125M	-4.695E+00	1.949E+01	3.621E+01	NOT IDENT.
I-126	2.114E+00	1.602E+00	2.879E+00	FAIL ABUN
SB-126	-1.820E-01	1.080E+00	1.795E+00	FAIL ABUN
SN-126	6.986E-02	1.136E-01	2.217E-01	NOT IDENT.
SB-127	0.000E+00	5.331E+02	0.000E+00	SHORT HLIF
I-131	1.561E+00	3.410E+00	6.509E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.318E+03	0.000E+00	SHORT HLIF
BA-133	2.172E-02	8.331E-02	1.393E-01	NOT IDENT.
I-133	0.000E+00	2.339E+15	0.000E+00	SHORT HLIF
CS-134	7.609E-02	7.362E-02	1.133E-01	FAIL ABUN
CS-135	4.707E-02	2.350E-01	4.217E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-2.219E-01	6.921E-01	1.259E+00	NOT IDENT.
CE-139	4.664E-03	4.581E-02	8.446E-02	NOT IDENT.
BA-140	-8.220E-01	2.473E+00	4.396E+00	NOT IDENT.
LA-140	-6.801E-01	5.362E-01	7.109E-01	FAIL ABUN
CE-141	-1.693E-01	1.659E-01	2.896E-01	NOT IDENT.
CE-143	0.000E+00	3.561E+09	0.000E+00	SHORT HLIF
CE-144	-1.004E-01	2.800E-01	5.099E-01	NOT IDENT.
PM-144	-1.165E-02	4.138E-02	7.366E-02	NOT IDENT.
PR-144	-8.869E-01	3.151E+00	5.608E+00	NOT IDENT.
PM-146	5.345E-02	1.597E-01	1.706E-01	FAIL ABUN
ND-147	-9.491E-01	7.123E+00	1.290E+01	NOT IDENT.
PM-147	8.614E+02	1.049E+03	2.044E+03	NOT IDENT.
PM-149	0.000E+00	4.093E+06	0.000E+00	SHORT HLIF
EU-150	-2.233E-02	4.751E-02	7.525E-02	FAIL ABUN
EU-152	2.545E-02	1.604E-01	2.829E-01	FAIL ABUN
GD-153	-1.423E-01	1.227E-01	2.178E-01	NOT IDENT.
EU-154	-9.908E-03	1.460E-01	2.720E-01	NOT IDENT.
EU-155	1.113E-01	1.504E-01	2.940E-01	NOT IDENT.
TB-160	-2.454E-02	1.575E-01	3.081E-01	FAIL ABUN
HO-166M	-5.945E-03	7.296E-02	1.331E-01	FAIL ABUN
TM-171	3.428E+01	4.109E+01	7.775E+01	NOT IDENT.
HF-172	4.193E-02	2.626E-01	4.941E-01	NOT IDENT.
LU-172	2.025E-02	6.876E-02	1.288E-01	FAIL ABUN
LU-176	2.003E-02	4.071E-02	7.889E-02	NOT IDENT.
HF-181	3.619E-02	1.559E-01	2.557E-01	NOT IDENT.
TA-182	-6.978E-02	2.025E-01	3.664E-01	FAIL ABUN
RE-183	2.489E-01	5.086E-01	9.350E-01	NOT IDENT.

RE-184	6.194E-02	2.843E-01	5.507E-01	NOT IDENT.
W-188	-1.961E+00	1.820E+01	2.812E+01	NOT IDENT.
IR-192	-9.361E-03	7.553E-02	1.408E-01	FAIL ABUN
HG-203	-3.906E-02	9.717E-02	1.665E-01	NOT IDENT.
BI-207	-1.299E-02	5.579E-02	1.031E-01	FAIL ABUN
PB-210	5.501E+00	1.041E+01	1.945E+01	NOT IDENT.
BI-211	0.000E+00	7.259E-01	1.013E+00	FAIL ABUN
PB-211	-4.099E-01	1.342E+00	2.418E+00	NOT IDENT.
BI-212	0.000E+00	1.046E+00	1.629E+00	FAIL ABUN
RN-219	-6.048E-02	7.154E-01	1.313E+00	NOT IDENT.
RA-223	8.779E-01	6.646E-01	1.906E+00	FAIL ABUN
AC-227	-1.049E-01	3.928E-01	6.842E-01	FAIL ABUN
TH-227	-1.049E-01	3.928E-01	6.842E-01	FAIL ABUN
TH-229	-2.917E-01	8.108E-01	1.431E+00	NOT IDENT.
TH-231	8.779E-01	6.646E-01	1.906E+00	FAIL ABUN
PA-233	2.611E-02	1.038E-01	1.977E-01	FAIL ABUN
PA-234	1.112E-01	2.994E-01	6.217E-01	NOT IDENT.
PA-234M	-3.228E+00	4.937E+00	9.101E+00	NOT IDENT.
TH-234	-4.169E-01	2.382E+00	4.209E+00	FAIL ABUN
U-235	-1.685E-01	2.941E-01	4.718E-01	FAIL ABUN
NP-237	2.611E-02	1.038E-01	1.977E-01	FAIL ABUN
NP-238	0.000E+00	1.155E+06	0.000E+00	SHORT HLIF
U-238	-4.169E-01	2.382E+00	4.209E+00	FAIL ABUN
NP-239	-2.804E-02	3.462E-01	6.474E-01	NOT IDENT.
PU-239	2.046E+02	4.598E+02	8.752E+02	FAIL ABUN
AM-241	-1.303E-01	2.868E-01	4.905E-01	NOT IDENT.
CM-243	-3.040E-02	1.487E-01	2.778E-01	NOT IDENT.
BK-247	3.231E-02	1.321E-01	2.369E-01	NOT IDENT.
CM-247	-3.605E-02	6.676E-02	1.187E-01	NOT IDENT.
CF-249	6.526E-02	7.307E-02	1.420E-01	NOT IDENT.
CF-251	-2.398E-02	1.809E-01	3.265E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	217	10.66*	1.146E+00	1.018E+01	1.018E+01	13.41
SR-82	776.52	19	15.08*	1.903E+00	3.755E-01	1.392E+00	149.10
BA-137M	661.66	2951	89.90*	2.157E+00	8.705E+00	8.732E+00	3.74
CS-137	661.66	2951	85.10*	2.157E+00	9.196E+00	9.224E+00	3.74
TL-208	277.37	-----	6.60	4.352E+00	-----	Line Not Found	-----
	583.19	95	85.00*	2.381E+00	2.693E-01	2.693E-01	43.57
	860.56	24	12.50	1.760E+00	6.213E-01	6.213E-01	43.47
BI-211	72.87	-----	1.23	3.448E+00	-----	Line Not Found	-----
	351.06	162	12.92*	3.589E+00	2.002E+00	2.002E+00	36.99
PB-212	74.82	109	10.28	3.671E+00	1.660E+00	1.660E+00	45.25
	77.11	196	17.10	3.924E+00	1.674E+00	1.674E+00	26.77
	238.63	355	43.60*	4.884E+00	9.536E-01	9.536E-01	19.37
	300.09	62	3.30	4.089E+00	2.641E+00	2.641E+00	66.79
BI-214	609.32	127	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21
	1120.29	45	14.92	1.430E+00	1.208E+00	1.209E+00	37.14
	1764.49	15	15.30	9.657E-01	5.783E-01	5.783E-01	87.12
PB-214	74.82	109	5.80	3.671E+00	2.941E+00	2.942E+00	45.25
	77.11	196	9.70	3.924E+00	2.951E+00	2.951E+00	26.77
	87.09	-----	3.41	4.849E+00	-----	Line Not Found	-----
	242.00	85	7.25	4.836E+00	1.385E+00	1.385E+00	55.13
	295.22	146	18.42	4.139E+00	1.093E+00	1.093E+00	37.69
	351.93	162	35.60*	3.589E+00	7.266E-01	7.267E-01	36.99
RN-222	609.32	127	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21
	1120.29	45	14.92	1.430E+00	1.208E+00	1.209E+00	37.14
	1764.49	15	15.30	9.657E-01	5.783E-01	5.783E-01	87.12
RA-224	240.99	85	4.10*	4.836E+00	2.449E+00	2.449E+00	55.13
RA-226	609.32	127	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21
	1120.29	45	14.92	1.430E+00	1.208E+00	1.209E+00	37.14
	1764.49	15	15.30	9.657E-01	5.783E-01	5.783E-01	87.12
AC-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	75	11.27	3.706E+00	1.027E+00	1.027E+00	70.58
	794.95	20	4.25	1.868E+00	1.464E+00	1.464E+00	98.74
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.682E+00	1.013E+00	1.013E+00	29.92
	968.97	42	15.80	1.602E+00	9.585E-01	9.585E-01	54.81
RA-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	75	11.27	3.706E+00	1.027E+00	1.027E+00	70.58
	794.95	20	4.25	1.868E+00	1.464E+00	1.464E+00	98.74
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.682E+00	1.013E+00	1.013E+00	29.92
	968.97	42	15.80	1.602E+00	9.585E-01	9.585E-01	54.81
TH-228	74.82	109	10.28	3.671E+00	1.660E+00	1.660E+00	45.25
	77.11	196	17.10	3.924E+00	1.674E+00	1.674E+00	26.77
	238.63	355	43.60*	4.884E+00	9.536E-01	9.536E-01	19.37
	300.09	62	3.30	4.089E+00	2.641E+00	2.641E+00	66.79
TH-230	609.32	127	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21
	1120.29	45	14.92	1.430E+00	1.208E+00	1.208E+00	37.14

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	1764.49	15	15.30	9.657E-01	5.783E-01	5.783E-01	87.12
PA-231	283.69	-----	1.70	4.275E+00	-----	Line Not Found	-----
	301.36	62	5.35*	4.089E+00	1.629E+00	1.629E+00	66.79
TH-232	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	75	11.27	3.706E+00	1.027E+00	1.027E+00	70.58
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.682E+00	1.013E+00	1.013E+00	29.92
	968.97	42	15.80	1.602E+00	9.585E-01	9.585E-01	54.81
U-234	609.32	127	45.49*	2.300E+00	6.957E-01	6.957E-01	32.21
	1120.29	45	14.92	1.430E+00	1.208E+00	1.208E+00	37.14
	1764.49	15	15.30	9.657E-01	5.783E-01	5.783E-01	87.12
AM-243	43.53	-----	5.90	1.969E-01	-----	Line Not Found	-----
	74.66	109	67.20*	3.671E+00	2.539E-01	2.539E-01	45.25
ANH-511	511.00	3	100.00*	2.649E+00	5.441E-03	5.441E-03	1967.40

Flag: "*" = Keyline

Total number of lines in spectrum 47
Number of unidentified lines 11
Number of lines tentatively identified by NID 36 76.60%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.018E+01	1.018E+01	0.137E+01	13.41	
SR-82	25.35D	3.71	3.755E-01	1.392E+00	2.075E+00	149.10	
BA-137M	30.08Y	1.00	8.705E+00	8.732E+00	0.327E+00	3.74	
CS-137	30.08Y	1.00	9.196E+00	9.224E+00	0.345E+00	3.74	
TL-208	1.41E+10Y	1.00	2.693E-01	2.693E-01	1.173E-01	43.57	
BI-211	7.04E+08Y	1.00	2.002E+00	2.002E+00	0.741E+00	36.99	
PB-212	1.41E+10Y	1.00	9.536E-01	9.536E-01	1.847E-01	19.37	
BI-214	1600.00Y	1.00	6.957E-01	6.957E-01	2.241E-01	32.21	
PB-214	1600.00Y	1.00	7.266E-01	7.267E-01	2.688E-01	36.99	
RN-222	1600.00Y	1.00	6.957E-01	6.957E-01	2.241E-01	32.21	
RA-224	1.41E+10Y	1.00	2.449E+00	2.449E+00	1.350E+00	55.13	
RA-226	1600.00Y	1.00	6.957E-01	6.957E-01	2.241E-01	32.21	
AC-228	1.41E+10Y	1.00	1.013E+00	1.013E+00	0.303E+00	29.92	
RA-228	1.41E+10Y	1.00	1.013E+00	1.013E+00	0.303E+00	29.92	
TH-228	1.41E+10Y	1.00	9.536E-01	9.536E-01	1.847E-01	19.37	
TH-230	7.54E+04Y	1.00	6.957E-01	6.957E-01	2.241E-01	32.21	
PA-231	7.04E+08Y	1.00	1.629E+00	1.629E+00	1.088E+00	66.79	
TH-232	1.41E+10Y	1.00	1.013E+00	1.013E+00	0.303E+00	29.92	
U-234	2.45E+05Y	1.00	6.957E-01	6.957E-01	2.241E-01	32.21	
AM-243	7370.00Y	1.00	2.539E-01	2.539E-01	1.149E-01	45.25	
ANH-511	1.00E+09Y	1.00	5.441E-03	5.441E-03	107.0E-03	1967.40	

Total Activity : 4.422E+01 4.529E+01

Grand Total Activity : 4.422E+01 4.529E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.66	27	255	1.18	185.01	181	8	6.43E-03	****	5.25E+00	T
0	140.52	11	177	1.19	280.78	277	7	2.62E-03	****	6.33E+00	T
0	186.00	86	254	1.30	371.78	365	11	2.17E-02	80.7	5.74E+00	T
0	200.15	38	149	1.02	400.09	397	7	9.67E-03	****	5.50E+00	
0	208.70	80	178	1.63	417.20	413	10	2.03E-02	69.7	5.36E+00	
1	323.99	24	35	1.18	647.87	646	11	6.16E-03	77.2	3.84E+00	T
1	326.43	55	96	1.31	652.76	646	11	1.43E-02	68.1	3.82E+00	T
0	375.72	29	107	0.78	751.37	747	9	7.57E-03	****	3.40E+00	T
0	454.71	17	165	2.82	909.43	904	12	4.66E-03	****	2.91E+00	T
0	479.71	36	159	3.31	959.45	949	13	9.60E-03	****	2.78E+00	
0	573.80	19	61	5.36	1147.71	1140	14	5.08E-03	****	2.41E+00	
3	665.59	20	4	1.78	1331.38	1316	19	5.51E-03	77.3	2.15E+00	T
0	726.68	46	24	1.18	1453.61	1447	14	1.26E-02	54.8	2.00E+00	T
0	809.12	9	3	0.98	1618.58	1616	7	2.64E-03	92.1	1.84E+00	T
0	816.03	11	7	1.41	1632.41	1624	14	3.06E-03	****	1.83E+00	T
0	981.06	9	4	1.45	1962.62	1959	6	2.46E-03	****	1.59E+00	
0	1098.70	10	8	0.79	2198.03	2191	11	2.73E-03	****	1.45E+00	T
0	1106.62	6	8	0.87	2213.86	2204	12	1.74E-03	****	1.44E+00	
0	1168.42	9	2	0.85	2337.52	2334	8	2.71E-03	82.1	1.38E+00	
0	1172.31	12	1	1.82	2345.32	2342	7	3.46E-03	66.3	1.38E+00	T
0	1177.05	6	6	1.45	2354.80	2351	8	1.60E-03	****	1.37E+00	T
0	1230.48	7	13	0.57	2461.72	2457	11	2.15E-03	****	1.32E+00	T
0	1238.71	18	19	2.05	2478.18	2468	16	5.32E-03	****	1.32E+00	T
0	1300.86	15	3	2.87	2602.54	2596	11	4.19E-03	67.0	1.26E+00	
0	1324.15	9	3	0.88	2649.16	2642	12	2.59E-03	98.2	1.25E+00	
0	1378.05	11	4	2.27	2757.00	2752	8	3.06E-03	87.2	1.20E+00	
0	1518.87	10	0	0.83	3038.80	3032	12	2.78E-03	63.2	1.11E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677023.CNF;1
Acquisition date : 28-JUN-2016 11:37:18 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.75 Half life ratio : *****
Sample date : 11-MAY-2016 14:10:00 Nuclide Library : SOLID
Sample ID : G398677023 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3121E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.421E-01
SR-82	9.162E-01
BA-137M	3.735E-02
CS-137	3.945E-02
TL-208	4.453E-02
PB-212	7.579E-02
BI-214	8.769E-02
PB-214	1.103E-01
RN-222	8.769E-02
RA-224	9.384E-01
RA-226	8.769E-02
AC-228	1.309E-01
RA-228	1.309E-01
TH-228	7.579E-02
TH-230	8.769E-02
PA-231	6.041E-01
TH-232	1.309E-01
U-234	8.769E-02
AM-243	6.565E-02
ANH-511	4.710E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.611E-01	NOT IDENT.
NA-22	4.283E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.444E-02	NOT IDENT.
SC-46	3.983E-02	FAIL ABUN
V-48	2.691E-01	NOT IDENT.
CR-51	1.235E+00	NOT IDENT.
MN-54	4.307E-02	NOT IDENT.
CO-56	4.936E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	3.440E-02	NOT IDENT.

CO-58	4.358E-02	NOT IDENT.
FE-59	1.308E-01	FAIL ABUN
CO-60	3.142E-02	FAIL ABUN
ZN-65	9.401E-02	NOT IDENT.
GE-68	1.096E+00	NOT IDENT.
AS-73	2.096E+00	NOT IDENT.
AS-74	4.027E-01	NOT IDENT.
SE-75	7.413E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
RB-83	1.344E-01	NOT IDENT.
KR-85	1.047E+01	NOT IDENT.
SR-85	7.829E-02	NOT IDENT.
RB-86	1.959E+00	NOT IDENT.
Y-88	3.931E-02	NOT IDENT.
Y-91	2.715E+01	NOT IDENT.
NB-94	3.036E-02	NOT IDENT.
NB-95	5.653E-02	NOT IDENT.
NB-95M	2.046E-01	NOT IDENT.
ZR-95	1.032E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.852E-02	FAIL ABUN
RH-102	6.529E-02	NOT IDENT.
RU-103	1.063E-01	FAIL ABUN
RH-106	4.065E-01	NOT IDENT.
RU-106	4.065E-01	NOT IDENT.
AG-108M	5.243E-02	NOT IDENT.
CD-109	1.131E+00	NOT IDENT.
AG-110M	4.070E-02	NOT IDENT.
SN-113	8.085E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.137E-01	NOT IDENT.
TE-123M	3.842E-02	NOT IDENT.
SB-124	1.119E-01	NOT IDENT.
SB-125	1.643E-01	NOT IDENT.
TE-125M	1.723E+01	NOT IDENT.
I-126	1.295E+00	FAIL ABUN
SB-126	7.916E-01	FAIL ABUN
SN-126	1.064E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	3.081E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	6.608E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.154E-02	FAIL ABUN
CS-135	1.998E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.493E-01	NOT IDENT.
CE-139	4.014E-02	NOT IDENT.
BA-140	2.027E+00	NOT IDENT.
LA-140	2.519E-01	FAIL ABUN
CE-141	1.375E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.422E-01	NOT IDENT.
PM-144	3.267E-02	NOT IDENT.
PR-144	2.487E+00	NOT IDENT.
PM-146	8.111E-02	FAIL ABUN
ND-147	5.970E+00	NOT IDENT.
PM-147	9.759E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.543E-02	FAIL ABUN
EU-152	1.333E-01	FAIL ABUN
GD-153	1.032E-01	NOT IDENT.
EU-154	1.186E-01	NOT IDENT.
EU-155	1.404E-01	NOT IDENT.
TB-160	1.303E-01	FAIL ABUN
HO-166M	5.945E-02	FAIL ABUN
TM-171	3.693E+01	NOT IDENT.
HF-172	2.353E-01	NOT IDENT.
LU-172	5.550E-02	FAIL ABUN
LU-176	3.735E-02	NOT IDENT.
HF-181	1.202E-01	NOT IDENT.
TA-182	1.544E-01	FAIL ABUN
RE-183	4.436E-01	NOT IDENT.
RE-184	2.445E-01	NOT IDENT.

W-188	1.331E+01	NOT IDENT.
IR-192	6.656E-02	FAIL ABUN
HG-203	7.867E-02	NOT IDENT.
BI-207	4.453E-02	FAIL ABUN
PB-210	9.227E+00	NOT IDENT.
BI-211	4.895E-01	FAIL ABUN
PB-211	1.144E+00	NOT IDENT.
BI-212	7.564E-01	FAIL ABUN
RN-219	6.193E-01	NOT IDENT.
RA-223	9.015E-01	FAIL ABUN
AC-227	3.241E-01	FAIL ABUN
TH-227	3.241E-01	FAIL ABUN
TH-229	6.832E-01	NOT IDENT.
TH-231	9.015E-01	FAIL ABUN
PA-233	9.370E-02	FAIL ABUN
PA-234	2.711E-01	NOT IDENT.
PA-234M	3.958E+00	NOT IDENT.
TH-234	2.008E+00	FAIL ABUN
U-235	2.244E-01	FAIL ABUN
NP-237	9.370E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	2.008E+00	FAIL ABUN
NP-239	3.075E-01	NOT IDENT.
PU-239	4.177E+02	FAIL ABUN
AM-241	2.326E-01	NOT IDENT.
CM-243	1.323E-01	NOT IDENT.
BK-247	1.126E-01	NOT IDENT.
CM-247	5.596E-02	NOT IDENT.
CF-249	6.738E-02	NOT IDENT.
CF-251	1.554E-01	NOT IDENT.

GEL Laboratories LLC
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Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677023.CNF;1
Acquisition date : 28-JUN-2016 11:37:18 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.75 Half life ratio : *****
Sample date : 11-MAY-2016 14:10:00 Nuclide Library : SOLID
Sample ID : G398677023 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3121E+02 GRAM
Quantity Err(%) : 1.5243E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.018E+01	1.439E+00	1.439E+00
SR-82	1.392E+00	2.035E+00	2.035E+00
BA-137M	8.732E+00	4.928E-01	4.928E-01
CS-137	9.224E+00	5.198E-01	5.198E-01
TL-208	2.693E-01	1.156E-01	1.156E-01
PB-212	9.536E-01	1.879E-01	1.879E-01
BI-214	6.957E-01	2.216E-01	2.216E-01
PB-214	7.267E-01	2.652E-01	2.652E-01
RN-222	6.957E-01	2.216E-01	2.216E-01
RA-224	5.164E-01	1.509E+00	1.509E+00
RA-226	6.957E-01	2.216E-01	2.216E-01
AC-228	1.013E+00	3.016E-01	3.016E-01
RA-228	1.013E+00	3.016E-01	3.016E-01
TH-228	9.536E-01	1.879E-01	1.879E-01
TH-230	6.957E-01	2.216E-01	2.216E-01
PA-231	1.629E+00	1.122E+00	1.122E+00
TH-232	1.013E+00	3.016E-01	3.016E-01
U-234	6.957E-01	2.216E-01	2.216E-01
AM-243	1.595E-01	1.189E-01	1.189E-01
ANH-511	5.441E-03	1.049E-01	1.049E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.059E+00	1.054E+00	1.157E+00	NOT IDENT.
NA-22	-2.633E-03	5.254E-02	5.256E-02	NOT IDENT.
NA-24	-1.051E+21	4.466E+21	0.000E+00	SHORT HLIF
AL-26	-1.954E-02	3.663E-02	3.767E-02	NOT IDENT.
SC-46	3.204E-04	4.657E-02	4.657E-02	FAIL ABUN
V-48	2.180E-02	3.620E-01	3.621E-01	NOT IDENT.
CR-51	9.912E-01	1.489E+00	1.554E+00	NOT IDENT.
MN-54	3.458E-02	4.548E-02	4.807E-02	NOT IDENT.
CO-56	1.388E-02	5.528E-02	5.563E-02	FAIL ABUN
MN-56	1.000E+41	3.982E+41	0.000E+00	SHORT HLIF

CO-57	8.410E-03	3.822E-02	3.841E-02	NOT IDENT.
CO-58	2.190E-02	7.441E-02	7.507E-02	NOT IDENT.
FE-59	1.409E-01	1.794E-01	1.903E-01	FAIL ABUN
CO-60	-4.908E-03	3.775E-02	3.782E-02	FAIL ABUN
ZN-65	6.848E-02	1.135E-01	1.176E-01	NOT IDENT.
GE-68	2.031E-01	1.266E+00	1.270E+00	NOT IDENT.
AS-73	1.037E+00	2.411E+00	2.456E+00	NOT IDENT.
AS-74	-2.792E-02	4.794E-01	4.796E-01	NOT IDENT.
SE-75	8.144E-03	8.780E-02	8.788E-02	NOT IDENT.
BR-77	2.109E+06	2.946E+06	3.096E+06	SHORT HLIF
RB-83	1.698E-02	1.564E-01	1.566E-01	NOT IDENT.
KR-85	1.699E+00	1.384E+01	1.386E+01	NOT IDENT.
SR-85	1.246E-02	1.035E-01	1.037E-01	NOT IDENT.
RB-86	-1.290E-01	2.368E+00	2.368E+00	NOT IDENT.
Y-88	-1.904E-02	5.384E-02	5.452E-02	NOT IDENT.
Y-91	9.746E+00	3.098E+01	3.129E+01	NOT IDENT.
NB-94	3.330E-03	3.619E-02	3.622E-02	NOT IDENT.
NB-95	-9.144E-03	7.641E-02	7.652E-02	NOT IDENT.
NB-95M	-1.463E-01	2.844E-01	2.920E-01	NOT IDENT.
ZR-95	5.232E-02	1.117E-01	1.141E-01	NOT IDENT.
NB-97	1.000E+41	8.230E+40	0.000E+00	SHORT HLIF
ZR-97	1.940E+20	3.518E+20	0.000E+00	SHORT HLIF
MO-99	-1.492E+04	5.022E+04	5.067E+04	SHORT HLIF
TC-99M	1.000E+41	4.424E+41	0.000E+00	SHORT HLIF
RH-101	1.713E-04	4.341E-02	4.341E-02	FAIL ABUN
RH-102	2.139E-02	7.548E-02	7.610E-02	NOT IDENT.
RU-103	-3.779E-02	1.276E-01	1.287E-01	FAIL ABUN
RH-106	-1.648E-02	4.879E-01	4.880E-01	NOT IDENT.
RU-106	-1.648E-02	4.879E-01	4.880E-01	NOT IDENT.
AG-108M	5.024E-02	5.734E-02	6.165E-02	NOT IDENT.
CD-109	8.776E-01	1.253E+00	1.314E+00	NOT IDENT.
AG-110M	1.950E-03	4.722E-02	4.723E-02	NOT IDENT.
SN-113	-7.085E-02	9.751E-02	1.026E-01	NOT IDENT.
CD-115	2.452E+05	4.859E+05	4.983E+05	SHORT HLIF
SN-117M	-2.230E-02	3.606E-01	3.607E-01	NOT IDENT.
TE-123M	1.458E-02	4.306E-02	4.356E-02	NOT IDENT.
SB-124	2.776E-02	1.253E-01	1.259E-01	NOT IDENT.
SB-125	1.914E-01	1.774E-01	1.972E-01	NOT IDENT.
TE-125M	-4.695E+00	1.949E+01	1.960E+01	NOT IDENT.
I-126	2.114E+00	1.607E+00	1.868E+00	FAIL ABUN
SB-126	-1.820E-01	1.081E+00	1.084E+00	FAIL ABUN
SN-126	6.986E-02	1.137E-01	1.179E-01	NOT IDENT.
SB-127	-3.455E+02	5.387E+02	5.607E+02	SHORT HLIF
I-131	1.561E+00	3.410E+00	3.482E+00	NOT IDENT.
I-132	-1.000E+41	3.641E+41	0.000E+00	SHORT HLIF
TE-132	6.142E+02	1.319E+03	1.348E+03	SHORT HLIF
BA-133	2.172E-02	8.332E-02	8.389E-02	NOT IDENT.
I-133	-1.802E+14	2.340E+15	2.341E+15	SHORT HLIF
CS-134	7.609E-02	7.370E-02	8.129E-02	FAIL ABUN
CS-135	4.707E-02	2.350E-01	2.360E-01	NOT IDENT.
I-135	-1.000E+41	5.293E+42	0.000E+00	SHORT HLIF
CS-136	-2.219E-01	6.924E-01	6.996E-01	NOT IDENT.
CE-139	4.664E-03	4.582E-02	4.587E-02	NOT IDENT.
BA-140	-8.220E-01	2.474E+00	2.501E+00	NOT IDENT.
LA-140	-6.801E-01	5.372E-01	6.185E-01	FAIL ABUN
CE-141	-1.693E-01	1.661E-01	1.828E-01	NOT IDENT.
CE-143	5.492E+09	3.572E+09	4.346E+09	SHORT HLIF
CE-144	-1.004E-01	2.800E-01	2.836E-01	NOT IDENT.
PM-144	-1.165E-02	4.139E-02	4.172E-02	NOT IDENT.
PR-144	-8.869E-01	3.151E+00	3.176E+00	NOT IDENT.
PM-146	5.345E-02	1.598E-01	1.616E-01	FAIL ABUN
ND-147	-9.491E-01	7.123E+00	7.136E+00	NOT IDENT.
PM-147	8.614E+02	1.049E+03	1.119E+03	NOT IDENT.
PM-149	-2.541E+06	4.108E+06	4.265E+06	SHORT HLIF
EU-150	-2.233E-02	4.752E-02	4.857E-02	FAIL ABUN
EU-152	2.545E-02	1.605E-01	1.609E-01	FAIL ABUN
GD-153	-1.423E-01	1.230E-01	1.387E-01	NOT IDENT.
EU-154	-9.908E-03	1.460E-01	1.460E-01	NOT IDENT.
EU-155	1.113E-01	1.506E-01	1.587E-01	NOT IDENT.
TB-160	-2.454E-02	1.575E-01	1.579E-01	FAIL ABUN
HO-166M	-5.945E-03	7.297E-02	7.301E-02	FAIL ABUN
TM-171	3.428E+01	4.120E+01	4.400E+01	NOT IDENT.
HF-172	4.193E-02	2.627E-01	2.634E-01	NOT IDENT.
LU-172	2.025E-02	6.879E-02	6.939E-02	FAIL ABUN
LU-176	2.003E-02	4.072E-02	4.171E-02	NOT IDENT.
HF-181	3.619E-02	1.560E-01	1.568E-01	NOT IDENT.
TA-182	-6.978E-02	2.026E-01	2.050E-01	FAIL ABUN
RE-183	2.489E-01	5.092E-01	5.215E-01	NOT IDENT.

RE-184	6.194E-02	2.844E-01	2.857E-01	NOT IDENT.
W-188	-1.961E+00	1.821E+01	1.823E+01	NOT IDENT.
IR-192	-9.361E-03	7.553E-02	7.565E-02	FAIL ABUN
HG-203	-3.906E-02	9.718E-02	9.876E-02	NOT IDENT.
BI-207	-1.299E-02	5.579E-02	5.610E-02	FAIL ABUN
PB-210	5.501E+00	1.042E+01	1.071E+01	NOT IDENT.
BI-211	2.002E+00	7.313E-01	1.162E+00	FAIL ABUN
PB-211	-4.099E-01	1.342E+00	1.354E+00	NOT IDENT.
BI-212	1.949E+00	1.051E+00	1.370E+00	FAIL ABUN
RN-219	-6.048E-02	7.155E-01	7.160E-01	NOT IDENT.
RA-223	8.779E-01	6.667E-01	7.754E-01	FAIL ABUN
AC-227	-1.049E-01	3.930E-01	3.959E-01	FAIL ABUN
TH-227	-1.049E-01	3.930E-01	3.959E-01	FAIL ABUN
TH-229	-2.917E-01	8.109E-01	8.215E-01	NOT IDENT.
TH-231	8.779E-01	6.667E-01	7.754E-01	FAIL ABUN
PA-233	2.611E-02	1.038E-01	1.045E-01	FAIL ABUN
PA-234	1.112E-01	3.253E-01	3.292E-01	NOT IDENT.
PA-234M	-3.228E+00	4.939E+00	5.149E+00	NOT IDENT.
TH-234	-4.169E-01	2.384E+00	2.391E+00	FAIL ABUN
U-235	-1.685E-01	2.942E-01	3.039E-01	FAIL ABUN
NP-237	2.611E-02	1.038E-01	1.045E-01	FAIL ABUN
NP-238	-2.619E+05	1.155E+06	1.161E+06	SHORT HLIF
U-238	-4.169E-01	2.384E+00	2.391E+00	FAIL ABUN
NP-239	-2.804E-02	3.463E-01	3.465E-01	NOT IDENT.
PU-239	2.046E+02	4.599E+02	4.691E+02	FAIL ABUN
AM-241	-1.303E-01	2.870E-01	2.929E-01	NOT IDENT.
CM-243	-3.040E-02	1.488E-01	1.494E-01	NOT IDENT.
BK-247	3.231E-02	1.322E-01	1.330E-01	NOT IDENT.
CM-247	-3.605E-02	6.703E-02	6.898E-02	NOT IDENT.
CF-249	6.526E-02	7.327E-02	7.895E-02	NOT IDENT.
CF-251	-2.398E-02	1.809E-01	1.812E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	118.7418	87.09	177.5476	136.47	113.6758
45.60	98.4913	87.57	162.8512	140.51	0.0000
46.54	94.1006	88.03	157.7573	143.76	132.4579
49.72	0.0000	88.34	151.2867	144.24	136.9265
51.35	101.5617	88.47	151.3297	145.44	137.1790
51.87	93.3504	89.96	199.3465	152.43	132.7354
52.39	94.7009	1093.63	175.8400	153.25	124.0364
52.97	104.4787	91.11	166.7535	323.87	120.2687
53.44	99.8198	92.59	163.7390	156.02	132.4501
54.07	103.6275	93.35	126.3255	158.56	112.1057
57.36	0.0000	94.56	115.9810	159.00	108.2050
57.53	107.1396	94.65	114.6695	162.33	120.6910
57.98	99.9653	94.67	114.6741	162.66	123.7402
59.27	127.2586	94.87	114.7220	163.33	111.8713
59.32	127.2769	97.43	142.1496	165.86	119.2869
59.54	127.3574	98.43	117.3555	176.31	131.1678
60.96	131.5602	98.44	117.3575	176.60	127.1489
61.17	132.8680	99.53	97.8640	177.52	135.4529
62.93	124.8661	100.11	100.6746	181.07	0.0000
63.29	133.6522	102.03	154.2973	181.52	144.3592
63.58	133.7585	103.18	142.8894	184.41	142.8460
64.28	127.8100	103.37	139.3244	143.76	143.0878
66.73	119.9092	105.21	113.4936	193.51	163.2175
67.24	137.5814	105.31	128.0459	197.03	161.3194
125.81	140.2444	106.12	130.9746	198.01	177.1936
67.75	140.2700	106.47	141.0742	201.83	148.0870
69.67	110.7640	109.28	135.4243	203.43	122.0653
70.83	117.4044	111.00	119.3379	205.31	121.8129
72.81	131.9479	111.76	0.0000	210.85	121.0195
72.87	131.9678	114.06	135.7078	215.65	132.3693
74.66	132.5533	116.30	0.0000	222.11	131.1937
74.82	132.6049	116.74	121.5252	227.09	117.8671
74.97	132.6541	119.76	125.9116	227.38	122.2316
77.11	133.3436	121.12	121.5384	228.16	0.0000
78.74	133.8625	121.22	121.5596	228.18	119.0917
79.69	136.7425	121.78	124.4866	116.74	119.0917
80.12	127.8415	122.06	128.2933	235.69	135.8958
80.19	127.8619	122.92	138.8012	235.96	135.9350
80.57	127.9752	123.07	145.4040	238.63	137.9663
81.00	139.7494	265.00	144.6186	238.98	0.0000
81.07	139.7716	125.81	128.1820	240.99	184.4165
81.75	159.4349	127.23	135.1044	242.00	123.6248
83.79	138.0421	127.91	145.6647	244.70	105.7930
84.00	138.1076	129.30	130.8350	252.40	0.0000
85.43	177.7654	131.20	130.2980	252.80	116.6825
86.55	169.4737	133.02	134.5054	254.15	0.0000
86.79	177.4299	133.52	130.7955	256.23	115.9738
86.94	177.4887	136.00	120.7795	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	115.8289	355.39	0.0000	584.27	44.3930
264.80	115.8436	356.01	103.7924	595.83	38.2830
265.00	115.8666	364.49	92.8905	427.87	44.7750
268.22	102.6916	366.42	0.0000	602.52	0.0000
269.46	107.3350	372.51	78.4700	604.72	49.5705
270.03	98.3511	375.05	81.5869	607.14	44.4971
271.23	93.9373	377.52	104.0310	609.32	46.0471
273.65	117.9797	356.01	115.7202	610.33	34.2852
276.40	106.9166	388.16	91.7464	614.28	46.3772
277.37	95.6296	388.63	88.9697	618.01	39.7969
277.60	97.9293	391.69	109.8178	620.36	39.8443
278.00	99.1052	264.66	90.6914	621.93	38.7982
279.20	110.6229	401.81	95.4935	630.19	0.0000
279.54	117.5032	402.40	104.9924	631.29	30.3174
279.70	116.3790	404.85	111.8080	633.25	39.0179
280.46	118.7456	410.95	122.7563	634.78	34.7090
283.69	106.5095	413.71	105.8324	635.95	34.7285
284.31	99.6946	414.70	100.1807	636.99	36.9177
285.41	99.7972	423.72	116.1664	645.85	39.2596
285.90	0.0000	427.09	85.6402	657.76	38.6096
287.50	78.1532	427.87	83.7609	657.90	0.0000
290.67	107.1982	433.94	87.0049	661.66	28.5716
293.27	0.0000	439.40	120.3104	664.57	0.0000
351.93	112.8534	453.88	114.6024	666.33	15.8594
295.96	112.9288	463.37	124.1716	666.50	15.8607
879.38	73.1411	468.07	131.4617	667.71	0.0000
299.98	81.9517	473.00	0.0000	677.62	28.7882
300.09	81.9603	475.06	150.9030	685.70	0.0000
300.13	81.9631	476.78	93.4220	695.00	24.5566
301.36	92.5284	477.60	93.4693	696.49	24.5734
302.85	106.6346	482.18	74.9877	696.51	24.5734
256.23	98.0376	487.02	83.0127	697.00	25.6960
304.85	98.0684	492.35	0.0000	697.30	25.6995
306.78	92.0961	497.08	75.4715	697.49	29.0548
308.46	109.8003	505.52	82.5289	702.65	20.1621
311.90	102.2009	507.63	0.0000	706.68	20.1989
316.51	104.3771	511.00	84.4200	711.68	24.7433
319.41	96.2756	514.00	73.1843	720.70	21.0798
320.08	89.4351	514.00	73.1843	721.93	0.0000
321.04	96.6128	520.40	60.1956	722.78	12.0566
323.87	111.0853	520.69	0.0000	722.91	13.5645
325.23	110.4999	522.65	0.0000	723.31	13.5670
328.76	94.3819	527.90	0.0000	724.19	13.5721
333.37	101.9204	528.26	48.1704	727.33	17.2155
333.97	100.5344	529.59	54.3603	733.00	21.1948
334.37	86.2017	529.87	0.0000	735.93	21.8279
338.28	84.6754	531.02	54.4055	333.97	22.7527
338.32	84.6783	537.26	53.5679	739.50	0.0000
311.90	85.1885	546.56	0.0000	747.24	20.1078
340.48	85.1885	552.55	48.8331	748.06	21.0296
340.55	83.7502	563.25	38.6700	752.31	21.0678
344.28	84.4851	569.33	31.8770	753.82	10.9992
345.93	89.4317	946.00	31.8797	756.73	17.4372
351.06	106.4829	569.70	31.8834	756.80	17.4377
351.93	106.5561	583.19	44.3687	884.68	22.0934

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.0322	1274.44	14.0755	1620.50	7.9554
766.42	27.6460	1001.03	17.1195	1621.92	5.9685
766.84	32.2596	1002.74	8.0609	1678.03	0.0000
772.60	0.0000	1004.73	23.1909	1690.97	4.0400
776.52	27.7639	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	7.1817
778.90	13.8959	1028.54	0.0000	1063.66	19.5164
783.70	0.0000	1037.84	14.2728	1771.35	6.1646
785.37	18.5776	1038.76	0.0000	1791.20	0.0000
792.07	13.9720	631.29	16.3586	1808.65	6.2122
794.95	19.5839	1048.07	19.4351	1810.72	0.0000
795.86	13.9937	1049.04	21.4881	1836.06	6.2471
810.06	15.6388	1050.41	19.4500		
810.29	15.6405	1063.66	15.4219		
344.28	9.3848	1077.00	10.3252		
810.76	9.3860	1077.34	10.3262		
815.77	6.2700	1085.87	9.3190		
1048.07	14.1229	1093.63	8.6499		
832.01	19.8787	1099.45	10.3989		
834.85	17.0583	1112.07	12.1799		
835.71	23.7000	1112.84	12.1828		
836.80	0.0000	1115.54	12.1930		
846.75	0.0000	1120.29	15.6995		
846.77	15.2340	1120.55	13.9564		
856.80	14.3375	1221.41	10.4697		
860.56	12.7630	1129.67	17.8442		
871.09	12.4941	1131.51	0.0000		
873.19	14.4280	1147.95	0.0000		
875.33	0.0000	1173.23	0.0000		
879.38	11.5696	1177.95	7.6074		
880.51	16.3969	1189.05	9.6166		
883.24	12.5519	1204.77	12.8813		
884.68	10.6267	1221.41	12.9428		
889.28	11.6127	1231.02	10.8154		
894.76	11.6364	1235.36	10.8291		
898.04	15.5344	1238.28	16.2568		
900.72	21.3807	1260.41	0.0000		
903.28	18.3747	1271.87	21.8809		
911.20	17.8862	1274.44	16.4224		
912.08	17.8920	1274.54	16.4224		
923.98	0.0000	1291.59	11.0000		
926.50	10.7919	1298.22	0.0000		
929.11	9.8201	1312.11	12.9051		
937.49	13.7895	1332.49	9.2684		
944.13	19.7461	1362.66	0.0000		
946.00	11.8556	1365.19	5.6091		
949.00	9.8901	1368.63	0.0000		
667.71	0.0000	1384.29	7.8917		
962.31	13.2490	1408.01	6.6163		
964.08	18.2286	1457.56	0.0000		
966.17	18.2420	1460.82	4.9256		
911.20	9.9600	1489.16	9.6444		
968.97	9.9600	1505.03	3.8724		
983.53	15.0154	1584.12	6.9037		
984.45	0.0000	1596.21	10.8787		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:39:39.22

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677024.CNF:1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM14.CNF:512
Background date    : 26-JUN-2016 12:04:30
Sample date       : 11-MAY-2016 13:57:00 Acquisition date : 28-JUN-2016 11:37:39
Sample ID        : G398677024 Sample quantity : 1.32240E+02 GRAM
Detector name     : GAM14 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.44 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.58*	40	115	1.63	127.61	123	9	1.10E-02	52.5	
2	3	75.22	97	124	1.10	150.89	147	12	2.68E-02	21.6	1.60E+00
3	3	77.56	118	96	1.04	155.58	147	12	3.28E-02	16.7	
4	0	87.48*	30	166	0.81	175.41	170	9	8.31E-03	80.7	
5	0	93.55*	68	120	1.36	187.54	184	11	1.89E-02	35.4	
6	0	129.79	45	105	1.37	260.01	255	10	1.26E-02	44.7	
7	0	133.52	17	73	1.00	267.45	266	7	4.72E-03	85.7	
8	0	178.99	22	64	0.81	358.36	354	8	6.11E-03	66.5	
9	0	186.36*	46	118	1.14	373.10	369	10	1.29E-02	48.0	
10	0	210.38	47	61	0.86	421.13	419	7	1.31E-02	31.1	
11	4	239.09*	299	40	1.01	478.53	473	17	8.31E-02	6.8	1.11E+00
12	4	241.93	58	59	1.80	484.21	473	17	1.62E-02	38.1	
13	0	271.92	29	80	1.85	544.16	535	12	7.93E-03	65.7	
14	0	295.46	100	57	1.30	591.22	585	12	2.77E-02	18.1	
15	0	301.30	28	52	1.33	602.90	599	9	7.77E-03	50.1	
16	0	328.25	27	88	0.53	656.78	649	15	7.36E-03	78.9	
17	0	338.97*	76	65	1.11	678.23	674	10	2.12E-02	23.0	
18	0	352.50*	117	58	1.16	705.27	703	6	3.25E-02	13.8	
19	0	394.73	26	40	4.28	789.70	784	13	7.16E-03	53.8	
20	0	427.97	20	28	1.85	856.15	849	11	5.42E-03	56.8	
21	0	511.47*	25	34	1.69	1023.10	1017	15	6.94E-03	66.1	
22	0	564.37	16	12	1.36	1128.86	1122	10	4.37E-03	48.9	
23	0	574.99	20	21	5.05	1150.10	1144	14	5.56E-03	53.5	
24	0	584.05*	62	52	1.60	1168.21	1162	15	1.72E-02	28.2	
25	0	609.90*	121	18	1.27	1219.89	1214	12	3.37E-02	11.7	
26	0	662.16	430	23	1.28	1324.39	1318	13	1.20E-01	5.3	
27	0	710.76	20	14	1.95	1421.54	1415	16	5.63E-03	44.7	
28	0	727.96*	22	10	1.05	1455.92	1451	10	6.22E-03	35.4	
29	0	768.79	15	11	1.39	1537.56	1532	9	4.07E-03	48.9	
30	0	786.80	9	2	0.95	1573.56	1570	8	2.44E-03	44.1	
31	0	817.52	12	2	2.91	1634.99	1631	8	3.38E-03	34.8	
32	0	841.98	8	10	4.31	1683.89	1675	11	2.16E-03	89.3	
33	0	911.63*	58	10	1.47	1823.13	1816	13	1.62E-02	17.8	
34	0	999.14	8	6	0.52	1998.09	1988	12	2.14E-03	73.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1014.67	15	2	3.61	2029.14	2024	10	4.07E-03	32.9	
36	0	1085.14	9	4	0.59	2170.04	2164	9	2.37E-03	56.3	
37	0	1097.13	8	2	3.93	2194.00	2188	10	2.14E-03	52.4	
38	0	1115.43	6	2	1.44	2230.60	2227	6	1.53E-03	55.3	
39	0	1122.64	12	14	2.66	2245.01	2236	11	3.37E-03	65.8	
40	0	1169.21	14	3	4.30	2338.12	2332	12	3.87E-03	36.6	
41	0	1206.16	13	3	1.12	2411.99	2404	12	3.50E-03	39.7	
42	0	1378.33	10	2	1.75	2756.19	2751	9	2.72E-03	42.2	
43	0	1461.22*	151	4	2.03	2921.91	2914	16	4.20E-02	8.8	
44	0	1647.24	8	3	2.83	3293.81	3286	12	2.21E-03	56.2	
45	0	1764.80*	22	0	1.95	3528.83	3520	15	6.04E-03	22.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:39:41

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677024.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 13:57:00 Acquisition date : 28-JUN-2016 11:37:39
Sample ID         : G398677024 Sample quantity  : 132.24 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA14 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.44 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.191E+00	6.444E+00	6.444E+00	17.70	OK
ZN-65	1115.54	50.60*	1.519E+00	3.954E-02	4.531E-02	110.60	OK
Y-91	1204.77	0.26*	1.414E+00	1.882E+01	3.321E+01	79.40	OK
CD-109	88.03	3.70*	5.963E+00	2.084E-01	2.240E-01	701.53	OK
SN-126	64.28	9.60	3.190E+00	8.694E-01	8.694E-01	104.96	OK
	86.94	8.90	5.963E+00	8.664E-02	8.664E-02	701.53	OK
	87.57	37.00*	5.963E+00	2.084E-02	2.084E-02	701.53	OK
BA-137M	661.66	89.90*	2.407E+00	1.142E+00	1.145E+00	10.67	OK
CS-137	661.66	85.10*	2.407E+00	1.206E+00	1.210E+00	10.67	OK
CE-144	80.12	1.36	5.319E+00	----- Line	Not Found	-----	Absent
	133.52	11.09*	6.940E+00	1.415E-01	1.590E-01	171.50	OK
TL-208	277.37	6.60	4.639E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.664E+00	1.581E-01	1.581E-01	56.45	OK
	860.56	12.50	1.924E+00	----- Line	Not Found	-----	Absent
BI-212	727.33	6.67*	2.224E+00	8.614E-01	8.614E-01	70.73	OK
	785.37	1.10	2.081E+00	2.173E+00	2.173E+00	88.30	OK
	1620.50	1.47	1.094E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	4.781E+00	8.865E-01	8.865E-01	65.77	OK
	77.11	17.10	5.050E+00	9.062E-01	9.062E-01	33.48	OK
	238.63	43.60*	5.150E+00	8.218E-01	8.218E-01	13.64	OK
	300.09	3.30	4.372E+00	1.176E+00	1.176E+00	100.27	OK
BI-214	609.32	45.49*	2.574E+00	5.985E-01	5.986E-01	23.44	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	7.380E-01	7.381E-01	45.77	OK
PB-214	74.82	5.80	4.734E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.050E+00	1.597E+00	1.598E+00	33.48	OK
	87.09	3.41	5.933E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.107E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.434E+00	7.426E-01	7.426E-01	36.30	OK
	351.93	35.60*	3.901E+00	5.053E-01	5.053E-01	27.58	OK
RN-222	609.32	45.49*	2.574E+00	5.985E-01	5.986E-01	23.44	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	7.380E-01	7.381E-01	45.77	OK
RA-224	240.99	4.10*	5.108E+00	3.996E-01	3.996E-01	347.98	OK
RA-226	609.32	45.49*	2.574E+00	5.985E-01	5.986E-01	23.44	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	7.380E-01	7.381E-01	45.77	OK
TH-228	74.82	10.28	4.781E+00	8.865E-01	8.865E-01	65.77	OK
	77.11	17.10	5.050E+00	9.062E-01	9.062E-01	33.48	OK
	238.63	43.60*	5.150E+00	8.218E-01	8.218E-01	13.64	OK
	300.09	3.30	4.372E+00	1.176E+00	1.176E+00	100.27	OK
TH-230	609.32	45.49*	2.574E+00	5.985E-01	5.985E-01	23.44	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	7.380E-01	7.380E-01	45.77	OK
PA-231	283.69	1.70	4.565E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.372E+00	7.255E-01	7.255E-01	100.27	OK
TH-234	63.29	3.70*	3.190E+00	2.256E+00	2.256E+00	104.96	OK
	92.59	4.23	6.353E+00	1.664E+00	1.664E+00	70.85	OK
U-234	609.32	45.49*	2.574E+00	5.985E-01	5.985E-01	23.44	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	7.380E-01	7.380E-01	45.77	OK
U-238	63.29	3.70*	3.190E+00	2.256E+00	2.256E+00	104.96	OK
	92.59	4.23	6.353E+00	1.664E+00	1.664E+00	70.85	OK
AM-243	43.53	5.90	5.274E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.781E+00	1.356E-01	1.356E-01	65.77	OK
ANH-511	511.00	100.00*	2.955E+00	4.948E-02	4.948E-02	132.19	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677024.CNF;1
Acquisition date : 28-JUN-2016 11:37:39 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.44 Half life ratio : *****
Sample date : 11-MAY-2016 13:57:00 Analyst initials: MXR1
Sample ID : G398677024 Sample Quantity : 1.3224E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.444E+00	1.118E+00	5.857E-01
ZN-65	4.531E-02	4.911E-02	1.542E-01
Y-91	3.321E+01	2.584E+01	4.434E+01
CD-109	2.240E-01	1.540E+00	1.589E+00
SN-126	2.084E-02	1.433E-01	1.528E-01
BA-137M	1.145E+00	1.198E-01	5.836E-02
CS-137	1.210E+00	1.265E-01	6.165E-02
CE-144	1.590E-01	2.673E-01	3.944E-01
TL-208	1.581E-01	8.746E-02	6.881E-02
BI-212	8.614E-01	5.971E-01	8.571E-01
PB-212	8.218E-01	1.098E-01	1.036E-01
BI-214	5.986E-01	1.375E-01	1.297E-01
PB-214	5.053E-01	1.366E-01	1.407E-01
RN-222	5.986E-01	1.375E-01	1.297E-01
RA-224	3.996E-01	1.363E+00	1.110E+00
RA-226	5.986E-01	1.375E-01	1.297E-01
TH-228	8.218E-01	1.098E-01	1.036E-01
TH-230	5.985E-01	1.375E-01	1.297E-01
PA-231	7.255E-01	7.129E-01	9.519E-01
TH-234	2.256E+00	2.320E+00	2.339E+00
U-234	5.985E-01	1.375E-01	1.297E-01
U-238	2.256E+00	2.320E+00	2.339E+00
AM-243	1.356E-01	8.741E-02	9.256E-02
ANH-511	4.948E-02	6.409E-02	6.095E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.967E-02	5.759E-01	1.046E+00	NOT IDENT.
NA-22	-4.598E-03	3.399E-02	6.795E-02	NOT IDENT.
NA-24	0.000E+00	4.161E+21	0.000E+00	SHORT HLIF
AL-26	1.010E-02	3.202E-02	7.361E-02	NOT IDENT.
SC-46	3.175E-03	4.481E-02	8.889E-02	NOT IDENT.
V-48	-9.935E-02	2.586E-01	4.680E-01	NOT IDENT.

CR-51	5.326E-01	8.678E-01	1.719E+00	NOT IDENT.
MN-54	2.444E-02	4.135E-02	7.774E-02	NOT IDENT.
CO-56	8.300E-03	5.830E-02	1.044E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-2.993E-03	2.762E-02	5.014E-02	NOT IDENT.
CO-58	-1.496E-02	4.385E-02	7.920E-02	NOT IDENT.
FE-59	2.066E-02	1.407E-01	2.474E-01	NOT IDENT.
CO-60	4.467E-04	2.112E-02	4.830E-02	NOT IDENT.
GE-68	8.836E-01	1.273E+00	2.658E+00	NOT IDENT.
AS-73	-5.246E-01	1.169E+00	2.171E+00	NOT IDENT.
AS-74	2.825E-01	3.369E-01	7.114E-01	NOT IDENT.
SE-75	2.638E-03	6.063E-02	1.017E-01	NOT IDENT.
BR-77	0.000E+00	2.436E+05	0.000E+00	SHORT HLIF
SR-82	2.594E-01	6.802E-01	1.421E+00	NOT IDENT.
RB-83	-2.479E-02	1.029E-01	1.836E-01	NOT IDENT.
KR-85	3.696E+00	9.816E+00	1.634E+01	NOT IDENT.
SR-85	2.723E-02	7.340E-02	1.221E-01	NOT IDENT.
RB-86	5.899E-01	2.502E+00	4.916E+00	NOT IDENT.
Y-88	1.504E-02	3.118E-02	8.379E-02	NOT IDENT.
NB-94	-2.763E-03	2.745E-02	5.194E-02	NOT IDENT.
NB-95	-2.884E-02	6.193E-02	9.368E-02	NOT IDENT.
NB-95M	1.377E-01	1.829E-01	3.299E-01	NOT IDENT.
ZR-95	2.517E-02	8.774E-02	1.796E-01	NOT IDENT.
NB-97	0.000E+00	1.847E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.879E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.331E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.454E+41	0.000E+00	SHORT HLIF
RH-101	-2.013E-02	3.723E-02	5.670E-02	NOT IDENT.
RH-102	2.042E-03	5.690E-02	1.106E-01	NOT IDENT.
RU-103	-1.613E-02	7.610E-02	1.371E-01	FAIL ABUN
RH-106	1.737E-02	2.917E-01	5.793E-01	NOT IDENT.
RU-106	1.737E-02	2.917E-01	5.793E-01	NOT IDENT.
AG-108M	-1.664E-03	3.270E-02	6.024E-02	NOT IDENT.
AG-110M	-6.652E-03	5.073E-02	9.640E-02	NOT IDENT.
SN-113	-5.033E-02	7.282E-02	1.067E-01	NOT IDENT.
CD-115	0.000E+00	3.187E+05	0.000E+00	SHORT HLIF
SN-117M	1.278E-01	3.212E-01	5.924E-01	NOT IDENT.
TE-123M	1.290E-02	3.763E-02	6.919E-02	NOT IDENT.
SB-124	3.737E-02	9.531E-02	2.346E-01	NOT IDENT.
SB-125	1.185E-01	1.319E-01	1.955E-01	FAIL ABUN
TE-125M	9.283E+00	1.487E+01	2.846E+01	NOT IDENT.
I-126	1.062E+00	1.218E+00	2.428E+00	NOT IDENT.
SB-126	-4.143E-01	8.171E-01	1.429E+00	NOT IDENT.
SB-127	0.000E+00	3.962E+02	0.000E+00	SHORT HLIF
I-131	-1.662E+00	1.993E+00	3.406E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.198E+02	0.000E+00	SHORT HLIF
BA-133	1.553E-02	5.283E-02	8.949E-02	NOT IDENT.
I-133	0.000E+00	1.535E+15	0.000E+00	SHORT HLIF
CS-134	1.044E-02	3.848E-02	7.887E-02	FAIL ABUN
CS-135	-3.499E-02	1.769E-01	2.877E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-4.867E-01	4.282E-01	5.969E-01	FAIL ABUN
CE-139	-1.626E-02	3.490E-02	6.037E-02	NOT IDENT.
BA-140	7.149E-02	1.770E+00	3.266E+00	NOT IDENT.
LA-140	1.283E-01	4.523E-01	1.016E+00	FAIL ABUN
CE-141	-7.293E-02	1.211E-01	2.088E-01	NOT IDENT.
CE-143	0.000E+00	1.970E+09	0.000E+00	SHORT HLIF
PM-144	3.332E-02	3.741E-02	7.906E-02	NOT IDENT.
PR-144	2.479E+00	2.840E+00	5.995E+00	NOT IDENT.
PM-146	-4.182E-03	5.003E-02	9.121E-02	NOT IDENT.
ND-147	1.318E+00	4.645E+00	8.900E+00	NOT IDENT.
PM-147	-1.281E+02	7.361E+02	1.332E+03	NOT IDENT.
PM-149	0.000E+00	2.579E+06	0.000E+00	SHORT HLIF
EU-150	-3.119E-02	4.896E-02	4.927E-02	FAIL ABUN
EU-152	5.658E-02	1.152E-01	2.013E-01	FAIL ABUN
GD-153	5.646E-02	9.102E-02	1.610E-01	NOT IDENT.
EU-154	-1.037E-02	9.532E-02	1.914E-01	NOT IDENT.
EU-155	1.504E-02	1.019E-01	1.904E-01	FAIL ABUN
TB-160	-7.808E-03	1.653E-01	3.196E-01	FAIL ABUN
HO-166M	9.437E-02	8.259E-02	1.274E-01	FAIL ABUN
TM-171	3.707E-02	1.835E+01	3.543E+01	NOT IDENT.
HF-172	2.246E-02	2.232E-01	3.639E-01	FAIL ABUN
LU-172	-6.868E-05	6.643E-02	1.111E-01	FAIL ABUN
LU-176	7.052E-03	2.950E-02	5.280E-02	FAIL ABUN
HF-181	1.957E-02	8.662E-02	1.631E-01	FAIL ABUN
TA-182	-1.840E-01	1.844E-01	3.005E-01	FAIL ABUN
RE-183	1.429E-01	2.893E-01	5.692E-01	NOT IDENT.

RE-184	1.219E-01	2.306E-01	4.625E-01	NOT IDENT.
W-188	4.278E+00	9.817E+00	1.745E+01	FAIL ABUN
IR-192	-5.999E-02	5.049E-02	8.423E-02	FAIL ABUN
HG-203	-2.996E-02	6.175E-02	1.118E-01	NOT IDENT.
BI-207	8.053E-03	5.429E-02	1.054E-01	FAIL ABUN
PB-210	-1.804E+00	3.758E+00	7.163E+00	NOT IDENT.
BI-211	0.000E+00	3.763E-01	7.590E-01	FAIL ABUN
PB-211	2.609E-01	7.663E-01	1.471E+00	FAIL ABUN
RN-219	-2.527E-02	4.294E-01	7.684E-01	FAIL ABUN
RA-223	-9.118E-02	8.030E-01	1.299E+00	FAIL ABUN
AC-227	-5.706E-02	2.425E-01	4.521E-01	FAIL ABUN
TH-227	-5.706E-02	2.425E-01	4.521E-01	FAIL ABUN
AC-228	0.000E+00	2.414E-01	5.070E-01	FAIL ABUN
RA-228	0.000E+00	2.414E-01	5.070E-01	FAIL ABUN
TH-229	8.633E-02	5.355E-01	1.033E+00	FAIL ABUN
TH-231	-9.118E-02	8.030E-01	1.299E+00	FAIL ABUN
TH-232	0.000E+00	2.414E-01	5.070E-01	FAIL ABUN
PA-233	5.892E-02	6.830E-02	1.376E-01	FAIL ABUN
PA-234	1.004E-01	2.514E-01	5.287E-01	FAIL ABUN
PA-234M	5.211E-01	4.185E+00	7.547E+00	NOT IDENT.
U-235	2.509E-01	1.945E-01	3.858E-01	FAIL ABUN
NP-237	5.892E-02	6.830E-02	1.376E-01	FAIL ABUN
NP-238	0.000E+00	8.246E+05	0.000E+00	SHORT HLIF
NP-239	1.381E-01	2.511E-01	4.817E-01	NOT IDENT.
PU-239	6.626E+02	5.809E+02	6.813E+02	FAIL ABUN
AM-241	6.602E-02	1.722E-01	3.040E-01	NOT IDENT.
CM-243	-1.739E-02	1.013E-01	1.851E-01	NOT IDENT.
BK-247	-1.352E-02	9.257E-02	1.516E-01	NOT IDENT.
CM-247	5.809E-03	3.865E-02	7.314E-02	NOT IDENT.
CF-249	2.028E-02	5.188E-02	9.231E-02	NOT IDENT.
CF-251	1.293E-01	1.685E-01	2.260E-01	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	144	10.66*	1.191E+00	6.444E+00	6.444E+00	17.70
ZN-65	1115.54	5	50.60*	1.519E+00	3.954E-02	4.531E-02	110.60
Y-91	1204.77	12	0.26*	1.414E+00	1.882E+01	3.321E+01	79.40
CD-109	88.03	35	3.70*	5.963E+00	8.928E-01	9.594E-01	161.38
SN-126	64.28	47	9.60	3.190E+00	8.694E-01	8.694E-01	104.96
	86.94	35	8.90	5.963E+00	3.712E-01	3.712E-01	161.38
	87.57	35	37.00*	5.963E+00	8.928E-02	8.928E-02	161.38
BA-137M	661.66	435	89.90*	2.407E+00	1.142E+00	1.145E+00	10.67
CS-137	661.66	435	85.10*	2.407E+00	1.206E+00	1.210E+00	10.67
CE-144	80.12	-----	1.36	5.319E+00	-----	Line Not Found	-----
	133.52	19	11.09*	6.940E+00	1.415E-01	1.590E-01	171.50
TL-208	277.37	-----	6.60	4.639E+00	-----	Line Not Found	-----
	583.19	63	85.00*	2.664E+00	1.581E-01	1.581E-01	56.45
	860.56	-----	12.50	1.924E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	4.493E+00	-----	Line Not Found	-----
	351.06	124	12.92*	3.901E+00	1.392E+00	1.392E+00	27.58
BI-212	727.33	23	6.67*	2.224E+00	8.614E-01	8.614E-01	70.73
	785.37	9	1.10	2.081E+00	2.173E+00	2.173E+00	88.30
	1620.50	-----	1.47	1.094E+00	-----	Line Not Found	-----
PB-212	74.82	113	10.28	4.781E+00	1.305E+00	1.305E+00	43.12
	77.11	138	17.10	5.050E+00	9.062E-01	9.062E-01	33.48
	238.63	325	43.60*	5.150E+00	8.218E-01	8.218E-01	13.64
	300.09	30	3.30	4.372E+00	1.176E+00	1.176E+00	100.27
BI-214	609.32	123	45.49*	2.574E+00	5.985E-01	5.986E-01	23.44
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	20	15.30	1.028E+00	7.380E-01	7.381E-01	45.77
PB-214	74.82	113	5.80	4.781E+00	2.314E+00	2.314E+00	43.12
	77.11	138	9.70	5.050E+00	1.597E+00	1.598E+00	33.48
	87.09	35	3.41	5.963E+00	9.687E-01	9.688E-01	161.38
	242.00	63	7.25	5.108E+00	9.686E-01	9.687E-01	76.28
	295.22	107	18.42	4.434E+00	7.426E-01	7.426E-01	36.30
	351.93	124	35.60*	3.901E+00	5.053E-01	5.053E-01	27.58
RN-222	609.32	123	45.49*	2.574E+00	5.985E-01	5.986E-01	23.44
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	20	15.30	1.028E+00	7.380E-01	7.381E-01	45.77
RA-224	240.99	63	4.10*	5.108E+00	1.713E+00	1.713E+00	76.28
RA-226	609.32	123	45.49*	2.574E+00	5.985E-01	5.986E-01	23.44
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	20	15.30	1.028E+00	7.380E-01	7.381E-01	45.77
TH-228	74.82	113	10.28	4.781E+00	1.305E+00	1.305E+00	43.12
	77.11	138	17.10	5.050E+00	9.062E-01	9.062E-01	33.48
	238.63	325	43.60*	5.150E+00	8.218E-01	8.218E-01	13.64
	300.09	30	3.30	4.372E+00	1.176E+00	1.176E+00	100.27
TH-230	609.32	123	45.49*	2.574E+00	5.985E-01	5.985E-01	23.44
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	20	15.30	1.028E+00	7.380E-01	7.380E-01	45.77
PA-231	283.69	-----	1.70	4.565E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	301.36	30	5.35*	4.372E+00	7.255E-01	7.255E-01	100.27
TH-234	63.29	47	3.70*	3.190E+00	2.256E+00	2.256E+00	104.96
	92.59	79	4.23	6.353E+00	1.664E+00	1.664E+00	70.85
U-234	609.32	123	45.49*	2.574E+00	5.985E-01	5.985E-01	23.44
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	20	15.30	1.028E+00	7.380E-01	7.380E-01	45.77
U-238	63.29	47	3.70*	3.190E+00	2.256E+00	2.256E+00	104.96
	92.59	79	4.23	6.353E+00	1.664E+00	1.664E+00	70.85
AM-243	43.53	-----	5.90	5.274E-01	-----	Line Not Found	-----
	74.66	113	67.20*	4.781E+00	1.997E-01	1.997E-01	43.12
ANH-511	511.00	26	100.00*	2.955E+00	4.948E-02	4.948E-02	132.19

Flag: "*" = Keyline

Total number of lines in spectrum 45
Number of unidentified lines 10
Number of lines tentatively identified by NID 35 77.78%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.444E+00	6.444E+00	1.141E+00	17.70	
ZN-65	244.06D	1.15	3.954E-02	4.531E-02	5.011E-02	110.60	
Y-91	58.51D	1.76	1.882E+01	3.321E+01	2.637E+01	79.40	
CD-109	461.40D	1.07	8.928E-01	9.594E-01	15.48E-01	161.38	
SN-126	2.30E+05Y	1.00	8.928E-02	8.928E-02	14.41E-02	161.38	
BA-137M	30.08Y	1.00	1.142E+00	1.145E+00	0.122E+00	10.67	
CS-137	30.08Y	1.00	1.206E+00	1.210E+00	0.129E+00	10.67	
CE-144	284.91D	1.12	1.415E-01	1.590E-01	2.727E-01	171.50	
TL-208	1.41E+10Y	1.00	1.581E-01	1.581E-01	0.892E-01	56.45	
BI-211	7.04E+08Y	1.00	1.392E+00	1.392E+00	0.384E+00	27.58	
BI-212	1.41E+10Y	1.00	8.614E-01	8.614E-01	6.093E-01	70.73	
PB-212	1.41E+10Y	1.00	8.218E-01	8.218E-01	1.121E-01	13.64	
BI-214	1600.00Y	1.00	5.985E-01	5.986E-01	1.403E-01	23.44	
PB-214	1600.00Y	1.00	5.053E-01	5.053E-01	1.394E-01	27.58	
RN-222	1600.00Y	1.00	5.985E-01	5.986E-01	1.403E-01	23.44	
RA-224	1.41E+10Y	1.00	1.713E+00	1.713E+00	1.306E+00	76.28	
RA-226	1600.00Y	1.00	5.985E-01	5.986E-01	1.403E-01	23.44	
TH-228	1.41E+10Y	1.00	8.218E-01	8.218E-01	1.121E-01	13.64	
TH-230	7.54E+04Y	1.00	5.985E-01	5.985E-01	1.403E-01	23.44	
PA-231	7.04E+08Y	1.00	7.255E-01	7.255E-01	7.274E-01	100.27	
TH-234	4.47E+09Y	1.00	2.256E+00	2.256E+00	2.368E+00	104.96	
U-234	2.45E+05Y	1.00	5.985E-01	5.985E-01	1.403E-01	23.44	
U-238	4.47E+09Y	1.00	2.256E+00	2.256E+00	2.368E+00	104.96	
AM-243	7370.00Y	1.00	1.997E-01	1.997E-01	0.861E-01	43.12	
ANH-511	1.00E+09Y	1.00	4.948E-02	4.948E-02	6.540E-02	132.19	
Total Activity :			4.353E+01	5.802E+01			

Grand Total Activity : 4.353E+01 5.802E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.79	51	118	1.37	260.01	255	10	1.26E-02	89.5	6.97E+00	T
0	178.99	24	71	0.81	358.36	354	8	6.11E-03	****	6.18E+00	T
0	186.36	51	130	1.14	373.10	369	10	1.29E-02	96.0	6.04E+00	T
0	210.38	52	67	0.86	421.13	419	7	1.31E-02	62.1	5.61E+00	T
0	271.92	31	87	1.85	544.16	535	12	7.93E-03	****	4.71E+00	T
0	328.25	28	93	0.53	656.78	649	15	7.36E-03	****	4.11E+00	T
0	338.97	81	69	1.11	678.23	674	10	2.12E-02	46.1	4.01E+00	T
0	394.73	27	42	4.28	789.70	784	13	7.16E-03	****	3.59E+00	
0	427.97	20	29	1.85	856.15	849	11	5.42E-03	****	3.38E+00	T
0	564.37	16	13	1.36	1128.86	1122	10	4.37E-03	97.7	2.74E+00	T
0	574.99	20	21	5.05	1150.10	1144	14	5.56E-03	****	2.70E+00	
0	710.76	20	14	1.95	1421.54	1415	16	5.63E-03	89.3	2.27E+00	T
0	768.79	15	11	1.39	1537.56	1532	9	4.07E-03	97.8	2.12E+00	
0	817.52	12	2	2.91	1634.99	1631	8	3.38E-03	69.7	2.01E+00	T
0	841.98	8	10	4.31	1683.89	1675	11	2.16E-03	****	1.96E+00	
0	911.63	58	10	1.47	1823.13	1816	13	1.62E-02	35.6	1.83E+00	T
0	999.14	8	6	0.52	1998.09	1988	12	2.14E-03	****	1.68E+00	
0	1014.67	14	2	3.61	2029.14	2024	10	4.07E-03	65.8	1.66E+00	
0	1085.14	8	4	0.59	2170.04	2164	9	2.37E-03	****	1.56E+00	T
0	1097.13	8	2	3.93	2194.00	2188	10	2.14E-03	****	1.54E+00	
0	1122.64	12	13	2.66	2245.01	2236	11	3.37E-03	****	1.51E+00	T
0	1169.21	14	3	4.30	2338.12	2332	12	3.87E-03	73.2	1.45E+00	
0	1378.33	9	2	1.75	2756.19	2751	9	2.72E-03	84.4	1.25E+00	
0	1647.24	8	3	2.83	3293.81	3286	12	2.21E-03	****	1.08E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677024.CNF;1
Acquisition date : 28-JUN-2016 11:37:39 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.44 Half life ratio : *****
Sample date : 11-MAY-2016 13:57:00 Nuclide Library : SOLID
Sample ID : G398677024 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3224E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.323E-01
ZN-65	6.562E-02
Y-91	1.847E+01
CD-109	7.556E-01
SN-126	7.279E-02
BA-137M	2.558E-02
CS-137	2.702E-02
CE-144	1.856E-01
TL-208	3.097E-02
BI-212	3.762E-01
PB-212	4.828E-02
BI-214	5.820E-02
PB-214	6.471E-02
RN-222	5.820E-02
RA-224	5.174E-01
RA-226	5.820E-02
TH-228	4.828E-02
TH-230	5.820E-02
PA-231	4.424E-01
TH-234	1.100E+00
U-234	5.820E-02
U-238	1.100E+00
AM-243	4.375E-02
ANH-511	2.784E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.781E-01	NOT IDENT.
NA-22	2.804E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.921E-02	NOT IDENT.
SC-46	3.828E-02	NOT IDENT.
V-48	1.977E-01	NOT IDENT.
CR-51	7.969E-01	NOT IDENT.

MN-54	3.451E-02	NOT IDENT.
CO-56	4.609E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.357E-02	NOT IDENT.
CO-58	3.345E-02	NOT IDENT.
FE-59	1.050E-01	NOT IDENT.
CO-60	1.808E-02	NOT IDENT.
GE-68	1.156E+00	NOT IDENT.
AS-73	1.014E+00	NOT IDENT.
AS-74	3.231E-01	NOT IDENT.
SE-75	4.719E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.197E-01	NOT IDENT.
RB-83	8.308E-02	NOT IDENT.
KR-85	7.556E+00	NOT IDENT.
SR-85	5.646E-02	NOT IDENT.
RB-86	2.120E+00	NOT IDENT.
Y-88	3.137E-02	NOT IDENT.
NB-94	2.257E-02	NOT IDENT.
NB-95	4.071E-02	NOT IDENT.
NB-95M	1.547E-01	NOT IDENT.
ZR-95	7.868E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.663E-02	NOT IDENT.
RH-102	4.963E-02	NOT IDENT.
RU-103	6.193E-02	FAIL ABUN
RH-106	2.558E-01	NOT IDENT.
RU-106	2.558E-01	NOT IDENT.
AG-108M	2.754E-02	NOT IDENT.
AG-110M	4.172E-02	NOT IDENT.
SN-113	4.890E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.802E-01	NOT IDENT.
TE-123M	3.270E-02	NOT IDENT.
SB-124	9.088E-02	NOT IDENT.
SB-125	8.974E-02	FAIL ABUN
TE-125M	1.347E+01	NOT IDENT.
I-126	1.085E+00	NOT IDENT.
SB-126	6.198E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.545E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.145E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.484E-02	FAIL ABUN
CS-135	1.335E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	2.234E-01	FAIL ABUN
CE-139	2.822E-02	NOT IDENT.
BA-140	1.481E+00	NOT IDENT.
LA-140	4.097E-01	FAIL ABUN
CE-141	9.769E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
PM-144	3.583E-02	NOT IDENT.
PR-144	2.715E+00	NOT IDENT.
PM-146	4.183E-02	NOT IDENT.
ND-147	4.023E+00	NOT IDENT.
PM-147	6.248E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.261E-02	FAIL ABUN
EU-152	9.315E-02	FAIL ABUN
GD-153	7.568E-02	NOT IDENT.
EU-154	7.916E-02	NOT IDENT.
EU-155	8.953E-02	FAIL ABUN
TB-160	1.382E-01	FAIL ABUN
HO-166M	5.738E-02	FAIL ABUN
TM-171	1.653E+01	NOT IDENT.
HF-172	1.714E-01	FAIL ABUN
LU-172	4.726E-02	FAIL ABUN
LU-176	2.445E-02	FAIL ABUN
HF-181	7.469E-02	FAIL ABUN
TA-182	1.230E-01	FAIL ABUN
RE-183	2.685E-01	NOT IDENT.
RE-184	2.031E-01	NOT IDENT.

W-188	8.023E+00	FAIL ABUN
IR-192	3.858E-02	FAIL ABUN
HG-203	5.166E-02	NOT IDENT.
BI-207	4.619E-02	FAIL ABUN
PB-210	3.345E+00	NOT IDENT.
BI-211	3.641E-01	FAIL ABUN
PB-211	6.769E-01	FAIL ABUN
RN-219	3.507E-01	FAIL ABUN
RA-223	6.019E-01	FAIL ABUN
AC-227	2.092E-01	FAIL ABUN
TH-227	2.092E-01	FAIL ABUN
AC-228	2.372E-01	FAIL ABUN
RA-228	2.372E-01	FAIL ABUN
TH-229	4.861E-01	FAIL ABUN
TH-231	6.019E-01	FAIL ABUN
TH-232	2.372E-01	FAIL ABUN
PA-233	6.402E-02	FAIL ABUN
PA-234	2.279E-01	FAIL ABUN
PA-234M	3.225E+00	NOT IDENT.
U-235	1.823E-01	FAIL ABUN
NP-237	6.402E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.265E-01	NOT IDENT.
PU-239	3.226E+02	FAIL ABUN
AM-241	1.433E-01	NOT IDENT.
CM-243	8.686E-02	NOT IDENT.
BK-247	7.034E-02	NOT IDENT.
CM-247	3.350E-02	NOT IDENT.
CF-249	4.289E-02	NOT IDENT.
CF-251	1.056E-01	FAIL ABUN

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677024.CNF;1
Acquisition date : 28-JUN-2016 11:37:39 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.44 Half life ratio : *****
Sample date : 11-MAY-2016 13:57:00 Nuclide Library : SOLID
Sample ID : G398677024 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3224E+02 GRAM
Quantity Err(%) : 1.5124E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.444E+00	1.252E+00	1.252E+00
ZN-65	4.531E-02	4.994E-02	4.994E-02
Y-91	3.321E+01	2.600E+01	2.600E+01
CD-109	2.240E-01	1.545E+00	1.545E+00
SN-126	2.084E-02	1.437E-01	1.437E-01
BA-137M	1.145E+00	1.522E-01	1.522E-01
CS-137	1.210E+00	1.607E-01	1.607E-01
CE-144	1.590E-01	2.676E-01	2.676E-01
TL-208	1.581E-01	8.845E-02	8.845E-02
BI-212	8.614E-01	6.034E-01	6.034E-01
PB-212	8.218E-01	1.320E-01	1.320E-01
BI-214	5.986E-01	1.462E-01	1.462E-01
PB-214	5.053E-01	1.433E-01	1.433E-01
RN-222	5.986E-01	1.462E-01	1.462E-01
RA-224	3.996E-01	1.373E+00	1.373E+00
RA-226	5.986E-01	1.462E-01	1.462E-01
TH-228	8.218E-01	1.320E-01	1.320E-01
TH-230	5.985E-01	1.462E-01	1.462E-01
PA-231	7.255E-01	7.318E-01	7.318E-01
TH-234	2.256E+00	2.381E+00	2.381E+00
U-234	5.985E-01	1.462E-01	1.462E-01
U-238	2.256E+00	2.381E+00	2.381E+00
AM-243	1.356E-01	8.894E-02	8.894E-02
ANH-511	4.948E-02	6.422E-02	6.422E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.967E-02	5.759E-01	5.766E-01	NOT IDENT.
NA-22	-4.598E-03	3.399E-02	3.406E-02	NOT IDENT.
NA-24	-2.205E+21	4.167E+21	0.000E+00	SHORT HLIF
AL-26	1.010E-02	3.203E-02	3.235E-02	NOT IDENT.
SC-46	3.175E-03	4.481E-02	4.484E-02	NOT IDENT.
V-48	-9.935E-02	2.591E-01	2.629E-01	NOT IDENT.

CR-51	5.326E-01	8.692E-01	9.017E-01	NOT IDENT.
MN-54	2.444E-02	4.146E-02	4.290E-02	NOT IDENT.
CO-56	8.300E-03	5.831E-02	5.843E-02	NOT IDENT.
MN-56	1.000E+41	3.796E+41	0.000E+00	SHORT HLIF
CO-57	-2.993E-03	2.762E-02	2.766E-02	NOT IDENT.
CO-58	-1.496E-02	4.388E-02	4.440E-02	NOT IDENT.
FE-59	2.066E-02	1.407E-01	1.411E-01	NOT IDENT.
CO-60	4.467E-04	2.112E-02	2.112E-02	NOT IDENT.
GE-68	8.836E-01	1.284E+00	1.345E+00	NOT IDENT.
AS-73	-5.246E-01	1.174E+00	1.198E+00	NOT IDENT.
AS-74	2.825E-01	3.383E-01	3.614E-01	NOT IDENT.
SE-75	2.638E-03	6.063E-02	6.065E-02	NOT IDENT.
BR-77	1.823E+06	2.538E+06	2.668E+06	SHORT HLIF
SR-82	2.594E-01	6.808E-01	6.907E-01	NOT IDENT.
RB-83	-2.479E-02	1.029E-01	1.035E-01	NOT IDENT.
KR-85	3.696E+00	9.821E+00	9.961E+00	NOT IDENT.
SR-85	2.723E-02	7.344E-02	7.446E-02	NOT IDENT.
RB-86	5.899E-01	2.505E+00	2.519E+00	NOT IDENT.
Y-88	1.504E-02	3.120E-02	3.193E-02	NOT IDENT.
NB-94	-2.763E-03	2.745E-02	2.748E-02	NOT IDENT.
NB-95	-2.884E-02	6.201E-02	6.335E-02	NOT IDENT.
NB-95M	1.377E-01	1.835E-01	1.937E-01	NOT IDENT.
ZR-95	2.517E-02	8.778E-02	8.851E-02	NOT IDENT.
NB-97	-1.000E+41	1.848E+41	0.000E+00	SHORT HLIF
ZR-97	8.081E+19	1.880E+20	0.000E+00	SHORT HLIF
MO-99	4.818E+03	4.332E+04	4.337E+04	SHORT HLIF
TC-99M	-1.000E+41	1.459E+41	0.000E+00	SHORT HLIF
RH-101	-2.013E-02	3.742E-02	3.851E-02	NOT IDENT.
RH-102	2.042E-03	5.690E-02	5.691E-02	NOT IDENT.
RU-103	-1.613E-02	7.612E-02	7.646E-02	FAIL ABUN
RH-106	1.737E-02	2.917E-01	2.918E-01	NOT IDENT.
RU-106	1.737E-02	2.917E-01	2.918E-01	NOT IDENT.
AG-108M	-1.664E-03	3.270E-02	3.271E-02	NOT IDENT.
AG-110M	-6.652E-03	5.074E-02	5.082E-02	NOT IDENT.
SN-113	-5.033E-02	7.292E-02	7.637E-02	NOT IDENT.
CD-115	1.926E+04	3.187E+05	3.188E+05	SHORT HLIF
SN-117M	1.278E-01	3.213E-01	3.265E-01	NOT IDENT.
TE-123M	1.290E-02	3.765E-02	3.809E-02	NOT IDENT.
SB-124	3.737E-02	9.535E-02	9.683E-02	NOT IDENT.
SB-125	1.185E-01	1.322E-01	1.426E-01	FAIL ABUN
TE-125M	9.283E+00	1.489E+01	1.547E+01	NOT IDENT.
I-126	1.062E+00	1.222E+00	1.313E+00	NOT IDENT.
SB-126	-4.143E-01	8.190E-01	8.400E-01	NOT IDENT.
SB-127	8.270E+01	3.967E+02	3.984E+02	SHORT HLIF
I-131	-1.662E+00	1.999E+00	2.134E+00	NOT IDENT.
I-132	1.000E+41	6.744E+41	0.000E+00	SHORT HLIF
TE-132	-1.391E+02	8.200E+02	8.224E+02	SHORT HLIF
BA-133	1.553E-02	5.284E-02	5.330E-02	NOT IDENT.
I-133	6.525E+14	1.548E+15	1.576E+15	SHORT HLIF
CS-134	1.044E-02	3.850E-02	3.878E-02	FAIL ABUN
CS-135	-3.499E-02	1.770E-01	1.777E-01	NOT IDENT.
I-135	1.000E+41	5.418E+41	0.000E+00	SHORT HLIF
CS-136	-4.867E-01	4.388E-01	4.906E-01	FAIL ABUN
CE-139	-1.626E-02	3.506E-02	3.582E-02	NOT IDENT.
BA-140	7.149E-02	1.770E+00	1.771E+00	NOT IDENT.
LA-140	1.283E-01	4.524E-01	4.561E-01	FAIL ABUN
CE-141	-7.293E-02	1.212E-01	1.256E-01	NOT IDENT.
CE-143	1.821E+09	1.977E+09	2.141E+09	SHORT HLIF
PM-144	3.332E-02	3.754E-02	4.043E-02	NOT IDENT.
PR-144	2.479E+00	2.849E+00	3.061E+00	NOT IDENT.
PM-146	-4.182E-03	5.003E-02	5.007E-02	NOT IDENT.
ND-147	1.318E+00	4.647E+00	4.685E+00	NOT IDENT.
PM-147	-1.281E+02	7.362E+02	7.385E+02	NOT IDENT.
PM-149	5.837E+05	2.580E+06	2.594E+06	SHORT HLIF
EU-150	-3.119E-02	4.903E-02	5.101E-02	FAIL ABUN
EU-152	5.658E-02	1.153E-01	1.181E-01	FAIL ABUN
GD-153	5.646E-02	9.115E-02	9.464E-02	NOT IDENT.
EU-154	-1.037E-02	9.532E-02	9.543E-02	NOT IDENT.
EU-155	1.504E-02	1.019E-01	1.021E-01	FAIL ABUN
TB-160	-7.808E-03	1.653E-01	1.654E-01	FAIL ABUN
HO-166M	9.437E-02	8.312E-02	9.338E-02	FAIL ABUN
TM-171	3.707E-02	1.835E+01	1.835E+01	NOT IDENT.
HF-172	2.246E-02	2.232E-01	2.235E-01	FAIL ABUN
LU-172	-6.868E-05	6.643E-02	6.643E-02	FAIL ABUN
LU-176	7.052E-03	2.951E-02	2.968E-02	FAIL ABUN
HF-181	1.957E-02	8.664E-02	8.708E-02	FAIL ABUN
TA-182	-1.840E-01	1.851E-01	2.028E-01	FAIL ABUN
RE-183	1.429E-01	2.900E-01	2.970E-01	NOT IDENT.

RE-184	1.219E-01	2.315E-01	2.379E-01	NOT IDENT.
W-188	4.278E+00	9.834E+00	1.002E+01	FAIL ABUN
IR-192	-5.999E-02	5.078E-02	5.754E-02	FAIL ABUN
HG-203	-2.996E-02	6.182E-02	6.327E-02	NOT IDENT.
BI-207	8.053E-03	5.431E-02	5.443E-02	FAIL ABUN
PB-210	-1.804E+00	3.763E+00	3.850E+00	NOT IDENT.
BI-211	1.392E+00	3.955E-01	7.418E-01	FAIL ABUN
PB-211	2.609E-01	7.666E-01	7.756E-01	FAIL ABUN
RN-219	-2.527E-02	4.294E-01	4.296E-01	FAIL ABUN
RA-223	-9.118E-02	8.030E-01	8.041E-01	FAIL ABUN
AC-227	-5.706E-02	2.427E-01	2.440E-01	FAIL ABUN
TH-227	-5.706E-02	2.427E-01	2.440E-01	FAIL ABUN
AC-228	6.926E-01	2.635E-01	4.085E-01	FAIL ABUN
RA-228	6.926E-01	2.635E-01	4.085E-01	FAIL ABUN
TH-229	8.633E-02	5.356E-01	5.370E-01	FAIL ABUN
TH-231	-9.118E-02	8.030E-01	8.041E-01	FAIL ABUN
TH-232	6.926E-01	2.635E-01	4.085E-01	FAIL ABUN
PA-233	5.892E-02	6.852E-02	7.349E-02	FAIL ABUN
PA-234	1.004E-01	2.768E-01	2.805E-01	FAIL ABUN
PA-234M	5.211E-01	4.186E+00	4.193E+00	NOT IDENT.
U-235	2.509E-01	1.955E-01	2.259E-01	FAIL ABUN
NP-237	5.892E-02	6.852E-02	7.349E-02	FAIL ABUN
NP-238	7.967E+04	8.247E+05	8.255E+05	SHORT HLIF
NP-239	1.381E-01	2.516E-01	2.591E-01	NOT IDENT.
PU-239	6.626E+02	5.833E+02	6.553E+02	FAIL ABUN
AM-241	6.602E-02	1.723E-01	1.749E-01	NOT IDENT.
CM-243	-1.739E-02	1.013E-01	1.016E-01	NOT IDENT.
BK-247	-1.352E-02	9.261E-02	9.281E-02	NOT IDENT.
CM-247	5.809E-03	3.866E-02	3.875E-02	NOT IDENT.
CF-249	2.028E-02	5.192E-02	5.272E-02	NOT IDENT.
CF-251	1.293E-01	1.693E-01	1.790E-01	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	60.0882	87.09	116.9197	136.47	65.7581
45.60	72.5138	87.57	134.3176	140.51	0.0000
46.54	64.3079	88.03	126.7892	143.76	59.7437
49.72	0.0000	88.34	126.8582	144.24	68.6362
51.35	68.8829	88.47	126.8873	145.44	85.3710
51.87	69.9168	89.96	98.0962	152.43	105.1275
52.39	65.2766	1093.63	76.7284	153.25	83.9622
52.97	74.8434	91.11	101.3636	323.87	67.2485
53.44	78.7233	92.59	124.7172	156.02	98.8469
54.07	82.6433	93.35	111.0037	158.56	90.1343
57.36	0.0000	94.56	111.2311	159.00	89.0542
57.53	80.4502	94.65	111.2476	162.33	99.5890
57.98	79.5750	94.67	111.2514	162.66	87.1741
59.27	83.6573	94.87	111.2888	163.33	74.7791
59.32	83.6668	97.43	65.1959	165.86	80.6803
59.54	79.3789	98.43	71.5226	176.31	82.7871
60.96	86.8730	98.44	71.5240	176.60	82.8135
61.17	95.6051	99.53	74.7667	177.52	75.9896
62.93	84.3445	100.11	83.1527	181.07	0.0000
63.29	84.4111	102.03	80.2823	181.52	69.3835
63.58	84.4646	103.18	82.5187	184.41	95.7003
64.28	90.4271	103.37	82.5440	143.76	90.6064
66.73	70.3759	105.21	79.6402	193.51	81.6886
67.24	71.9190	105.31	79.6530	197.03	84.6299
125.81	76.3929	106.12	90.2478	198.01	79.4202
67.75	76.4040	106.47	98.6967	201.83	84.1571
69.67	104.2456	109.28	86.4715	203.43	94.0520
70.83	115.3361	111.00	86.6979	205.31	51.8129
72.81	96.4978	111.76	0.0000	210.85	78.6550
72.87	96.5097	114.06	80.7241	215.65	63.4562
74.66	99.3357	116.30	0.0000	222.11	61.4372
74.82	99.3668	116.74	69.3141	227.09	65.3544
74.97	99.3963	119.76	81.4002	227.38	66.2793
77.11	99.8103	121.12	76.1933	228.16	0.0000
78.74	111.1349	121.22	80.4974	228.18	61.7853
79.69	114.3438	121.78	80.5614	116.74	61.7853
80.12	109.9194	122.06	84.8922	235.69	57.0865
80.19	109.9339	122.92	80.6919	235.96	70.2773
80.57	111.5188	123.07	76.4046	238.63	63.2914
81.00	111.6086	265.00	78.6244	238.98	0.0000
81.07	108.6064	125.81	82.6404	240.99	63.4241
81.75	104.2128	127.23	94.1679	242.00	63.4809
83.79	112.1839	127.91	94.2569	244.70	50.1678
84.00	112.2268	129.30	74.8974	252.40	0.0000
85.43	110.9976	131.20	58.7675	252.80	46.4352
86.55	116.8068	133.02	58.9120	254.15	0.0000
86.79	116.8565	133.52	85.1514	256.23	55.8856
86.94	116.8881	136.00	72.2896	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	54.0308	355.39	0.0000	584.27	27.3127
264.80	52.5359	356.01	46.5770	595.83	21.0504
265.00	58.5495	364.49	46.4359	427.87	38.5229
268.22	60.2109	366.42	0.0000	602.52	0.0000
269.46	59.3297	372.51	36.5312	604.72	24.5039
270.03	59.3576	375.05	35.5746	607.14	38.3291
271.23	75.4492	377.52	44.7936	609.32	25.7824
273.65	65.0134	356.01	58.2620	610.33	25.7940
276.40	51.7730	388.16	49.1960	614.28	16.9185
277.37	61.6070	388.63	37.7282	618.01	18.4868
277.60	63.5148	391.69	55.8784	620.36	22.2070
278.00	66.3791	264.66	31.3996	621.93	18.5186
279.20	58.8497	401.81	37.8002	630.19	0.0000
279.54	59.8152	402.40	37.2233	631.29	25.1022
279.70	57.9238	404.85	38.3143	633.25	23.2629
280.46	58.9093	410.95	42.6128	634.78	29.7961
283.69	45.7236	413.71	55.1763	635.95	28.8793
284.31	49.5577	414.70	40.6252	636.99	26.0962
285.41	55.3246	423.72	30.1605	645.85	14.9688
285.90	0.0000	427.09	34.6274	657.76	23.5071
287.50	52.5486	427.87	35.2729	657.90	0.0000
290.67	35.2468	433.94	38.9794	661.66	16.9528
293.27	0.0000	439.40	39.1013	664.57	0.0000
351.93	53.8245	453.88	42.6184	666.33	12.5820
295.96	53.8552	463.37	23.5637	666.50	14.1559
879.38	61.6719	468.07	38.6576	667.71	0.0000
299.98	61.7373	473.00	0.0000	677.62	18.9609
300.09	30.8711	475.06	37.7264	685.70	0.0000
300.13	30.8721	476.78	47.4717	695.00	15.2762
301.36	57.9391	477.60	39.9369	696.49	19.1069
302.85	60.3243	482.18	35.7065	696.51	19.1069
256.23	38.7170	487.02	24.9504	697.00	24.8441
304.85	43.3747	492.35	0.0000	697.30	24.8473
306.78	47.8323	497.08	32.7164	697.49	25.8049
308.46	53.3937	505.52	31.5448	702.65	15.9615
311.90	42.8237	507.63	0.0000	706.68	9.5923
316.51	63.4756	511.00	37.3452	711.68	21.1449
319.41	46.9731	514.00	42.2423	720.70	20.3627
320.08	42.1004	514.00	42.2426	721.93	0.0000
321.04	37.8843	520.40	34.2118	722.78	8.0444
323.87	56.5497	520.69	0.0000	722.91	11.2628
325.23	53.4595	522.65	0.0000	723.31	11.2645
328.76	40.3925	527.90	0.0000	724.19	11.2685
333.37	60.6211	528.26	27.6993	727.33	17.4067
333.97	63.2832	529.59	24.3915	733.00	17.7680
334.37	39.5630	529.87	0.0000	735.93	11.6432
338.28	60.2999	531.02	25.5177	333.97	10.6791
338.32	60.3018	537.26	31.1608	739.50	0.0000
311.90	52.4455	546.56	0.0000	747.24	20.4637
340.48	52.4455	552.55	28.0296	748.06	21.4452
340.55	52.4479	563.25	17.1292	752.31	22.4559
344.28	41.4292	569.33	21.0963	753.82	17.5843
345.93	52.8415	946.00	18.0840	756.73	13.6917
351.06	40.0195	569.70	18.0854	756.80	13.6920
351.93	44.0477	583.19	27.2988	884.68	13.0749

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.2615	1274.44	12.3673	1620.50	6.1799
766.42	17.9945	1001.03	8.8464	1621.92	8.2425
766.84	17.9972	1002.74	3.5404	1678.03	0.0000
772.60	0.0000	1004.73	4.7234	1690.97	2.0892
776.52	11.8225	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.0000
778.90	15.7770	1028.54	0.0000	1063.66	5.4549
783.70	0.0000	1037.84	16.0986	1771.35	14.8528
785.37	4.9420	1038.76	0.0000	1791.20	0.0000
792.07	21.4678	631.29	11.8357	1808.65	3.2051
794.95	11.9024	1048.07	11.8411	1810.72	0.0000
795.86	13.8906	1049.04	8.6141	1836.06	1.0738
810.06	11.9672	1050.41	10.7720		
810.29	13.2979	1063.66	15.1382		
344.28	13.2985	1077.00	10.8545		
810.76	13.3001	1077.34	8.1416		
815.77	11.6584	1085.87	12.6955		
1048.07	21.6720	1093.63	10.9053		
832.01	23.1151	1099.45	9.1028		
834.85	13.4134	1112.07	10.9619		
835.71	15.0945	1112.84	9.1366		
836.80	0.0000	1115.54	10.9722		
846.75	0.0000	1120.29	12.5564		
846.77	17.3170	1120.55	12.5569		
856.80	16.2184	1221.41	16.4846		
860.56	12.1793	1129.67	13.7689		
871.09	13.2412	1131.51	0.0000		
873.19	13.2507	1147.95	0.0000		
875.33	0.0000	1173.23	9.5529		
879.38	14.2998	1177.95	9.2989		
880.51	13.2831	1189.05	7.4609		
883.24	8.1818	1204.77	8.4280		
884.68	15.3483	1221.41	15.9880		
889.28	12.2974	1231.02	14.1418		
894.76	11.2930	1235.36	14.1577		
898.04	13.3605	1238.28	16.0572		
900.72	17.4868	1260.41	0.0000		
903.28	11.5821	1271.87	11.4307		
911.20	14.4505	1274.44	8.5781		
912.08	8.6039	1274.54	8.5785		
923.98	0.0000	1291.59	5.7432		
926.50	10.3728	1298.22	0.0000		
929.11	19.7246	1312.11	0.9620		
937.49	20.8184	1332.49	2.9001		
944.13	15.6467	1362.66	0.0000		
946.00	9.3935	1365.19	4.8710		
949.00	11.4917	1368.63	0.0000		
667.71	0.0000	1384.29	5.8713		
962.31	16.7852	1408.01	4.9196		
964.08	23.0925	1457.56	0.0000		
966.17	44.1133	1460.82	4.9784		
911.20	25.2299	1489.16	4.0076		
968.97	25.2299	1505.03	9.0483		
983.53	13.7274	1584.12	12.2681		
984.45	0.0000	1596.21	4.0996		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:40:27.50

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677025.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM17.CNF;468
Background date  : 26-JUN-2016 12:04:46
Sample date     : 11-MAY-2016 13:51:00 Acquisition date : 28-JUN-2016 11:38:00
Sample ID       : G398677025 Sample quantity : 1.41100E+02 GRAM
Detector name   : GAM17 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.49 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572486 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.26*	10	217	2.11	92.66	88	12	2.91E-03	289.9	
2	0	62.32*	51	236	1.25	124.80	119	13	1.42E-02	64.7	
3	1	75.01	153	161	1.46	150.20	144	17	4.26E-02	18.0	1.21E+00
4	1	77.28	223	143	1.46	154.73	144	17	6.21E-02	12.8	
5	0	87.08*	49	117	1.17	174.35	172	6	1.36E-02	38.5	
6	0	93.14*	68	173	1.81	186.48	182	11	1.90E-02	41.7	
7	0	98.47*	20	110	1.11	197.15	194	8	5.43E-03	97.1	
8	0	130.45	52	150	2.99	261.16	254	14	1.44E-02	52.6	
9	2	170.64	45	103	1.77	341.59	336	18	1.24E-02	45.0	3.24E+00
10	2	175.03*	26	64	1.78	350.38	336	18	7.10E-03	55.7	
11	0	185.45*	63	86	1.56	371.22	367	10	1.75E-02	31.6	
12	0	210.20	31	99	1.55	420.75	415	10	8.60E-03	62.9	
13	0	220.14	41	71	2.50	440.66	436	10	1.14E-02	41.8	
14	0	234.88	29	70	1.33	470.15	465	9	8.08E-03	55.0	
15	4	238.64*	252	75	1.44	477.68	473	15	6.99E-02	9.0	1.17E+00
16	4	241.77*	37	73	1.50	483.93	473	15	1.02E-02	51.3	
17	0	295.50*	100	45	1.71	591.46	587	10	2.78E-02	16.7	
18	0	300.29*	9	50	1.36	601.04	596	8	2.44E-03	146.1	
19	0	339.58	37	101	1.82	679.68	673	13	1.02E-02	58.6	
20	0	352.10*	99	64	1.63	704.73	700	10	2.76E-02	18.7	
21	0	464.28	14	63	0.84	929.21	922	10	3.95E-03	107.3	
22	0	511.02*	37	46	1.18	1022.74	1017	13	1.02E-02	47.5	
23	0	567.01	75	41	13.62	1134.79	1117	33	2.08E-02	28.6	
24	0	583.32*	114	10	1.20	1167.43	1161	13	3.16E-02	11.2	
25	0	602.58	16	55	7.99	1205.98	1189	22	4.50E-03	119.4	
26	0	609.84*	61	26	1.71	1220.49	1213	16	1.70E-02	23.7	
27	0	661.70	761	26	1.52	1324.27	1315	17	2.11E-01	3.9	
28	0	679.41	16	7	1.22	1359.71	1354	10	4.32E-03	41.6	
29	0	726.86	31	9	1.60	1454.65	1450	9	8.61E-03	25.0	
30	0	806.14	9	9	3.80	1613.30	1605	12	2.52E-03	73.9	
31	0	836.11	16	0	0.67	1673.25	1668	10	4.44E-03	25.0	
32	0	869.33	13	7	1.03	1739.73	1730	14	3.61E-03	51.3	
33	0	891.93	17	6	3.60	1784.94	1780	11	4.58E-03	36.9	
34	0	911.33*	42	6	1.67	1823.77	1817	14	1.18E-02	21.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	943.91	5	9	0.58	1888.95	1881	10	1.31E-03	132.5	
36	0	968.83	44	12	2.10	1938.82	1931	17	1.22E-02	24.0	
37	0	1078.71	18	3	1.47	2158.67	2153	10	5.11E-03	28.4	
38	0	1120.84*	21	10	4.96	2242.94	2235	13	5.83E-03	39.2	
39	0	1155.50	21	0	3.16	2312.29	2305	15	5.83E-03	21.8	
40	0	1460.88*	100	0	2.47	2923.24	2916	13	2.78E-02	10.3	
41	0	1765.70*	10	4	1.18	3533.02	3522	15	2.64E-03	59.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:40:29

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677025.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 13:51:00 Acquisition date : 28-JUN-2016 11:38:00
Sample ID        : G398677025 Sample quantity  : 141.10 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA17 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.49 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	7.897E-01	6.068E+00	6.068E+00	20.59	OK
MN-54	834.85	99.98*	1.298E+00	6.615E-02	7.358E-02	50.00	OK
GE-68	1077.34	3.22*	1.042E+00	2.878E+00	3.254E+00	56.73	OK
NB-95M	235.69	24.80*	4.053E+00	1.727E-01	2.902E-01	109.99	OK
CD-109	88.03	3.70*	6.705E+00	4.093E-01	4.399E-01	249.05	OK
SN-126	64.28	9.60	6.710E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	6.705E+00	1.702E-01	1.702E-01	249.05	OK
	87.57	37.00*	6.705E+00	4.093E-02	4.093E-02	249.05	OK
BA-137M	661.66	89.90*	1.587E+00	2.922E+00	2.930E+00	7.87	OK
CS-137	661.66	85.10*	1.587E+00	3.086E+00	3.096E+00	7.87	OK
TL-208	277.37	6.60	3.487E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.770E+00	4.186E-01	4.186E-01	22.48	OK
	860.56	12.50	1.267E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	6.802E+00	2.441E-01	2.451E-01	579.74	OK
PB-212	74.82	10.28	6.701E+00	9.213E-01	9.213E-01	59.66	OK
	77.11	17.10	6.704E+00	1.266E+00	1.266E+00	25.55	OK
	238.63	43.60*	3.996E+00	8.615E-01	8.615E-01	18.06	OK
	300.09	3.30	3.240E+00	4.806E-01	4.806E-01	292.24	OK
BI-214	609.32	45.49*	1.703E+00	4.352E-01	4.353E-01	47.31	OK
	1120.29	14.92	1.007E+00	7.300E-01	7.300E-01	78.36	OK
	1764.49	15.30	6.531E-01	4.773E-01	4.773E-01	119.20	OK
PB-214	74.82	5.80	6.701E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.704E+00	2.232E+00	2.232E+00	25.55	OK
	87.09	3.41	6.705E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.950E+00	7.646E-01	7.647E-01	102.63	OK
	295.22	18.42	3.288E+00	9.668E-01	9.669E-01	33.45	OK
	351.93	35.60*	2.794E+00	5.769E-01	5.769E-01	37.43	OK
RN-222	609.32	45.49*	1.703E+00	4.352E-01	4.353E-01	47.31	OK
	1120.29	14.92	1.007E+00	7.300E-01	7.300E-01	78.36	OK
	1764.49	15.30	6.531E-01	4.773E-01	4.773E-01	119.20	OK
RA-226	609.32	45.49*	1.703E+00	4.352E-01	4.353E-01	47.31	OK
	1120.29	14.92	1.007E+00	7.300E-01	7.300E-01	78.36	OK
	1764.49	15.30	6.531E-01	4.773E-01	4.773E-01	119.20	OK
AC-228	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.890E+00	6.546E-01	6.546E-01	117.26	OK
	794.95	4.25	1.356E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.298E+00	4.108E+00	4.108E+00	50.00	OK
	911.20	25.80*	1.206E+00	7.259E-01	7.259E-01	42.20	OK
	968.97	15.80	1.144E+00	1.283E+00	1.283E+00	47.94	OK
RA-228	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.890E+00	6.546E-01	6.546E-01	117.26	OK
	794.95	4.25	1.356E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.298E+00	4.108E+00	4.108E+00	50.00	OK
	911.20	25.80*	1.206E+00	7.259E-01	7.259E-01	42.20	OK
	968.97	15.80	1.144E+00	1.283E+00	1.283E+00	47.94	OK
TH-228	74.82	10.28	6.701E+00	9.213E-01	9.213E-01	59.66	OK
	77.11	17.10	6.704E+00	1.266E+00	1.266E+00	25.55	OK
	238.63	43.60*	3.996E+00	8.615E-01	8.615E-01	18.06	OK
	300.09	3.30	3.240E+00	4.806E-01	4.806E-01	292.24	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	1.703E+00	4.352E-01	4.352E-01	47.31	OK
	1120.29	14.92	1.007E+00	7.300E-01	7.300E-01	78.36	OK
	1764.49	15.30	6.531E-01	4.773E-01	4.773E-01	119.20	OK
PA-231	283.69	1.70	3.415E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.240E+00	2.964E-01	2.964E-01	292.24	OK
TH-232	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.890E+00	6.546E-01	6.546E-01	117.26	OK
	835.71	1.61	1.298E+00	4.108E+00	4.108E+00	50.00	OK
	911.20	25.80*	1.206E+00	7.259E-01	7.259E-01	42.20	OK
	968.97	15.80	1.144E+00	1.283E+00	1.283E+00	47.94	OK
TH-234	63.29	3.70*	6.723E+00	1.353E+00	1.353E+00	129.47	OK
	92.59	4.23	6.683E+00	1.551E+00	1.551E+00	83.43	OK
U-234	609.32	45.49*	1.703E+00	4.352E-01	4.352E-01	47.31	OK
	1120.29	14.92	1.007E+00	7.300E-01	7.300E-01	78.36	OK
	1764.49	15.30	6.531E-01	4.773E-01	4.773E-01	119.20	OK
U-238	63.29	3.70*	6.723E+00	1.353E+00	1.353E+00	129.47	OK
	92.59	4.23	6.683E+00	1.551E+00	1.551E+00	83.43	OK
AM-243	43.53	5.90	6.544E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.701E+00	1.409E-01	1.409E-01	59.66	OK
ANH-511	511.00	100.00*	1.990E+00	1.030E-01	1.030E-01	94.95	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677025.CNF;1
Acquisition date : 28-JUN-2016 11:38:00 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.49 Half life ratio : *****
Sample date : 11-MAY-2016 13:51:00 Analyst initials: MXR1
Sample ID : G398677025 Sample Quantity : 1.4110E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.068E+00	1.224E+00	7.521E-01
MN-54	7.358E-02	3.606E-02	1.004E-01
GE-68	3.254E+00	1.809E+00	3.069E+00
NB-95M	2.902E-01	3.128E-01	3.729E-01
CD-109	4.399E-01	1.074E+00	1.650E+00
SN-126	4.093E-02	9.990E-02	1.571E-01
BA-137M	2.930E+00	2.259E-01	9.607E-02
CS-137	3.096E+00	2.386E-01	1.015E-01
TL-208	4.186E-01	9.220E-02	8.633E-02
PB-210	2.451E-01	1.393E+00	1.065E+00
PB-212	8.615E-01	1.524E-01	1.462E-01
BI-214	4.353E-01	2.018E-01	2.151E-01
PB-214	5.769E-01	2.116E-01	2.210E-01
RN-222	4.353E-01	2.018E-01	2.151E-01
RA-226	4.353E-01	2.018E-01	2.151E-01
AC-228	7.259E-01	3.002E-01	3.265E-01
RA-228	7.259E-01	3.002E-01	3.265E-01
TH-228	8.615E-01	1.524E-01	1.462E-01
TH-230	4.352E-01	2.018E-01	2.151E-01
PA-231	2.964E-01	8.489E-01	1.334E+00
TH-232	7.259E-01	3.002E-01	3.265E-01
TH-234	1.353E+00	1.717E+00	1.366E+00
U-234	4.352E-01	2.018E-01	2.151E-01
U-238	1.353E+00	1.717E+00	1.366E+00
AM-243	1.409E-01	8.240E-02	7.669E-02
ANH-511	1.030E-01	9.588E-02	9.751E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.221E+00	1.004E+00	2.017E+00	NOT IDENT.
NA-22	-2.573E-02	5.028E-02	9.289E-02	NOT IDENT.
NA-24	0.000E+00	6.306E+21	0.000E+00	SHORT HLIF
AL-26	-4.351E-02	5.542E-02	9.011E-02	NOT IDENT.

SC-46	1.047E-02	7.337E-02	1.294E-01	FAIL ABUN
V-48	2.678E-01	3.430E-01	7.739E-01	FAIL ABUN
CR-51	2.513E-01	1.380E+00	2.617E+00	NOT IDENT.
CO-56	2.353E-02	7.383E-02	1.503E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.230E-02	3.225E-02	6.233E-02	NOT IDENT.
CO-58	-2.494E-02	8.021E-02	1.262E-01	NOT IDENT.
FE-59	3.996E-02	2.004E-01	4.016E-01	NOT IDENT.
CO-60	1.543E-02	5.097E-02	1.101E-01	NOT IDENT.
ZN-65	2.885E-02	1.336E-01	2.361E-01	NOT IDENT.
AS-73	3.656E-02	3.811E-01	7.074E-01	NOT IDENT.
AS-74	4.601E-01	5.526E-01	1.023E+00	NOT IDENT.
SE-75	-4.130E-03	8.094E-02	1.522E-01	NOT IDENT.
BR-77	0.000E+00	3.385E+05	0.000E+00	SHORT HLIF
SR-82	-2.324E-01	1.133E+00	2.150E+00	NOT IDENT.
RB-83	-3.770E-02	1.459E-01	2.640E-01	NOT IDENT.
KR-85	1.837E+01	1.483E+01	2.701E+01	NOT IDENT.
SR-85	1.369E-01	1.109E-01	2.019E-01	NOT IDENT.
RB-86	6.104E+00	4.200E+00	9.130E+00	NOT IDENT.
Y-88	-2.505E-02	6.597E-02	1.257E-01	NOT IDENT.
Y-91	-9.425E+00	3.686E+01	6.826E+01	NOT IDENT.
NB-94	4.702E-02	4.567E-02	1.001E-01	NOT IDENT.
NB-95	2.765E-02	8.663E-02	1.734E-01	NOT IDENT.
ZR-95	-1.780E-02	1.471E-01	2.815E-01	NOT IDENT.
NB-97	0.000E+00	5.107E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.647E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.226E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.166E+41	0.000E+00	SHORT HLIF
RH-101	-1.040E-02	4.730E-02	7.454E-02	NOT IDENT.
RH-102	3.565E-02	8.334E-02	1.697E-01	NOT IDENT.
RU-103	1.059E-01	1.380E-01	2.703E-01	FAIL ABUN
RH-106	3.518E-01	5.046E-01	1.053E+00	NOT IDENT.
RU-106	3.518E-01	5.046E-01	1.053E+00	NOT IDENT.
AG-108M	1.338E-02	5.019E-02	9.560E-02	NOT IDENT.
AG-110M	-3.974E-02	7.388E-02	1.196E-01	NOT IDENT.
SN-113	7.295E-03	1.005E-01	1.869E-01	NOT IDENT.
CD-115	0.000E+00	5.091E+05	0.000E+00	SHORT HLIF
SN-117M	-2.741E-02	3.539E-01	6.441E-01	NOT IDENT.
TE-123M	6.624E-03	4.064E-02	7.538E-02	NOT IDENT.
SB-124	-2.523E-02	1.493E-01	3.114E-01	NOT IDENT.
SB-125	9.509E-03	1.646E-01	3.066E-01	FAIL ABUN
TE-125M	-1.458E+00	1.645E+01	3.034E+01	NOT IDENT.
I-126	-6.598E-01	2.127E+00	3.369E+00	NOT IDENT.
SB-126	8.984E-01	1.335E+00	2.555E+00	NOT IDENT.
SB-127	0.000E+00	5.792E+02	0.000E+00	SHORT HLIF
I-131	1.061E+00	3.346E+00	6.395E+00	NOT IDENT.
I-132	0.000E+00	1.490E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.379E+03	0.000E+00	SHORT HLIF
BA-133	5.481E-03	7.615E-02	1.247E-01	NOT IDENT.
I-133	0.000E+00	2.223E+15	0.000E+00	SHORT HLIF
CS-134	2.668E-02	6.599E-02	1.307E-01	NOT IDENT.
CS-135	-2.208E-02	2.384E-01	4.458E-01	NOT IDENT.
I-135	0.000E+00	1.562E+41	0.000E+00	SHORT HLIF
CS-136	-2.208E-02	6.201E-01	1.247E+00	FAIL ABUN
CE-139	1.581E-02	4.861E-02	8.012E-02	NOT IDENT.
BA-140	-1.483E-01	2.622E+00	4.836E+00	NOT IDENT.
LA-140	-5.791E-01	9.150E-01	1.597E+00	NOT IDENT.
CE-141	1.448E-01	1.648E-01	3.172E-01	NOT IDENT.
CE-143	0.000E+00	3.442E+09	0.000E+00	SHORT HLIF
CE-144	1.277E-01	2.768E-01	4.670E-01	NOT IDENT.
PM-144	-2.500E-03	4.759E-02	9.270E-02	NOT IDENT.
PR-144	-1.669E-01	3.627E+00	7.070E+00	NOT IDENT.
PM-146	-7.780E-03	7.928E-02	1.450E-01	NOT IDENT.
ND-147	-3.954E+00	6.925E+00	1.204E+01	NOT IDENT.
PM-147	-2.007E+01	8.733E+02	1.615E+03	NOT IDENT.
PM-149	0.000E+00	3.850E+06	0.000E+00	SHORT HLIF
EU-150	-1.328E-02	4.692E-02	7.386E-02	FAIL ABUN
EU-152	-2.266E-02	1.955E-01	3.116E-01	NOT IDENT.
GD-153	7.423E-02	1.413E-01	1.944E-01	FAIL ABUN
EU-154	-7.170E-02	1.401E-01	2.588E-01	NOT IDENT.
EU-155	-3.988E-02	1.122E-01	2.042E-01	FAIL ABUN
TB-160	1.598E-02	2.659E-01	5.199E-01	FAIL ABUN
HO-166M	1.361E-01	8.983E-02	2.029E-01	FAIL ABUN
TM-171	2.488E+00	6.278E+00	1.087E+01	NOT IDENT.
HF-172	-3.950E-02	2.708E-01	4.309E-01	FAIL ABUN
LU-172	-4.494E-02	9.428E-02	1.671E-01	FAIL ABUN
LU-176	1.186E-02	3.782E-02	7.329E-02	FAIL ABUN
HF-181	-9.444E-02	1.395E-01	2.405E-01	NOT IDENT.

TA-182	-9.153E-02	2.556E-01	4.652E-01	FAIL ABUN
RE-183	-2.201E-02	1.344E-01	2.219E-01	NOT IDENT.
RE-184	3.476E-01	2.981E-01	6.659E-01	NOT IDENT.
W-188	3.134E+00	1.743E+01	2.903E+01	FAIL ABUN
IR-192	3.704E-02	8.007E-02	1.545E-01	FAIL ABUN
HG-203	8.398E-02	8.906E-02	1.795E-01	NOT IDENT.
BI-207	5.410E-03	6.232E-02	1.252E-01	FAIL ABUN
BI-211	0.000E+00	5.831E-01	9.708E-01	FAIL ABUN
PB-211	7.294E-01	1.304E+00	2.517E+00	NOT IDENT.
BI-212	1.725E+00	8.467E-01	1.896E+00	FAIL ABUN
RN-219	-9.068E-02	7.090E-01	1.301E+00	NOT IDENT.
RA-223	-5.677E-01	1.026E+00	1.839E+00	FAIL ABUN
RA-224	1.352E+00	1.360E+00	2.644E+00	FAIL ABUN
AC-227	3.259E-01	3.798E-01	7.566E-01	FAIL ABUN
TH-227	3.259E-01	3.798E-01	7.566E-01	FAIL ABUN
TH-229	-6.149E-01	7.304E-01	1.238E+00	FAIL ABUN
TH-231	-5.677E-01	1.026E+00	1.839E+00	FAIL ABUN
PA-233	-5.435E-02	1.016E-01	1.829E-01	FAIL ABUN
PA-234	-7.719E-02	4.738E-01	7.630E-01	FAIL ABUN
PA-234M	-1.095E-01	6.205E+00	1.200E+01	NOT IDENT.
U-235	2.145E-01	2.538E-01	4.894E-01	FAIL ABUN
NP-237	-5.435E-02	1.016E-01	1.829E-01	FAIL ABUN
NP-238	0.000E+00	1.120E+06	0.000E+00	SHORT HLIF
NP-239	-9.820E-02	3.125E-01	5.668E-01	FAIL ABUN
PU-239	0.000E+00	8.603E+02	8.186E+02	FAIL ABUN
AM-241	1.161E-02	8.204E-02	1.383E-01	NOT IDENT.
CM-243	-2.389E-02	1.264E-01	2.030E-01	FAIL ABUN
BK-247	-6.229E-02	1.238E-01	2.253E-01	NOT IDENT.
CM-247	7.778E-03	6.597E-02	1.235E-01	NOT IDENT.
CF-249	3.538E-02	7.271E-02	1.397E-01	NOT IDENT.
CF-251	-6.860E-02	2.150E-01	3.290E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	96	10.66*	7.897E-01	6.068E+00	6.068E+00	20.59
MN-54	834.85	16	99.98*	1.298E+00	6.615E-02	7.358E-02	50.00
GE-68	1077.34	18	3.22*	1.042E+00	2.878E+00	3.254E+00	56.73
NB-95M	235.69	33	24.80*	4.053E+00	1.727E-01	2.902E-01	109.99
CD-109	88.03	59	3.70*	6.705E+00	1.273E+00	1.368E+00	77.08
SN-126	64.28	-----	9.60	6.710E+00	-----	Line Not Found	-----
	86.94	59	8.90	6.705E+00	5.294E-01	5.294E-01	77.08
	87.57	59	37.00*	6.705E+00	1.273E-01	1.273E-01	77.08
BA-137M	661.66	783	89.90*	1.587E+00	2.922E+00	2.930E+00	7.87
CS-137	661.66	783	85.10*	1.587E+00	3.086E+00	3.096E+00	7.87
TL-208	277.37	-----	6.60	3.487E+00	-----	Line Not Found	-----
	583.19	118	85.00*	1.770E+00	4.186E-01	4.186E-01	22.48
	860.56	-----	12.50	1.267E+00	-----	Line Not Found	-----
PB-210	46.54	13	4.25*	6.802E+00	2.441E-01	2.451E-01	579.74
BI-211	72.87	-----	1.23	6.698E+00	-----	Line Not Found	-----
	351.06	108	12.92*	2.794E+00	1.590E+00	1.590E+00	37.43
PB-212	74.82	188	10.28	6.701E+00	1.450E+00	1.450E+00	36.07
	77.11	273	17.10	6.704E+00	1.266E+00	1.266E+00	25.55
	238.63	282	43.60*	3.996E+00	8.615E-01	8.615E-01	18.06
	300.09	10	3.30	3.240E+00	4.806E-01	4.806E-01	292.24
BI-214	609.32	63	45.49*	1.703E+00	4.352E-01	4.353E-01	47.31
	1120.29	21	14.92	1.007E+00	7.300E-01	7.300E-01	78.36
	1764.49	9	15.30	6.531E-01	4.773E-01	4.773E-01	119.20
PB-214	74.82	188	5.80	6.701E+00	2.570E+00	2.570E+00	36.07
	77.11	273	9.70	6.704E+00	2.232E+00	2.232E+00	25.55
	87.09	59	3.41	6.705E+00	1.382E+00	1.382E+00	77.08
	242.00	41	7.25	3.950E+00	7.646E-01	7.647E-01	102.63
	295.22	110	18.42	3.288E+00	9.668E-01	9.669E-01	33.45
	351.93	108	35.60*	2.794E+00	5.769E-01	5.769E-01	37.43
RN-222	609.32	63	45.49*	1.703E+00	4.352E-01	4.353E-01	47.31
	1120.29	21	14.92	1.007E+00	7.300E-01	7.300E-01	78.36
	1764.49	9	15.30	6.531E-01	4.773E-01	4.773E-01	119.20
RA-224	240.99	41	4.10*	3.950E+00	1.352E+00	1.352E+00	102.63
RA-226	609.32	63	45.49*	1.703E+00	4.352E-01	4.353E-01	47.31
	1120.29	21	14.92	1.007E+00	7.300E-01	7.300E-01	78.36
	1764.49	9	15.30	6.531E-01	4.773E-01	4.773E-01	119.20
AC-228	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	40	11.27	2.890E+00	6.546E-01	6.546E-01	117.26
	794.95	-----	4.25	1.356E+00	-----	Line Not Found	-----
	835.71	16	1.61	1.298E+00	4.108E+00	4.108E+00	50.00
	911.20	42	25.80*	1.206E+00	7.259E-01	7.259E-01	42.20
	968.97	44	15.80	1.144E+00	1.283E+00	1.283E+00	47.94
RA-228	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	40	11.27	2.890E+00	6.546E-01	6.546E-01	117.26
	794.95	-----	4.25	1.356E+00	-----	Line Not Found	-----
	835.71	16	1.61	1.298E+00	4.108E+00	4.108E+00	50.00
	911.20	42	25.80*	1.206E+00	7.259E-01	7.259E-01	42.20

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	44	15.80	1.144E+00	1.283E+00	1.283E+00	47.94
	74.82	188	10.28	6.701E+00	1.450E+00	1.450E+00	36.07
	77.11	273	17.10	6.704E+00	1.266E+00	1.266E+00	25.55
	238.63	282	43.60*	3.996E+00	8.615E-01	8.615E-01	18.06
TH-230	300.09	10	3.30	3.240E+00	4.806E-01	4.806E-01	292.24
	609.32	63	45.49*	1.703E+00	4.352E-01	4.352E-01	47.31
	1120.29	21	14.92	1.007E+00	7.300E-01	7.300E-01	78.36
	1764.49	9	15.30	6.531E-01	4.773E-01	4.773E-01	119.20
PA-231	283.69	-----	1.70	3.415E+00	-----	Line Not Found	-----
TH-232	301.36	10	5.35*	3.240E+00	2.964E-01	2.964E-01	292.24
	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	40	11.27	2.890E+00	6.546E-01	6.546E-01	117.26
	835.71	16	1.61	1.298E+00	4.108E+00	4.108E+00	50.00
TH-234	911.20	42	25.80*	1.206E+00	7.259E-01	7.259E-01	42.20
	968.97	44	15.80	1.144E+00	1.283E+00	1.283E+00	47.94
	63.29	63	3.70*	6.723E+00	1.353E+00	1.353E+00	129.47
	92.59	82	4.23	6.683E+00	1.551E+00	1.551E+00	83.43
U-234	609.32	63	45.49*	1.703E+00	4.352E-01	4.352E-01	47.31
	1120.29	21	14.92	1.007E+00	7.300E-01	7.300E-01	78.36
	1764.49	9	15.30	6.531E-01	4.773E-01	4.773E-01	119.20
U-238	63.29	63	3.70*	6.723E+00	1.353E+00	1.353E+00	129.47
	92.59	82	4.23	6.683E+00	1.551E+00	1.551E+00	83.43
AM-243	43.53	-----	5.90	6.544E+00	-----	Line Not Found	-----
ANH-511	74.66	188	67.20*	6.701E+00	2.218E-01	2.218E-01	36.07
	511.00	39	100.00*	1.990E+00	1.030E-01	1.030E-01	94.95

Flag: "*" = Keyline

Total number of lines in spectrum 41
Number of unidentified lines 8
Number of lines tentatively identified by NID 33 80.49%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.068E+00	6.068E+00	1.249E+00	20.59	
MN-54	312.05D	1.11	6.615E-02	7.358E-02	3.679E-02	50.00	
GE-68	270.95D	1.13	2.878E+00	3.254E+00	1.846E+00	56.73	
NB-95M	64.03D	1.68	1.727E-01	2.902E-01	3.192E-01	109.99	
CD-109	461.40D	1.07	1.273E+00	1.368E+00	1.055E+00	77.08	
SN-126	2.30E+05Y	1.00	1.273E-01	1.273E-01	0.981E-01	77.08	
BA-137M	30.08Y	1.00	2.922E+00	2.930E+00	0.231E+00	7.87	
CS-137	30.08Y	1.00	3.086E+00	3.096E+00	0.244E+00	7.87	
TL-208	1.41E+10Y	1.00	4.186E-01	4.186E-01	0.941E-01	22.48	
PB-210	22.20Y	1.00	2.441E-01	2.451E-01	14.21E-01	579.74	
BI-211	7.04E+08Y	1.00	1.590E+00	1.590E+00	0.595E+00	37.43	
PB-212	1.41E+10Y	1.00	8.615E-01	8.615E-01	1.555E-01	18.06	
BI-214	1600.00Y	1.00	4.352E-01	4.353E-01	2.059E-01	47.31	
PB-214	1600.00Y	1.00	5.769E-01	5.769E-01	2.159E-01	37.43	
RN-222	1600.00Y	1.00	4.352E-01	4.353E-01	2.059E-01	47.31	
RA-224	1.41E+10Y	1.00	1.352E+00	1.352E+00	1.388E+00	102.63	
RA-226	1600.00Y	1.00	4.352E-01	4.353E-01	2.059E-01	47.31	
AC-228	1.41E+10Y	1.00	7.259E-01	7.259E-01	3.063E-01	42.20	
RA-228	1.41E+10Y	1.00	7.259E-01	7.259E-01	3.063E-01	42.20	
TH-228	1.41E+10Y	1.00	8.615E-01	8.615E-01	1.555E-01	18.06	
TH-230	7.54E+04Y	1.00	4.352E-01	4.352E-01	2.059E-01	47.31	
PA-231	7.04E+08Y	1.00	2.964E-01	2.964E-01	8.663E-01	292.24	
TH-232	1.41E+10Y	1.00	7.259E-01	7.259E-01	3.063E-01	42.20	
TH-234	4.47E+09Y	1.00	1.353E+00	1.353E+00	1.752E+00	129.47	
U-234	2.45E+05Y	1.00	4.352E-01	4.352E-01	2.059E-01	47.31	
U-238	4.47E+09Y	1.00	1.353E+00	1.353E+00	1.752E+00	129.47	
AM-243	7370.00Y	1.00	2.218E-01	2.218E-01	0.800E-01	36.07	
ANH-511	1.00E+09Y	1.00	1.030E-01	1.030E-01	0.978E-01	94.95	
Total Activity :			3.018E+01	3.079E+01			

Grand Total Activity : 3.018E+01 3.079E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	98.47	23	132	1.11	197.15	194	8	5.43E-03	****	6.65E+00	T
0	130.45	61	176	2.99	261.16	254	14	1.44E-02	****	6.14E+00	T
2	170.64	52	118	1.77	341.59	336	18	1.24E-02	90.0	5.25E+00	
2	175.03	29	73	1.78	350.38	336	18	7.10E-03	****	5.15E+00	T
0	185.45	72	98	1.56	371.22	367	10	1.75E-02	63.2	4.94E+00	T
0	210.20	35	112	1.55	420.75	415	10	8.60E-03	****	4.46E+00	T
0	220.14	46	80	2.50	440.66	436	10	1.14E-02	83.7	4.29E+00	
0	464.28	15	67	0.84	929.21	922	10	3.95E-03	****	2.17E+00	T
0	567.01	78	43	13.62	1134.79	1117	33	2.08E-02	57.1	1.81E+00	
0	602.58	17	57	7.99	1205.98	1189	22	4.50E-03	****	1.72E+00	T
0	679.41	16	8	1.22	1359.71	1354	10	4.32E-03	83.1	1.55E+00	
0	726.86	32	9	1.60	1454.65	1450	9	8.61E-03	50.1	1.46E+00	T
0	806.14	9	9	3.80	1613.30	1605	12	2.52E-03	****	1.34E+00	
0	869.33	13	7	1.03	1739.73	1730	14	3.61E-03	****	1.26E+00	
0	891.93	17	6	3.60	1784.94	1780	11	4.58E-03	73.9	1.23E+00	
0	943.91	5	9	0.58	1888.95	1881	10	1.31E-03	****	1.17E+00	T
0	1155.50	21	0	3.16	2312.29	2305	15	5.83E-03	43.6	9.80E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677025.CNF;1  *
* Acquisition date   : 28-JUN-2016 11:38:00 Sensitivity      : 3.000          *
* Detector ID        : GAM17 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.49 Half life ratio  : *****    *
* Sample date        : 11-MAY-2016 13:51:00 Nuclide Library : SOLID      *
* Sample ID          : G398677025 Analyst initials: MXR1        *
* Batch Number       : 1572486 Sample Quantity : 1.4110E+02 GRAM  *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 1-JUN-2016 09:40:09 Eff. Geometry    : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.902E-01
MN-54	4.396E-02
GE-68	1.290E+00
NB-95M	1.739E-01
CD-109	7.920E-01
SN-126	7.551E-02
BA-137M	4.288E-02
CS-137	4.530E-02
TL-208	3.828E-02
PB-210	5.060E-01
PB-212	6.880E-02
BI-214	9.810E-02
PB-214	1.031E-01
RN-222	9.810E-02
RA-226	9.810E-02
AC-228	1.399E-01
RA-228	1.399E-01
TH-228	6.880E-02
TH-230	9.810E-02
PA-231	6.240E-01
TH-232	1.399E-01
TH-234	6.525E-01
U-234	9.810E-02
U-238	6.525E-01
AM-243	3.666E-02
ANH-511	4.506E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.465E-01	NOT IDENT.
NA-22	3.808E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.373E-02	NOT IDENT.
SC-46	5.588E-02	FAIL ABUN

V-48	3.354E-01	FAIL ABUN
CR-51	1.227E+00	NOT IDENT.
CO-56	6.641E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.959E-02	NOT IDENT.
CO-58	5.432E-02	NOT IDENT.
FE-59	1.744E-01	NOT IDENT.
CO-60	4.653E-02	NOT IDENT.
ZN-65	1.018E-01	NOT IDENT.
AS-73	3.373E-01	NOT IDENT.
AS-74	4.652E-01	NOT IDENT.
SE-75	7.154E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	9.450E-01	NOT IDENT.
RB-83	1.197E-01	NOT IDENT.
KR-85	1.264E+01	NOT IDENT.
SR-85	9.452E-02	NOT IDENT.
RB-86	4.087E+00	NOT IDENT.
Y-88	4.706E-02	NOT IDENT.
Y-91	2.892E+01	NOT IDENT.
NB-94	4.518E-02	NOT IDENT.
NB-95	7.793E-02	NOT IDENT.
ZR-95	1.248E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.544E-02	NOT IDENT.
RH-102	7.675E-02	NOT IDENT.
RU-103	1.259E-01	FAIL ABUN
RH-106	4.784E-01	NOT IDENT.
RU-106	4.784E-01	NOT IDENT.
AG-108M	4.426E-02	NOT IDENT.
AG-110M	5.053E-02	NOT IDENT.
SN-113	8.746E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.039E-01	NOT IDENT.
TE-123M	3.555E-02	NOT IDENT.
SB-124	1.172E-01	NOT IDENT.
SB-125	1.423E-01	FAIL ABUN
TE-125M	1.441E+01	NOT IDENT.
I-126	1.500E+00	NOT IDENT.
SB-126	1.142E+00	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.988E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.801E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.876E-02	NOT IDENT.
CS-135	2.100E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.171E-01	FAIL ABUN
CE-139	3.783E-02	NOT IDENT.
BA-140	2.204E+00	NOT IDENT.
LA-140	6.574E-01	NOT IDENT.
CE-141	1.512E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.209E-01	NOT IDENT.
PM-144	4.104E-02	NOT IDENT.
PR-144	3.131E+00	NOT IDENT.
PM-146	6.729E-02	NOT IDENT.
ND-147	5.417E+00	NOT IDENT.
PM-147	7.641E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.429E-02	FAIL ABUN
EU-152	1.460E-01	NOT IDENT.
GD-153	9.271E-02	FAIL ABUN
EU-154	1.061E-01	NOT IDENT.
EU-155	9.657E-02	FAIL ABUN
TB-160	2.291E-01	FAIL ABUN
HO-166M	9.236E-02	FAIL ABUN
TM-171	5.186E+00	NOT IDENT.
HF-172	2.042E-01	FAIL ABUN
LU-172	7.179E-02	FAIL ABUN
LU-176	3.415E-02	FAIL ABUN
HF-181	1.107E-01	NOT IDENT.
TA-182	1.942E-01	FAIL ABUN

RE-183	1.056E-01	NOT IDENT.
RE-184	2.927E-01	NOT IDENT.
W-188	1.362E+01	FAIL ABUN
IR-192	7.269E-02	FAIL ABUN
HG-203	8.438E-02	NOT IDENT.
BI-207	5.335E-02	FAIL ABUN
BI-211	4.651E-01	FAIL ABUN
PB-211	1.179E+00	NOT IDENT.
BI-212	8.733E-01	FAIL ABUN
RN-219	6.055E-01	NOT IDENT.
RA-223	8.578E-01	FAIL ABUN
RA-224	1.277E+00	FAIL ABUN
AC-227	3.574E-01	FAIL ABUN
TH-227	3.574E-01	FAIL ABUN
TH-229	5.835E-01	FAIL ABUN
TH-231	8.578E-01	FAIL ABUN
PA-233	8.529E-02	FAIL ABUN
PA-234	3.296E-01	FAIL ABUN
PA-234M	5.224E+00	NOT IDENT.
U-235	2.330E-01	FAIL ABUN
NP-237	8.529E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.686E-01	FAIL ABUN
PU-239	3.900E+02	FAIL ABUN
AM-241	6.602E-02	NOT IDENT.
CM-243	9.597E-02	FAIL ABUN
BK-247	1.058E-01	NOT IDENT.
CM-247	5.758E-02	NOT IDENT.
CF-249	6.547E-02	NOT IDENT.
CF-251	1.560E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677025.CNF;1
Acquisition date : 28-JUN-2016 11:38:00 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.49 Half life ratio : *****
Sample date : 11-MAY-2016 13:51:00 Nuclide Library : SOLID
Sample ID : G398677025 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4110E+02 GRAM
Quantity Err(%) : 1.4174E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.068E+00	1.265E+00	1.265E+00
MN-54	7.358E-02	3.619E-02	3.619E-02
GE-68	3.254E+00	1.813E+00	1.813E+00
NB-95M	2.902E-01	3.137E-01	3.137E-01
CD-109	4.403E-01	1.080E+00	1.080E+00
SN-126	4.097E-02	1.005E-01	1.005E-01
BA-137M	2.930E+00	2.588E-01	2.588E-01
CS-137	3.096E+00	2.732E-01	2.732E-01
TL-208	4.186E-01	9.391E-02	9.391E-02
PB-210	2.451E-01	1.393E+00	1.393E+00
PB-212	8.615E-01	1.591E-01	1.591E-01
BI-214	4.353E-01	2.027E-01	2.027E-01
PB-214	5.769E-01	2.130E-01	2.130E-01
RN-222	4.353E-01	2.027E-01	2.027E-01
RA-226	4.353E-01	2.027E-01	2.027E-01
AC-228	7.259E-01	3.025E-01	3.025E-01
RA-228	7.259E-01	3.025E-01	3.025E-01
TH-228	8.615E-01	1.591E-01	1.591E-01
TH-230	4.352E-01	2.026E-01	2.026E-01
PA-231	2.964E-01	8.513E-01	8.513E-01
TH-232	7.259E-01	3.025E-01	3.025E-01
TH-234	1.353E+00	1.743E+00	1.743E+00
U-234	4.352E-01	2.026E-01	2.026E-01
U-238	1.353E+00	1.743E+00	1.743E+00
AM-243	1.410E-01	8.346E-02	8.346E-02
ANH-511	1.030E-01	9.598E-02	9.598E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.221E+00	1.006E+00	1.146E+00	NOT IDENT.
NA-22	-2.573E-02	5.028E-02	5.160E-02	NOT IDENT.
NA-24	-2.232E+21	6.309E+21	0.000E+00	SHORT HLIF
AL-26	-4.351E-02	5.548E-02	5.885E-02	NOT IDENT.

SC-46	1.047E-02	7.337E-02	7.352E-02	FAIL ABUN
V-48	2.678E-01	3.432E-01	3.638E-01	FAIL ABUN
CR-51	2.513E-01	1.380E+00	1.385E+00	NOT IDENT.
CO-56	2.353E-02	7.383E-02	7.459E-02	NOT IDENT.
MN-56	1.000E+41	3.106E+41	0.000E+00	SHORT HLIF
CO-57	2.230E-02	3.227E-02	3.380E-02	NOT IDENT.
CO-58	-2.494E-02	8.022E-02	8.100E-02	NOT IDENT.
FE-59	3.996E-02	2.004E-01	2.013E-01	NOT IDENT.
CO-60	1.543E-02	5.097E-02	5.145E-02	NOT IDENT.
ZN-65	2.885E-02	1.336E-01	1.342E-01	NOT IDENT.
AS-73	3.656E-02	3.812E-01	3.815E-01	NOT IDENT.
AS-74	4.601E-01	5.537E-01	5.913E-01	NOT IDENT.
SE-75	-4.130E-03	8.094E-02	8.097E-02	NOT IDENT.
BR-77	1.913E+06	2.670E+06	2.806E+06	SHORT HLIF
SR-82	-2.324E-01	1.133E+00	1.138E+00	NOT IDENT.
RB-83	-3.770E-02	1.460E-01	1.470E-01	NOT IDENT.
KR-85	1.837E+01	1.485E+01	1.700E+01	NOT IDENT.
SR-85	1.369E-01	1.110E-01	1.270E-01	NOT IDENT.
RB-86	6.104E+00	4.207E+00	5.027E+00	NOT IDENT.
Y-88	-2.505E-02	6.599E-02	6.695E-02	NOT IDENT.
Y-91	-9.425E+00	3.686E+01	3.710E+01	NOT IDENT.
NB-94	4.702E-02	4.572E-02	5.039E-02	NOT IDENT.
NB-95	2.765E-02	8.664E-02	8.753E-02	NOT IDENT.
ZR-95	-1.780E-02	1.471E-01	1.473E-01	NOT IDENT.
NB-97	1.000E+41	5.125E+40	0.000E+00	SHORT HLIF
ZR-97	3.542E+20	3.650E+20	0.000E+00	SHORT HLIF
MO-99	7.816E+03	7.226E+04	7.235E+04	SHORT HLIF
TC-99M	-1.000E+41	1.170E+41	0.000E+00	SHORT HLIF
RH-101	-1.040E-02	4.734E-02	4.757E-02	NOT IDENT.
RH-102	3.565E-02	8.339E-02	8.492E-02	NOT IDENT.
RU-103	1.059E-01	1.380E-01	1.461E-01	FAIL ABUN
RH-106	3.518E-01	5.051E-01	5.294E-01	NOT IDENT.
RU-106	3.518E-01	5.051E-01	5.294E-01	NOT IDENT.
AG-108M	1.338E-02	5.019E-02	5.055E-02	NOT IDENT.
AG-110M	-3.974E-02	7.391E-02	7.605E-02	NOT IDENT.
SN-113	7.295E-03	1.005E-01	1.005E-01	NOT IDENT.
CD-115	-2.654E+05	5.094E+05	5.232E+05	SHORT HLIF
SN-117M	-2.741E-02	3.539E-01	3.541E-01	NOT IDENT.
TE-123M	6.624E-03	4.064E-02	4.075E-02	NOT IDENT.
SB-124	-2.523E-02	1.493E-01	1.497E-01	NOT IDENT.
SB-125	9.509E-03	1.646E-01	1.646E-01	FAIL ABUN
TE-125M	-1.458E+00	1.645E+01	1.646E+01	NOT IDENT.
I-126	-6.598E-01	2.127E+00	2.148E+00	NOT IDENT.
SB-126	8.984E-01	1.338E+00	1.398E+00	NOT IDENT.
SB-127	3.472E+01	5.792E+02	5.795E+02	SHORT HLIF
I-131	1.061E+00	3.346E+00	3.380E+00	NOT IDENT.
I-132	1.000E+41	3.309E+41	0.000E+00	SHORT HLIF
TE-132	-1.845E+02	1.379E+03	1.382E+03	SHORT HLIF
BA-133	5.481E-03	7.615E-02	7.619E-02	NOT IDENT.
I-133	-8.173E+14	2.236E+15	2.266E+15	SHORT HLIF
CS-134	2.668E-02	6.600E-02	6.708E-02	NOT IDENT.
CS-135	-2.208E-02	2.384E-01	2.387E-01	NOT IDENT.
I-135	-1.000E+41	1.902E+41	0.000E+00	SHORT HLIF
CS-136	-2.208E-02	6.201E-01	6.202E-01	FAIL ABUN
CE-139	1.581E-02	4.872E-02	4.923E-02	NOT IDENT.
BA-140	-1.483E-01	2.622E+00	2.623E+00	NOT IDENT.
LA-140	-5.791E-01	9.154E-01	9.519E-01	NOT IDENT.
CE-141	1.448E-01	1.650E-01	1.774E-01	NOT IDENT.
CE-143	7.988E+09	3.466E+09	4.998E+09	SHORT HLIF
CE-144	1.277E-01	2.769E-01	2.828E-01	NOT IDENT.
PM-144	-2.500E-03	4.759E-02	4.760E-02	NOT IDENT.
PR-144	-1.669E-01	3.627E+00	3.628E+00	NOT IDENT.
PM-146	-7.780E-03	7.928E-02	7.936E-02	NOT IDENT.
ND-147	-3.954E+00	6.927E+00	7.153E+00	NOT IDENT.
PM-147	-2.007E+01	8.733E+02	8.734E+02	NOT IDENT.
PM-149	3.068E+06	3.873E+06	4.112E+06	SHORT HLIF
EU-150	-1.328E-02	4.692E-02	4.730E-02	FAIL ABUN
EU-152	-2.266E-02	1.955E-01	1.958E-01	NOT IDENT.
GD-153	7.423E-02	1.414E-01	1.453E-01	FAIL ABUN
EU-154	-7.170E-02	1.401E-01	1.438E-01	NOT IDENT.
EU-155	-3.988E-02	1.122E-01	1.137E-01	FAIL ABUN
TB-160	1.598E-02	2.659E-01	2.660E-01	FAIL ABUN
HO-166M	1.361E-01	9.013E-02	1.090E-01	FAIL ABUN
TM-171	2.488E+00	6.282E+00	6.381E+00	NOT IDENT.
HF-172	-3.950E-02	2.708E-01	2.714E-01	FAIL ABUN
LU-172	-4.494E-02	9.439E-02	9.654E-02	FAIL ABUN
LU-176	1.186E-02	3.782E-02	3.820E-02	FAIL ABUN
HF-181	-9.444E-02	1.396E-01	1.459E-01	NOT IDENT.

TA-182	-9.153E-02	2.557E-01	2.590E-01	FAIL ABUN
RE-183	-2.201E-02	1.344E-01	1.348E-01	NOT IDENT.
RE-184	3.476E-01	2.995E-01	3.380E-01	NOT IDENT.
W-188	3.134E+00	1.744E+01	1.749E+01	FAIL ABUN
IR-192	3.704E-02	8.009E-02	8.181E-02	FAIL ABUN
HG-203	8.398E-02	8.914E-02	9.685E-02	NOT IDENT.
BI-207	5.410E-03	6.232E-02	6.237E-02	FAIL ABUN
BI-211	1.590E+00	5.874E-01	9.265E-01	FAIL ABUN
PB-211	7.294E-01	1.305E+00	1.346E+00	NOT IDENT.
BI-212	1.725E+00	8.512E-01	1.153E+00	FAIL ABUN
RN-219	-9.068E-02	7.091E-01	7.103E-01	NOT IDENT.
RA-223	-5.677E-01	1.026E+00	1.058E+00	FAIL ABUN
RA-224	1.352E+00	1.362E+00	1.492E+00	FAIL ABUN
AC-227	3.259E-01	3.822E-01	4.095E-01	FAIL ABUN
TH-227	3.259E-01	3.822E-01	4.095E-01	FAIL ABUN
TH-229	-6.149E-01	7.309E-01	7.817E-01	FAIL ABUN
TH-231	-5.677E-01	1.026E+00	1.058E+00	FAIL ABUN
PA-233	-5.435E-02	1.016E-01	1.045E-01	FAIL ABUN
PA-234	-7.719E-02	4.820E-01	4.832E-01	FAIL ABUN
PA-234M	-1.095E-01	6.205E+00	6.205E+00	NOT IDENT.
U-235	2.145E-01	2.540E-01	2.718E-01	FAIL ABUN
NP-237	-5.435E-02	1.016E-01	1.045E-01	FAIL ABUN
NP-238	7.559E+05	1.120E+06	1.171E+06	SHORT HLIF
NP-239	-9.820E-02	3.126E-01	3.158E-01	FAIL ABUN
PU-239	8.350E+02	8.610E+02	9.397E+02	FAIL ABUN
AM-241	1.161E-02	8.205E-02	8.221E-02	NOT IDENT.
CM-243	-2.389E-02	1.264E-01	1.269E-01	FAIL ABUN
BK-247	-6.229E-02	1.244E-01	1.276E-01	NOT IDENT.
CM-247	7.778E-03	6.599E-02	6.608E-02	NOT IDENT.
CF-249	3.538E-02	7.276E-02	7.449E-02	NOT IDENT.
CF-251	-6.860E-02	2.152E-01	2.174E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	127.1818	87.09	182.5008	136.47	86.9876
45.60	119.6931	87.57	202.2583	140.51	0.0000
46.54	119.8984	88.03	192.6596	143.76	99.8144
49.72	0.0000	88.34	161.9611	144.24	109.5221
51.35	142.7993	88.47	161.9873	145.44	109.6419
51.87	122.9473	89.96	141.9990	152.43	100.5948
52.39	129.2084	1093.63	142.1170	153.25	86.5955
52.97	144.9887	91.11	142.1982	323.87	91.0015
53.44	136.4810	92.59	191.2939	156.02	105.2516
54.07	137.8641	93.35	172.7288	158.56	95.6961
57.36	0.0000	94.56	114.2307	159.00	87.0288
57.53	134.9602	94.65	97.9226	162.33	93.8224
57.98	138.1616	94.67	97.9248	162.66	97.1224
59.27	139.9996	94.87	97.9481	163.33	100.4530
59.32	140.0106	97.43	98.2430	165.86	85.7853
59.54	140.0589	98.43	114.7502	176.31	123.6040
60.96	134.1307	98.44	114.7515	176.60	107.7374
61.17	149.1908	99.53	91.9169	177.52	123.7245
62.93	149.5932	100.11	90.3358	181.07	0.0000
63.29	149.6748	102.03	113.5784	181.52	109.9327
63.58	149.7405	103.18	95.5956	184.41	115.5139
64.28	195.9452	103.37	107.1560	143.76	121.1913
66.73	177.7791	105.21	110.4740	193.51	114.0878
67.24	181.0604	105.31	110.4866	197.03	91.9607
125.81	168.5727	106.12	96.1166	198.01	98.7617
67.75	177.2555	106.47	102.3570	201.83	108.0454
69.67	170.6379	109.28	120.3034	203.43	105.5973
70.83	191.4922	111.00	115.3317	205.31	100.7985
72.81	169.8070	111.76	0.0000	210.85	95.1607
72.87	169.8214	114.06	110.4969	215.65	81.8448
74.66	156.1208	116.30	0.0000	222.11	94.3951
74.82	156.1549	116.74	118.1257	227.09	101.8480
74.97	156.1873	119.76	119.5438	227.38	105.9431
77.11	156.6407	121.12	103.9590	228.16	0.0000
78.74	129.5852	121.22	103.9696	228.18	106.6379
79.69	131.3501	121.78	94.5713	116.74	106.6379
80.12	131.4242	122.06	96.7007	235.69	64.5372
80.19	152.2737	122.92	100.9927	235.96	64.5488
80.57	152.3496	123.07	103.8137	238.63	86.2171
81.00	184.5271	265.00	97.7012	238.98	0.0000
81.07	184.5440	125.81	114.7903	240.99	87.8936
81.75	200.7683	127.23	131.8561	242.00	89.4946
83.79	148.9592	127.91	116.7207	244.70	68.0119
84.00	148.9993	129.30	100.5758	252.40	0.0000
85.43	138.7810	131.20	100.7628	252.80	98.8212
86.55	163.6203	133.02	79.9017	254.15	0.0000
86.79	182.4319	133.52	88.4444	256.23	75.6782
86.94	182.4671	136.00	88.6533	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	82.6515	355.39	0.0000	584.27	16.3217
264.80	87.3544	356.01	57.6448	595.83	20.0310
265.00	93.0022	364.49	60.5368	427.87	29.7061
268.22	90.3621	366.42	0.0000	602.52	0.0000
269.46	96.0820	372.51	60.7766	604.72	38.3607
270.03	98.9425	375.05	68.8332	607.14	38.3923
271.23	75.4404	377.52	76.9060	609.32	36.0699
273.65	84.9946	356.01	83.1520	610.33	36.0819
276.40	84.1893	388.16	63.2453	614.28	29.3242
277.37	83.2917	388.63	73.3012	618.01	34.4086
277.60	83.3024	391.69	69.3849	620.36	27.5488
278.00	75.7480	264.66	63.6191	621.93	22.9701
279.20	60.6414	401.81	62.6426	630.19	0.0000
279.54	60.6539	402.40	61.6493	631.29	23.9650
279.70	64.4506	404.85	60.7075	633.25	25.8256
280.46	75.8584	410.95	64.9367	634.78	21.2246
283.69	75.0539	413.71	60.9551	635.95	24.9258
284.31	70.3289	414.70	63.0157	636.99	24.0111
285.41	58.0111	423.72	64.2935	645.85	17.5987
285.90	0.0000	427.09	50.0814	657.76	31.8827
287.50	76.1738	427.87	55.2109	657.90	0.0000
290.67	73.1347	433.94	47.1584	661.66	23.2778
293.27	0.0000	439.40	58.5753	664.57	0.0000
351.93	78.1087	453.88	57.9093	666.33	27.1768
295.96	28.7051	463.37	47.7604	666.50	27.1779
879.38	28.7479	468.07	69.3547	667.71	0.0000
299.98	70.3291	473.00	0.0000	677.62	16.0449
300.09	70.3336	475.06	89.7279	685.70	0.0000
300.13	75.1300	476.78	63.6896	695.00	17.8821
301.36	70.3837	477.60	50.1334	696.49	20.7150
302.85	57.6350	482.18	58.5990	696.51	20.7154
256.23	60.8934	487.02	37.7455	697.00	19.7768
304.85	56.0974	492.35	0.0000	697.30	19.7785
306.78	55.8370	497.08	46.3214	697.49	19.7798
308.46	70.3436	505.52	44.0130	702.65	14.1513
311.90	76.2709	507.63	0.0000	706.68	34.0063
316.51	73.5601	511.00	49.7539	711.68	14.1913
319.41	79.4936	514.00	42.3938	720.70	14.6376
320.08	71.7634	514.00	42.3938	721.93	0.0000
321.04	76.6528	520.40	36.1250	722.78	14.6470
323.87	77.7422	520.69	0.0000	722.91	14.6476
325.23	69.0465	522.65	0.0000	723.31	14.6495
328.76	53.5874	527.90	0.0000	724.19	19.5377
333.37	63.4861	528.26	35.1688	727.33	22.8159
333.97	63.5059	529.59	34.1211	733.00	24.2839
334.37	63.5194	529.87	0.0000	735.93	24.7823
338.28	60.3862	531.02	36.2736	333.97	21.9331
338.32	60.3870	537.26	36.3599	739.50	0.0000
311.90	76.7948	546.56	0.0000	747.24	27.7362
340.48	76.7948	552.55	29.0408	748.06	24.8733
340.55	73.5297	563.25	23.7563	752.31	13.4104
344.28	76.9459	569.33	23.8095	753.82	17.2496
345.93	78.6504	946.00	23.8111	756.73	22.0604
351.06	82.1431	569.70	23.8127	756.80	22.0609
351.93	64.1002	583.19	20.6662	884.68	22.1076

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	22.1198	1274.44	15.3421	1620.50	1.9873
766.42	24.0473	1001.03	15.3598	1621.92	1.9878
766.84	25.0124	1002.74	15.3662	1678.03	0.0000
772.60	0.0000	1004.73	12.2988	1690.97	4.0212
776.52	20.2600	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.3403
778.90	18.3432	1028.54	0.0000	1063.66	1.7817
783.70	0.0000	1037.84	5.1652	1771.35	15.2747
785.37	16.4432	1038.76	0.0000	1791.20	0.0000
792.07	27.1353	631.29	6.2109	1808.65	8.1939
794.95	16.4885	1048.07	8.2842	1810.72	0.0000
795.86	21.1674	1049.04	10.3577	1836.06	5.1428
810.06	15.0290	1050.41	9.3248		
810.29	15.0299	1063.66	10.3931		
344.28	18.3707	1077.00	7.1484		
810.76	16.7024	1077.34	9.3831		
815.77	17.5620	1085.87	10.0281		
1048.07	14.6463	1093.63	17.7900		
832.01	6.7208	1099.45	12.5742		
834.85	16.6752	1112.07	6.3049		
835.71	19.6224	1112.84	5.4051		
836.80	0.0000	1115.54	10.8168		
846.75	0.0000	1120.29	14.4375		
846.77	15.7458	1120.55	14.4386		
856.80	27.6309	1221.41	12.6357		
860.56	10.1604	1129.67	15.8240		
871.09	16.9821	1131.51	0.0000		
873.19	16.9918	1147.95	0.0000		
875.33	0.0000	1173.23	15.9753		
879.38	17.8711	1177.95	11.7269		
880.51	15.8900	1189.05	9.6178		
883.24	15.1789	1204.77	12.8662		
884.68	15.9076	1221.41	11.8352		
889.28	11.9453	1231.02	12.9370		
894.76	8.5447	1235.36	15.1069		
898.04	15.3937	1238.28	8.6377		
900.72	12.9799	1260.41	0.0000		
903.28	5.9946	1271.87	3.7274		
911.20	12.0142	1274.44	11.1881		
912.08	10.3002	1274.54	11.1885		
923.98	0.0000	1291.59	6.5488		
926.50	8.0412	1298.22	0.0000		
929.11	23.1338	1312.11	7.5151		
937.49	20.7351	1332.49	7.5452		
944.13	15.5777	1362.66	0.0000		
946.00	15.5849	1365.19	11.3898		
949.00	13.6472	1368.63	0.0000		
667.71	0.0000	1384.29	9.5260		
962.31	17.3877	1408.01	7.6551		
964.08	20.8744	1457.56	0.0000		
966.17	19.1449	1460.82	3.8651		
911.20	15.2396	1489.16	5.8274		
968.97	15.2396	1505.03	8.7658		
983.53	7.1374	1584.12	9.8755		
984.45	0.0000	1596.21	12.8644		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:41:15.59

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677026.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;261
Background date    : 26-JUN-2016 12:05:51
Sample date       : 11-MAY-2016 14:35:00 Acquisition date : 28-JUN-2016 11:38:22
Sample ID        : G398677026 Sample quantity : 1.42640E+02 GRAM
Detector name    : GAM32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.59 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1572486 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	64.48*	13	127	1.46	130.05	125	8	3.64E-03	157.1	
2	1	74.99	74	120	1.27	151.08	147	16	2.06E-02	29.9	2.31E+00
3	1	77.33*	118	127	1.20	155.77	147	16	3.28E-02	18.4	
4	0	84.65*	24	96	0.97	170.40	168	6	6.62E-03	69.4	
5	0	87.24	39	108	1.03	175.59	174	6	1.08E-02	44.9	
6	0	116.28	32	157	0.66	233.69	228	11	8.87E-03	78.4	
7	0	157.99	28	56	1.39	317.12	315	5	7.64E-03	45.0	
8	0	160.74	17	76	0.94	322.62	321	6	4.67E-03	85.2	
9	0	163.35	21	145	1.46	327.85	326	10	5.70E-03	111.4	
10	0	174.83	25	49	0.85	350.82	349	5	6.81E-03	47.0	
11	0	185.95*	46	176	1.78	373.05	368	12	1.27E-02	61.3	
12	2	238.95*	216	99	1.12	479.08	474	17	5.99E-02	10.2	1.34E+00
13	2	242.13	55	122	1.63	485.43	474	17	1.53E-02	41.6	
14	0	292.05	27	82	0.64	585.30	579	10	7.61E-03	64.8	
15	0	295.37*	88	41	1.51	591.96	589	7	2.45E-02	16.3	
16	0	306.87	45	85	4.80	614.96	608	14	1.26E-02	45.3	
17	0	339.21	74	137	1.86	679.66	674	16	2.07E-02	36.5	
18	0	352.34*	133	98	1.44	705.92	701	11	3.70E-02	16.9	
19	0	464.67	60	79	0.69	930.64	924	15	1.66E-02	34.8	
20	0	486.60	12	64	1.61	974.51	967	12	3.40E-03	139.8	
21	0	511.39*	15	63	2.12	1024.11	1016	14	4.08E-03	133.6	
22	0	518.71	23	47	3.79	1038.76	1030	15	6.44E-03	68.6	
23	0	583.78*	77	27	1.24	1168.93	1164	11	2.13E-02	18.2	
24	0	609.89*	111	45	1.41	1221.16	1213	15	3.09E-02	16.5	
25	0	662.08*	1311	31	1.40	1325.58	1318	14	3.64E-01	2.9	
26	0	726.92	39	4	2.98	1455.28	1448	15	1.09E-02	19.3	
27	0	862.14	10	11	1.79	1725.80	1717	11	2.78E-03	71.6	
28	0	912.25*	49	15	1.71	1826.05	1817	14	1.36E-02	22.1	
29	0	940.16	10	3	0.71	1881.89	1878	7	2.71E-03	44.8	
30	0	969.56*	34	10	1.72	1940.72	1936	11	9.51E-03	26.3	
31	0	974.91	6	1	0.76	1951.42	1948	6	1.55E-03	54.6	
32	0	1014.94	5	6	1.30	2031.50	2025	8	1.40E-03	95.1	
33	0	1027.41	6	4	0.86	2056.44	2052	6	1.57E-03	72.4	
34	0	1120.79*	24	6	0.96	2243.28	2236	12	6.55E-03	30.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1161.88	8	2	1.27	2325.48	2321	8	2.24E-03	46.5	
36	0	1165.42	9	0	0.83	2332.56	2329	7	2.50E-03	33.3	
37	0	1175.13	8	5	0.92	2351.98	2347	7	2.14E-03	61.2	
38	0	1204.56	6	9	0.55	2410.87	2401	12	1.73E-03	104.0	
39	4	1239.02	20	12	2.08	2479.81	2474	14	5.48E-03	39.2	2.98E+00
40	4	1241.76	7	6	1.29	2485.29	2474	14	1.98E-03	61.1	
41	0	1378.21	7	0	0.58	2758.29	2755	6	1.94E-03	37.8	
42	0	1461.52*	129	0	1.77	2924.96	2919	13	3.58E-02	9.0	
43	0	1764.88	15	3	1.81	3531.90	3526	11	4.28E-03	32.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:41:17

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677026.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:35:00 Acquisition date : 28-JUN-2016 11:38:22
Sample ID        : G398677026 Sample quantity  : 142.64 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.59 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.119E+00	5.460E+00	5.460E+00	18.03	OK
Y-91	1204.77	0.26*	1.331E+00	9.272E+00	1.635E+01	207.94	OK
CD-109	88.03	3.70*	4.968E+00	7.138E-01	7.670E-01	173.09	OK
SN-117M	156.02	2.11	5.965E+00	----- Line	Not Found	-----	Absent
	158.56	86.40*	5.933E+00	3.287E-02	3.775E-01	90.05	OK
TE-123M	159.00	84.00*	5.933E+00	3.381E-02	4.466E-02	90.05	OK
SN-126	64.28	9.60	2.285E+00	3.914E-01	3.914E-01	314.20	OK
	86.94	8.90	4.968E+00	2.967E-01	2.967E-01	173.09	OK
	87.57	37.00*	4.968E+00	7.138E-02	7.138E-02	173.09	OK
BA-137M	661.66	89.90*	2.271E+00	3.491E+00	3.502E+00	5.82	OK
CS-137	661.66	85.10*	2.271E+00	3.688E+00	3.700E+00	5.82	OK
TL-208	277.37	6.60	4.192E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.502E+00	1.986E-01	1.986E-01	36.35	OK
	860.56	12.50	1.820E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.684E+00	8.784E-01	8.784E-01	87.72	OK
	77.11	17.10	3.966E+00	1.128E+00	1.128E+00	36.89	OK
	238.63	43.60*	4.641E+00	6.321E-01	6.321E-01	20.36	OK
	300.09	3.30	3.972E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.421E+00	5.522E-01	5.523E-01	32.99	OK
	1120.29	14.92	1.424E+00	5.747E-01	5.747E-01	61.65	OK
	1764.49	15.30	9.782E-01	5.111E-01	5.111E-01	65.59	OK
PB-214	74.82	5.80	3.663E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.966E+00	1.989E+00	1.989E+00	36.89	OK
	87.09	3.41	4.955E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.601E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.015E+00	6.958E-01	6.959E-01	32.53	OK
	351.93	35.60*	3.561E+00	6.028E-01	6.028E-01	33.70	OK
RN-222	609.32	45.49*	2.421E+00	5.522E-01	5.523E-01	32.99	OK
	1120.29	14.92	1.424E+00	5.747E-01	5.747E-01	61.65	OK
	1764.49	15.30	9.782E-01	5.111E-01	5.111E-01	65.59	OK
RA-224	240.99	4.10*	4.599E+00	4.952E-01	4.952E-01	300.98	OK
RA-226	609.32	45.49*	2.421E+00	5.522E-01	5.523E-01	32.99	OK
	1120.29	14.92	1.424E+00	5.747E-01	5.747E-01	61.65	OK
	1764.49	15.30	9.782E-01	5.111E-01	5.111E-01	65.59	OK
AC-228	105.21	1.10	5.988E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.654E+00	1.041E+00	1.041E+00	72.99	OK
	794.95	4.25	1.951E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.868E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.726E+00	5.820E-01	5.820E-01	44.24	OK
	968.97	15.80	1.632E+00	6.972E-01	6.972E-01	52.65	OK
RA-228	105.21	1.10	5.988E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.654E+00	1.041E+00	1.041E+00	72.99	OK
	794.95	4.25	1.951E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.868E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.726E+00	5.820E-01	5.820E-01	44.24	OK
	968.97	15.80	1.632E+00	6.972E-01	6.972E-01	52.65	OK
TH-228	74.82	10.28	3.684E+00	8.784E-01	8.784E-01	87.72	OK
	77.11	17.10	3.966E+00	1.128E+00	1.128E+00	36.89	OK
	238.63	43.60*	4.641E+00	6.321E-01	6.321E-01	20.36	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	300.09	3.30	3.972E+00	----- Line	Not Found	-----	Absent
	85.43	14.70	4.737E+00	2.201E-01	2.201E-01	138.83	OK
	88.47	24.00	4.968E+00	1.100E-01	1.100E-01	173.09	OK
	193.51	4.41*	5.324E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	5.043E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.421E+00	5.522E-01	5.522E-01	32.99	OK
	1120.29	14.92	1.424E+00	5.747E-01	5.747E-01	61.65	OK
	1764.49	15.30	9.782E-01	5.111E-01	5.111E-01	65.59	OK
TH-232	105.21	1.10	5.988E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.654E+00	1.041E+00	1.041E+00	72.99	OK
	835.71	1.61	1.868E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.726E+00	5.820E-01	5.820E-01	44.24	OK
U-234	968.97	15.80	1.632E+00	6.972E-01	6.972E-01	52.65	OK
	609.32	45.49*	2.421E+00	5.522E-01	5.522E-01	32.99	OK
	1120.29	14.92	1.424E+00	5.747E-01	5.747E-01	61.65	OK
	1764.49	15.30	9.782E-01	5.111E-01	5.111E-01	65.59	OK
AM-243	43.53	5.90	1.916E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.684E+00	1.344E-01	1.344E-01	87.72	OK
ANH-511	511.00	100.00*	2.756E+00	2.962E-02	2.962E-02	267.15	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677026.CNF;1
Acquisition date : 28-JUN-2016 11:38:22 Sensitivity : 3.000
Detector ID : GAM32 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.59 Half life ratio : *****
Sample date : 11-MAY-2016 14:35:00 Analyst initials: MXR1
Sample ID : G398677026 Sample Quantity : 1.4264E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 6-AUG-2015 09:24:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.460E+00	9.650E-01	4.993E-01
Y-91	1.635E+01	3.332E+01	5.787E+01
CD-109	7.670E-01	1.301E+00	1.874E+00
SN-117M	3.775E-01	3.332E-01	6.548E-01
TE-123M	4.466E-02	3.942E-02	7.708E-02
SN-126	7.138E-02	1.211E-01	1.871E-01
BA-137M	3.502E+00	1.997E-01	6.542E-02
CS-137	3.700E+00	2.109E-01	6.911E-02
TL-208	1.986E-01	7.075E-02	7.156E-02
PB-212	6.321E-01	1.261E-01	1.359E-01
BI-214	5.523E-01	1.786E-01	1.333E-01
PB-214	6.028E-01	1.991E-01	1.775E-01
RN-222	5.523E-01	1.786E-01	1.333E-01
RA-224	4.952E-01	1.461E+00	1.456E+00
RA-226	5.523E-01	1.786E-01	1.333E-01
AC-228	5.820E-01	2.523E-01	2.464E-01
RA-228	5.820E-01	2.523E-01	2.464E-01
TH-228	6.321E-01	1.261E-01	1.359E-01
TH-229	2.904E-01	6.996E-01	1.334E+00
TH-230	5.522E-01	1.785E-01	1.333E-01
TH-232	5.820E-01	2.523E-01	2.464E-01
U-234	5.522E-01	1.785E-01	1.333E-01
AM-243	1.344E-01	1.155E-01	1.272E-01
ANH-511	2.962E-02	7.756E-02	7.607E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.486E-01	7.337E-01	1.447E+00	NOT IDENT.
NA-22	4.900E-03	3.936E-02	8.079E-02	NOT IDENT.
NA-24	0.000E+00	3.376E+21	0.000E+00	SHORT HLIF
AL-26	2.452E-02	3.175E-02	8.000E-02	NOT IDENT.
SC-46	1.275E-02	4.084E-02	8.553E-02	FAIL ABUN
V-48	-8.029E-02	2.367E-01	4.355E-01	NOT IDENT.

CR-51	-1.584E-01	1.148E+00	2.079E+00	NOT IDENT.
MN-54	1.282E-03	3.461E-02	6.764E-02	NOT IDENT.
CO-56	4.376E-03	4.402E-02	8.800E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.847E-03	3.281E-02	6.129E-02	NOT IDENT.
CO-58	-9.228E-03	4.481E-02	8.514E-02	NOT IDENT.
FE-59	-1.121E-01	1.332E-01	2.299E-01	NOT IDENT.
CO-60	-1.153E-02	3.697E-02	7.052E-02	NOT IDENT.
ZN-65	5.084E-02	8.403E-02	1.693E-01	NOT IDENT.
GE-68	2.157E-02	1.258E+00	2.433E+00	NOT IDENT.
AS-73	1.544E+00	2.491E+00	4.817E+00	NOT IDENT.
AS-74	1.645E-01	4.203E-01	8.245E-01	NOT IDENT.
SE-75	-3.291E-02	7.134E-02	1.274E-01	NOT IDENT.
BR-77	0.000E+00	2.777E+05	0.000E+00	SHORT HLIF
SR-82	5.359E-02	7.585E-01	1.487E+00	NOT IDENT.
RB-83	-7.017E-02	1.282E-01	1.970E-01	NOT IDENT.
KR-85	1.222E+01	1.414E+01	1.894E+01	NOT IDENT.
SR-85	9.123E-02	1.057E-01	1.416E-01	NOT IDENT.
RB-86	1.333E-01	2.370E+00	4.642E+00	NOT IDENT.
Y-88	3.120E-02	3.010E-02	9.185E-02	NOT IDENT.
NB-94	-8.264E-03	3.437E-02	6.380E-02	NOT IDENT.
NB-95	2.253E-02	5.562E-02	1.127E-01	NOT IDENT.
NB-95M	1.433E-02	2.413E-01	3.942E-01	NOT IDENT.
ZR-95	-6.390E-02	8.915E-02	1.540E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.575E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.236E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.774E-02	3.979E-02	7.392E-02	NOT IDENT.
RH-102	5.276E-03	6.118E-02	1.184E-01	NOT IDENT.
RU-103	1.717E-02	8.649E-02	1.686E-01	FAIL ABUN
RH-106	4.326E-02	3.646E-01	7.085E-01	NOT IDENT.
RU-106	4.326E-02	3.646E-01	7.085E-01	NOT IDENT.
AG-108M	1.576E-02	4.383E-02	8.137E-02	NOT IDENT.
AG-110M	1.304E-02	4.072E-02	8.633E-02	NOT IDENT.
SN-113	-1.823E-02	7.798E-02	1.385E-01	NOT IDENT.
CD-115	0.000E+00	3.875E+05	0.000E+00	SHORT HLIF
SB-124	6.872E-03	5.866E-02	1.569E-01	NOT IDENT.
SB-125	9.447E-02	1.363E-01	2.599E-01	FAIL ABUN
TE-125M	1.447E+01	1.724E+01	3.459E+01	NOT IDENT.
I-126	-5.818E-01	1.524E+00	2.363E+00	NOT IDENT.
SB-126	2.742E-01	7.351E-01	1.393E+00	NOT IDENT.
SB-127	0.000E+00	4.199E+02	0.000E+00	SHORT HLIF
I-131	-1.795E+00	2.416E+00	4.120E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.158E+03	0.000E+00	SHORT HLIF
BA-133	7.963E-04	6.509E-02	1.039E-01	NOT IDENT.
I-133	0.000E+00	1.790E+15	0.000E+00	SHORT HLIF
CS-134	-4.387E-03	3.753E-02	7.162E-02	NOT IDENT.
CS-135	1.136E-01	2.000E-01	3.837E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-1.076E-01	5.562E-01	1.035E+00	FAIL ABUN
CE-139	3.426E-02	4.813E-02	8.435E-02	NOT IDENT.
BA-140	-1.373E+00	1.897E+00	3.368E+00	FAIL ABUN
LA-140	-4.369E-01	5.285E-01	8.603E-01	FAIL ABUN
CE-141	3.421E-02	1.510E-01	2.885E-01	NOT IDENT.
CE-143	0.000E+00	3.487E+09	0.000E+00	SHORT HLIF
CE-144	-9.675E-02	2.574E-01	4.793E-01	NOT IDENT.
PM-144	1.337E-02	3.836E-02	7.621E-02	NOT IDENT.
PR-144	8.220E-01	2.947E+00	5.804E+00	NOT IDENT.
PM-146	1.752E-03	6.210E-02	1.180E-01	NOT IDENT.
ND-147	3.119E+00	5.534E+00	1.109E+01	NOT IDENT.
PM-147	-8.439E+02	1.030E+03	1.621E+03	NOT IDENT.
PM-149	0.000E+00	4.293E+06	0.000E+00	SHORT HLIF
EU-150	-1.118E-02	4.312E-02	6.680E-02	FAIL ABUN
EU-152	5.056E-02	1.562E-01	2.572E-01	NOT IDENT.
GD-153	-6.832E-02	1.131E-01	2.111E-01	NOT IDENT.
EU-154	-1.148E-02	1.138E-01	2.236E-01	NOT IDENT.
EU-155	-1.999E-02	1.211E-01	2.315E-01	FAIL ABUN
TB-160	1.106E-01	1.495E-01	3.309E-01	FAIL ABUN
HO-166M	1.783E-02	5.738E-02	1.155E-01	NOT IDENT.
TM-171	1.270E+01	4.275E+01	8.102E+01	NOT IDENT.
HF-172	-2.009E-01	2.420E-01	4.399E-01	NOT IDENT.
LU-172	3.429E-02	5.690E-02	1.256E-01	FAIL ABUN
LU-176	0.000E+00	6.400E-02	6.670E-02	FAIL ABUN
HF-181	-3.080E-02	1.275E-01	2.045E-01	NOT IDENT.
TA-182	1.068E-01	2.166E-01	4.553E-01	FAIL ABUN
RE-183	1.340E-01	5.105E-01	9.608E-01	FAIL ABUN

RE-184	-1.636E-01	2.796E-01	4.485E-01	NOT IDENT.
W-188	1.581E+01	2.007E+01	2.675E+01	FAIL ABUN
IR-192	-6.122E-03	6.639E-02	1.206E-01	FAIL ABUN
HG-203	1.463E-03	8.509E-02	1.565E-01	NOT IDENT.
BI-207	-8.970E-03	5.974E-02	1.096E-01	FAIL ABUN
PB-210	-1.165E+01	1.062E+01	1.849E+01	NOT IDENT.
BI-211	0.000E+00	5.486E-01	8.183E-01	FAIL ABUN
PB-211	5.026E-01	9.695E-01	1.837E+00	NOT IDENT.
BI-212	0.000E+00	5.684E-01	1.197E+00	FAIL ABUN
RN-219	4.509E-02	5.603E-01	1.023E+00	NOT IDENT.
RA-223	5.080E-01	8.395E-01	1.611E+00	FAIL ABUN
AC-227	-2.383E-02	3.129E-01	5.771E-01	NOT IDENT.
TH-227	-2.383E-02	3.129E-01	5.771E-01	NOT IDENT.
PA-231	6.045E-01	7.022E-01	1.228E+00	NOT IDENT.
TH-231	5.080E-01	8.395E-01	1.611E+00	FAIL ABUN
PA-233	5.473E-03	1.003E-01	1.617E-01	FAIL ABUN
PA-234	5.361E-02	2.335E-01	4.641E-01	NOT IDENT.
PA-234M	-1.464E+00	3.847E+00	7.191E+00	NOT IDENT.
TH-234	1.015E+00	3.127E+00	4.144E+00	FAIL ABUN
U-235	-4.739E-02	2.357E-01	4.399E-01	FAIL ABUN
NP-237	5.473E-03	1.003E-01	1.617E-01	FAIL ABUN
NP-238	0.000E+00	7.642E+05	0.000E+00	SHORT HLIF
U-238	1.015E+00	3.127E+00	4.144E+00	FAIL ABUN
NP-239	4.056E-01	6.235E-01	6.343E-01	FAIL ABUN
PU-239	3.284E+02	4.209E+02	8.329E+02	NOT IDENT.
AM-241	-2.621E-02	3.026E-01	4.927E-01	NOT IDENT.
CM-243	-3.715E-02	1.183E-01	2.246E-01	NOT IDENT.
BK-247	-8.287E-02	1.075E-01	1.873E-01	FAIL ABUN
CM-247	-3.236E-05	5.194E-02	9.409E-02	NOT IDENT.
CF-249	2.771E-02	5.550E-02	1.049E-01	NOT IDENT.
CF-251	-1.110E-02	1.768E-01	2.906E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	124	10.66*	1.119E+00	5.460E+00	5.460E+00	18.03
Y-91	1204.77	6	0.26*	1.331E+00	9.272E+00	1.635E+01	207.94
CD-109	88.03	47	3.70*	4.968E+00	1.355E+00	1.456E+00	89.86
SN-117M	156.02	-----	2.11	5.965E+00	-----	Line Not Found	-----
	158.56	32	86.40*	5.933E+00	3.287E-02	3.775E-01	90.05
TE-123M	159.00	32	84.00*	5.933E+00	3.381E-02	4.466E-02	90.05
SN-126	64.28	16	9.60	2.285E+00	3.914E-01	3.914E-01	314.20
	86.94	47	8.90	4.968E+00	5.634E-01	5.634E-01	89.86
	87.57	47	37.00*	4.968E+00	1.355E-01	1.355E-01	89.86
BA-137M	661.66	1354	89.90*	2.271E+00	3.491E+00	3.502E+00	5.82
CS-137	661.66	1354	85.10*	2.271E+00	3.688E+00	3.700E+00	5.82
TL-208	277.37	-----	6.60	4.192E+00	-----	Line Not Found	-----
	583.19	80	85.00*	2.502E+00	1.986E-01	1.986E-01	36.35
	860.56	-----	12.50	1.820E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.416E+00	-----	Line Not Found	-----
	351.06	145	12.92*	3.561E+00	1.661E+00	1.661E+00	33.70
PB-212	74.82	91	10.28	3.684E+00	1.271E+00	1.271E+00	59.79
	77.11	145	17.10	3.966E+00	1.128E+00	1.128E+00	36.89
	238.63	243	43.60*	4.641E+00	6.321E-01	6.321E-01	20.36
	300.09	-----	3.30	3.972E+00	-----	Line Not Found	-----
BI-214	609.32	116	45.49*	2.421E+00	5.522E-01	5.523E-01	32.99
	1120.29	23	14.92	1.424E+00	5.747E-01	5.747E-01	61.65
	1764.49	15	15.30	9.782E-01	5.111E-01	5.111E-01	65.59
PB-214	74.82	91	5.80	3.684E+00	2.253E+00	2.253E+00	59.79
	77.11	145	9.70	3.966E+00	1.989E+00	1.989E+00	36.89
	87.09	47	3.41	4.968E+00	1.470E+00	1.470E+00	89.86
	242.00	62	7.25	4.599E+00	9.759E-01	9.759E-01	83.20
	295.22	98	18.42	4.015E+00	6.958E-01	6.959E-01	32.53
	351.93	145	35.60*	3.561E+00	6.028E-01	6.028E-01	33.70
RN-222	609.32	116	45.49*	2.421E+00	5.522E-01	5.523E-01	32.99
	1120.29	23	14.92	1.424E+00	5.747E-01	5.747E-01	61.65
	1764.49	15	15.30	9.782E-01	5.111E-01	5.111E-01	65.59
RA-224	240.99	62	4.10*	4.599E+00	1.726E+00	1.726E+00	83.20
RA-226	609.32	116	45.49*	2.421E+00	5.522E-01	5.523E-01	32.99
	1120.29	23	14.92	1.424E+00	5.747E-01	5.747E-01	61.65
	1764.49	15	15.30	9.782E-01	5.111E-01	5.111E-01	65.59
AC-228	105.21	-----	1.10	5.988E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.654E+00	1.041E+00	1.041E+00	72.99
	794.95	-----	4.25	1.951E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.868E+00	-----	Line Not Found	-----
	911.20	49	25.80*	1.726E+00	5.820E-01	5.820E-01	44.24
	968.97	34	15.80	1.632E+00	6.972E-01	6.972E-01	52.65
RA-228	105.21	-----	1.10	5.988E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.654E+00	1.041E+00	1.041E+00	72.99
	794.95	-----	4.25	1.951E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.868E+00	-----	Line Not Found	-----
	911.20	49	25.80*	1.726E+00	5.820E-01	5.820E-01	44.24

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	34	15.80	1.632E+00	6.972E-01	6.972E-01	52.65
	74.82	91	10.28	3.684E+00	1.271E+00	1.271E+00	59.79
	77.11	145	17.10	3.966E+00	1.128E+00	1.128E+00	36.89
	238.63	243	43.60*	4.641E+00	6.321E-01	6.321E-01	20.36
TH-229	300.09	-----	3.30	3.972E+00	-----	Line Not Found	-----
	85.43	29	14.70	4.737E+00	2.201E-01	2.201E-01	138.83
	88.47	47	24.00	4.968E+00	2.089E-01	2.089E-01	89.86
	193.51	-----	4.41*	5.324E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	5.043E+00	-----	Line Not Found	-----
	609.32	116	45.49*	2.421E+00	5.522E-01	5.522E-01	32.99
	1120.29	23	14.92	1.424E+00	5.747E-01	5.747E-01	61.65
	1764.49	15	15.30	9.782E-01	5.111E-01	5.111E-01	65.59
TH-232	105.21	-----	1.10	5.988E+00	-----	Line Not Found	-----
	338.32	81	11.27	3.654E+00	1.041E+00	1.041E+00	72.99
	835.71	-----	1.61	1.868E+00	-----	Line Not Found	-----
	911.20	49	25.80*	1.726E+00	5.820E-01	5.820E-01	44.24
U-234	968.97	34	15.80	1.632E+00	6.972E-01	6.972E-01	52.65
	609.32	116	45.49*	2.421E+00	5.522E-01	5.522E-01	32.99
	1120.29	23	14.92	1.424E+00	5.747E-01	5.747E-01	61.65
	1764.49	15	15.30	9.782E-01	5.111E-01	5.111E-01	65.59
AM-243	43.53	-----	5.90	1.916E-01	-----	Line Not Found	-----
	74.66	91	67.20*	3.684E+00	1.944E-01	1.944E-01	59.79
ANH-511	511.00	16	100.00*	2.756E+00	2.962E-02	2.962E-02	267.15

Flag: "*" = Keyline

Total number of lines in spectrum 43
Number of unidentified lines 11
Number of lines tentatively identified by NID 32 74.42%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.460E+00	5.460E+00	0.985E+00	18.03	
Y-91	58.51D	1.76	9.272E+00	1.635E+01	3.400E+01	207.94	
CD-109	461.40D	1.07	1.355E+00	1.456E+00	1.309E+00	89.86	
SN-117M	13.60D	11.5	3.287E-02	3.775E-01	3.400E-01	90.05	
TE-123M	119.20D	1.32	3.381E-02	4.466E-02	4.022E-02	90.05	
SN-126	2.30E+05Y	1.00	1.355E-01	1.355E-01	1.218E-01	89.86	
BA-137M	30.08Y	1.00	3.491E+00	3.502E+00	0.204E+00	5.82	
CS-137	30.08Y	1.00	3.688E+00	3.700E+00	0.215E+00	5.82	
TL-208	1.41E+10Y	1.00	1.986E-01	1.986E-01	0.722E-01	36.35	
BI-211	7.04E+08Y	1.00	1.661E+00	1.661E+00	0.560E+00	33.70	
PB-212	1.41E+10Y	1.00	6.321E-01	6.321E-01	1.287E-01	20.36	
BI-214	1600.00Y	1.00	5.522E-01	5.523E-01	1.822E-01	32.99	
PB-214	1600.00Y	1.00	6.028E-01	6.028E-01	2.032E-01	33.70	
RN-222	1600.00Y	1.00	5.522E-01	5.523E-01	1.822E-01	32.99	
RA-224	1.41E+10Y	1.00	1.726E+00	1.726E+00	1.436E+00	83.20	
RA-226	1600.00Y	1.00	5.522E-01	5.523E-01	1.822E-01	32.99	
AC-228	1.41E+10Y	1.00	5.820E-01	5.820E-01	2.575E-01	44.24	
RA-228	1.41E+10Y	1.00	5.820E-01	5.820E-01	2.575E-01	44.24	
TH-228	1.41E+10Y	1.00	6.321E-01	6.321E-01	1.287E-01	20.36	
TH-229	7340.00Y	1.00	2.089E-01	2.089E-01	1.877E-01	89.86	K
TH-230	7.54E+04Y	1.00	5.522E-01	5.522E-01	1.822E-01	32.99	
TH-232	1.41E+10Y	1.00	5.820E-01	5.820E-01	2.575E-01	44.24	
U-234	2.45E+05Y	1.00	5.522E-01	5.522E-01	1.822E-01	32.99	
AM-243	7370.00Y	1.00	1.944E-01	1.944E-01	1.162E-01	59.79	
ANH-511	1.00E+09Y	1.00	2.962E-02	2.962E-02	7.914E-02	267.15	
Total Activity :			3.386E+01	4.142E+01			

Grand Total Activity : 3.386E+01 4.142E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	116.28	38	187	0.66	233.69	228	11	8.87E-03	****	6.22E+00	T
0	160.74	20	89	0.94	322.62	321	6	4.67E-03	****	5.89E+00	
0	163.35	24	169	1.46	327.85	326	10	5.70E-03	****	5.84E+00	T
0	174.83	28	56	0.85	350.82	349	5	6.81E-03	93.9	5.65E+00	T
0	185.95	53	202	1.78	373.05	368	12	1.27E-02	****	5.45E+00	T
0	292.05	30	90	0.64	585.30	579	10	7.61E-03	****	4.05E+00	T
0	306.87	50	93	4.80	614.96	608	14	1.26E-02	90.7	3.91E+00	T
0	464.67	64	84	0.69	930.64	924	15	1.66E-02	69.7	2.95E+00	T
0	486.60	13	68	1.61	974.51	967	12	3.40E-03	****	2.85E+00	T
0	518.71	24	49	3.79	1038.76	1030	15	6.44E-03	****	2.73E+00	
0	726.92	40	4	2.98	1455.28	1448	15	1.09E-02	38.6	2.10E+00	T
0	862.14	10	11	1.79	1725.80	1717	11	2.78E-03	****	1.82E+00	
0	940.16	10	3	0.71	1881.89	1878	7	2.71E-03	89.5	1.68E+00	
0	974.91	6	1	0.76	1951.42	1948	6	1.55E-03	****	1.62E+00	
0	1014.94	5	6	1.30	2031.50	2025	8	1.40E-03	****	1.56E+00	
0	1027.41	6	4	0.86	2056.44	2052	6	1.57E-03	****	1.55E+00	T
0	1161.88	8	2	1.27	2325.48	2321	8	2.24E-03	93.0	1.38E+00	
0	1165.42	9	0	0.83	2332.56	2329	7	2.50E-03	66.7	1.37E+00	
0	1175.13	8	5	0.92	2351.98	2347	7	2.14E-03	****	1.36E+00	
4	1239.02	19	12	2.08	2479.81	2474	14	5.48E-03	78.5	1.30E+00	T
4	1241.76	7	6	1.29	2485.29	2474	14	1.98E-03	****	1.29E+00	
0	1378.21	7	0	0.58	2758.29	2755	6	1.94E-03	75.6	1.18E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677026.CNF;1  *
* Acquisition date   : 28-JUN-2016 11:38:22 Sensitivity      : 3.000          *
* Detector ID        : GAM32 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 01:00:00.59 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 14:35:00 Nuclide Library : SOLID          *
* Sample ID          : G398677026 Analyst initials: MXR1          *
* Batch Number       : 1572486 Sample Quantity : 1.4264E+02 GRAM          *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 6-AUG-2015 09:24:00 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.897E-01
Y-91	2.528E+01
CD-109	8.938E-01
SN-117M	3.107E-01
TE-123M	3.656E-02
SN-126	8.947E-02
BA-137M	2.915E-02
CS-137	3.079E-02
TL-208	3.236E-02
PB-212	6.433E-02
BI-214	6.005E-02
PB-214	8.299E-02
RN-222	6.005E-02
RA-224	6.890E-01
RA-226	6.005E-02
AC-228	1.070E-01
RA-228	1.070E-01
TH-228	6.433E-02
TH-229	6.353E-01
TH-230	6.004E-02
TH-232	1.070E-01
U-234	6.004E-02
AM-243	6.052E-02
ANH-511	3.540E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.785E-01	NOT IDENT.
NA-22	3.452E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.262E-02	NOT IDENT.
SC-46	3.669E-02	FAIL ABUN
V-48	1.820E-01	NOT IDENT.
CR-51	9.750E-01	NOT IDENT.

MN-54	2.952E-02	NOT IDENT.
CO-56	3.798E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.907E-02	NOT IDENT.
CO-58	3.651E-02	NOT IDENT.
FE-59	9.647E-02	NOT IDENT.
CO-60	2.925E-02	NOT IDENT.
ZN-65	7.330E-02	NOT IDENT.
GE-68	1.046E+00	NOT IDENT.
AS-73	2.286E+00	NOT IDENT.
AS-74	3.799E-01	NOT IDENT.
SE-75	5.986E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.540E-01	NOT IDENT.
RB-83	8.974E-02	NOT IDENT.
KR-85	8.856E+00	NOT IDENT.
SR-85	6.621E-02	NOT IDENT.
RB-86	1.987E+00	NOT IDENT.
Y-88	3.571E-02	NOT IDENT.
NB-94	2.855E-02	NOT IDENT.
NB-95	5.031E-02	NOT IDENT.
NB-95M	1.864E-01	NOT IDENT.
ZR-95	6.601E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.516E-02	NOT IDENT.
RH-102	5.355E-02	NOT IDENT.
RU-103	7.768E-02	FAIL ABUN
RH-106	3.207E-01	NOT IDENT.
RU-106	3.207E-01	NOT IDENT.
AG-108M	3.808E-02	NOT IDENT.
AG-110M	3.677E-02	NOT IDENT.
SN-113	6.470E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SB-124	5.251E-02	NOT IDENT.
SB-125	1.219E-01	FAIL ABUN
TE-125M	1.649E+01	NOT IDENT.
I-126	1.054E+00	NOT IDENT.
SB-126	6.029E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.899E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.856E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.128E-02	NOT IDENT.
CS-135	1.811E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.438E-01	FAIL ABUN
CE-139	4.014E-02	NOT IDENT.
BA-140	1.532E+00	FAIL ABUN
LA-140	3.334E-01	FAIL ABUN
CE-141	1.372E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.275E-01	NOT IDENT.
PM-144	3.445E-02	NOT IDENT.
PR-144	2.624E+00	NOT IDENT.
PM-146	5.518E-02	NOT IDENT.
ND-147	5.119E+00	NOT IDENT.
PM-147	7.671E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.132E-02	FAIL ABUN
EU-152	1.209E-01	NOT IDENT.
GD-153	1.003E-01	NOT IDENT.
EU-154	9.543E-02	NOT IDENT.
EU-155	1.097E-01	FAIL ABUN
TB-160	1.442E-01	FAIL ABUN
HO-166M	5.150E-02	NOT IDENT.
TM-171	3.840E+01	NOT IDENT.
HF-172	2.089E-01	NOT IDENT.
LU-172	5.458E-02	FAIL ABUN
LU-176	3.134E-02	FAIL ABUN
HF-181	9.534E-02	NOT IDENT.
TA-182	2.007E-01	FAIL ABUN
RE-183	4.555E-01	FAIL ABUN
RE-184	1.965E-01	NOT IDENT.

W-188	1.265E+01	FAIL ABUN
IR-192	5.666E-02	FAIL ABUN
HG-203	7.386E-02	NOT IDENT.
BI-207	4.834E-02	FAIL ABUN
PB-210	8.718E+00	NOT IDENT.
BI-211	3.933E-01	FAIL ABUN
PB-211	8.586E-01	NOT IDENT.
BI-212	5.469E-01	FAIL ABUN
RN-219	4.774E-01	NOT IDENT.
RA-223	7.568E-01	FAIL ABUN
AC-227	2.710E-01	NOT IDENT.
TH-227	2.710E-01	NOT IDENT.
PA-231	5.794E-01	NOT IDENT.
TH-231	7.568E-01	FAIL ABUN
PA-233	7.593E-02	FAIL ABUN
PA-234	1.961E-01	NOT IDENT.
PA-234M	3.054E+00	NOT IDENT.
TH-234	1.976E+00	FAIL ABUN
U-235	2.089E-01	FAIL ABUN
NP-237	7.593E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.976E+00	FAIL ABUN
NP-239	3.020E-01	FAIL ABUN
PU-239	3.976E+02	NOT IDENT.
AM-241	2.333E-01	NOT IDENT.
CM-243	1.062E-01	NOT IDENT.
BK-247	8.797E-02	FAIL ABUN
CM-247	4.393E-02	NOT IDENT.
CF-249	4.915E-02	NOT IDENT.
CF-251	1.376E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677026.CNF;1
Acquisition date : 28-JUN-2016 11:38:22 Sensitivity : 3.000
Detector ID : GAM32 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.59 Half life ratio : *****
Sample date : 11-MAY-2016 14:35:00 Nuclide Library : SOLID
Sample ID : G398677026 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4264E+02 GRAM
Quantity Err(%) : 1.4021E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 6-AUG-2015 09:24:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.460E+00	1.071E+00	1.071E+00
Y-91	1.635E+01	3.335E+01	3.335E+01
CD-109	7.670E-01	1.308E+00	1.308E+00
SN-117M	3.775E-01	3.344E-01	3.344E-01
TE-123M	4.466E-02	3.955E-02	3.955E-02
SN-126	7.138E-02	1.217E-01	1.217E-01
BA-137M	3.502E+00	3.786E-01	3.786E-01
CS-137	3.700E+00	3.998E-01	3.998E-01
TL-208	1.986E-01	7.295E-02	7.295E-02
PB-212	6.321E-01	1.393E-01	1.393E-01
BI-214	5.523E-01	1.854E-01	1.854E-01
PB-214	6.028E-01	2.064E-01	2.064E-01
RN-222	5.523E-01	1.854E-01	1.854E-01
RA-224	4.952E-01	1.471E+00	1.471E+00
RA-226	5.523E-01	1.854E-01	1.854E-01
AC-228	5.820E-01	2.683E-01	2.683E-01
RA-228	5.820E-01	2.683E-01	2.683E-01
TH-228	6.321E-01	1.393E-01	1.393E-01
TH-229	2.904E-01	6.999E-01	6.999E-01
TH-230	5.522E-01	1.854E-01	1.854E-01
TH-232	5.820E-01	2.683E-01	2.683E-01
U-234	5.522E-01	1.854E-01	1.854E-01
AM-243	1.344E-01	1.165E-01	1.165E-01
ANH-511	2.962E-02	7.760E-02	7.760E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.486E-01	7.347E-01	7.620E-01	NOT IDENT.
NA-22	4.900E-03	3.937E-02	3.943E-02	NOT IDENT.
NA-24	1.679E+21	3.380E+21	0.000E+00	SHORT HLIF
AL-26	2.452E-02	3.180E-02	3.367E-02	NOT IDENT.
SC-46	1.275E-02	4.088E-02	4.129E-02	FAIL ABUN
V-48	-8.029E-02	2.371E-01	2.399E-01	NOT IDENT.

CR-51	-1.584E-01	1.148E+00	1.150E+00	NOT IDENT.
MN-54	1.282E-03	3.461E-02	3.462E-02	NOT IDENT.
CO-56	4.376E-03	4.402E-02	4.407E-02	FAIL ABUN
MN-56	1.000E+41	1.047E+42	0.000E+00	SHORT HLIF
CO-57	3.847E-03	3.281E-02	3.286E-02	NOT IDENT.
CO-58	-9.228E-03	4.482E-02	4.502E-02	NOT IDENT.
FE-59	-1.121E-01	1.353E-01	1.445E-01	NOT IDENT.
CO-60	-1.153E-02	3.698E-02	3.734E-02	NOT IDENT.
ZN-65	5.084E-02	8.469E-02	8.773E-02	NOT IDENT.
GE-68	2.157E-02	1.258E+00	1.258E+00	NOT IDENT.
AS-73	1.544E+00	2.517E+00	2.611E+00	NOT IDENT.
AS-74	1.645E-01	4.207E-01	4.272E-01	NOT IDENT.
SE-75	-3.291E-02	7.142E-02	7.294E-02	NOT IDENT.
BR-77	1.391E+06	1.948E+06	2.046E+06	SHORT HLIF
SR-82	5.359E-02	7.585E-01	7.589E-01	NOT IDENT.
RB-83	-7.017E-02	1.286E-01	1.325E-01	NOT IDENT.
KR-85	1.222E+01	1.417E+01	1.521E+01	NOT IDENT.
SR-85	9.123E-02	1.060E-01	1.137E-01	NOT IDENT.
RB-86	1.333E-01	2.370E+00	2.371E+00	NOT IDENT.
Y-88	3.120E-02	3.019E-02	3.331E-02	NOT IDENT.
NB-94	-8.264E-03	3.438E-02	3.458E-02	NOT IDENT.
NB-95	2.253E-02	5.568E-02	5.660E-02	NOT IDENT.
NB-95M	1.433E-02	2.413E-01	2.414E-01	NOT IDENT.
ZR-95	-6.390E-02	8.945E-02	9.397E-02	NOT IDENT.
NB-97	1.000E+41	3.268E+42	0.000E+00	SHORT HLIF
ZR-97	-1.128E+20	2.577E+20	0.000E+00	SHORT HLIF
MO-99	-7.458E+03	4.236E+04	4.250E+04	SHORT HLIF
TC-99M	-1.000E+41	2.509E+43	0.000E+00	SHORT HLIF
RH-101	-1.774E-02	3.994E-02	4.074E-02	NOT IDENT.
RH-102	5.276E-03	6.118E-02	6.123E-02	NOT IDENT.
RU-103	1.717E-02	8.650E-02	8.685E-02	FAIL ABUN
RH-106	4.326E-02	3.647E-01	3.652E-01	NOT IDENT.
RU-106	4.326E-02	3.647E-01	3.652E-01	NOT IDENT.
AG-108M	1.576E-02	4.385E-02	4.443E-02	NOT IDENT.
AG-110M	1.304E-02	4.076E-02	4.119E-02	NOT IDENT.
SN-113	-1.823E-02	7.799E-02	7.842E-02	NOT IDENT.
CD-115	6.605E+04	3.876E+05	3.887E+05	SHORT HLIF
SB-124	6.872E-03	5.866E-02	5.874E-02	NOT IDENT.
SB-125	9.447E-02	1.365E-01	1.430E-01	FAIL ABUN
TE-125M	1.447E+01	1.728E+01	1.847E+01	NOT IDENT.
I-126	-5.818E-01	1.525E+00	1.548E+00	NOT IDENT.
SB-126	2.742E-01	7.361E-01	7.464E-01	NOT IDENT.
SB-127	1.473E+02	4.214E+02	4.266E+02	SHORT HLIF
I-131	-1.795E+00	2.421E+00	2.553E+00	NOT IDENT.
I-132	-1.000E+41	6.032E+41	0.000E+00	SHORT HLIF
TE-132	2.397E+02	1.159E+03	1.164E+03	SHORT HLIF
BA-133	7.963E-04	6.509E-02	6.509E-02	NOT IDENT.
I-133	9.829E+14	1.815E+15	1.868E+15	SHORT HLIF
CS-134	-4.387E-03	3.754E-02	3.759E-02	NOT IDENT.
CS-135	1.136E-01	2.004E-01	2.068E-01	NOT IDENT.
I-135	1.000E+41	7.954E+41	0.000E+00	SHORT HLIF
CS-136	-1.076E-01	5.566E-01	5.587E-01	FAIL ABUN
CE-139	3.426E-02	4.865E-02	5.104E-02	NOT IDENT.
BA-140	-1.373E+00	1.901E+00	1.999E+00	FAIL ABUN
LA-140	-4.369E-01	5.296E-01	5.651E-01	FAIL ABUN
CE-141	3.421E-02	1.510E-01	1.518E-01	NOT IDENT.
CE-143	2.746E+09	3.499E+09	3.711E+09	SHORT HLIF
CE-144	-9.675E-02	2.575E-01	2.612E-01	NOT IDENT.
PM-144	1.337E-02	3.838E-02	3.885E-02	NOT IDENT.
PR-144	8.220E-01	2.948E+00	2.971E+00	NOT IDENT.
PM-146	1.752E-03	6.210E-02	6.210E-02	NOT IDENT.
ND-147	3.119E+00	5.541E+00	5.716E+00	NOT IDENT.
PM-147	-8.439E+02	1.033E+03	1.101E+03	NOT IDENT.
PM-149	-8.509E+04	4.293E+06	4.293E+06	SHORT HLIF
EU-150	-1.118E-02	4.314E-02	4.343E-02	FAIL ABUN
EU-152	5.056E-02	1.562E-01	1.579E-01	NOT IDENT.
GD-153	-6.832E-02	1.132E-01	1.173E-01	NOT IDENT.
EU-154	-1.148E-02	1.138E-01	1.139E-01	NOT IDENT.
EU-155	-1.999E-02	1.211E-01	1.214E-01	FAIL ABUN
TB-160	1.106E-01	1.504E-01	1.584E-01	FAIL ABUN
HO-166M	1.783E-02	5.741E-02	5.797E-02	NOT IDENT.
TM-171	1.270E+01	4.278E+01	4.316E+01	NOT IDENT.
HF-172	-2.009E-01	2.446E-01	2.609E-01	NOT IDENT.
LU-172	3.429E-02	5.741E-02	5.945E-02	FAIL ABUN
LU-176	7.202E-02	6.440E-02	7.212E-02	FAIL ABUN
HF-181	-3.080E-02	1.276E-01	1.283E-01	NOT IDENT.
TA-182	1.068E-01	2.168E-01	2.221E-01	FAIL ABUN
RE-183	1.340E-01	5.109E-01	5.145E-01	FAIL ABUN

RE-184	-1.636E-01	2.809E-01	2.905E-01	NOT IDENT.
W-188	1.581E+01	2.020E+01	2.142E+01	FAIL ABUN
IR-192	-6.122E-03	6.639E-02	6.645E-02	FAIL ABUN
HG-203	1.463E-03	8.509E-02	8.510E-02	NOT IDENT.
BI-207	-8.970E-03	5.976E-02	5.990E-02	FAIL ABUN
PB-210	-1.165E+01	1.070E+01	1.192E+01	NOT IDENT.
BI-211	1.661E+00	5.693E-01	9.406E-01	FAIL ABUN
PB-211	5.026E-01	9.705E-01	9.966E-01	NOT IDENT.
BI-212	1.504E+00	5.918E-01	9.001E-01	FAIL ABUN
RN-219	4.509E-02	5.603E-01	5.607E-01	NOT IDENT.
RA-223	5.080E-01	8.412E-01	8.718E-01	FAIL ABUN
AC-227	-2.383E-02	3.129E-01	3.131E-01	NOT IDENT.
TH-227	-2.383E-02	3.129E-01	3.131E-01	NOT IDENT.
PA-231	6.045E-01	7.160E-01	7.661E-01	NOT IDENT.
TH-231	5.080E-01	8.412E-01	8.718E-01	FAIL ABUN
PA-233	5.473E-03	1.003E-01	1.003E-01	FAIL ABUN
PA-234	5.361E-02	2.416E-01	2.428E-01	NOT IDENT.
PA-234M	-1.464E+00	3.855E+00	3.911E+00	NOT IDENT.
TH-234	1.015E+00	3.136E+00	3.169E+00	FAIL ABUN
U-235	-4.739E-02	2.357E-01	2.367E-01	FAIL ABUN
NP-237	5.473E-03	1.003E-01	1.003E-01	FAIL ABUN
NP-238	-3.406E+05	7.664E+05	7.817E+05	SHORT HLIF
U-238	1.015E+00	3.136E+00	3.169E+00	FAIL ABUN
NP-239	4.056E-01	6.251E-01	6.513E-01	FAIL ABUN
PU-239	3.284E+02	4.218E+02	4.471E+02	NOT IDENT.
AM-241	-2.621E-02	3.027E-01	3.029E-01	NOT IDENT.
CM-243	-3.715E-02	1.184E-01	1.196E-01	NOT IDENT.
BK-247	-8.287E-02	1.090E-01	1.152E-01	FAIL ABUN
CM-247	-3.236E-05	5.194E-02	5.194E-02	NOT IDENT.
CF-249	2.771E-02	5.558E-02	5.697E-02	NOT IDENT.
CF-251	-1.110E-02	1.768E-01	1.769E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	99.7046	87.09	164.5320	136.47	119.7171
45.60	114.3977	87.57	160.4113	140.51	0.0000
46.54	113.4966	88.03	140.7935	143.76	121.4822
49.72	0.0000	88.34	140.8490	144.24	115.9265
51.35	104.4804	88.47	191.5862	145.44	117.9279
51.87	109.0253	89.96	249.8105	152.43	123.3922
52.39	101.3290	1093.63	216.1209	153.25	109.8825
52.97	89.1695	91.11	158.2984	323.87	101.1355
53.44	97.0499	92.59	158.7899	156.02	98.2744
54.07	103.8544	93.35	147.9285	158.56	115.1634
57.36	0.0000	94.56	153.4690	159.00	113.6911
57.53	111.1945	94.65	153.4862	162.33	83.6152
57.98	103.4078	94.67	153.4895	162.66	83.6393
59.27	118.2663	94.87	153.5271	163.33	83.6877
59.32	118.2759	97.43	139.7563	165.86	105.2174
59.54	109.8663	98.43	122.0977	176.31	104.6015
60.96	138.9143	98.44	122.0992	176.60	104.6264
61.17	138.9603	99.53	106.1932	177.52	109.3237
62.93	122.3503	100.11	108.0513	181.07	0.0000
63.29	122.4186	102.03	116.3476	181.52	131.3049
63.58	120.2054	103.18	110.2286	184.41	122.3188
64.28	105.5766	103.37	110.2530	143.76	124.9648
66.73	140.1524	105.21	114.0778	193.51	121.8290
67.24	124.8650	105.31	114.0904	197.03	144.6351
125.81	130.0817	106.12	123.1868	198.01	125.1836
67.75	130.0950	106.47	122.3359	201.83	139.2764
69.67	115.3575	109.28	111.8925	203.43	147.2992
70.83	96.2927	111.00	120.0607	205.31	127.8378
72.81	129.3297	111.76	0.0000	210.85	126.3848
72.87	129.3411	114.06	120.4609	215.65	113.9445
74.66	127.9389	116.30	0.0000	222.11	104.5153
74.82	127.9672	116.74	103.7052	227.09	98.8867
74.97	127.9943	119.76	121.1930	227.38	102.9033
77.11	128.3737	121.12	131.6003	228.16	0.0000
78.74	128.6593	121.22	131.6140	228.18	94.9630
79.69	118.3795	121.78	119.4973	116.74	94.9630
80.12	132.3831	122.06	109.7740	235.69	99.6730
80.19	132.3952	122.92	100.7156	235.96	99.6912
80.57	142.9201	123.07	99.8154	238.63	103.6970
81.00	146.4899	265.00	103.5434	238.98	0.0000
81.07	146.5040	125.81	144.1738	240.99	103.8605
81.75	143.1447	127.23	140.7019	242.00	103.9304
83.79	165.7006	127.91	126.9953	244.70	101.8936
84.00	141.8180	129.30	122.5637	252.40	0.0000
85.43	123.4874	131.20	130.1823	252.80	80.2808
86.55	105.3964	133.02	123.0163	254.15	0.0000
86.79	105.4285	133.52	128.6284	256.23	81.4771
86.94	164.5005	136.00	119.6630	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	94.2012	355.39	0.0000	584.27	28.5396
264.80	100.3537	356.01	69.0098	595.83	39.1672
265.00	100.3657	364.49	61.7280	427.87	39.2343
268.22	80.0435	366.42	0.0000	602.52	0.0000
269.46	71.8895	372.51	88.0722	604.72	43.1257
270.03	70.8878	375.05	48.9908	607.14	27.1761
271.23	98.6997	377.52	45.7808	609.32	27.8367
273.65	95.7572	356.01	55.7641	610.33	27.8467
276.40	81.4796	388.16	61.3594	614.28	30.4498
277.37	86.6878	388.63	61.3730	618.01	27.9224
277.60	83.6029	391.69	73.5379	620.36	28.9087
278.00	91.8831	264.66	59.5231	621.93	28.9248
279.20	92.9828	401.81	63.9676	630.19	0.0000
279.54	94.0354	402.40	66.1917	631.29	29.0186
279.70	107.4785	404.85	57.4320	633.25	30.0055
280.46	107.5277	410.95	73.1029	634.78	35.8320
283.69	98.4138	413.71	67.6514	635.95	31.0023
284.31	90.1595	414.70	66.5735	636.99	32.9516
285.41	96.7869	423.72	72.4198	645.85	34.9954
285.90	0.0000	427.09	64.7199	657.76	29.2800
287.50	109.6444	427.87	59.1616	657.90	0.0000
290.67	91.5409	433.94	62.6821	661.66	22.4772
293.27	0.0000	439.40	65.0792	664.57	0.0000
351.93	75.0981	453.88	69.5594	666.33	29.3635
295.96	81.8082	463.37	71.6593	666.50	29.3650
879.38	75.2443	468.07	62.1081	667.71	0.0000
299.98	64.1494	473.00	0.0000	677.62	16.7012
300.09	54.3907	475.06	59.2530	685.70	0.0000
300.13	54.3923	476.78	63.8571	695.00	24.6991
301.36	68.6660	477.60	62.0542	696.49	24.7113
302.85	88.8397	482.18	70.0968	696.51	25.6998
256.23	95.6350	487.02	61.0767	697.00	21.7492
304.85	90.6188	492.35	0.0000	697.30	24.7174
306.78	76.6491	497.08	42.3175	697.49	24.7192
308.46	79.0348	505.52	47.6933	702.65	27.7307
311.90	77.5026	507.63	0.0000	706.68	22.8080
316.51	83.4047	511.00	60.1329	711.68	18.8715
319.41	77.1938	514.00	41.6799	720.70	9.9604
320.08	79.3385	514.00	41.6810	721.93	0.0000
321.04	79.3797	520.40	46.4294	722.78	14.9506
323.87	65.7227	520.69	0.0000	722.91	14.9509
325.23	76.3802	522.65	0.0000	723.31	9.9685
328.76	83.9676	527.90	0.0000	724.19	14.9572
333.37	81.8320	528.26	47.5050	727.33	19.9624
333.97	83.5644	529.59	44.7328	733.00	13.3314
334.37	90.4054	529.87	0.0000	735.93	21.0164
338.28	82.2613	531.02	38.2313	333.97	15.0187
338.32	82.2625	537.26	46.7358	739.50	0.0000
311.90	82.3577	546.56	0.0000	747.24	25.1062
340.48	82.3577	552.55	30.0859	748.06	22.0988
340.55	82.3600	563.25	26.4318	752.31	11.0636
344.28	73.7346	569.33	32.1680	753.82	15.0938
345.93	83.6665	946.00	28.3857	756.73	20.1426
351.06	61.9506	569.70	28.3872	756.80	20.1431
351.93	68.8643	583.19	30.1135	884.68	27.2518

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	18.1780	1274.44	8.5996	1620.50	5.0846
766.42	15.1512	1001.03	11.8384	1621.92	3.0515
766.84	14.1429	1002.74	8.6133	1678.03	0.0000
772.60	0.0000	1004.73	6.4632	1690.97	1.0290
776.52	17.2229	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1240
778.90	18.2487	1028.54	0.0000	1063.66	1.7868
783.70	0.0000	1037.84	7.6009	1771.35	8.3398
785.37	17.2681	1038.76	0.0000	1791.20	0.0000
792.07	18.3195	631.29	9.7932	1808.65	2.0972
794.95	18.3349	1048.07	14.1508	1810.72	0.0000
795.86	17.3208	1049.04	16.3315	1836.06	0.0000
810.06	15.3461	1050.41	13.0693		
810.29	15.3472	1063.66	20.7581		
344.28	15.3479	1077.00	9.8635		
810.76	14.3259	1077.34	10.9600		
815.77	16.3961	1085.87	12.0801		
1048.07	10.2556	1093.63	9.1679		
832.01	14.4125	1099.45	17.4422		
834.85	15.4545	1112.07	14.3622		
835.71	17.5192	1112.84	9.6686		
836.80	0.0000	1115.54	7.8976		
846.75	0.0000	1120.29	18.9743		
846.77	12.4049	1120.55	18.9760		
856.80	10.3662	1221.41	11.0713		
860.56	15.5654	1129.67	14.7891		
871.09	11.4474	1131.51	0.0000		
873.19	18.7431	1147.95	0.0000		
875.33	0.0000	1173.23	6.5329		
879.38	8.3441	1177.95	14.4141		
880.51	10.4333	1189.05	15.9202		
883.24	14.6176	1204.77	16.1084		
884.68	8.3561	1221.41	13.2019		
889.28	9.4122	1231.02	18.1422		
894.76	17.8048	1235.36	12.9704		
898.04	16.7723	1238.28	14.6005		
900.72	14.6860	1260.41	0.0000		
903.28	24.9305	1271.87	10.4821		
911.20	14.7270	1274.44	12.3949		
912.08	7.0143	1274.54	10.4880		
923.98	0.0000	1291.59	5.7407		
926.50	15.8419	1298.22	0.0000		
929.11	8.4549	1312.11	4.8037		
937.49	7.0610	1332.49	10.6110		
944.13	7.0731	1362.66	0.0000		
946.00	7.9611	1365.19	10.6795		
949.00	13.8096	1368.63	0.0000		
667.71	0.0000	1384.29	7.0160		
962.31	17.3208	1408.01	11.7466		
964.08	15.9954	1457.56	0.0000		
966.17	12.4474	1460.82	3.3894		
911.20	23.1330	1489.16	3.9749		
968.97	23.1330	1505.03	7.9727		
983.53	11.7874	1584.12	4.0425		
984.45	0.0000	1596.21	10.1274		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:42:03.14

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677027.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;102
Background date    : 26-JUN-2016 12:06:12
Sample date       : 11-MAY-2016 14:55:00 Acquisition date : 28-JUN-2016 11:38:44
Sample ID        : G398677027 Sample quantity : 1.45400E+02 GRAM
Detector name     : GAM41 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:05.71 0.2%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	36.72	19	72	0.55	73.75	73	5	5.16E-03	73.5	
2	0	40.02	32	94	1.26	80.34	77	7	9.01E-03	52.3	
3	0	46.47*	19	124	1.01	93.23	89	8	5.32E-03	111.9	
4	0	63.30*	11	214	0.65	126.89	123	10	3.05E-03	267.6	
5	3	74.73*	193	121	1.25	149.73	142	19	5.36E-02	12.5	2.26E+00
6	3	77.14*	240	104	1.11	154.55	142	19	6.67E-02	10.0	
7	0	83.98*	42	172	1.04	168.23	162	10	1.17E-02	61.4	
8	2	87.17	84	64	1.38	174.62	172	21	2.33E-02	16.4	1.45E+00
9	2	90.02	66	136	1.52	180.30	172	21	1.83E-02	35.4	
10	2	92.61*	57	113	1.34	185.49	172	21	1.58E-02	42.0	
11	0	105.09	28	103	0.96	210.45	208	8	7.78E-03	65.0	
12	1	185.97*	79	76	1.28	372.15	368	24	2.21E-02	23.9	2.12E+00
13	1	191.53	25	86	1.53	383.28	368	24	6.91E-03	68.8	
14	1	194.54	25	48	1.54	389.28	368	24	6.93E-03	44.5	
15	0	209.64	53	69	1.21	419.48	415	9	1.46E-02	32.0	
16	0	215.17	23	52	1.45	430.54	427	7	6.39E-03	56.2	
17	0	238.65*	256	120	1.19	477.50	474	9	7.12E-02	9.9	
18	0	242.09	47	58	1.04	484.37	482	7	1.31E-02	32.2	
19	0	271.46	12	74	0.69	543.08	538	8	3.20E-03	135.2	
20	0	283.30	36	74	5.42	566.77	559	15	9.87E-03	55.7	
21	0	295.39*	60	48	1.05	590.95	588	7	1.67E-02	23.1	
22	0	338.24	107	50	1.17	676.62	671	13	2.98E-02	16.5	
23	0	352.21*	132	41	1.06	704.56	699	12	3.68E-02	13.3	
24	1	460.61	29	22	1.80	921.33	918	18	7.95E-03	32.4	2.75E+00
25	1	462.95*	37	35	1.64	926.00	918	18	1.03E-02	35.7	
26	0	511.78*	57	58	2.51	1023.66	1014	23	1.58E-02	41.3	
27	5	583.27*	56	24	1.91	1166.62	1158	34	1.57E-02	22.1	1.49E+00
28	5	592.95	16	17	2.78	1185.99	1158	34	4.31E-03	61.4	
29	0	609.65*	89	46	0.88	1219.38	1209	15	2.46E-02	19.9	
30	0	661.79	784	19	1.49	1323.66	1317	12	2.18E-01	3.7	
31	5	677.54	12	4	1.91	1355.17	1353	14	3.37E-03	27.0	8.15E-01
32	5	681.51	13	2	2.10	1363.11	1353	14	3.64E-03	35.1	
33	0	726.66	22	9	1.61	1453.41	1445	14	6.15E-03	37.2	
34	0	755.47	6	2	1.20	1511.03	1508	6	1.79E-03	49.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	818.85	9	4	0.66	1637.79	1634	7	2.39E-03	54.7	
36	0	911.32*	57	15	1.75	1822.75	1815	15	1.59E-02	20.2	
37	0	942.38	8	7	1.21	1884.88	1879	9	2.13E-03	77.4	
38	0	968.87	37	12	1.73	1937.88	1931	12	1.02E-02	25.0	
39	0	987.63	13	0	1.69	1975.38	1970	10	3.61E-03	27.7	
40	0	1119.75	19	6	0.56	2239.68	2231	14	5.39E-03	36.3	
41	0	1220.18	11	9	0.88	2440.60	2433	13	2.94E-03	68.0	
42	0	1460.88*	105	0	1.87	2922.16	2915	14	2.92E-02	9.9	
43	0	1764.62	15	3	1.95	3529.93	3522	14	4.15E-03	36.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:42:05

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677027.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:55:00 Acquisition date : 28-JUN-2016 11:38:44
Sample ID        : G398677027 Sample quantity  : 145.40 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA41 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.71 0.2%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.931E-01	5.482E+00	5.482E+00	19.81	OK
CD-109	88.03	3.70*	7.452E+00	1.474E+00	1.584E+00	45.53	OK
SN-126	64.28	9.60	7.794E+00	9.595E-02	9.595E-02	535.12	OK
	86.94	8.90	7.452E+00	6.128E-01	6.128E-01	45.53	OK
	87.57	37.00*	7.452E+00	1.474E-01	1.474E-01	45.53	OK
BA-137M	661.66	89.90*	1.827E+00	2.559E+00	2.566E+00	7.47	OK
CS-137	661.66	85.10*	1.827E+00	2.703E+00	2.711E+00	7.47	OK
EU-155	86.55	30.70	7.452E+00	1.776E-01	1.811E-01	45.53	OK
	105.31	21.10*	7.031E+00	1.186E-01	1.208E-01	129.92	OK
TL-208	277.37	6.60	3.907E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.052E+00	1.757E-01	1.757E-01	44.24	OK
	860.56	12.50	1.434E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	7.550E+00	3.988E-01	4.004E-01	223.86	OK
BI-211	72.87	1.23	7.711E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.212E+00	4.124E-01	4.124E-01	195.34	OK
PB-212	74.82	10.28	7.685E+00	1.290E+00	1.290E+00	32.32	OK
	77.11	17.10	7.647E+00	1.182E+00	1.182E+00	19.98	OK
	238.63	43.60*	4.386E+00	7.873E-01	7.873E-01	19.84	OK
	300.09	3.30	3.668E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73	OK
	1120.29	14.92	1.129E+00	5.874E-01	5.874E-01	72.53	OK
	1764.49	15.30	7.620E-01	6.245E-01	6.245E-01	73.61	OK
PB-214	74.82	5.80	7.683E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	7.647E+00	2.083E+00	2.083E+00	19.98	OK
	87.09	3.41	7.454E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.340E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.716E+00	5.074E-01	5.074E-01	46.18	OK
	351.93	35.60*	3.214E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73	OK
	1120.29	14.92	1.129E+00	5.874E-01	5.874E-01	72.53	OK
	1764.49	15.30	7.620E-01	6.245E-01	6.245E-01	73.61	OK
RA-224	240.99	4.10*	4.339E+00	6.587E-01	6.587E-01	164.43	OK
RA-226	609.32	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73	OK
	1120.29	14.92	1.129E+00	5.874E-01	5.874E-01	72.53	OK
	1764.49	15.30	7.620E-01	6.245E-01	6.245E-01	73.61	OK
AC-228	105.21	1.10	7.031E+00	2.274E+00	2.274E+00	129.92	OK
	338.32	11.27	3.323E+00	1.633E+00	1.633E+00	33.09	OK
	794.95	4.25	1.543E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.361E+00	8.472E-01	8.472E-01	40.43	OK
	968.97	15.80	1.287E+00	9.386E-01	9.386E-01	49.97	OK
RA-228	105.21	1.10	7.031E+00	2.274E+00	2.274E+00	129.92	OK
	338.32	11.27	3.323E+00	1.633E+00	1.633E+00	33.09	OK
	794.95	4.25	1.543E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.361E+00	8.472E-01	8.472E-01	40.43	OK
	968.97	15.80	1.287E+00	9.386E-01	9.386E-01	49.97	OK
TH-228	74.82	10.28	7.685E+00	1.290E+00	1.290E+00	32.32	OK
	77.11	17.10	7.647E+00	1.182E+00	1.182E+00	19.98	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	4.386E+00	7.873E-01	7.873E-01	19.84	OK
	300.09	3.30	3.668E+00	----- Line	Not Found	-----	Absent
TH-229	85.43	14.70	7.519E+00	2.432E-01	2.432E-01	122.89	OK
	88.47	24.00	7.452E+00	2.272E-01	2.272E-01	45.53	OK
	193.51	4.41*	5.070E+00	6.662E-01	6.663E-01	89.06	OK
	210.85	2.80	4.817E+00	2.319E+00	2.319E+00	63.97	OK
TH-230	609.32	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73	OK
	1120.29	14.92	1.129E+00	5.874E-01	5.874E-01	72.53	OK
	1764.49	15.30	7.620E-01	6.245E-01	6.245E-01	73.61	OK
TH-232	105.21	1.10	7.031E+00	2.274E+00	2.274E+00	129.92	OK
	338.32	11.27	3.323E+00	1.633E+00	1.633E+00	33.09	OK
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.361E+00	8.472E-01	8.472E-01	40.43	OK
	968.97	15.80	1.287E+00	9.386E-01	9.386E-01	49.97	OK
TH-234	63.29	3.70*	7.794E+00	2.490E-01	2.490E-01	535.12	OK
	92.59	4.23	7.331E+00	1.160E+00	1.160E+00	83.99	OK
U-234	609.32	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73	OK
	1120.29	14.92	1.129E+00	5.874E-01	5.874E-01	72.53	OK
	1764.49	15.30	7.620E-01	6.245E-01	6.245E-01	73.61	OK
U-235	89.96	3.47	7.390E+00	1.631E+00	1.631E+00	70.73	OK
	93.35	5.60	7.331E+00	8.764E-01	8.764E-01	83.99	OK
	143.76	10.96*	6.093E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.667E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.224E+00	1.593E-01	1.593E-01	47.71	OK
	205.31	5.01	4.887E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	7.794E+00	2.490E-01	2.490E-01	535.12	OK
	92.59	4.23	7.331E+00	1.160E+00	1.160E+00	83.99	OK
AM-243	43.53	5.90	7.421E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	7.685E+00	1.974E-01	1.974E-01	32.32	OK
ANH-511	511.00	100.00*	2.311E+00	1.354E-01	1.354E-01	82.50	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677027.CNF;1  *
* Acquisition date   : 28-JUN-2016 11:38:44 Sensitivity      : 3.000          *
* Detector ID        : GAM41 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 01:00:05.71 Half life ratio : *****          *
* Sample date        : 11-MAY-2016 14:55:00 Analyst initials: MXR1          *
* Sample ID          : G398677027 Sample Quantity : 1.4540E+02 GRAM          *
* Batch Number       : 1572486 Wet Weight : 0.00000          *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.482E+00	1.064E+00	4.711E-01
CD-109	1.584E+00	7.068E-01	1.201E+00
SN-126	1.474E-01	6.577E-02	1.116E-01
BA-137M	2.566E+00	1.879E-01	7.798E-02
CS-137	2.711E+00	1.985E-01	8.238E-02
EU-155	1.208E-01	1.539E-01	1.970E-01
TL-208	1.757E-01	7.617E-02	8.826E-02
PB-210	4.004E-01	8.785E-01	9.279E-01
BI-211	4.124E-01	7.894E-01	4.890E-01
PB-212	7.873E-01	1.531E-01	1.419E-01
BI-214	5.343E-01	2.080E-01	1.697E-01
PB-214	6.571E-01	1.713E-01	2.952E-01
RN-222	5.343E-01	2.080E-01	1.697E-01
RA-224	6.587E-01	1.062E+00	1.744E+00
RA-226	5.343E-01	2.080E-01	1.697E-01
AC-228	8.472E-01	3.357E-01	3.595E-01
RA-228	8.472E-01	3.357E-01	3.595E-01
TH-228	7.873E-01	1.531E-01	1.419E-01
TH-229	6.663E-01	5.815E-01	1.141E+00
TH-230	5.343E-01	2.080E-01	1.697E-01
TH-232	8.472E-01	3.357E-01	3.595E-01
TH-234	2.490E-01	1.306E+00	1.179E+00
U-234	5.343E-01	2.080E-01	1.697E-01
U-235	6.527E-02	2.223E-01	4.273E-01
U-238	2.490E-01	1.306E+00	1.179E+00
AM-243	1.974E-01	6.254E-02	6.448E-02
ANH-511	1.354E-01	1.095E-01	6.957E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.463E-01	7.541E-01	1.441E+00	NOT IDENT.
NA-22	-4.720E-03	5.183E-02	9.967E-02	NOT IDENT.
NA-24	0.000E+00	4.048E+21	0.000E+00	SHORT HLIF

AL-26	-3.379E-03	3.686E-02	7.878E-02	NOT IDENT.
SC-46	-4.506E-02	6.175E-02	1.083E-01	FAIL ABUN
V-48	-7.523E-02	2.122E-01	3.417E-01	NOT IDENT.
CR-51	2.520E-01	1.004E+00	1.971E+00	NOT IDENT.
MN-54	1.333E-03	4.135E-02	8.297E-02	NOT IDENT.
CO-56	-3.156E-02	5.919E-02	1.082E-01	NOT IDENT.
MN-56	0.000E+00	1.875E+41	0.000E+00	SHORT HLIF
CO-57	-1.181E-03	2.904E-02	5.488E-02	NOT IDENT.
CO-58	6.336E-03	4.903E-02	1.027E-01	NOT IDENT.
FE-59	-1.409E-03	1.545E-01	3.087E-01	NOT IDENT.
CO-60	9.942E-03	3.077E-02	7.175E-02	NOT IDENT.
ZN-65	-5.637E-03	9.705E-02	1.665E-01	NOT IDENT.
GE-68	5.190E-01	1.110E+00	2.535E+00	NOT IDENT.
AS-73	-8.883E-02	3.078E-01	5.926E-01	NOT IDENT.
AS-74	-4.493E-02	4.747E-01	7.649E-01	NOT IDENT.
SE-75	-9.867E-03	7.304E-02	1.270E-01	NOT IDENT.
BR-77	0.000E+00	3.356E+05	0.000E+00	SHORT HLIF
SR-82	-8.213E-01	7.900E-01	1.315E+00	NOT IDENT.
RB-83	-2.780E-02	1.383E-01	2.198E-01	NOT IDENT.
KR-85	1.357E+01	1.004E+01	2.099E+01	NOT IDENT.
SR-85	1.013E-01	7.506E-02	1.569E-01	NOT IDENT.
RB-86	5.058E-01	2.196E+00	4.786E+00	NOT IDENT.
Y-88	-8.282E-02	5.859E-02	8.944E-02	NOT IDENT.
Y-91	2.170E+01	3.130E+01	6.888E+01	NOT IDENT.
NB-94	-2.329E-02	3.879E-02	6.699E-02	NOT IDENT.
NB-95	8.113E-03	7.006E-02	1.392E-01	NOT IDENT.
NB-95M	3.878E-02	2.333E-01	3.800E-01	NOT IDENT.
ZR-95	6.510E-02	6.346E-02	2.149E-01	FAIL ABUN
NB-97	0.000E+00	8.053E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.537E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.432E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.276E-02	3.595E-02	7.029E-02	NOT IDENT.
RH-102	3.442E-02	6.567E-02	1.339E-01	NOT IDENT.
RU-103	-7.802E-03	1.048E-01	1.928E-01	FAIL ABUN
RH-106	-1.132E-01	4.402E-01	8.039E-01	NOT IDENT.
RU-106	-1.132E-01	4.402E-01	8.039E-01	NOT IDENT.
AG-108M	2.405E-02	4.613E-02	9.013E-02	NOT IDENT.
AG-110M	-8.823E-03	5.826E-02	1.139E-01	FAIL ABUN
SN-113	-1.499E-02	7.465E-02	1.392E-01	NOT IDENT.
CD-115	0.000E+00	4.196E+05	0.000E+00	SHORT HLIF
SN-117M	-2.962E-03	3.112E-01	5.833E-01	NOT IDENT.
TE-123M	1.508E-03	3.640E-02	6.852E-02	NOT IDENT.
SB-124	5.076E-02	1.461E-01	3.372E-01	NOT IDENT.
SB-125	3.721E-02	1.393E-01	2.679E-01	FAIL ABUN
TE-125M	-1.243E+00	1.650E+01	2.739E+01	NOT IDENT.
I-126	1.026E+00	1.457E+00	2.801E+00	NOT IDENT.
SB-126	-3.663E-01	1.114E+00	1.700E+00	NOT IDENT.
SB-127	0.000E+00	5.042E+02	0.000E+00	SHORT HLIF
I-131	3.735E-01	2.731E+00	5.244E+00	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.121E+03	0.000E+00	SHORT HLIF
BA-133	1.933E-02	6.337E-02	1.088E-01	NOT IDENT.
I-133	0.000E+00	1.970E+15	0.000E+00	SHORT HLIF
CS-134	7.081E-02	5.217E-02	1.182E-01	NOT IDENT.
CS-135	1.681E-02	2.455E-01	3.913E-01	NOT IDENT.
I-135	0.000E+00	9.799E+40	0.000E+00	SHORT HLIF
CS-136	-1.616E-01	6.067E-01	1.158E+00	FAIL ABUN
CE-139	-1.012E-02	3.951E-02	7.247E-02	NOT IDENT.
BA-140	-1.844E+00	1.918E+00	3.213E+00	NOT IDENT.
LA-140	1.446E-01	5.212E-01	1.201E+00	NOT IDENT.
CE-141	1.489E-01	1.404E-01	2.804E-01	NOT IDENT.
CE-143	0.000E+00	2.618E+09	0.000E+00	SHORT HLIF
CE-144	-1.482E-01	2.309E-01	4.172E-01	NOT IDENT.
PM-144	2.303E-02	4.183E-02	8.551E-02	NOT IDENT.
PR-144	1.754E+00	3.185E+00	6.510E+00	NOT IDENT.
PM-146	-1.131E-02	6.379E-02	1.150E-01	NOT IDENT.
ND-147	6.803E-01	6.075E+00	1.160E+01	FAIL ABUN
PM-147	-1.468E+02	7.920E+02	1.484E+03	NOT IDENT.
PM-149	0.000E+00	3.527E+06	0.000E+00	SHORT HLIF
EU-150	2.410E-02	3.769E-02	6.745E-02	FAIL ABUN
EU-152	8.159E-02	1.381E-01	2.460E-01	NOT IDENT.
GD-153	2.261E-02	9.302E-02	1.598E-01	NOT IDENT.
EU-154	1.949E-03	1.411E-01	2.775E-01	FAIL ABUN
TB-160	2.428E-02	2.223E-01	4.443E-01	FAIL ABUN
HO-166M	-4.529E-02	7.234E-02	1.242E-01	NOT IDENT.
TM-171	5.328E+00	4.692E+00	9.707E+00	NOT IDENT.
HF-172	5.620E-02	2.170E-01	4.158E-01	FAIL ABUN

LU-172	2.188E-02	6.028E-02	1.313E-01	FAIL ABUN
LU-176	-1.371E-02	3.344E-02	6.221E-02	FAIL ABUN
HF-181	-5.035E-02	1.070E-01	1.924E-01	NOT IDENT.
TA-182	2.532E-01	3.374E-01	5.858E-01	FAIL ABUN
RE-183	8.244E-02	1.041E-01	1.985E-01	NOT IDENT.
RE-184	-1.811E-02	2.888E-01	5.095E-01	NOT IDENT.
W-188	5.408E-01	1.485E+01	2.207E+01	FAIL ABUN
IR-192	-4.247E-02	5.645E-02	1.019E-01	FAIL ABUN
HG-203	4.542E-03	8.970E-02	1.435E-01	NOT IDENT.
BI-207	1.749E-02	6.586E-02	1.331E-01	FAIL ABUN
PB-211	6.711E-01	1.056E+00	2.086E+00	NOT IDENT.
BI-212	1.053E+00	7.670E-01	1.322E+00	FAIL ABUN
RN-219	-4.541E-02	5.942E-01	1.114E+00	FAIL ABUN
RA-223	-4.953E-01	8.245E-01	1.504E+00	FAIL ABUN
AC-227	-1.469E-01	3.066E-01	5.393E-01	NOT IDENT.
TH-227	-1.469E-01	3.066E-01	5.393E-01	NOT IDENT.
PA-231	1.610E-01	6.547E-01	1.208E+00	FAIL ABUN
TH-231	-4.953E-01	8.245E-01	1.504E+00	FAIL ABUN
PA-233	2.776E-02	7.992E-02	1.576E-01	NOT IDENT.
PA-234	-4.057E-02	3.735E-01	6.255E-01	NOT IDENT.
PA-234M	4.393E+00	5.275E+00	1.182E+01	NOT IDENT.
NP-237	2.776E-02	7.992E-02	1.576E-01	NOT IDENT.
NP-238	0.000E+00	8.069E+05	0.000E+00	SHORT HLIF
NP-239	-2.967E-01	2.750E-01	4.856E-01	FAIL ABUN
PU-239	6.306E+01	3.866E+02	7.344E+02	NOT IDENT.
AM-241	3.436E-02	6.796E-02	1.209E-01	NOT IDENT.
CM-243	-3.969E-03	1.115E-01	1.877E-01	NOT IDENT.
BK-247	1.910E-02	1.081E-01	1.858E-01	FAIL ABUN
CM-247	-1.456E-02	5.609E-02	1.035E-01	NOT IDENT.
CF-249	1.134E-02	5.526E-02	1.065E-01	NOT IDENT.
CF-251	7.117E-02	1.463E-01	2.817E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	101	10.66*	8.931E-01	5.482E+00	5.482E+00	19.81
CD-109	88.03	104	3.70*	7.452E+00	1.942E+00	2.086E+00	32.73
SN-126	64.28	14	9.60	7.794E+00	9.595E-02	9.595E-02	535.12
	86.94	104	8.90	7.452E+00	8.072E-01	8.072E-01	32.73
	87.57	104	37.00*	7.452E+00	1.942E-01	1.942E-01	32.73
BA-137M	661.66	814	89.90*	1.827E+00	2.559E+00	2.566E+00	7.47
CS-137	661.66	814	85.10*	1.827E+00	2.703E+00	2.711E+00	7.47
EU-155	86.55	104	30.70	7.452E+00	2.340E-01	2.385E-01	32.73
	105.31	34	21.10*	7.031E+00	1.186E-01	1.208E-01	129.92
TL-208	277.37	-----	6.60	3.907E+00	-----	Line Not Found	-----
	583.19	59	85.00*	2.052E+00	1.757E-01	1.757E-01	44.24
	860.56	-----	12.50	1.434E+00	-----	Line Not Found	-----
PB-210	46.54	25	4.25*	7.550E+00	3.988E-01	4.004E-01	223.86
BI-211	72.87	-----	1.23	7.711E+00	-----	Line Not Found	-----
	351.06	145	12.92*	3.212E+00	1.810E+00	1.810E+00	26.61
PB-212	74.82	241	10.28	7.685E+00	1.577E+00	1.577E+00	25.09
	77.11	299	17.10	7.647E+00	1.182E+00	1.182E+00	19.98
	238.63	292	43.60*	4.386E+00	7.873E-01	7.873E-01	19.84
	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
BI-214	609.32	93	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73
	1120.29	19	14.92	1.129E+00	5.874E-01	5.874E-01	72.53
	1764.49	14	15.30	7.620E-01	6.245E-01	6.245E-01	73.61
PB-214	74.82	241	5.80	7.685E+00	2.795E+00	2.795E+00	25.09
	77.11	299	9.70	7.647E+00	2.083E+00	2.083E+00	19.98
	87.09	104	3.41	7.452E+00	2.107E+00	2.107E+00	32.73
	242.00	54	7.25	4.339E+00	8.799E-01	8.800E-01	64.32
	295.22	67	18.42	3.716E+00	5.074E-01	5.074E-01	46.18
	351.93	145	35.60*	3.212E+00	6.571E-01	6.571E-01	26.61
RN-222	609.32	93	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73
	1120.29	19	14.92	1.129E+00	5.874E-01	5.874E-01	72.53
	1764.49	14	15.30	7.620E-01	6.245E-01	6.245E-01	73.61
RA-224	240.99	54	4.10*	4.339E+00	1.556E+00	1.556E+00	64.32
RA-226	609.32	93	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73
	1120.29	19	14.92	1.129E+00	5.874E-01	5.874E-01	72.53
	1764.49	14	15.30	7.620E-01	6.245E-01	6.245E-01	73.61
AC-228	105.21	34	1.10	7.031E+00	2.274E+00	2.274E+00	129.92
	338.32	118	11.27	3.323E+00	1.633E+00	1.633E+00	33.09
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	58	25.80*	1.361E+00	8.472E-01	8.472E-01	40.43
	968.97	37	15.80	1.287E+00	9.386E-01	9.386E-01	49.97
RA-228	105.21	34	1.10	7.031E+00	2.274E+00	2.274E+00	129.92
	338.32	118	11.27	3.323E+00	1.633E+00	1.633E+00	33.09
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	58	25.80*	1.361E+00	8.472E-01	8.472E-01	40.43
	968.97	37	15.80	1.287E+00	9.386E-01	9.386E-01	49.97

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	241	10.28	7.685E+00	1.577E+00	1.577E+00	25.09
	77.11	299	17.10	7.647E+00	1.182E+00	1.182E+00	19.98
	238.63	292	43.60*	4.386E+00	7.873E-01	7.873E-01	19.84
	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
TH-229	85.43	52	14.70	7.519E+00	2.432E-01	2.432E-01	122.89
	88.47	104	24.00	7.452E+00	2.993E-01	2.993E-01	32.73
	193.51	29	4.41*	5.070E+00	6.662E-01	6.663E-01	89.06
	210.85	61	2.80	4.817E+00	2.319E+00	2.319E+00	63.97
TH-230	609.32	93	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73
	1120.29	19	14.92	1.129E+00	5.874E-01	5.874E-01	72.53
	1764.49	14	15.30	7.620E-01	6.245E-01	6.245E-01	73.61
TH-232	105.21	34	1.10	7.031E+00	2.274E+00	2.274E+00	129.92
	338.32	118	11.27	3.323E+00	1.633E+00	1.633E+00	33.09
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	58	25.80*	1.361E+00	8.472E-01	8.472E-01	40.43
	968.97	37	15.80	1.287E+00	9.386E-01	9.386E-01	49.97
TH-234	63.29	14	3.70*	7.794E+00	2.490E-01	2.490E-01	535.12
	92.59	70	4.23	7.331E+00	1.160E+00	1.160E+00	83.99
U-234	609.32	93	45.49*	1.970E+00	5.343E-01	5.343E-01	39.73
	1120.29	19	14.92	1.129E+00	5.874E-01	5.874E-01	72.53
	1764.49	14	15.30	7.620E-01	6.245E-01	6.245E-01	73.61
U-235	89.96	81	3.47	7.390E+00	1.631E+00	1.631E+00	70.73
	93.35	70	5.60	7.331E+00	8.764E-01	8.764E-01	83.99
	143.76	-----	10.96*	6.093E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.667E+00	-----	Line Not Found	-----
	185.72	92	57.20	5.224E+00	1.593E-01	1.593E-01	47.71
	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
U-238	63.29	14	3.70*	7.794E+00	2.490E-01	2.490E-01	535.12
	92.59	70	4.23	7.331E+00	1.160E+00	1.160E+00	83.99
AM-243	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
	74.66	241	67.20*	7.685E+00	2.412E-01	2.412E-01	25.09
ANH-511	511.00	61	100.00*	2.311E+00	1.354E-01	1.354E-01	82.50

Flag: "*" = Keyline

Total number of lines in spectrum 43
Number of unidentified lines 8
Number of lines tentatively identified by NID 35 81.40%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.482E+00	5.482E+00	1.086E+00	19.81	
CD-109	461.40D	1.07	1.942E+00	2.086E+00	0.683E+00	32.73	
SN-126	2.30E+05Y	1.00	1.942E-01	1.942E-01	0.635E-01	32.73	
BA-137M	30.08Y	1.00	2.559E+00	2.566E+00	0.192E+00	7.47	
CS-137	30.08Y	1.00	2.703E+00	2.711E+00	0.203E+00	7.47	
EU-155	4.75Y	1.02	1.186E-01	1.208E-01	1.570E-01	129.92	
TL-208	1.41E+10Y	1.00	1.757E-01	1.757E-01	0.777E-01	44.24	
PB-210	22.20Y	1.00	3.988E-01	4.004E-01	8.964E-01	223.86	
BI-211	7.04E+08Y	1.00	1.810E+00	1.810E+00	0.482E+00	26.61	
PB-212	1.41E+10Y	1.00	7.873E-01	7.873E-01	1.562E-01	19.84	
BI-214	1600.00Y	1.00	5.343E-01	5.343E-01	2.123E-01	39.73	
PB-214	1600.00Y	1.00	6.571E-01	6.571E-01	1.748E-01	26.61	
RN-222	1600.00Y	1.00	5.343E-01	5.343E-01	2.123E-01	39.73	
RA-224	1.41E+10Y	1.00	1.556E+00	1.556E+00	1.001E+00	64.32	
RA-226	1600.00Y	1.00	5.343E-01	5.343E-01	2.123E-01	39.73	
AC-228	1.41E+10Y	1.00	8.472E-01	8.472E-01	3.425E-01	40.43	
RA-228	1.41E+10Y	1.00	8.472E-01	8.472E-01	3.425E-01	40.43	
TH-228	1.41E+10Y	1.00	7.873E-01	7.873E-01	1.562E-01	19.84	
TH-229	7340.00Y	1.00	6.662E-01	6.663E-01	5.933E-01	89.06	
TH-230	7.54E+04Y	1.00	5.343E-01	5.343E-01	2.123E-01	39.73	
TH-232	1.41E+10Y	1.00	8.472E-01	8.472E-01	3.425E-01	40.43	
TH-234	4.47E+09Y	1.00	2.490E-01	2.490E-01	13.32E-01	535.12	
U-234	2.45E+05Y	1.00	5.343E-01	5.343E-01	2.123E-01	39.73	
U-235	7.04E+08Y	1.00	1.593E-01	1.593E-01	0.760E-01	47.71	K
U-238	4.47E+09Y	1.00	2.490E-01	2.490E-01	13.32E-01	535.12	
AM-243	7370.00Y	1.00	2.412E-01	2.412E-01	0.605E-01	25.09	
ANH-511	1.00E+09Y	1.00	1.354E-01	1.354E-01	1.117E-01	82.50	
Total Activity :			2.608E+01	2.625E+01			

Grand Total Activity : 2.608E+01 2.625E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	36.72	24	95	0.55	73.75	73	5	5.16E-03	****	6.97E+00	
0	40.02	42	123	1.26	80.34	77	7	9.01E-03	****	7.22E+00	
1	191.53	29	99	1.53	383.28	368	24	6.91E-03	****	5.12E+00	
0	215.17	26	60	1.45	430.54	427	7	6.39E-03	****	4.73E+00	T
0	271.46	13	84	0.69	543.08	538	8	3.20E-03	****	3.97E+00	T
0	283.30	40	83	5.42	566.77	559	15	9.87E-03	****	3.84E+00	T
1	460.61	31	24	1.80	921.33	918	18	7.95E-03	64.7	2.54E+00	
1	462.95	40	37	1.64	926.00	918	18	1.03E-02	71.4	2.53E+00	T
5	592.95	16	18	2.78	1185.99	1158	34	4.31E-03	****	2.02E+00	
5	677.54	13	4	1.91	1355.17	1353	14	3.37E-03	53.9	1.79E+00	T
5	681.51	14	2	2.10	1363.11	1353	14	3.64E-03	70.3	1.78E+00	
0	726.66	23	9	1.61	1453.41	1445	14	6.15E-03	74.3	1.68E+00	T
0	755.47	7	2	1.20	1511.03	1508	6	1.79E-03	99.5	1.62E+00	T
0	818.85	9	4	0.66	1637.79	1634	7	2.39E-03	****	1.50E+00	T
0	942.38	8	7	1.21	1884.88	1879	9	2.13E-03	****	1.32E+00	
0	987.63	13	0	1.69	1975.38	1970	10	3.61E-03	55.5	1.26E+00	
0	1220.18	10	9	0.88	2440.60	2433	13	2.94E-03	****	1.05E+00	T

Flags: "T" = Tentatively associated


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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677027.CNF;1  *
* Acquisition date   : 28-JUN-2016 11:38:44 Sensitivity      : 3.000          *
* Detector ID        : GAM41 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 01:00:05.71 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 14:55:00 Nuclide Library : SOLID          *
* Sample ID          : G398677027 Analyst initials: MXR1          *
* Batch Number       : 1572486 Sample Quantity : 1.4540E+02 GRAM          *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.617E-01
CD-109	5.714E-01
SN-126	5.310E-02
BA-137M	3.464E-02
CS-137	3.659E-02
EU-155	9.341E-02
TL-208	4.003E-02
PB-210	4.405E-01
BI-211	2.272E-01
PB-212	6.716E-02
BI-214	7.691E-02
PB-214	1.413E-01
RN-222	7.691E-02
RA-224	8.312E-01
RA-226	7.691E-02
AC-228	1.596E-01
RA-228	1.596E-01
TH-228	6.716E-02
TH-229	5.381E-01
TH-230	7.690E-02
TH-232	1.596E-01
TH-234	5.638E-01
U-234	7.690E-02
U-235	2.026E-01
U-238	5.638E-01
AM-243	3.081E-02
ANH-511	3.169E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.684E-01	NOT IDENT.
NA-22	4.259E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.001E-02	NOT IDENT.

SC-46	4.659E-02	FAIL ABUN
V-48	1.262E-01	NOT IDENT.
CR-51	9.161E-01	NOT IDENT.
MN-54	3.613E-02	NOT IDENT.
CO-56	4.660E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.597E-02	NOT IDENT.
CO-58	4.380E-02	NOT IDENT.
FE-59	1.314E-01	NOT IDENT.
CO-60	2.847E-02	NOT IDENT.
ZN-65	6.912E-02	NOT IDENT.
GE-68	1.055E+00	NOT IDENT.
AS-73	2.821E-01	NOT IDENT.
AS-74	3.435E-01	NOT IDENT.
SE-75	5.949E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.464E-01	NOT IDENT.
RB-83	9.962E-02	NOT IDENT.
KR-85	9.773E+00	NOT IDENT.
SR-85	7.306E-02	NOT IDENT.
RB-86	1.978E+00	NOT IDENT.
Y-88	3.169E-02	NOT IDENT.
Y-91	2.992E+01	NOT IDENT.
NB-94	2.937E-02	NOT IDENT.
NB-95	6.213E-02	NOT IDENT.
NB-95M	1.789E-01	NOT IDENT.
ZR-95	9.384E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.343E-02	NOT IDENT.
RH-102	6.008E-02	NOT IDENT.
RU-103	8.868E-02	FAIL ABUN
RH-106	3.613E-01	NOT IDENT.
RU-106	3.613E-01	NOT IDENT.
AG-108M	4.211E-02	NOT IDENT.
AG-110M	4.898E-02	FAIL ABUN
SN-113	6.458E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.748E-01	NOT IDENT.
TE-123M	3.226E-02	NOT IDENT.
SB-124	1.363E-01	NOT IDENT.
SB-125	1.248E-01	FAIL ABUN
TE-125M	1.299E+01	NOT IDENT.
I-126	1.245E+00	NOT IDENT.
SB-126	7.347E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.445E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.070E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.345E-02	NOT IDENT.
CS-135	1.844E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.872E-01	FAIL ABUN
CE-139	3.416E-02	NOT IDENT.
BA-140	1.427E+00	NOT IDENT.
LA-140	4.809E-01	NOT IDENT.
CE-141	1.333E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.968E-01	NOT IDENT.
PM-144	3.826E-02	NOT IDENT.
PR-144	2.913E+00	NOT IDENT.
PM-146	5.313E-02	NOT IDENT.
ND-147	5.300E+00	FAIL ABUN
PM-147	7.016E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.148E-02	FAIL ABUN
EU-152	1.146E-01	NOT IDENT.
GD-153	7.584E-02	NOT IDENT.
EU-154	1.185E-01	FAIL ABUN
TB-160	1.957E-01	FAIL ABUN
HO-166M	5.440E-02	NOT IDENT.
TM-171	4.637E+00	NOT IDENT.
HF-172	1.974E-01	FAIL ABUN
LU-172	5.544E-02	FAIL ABUN

LU-176	2.896E-02	FAIL ABUN
HF-181	8.823E-02	NOT IDENT.
TA-182	2.595E-01	FAIL ABUN
RE-183	9.477E-02	NOT IDENT.
RE-184	2.201E-01	NOT IDENT.
W-188	1.027E+01	FAIL ABUN
IR-192	4.706E-02	FAIL ABUN
HG-203	6.707E-02	NOT IDENT.
BI-207	5.855E-02	FAIL ABUN
PB-211	9.762E-01	NOT IDENT.
BI-212	5.974E-01	FAIL ABUN
RN-219	5.191E-01	FAIL ABUN
RA-223	6.995E-01	FAIL ABUN
AC-227	2.513E-01	NOT IDENT.
TH-227	2.513E-01	NOT IDENT.
PA-231	5.669E-01	FAIL ABUN
TH-231	6.995E-01	FAIL ABUN
PA-233	7.352E-02	NOT IDENT.
PA-234	2.679E-01	NOT IDENT.
PA-234M	5.237E+00	NOT IDENT.
NP-237	7.352E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.290E-01	FAIL ABUN
PU-239	3.491E+02	NOT IDENT.
AM-241	5.779E-02	NOT IDENT.
CM-243	8.886E-02	NOT IDENT.
BK-247	8.695E-02	FAIL ABUN
CM-247	4.825E-02	NOT IDENT.
CF-249	4.957E-02	NOT IDENT.
CF-251	1.330E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677027.CNF;1
Acquisition date : 28-JUN-2016 11:38:44 Sensitivity : 3.000
Detector ID : GAM41 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:05.71 Half life ratio : *****
Sample date : 11-MAY-2016 14:55:00 Nuclide Library : SOLID
Sample ID : G398677027 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4540E+02 GRAM
Quantity Err(%) : 1.3755E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.482E+00	1.162E+00	1.162E+00
CD-109	1.584E+00	7.293E-01	7.293E-01
SN-126	1.474E-01	6.741E-02	6.741E-02
BA-137M	2.566E+00	2.814E-01	2.814E-01
CS-137	2.711E+00	2.972E-01	2.972E-01
EU-155	1.208E-01	1.544E-01	1.544E-01
TL-208	1.757E-01	7.763E-02	7.763E-02
PB-210	4.004E-01	8.799E-01	8.799E-01
BI-211	4.124E-01	8.085E-01	8.085E-01
PB-212	7.873E-01	1.703E-01	1.703E-01
BI-214	5.343E-01	2.129E-01	2.129E-01
PB-214	6.571E-01	1.803E-01	1.803E-01
RN-222	5.343E-01	2.129E-01	2.129E-01
RA-224	6.587E-01	1.069E+00	1.069E+00
RA-226	5.343E-01	2.129E-01	2.129E-01
AC-228	8.472E-01	3.504E-01	3.504E-01
RA-228	8.472E-01	3.504E-01	3.504E-01
TH-228	7.873E-01	1.703E-01	1.703E-01
TH-229	6.663E-01	5.848E-01	5.848E-01
TH-230	5.343E-01	2.129E-01	2.129E-01
TH-232	8.472E-01	3.504E-01	3.504E-01
TH-234	2.490E-01	1.307E+00	1.307E+00
U-234	5.343E-01	2.129E-01	2.129E-01
U-235	6.527E-02	2.224E-01	2.224E-01
U-238	2.490E-01	1.307E+00	1.307E+00
AM-243	1.974E-01	6.649E-02	6.649E-02
ANH-511	1.354E-01	1.101E-01	1.101E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.463E-01	7.542E-01	7.571E-01	NOT IDENT.
NA-22	-4.720E-03	5.184E-02	5.188E-02	NOT IDENT.
NA-24	-2.036E+20	4.048E+21	0.000E+00	SHORT HLIF

AL-26	-3.379E-03	3.686E-02	3.689E-02	NOT IDENT.
SC-46	-4.506E-02	6.194E-02	6.519E-02	FAIL ABUN
V-48	-7.523E-02	2.125E-01	2.151E-01	NOT IDENT.
CR-51	2.520E-01	1.004E+00	1.011E+00	NOT IDENT.
MN-54	1.333E-03	4.135E-02	4.136E-02	NOT IDENT.
CO-56	-3.156E-02	5.928E-02	6.097E-02	NOT IDENT.
MN-56	-1.000E+41	1.878E+41	0.000E+00	SHORT HLIF
CO-57	-1.181E-03	2.904E-02	2.904E-02	NOT IDENT.
CO-58	6.336E-03	4.904E-02	4.912E-02	NOT IDENT.
FE-59	-1.409E-03	1.545E-01	1.545E-01	NOT IDENT.
CO-60	9.942E-03	3.077E-02	3.110E-02	NOT IDENT.
ZN-65	-5.637E-03	9.705E-02	9.709E-02	NOT IDENT.
GE-68	5.190E-01	1.113E+00	1.137E+00	NOT IDENT.
AS-73	-8.883E-02	3.084E-01	3.110E-01	NOT IDENT.
AS-74	-4.493E-02	4.747E-01	4.751E-01	NOT IDENT.
SE-75	-9.867E-03	7.305E-02	7.318E-02	NOT IDENT.
BR-77	1.726E+06	2.415E+06	2.537E+06	SHORT HLIF
SR-82	-8.213E-01	7.939E-01	8.760E-01	NOT IDENT.
RB-83	-2.780E-02	1.384E-01	1.389E-01	NOT IDENT.
KR-85	1.357E+01	1.011E+01	1.181E+01	NOT IDENT.
SR-85	1.013E-01	7.556E-02	8.830E-02	NOT IDENT.
RB-86	5.058E-01	2.197E+00	2.209E+00	NOT IDENT.
Y-88	-8.282E-02	5.892E-02	6.975E-02	NOT IDENT.
Y-91	2.170E+01	3.135E+01	3.284E+01	NOT IDENT.
NB-94	-2.329E-02	3.884E-02	4.023E-02	NOT IDENT.
NB-95	8.113E-03	7.006E-02	7.016E-02	NOT IDENT.
NB-95M	3.878E-02	2.334E-01	2.340E-01	NOT IDENT.
ZR-95	6.510E-02	6.375E-02	7.018E-02	FAIL ABUN
NB-97	1.000E+41	8.095E+40	0.000E+00	SHORT HLIF
ZR-97	4.722E+20	2.569E+20	0.000E+00	SHORT HLIF
MO-99	-4.346E+04	4.453E+04	4.865E+04	SHORT HLIF
TC-99M	1.000E+41	1.977E+41	0.000E+00	SHORT HLIF
RH-101	2.276E-02	3.626E-02	3.769E-02	NOT IDENT.
RH-102	3.442E-02	6.577E-02	6.758E-02	NOT IDENT.
RU-103	-7.802E-03	1.048E-01	1.049E-01	FAIL ABUN
RH-106	-1.132E-01	4.403E-01	4.433E-01	NOT IDENT.
RU-106	-1.132E-01	4.403E-01	4.433E-01	NOT IDENT.
AG-108M	2.405E-02	4.617E-02	4.743E-02	NOT IDENT.
AG-110M	-8.823E-03	5.826E-02	5.840E-02	FAIL ABUN
SN-113	-1.499E-02	7.466E-02	7.496E-02	NOT IDENT.
CD-115	-1.571E+05	4.199E+05	4.258E+05	SHORT HLIF
SN-117M	-2.962E-03	3.112E-01	3.112E-01	NOT IDENT.
TE-123M	1.508E-03	3.640E-02	3.641E-02	NOT IDENT.
SB-124	5.076E-02	1.461E-01	1.479E-01	NOT IDENT.
SB-125	3.721E-02	1.394E-01	1.404E-01	FAIL ABUN
TE-125M	-1.243E+00	1.650E+01	1.651E+01	NOT IDENT.
I-126	1.026E+00	1.460E+00	1.532E+00	NOT IDENT.
SB-126	-3.663E-01	1.115E+00	1.128E+00	NOT IDENT.
SB-127	1.885E+02	5.061E+02	5.132E+02	SHORT HLIF
I-131	3.735E-01	2.731E+00	2.736E+00	FAIL ABUN
I-132	1.000E+41	1.581E+42	0.000E+00	SHORT HLIF
TE-132	-7.857E+02	1.125E+03	1.180E+03	SHORT HLIF
BA-133	1.933E-02	6.339E-02	6.399E-02	NOT IDENT.
I-133	1.032E+14	1.970E+15	1.971E+15	SHORT HLIF
CS-134	7.081E-02	5.264E-02	6.156E-02	NOT IDENT.
CS-135	1.681E-02	2.455E-01	2.456E-01	NOT IDENT.
I-135	1.000E+41	1.463E+41	0.000E+00	SHORT HLIF
CS-136	-1.616E-01	6.073E-01	6.117E-01	FAIL ABUN
CE-139	-1.012E-02	3.957E-02	3.983E-02	NOT IDENT.
BA-140	-1.844E+00	1.925E+00	2.096E+00	NOT IDENT.
LA-140	1.446E-01	5.214E-01	5.254E-01	NOT IDENT.
CE-141	1.489E-01	1.413E-01	1.564E-01	NOT IDENT.
CE-143	5.726E+09	2.669E+09	3.713E+09	SHORT HLIF
CE-144	-1.482E-01	2.316E-01	2.410E-01	NOT IDENT.
PM-144	2.303E-02	4.188E-02	4.315E-02	NOT IDENT.
PR-144	1.754E+00	3.188E+00	3.285E+00	NOT IDENT.
PM-146	-1.131E-02	6.380E-02	6.400E-02	NOT IDENT.
ND-147	6.803E-01	6.075E+00	6.083E+00	FAIL ABUN
PM-147	-1.468E+02	7.921E+02	7.949E+02	NOT IDENT.
PM-149	1.689E+06	3.537E+06	3.618E+06	SHORT HLIF
EU-150	2.410E-02	3.775E-02	3.928E-02	FAIL ABUN
EU-152	8.159E-02	1.383E-01	1.432E-01	NOT IDENT.
GD-153	2.261E-02	9.305E-02	9.360E-02	NOT IDENT.
EU-154	1.949E-03	1.411E-01	1.411E-01	FAIL ABUN
TB-160	2.428E-02	2.223E-01	2.226E-01	FAIL ABUN
HO-166M	-4.529E-02	7.246E-02	7.528E-02	NOT IDENT.
TM-171	5.328E+00	4.747E+00	5.320E+00	NOT IDENT.
HF-172	5.620E-02	2.172E-01	2.187E-01	FAIL ABUN

LU-172	2.188E-02	6.043E-02	6.123E-02	FAIL ABUN
LU-176	-1.371E-02	3.346E-02	3.403E-02	FAIL ABUN
HF-181	-5.035E-02	1.071E-01	1.094E-01	NOT IDENT.
TA-182	2.532E-01	3.380E-01	3.568E-01	FAIL ABUN
RE-183	8.244E-02	1.049E-01	1.113E-01	NOT IDENT.
RE-184	-1.811E-02	2.888E-01	2.889E-01	NOT IDENT.
W-188	5.408E-01	1.485E+01	1.485E+01	FAIL ABUN
IR-192	-4.247E-02	5.658E-02	5.973E-02	FAIL ABUN
HG-203	4.542E-03	8.970E-02	8.973E-02	NOT IDENT.
BI-207	1.749E-02	6.592E-02	6.639E-02	FAIL ABUN
PB-211	6.711E-01	1.058E+00	1.100E+00	NOT IDENT.
BI-212	1.053E+00	7.732E-01	9.073E-01	FAIL ABUN
RN-219	-4.541E-02	5.942E-01	5.946E-01	FAIL ABUN
RA-223	-4.953E-01	8.259E-01	8.556E-01	FAIL ABUN
AC-227	-1.469E-01	3.074E-01	3.144E-01	NOT IDENT.
TH-227	-1.469E-01	3.074E-01	3.144E-01	NOT IDENT.
PA-231	1.610E-01	6.558E-01	6.598E-01	FAIL ABUN
TH-231	-4.953E-01	8.259E-01	8.556E-01	FAIL ABUN
PA-233	2.776E-02	7.996E-02	8.093E-02	NOT IDENT.
PA-234	-4.057E-02	3.764E-01	3.769E-01	NOT IDENT.
PA-234M	4.393E+00	5.312E+00	5.670E+00	NOT IDENT.
NP-237	2.776E-02	7.996E-02	8.093E-02	NOT IDENT.
NP-238	-1.560E+05	8.072E+05	8.103E+05	SHORT HLIF
NP-239	-2.967E-01	2.777E-01	3.083E-01	FAIL ABUN
PU-239	6.306E+01	3.867E+02	3.877E+02	NOT IDENT.
AM-241	3.436E-02	6.812E-02	6.986E-02	NOT IDENT.
CM-243	-3.969E-03	1.115E-01	1.115E-01	NOT IDENT.
BK-247	1.910E-02	1.082E-01	1.085E-01	FAIL ABUN
CM-247	-1.456E-02	5.615E-02	5.653E-02	NOT IDENT.
CF-249	1.134E-02	5.527E-02	5.551E-02	NOT IDENT.
CF-251	7.117E-02	1.466E-01	1.501E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	111.8889	87.09	123.9640	136.47	106.4620
45.60	92.6975	87.57	129.3071	140.51	0.0000
46.54	116.7927	88.03	129.3874	143.76	96.2197
49.72	0.0000	88.34	129.4415	144.24	99.2734
51.35	102.9658	88.47	129.4640	145.44	91.3596
51.87	108.6504	89.96	129.7217	152.43	99.0542
52.39	111.1689	1093.63	129.8388	153.25	86.9927
52.97	130.8742	91.11	129.9196	323.87	97.1968
53.44	134.5512	92.59	130.1721	156.02	89.2488
54.07	139.1657	93.35	130.3007	158.56	88.4443
57.36	0.0000	94.56	127.4699	159.00	85.4291
57.53	120.0215	94.65	127.4848	162.33	99.9731
57.98	120.9706	94.67	127.4883	162.66	106.1257
59.27	133.9645	94.87	126.0031	163.33	89.8537
59.32	133.9759	97.43	108.1381	165.86	97.2237
59.54	136.9087	98.43	97.5996	176.31	82.6324
60.96	154.5746	98.44	97.6008	176.60	81.6200
61.17	154.6292	99.53	109.0781	177.52	82.7191
62.93	157.6201	100.11	115.7064	181.07	0.0000
63.29	157.7141	102.03	111.8236	181.52	91.3032
63.58	157.7891	103.18	101.2430	184.41	68.2286
64.28	157.9703	103.37	101.2667	143.76	89.9609
66.73	156.0441	105.21	112.4493	193.51	91.1711
67.24	155.0761	105.31	112.4627	197.03	97.5267
125.81	165.5300	106.12	118.5379	198.01	75.7266
67.75	165.5480	106.47	117.0476	201.83	110.7718
69.67	142.8502	109.28	115.8929	203.43	100.1981
70.83	152.6465	111.00	113.5463	205.31	86.3221
72.81	151.6364	111.76	0.0000	210.85	59.4962
72.87	151.6503	114.06	92.2596	215.65	87.7443
74.66	152.0583	116.30	0.0000	222.11	100.7241
74.82	152.0947	116.74	122.7388	227.09	92.4911
74.97	152.1287	119.76	83.0804	227.38	98.9650
77.11	152.6090	121.12	100.8256	228.16	0.0000
78.74	133.6641	121.22	105.7316	228.18	101.1759
79.69	118.9746	121.78	104.8175	116.74	101.1759
80.12	119.0479	122.06	104.8497	235.69	81.3814
80.19	119.0596	122.92	120.6418	235.96	88.3243
80.57	119.1240	123.07	120.6615	238.63	104.1086
81.00	119.1968	265.00	124.6683	238.98	0.0000
81.07	119.2090	125.81	110.1974	240.99	139.0430
81.75	119.3232	127.23	107.4087	242.00	83.4855
83.79	172.0178	127.91	110.4457	244.70	45.3067
84.00	123.4398	129.30	118.5086	252.40	0.0000
85.43	123.6835	131.20	98.9555	252.80	58.0460
86.55	123.8734	133.02	116.9899	254.15	0.0000
86.79	123.9131	133.52	111.0985	256.23	73.5501
86.94	123.9388	136.00	114.3665	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	76.9627	355.39	0.0000	584.27	32.0369
264.80	76.9702	356.01	55.9563	595.83	27.6790
265.00	66.2531	364.49	60.8954	427.87	25.9955
268.22	86.7549	366.42	0.0000	602.52	0.0000
269.46	69.1060	372.51	57.3908	604.72	24.3000
270.03	62.0413	375.05	53.6984	607.14	29.1860
271.23	69.8503	377.52	49.9942	609.32	31.2957
273.65	79.9552	356.01	52.9970	610.33	31.3074
276.40	57.8478	388.16	55.9593	614.28	33.0946
277.37	56.9930	388.63	62.6130	618.01	28.2564
277.60	57.0016	391.69	58.9098	620.36	29.3282
278.00	58.7982	264.66	66.8110	621.93	30.3927
279.20	67.7589	401.81	63.9845	630.19	0.0000
279.54	74.9068	402.40	69.7341	631.29	18.9286
279.70	74.9150	404.85	57.3853	633.25	18.9417
280.46	78.5200	410.95	57.5581	634.78	14.7407
283.69	60.3520	413.71	62.4387	635.95	23.1736
284.31	60.3759	414.70	60.5460	636.99	36.8807
285.41	50.1238	423.72	57.9148	645.85	34.8828
285.90	0.0000	427.09	56.0742	657.76	28.3066
287.50	51.9826	427.87	56.0948	657.90	0.0000
290.67	58.3715	433.94	56.2562	661.66	21.2588
293.27	0.0000	439.40	72.9309	664.57	0.0000
351.93	78.3478	453.88	53.2973	666.33	12.4209
295.96	80.1847	463.37	51.1234	666.50	12.4218
879.38	64.6723	468.07	39.4087	667.71	0.0000
299.98	67.7380	473.00	0.0000	677.62	32.0640
300.09	67.7426	475.06	44.4721	685.70	0.0000
300.13	67.7440	476.78	42.5281	695.00	18.2767
301.36	72.3145	477.60	48.4796	696.49	17.2102
302.85	79.6168	482.18	49.5685	696.51	17.2105
256.23	70.6399	487.02	44.7056	697.00	19.3649
304.85	70.6551	492.35	0.0000	697.30	18.2908
306.78	69.8301	497.08	43.9017	697.49	19.3680
308.46	62.6374	505.52	33.3785	702.65	24.7907
311.90	57.3083	507.63	0.0000	706.68	16.1895
316.51	63.8485	511.00	35.1284	711.68	24.8648
319.41	52.0793	514.00	35.1724	720.70	18.0717
320.08	53.0135	514.00	35.1724	721.93	0.0000
321.04	53.9578	520.40	35.2657	722.78	12.6587
323.87	72.3662	520.69	0.0000	722.91	12.6593
325.23	69.6729	522.65	0.0000	723.31	10.8521
328.76	64.3022	527.90	0.0000	724.19	14.4736
333.37	56.7963	528.26	40.4346	727.33	21.7324
333.97	50.6729	529.59	37.4219	733.00	15.5518
334.37	55.2920	529.87	0.0000	735.93	11.9861
338.28	57.2607	531.02	35.4204	333.97	20.7135
338.32	57.2622	537.26	35.5101	739.50	0.0000
311.90	67.8110	546.56	0.0000	747.24	15.3104
340.48	67.8110	552.55	22.4576	748.06	13.1268
340.55	67.8136	563.25	28.7027	752.31	18.2560
344.28	49.4212	569.33	26.7160	753.82	16.4385
345.93	37.0996	946.00	26.7173	756.73	15.3566
351.06	57.3563	569.70	20.5537	756.80	15.3569
351.93	54.9020	583.19	32.0240	884.68	29.6835

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	20.1671	1274.44	19.5667	1620.50	5.7397
766.42	18.3374	1001.03	6.8566	1621.92	4.7843
766.84	20.1734	1002.74	9.7994	1678.03	0.0000
772.60	0.0000	1004.73	16.6676	1690.97	3.8735
776.52	18.3948	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.1469
778.90	14.7266	1028.54	0.0000	1063.66	6.8691
783.70	0.0000	1037.84	18.7843	1771.35	15.7037
785.37	13.8336	1038.76	0.0000	1791.20	0.0000
792.07	20.3309	631.29	13.8713	1808.65	3.9499
794.95	12.0243	1048.07	11.8940	1810.72	0.0000
795.86	12.9530	1049.04	12.8884	1836.06	6.9429
810.06	11.1501	1050.41	11.9009		
810.29	11.1509	1063.66	14.9243		
344.28	11.1514	1077.00	5.9893		
810.76	10.2230	1077.34	4.9915		
815.77	15.9560	1085.87	9.0029		
1048.07	11.1782	1093.63	7.0154		
832.01	14.0286	1099.45	9.0322		
834.85	14.9762	1112.07	10.3535		
835.71	15.9164	1112.84	6.9037		
836.80	0.0000	1115.54	8.6349		
846.75	0.0000	1120.29	13.8315		
846.77	18.7858	1120.55	13.8320		
856.80	17.8979	1221.41	13.8348		
860.56	8.4871	1129.67	12.1289		
871.09	12.2962	1131.51	0.0000		
873.19	15.1426	1147.95	0.0000		
875.33	0.0000	1173.23	7.1464		
879.38	17.0654	1177.95	14.3082		
880.51	16.1225	1189.05	12.2949		
883.24	15.1855	1204.77	8.2253		
884.68	14.2422	1221.41	17.6904		
889.28	20.9155	1231.02	18.6145		
894.76	15.2347	1235.36	10.3512		
898.04	13.3425	1238.28	10.3577		
900.72	16.2135	1260.41	0.0000		
903.28	14.3161	1271.87	6.2598		
911.20	21.0431	1274.44	11.4825		
912.08	18.0411	1274.54	12.5264		
923.98	0.0000	1291.59	8.3812		
926.50	12.4864	1298.22	0.0000		
929.11	17.3013	1312.11	4.2087		
937.49	23.1206	1332.49	3.1698		
944.13	13.2352	1362.66	0.0000		
946.00	13.2419	1365.19	4.2546		
949.00	12.7555	1368.63	0.0000		
667.71	0.0000	1384.29	9.6094		
962.31	11.6367	1408.01	5.3638		
964.08	13.3052	1457.56	0.0000		
966.17	8.3205	1460.82	1.6257		
911.20	8.3266	1489.16	0.9340		
968.97	8.3266	1505.03	9.3677		
983.53	5.0149	1584.12	5.7026		
984.45	0.0000	1596.21	3.8100		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:42:51.01

```
*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677028.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;136
Background date    : 26-JUN-2016 12:06:18
Sample date       : 11-MAY-2016 14:50:00 Acquisition date : 28-JUN-2016 11:39:09
Sample ID        : G398677028 Sample quantity : 1.48550E+02 GRAM
Detector name    : GAM43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.65 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572486 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.81*	6	190	1.44	127.40	120	11	1.56E-03	481.8	
2	3	74.52*	90	108	1.22	148.83	144	14	2.51E-02	22.0	2.18E+00
3	3	76.83	157	102	1.14	153.46	144	14	4.37E-02	13.5	
4	2	87.14*	58	98	1.39	174.09	171	21	1.62E-02	29.3	1.91E+00
5	2	89.84	37	122	1.26	179.48	171	21	1.03E-02	54.1	
6	2	92.34*	61	115	1.41	184.49	171	21	1.71E-02	35.3	
7	0	127.75	17	111	1.21	255.33	254	8	4.70E-03	109.7	
8	0	185.83*	64	147	1.82	371.52	367	11	1.78E-02	39.4	
9	0	209.20	56	85	1.59	418.28	413	10	1.55E-02	33.6	
10	0	238.38*	291	150	0.96	476.65	471	10	8.09E-02	9.9	
11	0	241.64*	47	83	0.77	483.18	481	7	1.30E-02	37.4	
12	0	272.72	54	177	8.29	545.35	521	26	1.49E-02	69.0	
13	0	295.00*	60	62	1.19	589.92	587	8	1.66E-02	27.3	
14	0	299.67	50	44	2.06	599.26	595	9	1.38E-02	28.2	
15	0	338.48*	62	85	1.40	676.91	671	10	1.72E-02	30.8	
16	0	352.00*	138	72	1.18	703.95	699	10	3.85E-02	14.6	
17	0	463.35	43	39	2.16	926.71	922	10	1.19E-02	31.6	
18	0	511.12*	13	57	2.39	1022.27	1016	14	3.61E-03	146.9	
19	0	583.02*	115	14	1.18	1166.10	1159	14	3.18E-02	11.9	
20	0	609.46*	102	49	1.73	1218.99	1211	18	2.84E-02	19.1	
21	0	649.21	22	39	4.01	1298.51	1287	20	6.07E-03	74.0	
22	0	661.53	632	38	1.58	1323.15	1316	16	1.76E-01	4.5	
23	0	727.16	28	15	1.02	1454.43	1449	10	7.89E-03	31.6	
24	0	743.98	9	10	3.84	1488.08	1481	13	2.46E-03	80.3	
25	0	797.00	16	21	3.94	1594.14	1584	15	4.39E-03	73.6	
26	0	804.10	19	12	1.53	1608.32	1602	16	5.18E-03	47.6	
27	0	840.26	7	2	1.46	1680.67	1677	8	2.05E-03	48.8	
28	0	860.93	26	13	3.09	1722.02	1716	11	7.19E-03	33.9	
29	0	893.33	19	4	3.13	1786.81	1779	13	5.40E-03	29.8	
30	0	911.12*	65	12	1.00	1822.40	1816	12	1.80E-02	16.7	
31	0	917.07	12	5	1.38	1834.30	1830	9	3.19E-03	44.4	
32	0	940.70	8	3	1.44	1881.56	1875	11	2.35E-03	51.0	
33	0	969.33	48	13	1.83	1938.85	1933	14	1.35E-02	21.7	
34	0	985.78	15	0	4.37	1971.73	1965	13	4.17E-03	25.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1035.58	11	0	1.96	2071.36	2068	8	3.06E-03	30.2	
36	0	1070.23	8	3	3.86	2140.66	2134	12	2.26E-03	55.0	
37	0	1120.76	28	12	1.77	2241.73	2236	14	7.81E-03	31.2	
38	0	1188.66	12	2	1.87	2377.54	2372	9	3.21E-03	37.7	
39	0	1238.77*	12	9	4.40	2477.77	2469	13	3.39E-03	60.4	
40	0	1460.71*	132	11	2.19	2921.66	2913	15	3.67E-02	10.4	
41	0	1603.72	6	2	1.03	3207.69	3202	9	1.65E-03	60.9	
42	2	1763.36*	14	1	2.59	3526.95	3522	15	3.81E-03	33.9	8.06E-01
43	2	1766.14	13	3	2.88	3532.52	3522	15	3.54E-03	36.1	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:42:52

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677028.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:50:00 Acquisition date : 28-JUN-2016 11:39:09
Sample ID         : G398677028 Sample quantity   : 148.55 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA43 Detector geometry   : CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.65 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated : No Systematic Error    : 0.00 %
Efficiency type   : Empirical Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.017E+00	5.941E+00	5.941E+00	20.79	OK
CD-109	88.03	3.70*	4.659E+00	1.701E+00	1.828E+00	75.04	OK
SN-126	64.28	9.60	1.923E+00	1.974E-01	1.974E-01	963.55	OK
	86.94	8.90	4.659E+00	7.071E-01	7.071E-01	75.04	OK
	87.57	37.00*	4.659E+00	1.701E-01	1.701E-01	75.04	OK
BA-137M	661.66	89.90*	2.125E+00	1.746E+00	1.751E+00	9.03	OK
CS-137	661.66	85.10*	2.125E+00	1.845E+00	1.850E+00	9.03	OK
TL-208	277.37	6.60	4.073E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.356E+00	3.058E-01	3.058E-01	23.78	OK
	860.56	12.50	1.682E+00	6.333E-01	6.333E-01	67.72	OK
BI-211	72.87	1.23	3.101E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.430E+00	4.405E-01	4.405E-01	199.31	OK
PB-212	74.82	10.28	3.308E+00	1.433E+00	1.433E+00	53.21	OK
	77.11	17.10	3.588E+00	1.641E+00	1.641E+00	27.06	OK
	238.63	43.60*	4.538E+00	8.550E-01	8.550E-01	19.87	OK
	300.09	3.30	3.852E+00	2.219E+00	2.219E+00	56.37	OK
BI-214	609.32	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26	OK
	1120.29	14.92	1.303E+00	7.239E-01	7.239E-01	62.33	OK
	1764.49	15.30	8.859E-01	4.834E-01	4.835E-01	67.84	OK
PB-214	74.82	5.80	3.345E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.588E+00	2.892E+00	2.892E+00	27.06	OK
	87.09	3.41	4.655E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.490E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.896E+00	4.758E-01	4.758E-01	54.51	OK
	351.93	35.60*	3.430E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26	OK
	1120.29	14.92	1.303E+00	7.239E-01	7.239E-01	62.33	OK
	1764.49	15.30	8.859E-01	4.834E-01	4.835E-01	67.84	OK
RA-224	240.99	4.10*	4.495E+00	6.331E-01	6.331E-01	188.69	OK
RA-226	609.32	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26	OK
	1120.29	14.92	1.303E+00	7.239E-01	7.239E-01	62.33	OK
	1764.49	15.30	8.859E-01	4.834E-01	4.835E-01	67.84	OK
AC-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.528E+00	8.785E-01	8.785E-01	61.50	OK
	794.95	4.25	1.810E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.594E+00	8.068E-01	8.068E-01	33.47	OK
	968.97	15.80	1.502E+00	1.037E+00	1.037E+00	43.30	OK
RA-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.528E+00	8.785E-01	8.785E-01	61.50	OK
	794.95	4.25	1.810E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.594E+00	8.068E-01	8.068E-01	33.47	OK
	968.97	15.80	1.502E+00	1.037E+00	1.037E+00	43.30	OK
TH-228	74.82	10.28	3.308E+00	1.433E+00	1.433E+00	53.21	OK
	77.11	17.10	3.588E+00	1.641E+00	1.641E+00	27.06	OK
	238.63	43.60*	4.538E+00	8.550E-01	8.550E-01	19.87	OK
	300.09	3.30	3.852E+00	2.219E+00	2.219E+00	56.37	OK
TH-230	609.32	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.303E+00	7.239E-01	7.239E-01	62.33	OK
	1764.49	15.30	8.859E-01	4.834E-01	4.834E-01	67.84	OK
TH-232	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.528E+00	8.785E-01	8.785E-01	61.50	OK
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.594E+00	8.068E-01	8.068E-01	33.47	OK
	968.97	15.80	1.502E+00	1.037E+00	1.037E+00	43.30	OK
TH-234	63.29	3.70*	1.923E+00	5.122E-01	5.122E-01	963.55	OK
	92.59	4.23	5.074E+00	1.803E+00	1.803E+00	70.67	OK
U-234	609.32	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26	OK
	1120.29	14.92	1.303E+00	7.239E-01	7.239E-01	62.33	OK
	1764.49	15.30	8.859E-01	4.834E-01	4.834E-01	67.84	OK
U-235	89.96	3.47	4.885E+00	1.387E+00	1.387E+00	108.18	OK
	93.35	5.60	5.074E+00	1.362E+00	1.362E+00	70.67	OK
	143.76	10.96*	6.014E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.735E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.352E+00	1.246E-01	1.246E-01	78.82	OK
	205.31	5.01	5.027E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	1.923E+00	5.122E-01	5.122E-01	963.55	OK
	92.59	4.23	5.074E+00	1.803E+00	1.803E+00	70.67	OK
AM-243	43.53	5.90	1.429E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.308E+00	2.193E-01	2.193E-01	53.21	OK
ANH-511	511.00	100.00*	2.610E+00	2.695E-02	2.695E-02	293.79	OK

Flag: "*" = Keyline

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677028.CNF;1  *
* Acquisition date   : 28-JUN-2016 11:39:09 Sensitivity      : 3.000          *
* Detector ID        : GAM43 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.65 Half life ratio : *****      *
* Sample date        : 11-MAY-2016 14:50:00 Analyst initials: MXR1      *
* Sample ID          : G398677028 Sample Quantity : 1.4855E+02 GRAM    *
* Batch Number       : 1572486 Wet Weight : 0.00000         *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-SEP-2015 10:32:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.941E+00	1.210E+00	9.093E-01
CD-109	1.828E+00	1.344E+00	1.843E+00
SN-126	1.701E-01	1.251E-01	1.729E-01
BA-137M	1.751E+00	1.550E-01	6.763E-02
CS-137	1.850E+00	1.637E-01	7.144E-02
TL-208	3.058E-01	7.124E-02	7.257E-02
BI-211	4.405E-01	8.603E-01	5.012E-01
PB-212	8.550E-01	1.665E-01	1.644E-01
BI-214	5.265E-01	1.974E-01	1.322E-01
PB-214	6.357E-01	1.814E-01	3.029E-01
RN-222	5.265E-01	1.974E-01	1.322E-01
RA-224	6.331E-01	1.171E+00	1.762E+00
RA-226	5.265E-01	1.974E-01	1.322E-01
AC-228	8.068E-01	2.646E-01	2.540E-01
RA-228	8.068E-01	2.646E-01	2.540E-01
TH-228	8.550E-01	1.665E-01	1.644E-01
TH-230	5.265E-01	1.974E-01	1.322E-01
TH-232	8.068E-01	2.646E-01	2.540E-01
TH-234	5.122E-01	4.837E+00	3.985E+00
U-234	5.265E-01	1.974E-01	1.322E-01
U-235	-4.639E-02	2.077E-01	3.915E-01
U-238	5.122E-01	4.837E+00	3.985E+00
AM-243	2.193E-01	1.144E-01	1.261E-01
ANH-511	2.695E-02	7.760E-02	6.409E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-3.566E-01	6.566E-01	1.161E+00	NOT IDENT.
NA-22	-3.555E-02	4.009E-02	6.563E-02	NOT IDENT.
NA-24	0.000E+00	4.739E+21	0.000E+00	SHORT HLIF
AL-26	-3.461E-02	3.557E-02	5.346E-02	NOT IDENT.
SC-46	2.306E-02	5.670E-02	1.038E-01	FAIL ABUN
V-48	4.033E-02	3.055E-01	5.306E-01	NOT IDENT.

CR-51	5.781E-01	1.080E+00	2.138E+00	NOT IDENT.
MN-54	1.175E-02	4.765E-02	8.250E-02	NOT IDENT.
CO-56	3.832E-02	5.673E-02	1.138E-01	FAIL ABUN
MN-56	0.000E+00	1.462E+41	0.000E+00	SHORT HLIF
CO-57	4.770E-05	3.046E-02	5.884E-02	NOT IDENT.
CO-58	1.811E-02	5.764E-02	1.040E-01	NOT IDENT.
FE-59	2.665E-04	1.200E-01	2.457E-01	NOT IDENT.
CO-60	-3.416E-03	4.263E-02	8.336E-02	NOT IDENT.
ZN-65	-2.924E-02	1.102E-01	1.746E-01	NOT IDENT.
GE-68	1.271E+00	1.521E+00	3.121E+00	NOT IDENT.
AS-73	-5.291E-03	2.614E+00	4.989E+00	NOT IDENT.
AS-74	-1.213E-01	4.137E-01	7.389E-01	NOT IDENT.
SE-75	-3.299E-02	6.664E-02	1.172E-01	NOT IDENT.
BR-77	0.000E+00	3.655E+05	0.000E+00	SHORT HLIF
SR-82	9.085E-02	8.408E-01	1.655E+00	NOT IDENT.
RB-83	3.177E-03	1.113E-01	2.087E-01	NOT IDENT.
KR-85	7.461E+00	1.036E+01	1.811E+01	NOT IDENT.
SR-85	5.555E-02	7.745E-02	1.354E-01	NOT IDENT.
RB-86	2.313E+00	2.946E+00	6.013E+00	NOT IDENT.
Y-88	5.630E-02	6.083E-02	1.456E-01	NOT IDENT.
Y-91	4.207E+00	2.756E+01	5.607E+01	NOT IDENT.
NB-94	-3.230E-03	3.326E-02	6.394E-02	NOT IDENT.
NB-95	-4.285E-03	6.539E-02	1.242E-01	NOT IDENT.
NB-95M	4.096E-01	2.353E-01	4.380E-01	NOT IDENT.
ZR-95	-8.000E-04	1.033E-01	2.007E-01	NOT IDENT.
NB-97	0.000E+00	3.561E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.704E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.504E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.563E-02	5.510E-02	7.092E-02	FAIL ABUN
RH-102	1.238E-02	5.671E-02	1.140E-01	NOT IDENT.
RU-103	-8.748E-02	8.593E-02	1.431E-01	FAIL ABUN
RH-106	1.721E-01	3.498E-01	7.212E-01	NOT IDENT.
RU-106	1.721E-01	3.498E-01	7.212E-01	NOT IDENT.
AG-108M	-4.196E-03	3.997E-02	7.417E-02	NOT IDENT.
AG-110M	-9.605E-03	6.400E-02	1.069E-01	NOT IDENT.
SN-113	-2.868E-03	7.074E-02	1.330E-01	NOT IDENT.
CD-115	0.000E+00	3.790E+05	0.000E+00	SHORT HLIF
SN-117M	1.683E-01	3.402E-01	6.620E-01	NOT IDENT.
TE-123M	7.020E-03	4.086E-02	7.795E-02	NOT IDENT.
SB-124	-1.368E-02	7.515E-02	1.889E-01	NOT IDENT.
SB-125	4.400E-02	1.257E-01	2.423E-01	FAIL ABUN
TE-125M	8.958E+00	1.626E+01	3.258E+01	NOT IDENT.
I-126	5.765E-01	1.551E+00	2.756E+00	NOT IDENT.
SB-126	9.176E-01	9.961E-01	1.958E+00	NOT IDENT.
SB-127	0.000E+00	4.385E+02	0.000E+00	SHORT HLIF
I-131	-9.649E-01	2.387E+00	4.391E+00	NOT IDENT.
I-132	0.000E+00	1.677E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.048E+03	0.000E+00	SHORT HLIF
BA-133	-1.587E-02	5.760E-02	9.230E-02	NOT IDENT.
I-133	0.000E+00	1.679E+15	0.000E+00	SHORT HLIF
CS-134	5.548E-02	8.005E-02	9.838E-02	FAIL ABUN
CS-135	1.983E-02	1.968E-01	3.621E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-2.057E-01	5.967E-01	1.125E+00	FAIL ABUN
CE-139	-1.906E-02	4.179E-02	7.651E-02	NOT IDENT.
BA-140	-1.311E+00	1.848E+00	3.172E+00	NOT IDENT.
LA-140	-2.460E-02	6.240E-01	1.099E+00	NOT IDENT.
CE-141	-4.369E-02	1.305E-01	2.440E-01	NOT IDENT.
CE-143	0.000E+00	2.764E+09	0.000E+00	SHORT HLIF
CE-144	-9.794E-02	2.626E-01	4.293E-01	NOT IDENT.
PM-144	-2.471E-03	3.990E-02	7.640E-02	NOT IDENT.
PR-144	-2.048E-01	3.036E+00	5.809E+00	NOT IDENT.
PM-146	2.666E-03	5.671E-02	1.064E-01	NOT IDENT.
ND-147	9.190E-01	5.386E+00	1.024E+01	FAIL ABUN
PM-147	-2.572E+02	8.350E+02	1.584E+03	NOT IDENT.
PM-149	0.000E+00	3.360E+06	0.000E+00	SHORT HLIF
EU-150	1.135E-02	3.959E-02	6.745E-02	FAIL ABUN
EU-152	-8.191E-02	1.321E-01	2.239E-01	NOT IDENT.
GD-153	-5.327E-02	1.195E-01	1.993E-01	NOT IDENT.
EU-154	-9.652E-02	1.123E-01	1.853E-01	NOT IDENT.
EU-155	1.899E-02	1.207E-01	2.372E-01	FAIL ABUN
TB-160	1.123E-01	1.848E-01	3.893E-01	FAIL ABUN
HO-166M	2.676E-03	5.545E-02	1.099E-01	FAIL ABUN
TM-171	-2.330E+01	4.290E+01	7.877E+01	NOT IDENT.
HF-172	1.046E-01	2.341E-01	4.137E-01	FAIL ABUN
LU-172	1.582E-02	5.913E-02	1.244E-01	FAIL ABUN
LU-176	1.833E-02	3.284E-02	6.540E-02	FAIL ABUN

HF-181	-1.057E-02	1.010E-01	1.862E-01	NOT IDENT.
TA-182	-1.289E-02	2.267E-01	4.392E-01	FAIL ABUN
RE-183	-8.293E-02	5.922E-01	9.875E-01	NOT IDENT.
RE-184	1.594E-01	2.463E-01	4.874E-01	FAIL ABUN
W-188	1.541E+00	1.438E+01	2.309E+01	FAIL ABUN
IR-192	3.252E-03	5.777E-02	1.111E-01	FAIL ABUN
HG-203	-7.505E-02	7.470E-02	1.246E-01	NOT IDENT.
BI-207	-3.699E-03	4.892E-02	8.420E-02	FAIL ABUN
PB-210	1.437E+00	1.209E+01	2.344E+01	NOT IDENT.
PB-211	-4.361E-01	9.557E-01	1.728E+00	NOT IDENT.
BI-212	1.136E+00	7.037E-01	1.333E+00	FAIL ABUN
RN-219	1.786E-01	5.136E-01	9.965E-01	FAIL ABUN
RA-223	-6.656E-01	8.678E-01	1.561E+00	FAIL ABUN
AC-227	-6.845E-02	3.305E-01	5.745E-01	FAIL ABUN
TH-227	-6.845E-02	3.305E-01	5.745E-01	FAIL ABUN
TH-229	-1.446E-01	6.367E-01	1.169E+00	FAIL ABUN
PA-231	2.412E-01	6.737E-01	1.160E+00	NOT IDENT.
TH-231	-6.656E-01	8.678E-01	1.561E+00	FAIL ABUN
PA-233	1.757E-02	7.662E-02	1.489E-01	FAIL ABUN
PA-234	-1.041E-01	3.261E-01	4.990E-01	NOT IDENT.
PA-234M	-1.285E+00	4.471E+00	8.232E+00	NOT IDENT.
NP-237	1.757E-02	7.662E-02	1.489E-01	FAIL ABUN
NP-238	0.000E+00	6.527E+05	0.000E+00	SHORT HLIF
NP-239	7.664E-02	2.811E-01	5.549E-01	NOT IDENT.
PU-239	3.582E+02	4.267E+02	7.705E+02	NOT IDENT.
AM-241	-5.605E-02	3.122E-01	5.173E-01	NOT IDENT.
CM-243	-4.468E-02	1.226E-01	2.341E-01	NOT IDENT.
BK-247	-5.448E-02	9.889E-02	1.731E-01	NOT IDENT.
CM-247	-4.884E-03	4.799E-02	8.964E-02	NOT IDENT.
CF-249	3.973E-02	5.098E-02	1.022E-01	NOT IDENT.
CF-251	6.699E-02	1.480E-01	2.864E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	127	10.66*	1.017E+00	5.941E+00	5.941E+00	20.79
CD-109	88.03	73	3.70*	4.659E+00	2.139E+00	2.299E+00	58.60
SN-126	64.28	7	9.60	1.923E+00	1.974E-01	1.974E-01	963.55
	86.94	73	8.90	4.659E+00	8.894E-01	8.894E-01	58.60
	87.57	73	37.00*	4.659E+00	2.139E-01	2.139E-01	58.60
BA-137M	661.66	660	89.90*	2.125E+00	1.746E+00	1.751E+00	9.03
CS-137	661.66	660	85.10*	2.125E+00	1.845E+00	1.850E+00	9.03
TL-208	277.37	-----	6.60	4.073E+00	-----	Line Not Found	-----
	583.19	121	85.00*	2.356E+00	3.058E-01	3.058E-01	23.78
	860.56	26	12.50	1.682E+00	6.333E-01	6.333E-01	67.72
BI-211	72.87	-----	1.23	3.101E+00	-----	Line Not Found	-----
	351.06	154	12.92*	3.430E+00	1.752E+00	1.752E+00	29.11
PB-212	74.82	115	10.28	3.308E+00	1.702E+00	1.702E+00	43.99
	77.11	199	17.10	3.588E+00	1.641E+00	1.641E+00	27.06
	238.63	335	43.60*	4.538E+00	8.550E-01	8.550E-01	19.87
	300.09	56	3.30	3.852E+00	2.219E+00	2.219E+00	56.37
BI-214	609.32	108	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26
	1120.29	28	14.92	1.303E+00	7.239E-01	7.239E-01	62.33
	1764.49	13	15.30	8.859E-01	4.834E-01	4.835E-01	67.84
PB-214	74.82	115	5.80	3.308E+00	3.016E+00	3.017E+00	43.99
	77.11	199	9.70	3.588E+00	2.892E+00	2.892E+00	27.06
	87.09	73	3.41	4.659E+00	2.321E+00	2.321E+00	58.60
	242.00	54	7.25	4.495E+00	8.339E-01	8.339E-01	74.81
	295.22	68	18.42	3.896E+00	4.758E-01	4.758E-01	54.51
	351.93	154	35.60*	3.430E+00	6.357E-01	6.357E-01	29.11
RN-222	609.32	108	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26
	1120.29	28	14.92	1.303E+00	7.239E-01	7.239E-01	62.33
	1764.49	13	15.30	8.859E-01	4.834E-01	4.835E-01	67.84
RA-224	240.99	54	4.10*	4.495E+00	1.474E+00	1.474E+00	74.81
RA-226	609.32	108	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26
	1120.29	28	14.92	1.303E+00	7.239E-01	7.239E-01	62.33
	1764.49	13	15.30	8.859E-01	4.834E-01	4.835E-01	67.84
AC-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	69	11.27	3.528E+00	8.785E-01	8.785E-01	61.50
	794.95	-----	4.25	1.810E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	66	25.80*	1.594E+00	8.068E-01	8.068E-01	33.47
	968.97	49	15.80	1.502E+00	1.037E+00	1.037E+00	43.30
RA-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	69	11.27	3.528E+00	8.785E-01	8.785E-01	61.50
	794.95	-----	4.25	1.810E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	66	25.80*	1.594E+00	8.068E-01	8.068E-01	33.47
	968.97	49	15.80	1.502E+00	1.037E+00	1.037E+00	43.30
TH-228	74.82	115	10.28	3.308E+00	1.702E+00	1.702E+00	43.99
	77.11	199	17.10	3.588E+00	1.641E+00	1.641E+00	27.06
	238.63	335	43.60*	4.538E+00	8.550E-01	8.550E-01	19.87

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	300.09	56	3.30	3.852E+00	2.219E+00	2.219E+00	56.37
	609.32	108	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26
	1120.29	28	14.92	1.303E+00	7.239E-01	7.239E-01	62.33
TH-232	1764.49	13	15.30	8.859E-01	4.834E-01	4.834E-01	67.84
	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	69	11.27	3.528E+00	8.785E-01	8.785E-01	61.50
TH-234	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	66	25.80*	1.594E+00	8.068E-01	8.068E-01	33.47
	968.97	49	15.80	1.502E+00	1.037E+00	1.037E+00	43.30
U-234	63.29	7	3.70*	1.923E+00	5.122E-01	5.122E-01	963.55
	92.59	77	4.23	5.074E+00	1.803E+00	1.803E+00	70.67
	609.32	108	45.49*	2.274E+00	5.265E-01	5.265E-01	38.26
U-235	1120.29	28	14.92	1.303E+00	7.239E-01	7.239E-01	62.33
	1764.49	13	15.30	8.859E-01	4.834E-01	4.834E-01	67.84
	89.96	47	3.47	4.885E+00	1.387E+00	1.387E+00	108.18
U-238	93.35	77	5.60	5.074E+00	1.362E+00	1.362E+00	70.67
	143.76	-----	10.96*	6.014E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.735E+00	-----	Line Not Found	-----
AM-243	185.72	75	57.20	5.352E+00	1.246E-01	1.246E-01	78.82
	205.31	-----	5.01	5.027E+00	-----	Line Not Found	-----
	63.29	7	3.70*	1.923E+00	5.122E-01	5.122E-01	963.55
ANH-511	92.59	77	4.23	5.074E+00	1.803E+00	1.803E+00	70.67
	43.53	-----	5.90	1.429E-01	-----	Line Not Found	-----
	74.66	115	67.20*	3.308E+00	2.604E-01	2.604E-01	43.99
	511.00	14	100.00*	2.610E+00	2.695E-02	2.695E-02	293.79

Flag: "*" = Keyline

Total number of lines in spectrum 43
Number of unidentified lines 11
Number of lines tentatively identified by NID 32 74.42%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.941E+00	5.941E+00	1.235E+00	20.79	
CD-109	461.40D	1.07	2.139E+00	2.299E+00	1.347E+00	58.60	
SN-126	2.30E+05Y	1.00	2.139E-01	2.139E-01	1.254E-01	58.60	
BA-137M	30.08Y	1.00	1.746E+00	1.751E+00	0.158E+00	9.03	
CS-137	30.08Y	1.00	1.845E+00	1.850E+00	0.167E+00	9.03	
TL-208	1.41E+10Y	1.00	3.058E-01	3.058E-01	0.727E-01	23.78	
BI-211	7.04E+08Y	1.00	1.752E+00	1.752E+00	0.510E+00	29.11	
PB-212	1.41E+10Y	1.00	8.550E-01	8.550E-01	1.699E-01	19.87	
BI-214	1600.00Y	1.00	5.265E-01	5.265E-01	2.014E-01	38.26	
PB-214	1600.00Y	1.00	6.357E-01	6.357E-01	1.851E-01	29.11	
RN-222	1600.00Y	1.00	5.265E-01	5.265E-01	2.014E-01	38.26	
RA-224	1.41E+10Y	1.00	1.474E+00	1.474E+00	1.103E+00	74.81	
RA-226	1600.00Y	1.00	5.265E-01	5.265E-01	2.014E-01	38.26	
AC-228	1.41E+10Y	1.00	8.068E-01	8.068E-01	2.700E-01	33.47	
RA-228	1.41E+10Y	1.00	8.068E-01	8.068E-01	2.700E-01	33.47	
TH-228	1.41E+10Y	1.00	8.550E-01	8.550E-01	1.699E-01	19.87	
TH-230	7.54E+04Y	1.00	5.265E-01	5.265E-01	2.014E-01	38.26	
TH-232	1.41E+10Y	1.00	8.068E-01	8.068E-01	2.700E-01	33.47	
TH-234	4.47E+09Y	1.00	5.122E-01	5.122E-01	49.35E-01	963.55	
U-234	2.45E+05Y	1.00	5.265E-01	5.265E-01	2.014E-01	38.26	
U-235	7.04E+08Y	1.00	1.246E-01	1.246E-01	0.982E-01	78.82	K
U-238	4.47E+09Y	1.00	5.122E-01	5.122E-01	49.35E-01	963.55	
AM-243	7370.00Y	1.00	2.604E-01	2.604E-01	1.145E-01	43.99	
ANH-511	1.00E+09Y	1.00	2.695E-02	2.695E-02	7.918E-02	293.79	
Total Activity :			2.425E+01	2.442E+01			

Grand Total Activity : 2.425E+01 2.442E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	127.75	21	135	1.21	255.33	254	8	4.70E-03	****	6.11E+00	T
0	209.20	65	99	1.59	418.28	413	10	1.55E-02	67.3	4.96E+00	
0	272.72	61	201	8.29	545.35	521	26	1.49E-02	****	4.12E+00	T
0	463.35	46	43	2.16	926.71	922	10	1.19E-02	63.2	2.81E+00	T
0	649.21	23	41	4.01	1298.51	1287	20	6.07E-03	****	2.16E+00	
0	727.16	29	15	1.02	1454.43	1449	10	7.89E-03	63.2	1.96E+00	T
0	743.98	9	10	3.84	1488.08	1481	13	2.46E-03	****	1.92E+00	
0	797.00	16	22	3.94	1594.14	1584	15	4.39E-03	****	1.81E+00	T
0	804.10	19	13	1.53	1608.32	1602	16	5.18E-03	95.3	1.79E+00	
0	840.26	8	2	1.46	1680.67	1677	8	2.05E-03	97.6	1.72E+00	
0	893.33	20	4	3.13	1786.81	1779	13	5.40E-03	59.6	1.62E+00	T
0	917.07	12	5	1.38	1834.30	1830	9	3.19E-03	88.9	1.58E+00	
0	940.70	9	3	1.44	1881.56	1875	11	2.35E-03	****	1.55E+00	
0	985.78	15	0	4.37	1971.73	1965	13	4.17E-03	51.6	1.48E+00	T
0	1035.58	11	0	1.96	2071.36	2068	8	3.06E-03	60.3	1.41E+00	
0	1070.23	8	3	3.86	2140.66	2134	12	2.26E-03	****	1.36E+00	
0	1188.66	11	2	1.87	2377.54	2372	9	3.21E-03	75.5	1.23E+00	T
0	1238.77	12	9	4.40	2477.77	2469	13	3.39E-03	****	1.18E+00	T
0	1603.72	6	2	1.03	3207.69	3202	9	1.65E-03	****	9.43E-01	
2	1766.14	12	3	2.88	3532.52	3522	15	3.54E-03	72.1	8.85E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677028.CNF;1
Acquisition date : 28-JUN-2016 11:39:09 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.65 Half life ratio : *****
Sample date : 11-MAY-2016 14:50:00 Nuclide Library : SOLID
Sample ID : G398677028 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4855E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.913E-01
CD-109	8.769E-01
SN-126	8.226E-02
BA-137M	3.014E-02
CS-137	3.184E-02
TL-208	3.278E-02
BI-211	2.347E-01
PB-212	7.862E-02
BI-214	5.931E-02
PB-214	1.457E-01
RN-222	5.931E-02
RA-224	8.427E-01
RA-226	5.931E-02
AC-228	1.101E-01
RA-228	1.101E-01
TH-228	7.862E-02
TH-230	5.931E-02
TH-232	1.101E-01
TH-234	1.885E+00
U-234	5.931E-02
U-235	1.848E-01
U-238	1.885E+00
AM-243	5.978E-02
ANH-511	2.935E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.349E-01	NOT IDENT.
NA-22	2.660E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.887E-02	NOT IDENT.
SC-46	4.557E-02	FAIL ABUN
V-48	2.279E-01	NOT IDENT.
CR-51	1.004E+00	NOT IDENT.

MN-54	3.678E-02	NOT IDENT.
CO-56	5.066E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.785E-02	NOT IDENT.
CO-58	4.570E-02	NOT IDENT.
FE-59	1.034E-01	NOT IDENT.
CO-60	3.533E-02	NOT IDENT.
ZN-65	7.537E-02	NOT IDENT.
GE-68	1.382E+00	NOT IDENT.
AS-73	2.350E+00	NOT IDENT.
AS-74	3.363E-01	NOT IDENT.
SE-75	5.484E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	7.348E-01	NOT IDENT.
RB-83	9.544E-02	NOT IDENT.
KR-85	8.427E+00	NOT IDENT.
SR-85	6.298E-02	NOT IDENT.
RB-86	2.656E+00	NOT IDENT.
Y-88	6.194E-02	NOT IDENT.
Y-91	2.418E+01	NOT IDENT.
NB-94	2.850E-02	NOT IDENT.
NB-95	5.582E-02	NOT IDENT.
NB-95M	2.085E-01	NOT IDENT.
ZR-95	8.898E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.368E-02	FAIL ABUN
RH-102	5.120E-02	NOT IDENT.
RU-103	6.478E-02	FAIL ABUN
RH-106	3.261E-01	NOT IDENT.
RU-106	3.261E-01	NOT IDENT.
AG-108M	3.444E-02	NOT IDENT.
AG-110M	4.681E-02	NOT IDENT.
SN-113	6.192E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.146E-01	NOT IDENT.
TE-123M	3.703E-02	NOT IDENT.
SB-124	6.691E-02	NOT IDENT.
SB-125	1.129E-01	FAIL ABUN
TE-125M	1.547E+01	NOT IDENT.
I-126	1.247E+00	NOT IDENT.
SB-126	8.823E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.033E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.277E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.449E-02	FAIL ABUN
CS-135	1.704E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.852E-01	FAIL ABUN
CE-139	3.625E-02	NOT IDENT.
BA-140	1.431E+00	NOT IDENT.
LA-140	4.470E-01	NOT IDENT.
CE-141	1.151E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.027E-01	NOT IDENT.
PM-144	3.442E-02	NOT IDENT.
PR-144	2.617E+00	NOT IDENT.
PM-146	4.936E-02	NOT IDENT.
ND-147	4.687E+00	FAIL ABUN
PM-147	7.486E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.165E-02	FAIL ABUN
EU-152	1.042E-01	NOT IDENT.
GD-153	9.432E-02	NOT IDENT.
EU-154	7.532E-02	NOT IDENT.
EU-155	1.125E-01	FAIL ABUN
TB-160	1.725E-01	FAIL ABUN
HO-166M	4.847E-02	FAIL ABUN
TM-171	3.687E+01	NOT IDENT.
HF-172	1.958E-01	FAIL ABUN
LU-172	5.354E-02	FAIL ABUN
LU-176	3.070E-02	FAIL ABUN
HF-181	8.609E-02	NOT IDENT.

TA-182	1.911E-01	FAIL ABUN
RE-183	4.653E-01	NOT IDENT.
RE-184	2.147E-01	FAIL ABUN
W-188	1.082E+01	FAIL ABUN
IR-192	5.194E-02	FAIL ABUN
HG-203	5.792E-02	NOT IDENT.
BI-207	3.532E-02	FAIL ABUN
PB-210	1.106E+01	NOT IDENT.
PB-211	8.038E-01	NOT IDENT.
BI-212	6.132E-01	FAIL ABUN
RN-219	4.640E-01	FAIL ABUN
RA-223	7.318E-01	FAIL ABUN
AC-227	2.698E-01	FAIL ABUN
TH-227	2.698E-01	FAIL ABUN
TH-229	5.535E-01	FAIL ABUN
PA-231	5.456E-01	NOT IDENT.
TH-231	7.318E-01	FAIL ABUN
PA-233	6.952E-02	FAIL ABUN
PA-234	2.119E-01	NOT IDENT.
PA-234M	3.549E+00	NOT IDENT.
NP-237	6.952E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.624E-01	NOT IDENT.
PU-239	3.665E+02	NOT IDENT.
AM-241	2.439E-01	NOT IDENT.
CM-243	1.109E-01	NOT IDENT.
BK-247	8.092E-02	NOT IDENT.
CM-247	4.167E-02	NOT IDENT.
CF-249	4.777E-02	NOT IDENT.
CF-251	1.357E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677028.CNF;1
Acquisition date : 28-JUN-2016 11:39:09 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.65 Half life ratio : *****
Sample date : 11-MAY-2016 14:50:00 Nuclide Library : SOLID
Sample ID : G398677028 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4855E+02 GRAM
Quantity Err(%) : 1.3463E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.941E+00	1.312E+00	1.312E+00
CD-109	1.828E+00	1.360E+00	1.360E+00
SN-126	1.701E-01	1.263E-01	1.263E-01
BA-137M	1.751E+00	2.210E-01	2.210E-01
CS-137	1.850E+00	2.334E-01	2.334E-01
TL-208	3.058E-01	7.630E-02	7.630E-02
BI-211	4.405E-01	8.785E-01	8.785E-01
PB-212	8.550E-01	1.839E-01	1.839E-01
BI-214	5.265E-01	2.030E-01	2.030E-01
PB-214	6.357E-01	1.900E-01	1.900E-01
RN-222	5.265E-01	2.030E-01	2.030E-01
RA-224	6.331E-01	1.177E+00	1.177E+00
RA-226	5.265E-01	2.030E-01	2.030E-01
AC-228	8.068E-01	2.939E-01	2.939E-01
RA-228	8.068E-01	2.939E-01	2.939E-01
TH-228	8.550E-01	1.839E-01	1.839E-01
TH-230	5.265E-01	2.030E-01	2.030E-01
TH-232	8.068E-01	2.939E-01	2.939E-01
TH-234	5.122E-01	4.838E+00	4.838E+00
U-234	5.265E-01	2.030E-01	2.030E-01
U-235	-4.639E-02	2.077E-01	2.077E-01
U-238	5.122E-01	4.838E+00	4.838E+00
AM-243	2.193E-01	1.165E-01	1.165E-01
ANH-511	2.695E-02	7.763E-02	7.763E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-3.566E-01	6.573E-01	6.767E-01	NOT IDENT.
NA-22	-3.555E-02	4.019E-02	4.327E-02	NOT IDENT.
NA-24	3.927E+21	4.757E+21	0.000E+00	SHORT HLIF
AL-26	-3.461E-02	3.567E-02	3.893E-02	NOT IDENT.
SC-46	2.306E-02	5.681E-02	5.775E-02	FAIL ABUN
V-48	4.033E-02	3.056E-01	3.062E-01	NOT IDENT.

CR-51	5.781E-01	1.082E+00	1.113E+00	NOT IDENT.
MN-54	1.175E-02	4.767E-02	4.797E-02	NOT IDENT.
CO-56	3.832E-02	5.697E-02	5.954E-02	FAIL ABUN
MN-56	1.000E+41	1.468E+41	0.000E+00	SHORT HLIF
CO-57	4.770E-05	3.046E-02	3.046E-02	NOT IDENT.
CO-58	1.811E-02	5.769E-02	5.826E-02	NOT IDENT.
FE-59	2.665E-04	1.200E-01	1.200E-01	NOT IDENT.
CO-60	-3.416E-03	4.263E-02	4.266E-02	NOT IDENT.
ZN-65	-2.924E-02	1.103E-01	1.111E-01	NOT IDENT.
GE-68	1.271E+00	1.541E+00	1.644E+00	NOT IDENT.
AS-73	-5.291E-03	2.614E+00	2.614E+00	NOT IDENT.
AS-74	-1.213E-01	4.140E-01	4.176E-01	NOT IDENT.
SE-75	-3.299E-02	6.672E-02	6.835E-02	NOT IDENT.
BR-77	1.877E+06	2.625E+06	2.758E+06	SHORT HLIF
SR-82	9.085E-02	8.408E-01	8.418E-01	NOT IDENT.
RB-83	3.177E-03	1.113E-01	1.113E-01	NOT IDENT.
KR-85	7.461E+00	1.038E+01	1.091E+01	NOT IDENT.
SR-85	5.555E-02	7.760E-02	8.154E-02	NOT IDENT.
RB-86	2.313E+00	2.980E+00	3.157E+00	NOT IDENT.
Y-88	5.630E-02	6.098E-02	6.605E-02	NOT IDENT.
Y-91	4.207E+00	2.756E+01	2.763E+01	NOT IDENT.
NB-94	-3.230E-03	3.327E-02	3.330E-02	NOT IDENT.
NB-95	-4.285E-03	6.539E-02	6.542E-02	NOT IDENT.
NB-95M	4.096E-01	2.395E-01	3.024E-01	NOT IDENT.
ZR-95	-8.000E-04	1.033E-01	1.033E-01	NOT IDENT.
NB-97	1.000E+41	3.673E+40	0.000E+00	SHORT HLIF
ZR-97	1.673E+20	2.708E+20	0.000E+00	SHORT HLIF
MO-99	-1.446E+04	5.507E+04	5.545E+04	SHORT HLIF
TC-99M	-1.000E+41	4.575E+41	0.000E+00	SHORT HLIF
RH-101	2.563E-02	5.532E-02	5.652E-02	FAIL ABUN
RH-102	1.238E-02	5.673E-02	5.701E-02	NOT IDENT.
RU-103	-8.748E-02	8.629E-02	9.488E-02	FAIL ABUN
RH-106	1.721E-01	3.503E-01	3.587E-01	NOT IDENT.
RU-106	1.721E-01	3.503E-01	3.587E-01	NOT IDENT.
AG-108M	-4.196E-03	3.997E-02	4.001E-02	NOT IDENT.
AG-110M	-9.605E-03	6.401E-02	6.416E-02	NOT IDENT.
SN-113	-2.868E-03	7.074E-02	7.075E-02	NOT IDENT.
CD-115	-2.075E+04	3.790E+05	3.791E+05	SHORT HLIF
SN-117M	1.683E-01	3.405E-01	3.488E-01	NOT IDENT.
TE-123M	7.020E-03	4.086E-02	4.098E-02	NOT IDENT.
SB-124	-1.368E-02	7.516E-02	7.541E-02	NOT IDENT.
SB-125	4.400E-02	1.258E-01	1.273E-01	FAIL ABUN
TE-125M	8.958E+00	1.628E+01	1.678E+01	NOT IDENT.
I-126	5.765E-01	1.552E+00	1.574E+00	NOT IDENT.
SB-126	9.176E-01	1.004E+00	1.086E+00	NOT IDENT.
SB-127	1.829E+02	4.407E+02	4.483E+02	SHORT HLIF
I-131	-9.649E-01	2.389E+00	2.428E+00	NOT IDENT.
I-132	-1.000E+41	3.396E+41	0.000E+00	SHORT HLIF
TE-132	6.199E+02	1.051E+03	1.087E+03	SHORT HLIF
BA-133	-1.587E-02	5.762E-02	5.806E-02	NOT IDENT.
I-133	8.012E+14	1.696E+15	1.734E+15	SHORT HLIF
CS-134	5.548E-02	8.034E-02	8.414E-02	FAIL ABUN
CS-135	1.983E-02	1.968E-01	1.970E-01	NOT IDENT.
I-135	-1.000E+41	1.346E+44	0.000E+00	SHORT HLIF
CS-136	-2.057E-01	5.982E-01	6.053E-01	FAIL ABUN
CE-139	-1.906E-02	4.198E-02	4.285E-02	NOT IDENT.
BA-140	-1.311E+00	1.852E+00	1.944E+00	NOT IDENT.
LA-140	-2.460E-02	6.241E-01	6.242E-01	NOT IDENT.
CE-141	-4.369E-02	1.306E-01	1.320E-01	NOT IDENT.
CE-143	5.492E+09	2.819E+09	3.751E+09	SHORT HLIF
CE-144	-9.794E-02	2.627E-01	2.664E-01	NOT IDENT.
PM-144	-2.471E-03	3.991E-02	3.992E-02	NOT IDENT.
PR-144	-2.048E-01	3.036E+00	3.037E+00	NOT IDENT.
PM-146	2.666E-03	5.671E-02	5.673E-02	NOT IDENT.
ND-147	9.190E-01	5.386E+00	5.402E+00	FAIL ABUN
PM-147	-2.572E+02	8.353E+02	8.433E+02	NOT IDENT.
PM-149	-4.074E+06	3.425E+06	3.886E+06	SHORT HLIF
EU-150	1.135E-02	3.960E-02	3.993E-02	FAIL ABUN
EU-152	-8.191E-02	1.324E-01	1.374E-01	NOT IDENT.
GD-153	-5.327E-02	1.196E-01	1.220E-01	NOT IDENT.
EU-154	-9.652E-02	1.125E-01	1.207E-01	NOT IDENT.
EU-155	1.899E-02	1.207E-01	1.210E-01	FAIL ABUN
TB-160	1.123E-01	1.855E-01	1.923E-01	FAIL ABUN
HO-166M	2.676E-03	5.545E-02	5.547E-02	FAIL ABUN
TM-171	-2.330E+01	4.306E+01	4.432E+01	NOT IDENT.
HF-172	1.046E-01	2.348E-01	2.395E-01	FAIL ABUN
LU-172	1.582E-02	5.924E-02	5.966E-02	FAIL ABUN
LU-176	1.833E-02	3.289E-02	3.391E-02	FAIL ABUN

HF-181	-1.057E-02	1.010E-01	1.011E-01	NOT IDENT.
TA-182	-1.289E-02	2.267E-01	2.268E-01	FAIL ABUN
RE-183	-8.293E-02	5.923E-01	5.935E-01	NOT IDENT.
RE-184	1.594E-01	2.477E-01	2.579E-01	FAIL ABUN
W-188	1.541E+00	1.438E+01	1.440E+01	FAIL ABUN
IR-192	3.252E-03	5.777E-02	5.779E-02	FAIL ABUN
HG-203	-7.505E-02	7.507E-02	8.234E-02	NOT IDENT.
BI-207	-3.699E-03	4.892E-02	4.895E-02	FAIL ABUN
PB-210	1.437E+00	1.210E+01	1.211E+01	NOT IDENT.
PB-211	-4.361E-01	9.564E-01	9.764E-01	NOT IDENT.
BI-212	1.136E+00	7.144E-01	8.790E-01	FAIL ABUN
RN-219	1.786E-01	5.143E-01	5.205E-01	FAIL ABUN
RA-223	-6.656E-01	8.706E-01	9.208E-01	FAIL ABUN
AC-227	-6.845E-02	3.307E-01	3.322E-01	FAIL ABUN
TH-227	-6.845E-02	3.307E-01	3.322E-01	FAIL ABUN
TH-229	-1.446E-01	6.368E-01	6.401E-01	FAIL ABUN
PA-231	2.412E-01	6.759E-01	6.846E-01	NOT IDENT.
TH-231	-6.656E-01	8.706E-01	9.208E-01	FAIL ABUN
PA-233	1.757E-02	7.664E-02	7.704E-02	FAIL ABUN
PA-234	-1.041E-01	3.475E-01	3.507E-01	NOT IDENT.
PA-234M	-1.285E+00	4.477E+00	4.515E+00	NOT IDENT.
NP-237	1.757E-02	7.664E-02	7.704E-02	FAIL ABUN
NP-238	1.290E+06	6.894E+05	9.019E+05	SHORT HLIF
NP-239	7.664E-02	2.812E-01	2.833E-01	NOT IDENT.
PU-239	3.582E+02	4.278E+02	4.572E+02	NOT IDENT.
AM-241	-5.605E-02	3.123E-01	3.133E-01	NOT IDENT.
CM-243	-4.468E-02	1.228E-01	1.244E-01	NOT IDENT.
BK-247	-5.448E-02	9.959E-02	1.026E-01	NOT IDENT.
CM-247	-4.884E-03	4.800E-02	4.805E-02	NOT IDENT.
CF-249	3.973E-02	5.116E-02	5.420E-02	NOT IDENT.
CF-251	6.699E-02	1.483E-01	1.513E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	92.4976	87.09	127.7030	136.47	104.5571
45.60	81.7422	87.57	127.8306	140.51	0.0000
46.54	90.2902	88.03	127.9531	143.76	100.9455
49.72	0.0000	88.34	128.0355	144.24	97.2055
51.35	105.3251	88.47	128.0699	145.44	101.1954
51.87	93.8839	89.96	128.4629	152.43	102.2168
52.39	85.5757	1093.63	128.6407	153.25	111.0246
52.97	86.7794	91.11	128.7638	323.87	119.8743
53.44	87.9576	92.59	129.1483	156.02	107.5787
54.07	85.9943	93.35	129.3447	158.56	106.9846
57.36	0.0000	94.56	99.5196	159.00	114.8347
57.53	88.4449	94.65	102.3412	162.33	121.2215
57.98	93.3842	94.67	102.3453	162.66	119.3193
59.27	108.2550	94.87	102.3854	163.33	106.7014
59.32	108.2695	97.43	118.4039	165.86	121.7967
59.54	97.0155	98.43	121.4572	176.31	100.5639
60.96	81.1541	98.44	121.4593	176.60	99.6048
61.17	87.6954	99.53	109.1780	177.52	94.7355
62.93	103.3288	100.11	100.9494	181.07	0.0000
63.29	103.4256	102.03	110.2034	181.52	113.8539
63.58	103.5030	103.18	119.3463	184.41	88.5129
64.28	111.3301	103.37	119.3887	143.76	105.7827
66.73	140.0290	105.21	109.0672	193.51	111.8673
67.24	138.5572	105.31	109.0872	197.03	112.3339
125.81	143.6630	106.12	109.2487	198.01	104.2832
67.75	140.3844	106.47	111.1106	201.83	104.7470
69.67	114.4976	109.28	104.4705	203.43	105.3516
70.83	108.1626	111.00	91.2400	205.31	108.8774
72.81	147.1277	111.76	0.0000	210.85	107.9006
72.87	147.1485	114.06	112.6196	215.65	90.7443
74.66	110.8241	116.30	0.0000	222.11	81.9300
74.82	110.8654	116.74	93.0667	227.09	95.0379
74.97	110.9037	119.76	96.2950	227.38	89.7856
77.11	111.4490	121.12	103.8671	228.16	0.0000
78.74	110.1646	121.22	108.4812	228.18	82.4608
79.69	110.3981	121.78	100.3006	116.74	82.4608
80.12	110.5033	122.06	104.9500	235.69	75.0106
80.19	110.5201	122.92	103.2551	235.96	71.6210
80.57	107.2094	123.07	101.1730	238.63	158.1680
81.00	131.1582	265.00	107.0764	238.98	0.0000
81.07	134.5854	125.81	91.8875	240.99	158.5485
81.75	131.0320	127.23	103.9812	242.00	99.5155
83.79	111.3905	127.91	102.6082	244.70	72.2588
84.00	111.4405	129.30	99.8547	252.40	0.0000
85.43	116.9393	131.20	107.6300	252.80	75.8746
86.55	141.3485	133.02	95.9437	254.15	0.0000
86.79	148.3177	133.52	106.5208	256.23	85.7603
86.94	148.3650	136.00	100.7166	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	82.2247	355.39	0.0000	584.27	34.5133
264.80	82.2361	356.01	59.9811	595.83	39.4664
265.00	82.2510	364.49	60.9977	427.87	39.8361
268.22	82.5005	366.42	0.0000	602.52	0.0000
269.46	82.5954	372.51	53.6881	604.72	33.0352
270.03	82.6389	375.05	49.9453	607.14	28.3504
271.23	63.5379	377.52	44.2610	609.32	25.7527
273.65	67.2181	356.01	62.8267	610.33	25.7658
276.40	60.2944	388.16	51.3845	614.28	18.9668
277.37	60.8546	388.63	59.1608	618.01	31.8672
277.60	62.1353	391.69	62.2031	620.36	26.8176
278.00	62.1583	264.66	44.0096	621.93	23.1364
279.20	82.2270	401.81	53.8325	630.19	0.0000
279.54	84.4749	402.40	60.7081	631.29	23.2412
279.70	88.9343	404.85	69.6376	633.25	23.2630
280.46	78.9834	410.95	72.8808	634.78	25.1422
283.69	55.7838	413.71	74.9897	635.95	25.1565
284.31	60.2803	414.70	61.2159	636.99	31.6945
285.41	81.5692	423.72	58.6039	645.85	36.9097
285.90	0.0000	427.09	53.7568	657.76	19.7682
287.50	62.6907	427.87	55.7758	657.90	0.0000
290.67	71.8467	433.94	58.9964	661.66	22.6333
293.27	0.0000	439.40	61.2107	664.57	0.0000
351.93	64.6199	453.88	53.6722	666.33	24.3023
295.96	69.1722	463.37	65.1930	666.50	29.1646
879.38	49.7363	468.07	45.9712	667.71	0.0000
299.98	49.7961	473.00	0.0000	677.62	20.8994
300.09	57.3464	475.06	49.2439	685.70	0.0000
300.13	57.3479	476.78	51.3489	695.00	23.9354
301.36	71.0058	477.60	56.5113	696.49	28.7415
302.85	72.6084	482.18	52.5452	696.51	28.7415
256.23	60.5924	487.02	45.4631	697.00	28.7476
304.85	80.3087	492.35	0.0000	697.30	27.7934
306.78	65.5664	497.08	48.8497	697.49	27.7958
308.46	60.1871	505.52	66.1475	702.65	24.0163
311.90	59.4466	507.63	0.0000	706.68	18.2849
316.51	67.0180	511.00	39.8128	711.68	18.3251
319.41	55.2151	514.00	43.7286	720.70	14.9386
320.08	68.1356	514.00	43.7286	721.93	0.0000
321.04	75.5607	520.40	37.9178	722.78	14.9521
323.87	94.2068	520.69	0.0000	722.91	14.9530
325.23	82.2902	522.65	0.0000	723.31	16.6173
328.76	75.1069	527.90	0.0000	724.19	19.9482
333.37	77.5543	528.26	39.1427	727.33	25.2462
333.97	69.8318	529.59	32.8194	733.00	20.0236
334.37	71.4071	529.87	0.0000	735.93	14.6188
338.28	68.5128	531.02	36.0237	333.97	16.7181
338.32	68.5146	537.26	40.4000	739.50	0.0000
311.90	65.5105	546.56	0.0000	747.24	16.7871
340.48	65.5105	552.55	31.0872	748.06	16.7927
340.55	65.5148	563.25	39.8888	752.31	19.2696
344.28	76.2641	569.33	35.6901	753.82	22.5845
345.93	70.4874	946.00	36.7750	756.73	20.6458
351.06	72.3373	569.70	34.6148	756.80	19.6631
351.93	60.4258	583.19	29.4106	884.68	26.6237

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	27.6309	1274.44	21.4823	1620.50	6.6631
766.42	28.6248	1001.03	13.9855	1621.92	5.7131
766.84	28.6301	1002.74	15.0698	1678.03	0.0000
772.60	0.0000	1004.73	14.0027	1690.97	0.9665
776.52	19.8230	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	7.8506
778.90	18.8500	1028.54	0.0000	1063.66	3.4933
783.70	0.0000	1037.84	11.4318	1771.35	3.4940
785.37	13.9257	1038.76	0.0000	1791.20	0.0000
792.07	25.6468	631.29	14.0374	1808.65	7.9209
794.95	14.6449	1048.07	16.8524	1810.72	0.0000
795.86	14.6503	1049.04	20.6043	1836.06	3.9821
810.06	15.4979	1050.41	20.6127		
810.29	12.0552	1063.66	9.8793		
344.28	12.0559	1077.00	10.2877		
810.76	13.7799	1077.34	10.2888		
815.77	15.1013	1085.87	18.0000		
1048.07	17.1332	1093.63	10.4460		
832.01	11.1441	1099.45	9.5135		
834.85	19.1249	1112.07	10.9388		
835.71	17.3922	1112.84	11.8872		
836.80	0.0000	1115.54	16.7297		
846.75	0.0000	1120.29	11.7275		
846.77	13.5843	1120.55	15.0793		
856.80	15.7783	1221.41	16.2802		
860.56	13.3134	1129.67	21.5047		
871.09	7.1970	1131.51	0.0000		
873.19	17.4918	1147.95	0.0000		
875.33	0.0000	1173.23	11.6685		
879.38	13.4065	1177.95	11.6844		
880.51	14.4438	1189.05	9.7681		
883.24	19.1525	1204.77	11.7744		
884.68	18.5991	1221.41	15.7723		
889.28	12.4202	1231.02	20.7568		
894.76	7.1113	1235.36	13.8545		
898.04	21.3591	1238.28	8.6661		
900.72	9.7002	1260.41	0.0000		
903.28	10.9228	1271.87	9.9951		
911.20	14.3069	1274.44	14.0029		
912.08	12.5225	1274.54	14.0034		
923.98	0.0000	1291.59	12.0578		
926.50	7.3421	1298.22	0.0000		
929.11	17.8470	1312.11	9.0926		
937.49	18.0500	1332.49	11.1726		
944.13	16.2824	1362.66	0.0000		
946.00	14.4824	1365.19	11.2666		
949.00	8.4569	1368.63	0.0000		
667.71	0.0000	1384.29	11.3211		
962.31	21.8458	1408.01	7.2471		
964.08	21.8588	1457.56	0.0000		
966.17	16.4057	1460.82	12.8469		
911.20	49.2643	1489.16	1.0558		
968.97	49.2643	1505.03	6.3585		
983.53	11.0014	1584.12	3.7769		
984.45	0.0000	1596.21	6.7326		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:14:53.52

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677029.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;485
Background date  : 26-JUN-2016 12:03:51
Sample date     : 11-MAY-2016 14:45:00 Acquisition date : 28-JUN-2016 12:14:27
Sample ID      : G398677029 Sample quantity : 1.48190E+02 GRAM
Detector name   : GAM06 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.63 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572486 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.29*	13	111	0.75	126.29	123	8	3.74E-03	142.2	
2	1	74.71	89	117	0.92	149.12	144	14	2.47E-02	21.3	1.01E+00
3	1	77.07	117	94	1.03	153.83	144	14	3.25E-02	16.5	
4	1	87.23*	49	93	1.05	174.13	170	12	1.36E-02	34.3	1.60E+00
5	1	89.57	52	93	1.05	178.81	170	12	1.46E-02	32.2	
6	0	92.31*	28	140	1.47	184.28	182	9	7.85E-03	81.3	
7	0	185.37*	66	109	1.40	370.25	366	10	1.83E-02	33.2	
8	0	209.64	27	118	0.96	418.77	415	9	7.62E-03	74.5	
9	5	238.49*	253	68	1.21	476.43	471	17	7.04E-02	8.3	1.26E+00
10	5	241.47	68	88	1.62	482.37	471	17	1.90E-02	30.1	
11	0	295.13	83	45	1.15	589.63	585	10	2.30E-02	18.8	
12	0	328.61	34	75	2.38	656.54	649	12	9.43E-03	53.8	
13	0	338.04*	65	45	1.27	675.40	671	9	1.80E-02	22.7	
14	0	351.61*	131	92	1.41	702.53	696	15	3.64E-02	18.2	
15	0	462.52	49	31	2.11	924.22	920	10	1.35E-02	26.0	
16	0	583.19*	61	43	1.54	1165.45	1160	13	1.68E-02	26.6	
17	0	609.20	70	43	0.87	1217.45	1214	12	1.93E-02	23.1	
18	0	661.19	975	10	1.67	1321.40	1315	13	2.71E-01	3.3	
19	4	701.92	12	9	1.95	1402.83	1400	11	3.41E-03	42.6	2.54E+00
20	4	704.68	8	5	1.07	1408.35	1400	11	2.27E-03	60.1	
21	0	708.20*	8	2	1.19	1415.39	1412	7	2.11E-03	52.2	
22	0	726.79*	22	9	1.86	1452.55	1448	9	6.25E-03	34.2	
23	0	785.33	20	10	1.47	1569.61	1562	14	5.47E-03	41.5	
24	0	795.29	7	11	0.97	1589.53	1584	8	2.04E-03	88.4	
25	0	859.65	20	7	1.94	1718.23	1710	13	5.42E-03	35.2	
26	0	910.94	40	15	1.81	1820.79	1815	12	1.10E-02	25.3	
27	0	963.84	12	0	1.57	1926.58	1923	7	3.33E-03	28.9	
28	0	968.56	42	2	0.78	1936.01	1931	11	1.15E-02	17.3	
29	0	1030.84	10	2	3.31	2060.57	2056	9	2.78E-03	41.3	
30	0	1120.30	9	11	1.02	2239.50	2233	9	2.44E-03	76.5	
31	0	1165.44	12	5	0.77	2329.78	2324	10	3.40E-03	44.4	
32	0	1208.50	10	8	1.03	2415.92	2408	11	2.67E-03	66.4	
33	0	1238.05	10	10	1.85	2475.02	2467	10	2.75E-03	67.8	
34	0	1459.68	117	4	2.34	2918.39	2910	16	3.25E-02	10.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1763.07*	16	0	0.64	3525.47	3519	12	4.46E-03	27.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:14:55

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677029.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:45:00 Acquisition date : 28-JUN-2016 12:14:27
Sample ID         : G398677029 Sample quantity  : 148.19 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA6 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.63 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.005E+00	5.325E+00	5.325E+00	20.03	OK
CD-109	88.03	3.70*	5.200E+00	9.897E-01	1.064E+00	114.37	OK
SN-126	64.28	9.60	2.638E+00	3.457E-01	3.457E-01	284.49	OK
	86.94	8.90	5.200E+00	4.114E-01	4.114E-01	114.37	OK
	87.57	37.00*	5.200E+00	9.897E-02	9.897E-02	114.37	OK
BA-137M	661.66	89.90*	2.029E+00	2.829E+00	2.838E+00	6.54	OK
CS-137	661.66	85.10*	2.029E+00	2.989E+00	2.998E+00	6.54	OK
TL-208	277.37	6.60	3.958E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.243E+00	1.700E-01	1.700E-01	53.19	OK
	860.56	12.50	1.625E+00	4.947E-01	4.947E-01	70.41	OK
BI-212	727.33	6.67*	1.876E+00	9.414E-01	9.414E-01	68.37	OK
	785.37	1.10	1.758E+00	5.299E+00	5.299E+00	82.94	OK
	1620.50	1.47	9.190E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	4.068E+00	9.814E-01	9.814E-01	60.98	OK
	77.11	17.10	4.321E+00	1.012E+00	1.012E+00	33.08	OK
	238.63	43.60*	4.431E+00	7.628E-01	7.628E-01	16.53	OK
	300.09	3.30	3.729E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11	OK
	1120.29	14.92	1.280E+00	2.312E-01	2.313E-01	152.99	OK
	1764.49	15.30	8.597E-01	5.839E-01	5.839E-01	55.11	OK
PB-214	74.82	5.80	4.080E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.321E+00	1.784E+00	1.784E+00	33.08	OK
	87.09	3.41	5.190E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.384E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.776E+00	6.776E-01	6.776E-01	37.54	OK
	351.93	35.60*	3.306E+00	6.258E-01	6.258E-01	36.33	OK
RN-222	609.32	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11	OK
	1120.29	14.92	1.280E+00	2.312E-01	2.313E-01	152.99	OK
	1764.49	15.30	8.597E-01	5.839E-01	5.839E-01	55.11	OK
RA-224	240.99	4.10*	4.391E+00	1.011E+00	1.011E+00	139.01	OK
RA-226	609.32	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11	OK
	1120.29	14.92	1.280E+00	2.312E-01	2.313E-01	152.99	OK
	1764.49	15.30	8.597E-01	5.839E-01	5.839E-01	55.11	OK
AC-228	105.21	1.10	6.007E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.406E+00	9.526E-01	9.526E-01	45.42	OK
	794.95	4.25	1.739E+00	5.154E-01	5.154E-01	176.75	OK
	835.71	1.61	1.666E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.544E+00	5.090E-01	5.090E-01	50.53	OK
	968.97	15.80	1.462E+00	9.166E-01	9.166E-01	34.55	OK
RA-228	105.21	1.10	6.007E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.406E+00	9.526E-01	9.526E-01	45.42	OK
	794.95	4.25	1.739E+00	5.154E-01	5.154E-01	176.75	OK
	835.71	1.61	1.666E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.544E+00	5.090E-01	5.090E-01	50.53	OK
	968.97	15.80	1.462E+00	9.166E-01	9.166E-01	34.55	OK
TH-228	74.82	10.28	4.068E+00	9.814E-01	9.814E-01	60.98	OK
	77.11	17.10	4.321E+00	1.012E+00	1.012E+00	33.08	OK
	238.63	43.60*	4.431E+00	7.628E-01	7.628E-01	16.53	OK
	300.09	3.30	3.729E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11	OK
	1120.29	14.92	1.280E+00	2.312E-01	2.312E-01	152.99	OK
	1764.49	15.30	8.597E-01	5.839E-01	5.839E-01	55.11	OK
TH-232	105.21	1.10	6.007E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.406E+00	9.526E-01	9.526E-01	45.42	OK
	835.71	1.61	1.666E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.544E+00	5.090E-01	5.090E-01	50.53	OK
	968.97	15.80	1.462E+00	9.166E-01	9.166E-01	34.55	OK
TH-234	63.29	3.70*	2.638E+00	8.970E-01	8.970E-01	284.49	OK
	92.59	4.23	5.516E+00	7.633E-01	7.633E-01	162.52	OK
U-234	609.32	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11	OK
	1120.29	14.92	1.280E+00	2.312E-01	2.312E-01	152.99	OK
	1764.49	15.30	8.597E-01	5.839E-01	5.839E-01	55.11	OK
U-235	89.96	3.47	5.355E+00	1.784E+00	1.784E+00	64.31	OK
	93.35	5.60	5.516E+00	5.765E-01	5.765E-01	162.52	OK
	143.76	10.96*	5.990E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.669E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.273E+00	1.300E-01	1.300E-01	66.43	OK
	205.31	5.01	4.931E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	2.638E+00	8.970E-01	8.970E-01	284.49	OK
	92.59	4.23	5.516E+00	7.633E-01	7.633E-01	162.52	OK
AM-243	43.53	5.90	3.924E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.068E+00	1.501E-01	1.501E-01	60.98	OK

Flag: "*" = Keyline

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677029.CNF;1  *
* Acquisition date   : 28-JUN-2016 12:14:27 Sensitivity      : 3.000          *
* Detector ID        : GAM06 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.63 Half life ratio : *****      *
* Sample date        : 11-MAY-2016 14:45:00 Analyst initials: MXR1      *
* Sample ID          : G398677029 Sample Quantity : 1.4819E+02 GRAM    *
* Batch Number       : 1572486 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 8-MAR-2016 07:26:53 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.325E+00	1.045E+00	5.423E-01
CD-109	1.064E+00	1.192E+00	1.442E+00
SN-126	9.897E-02	1.109E-01	1.349E-01
BA-137M	2.838E+00	1.818E-01	6.958E-02
CS-137	2.998E+00	1.921E-01	7.351E-02
TL-208	1.700E-01	8.859E-02	8.194E-02
BI-212	9.414E-01	6.308E-01	9.604E-01
PB-212	7.628E-01	1.236E-01	1.120E-01
BI-214	3.761E-01	1.700E-01	1.501E-01
PB-214	6.258E-01	2.228E-01	1.567E-01
RN-222	3.761E-01	1.700E-01	1.501E-01
RA-224	1.011E+00	1.377E+00	1.201E+00
RA-226	3.761E-01	1.700E-01	1.501E-01
AC-228	5.090E-01	2.521E-01	2.292E-01
RA-228	5.090E-01	2.521E-01	2.292E-01
TH-228	7.628E-01	1.236E-01	1.120E-01
TH-230	3.761E-01	1.699E-01	1.501E-01
TH-232	5.090E-01	2.521E-01	2.292E-01
TH-234	8.970E-01	2.501E+00	2.619E+00
U-234	3.761E-01	1.699E-01	1.501E-01
U-235	-4.241E-02	2.146E-01	3.954E-01
U-238	8.970E-01	2.501E+00	2.619E+00
AM-243	1.501E-01	8.973E-02	1.040E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.923E-01	6.956E-01	1.334E+00	NOT IDENT.
NA-22	-2.729E-02	4.317E-02	7.637E-02	NOT IDENT.
NA-24	0.000E+00	4.441E+21	0.000E+00	SHORT HLIF
AL-26	7.098E-03	3.043E-02	7.236E-02	NOT IDENT.
SC-46	6.067E-03	4.198E-02	8.665E-02	FAIL ABUN
V-48	6.111E-02	2.162E-01	4.665E-01	NOT IDENT.
CR-51	-2.495E-01	9.837E-01	1.838E+00	NOT IDENT.

MN-54	-3.440E-03	4.062E-02	7.773E-02	NOT IDENT.
CO-56	-4.711E-03	5.390E-02	1.036E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	6.318E-04	2.774E-02	5.265E-02	NOT IDENT.
CO-58	2.849E-02	5.280E-02	1.117E-01	NOT IDENT.
FE-59	-6.242E-03	1.243E-01	2.532E-01	NOT IDENT.
CO-60	2.649E-03	3.246E-02	6.928E-02	NOT IDENT.
ZN-65	-2.124E-02	8.260E-02	1.370E-01	NOT IDENT.
GE-68	-3.041E-01	1.263E+00	2.349E+00	NOT IDENT.
AS-73	4.374E-01	1.298E+00	2.663E+00	NOT IDENT.
AS-74	6.884E-02	3.778E-01	7.516E-01	NOT IDENT.
SE-75	-2.992E-02	5.796E-02	1.076E-01	NOT IDENT.
BR-77	0.000E+00	2.735E+05	0.000E+00	SHORT HLIF
SR-82	-4.002E-02	8.014E-01	1.524E+00	NOT IDENT.
RB-83	-3.175E-02	9.991E-02	1.802E-01	NOT IDENT.
KR-85	-2.654E+01	1.102E+01	1.537E+01	NOT IDENT.
SR-85	-1.985E-01	8.244E-02	1.150E-01	NOT IDENT.
RB-86	-8.082E-01	2.668E+00	4.864E+00	NOT IDENT.
Y-88	2.750E-02	3.710E-02	1.027E-01	NOT IDENT.
Y-91	1.465E+01	3.000E+01	5.852E+01	NOT IDENT.
NB-94	3.345E-02	2.791E-02	7.259E-02	FAIL ABUN
NB-95	4.682E-02	5.367E-02	1.182E-01	NOT IDENT.
NB-95M	-1.495E-01	2.122E-01	3.381E-01	NOT IDENT.
ZR-95	3.584E-02	9.749E-02	2.020E-01	NOT IDENT.
NB-97	0.000E+00	4.739E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.750E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.724E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	3.433E-03	3.392E-02	6.431E-02	NOT IDENT.
RH-102	-4.952E-02	5.952E-02	1.046E-01	NOT IDENT.
RU-103	-1.976E-02	9.626E-02	1.742E-01	FAIL ABUN
RH-106	-9.661E-02	3.542E-01	6.732E-01	NOT IDENT.
RU-106	-9.661E-02	3.542E-01	6.732E-01	NOT IDENT.
AG-108M	-2.311E-02	4.101E-02	7.228E-02	NOT IDENT.
AG-110M	-1.606E-02	5.025E-02	9.356E-02	NOT IDENT.
SN-113	2.149E-02	7.202E-02	1.383E-01	NOT IDENT.
CD-115	0.000E+00	3.455E+05	0.000E+00	SHORT HLIF
SN-117M	2.118E-01	3.127E-01	6.084E-01	NOT IDENT.
TE-123M	1.874E-02	3.657E-02	7.043E-02	NOT IDENT.
SB-124	-7.364E-03	1.337E-01	2.737E-01	NOT IDENT.
SB-125	-2.985E-02	1.247E-01	2.274E-01	FAIL ABUN
TE-125M	-2.766E+00	1.283E+01	2.424E+01	NOT IDENT.
I-126	-7.511E-01	1.421E+00	2.179E+00	NOT IDENT.
SB-126	-4.353E-01	9.804E-01	1.606E+00	NOT IDENT.
SB-127	0.000E+00	3.854E+02	0.000E+00	SHORT HLIF
I-131	1.223E+00	2.466E+00	4.854E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.845E+02	0.000E+00	SHORT HLIF
BA-133	3.723E-03	5.636E-02	9.469E-02	NOT IDENT.
I-133	0.000E+00	1.741E+15	0.000E+00	SHORT HLIF
CS-134	2.678E-02	4.639E-02	8.376E-02	FAIL ABUN
CS-135	9.573E-02	1.702E-01	3.417E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	3.623E-01	5.625E-01	1.219E+00	NOT IDENT.
CE-139	-2.832E-03	3.564E-02	6.576E-02	NOT IDENT.
BA-140	-1.266E+00	1.731E+00	2.923E+00	NOT IDENT.
LA-140	-4.062E-01	6.096E-01	1.034E+00	FAIL ABUN
CE-141	-2.948E-02	1.309E-01	2.403E-01	NOT IDENT.
CE-143	0.000E+00	2.279E+09	0.000E+00	SHORT HLIF
CE-144	4.982E-02	2.162E-01	4.137E-01	NOT IDENT.
PM-144	1.468E-02	3.857E-02	7.334E-02	NOT IDENT.
PR-144	1.109E+00	2.935E+00	5.579E+00	NOT IDENT.
PM-146	4.076E-02	5.645E-02	1.120E-01	NOT IDENT.
ND-147	5.133E-01	5.350E+00	1.007E+01	FAIL ABUN
PM-147	5.640E+01	7.744E+02	1.475E+03	NOT IDENT.
PM-149	0.000E+00	3.103E+06	0.000E+00	SHORT HLIF
EU-150	5.851E-03	3.926E-02	5.719E-02	FAIL ABUN
EU-152	-9.380E-02	1.150E-01	1.941E-01	FAIL ABUN
GD-153	-2.277E-02	1.002E-01	1.697E-01	NOT IDENT.
EU-154	-7.606E-02	1.203E-01	2.128E-01	NOT IDENT.
EU-155	1.752E-02	9.632E-02	1.878E-01	FAIL ABUN
TB-160	8.500E-02	1.454E-01	3.238E-01	FAIL ABUN
HO-166M	-2.987E-04	6.199E-02	1.069E-01	FAIL ABUN
TM-171	-3.273E+00	2.195E+01	4.363E+01	NOT IDENT.
HF-172	4.974E-02	2.021E-01	3.879E-01	FAIL ABUN
LU-172	2.290E-02	5.318E-02	1.182E-01	FAIL ABUN
LU-176	2.276E-02	3.021E-02	6.136E-02	FAIL ABUN
HF-181	-1.054E-01	1.036E-01	1.715E-01	NOT IDENT.

TA-182	-6.530E-02	1.739E-01	3.301E-01	FAIL ABUN
RE-183	1.180E-01	2.868E-01	5.892E-01	NOT IDENT.
RE-184	2.745E-02	2.383E-01	4.501E-01	NOT IDENT.
W-188	-6.864E-01	1.213E+01	2.046E+01	FAIL ABUN
IR-192	-2.185E-02	5.624E-02	1.039E-01	FAIL ABUN
HG-203	2.190E-02	6.911E-02	1.362E-01	NOT IDENT.
BI-207	2.588E-02	4.572E-02	9.941E-02	FAIL ABUN
PB-210	-2.035E+00	4.876E+00	9.546E+00	NOT IDENT.
BI-211	0.000E+00	6.139E-01	7.862E-01	FAIL ABUN
PB-211	4.420E-01	9.433E-01	1.843E+00	NOT IDENT.
RN-219	2.026E-01	5.618E-01	1.078E+00	NOT IDENT.
RA-223	-4.736E-01	8.543E-01	1.336E+00	FAIL ABUN
AC-227	-3.170E-02	2.677E-01	5.147E-01	NOT IDENT.
TH-227	-3.170E-02	2.677E-01	5.147E-01	NOT IDENT.
TH-229	5.615E-02	5.716E-01	1.055E+00	FAIL ABUN
PA-231	1.929E-01	5.980E-01	1.131E+00	NOT IDENT.
TH-231	-4.736E-01	8.543E-01	1.336E+00	FAIL ABUN
PA-233	8.786E-03	7.067E-02	1.372E-01	NOT IDENT.
PA-234	-1.190E-01	2.827E-01	5.118E-01	NOT IDENT.
PA-234M	-2.594E+00	4.166E+00	7.163E+00	NOT IDENT.
NP-237	8.786E-03	7.067E-02	1.372E-01	NOT IDENT.
NP-238	0.000E+00	7.220E+05	0.000E+00	SHORT HLIF
NP-239	-1.877E-01	2.597E-01	4.678E-01	NOT IDENT.
PU-239	5.072E+01	3.506E+02	6.665E+02	NOT IDENT.
AM-241	2.564E-02	1.675E-01	3.056E-01	NOT IDENT.
CM-243	-2.701E-02	9.905E-02	1.867E-01	NOT IDENT.
BK-247	-4.913E-02	8.593E-02	1.588E-01	NOT IDENT.
CM-247	-6.896E-03	5.188E-02	9.558E-02	NOT IDENT.
CF-249	-2.739E-02	4.955E-02	8.852E-02	NOT IDENT.
CF-251	-4.518E-02	1.364E-01	2.449E-01	NOT IDENT.
ANH-511	-1.086E-02	5.036E-02	1.040E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	113	10.66*	1.005E+00	5.325E+00	5.325E+00	20.03
CD-109	88.03	61	3.70*	5.200E+00	1.614E+00	1.735E+00	68.60
SN-126	64.28	17	9.60	2.638E+00	3.457E-01	3.457E-01	284.49
	86.94	61	8.90	5.200E+00	6.710E-01	6.710E-01	68.60
	87.57	61	37.00*	5.200E+00	1.614E-01	1.614E-01	68.60
BA-137M	661.66	1018	89.90*	2.029E+00	2.829E+00	2.838E+00	6.54
CS-137	661.66	1018	85.10*	2.029E+00	2.989E+00	2.998E+00	6.54
TL-208	277.37	-----	6.60	3.958E+00	-----	Line Not Found	-----
	583.19	64	85.00*	2.243E+00	1.700E-01	1.700E-01	53.19
	860.56	20	12.50	1.625E+00	4.947E-01	4.947E-01	70.41
BI-211	72.87	-----	1.23	3.859E+00	-----	Line Not Found	-----
	351.06	145	12.92*	3.306E+00	1.724E+00	1.724E+00	36.33
BI-212	727.33	23	6.67*	1.876E+00	9.414E-01	9.414E-01	68.37
	785.37	20	1.10	1.758E+00	5.299E+00	5.299E+00	82.94
	1620.50	-----	1.47	9.190E-01	-----	Line Not Found	-----
PB-212	74.82	113	10.28	4.068E+00	1.364E+00	1.364E+00	42.61
	77.11	148	17.10	4.321E+00	1.012E+00	1.012E+00	33.08
	238.63	291	43.60*	4.431E+00	7.628E-01	7.628E-01	16.53
	300.09	-----	3.30	3.729E+00	-----	Line Not Found	-----
BI-214	609.32	73	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11
	1120.29	9	14.92	1.280E+00	2.312E-01	2.313E-01	152.99
	1764.49	15	15.30	8.597E-01	5.839E-01	5.839E-01	55.11
PB-214	74.82	113	5.80	4.068E+00	2.417E+00	2.417E+00	42.61
	77.11	148	9.70	4.321E+00	1.784E+00	1.784E+00	33.08
	87.09	61	3.41	5.200E+00	1.751E+00	1.752E+00	68.60
	242.00	78	7.25	4.391E+00	1.249E+00	1.249E+00	60.26
	295.22	93	18.42	3.776E+00	6.776E-01	6.776E-01	37.54
	351.93	145	35.60*	3.306E+00	6.258E-01	6.258E-01	36.33
RN-222	609.32	73	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11
	1120.29	9	14.92	1.280E+00	2.312E-01	2.313E-01	152.99
	1764.49	15	15.30	8.597E-01	5.839E-01	5.839E-01	55.11
RA-224	240.99	78	4.10*	4.391E+00	2.209E+00	2.209E+00	60.26
RA-226	609.32	73	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11
	1120.29	9	14.92	1.280E+00	2.312E-01	2.313E-01	152.99
	1764.49	15	15.30	8.597E-01	5.839E-01	5.839E-01	55.11
AC-228	105.21	-----	1.10	6.007E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.406E+00	9.526E-01	9.526E-01	45.42
	794.95	8	4.25	1.739E+00	5.154E-01	5.154E-01	176.75
	835.71	-----	1.61	1.666E+00	-----	Line Not Found	-----
	911.20	40	25.80*	1.544E+00	5.090E-01	5.090E-01	50.53
	968.97	42	15.80	1.462E+00	9.166E-01	9.166E-01	34.55
RA-228	105.21	-----	1.10	6.007E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.406E+00	9.526E-01	9.526E-01	45.42
	794.95	8	4.25	1.739E+00	5.154E-01	5.154E-01	176.75
	835.71	-----	1.61	1.666E+00	-----	Line Not Found	-----
	911.20	40	25.80*	1.544E+00	5.090E-01	5.090E-01	50.53
	968.97	42	15.80	1.462E+00	9.166E-01	9.166E-01	34.55

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	113	10.28	4.068E+00	1.364E+00	1.364E+00	42.61
	77.11	148	17.10	4.321E+00	1.012E+00	1.012E+00	33.08
	238.63	291	43.60*	4.431E+00	7.628E-01	7.628E-01	16.53
	300.09	-----	3.30	3.729E+00	-----	Line Not Found	-----
TH-230	609.32	73	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11
	1120.29	9	14.92	1.280E+00	2.312E-01	2.312E-01	152.99
	1764.49	15	15.30	8.597E-01	5.839E-01	5.839E-01	55.11
TH-232	105.21	-----	1.10	6.007E+00	-----	Line Not Found	-----
	338.32	72	11.27	3.406E+00	9.526E-01	9.526E-01	45.42
	835.71	-----	1.61	1.666E+00	-----	Line Not Found	-----
	911.20	40	25.80*	1.544E+00	5.090E-01	5.090E-01	50.53
	968.97	42	15.80	1.462E+00	9.166E-01	9.166E-01	34.55
TH-234	63.29	17	3.70*	2.638E+00	8.970E-01	8.970E-01	284.49
	92.59	35	4.23	5.516E+00	7.633E-01	7.633E-01	162.52
U-234	609.32	73	45.49*	2.167E+00	3.761E-01	3.761E-01	46.11
	1120.29	9	14.92	1.280E+00	2.312E-01	2.312E-01	152.99
	1764.49	15	15.30	8.597E-01	5.839E-01	5.839E-01	55.11
U-235	89.96	65	3.47	5.355E+00	1.784E+00	1.784E+00	64.31
	93.35	35	5.60	5.516E+00	5.765E-01	5.765E-01	162.52
	143.76	-----	10.96*	5.990E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.669E+00	-----	Line Not Found	-----
	185.72	77	57.20	5.273E+00	1.300E-01	1.300E-01	66.43
	205.31	-----	5.01	4.931E+00	-----	Line Not Found	-----
U-238	63.29	17	3.70*	2.638E+00	8.970E-01	8.970E-01	284.49
	92.59	35	4.23	5.516E+00	7.633E-01	7.633E-01	162.52
AM-243	43.53	-----	5.90	3.924E-01	-----	Line Not Found	-----
	74.66	113	67.20*	4.068E+00	2.086E-01	2.086E-01	42.61

Flag: "*" = Keyline

Total number of lines in spectrum 35
Number of unidentified lines 5
Number of lines tentatively identified by NID 30 85.71%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.325E+00	5.325E+00	1.066E+00	20.03	
CD-109	461.40D	1.07	1.614E+00	1.735E+00	1.190E+00	68.60	
SN-126	2.30E+05Y	1.00	1.614E-01	1.614E-01	1.107E-01	68.60	
BA-137M	30.08Y	1.00	2.829E+00	2.838E+00	0.186E+00	6.54	
CS-137	30.08Y	1.00	2.989E+00	2.998E+00	0.196E+00	6.54	
TL-208	1.41E+10Y	1.00	1.700E-01	1.700E-01	0.904E-01	53.19	
BI-211	7.04E+08Y	1.00	1.724E+00	1.724E+00	0.626E+00	36.33	
BI-212	1.41E+10Y	1.00	9.414E-01	9.414E-01	6.437E-01	68.37	
PB-212	1.41E+10Y	1.00	7.628E-01	7.628E-01	1.261E-01	16.53	
BI-214	1600.00Y	1.00	3.761E-01	3.761E-01	1.734E-01	46.11	
PB-214	1600.00Y	1.00	6.258E-01	6.258E-01	2.274E-01	36.33	
RN-222	1600.00Y	1.00	3.761E-01	3.761E-01	1.734E-01	46.11	
RA-224	1.41E+10Y	1.00	2.209E+00	2.209E+00	1.331E+00	60.26	
RA-226	1600.00Y	1.00	3.761E-01	3.761E-01	1.734E-01	46.11	
AC-228	1.41E+10Y	1.00	5.090E-01	5.090E-01	2.572E-01	50.53	
RA-228	1.41E+10Y	1.00	5.090E-01	5.090E-01	2.572E-01	50.53	
TH-228	1.41E+10Y	1.00	7.628E-01	7.628E-01	1.261E-01	16.53	
TH-230	7.54E+04Y	1.00	3.761E-01	3.761E-01	1.734E-01	46.11	
TH-232	1.41E+10Y	1.00	5.090E-01	5.090E-01	2.572E-01	50.53	
TH-234	4.47E+09Y	1.00	8.970E-01	8.970E-01	25.52E-01	284.49	
U-234	2.45E+05Y	1.00	3.761E-01	3.761E-01	1.734E-01	46.11	
U-235	7.04E+08Y	1.00	1.300E-01	1.300E-01	0.864E-01	66.43	K
U-238	4.47E+09Y	1.00	8.970E-01	8.970E-01	25.52E-01	284.49	
AM-243	7370.00Y	1.00	2.086E-01	2.086E-01	0.889E-01	42.61	
Total Activity :			2.565E+01	2.579E+01			

Grand Total Activity : 2.565E+01 2.579E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.64	32	136	0.96	418.77	415	9	7.62E-03	****	4.86E+00	T
0	328.61	38	84	2.38	656.54	649	12	9.43E-03	****	3.48E+00	T
0	462.52	53	34	2.11	924.22	920	10	1.35E-02	52.1	2.68E+00	T
4	701.92	13	10	1.95	1402.83	1400	11	3.41E-03	85.1	1.93E+00	T
4	704.68	8	5	1.07	1408.35	1400	11	2.27E-03	****	1.93E+00	
0	708.20	8	2	1.19	1415.39	1412	7	2.11E-03	****	1.92E+00	
0	963.84	12	0	1.57	1926.58	1923	7	3.33E-03	57.7	1.47E+00	T
0	1030.84	10	2	3.31	2060.57	2056	9	2.78E-03	82.6	1.38E+00	
0	1165.44	12	5	0.77	2329.78	2324	10	3.40E-03	88.8	1.23E+00	
0	1208.50	9	8	1.03	2415.92	2408	11	2.67E-03	****	1.19E+00	
0	1238.05	10	10	1.85	2475.02	2467	10	2.75E-03	****	1.17E+00	T

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677029.CNF;1
Acquisition date : 28-JUN-2016 12:14:27 Sensitivity : 3.000
Detector ID : GAM06 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.63 Half life ratio : *****
Sample date : 11-MAY-2016 14:45:00 Nuclide Library : SOLID
Sample ID : G398677029 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4819E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-MAR-2016 07:26:53 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.068E-01
CD-109	6.806E-01
SN-126	6.369E-02
BA-137M	3.093E-02
CS-137	3.268E-02
TL-208	3.729E-02
BI-212	4.243E-01
PB-212	5.229E-02
BI-214	6.794E-02
PB-214	7.229E-02
RN-222	6.794E-02
RA-224	5.606E-01
RA-226	6.794E-02
AC-228	9.713E-02
RA-228	9.713E-02
TH-228	5.229E-02
TH-230	6.794E-02
TH-232	9.713E-02
TH-234	1.234E+00
U-234	6.794E-02
U-235	1.867E-01
U-238	1.234E+00
AM-243	4.932E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.189E-01	NOT IDENT.
NA-22	3.188E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.803E-02	NOT IDENT.
SC-46	3.676E-02	FAIL ABUN
V-48	1.946E-01	NOT IDENT.
CR-51	8.519E-01	NOT IDENT.
MN-54	3.421E-02	NOT IDENT.

CO-56	4.528E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.478E-02	NOT IDENT.
CO-58	4.928E-02	NOT IDENT.
FE-59	1.067E-01	NOT IDENT.
CO-60	2.820E-02	NOT IDENT.
ZN-65	5.626E-02	NOT IDENT.
GE-68	9.908E-01	NOT IDENT.
AS-73	1.251E+00	NOT IDENT.
AS-74	3.408E-01	NOT IDENT.
SE-75	4.990E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.651E-01	NOT IDENT.
RB-83	8.069E-02	NOT IDENT.
KR-85	7.024E+00	NOT IDENT.
SR-85	5.255E-02	NOT IDENT.
RB-86	2.072E+00	NOT IDENT.
Y-88	4.003E-02	NOT IDENT.
Y-91	2.534E+01	NOT IDENT.
NB-94	3.266E-02	FAIL ABUN
NB-95	5.256E-02	NOT IDENT.
NB-95M	1.582E-01	NOT IDENT.
ZR-95	8.912E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.038E-02	NOT IDENT.
RH-102	4.622E-02	NOT IDENT.
RU-103	8.001E-02	FAIL ABUN
RH-106	3.003E-01	NOT IDENT.
RU-106	3.003E-01	NOT IDENT.
AG-108M	3.337E-02	NOT IDENT.
AG-110M	3.987E-02	NOT IDENT.
SN-113	6.437E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.875E-01	NOT IDENT.
TE-123M	3.324E-02	NOT IDENT.
SB-124	1.086E-01	NOT IDENT.
SB-125	1.051E-01	FAIL ABUN
TE-125M	1.133E+01	NOT IDENT.
I-126	9.515E-01	NOT IDENT.
SB-126	7.015E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.258E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.382E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.697E-02	FAIL ABUN
CS-135	1.599E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.299E-01	NOT IDENT.
CE-139	3.084E-02	NOT IDENT.
BA-140	1.298E+00	NOT IDENT.
LA-140	4.124E-01	FAIL ABUN
CE-141	1.132E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.949E-01	NOT IDENT.
PM-144	3.270E-02	NOT IDENT.
PR-144	2.488E+00	NOT IDENT.
PM-146	5.196E-02	NOT IDENT.
ND-147	4.577E+00	FAIL ABUN
PM-147	6.947E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.643E-02	FAIL ABUN
EU-152	8.903E-02	FAIL ABUN
GD-153	7.984E-02	NOT IDENT.
EU-154	8.885E-02	NOT IDENT.
EU-155	8.807E-02	FAIL ABUN
TB-160	1.389E-01	FAIL ABUN
HO-166M	4.667E-02	FAIL ABUN
TM-171	2.046E+01	NOT IDENT.
HF-172	1.830E-01	FAIL ABUN
LU-172	5.025E-02	FAIL ABUN
LU-176	2.861E-02	FAIL ABUN
HF-181	7.836E-02	NOT IDENT.
TA-182	1.361E-01	FAIL ABUN

RE-183	2.766E-01	NOT IDENT.
RE-184	1.951E-01	NOT IDENT.
W-188	9.480E+00	FAIL ABUN
IR-192	4.817E-02	FAIL ABUN
HG-203	6.356E-02	NOT IDENT.
BI-207	4.276E-02	FAIL ABUN
PB-210	4.491E+00	NOT IDENT.
BI-211	3.766E-01	FAIL ABUN
PB-211	8.585E-01	NOT IDENT.
RN-219	5.032E-01	NOT IDENT.
RA-223	6.175E-01	FAIL ABUN
AC-227	2.394E-01	NOT IDENT.
TH-227	2.394E-01	NOT IDENT.
TH-229	4.957E-01	FAIL ABUN
PA-231	5.296E-01	NOT IDENT.
TH-231	6.175E-01	FAIL ABUN
PA-233	6.350E-02	NOT IDENT.
PA-234	2.171E-01	NOT IDENT.
PA-234M	2.998E+00	NOT IDENT.
NP-237	6.350E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.190E-01	NOT IDENT.
PU-239	3.146E+02	NOT IDENT.
AM-241	1.431E-01	NOT IDENT.
CM-243	8.747E-02	NOT IDENT.
BK-247	7.358E-02	NOT IDENT.
CM-247	4.450E-02	NOT IDENT.
CF-249	4.076E-02	NOT IDENT.
CF-251	1.148E-01	NOT IDENT.
ANH-511	4.920E-02	NOT IDENT.

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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677029.CNF;1
Acquisition date : 28-JUN-2016 12:14:27 Sensitivity : 3.000
Detector ID : GAM06 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.63 Half life ratio : *****
Sample date : 11-MAY-2016 14:45:00 Nuclide Library : SOLID
Sample ID : G398677029 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4819E+02 GRAM
Quantity Err(%) : 1.3496E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-MAR-2016 07:26:53 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.325E+00	1.139E+00	1.139E+00
CD-109	1.064E+00	1.201E+00	1.201E+00
SN-126	9.897E-02	1.117E-01	1.117E-01
BA-137M	2.838E+00	2.966E-01	2.966E-01
CS-137	2.998E+00	3.132E-01	3.132E-01
TL-208	1.700E-01	8.978E-02	8.978E-02
BI-212	9.414E-01	6.374E-01	6.374E-01
PB-212	7.628E-01	1.414E-01	1.414E-01
BI-214	3.761E-01	1.729E-01	1.729E-01
PB-214	6.258E-01	2.298E-01	2.298E-01
RN-222	3.761E-01	1.729E-01	1.729E-01
RA-224	1.011E+00	1.389E+00	1.389E+00
RA-226	3.761E-01	1.729E-01	1.729E-01
AC-228	5.090E-01	2.607E-01	2.607E-01
RA-228	5.090E-01	2.607E-01	2.607E-01
TH-228	7.628E-01	1.414E-01	1.414E-01
TH-230	3.761E-01	1.729E-01	1.729E-01
TH-232	5.090E-01	2.607E-01	2.607E-01
TH-234	8.970E-01	2.509E+00	2.509E+00
U-234	3.761E-01	1.729E-01	1.729E-01
U-235	-4.241E-02	2.147E-01	2.147E-01
U-238	8.970E-01	2.509E+00	2.509E+00
AM-243	1.501E-01	9.090E-02	9.090E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.923E-01	6.960E-01	7.084E-01	NOT IDENT.
NA-22	-2.729E-02	4.323E-02	4.495E-02	NOT IDENT.
NA-24	3.353E+21	4.455E+21	0.000E+00	SHORT HLIF
AL-26	7.098E-03	3.044E-02	3.060E-02	NOT IDENT.
SC-46	6.067E-03	4.199E-02	4.207E-02	FAIL ABUN
V-48	6.111E-02	2.164E-01	2.182E-01	NOT IDENT.
CR-51	-2.495E-01	9.840E-01	9.904E-01	NOT IDENT.

MN-54	-3.440E-03	4.062E-02	4.065E-02	NOT IDENT.
CO-56	-4.711E-03	5.391E-02	5.395E-02	FAIL ABUN
MN-56	-1.000E+41	1.193E+42	0.000E+00	SHORT HLIF
CO-57	6.318E-04	2.774E-02	2.774E-02	NOT IDENT.
CO-58	2.849E-02	5.289E-02	5.442E-02	NOT IDENT.
FE-59	-6.242E-03	1.243E-01	1.243E-01	NOT IDENT.
CO-60	2.649E-03	3.246E-02	3.248E-02	NOT IDENT.
ZN-65	-2.124E-02	8.269E-02	8.324E-02	NOT IDENT.
GE-68	-3.041E-01	1.264E+00	1.271E+00	NOT IDENT.
AS-73	4.374E-01	1.301E+00	1.316E+00	NOT IDENT.
AS-74	6.884E-02	3.779E-01	3.792E-01	NOT IDENT.
SE-75	-2.992E-02	5.802E-02	5.957E-02	NOT IDENT.
BR-77	1.688E+06	2.355E+06	2.475E+06	SHORT HLIF
SR-82	-4.002E-02	8.014E-01	8.016E-01	NOT IDENT.
RB-83	-3.175E-02	1.000E-01	1.011E-01	NOT IDENT.
KR-85	-2.654E+01	1.126E+01	1.643E+01	NOT IDENT.
SR-85	-1.985E-01	8.420E-02	1.229E-01	NOT IDENT.
RB-86	-8.082E-01	2.671E+00	2.696E+00	NOT IDENT.
Y-88	2.750E-02	3.715E-02	3.916E-02	NOT IDENT.
Y-91	1.465E+01	3.003E+01	3.075E+01	NOT IDENT.
NB-94	3.345E-02	2.807E-02	3.186E-02	FAIL ABUN
NB-95	4.682E-02	5.388E-02	5.786E-02	NOT IDENT.
NB-95M	-1.495E-01	2.128E-01	2.232E-01	NOT IDENT.
ZR-95	3.584E-02	9.755E-02	9.888E-02	NOT IDENT.
NB-97	1.000E+41	4.810E+40	0.000E+00	SHORT HLIF
ZR-97	-4.737E+20	2.780E+20	0.000E+00	SHORT HLIF
MO-99	2.143E+04	4.729E+04	4.826E+04	SHORT HLIF
TC-99M	1.000E+41	2.000E+41	0.000E+00	SHORT HLIF
RH-101	3.433E-03	3.393E-02	3.397E-02	NOT IDENT.
RH-102	-4.952E-02	5.977E-02	6.380E-02	NOT IDENT.
RU-103	-1.976E-02	9.627E-02	9.668E-02	FAIL ABUN
RH-106	-9.661E-02	3.544E-01	3.570E-01	NOT IDENT.
RU-106	-9.661E-02	3.544E-01	3.570E-01	NOT IDENT.
AG-108M	-2.311E-02	4.106E-02	4.236E-02	NOT IDENT.
AG-110M	-1.606E-02	5.029E-02	5.081E-02	NOT IDENT.
SN-113	2.149E-02	7.204E-02	7.269E-02	NOT IDENT.
CD-115	9.612E+03	3.455E+05	3.455E+05	SHORT HLIF
SN-117M	2.118E-01	3.131E-01	3.273E-01	NOT IDENT.
TE-123M	1.874E-02	3.659E-02	3.755E-02	NOT IDENT.
SB-124	-7.364E-03	1.337E-01	1.338E-01	NOT IDENT.
SB-125	-2.985E-02	1.248E-01	1.255E-01	FAIL ABUN
TE-125M	-2.766E+00	1.283E+01	1.289E+01	NOT IDENT.
I-126	-7.511E-01	1.423E+00	1.463E+00	NOT IDENT.
SB-126	-4.353E-01	9.821E-01	1.001E+00	NOT IDENT.
SB-127	1.970E+02	3.882E+02	3.983E+02	SHORT HLIF
I-131	1.223E+00	2.469E+00	2.530E+00	NOT IDENT.
I-132	1.000E+41	4.398E+41	0.000E+00	SHORT HLIF
TE-132	-4.901E+02	9.864E+02	1.011E+03	SHORT HLIF
BA-133	3.723E-03	5.636E-02	5.639E-02	NOT IDENT.
I-133	-1.094E+15	1.773E+15	1.841E+15	SHORT HLIF
CS-134	2.678E-02	4.648E-02	4.802E-02	FAIL ABUN
CS-135	9.573E-02	1.705E-01	1.758E-01	NOT IDENT.
I-135	1.000E+41	1.964E+42	0.000E+00	SHORT HLIF
CS-136	3.623E-01	5.662E-01	5.892E-01	NOT IDENT.
CE-139	-2.832E-03	3.565E-02	3.567E-02	NOT IDENT.
BA-140	-1.266E+00	1.734E+00	1.826E+00	NOT IDENT.
LA-140	-4.062E-01	6.105E-01	6.373E-01	FAIL ABUN
CE-141	-2.948E-02	1.309E-01	1.316E-01	NOT IDENT.
CE-143	1.871E+09	2.286E+09	2.437E+09	SHORT HLIF
CE-144	4.982E-02	2.162E-01	2.174E-01	NOT IDENT.
PM-144	1.468E-02	3.859E-02	3.916E-02	NOT IDENT.
PR-144	1.109E+00	2.937E+00	2.979E+00	NOT IDENT.
PM-146	4.076E-02	5.661E-02	5.952E-02	NOT IDENT.
ND-147	5.133E-01	5.350E+00	5.355E+00	FAIL ABUN
PM-147	5.640E+01	7.744E+02	7.748E+02	NOT IDENT.
PM-149	1.937E+04	3.103E+06	3.103E+06	SHORT HLIF
EU-150	5.851E-03	3.926E-02	3.935E-02	FAIL ABUN
EU-152	-9.380E-02	1.154E-01	1.229E-01	FAIL ABUN
GD-153	-2.277E-02	1.003E-01	1.008E-01	NOT IDENT.
EU-154	-7.606E-02	1.205E-01	1.252E-01	NOT IDENT.
EU-155	1.752E-02	9.633E-02	9.666E-02	FAIL ABUN
TB-160	8.500E-02	1.458E-01	1.507E-01	FAIL ABUN
HO-166M	-2.987E-04	6.199E-02	6.199E-02	FAIL ABUN
TM-171	-3.273E+00	2.195E+01	2.200E+01	NOT IDENT.
HF-172	4.974E-02	2.022E-01	2.035E-01	FAIL ABUN
LU-172	2.290E-02	5.337E-02	5.436E-02	FAIL ABUN
LU-176	2.276E-02	3.028E-02	3.197E-02	FAIL ABUN
HF-181	-1.054E-01	1.040E-01	1.143E-01	NOT IDENT.

TA-182	-6.530E-02	1.740E-01	1.765E-01	FAIL ABUN
RE-183	1.180E-01	2.871E-01	2.920E-01	NOT IDENT.
RE-184	2.745E-02	2.384E-01	2.387E-01	NOT IDENT.
W-188	-6.864E-01	1.213E+01	1.214E+01	FAIL ABUN
IR-192	-2.185E-02	5.628E-02	5.713E-02	FAIL ABUN
HG-203	2.190E-02	6.914E-02	6.984E-02	NOT IDENT.
BI-207	2.588E-02	4.591E-02	4.737E-02	FAIL ABUN
PB-210	-2.035E+00	4.879E+00	4.965E+00	NOT IDENT.
BI-211	1.724E+00	6.337E-01	1.003E+00	FAIL ABUN
PB-211	4.420E-01	9.441E-01	9.649E-01	NOT IDENT.
RN-219	2.026E-01	5.626E-01	5.700E-01	NOT IDENT.
RA-223	-4.736E-01	8.557E-01	8.819E-01	FAIL ABUN
AC-227	-3.170E-02	2.678E-01	2.682E-01	NOT IDENT.
TH-227	-3.170E-02	2.678E-01	2.682E-01	NOT IDENT.
TH-229	5.615E-02	5.716E-01	5.722E-01	FAIL ABUN
PA-231	1.929E-01	5.997E-01	6.059E-01	NOT IDENT.
TH-231	-4.736E-01	8.557E-01	8.819E-01	FAIL ABUN
PA-233	8.786E-03	7.068E-02	7.079E-02	NOT IDENT.
PA-234	-1.190E-01	3.142E-01	3.188E-01	NOT IDENT.
PA-234M	-2.594E+00	4.184E+00	4.344E+00	NOT IDENT.
NP-237	8.786E-03	7.068E-02	7.079E-02	NOT IDENT.
NP-238	7.432E+05	7.300E+05	8.032E+05	SHORT HLIF
NP-239	-1.877E-01	2.604E-01	2.738E-01	NOT IDENT.
PU-239	5.072E+01	3.506E+02	3.513E+02	NOT IDENT.
AM-241	2.564E-02	1.676E-01	1.680E-01	NOT IDENT.
CM-243	-2.701E-02	9.909E-02	9.983E-02	NOT IDENT.
BK-247	-4.913E-02	8.659E-02	8.937E-02	NOT IDENT.
CM-247	-6.896E-03	5.189E-02	5.198E-02	NOT IDENT.
CF-249	-2.739E-02	4.964E-02	5.115E-02	NOT IDENT.
CF-251	-4.518E-02	1.365E-01	1.380E-01	NOT IDENT.
ANH-511	-1.086E-02	5.037E-02	5.061E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	77.3961	87.09	94.3231	136.47	78.0464
45.60	86.4869	87.57	94.4178	140.51	0.0000
46.54	85.8894	88.03	94.5089	143.76	94.6921
49.72	0.0000	88.34	94.5699	144.24	85.2838
51.35	82.8165	88.47	94.5955	145.44	93.8726
51.87	81.1988	89.96	89.1368	152.43	82.0404
52.39	79.5752	1093.63	89.2612	153.25	77.8692
52.97	84.0908	91.11	89.3468	323.87	100.4057
53.44	71.9264	92.59	95.3972	156.02	79.2438
54.07	74.6945	93.35	95.5432	158.56	77.3752
57.36	0.0000	94.56	92.8716	159.00	77.4221
57.53	75.4310	94.65	92.8882	162.33	87.4979
57.98	69.3051	94.67	92.8921	162.66	82.1331
59.27	69.5507	94.87	92.9290	163.33	74.6363
59.32	69.5602	97.43	87.5601	165.86	78.1465
59.54	69.6019	98.43	93.5791	176.31	77.0218
60.96	84.6486	98.44	93.5806	176.60	78.1510
61.17	84.6959	99.53	79.1246	177.52	82.6508
62.93	89.1428	100.11	78.2345	181.07	0.0000
63.29	89.2265	102.03	75.5756	181.52	73.1006
63.58	89.2939	103.18	80.6570	184.41	86.7034
64.28	100.2990	103.37	80.6862	143.76	89.0706
66.73	98.1996	105.21	71.0889	193.51	78.6774
67.24	105.1536	105.31	71.1021	197.03	72.2350
125.81	102.5351	106.12	70.2189	198.01	83.6181
67.75	102.5528	106.47	76.2018	201.83	79.4521
69.67	107.1625	109.28	73.6074	203.43	81.8730
70.83	106.0865	111.00	82.8138	205.31	71.7940
72.81	117.6655	111.76	0.0000	210.85	77.4069
72.87	117.6824	114.06	77.2424	215.65	81.8568
74.66	112.1543	116.30	0.0000	222.11	74.3086
74.82	112.1962	116.74	90.7031	227.09	79.6674
74.97	112.2355	119.76	76.9884	227.38	87.5736
77.11	112.7907	121.12	86.3026	228.16	0.0000
78.74	99.6422	121.22	86.3169	228.18	88.5245
79.69	71.7265	121.78	90.4635	116.74	88.5245
80.12	73.2032	122.06	84.4041	235.69	90.4594
80.19	73.2147	122.92	75.3595	235.96	86.2437
80.57	83.1405	123.07	83.5269	238.63	66.4553
81.00	101.5560	265.00	86.6701	238.98	0.0000
81.07	101.5719	125.81	86.9732	240.99	66.6155
81.75	103.9846	127.23	94.3525	242.00	66.6842
83.79	100.7576	127.91	75.9760	244.70	69.8974
84.00	90.8650	129.30	90.5506	252.40	0.0000
85.43	82.5993	131.20	85.6647	252.80	60.2163
86.55	94.2159	133.02	78.6649	254.15	0.0000
86.79	94.2632	133.52	81.8344	256.23	62.2217
86.94	94.2932	136.00	88.3886	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	65.4543	355.39	0.0000	584.27	34.3744
264.80	69.1000	356.01	50.2781	595.83	29.1172
265.00	65.4752	364.49	49.4133	427.87	36.4844
268.22	58.3770	366.42	0.0000	602.52	0.0000
269.46	66.6642	372.51	60.6416	604.72	41.1295
270.03	63.0450	375.05	47.8066	607.14	28.9778
271.23	60.3714	377.52	46.8946	609.32	30.5363
273.65	69.6752	356.01	37.0853	610.33	22.9138
276.40	57.9032	388.16	56.3008	614.28	21.4278
277.37	52.4355	388.63	56.3196	618.01	22.4894
277.60	52.4460	391.69	54.4260	620.36	21.1852
278.00	52.4651	264.66	61.8666	621.93	26.7315
279.20	58.9727	401.81	57.8550	630.19	0.0000
279.54	69.1303	402.40	63.9719	631.29	30.5572
279.70	69.1406	404.85	48.8225	633.25	25.0251
280.46	66.4211	410.95	32.6836	634.78	20.4059
283.69	64.7641	413.71	60.3729	635.95	20.4171
284.31	58.3204	414.70	57.3416	636.99	18.5703
285.41	60.2313	423.72	53.5671	645.85	29.8383
285.90	0.0000	427.09	51.6212	657.76	25.0046
287.50	50.1314	427.87	54.7460	657.90	0.0000
290.67	55.1143	433.94	60.1488	661.66	21.6057
293.27	0.0000	439.40	42.6691	664.57	0.0000
351.93	49.5395	453.88	40.9626	666.33	23.5352
295.96	67.3429	463.37	50.7136	666.50	21.9679
879.38	58.4962	468.07	37.2974	667.71	0.0000
299.98	54.0624	473.00	0.0000	677.62	14.1947
300.09	54.0672	475.06	52.1410	685.70	0.0000
300.13	54.0694	476.78	51.1304	695.00	20.9822
301.36	65.5103	477.60	46.8923	696.49	17.7240
302.85	79.9767	482.18	57.7079	696.51	17.7245
256.23	62.1872	487.02	33.2242	697.00	19.0918
304.85	58.4353	492.35	0.0000	697.30	15.9119
306.78	48.1463	497.08	46.3587	697.49	12.7308
308.46	55.7779	505.52	61.7532	702.65	22.3296
311.90	49.3030	507.63	0.0000	706.68	9.5869
316.51	62.8176	511.00	43.4723	711.68	16.0132
319.41	49.6109	514.00	93.6242	720.70	22.0474
320.08	59.1846	514.00	93.6249	721.93	0.0000
321.04	58.9580	520.40	29.5008	722.78	22.5273
323.87	62.8153	520.69	0.0000	722.91	22.5284
325.23	58.2831	522.65	0.0000	723.31	19.3135
328.76	44.6066	527.90	0.0000	724.19	14.4906
333.37	57.8943	528.26	34.0198	727.33	19.3467
333.97	46.3374	529.59	38.4383	733.00	16.9698
334.37	42.4894	529.87	0.0000	735.93	17.4766
338.28	51.1452	531.02	31.8736	333.97	19.4307
338.32	51.1468	537.26	31.9834	739.50	0.0000
311.90	41.9182	546.56	0.0000	747.24	15.6090
340.48	41.9182	552.55	31.1377	748.06	15.6145
340.55	41.9205	563.25	25.7241	752.31	12.7093
344.28	57.8362	569.33	24.6842	753.82	15.6523
345.93	46.7739	946.00	26.9304	756.73	14.6917
351.06	47.9368	569.70	26.9333	756.80	14.6924
351.93	47.9689	583.19	34.3549	884.68	17.6832

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	11.7979	1274.44	10.7043	1620.50	3.1636
766.42	17.7012	1001.03	15.0097	1621.92	5.2743
766.84	13.7700	1002.74	10.7273	1678.03	0.0000
772.60	0.0000	1004.73	15.0281	1690.97	5.3536
776.52	16.4579	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.6309
778.90	24.7107	1028.54	0.0000	1063.66	14.9286
783.70	0.0000	1037.84	4.8225	1771.35	3.7330
785.37	11.8922	1038.76	0.0000	1791.20	0.0000
792.07	16.5617	631.29	7.6166	1808.65	2.8209
794.95	14.9227	1048.07	8.7090	1810.72	0.0000
795.86	6.6348	1049.04	10.8896	1836.06	0.9455
810.06	11.0091	1050.41	9.8046		
810.29	13.0121	1063.66	7.6580		
344.28	13.0127	1077.00	14.2816		
810.76	13.0143	1077.34	12.0855		
815.77	11.0338	1085.87	10.0981		
1048.07	17.0706	1093.63	7.3617		
832.01	17.1602	1099.45	10.1402		
834.85	19.1999	1112.07	11.1045		
835.71	19.2064	1112.84	16.6604		
836.80	0.0000	1115.54	9.5282		
846.75	0.0000	1120.29	15.9033		
846.77	17.2573	1120.55	14.3136		
856.80	16.9832	1221.41	11.1357		
860.56	8.5036	1129.67	14.8848		
871.09	11.2688	1131.51	0.0000		
873.19	5.1262	1147.95	0.0000		
875.33	0.0000	1173.23	9.4230		
879.38	7.1931	1177.95	13.2099		
880.51	7.1962	1189.05	6.6263		
883.24	15.4358	1204.77	8.1501		
884.68	14.4143	1221.41	10.5085		
889.28	9.2819	1231.02	6.5684		
894.76	6.2002	1235.36	9.8643		
898.04	16.5539	1238.28	4.9361		
900.72	11.3918	1260.41	0.0000		
903.28	12.9572	1271.87	8.7180		
911.20	10.3953	1274.44	14.5404		
912.08	10.3984	1274.54	14.5404		
923.98	0.0000	1291.59	7.7907		
926.50	15.6779	1298.22	0.0000		
929.11	13.5999	1312.11	9.7913		
937.49	12.5906	1332.49	5.9063		
944.13	11.5683	1362.66	0.0000		
946.00	14.7328	1365.19	3.9709		
949.00	11.5876	1368.63	0.0000		
667.71	0.0000	1384.29	5.9851		
962.31	5.2913	1408.01	5.0173		
964.08	7.0592	1457.56	0.0000		
966.17	0.0000	1460.82	3.4851		
911.20	14.1423	1489.16	9.2106		
968.97	14.1423	1505.03	4.1089		
983.53	6.3954	1584.12	5.2301		
984.45	0.0000	1596.21	10.4887		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:15:42.79

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677030.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM24.CNF;316
Background date : 26-JUN-2016 12:05:13
Sample date     : 11-MAY-2016 14:40:00 Acquisition date : 28-JUN-2016 12:14:48
Sample ID      : G398677030 Sample quantity : 1.50390E+02 GRAM
Detector name   : GAM24 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:02.26 0.1%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572486 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.86*	26	173	1.14	93.77	89	10	7.20E-03	98.9	
2	2	61.26	29	75	1.05	122.59	120	12	8.18E-03	44.6	2.06E+00
3	2	63.68*	43	134	1.23	127.43	120	12	1.19E-02	48.5	
4	2	74.97*	97	189	1.26	150.01	146	20	2.70E-02	27.4	9.82E-01
5	2	77.29	200	177	1.26	154.64	146	20	5.57E-02	13.9	
6	0	84.32*	43	134	1.61	168.70	165	7	1.20E-02	47.9	
7	0	87.16	80	138	1.15	174.38	172	7	2.21E-02	26.9	
8	0	93.26*	32	191	1.26	186.59	182	8	8.92E-03	81.1	
9	0	174.92	20	107	1.33	349.95	347	7	5.65E-03	87.6	
10	0	185.74*	69	162	1.24	371.59	366	11	1.91E-02	39.1	
11	0	238.54*	305	137	1.18	477.23	471	10	8.48E-02	9.3	
12	0	242.30	60	134	1.57	484.74	482	10	1.67E-02	39.8	
13	0	295.46*	86	134	1.18	591.09	586	11	2.39E-02	28.5	
14	0	300.90	23	78	0.82	601.97	598	8	6.47E-03	68.8	
15	0	338.08*	41	102	1.07	676.36	673	9	1.14E-02	47.9	
16	0	351.72*	176	83	1.15	703.64	697	11	4.89E-02	12.8	
17	0	384.39	20	68	1.82	769.01	764	8	5.60E-03	74.9	
18	0	441.29*	22	76	1.77	882.83	878	10	6.18E-03	77.2	
19	0	462.44	31	85	2.23	925.14	923	9	8.63E-03	55.6	
20	0	511.07*	47	60	1.79	1022.45	1016	14	1.32E-02	43.2	
21	0	575.71	19	12	1.46	1151.76	1147	8	5.28E-03	39.0	
22	0	583.16*	71	36	1.39	1166.67	1162	10	1.97E-02	20.0	
23	0	609.29*	106	38	1.37	1218.95	1213	11	2.94E-02	15.3	
24	0	661.63	1866	35	1.46	1323.67	1318	14	5.18E-01	2.4	
25	0	727.75	26	11	1.05	1455.96	1451	11	7.22E-03	31.5	
26	0	735.33	7	12	1.11	1471.13	1467	9	2.00E-03	92.7	
27	0	758.80	8	3	1.30	1518.10	1514	7	2.12E-03	54.2	
28	0	785.91	14	2	0.99	1572.34	1567	8	3.78E-03	32.9	
29	0	795.49	18	6	1.59	1591.51	1587	8	5.10E-03	32.7	
30	0	841.52	18	13	0.67	1683.61	1678	13	5.00E-03	47.5	
31	0	860.94	22	17	0.76	1722.46	1713	18	6.13E-03	49.6	
32	0	911.02*	73	16	1.68	1822.67	1814	16	2.02E-02	17.4	
33	0	926.90	14	3	2.94	1854.45	1847	12	3.84E-03	36.9	
34	0	942.98	10	2	1.11	1886.63	1883	7	2.87E-03	37.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	964.24	19	11	1.08	1929.16	1923	11	5.28E-03	40.9	
36	0	968.83*	27	12	2.32	1938.35	1933	10	7.51E-03	32.1	
37	0	1035.09	10	6	0.64	2070.95	2065	11	2.64E-03	57.8	
38	0	1120.30*	29	7	1.51	2241.45	2237	10	8.06E-03	26.5	
39	0	1182.18	4	15	3.21	2365.27	2355	12	1.22E-03	182.0	
40	4	1226.60	9	0	2.26	2454.17	2453	10	2.44E-03	21.3	5.78E-01
41	4	1229.40	9	4	1.69	2459.77	2453	10	2.42E-03	45.3	
42	0	1232.59	8	5	0.87	2466.16	2463	7	2.28E-03	57.5	
43	0	1238.40	12	12	1.35	2477.79	2473	10	3.33E-03	62.0	
44	0	1314.98	6	2	0.75	2631.04	2628	6	1.79E-03	49.7	
45	0	1377.43	6	7	1.02	2756.00	2752	7	1.67E-03	83.7	
46	0	1460.71*	115	14	1.74	2922.68	2916	14	3.20E-02	11.9	
47	0	1764.13*	21	2	1.00	3529.95	3526	9	5.91E-03	27.4	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677030.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 14:40:00 Acquisition date : 28-JUN-2016 12:14:48
Sample ID        : G398677030 Sample quantity   : 150.39 GRAM
Sample type      : SOLID Sample geometry      :
Detector name    : GAMMA24 Detector geometry   : CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:02.26 0.1%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error      : 0.00 %
Efficiency type  : Linear Efficiencies at    : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.354E+00	3.849E+00	3.849E+00	23.78	OK
CD-109	88.03	3.70*	7.492E+00	1.298E+00	1.395E+00	78.12	OK
SN-126	64.28	9.60	5.581E+00	5.162E-01	5.162E-01	97.09	OK
	86.94	8.90	7.492E+00	5.398E-01	5.398E-01	78.12	OK
	87.57	37.00*	7.492E+00	1.298E-01	1.298E-01	78.12	OK
BA-137M	661.66	89.90*	2.534E+00	4.287E+00	4.300E+00	4.82	OK
CS-137	661.66	85.10*	2.534E+00	4.529E+00	4.543E+00	4.82	OK
TL-208	277.37	6.60	5.023E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.791E+00	1.585E-01	1.585E-01	40.06	OK
	860.56	12.50	2.073E+00	4.340E-01	4.340E-01	99.24	OK
PB-210	46.54	4.25*	2.513E+00	1.610E+00	1.617E+00	197.84	OK
BI-211	72.87	1.23	6.565E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	4.157E+00	3.009E-01	3.009E-01	327.51	OK
BI-212	727.33	6.67*	2.357E+00	8.574E-01	8.574E-01	63.08	OK
	785.37	1.10	2.223E+00	2.859E+00	2.859E+00	65.80	OK
	1620.50	1.47	1.233E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	6.743E+00	5.819E-01	5.819E-01	89.62	OK
	77.11	17.10	6.920E+00	1.078E+00	1.078E+00	27.70	OK
	238.63	43.60*	5.640E+00	7.168E-01	7.168E-01	18.54	OK
	300.09	3.30	4.710E+00	8.466E-01	8.466E-01	137.65	OK
BI-214	609.32	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53	OK
	1120.29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03	OK
	1764.49	15.30	1.139E+00	5.764E-01	5.765E-01	54.90	OK
PB-214	74.82	5.80	6.730E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.920E+00	1.901E+00	1.901E+00	27.70	OK
	87.09	3.41	7.489E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.579E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.779E+00	5.525E-01	5.525E-01	56.97	OK
	351.93	35.60*	4.155E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53	OK
	1120.29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03	OK
	1764.49	15.30	1.139E+00	5.764E-01	5.765E-01	54.90	OK
RA-224	240.99	4.10*	5.574E+00	5.421E-01	5.421E-01	245.65	OK
RA-226	609.32	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53	OK
	1120.29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03	OK
	1764.49	15.30	1.139E+00	5.764E-01	5.765E-01	54.90	OK
AC-228	105.21	1.10	7.950E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.291E+00	4.750E-01	4.750E-01	95.79	OK
	794.95	4.25	2.202E+00	1.008E+00	1.008E+00	65.31	OK
	835.71	1.61	2.121E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.191E-01	7.191E-01	34.82	OK
	968.97	15.80	1.893E+00	4.547E-01	4.547E-01	64.18	OK
RA-228	105.21	1.10	7.950E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.291E+00	4.750E-01	4.750E-01	95.79	OK
	794.95	4.25	2.202E+00	1.008E+00	1.008E+00	65.31	OK
	835.71	1.61	2.121E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.191E-01	7.191E-01	34.82	OK
	968.97	15.80	1.893E+00	4.547E-01	4.547E-01	64.18	OK
TH-228	74.82	10.28	6.743E+00	5.819E-01	5.819E-01	89.62	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	6.920E+00	1.078E+00	1.078E+00	27.70	OK
	238.63	43.60*	5.640E+00	7.168E-01	7.168E-01	18.54	OK
	300.09	3.30	4.710E+00	8.466E-01	8.466E-01	137.65	OK
TH-229	85.43	14.70	7.355E+00	2.521E-01	2.521E-01	95.86	OK
	88.47	24.00	7.492E+00	2.002E-01	2.002E-01	78.12	OK
	193.51	4.41*	6.531E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	6.166E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53	OK
	1120.29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03	OK
	1764.49	15.30	1.139E+00	5.764E-01	5.764E-01	54.90	OK
PA-231	283.69	1.70	4.935E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.710E+00	5.222E-01	5.222E-01	137.65	OK
TH-232	105.21	1.10	7.950E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.291E+00	4.750E-01	4.750E-01	95.79	OK
	835.71	1.61	2.121E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.985E+00	7.191E-01	7.191E-01	34.82	OK
	968.97	15.80	1.893E+00	4.547E-01	4.547E-01	64.18	OK
TH-234	63.29	3.70*	5.581E+00	1.339E+00	1.339E+00	97.09	OK
	92.59	4.23	7.719E+00	6.161E-01	6.161E-01	162.26	OK
U-234	609.32	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53	OK
	1120.29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03	OK
	1764.49	15.30	1.139E+00	5.764E-01	5.764E-01	54.90	OK
U-238	63.29	3.70*	5.581E+00	1.339E+00	1.339E+00	97.09	OK
	92.59	4.23	7.719E+00	6.161E-01	6.161E-01	162.26	OK
AM-243	43.53	5.90	1.694E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.743E+00	8.902E-02	8.902E-02	89.62	OK
ANH-511	511.00	100.00*	3.091E+00	8.246E-02	8.246E-02	86.46	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677030.CNF;1
Acquisition date : 28-JUN-2016 12:14:48 Sensitivity : 3.000
Detector ID : GAM24 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:02.26 Half life ratio : *****
Sample date : 11-MAY-2016 14:40:00 Analyst initials: MXR1
Sample ID : G398677030 Sample Quantity : 1.5039E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 17-JUN-2016 07:45:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	3.849E+00	8.969E-01	6.768E-01
CD-109	1.395E+00	1.068E+00	1.413E+00
SN-126	1.298E-01	9.940E-02	1.250E-01
BA-137M	4.300E+00	2.032E-01	6.847E-02
CS-137	4.543E+00	2.146E-01	7.233E-02
TL-208	1.585E-01	6.222E-02	6.479E-02
PB-210	1.617E+00	3.135E+00	2.712E+00
BI-211	3.009E-01	9.658E-01	4.258E-01
BI-212	8.574E-01	5.301E-01	7.842E-01
PB-212	7.168E-01	1.303E-01	1.310E-01
BI-214	4.557E-01	1.364E-01	1.421E-01
PB-214	6.617E-01	1.665E-01	2.633E-01
RN-222	4.557E-01	1.364E-01	1.421E-01
RA-224	5.421E-01	1.305E+00	1.270E+00
RA-226	4.557E-01	1.364E-01	1.421E-01
AC-228	7.191E-01	2.454E-01	2.031E-01
RA-228	7.191E-01	2.454E-01	2.031E-01
TH-228	7.168E-01	1.303E-01	1.310E-01
TH-229	-1.735E-01	5.632E-01	1.057E+00
TH-230	4.557E-01	1.364E-01	1.420E-01
PA-231	5.222E-01	7.044E-01	9.070E-01
TH-232	7.191E-01	2.454E-01	2.031E-01
TH-234	1.339E+00	1.274E+00	1.433E+00
U-234	4.557E-01	1.364E-01	1.420E-01
U-238	1.339E+00	1.274E+00	1.433E+00
AM-243	8.902E-02	7.819E-02	7.441E-02
ANH-511	8.246E-02	6.987E-02	6.422E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.572E-01	6.697E-01	1.264E+00	NOT IDENT.
NA-22	5.307E-03	2.997E-02	6.257E-02	NOT IDENT.
NA-24	0.000E+00	3.315E+21	0.000E+00	SHORT HLIF

AL-26	2.574E-03	2.361E-02	5.288E-02	NOT IDENT.
SC-46	-3.899E-02	4.022E-02	6.518E-02	FAIL ABUN
V-48	-1.268E-01	2.256E-01	3.946E-01	FAIL ABUN
CR-51	7.890E-01	9.398E-01	1.857E+00	NOT IDENT.
MN-54	1.226E-02	3.900E-02	7.111E-02	NOT IDENT.
CO-56	2.902E-03	4.888E-02	8.329E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.332E-02	2.546E-02	4.843E-02	NOT IDENT.
CO-58	3.691E-03	4.302E-02	8.495E-02	NOT IDENT.
FE-59	4.349E-02	1.106E-01	2.282E-01	NOT IDENT.
CO-60	1.620E-02	3.172E-02	6.900E-02	NOT IDENT.
ZN-65	8.527E-02	5.973E-02	1.439E-01	NOT IDENT.
GE-68	1.436E-01	1.213E+00	2.338E+00	NOT IDENT.
AS-73	-1.993E-01	5.951E-01	1.120E+00	NOT IDENT.
AS-74	-1.936E-02	3.246E-01	6.235E-01	NOT IDENT.
SE-75	3.968E-02	5.747E-02	1.132E-01	NOT IDENT.
BR-77	0.000E+00	2.886E+05	0.000E+00	SHORT HLIF
SR-82	-2.778E-01	6.481E-01	1.186E+00	NOT IDENT.
RB-83	-5.242E-02	1.046E-01	1.811E-01	NOT IDENT.
KR-85	1.104E+01	1.001E+01	1.774E+01	NOT IDENT.
SR-85	8.250E-02	7.490E-02	1.327E-01	NOT IDENT.
RB-86	4.493E-01	2.256E+00	4.434E+00	NOT IDENT.
Y-88	4.120E-03	4.208E-02	8.855E-02	NOT IDENT.
Y-91	-3.894E-02	2.384E+01	4.694E+01	NOT IDENT.
NB-94	-4.539E-03	3.103E-02	5.862E-02	NOT IDENT.
NB-95	2.364E-02	4.808E-02	9.884E-02	NOT IDENT.
NB-95M	9.076E-02	1.933E-01	3.347E-01	NOT IDENT.
ZR-95	3.061E-03	8.759E-02	1.507E-01	NOT IDENT.
NB-97	0.000E+00	7.950E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.225E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.936E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	8.215E+40	0.000E+00	SHORT HLIF
RH-101	2.277E-02	3.263E-02	6.202E-02	NOT IDENT.
RH-102	-9.999E-03	5.635E-02	1.064E-01	NOT IDENT.
RU-103	-7.422E-02	9.000E-02	1.510E-01	FAIL ABUN
RH-106	-1.554E-01	3.273E-01	5.999E-01	NOT IDENT.
RU-106	-1.554E-01	3.273E-01	5.999E-01	NOT IDENT.
AG-108M	-6.524E-04	3.913E-02	7.128E-02	NOT IDENT.
AG-110M	3.998E-03	4.446E-02	8.735E-02	NOT IDENT.
SN-113	-1.391E-03	6.851E-02	1.256E-01	NOT IDENT.
CD-115	0.000E+00	3.229E+05	0.000E+00	SHORT HLIF
SN-117M	-1.404E-01	2.770E-01	4.832E-01	NOT IDENT.
TE-123M	-1.346E-02	3.231E-02	5.674E-02	NOT IDENT.
SB-124	-3.640E-02	1.233E-01	2.315E-01	NOT IDENT.
SB-125	5.923E-02	1.289E-01	2.423E-01	FAIL ABUN
TE-125M	-2.764E+00	1.318E+01	2.404E+01	NOT IDENT.
I-126	7.728E-01	1.186E+00	2.237E+00	NOT IDENT.
SB-126	-6.063E-02	7.084E-01	1.298E+00	NOT IDENT.
SB-127	0.000E+00	4.105E+02	0.000E+00	SHORT HLIF
I-131	-1.221E+00	2.343E+00	4.162E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.481E+02	0.000E+00	SHORT HLIF
BA-133	1.764E-02	5.912E-02	9.840E-02	FAIL ABUN
I-133	0.000E+00	1.461E+15	0.000E+00	SHORT HLIF
CS-134	5.240E-02	3.354E-02	7.684E-02	FAIL ABUN
CS-135	1.246E-02	1.752E-01	3.301E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	3.372E-01	5.048E-01	1.060E+00	NOT IDENT.
CE-139	1.533E-03	3.303E-02	6.406E-02	NOT IDENT.
BA-140	-3.530E-01	1.684E+00	3.177E+00	NOT IDENT.
LA-140	2.050E-01	4.720E-01	1.023E+00	NOT IDENT.
CE-141	-1.012E-01	1.299E-01	2.222E-01	NOT IDENT.
CE-143	0.000E+00	2.287E+09	0.000E+00	SHORT HLIF
CE-144	-9.061E-02	2.082E-01	3.692E-01	NOT IDENT.
PM-144	4.976E-04	2.865E-02	5.615E-02	NOT IDENT.
PR-144	2.408E-02	2.179E+00	4.268E+00	NOT IDENT.
PM-146	1.948E-02	5.977E-02	1.110E-01	FAIL ABUN
ND-147	-7.623E-02	4.590E+00	8.880E+00	NOT IDENT.
PM-147	-9.116E+01	6.942E+02	1.267E+03	NOT IDENT.
PM-149	0.000E+00	2.685E+06	0.000E+00	SHORT HLIF
EU-150	2.016E-02	3.725E-02	6.350E-02	FAIL ABUN
EU-152	8.406E-02	1.222E-01	2.223E-01	FAIL ABUN
GD-153	-5.253E-02	8.859E-02	1.504E-01	NOT IDENT.
EU-154	1.098E-02	8.266E-02	1.716E-01	NOT IDENT.
EU-155	6.857E-02	9.538E-02	1.847E-01	FAIL ABUN
TB-160	4.211E-04	1.589E-01	3.057E-01	FAIL ABUN
HO-166M	-3.580E-02	4.566E-02	7.940E-02	FAIL ABUN
TM-171	-4.240E+00	9.285E+00	1.737E+01	NOT IDENT.

HF-172	-5.141E-02	2.047E-01	3.681E-01	FAIL ABUN
LU-172	-9.075E-04	4.948E-02	9.529E-02	FAIL ABUN
LU-176	1.878E-02	2.927E-02	5.719E-02	FAIL ABUN
HF-181	-8.810E-02	1.022E-01	1.716E-01	NOT IDENT.
TA-182	2.960E-02	1.524E-01	2.980E-01	FAIL ABUN
RE-183	-8.273E-02	1.661E-01	2.734E-01	NOT IDENT.
RE-184	5.852E-02	1.850E-01	3.419E-01	NOT IDENT.
W-188	2.748E-01	1.152E+01	1.908E+01	FAIL ABUN
IR-192	-4.037E-02	5.195E-02	9.148E-02	FAIL ABUN
HG-203	4.711E-02	6.915E-02	1.352E-01	NOT IDENT.
BI-207	2.608E-02	3.732E-02	8.141E-02	FAIL ABUN
PB-211	6.626E-01	8.922E-01	1.725E+00	NOT IDENT.
RN-219	-2.542E-01	5.290E-01	9.335E-01	NOT IDENT.
RA-223	-5.393E-01	7.694E-01	1.360E+00	FAIL ABUN
AC-227	-1.246E-01	2.705E-01	4.955E-01	FAIL ABUN
TH-227	-1.246E-01	2.705E-01	4.955E-01	FAIL ABUN
TH-231	-5.393E-01	7.694E-01	1.360E+00	FAIL ABUN
PA-233	-2.086E-02	7.273E-02	1.331E-01	FAIL ABUN
PA-234	-9.192E-02	2.473E-01	3.782E-01	FAIL ABUN
PA-234M	-1.229E+00	3.682E+00	6.903E+00	NOT IDENT.
U-235	2.510E-01	2.014E-01	3.905E-01	FAIL ABUN
NP-237	-2.086E-02	7.273E-02	1.331E-01	FAIL ABUN
NP-238	0.000E+00	6.778E+05	0.000E+00	SHORT HLIF
NP-239	2.684E-01	2.368E-01	4.693E-01	NOT IDENT.
PU-239	2.795E+02	3.365E+02	6.449E+02	NOT IDENT.
AM-241	-3.110E-02	9.567E-02	1.596E-01	NOT IDENT.
CM-243	-8.346E-02	9.767E-02	1.713E-01	NOT IDENT.
BK-247	8.049E-02	8.499E-02	1.700E-01	FAIL ABUN
CM-247	-2.358E-02	4.825E-02	8.509E-02	NOT IDENT.
CF-249	1.924E-02	5.546E-02	9.260E-02	NOT IDENT.
CF-251	-3.654E-03	1.356E-01	2.306E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	111	10.66*	1.354E+00	3.849E+00	3.849E+00	23.78
CD-109	88.03	100	3.70*	7.492E+00	1.808E+00	1.943E+00	53.77
SN-126	64.28	55	9.60	5.581E+00	5.162E-01	5.162E-01	97.09
	86.94	100	8.90	7.492E+00	7.515E-01	7.515E-01	53.77
	87.57	100	37.00*	7.492E+00	1.808E-01	1.808E-01	53.77
BA-137M	661.66	1956	89.90*	2.534E+00	4.287E+00	4.300E+00	4.82
CS-137	661.66	1956	85.10*	2.534E+00	4.529E+00	4.543E+00	4.82
TL-208	277.37	-----	6.60	5.023E+00	-----	Line Not Found	-----
	583.19	75	85.00*	2.791E+00	1.585E-01	1.585E-01	40.06
	860.56	23	12.50	2.073E+00	4.340E-01	4.340E-01	99.24
PB-210	46.54	34	4.25*	2.513E+00	1.610E+00	1.617E+00	197.84
BI-211	72.87	-----	1.23	6.565E+00	-----	Line Not Found	-----
	351.06	196	12.92*	4.157E+00	1.823E+00	1.823E+00	25.68
BI-212	727.33	27	6.67*	2.357E+00	8.574E-01	8.574E-01	63.08
	785.37	14	1.10	2.223E+00	2.859E+00	2.859E+00	65.80
	1620.50	-----	1.47	1.233E+00	-----	Line Not Found	-----
PB-212	74.82	124	10.28	6.743E+00	8.936E-01	8.936E-01	54.88
	77.11	256	17.10	6.920E+00	1.078E+00	1.078E+00	27.70
	238.63	353	43.60*	5.640E+00	7.168E-01	7.168E-01	18.54
	300.09	26	3.30	4.710E+00	8.466E-01	8.466E-01	137.65
BI-214	609.32	112	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53
	1120.29	29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03
	1764.49	20	15.30	1.139E+00	5.764E-01	5.765E-01	54.90
PB-214	74.82	124	5.80	6.743E+00	1.584E+00	1.584E+00	54.88
	77.11	256	9.70	6.920E+00	1.901E+00	1.901E+00	27.70
	87.09	100	3.41	7.492E+00	1.961E+00	1.961E+00	53.77
	242.00	70	7.25	5.574E+00	8.590E-01	8.590E-01	79.64
	295.22	97	18.42	4.779E+00	5.525E-01	5.525E-01	56.97
RN-222	351.93	196	35.60*	4.157E+00	6.617E-01	6.617E-01	25.68
	609.32	112	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53
	1120.29	29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03
	1764.49	20	15.30	1.139E+00	5.764E-01	5.765E-01	54.90
RA-224	240.99	70	4.10*	5.574E+00	1.519E+00	1.519E+00	79.64
RA-226	609.32	112	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53
	1120.29	29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03
	1764.49	20	15.30	1.139E+00	5.764E-01	5.765E-01	54.90
AC-228	105.21	-----	1.10	7.950E+00	-----	Line Not Found	-----
	338.32	46	11.27	4.291E+00	4.750E-01	4.750E-01	95.79
	794.95	19	4.25	2.202E+00	1.008E+00	1.008E+00	65.31
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----
	911.20	74	25.80*	1.985E+00	7.191E-01	7.191E-01	34.82
	968.97	27	15.80	1.893E+00	4.547E-01	4.547E-01	64.18
RA-228	105.21	-----	1.10	7.950E+00	-----	Line Not Found	-----
	338.32	46	11.27	4.291E+00	4.750E-01	4.750E-01	95.79
	794.95	19	4.25	2.202E+00	1.008E+00	1.008E+00	65.31
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----
	911.20	74	25.80*	1.985E+00	7.191E-01	7.191E-01	34.82

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	27	15.80	1.893E+00	4.547E-01	4.547E-01	64.18
	74.82	124	10.28	6.743E+00	8.936E-01	8.936E-01	54.88
	77.11	256	17.10	6.920E+00	1.078E+00	1.078E+00	27.70
TH-229	238.63	353	43.60*	5.640E+00	7.168E-01	7.168E-01	18.54
	300.09	26	3.30	4.710E+00	8.466E-01	8.466E-01	137.65
	85.43	55	14.70	7.355E+00	2.521E-01	2.521E-01	95.86
TH-230	88.47	100	24.00	7.492E+00	2.787E-01	2.787E-01	53.77
	193.51	-----	4.41*	6.531E+00	-----	Line Not Found	-----
	210.85	-----	2.80	6.166E+00	-----	Line Not Found	-----
TH-231	609.32	112	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53
	1120.29	29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03
	1764.49	20	15.30	1.139E+00	5.764E-01	5.764E-01	54.90
PA-231	283.69	-----	1.70	4.935E+00	-----	Line Not Found	-----
	301.36	26	5.35*	4.710E+00	5.222E-01	5.222E-01	137.65
	105.21	-----	1.10	7.950E+00	-----	Line Not Found	-----
TH-232	338.32	46	11.27	4.291E+00	4.750E-01	4.750E-01	95.79
	835.71	-----	1.61	2.121E+00	-----	Line Not Found	-----
	911.20	74	25.80*	1.985E+00	7.191E-01	7.191E-01	34.82
TH-234	968.97	27	15.80	1.893E+00	4.547E-01	4.547E-01	64.18
	63.29	55	3.70*	5.581E+00	1.339E+00	1.339E+00	97.09
	92.59	40	4.23	7.719E+00	6.161E-01	6.161E-01	162.26
U-234	609.32	112	45.49*	2.699E+00	4.557E-01	4.557E-01	30.53
	1120.29	29	14.92	1.689E+00	5.704E-01	5.704E-01	53.03
	1764.49	20	15.30	1.139E+00	5.764E-01	5.764E-01	54.90
U-238	63.29	55	3.70*	5.581E+00	1.339E+00	1.339E+00	97.09
	92.59	40	4.23	7.719E+00	6.161E-01	6.161E-01	162.26
	43.53	-----	5.90	1.694E+00	-----	Line Not Found	-----
AM-243	74.66	124	67.20*	6.743E+00	1.367E-01	1.367E-01	54.88
ANH-511	511.00	51	100.00*	3.091E+00	8.246E-02	8.246E-02	86.46

Flag: "*" = Keyline

Total number of lines in spectrum 47
Number of unidentified lines 11
Number of lines tentatively identified by NID 36 76.60%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	3.849E+00	3.849E+00	0.915E+00	23.78	
CD-109	461.40D	1.07	1.808E+00	1.943E+00	1.044E+00	53.77	
SN-126	2.30E+05Y	1.00	1.808E-01	1.808E-01	0.972E-01	53.77	
BA-137M	30.08Y	1.00	4.287E+00	4.300E+00	0.207E+00	4.82	
CS-137	30.08Y	1.00	4.529E+00	4.543E+00	0.219E+00	4.82	
TL-208	1.41E+10Y	1.00	1.585E-01	1.585E-01	0.635E-01	40.06	
PB-210	22.20Y	1.00	1.610E+00	1.617E+00	3.199E+00	197.84	
BI-211	7.04E+08Y	1.00	1.823E+00	1.823E+00	0.468E+00	25.68	
BI-212	1.41E+10Y	1.00	8.574E-01	8.574E-01	5.409E-01	63.08	
PB-212	1.41E+10Y	1.00	7.168E-01	7.168E-01	1.329E-01	18.54	
BI-214	1600.00Y	1.00	4.557E-01	4.557E-01	1.391E-01	30.53	
PB-214	1600.00Y	1.00	6.617E-01	6.617E-01	1.699E-01	25.68	
RN-222	1600.00Y	1.00	4.557E-01	4.557E-01	1.391E-01	30.53	
RA-224	1.41E+10Y	1.00	1.519E+00	1.519E+00	1.210E+00	79.64	
RA-226	1600.00Y	1.00	4.557E-01	4.557E-01	1.391E-01	30.53	
AC-228	1.41E+10Y	1.00	7.191E-01	7.191E-01	2.504E-01	34.82	
RA-228	1.41E+10Y	1.00	7.191E-01	7.191E-01	2.504E-01	34.82	
TH-228	1.41E+10Y	1.00	7.168E-01	7.168E-01	1.329E-01	18.54	
TH-229	7340.00Y	1.00	2.787E-01	2.787E-01	1.498E-01	53.77	K
TH-230	7.54E+04Y	1.00	4.557E-01	4.557E-01	1.391E-01	30.53	
PA-231	7.04E+08Y	1.00	5.222E-01	5.222E-01	7.188E-01	137.65	
TH-232	1.41E+10Y	1.00	7.191E-01	7.191E-01	2.504E-01	34.82	
TH-234	4.47E+09Y	1.00	1.339E+00	1.339E+00	1.300E+00	97.09	
U-234	2.45E+05Y	1.00	4.557E-01	4.557E-01	1.391E-01	30.53	
U-238	4.47E+09Y	1.00	1.339E+00	1.339E+00	1.300E+00	97.09	
AM-243	7370.00Y	1.00	1.367E-01	1.367E-01	0.750E-01	54.88	
ANH-511	1.00E+09Y	1.00	8.246E-02	8.246E-02	7.129E-02	86.46	
Total Activity :			3.085E+01	3.102E+01			

Grand Total Activity : 3.085E+01 3.102E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	61.26	38	97	1.05	122.59	120	12	8.18E-03	89.3	5.26E+00	T
0	174.92	24	127	1.33	349.95	347	7	5.65E-03	****	6.94E+00	T
0	185.74	81	192	1.24	371.59	366	11	1.91E-02	78.2	6.70E+00	T
0	384.39	22	75	1.82	769.01	764	8	5.60E-03	****	3.87E+00	T
0	441.29	24	83	1.77	882.83	878	10	6.18E-03	****	3.47E+00	
0	462.44	34	92	2.23	925.14	923	9	8.63E-03	****	3.34E+00	T
0	575.71	20	13	1.46	1151.76	1147	8	5.28E-03	78.1	2.82E+00	
0	735.33	7	12	1.11	1471.13	1467	9	2.00E-03	****	2.34E+00	T
0	758.80	8	3	1.30	1518.10	1514	7	2.12E-03	****	2.28E+00	
0	841.52	18	13	0.67	1683.61	1678	13	5.00E-03	95.1	2.11E+00	
0	926.90	14	3	2.94	1854.45	1847	12	3.84E-03	73.8	1.96E+00	T
0	942.98	10	2	1.11	1886.63	1883	7	2.87E-03	75.1	1.93E+00	T
0	964.24	19	11	1.08	1929.16	1923	11	5.28E-03	81.7	1.90E+00	T
0	1035.09	10	6	0.64	2070.95	2065	11	2.64E-03	****	1.80E+00	
0	1182.18	4	14	3.21	2365.27	2355	12	1.22E-03	****	1.62E+00	
4	1226.60	9	0	2.26	2454.17	2453	10	2.44E-03	42.6	1.57E+00	
4	1229.40	9	4	1.69	2459.77	2453	10	2.42E-03	90.5	1.57E+00	
0	1232.59	8	5	0.87	2466.16	2463	7	2.28E-03	****	1.56E+00	
0	1238.40	12	12	1.35	2477.79	2473	10	3.33E-03	****	1.56E+00	T
0	1314.98	6	2	0.75	2631.04	2628	6	1.79E-03	99.5	1.48E+00	
0	1377.43	6	7	1.02	2756.00	2752	7	1.67E-03	****	1.42E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677030.CNF;1
Acquisition date : 28-JUN-2016 12:14:48 Sensitivity : 3.000
Detector ID : GAM24 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:02.26 Half life ratio : *****
Sample date : 11-MAY-2016 14:40:00 Nuclide Library : SOLID
Sample ID : G398677030 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5039E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 17-JUN-2016 07:45:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.914E-01
CD-109	6.788E-01
SN-126	5.991E-02
BA-137M	3.119E-02
CS-137	3.295E-02
TL-208	2.947E-02
PB-210	1.285E+00
BI-211	1.999E-01
BI-212	3.482E-01
PB-212	6.263E-02
BI-214	6.539E-02
PB-214	1.270E-01
RN-222	6.539E-02
RA-224	6.041E-01
RA-226	6.539E-02
AC-228	8.813E-02
RA-228	8.813E-02
TH-228	6.263E-02
TH-229	5.041E-01
TH-230	6.539E-02
PA-231	4.256E-01
TH-232	8.813E-02
TH-234	6.808E-01
U-234	6.539E-02
U-238	6.808E-01
AM-243	3.560E-02
ANH-511	2.987E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.941E-01	NOT IDENT.
NA-22	2.664E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.034E-02	NOT IDENT.

SC-46	2.753E-02	FAIL ABUN
V-48	1.679E-01	FAIL ABUN
CR-51	8.760E-01	NOT IDENT.
MN-54	3.195E-02	NOT IDENT.
CO-56	3.660E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.303E-02	NOT IDENT.
CO-58	3.738E-02	NOT IDENT.
FE-59	9.922E-02	NOT IDENT.
CO-60	2.978E-02	NOT IDENT.
ZN-65	6.280E-02	NOT IDENT.
GE-68	1.031E+00	NOT IDENT.
AS-73	5.327E-01	NOT IDENT.
AS-74	2.840E-01	NOT IDENT.
SE-75	5.355E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.176E-01	NOT IDENT.
RB-83	8.312E-02	NOT IDENT.
KR-85	8.344E+00	NOT IDENT.
SR-85	6.241E-02	NOT IDENT.
RB-86	1.947E+00	NOT IDENT.
Y-88	3.579E-02	NOT IDENT.
Y-91	2.056E+01	NOT IDENT.
NB-94	2.645E-02	NOT IDENT.
NB-95	4.430E-02	NOT IDENT.
NB-95M	1.590E-01	NOT IDENT.
ZR-95	6.602E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.964E-02	NOT IDENT.
RH-102	4.840E-02	NOT IDENT.
RU-103	6.988E-02	FAIL ABUN
RH-106	2.712E-01	NOT IDENT.
RU-106	2.712E-01	NOT IDENT.
AG-108M	3.345E-02	NOT IDENT.
AG-110M	3.836E-02	NOT IDENT.
SN-113	5.906E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.287E-01	NOT IDENT.
TE-123M	2.684E-02	NOT IDENT.
SB-124	9.490E-02	NOT IDENT.
SB-125	1.144E-01	FAIL ABUN
TE-125M	1.143E+01	NOT IDENT.
I-126	1.010E+00	NOT IDENT.
SB-126	5.695E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.948E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.644E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.460E-02	FAIL ABUN
CS-135	1.566E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.699E-01	NOT IDENT.
CE-139	3.045E-02	NOT IDENT.
BA-140	1.459E+00	NOT IDENT.
LA-140	4.344E-01	NOT IDENT.
CE-141	1.057E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.753E-01	NOT IDENT.
PM-144	2.495E-02	NOT IDENT.
PR-144	1.896E+00	NOT IDENT.
PM-146	5.228E-02	FAIL ABUN
ND-147	4.076E+00	NOT IDENT.
PM-147	6.008E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.007E-02	FAIL ABUN
EU-152	1.049E-01	FAIL ABUN
GD-153	7.155E-02	NOT IDENT.
EU-154	7.289E-02	NOT IDENT.
EU-155	8.800E-02	FAIL ABUN
TB-160	1.351E-01	FAIL ABUN
HO-166M	3.437E-02	FAIL ABUN
TM-171	8.249E+00	NOT IDENT.
HF-172	1.756E-01	FAIL ABUN

LU-172	4.102E-02	FAIL ABUN
LU-176	2.698E-02	FAIL ABUN
HF-181	7.998E-02	NOT IDENT.
TA-182	1.276E-01	FAIL ABUN
RE-183	1.295E-01	NOT IDENT.
RE-184	1.479E-01	NOT IDENT.
W-188	8.961E+00	FAIL ABUN
IR-192	4.280E-02	FAIL ABUN
HG-203	6.408E-02	NOT IDENT.
BI-207	3.548E-02	FAIL ABUN
PB-211	8.131E-01	NOT IDENT.
RN-219	4.385E-01	NOT IDENT.
RA-223	6.403E-01	FAIL ABUN
AC-227	2.339E-01	FAIL ABUN
TH-227	2.339E-01	FAIL ABUN
TH-231	6.403E-01	FAIL ABUN
PA-233	6.257E-02	FAIL ABUN
PA-234	1.594E-01	FAIL ABUN
PA-234M	3.010E+00	NOT IDENT.
U-235	1.867E-01	FAIL ABUN
NP-237	6.257E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.234E-01	NOT IDENT.
PU-239	3.081E+02	NOT IDENT.
AM-241	7.574E-02	NOT IDENT.
CM-243	8.129E-02	NOT IDENT.
BK-247	8.048E-02	FAIL ABUN
CM-247	3.995E-02	NOT IDENT.
CF-249	4.355E-02	NOT IDENT.
CF-251	1.094E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677030.CNF;1
Acquisition date : 28-JUN-2016 12:14:48 Sensitivity : 3.000
Detector ID : GAM24 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:02.26 Half life ratio : *****
Sample date : 11-MAY-2016 14:40:00 Nuclide Library : SOLID
Sample ID : G398677030 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5039E+02 GRAM
Quantity Err(%) : 1.3299E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 17-JUN-2016 07:45:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM24_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	3.849E+00	9.191E-01	9.191E-01
CD-109	1.395E+00	1.076E+00	1.076E+00
SN-126	1.298E-01	9.993E-02	9.993E-02
BA-137M	4.300E+00	2.744E-01	2.744E-01
CS-137	4.543E+00	2.896E-01	2.896E-01
TL-208	1.585E-01	6.258E-02	6.258E-02
PB-210	1.617E+00	3.138E+00	3.138E+00
BI-211	3.009E-01	9.703E-01	9.703E-01
BI-212	8.574E-01	5.318E-01	5.318E-01
PB-212	7.168E-01	1.356E-01	1.356E-01
BI-214	4.557E-01	1.378E-01	1.378E-01
PB-214	6.617E-01	1.688E-01	1.688E-01
RN-222	4.557E-01	1.378E-01	1.378E-01
RA-224	5.421E-01	1.307E+00	1.307E+00
RA-226	4.557E-01	1.378E-01	1.378E-01
AC-228	7.191E-01	2.481E-01	2.481E-01
RA-228	7.191E-01	2.481E-01	2.481E-01
TH-228	7.168E-01	1.356E-01	1.356E-01
TH-229	-1.735E-01	5.632E-01	5.632E-01
TH-230	4.557E-01	1.377E-01	1.377E-01
PA-231	5.222E-01	7.132E-01	7.132E-01
TH-232	7.191E-01	2.481E-01	2.481E-01
TH-234	1.339E+00	1.308E+00	1.308E+00
U-234	4.557E-01	1.377E-01	1.377E-01
U-238	1.339E+00	1.308E+00	1.308E+00
AM-243	8.902E-02	7.861E-02	7.861E-02
ANH-511	8.246E-02	6.995E-02	6.995E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.572E-01	6.698E-01	6.889E-01	NOT IDENT.
NA-22	5.307E-03	2.997E-02	3.006E-02	NOT IDENT.
NA-24	3.563E+20	3.315E+21	0.000E+00	SHORT HLIF

AL-26	2.574E-03	2.361E-02	2.363E-02	NOT IDENT.
SC-46	-3.899E-02	4.025E-02	4.392E-02	FAIL ABUN
V-48	-1.268E-01	2.257E-01	2.328E-01	FAIL ABUN
CR-51	7.890E-01	9.404E-01	1.005E+00	NOT IDENT.
MN-54	1.226E-02	3.901E-02	3.940E-02	NOT IDENT.
CO-56	2.902E-03	4.888E-02	4.890E-02	FAIL ABUN
MN-56	1.000E+41	1.872E+42	0.000E+00	SHORT HLIF
CO-57	1.332E-02	2.546E-02	2.616E-02	NOT IDENT.
CO-58	3.691E-03	4.302E-02	4.305E-02	NOT IDENT.
FE-59	4.349E-02	1.107E-01	1.124E-01	NOT IDENT.
CO-60	1.620E-02	3.173E-02	3.256E-02	NOT IDENT.
ZN-65	8.527E-02	5.981E-02	7.110E-02	NOT IDENT.
GE-68	1.436E-01	1.213E+00	1.215E+00	NOT IDENT.
AS-73	-1.993E-01	5.965E-01	6.032E-01	NOT IDENT.
AS-74	-1.936E-02	3.246E-01	3.247E-01	NOT IDENT.
SE-75	3.968E-02	5.750E-02	6.022E-02	NOT IDENT.
BR-77	1.588E+06	2.217E+06	2.329E+06	SHORT HLIF
SR-82	-2.778E-01	6.482E-01	6.601E-01	NOT IDENT.
RB-83	-5.242E-02	1.048E-01	1.075E-01	NOT IDENT.
KR-85	1.104E+01	1.002E+01	1.119E+01	NOT IDENT.
SR-85	8.250E-02	7.498E-02	8.370E-02	NOT IDENT.
RB-86	4.493E-01	2.256E+00	2.265E+00	NOT IDENT.
Y-88	4.120E-03	4.208E-02	4.213E-02	NOT IDENT.
Y-91	-3.894E-02	2.384E+01	2.384E+01	NOT IDENT.
NB-94	-4.539E-03	3.104E-02	3.110E-02	NOT IDENT.
NB-95	2.364E-02	4.809E-02	4.926E-02	NOT IDENT.
NB-95M	9.076E-02	1.934E-01	1.977E-01	NOT IDENT.
ZR-95	3.061E-03	8.759E-02	8.760E-02	NOT IDENT.
NB-97	1.000E+41	7.962E+40	0.000E+00	SHORT HLIF
ZR-97	1.485E+20	2.226E+20	0.000E+00	SHORT HLIF
MO-99	-2.874E+04	4.938E+04	5.105E+04	SHORT HLIF
TC-99M	-1.000E+41	8.274E+40	0.000E+00	SHORT HLIF
RH-101	2.277E-02	3.288E-02	3.445E-02	NOT IDENT.
RH-102	-9.999E-03	5.635E-02	5.653E-02	NOT IDENT.
RU-103	-7.422E-02	9.007E-02	9.609E-02	FAIL ABUN
RH-106	-1.554E-01	3.274E-01	3.348E-01	NOT IDENT.
RU-106	-1.554E-01	3.274E-01	3.348E-01	NOT IDENT.
AG-108M	-6.524E-04	3.913E-02	3.913E-02	NOT IDENT.
AG-110M	3.998E-03	4.446E-02	4.449E-02	NOT IDENT.
SN-113	-1.391E-03	6.851E-02	6.852E-02	NOT IDENT.
CD-115	-5.775E+02	3.229E+05	3.229E+05	SHORT HLIF
SN-117M	-1.404E-01	2.771E-01	2.843E-01	NOT IDENT.
TE-123M	-1.346E-02	3.231E-02	3.288E-02	NOT IDENT.
SB-124	-3.640E-02	1.233E-01	1.244E-01	NOT IDENT.
SB-125	5.923E-02	1.290E-01	1.317E-01	FAIL ABUN
TE-125M	-2.764E+00	1.318E+01	1.324E+01	NOT IDENT.
I-126	7.728E-01	1.187E+00	1.237E+00	NOT IDENT.
SB-126	-6.063E-02	7.084E-01	7.090E-01	NOT IDENT.
SB-127	1.541E+02	4.119E+02	4.177E+02	SHORT HLIF
I-131	-1.221E+00	2.343E+00	2.407E+00	NOT IDENT.
I-132	1.000E+41	6.362E+41	0.000E+00	SHORT HLIF
TE-132	1.363E+02	8.483E+02	8.505E+02	SHORT HLIF
BA-133	1.764E-02	5.912E-02	5.965E-02	FAIL ABUN
I-133	-2.868E+13	1.461E+15	1.461E+15	SHORT HLIF
CS-134	5.240E-02	3.361E-02	4.108E-02	FAIL ABUN
CS-135	1.246E-02	1.752E-01	1.753E-01	NOT IDENT.
I-135	-1.000E+41	2.378E+41	0.000E+00	SHORT HLIF
CS-136	3.372E-01	5.056E-01	5.280E-01	NOT IDENT.
CE-139	1.533E-03	3.303E-02	3.304E-02	NOT IDENT.
BA-140	-3.530E-01	1.684E+00	1.692E+00	NOT IDENT.
LA-140	2.050E-01	4.721E-01	4.811E-01	NOT IDENT.
CE-141	-1.012E-01	1.300E-01	1.377E-01	NOT IDENT.
CE-143	3.868E+09	2.295E+09	2.883E+09	SHORT HLIF
CE-144	-9.061E-02	2.083E-01	2.122E-01	NOT IDENT.
PM-144	4.976E-04	2.865E-02	2.865E-02	NOT IDENT.
PR-144	2.408E-02	2.179E+00	2.179E+00	NOT IDENT.
PM-146	1.948E-02	5.979E-02	6.043E-02	FAIL ABUN
ND-147	-7.623E-02	4.590E+00	4.590E+00	NOT IDENT.
PM-147	-9.116E+01	6.942E+02	6.954E+02	NOT IDENT.
PM-149	2.522E+05	2.686E+06	2.688E+06	SHORT HLIF
EU-150	2.016E-02	3.726E-02	3.835E-02	FAIL ABUN
EU-152	8.406E-02	1.223E-01	1.280E-01	FAIL ABUN
GD-153	-5.253E-02	8.864E-02	9.175E-02	NOT IDENT.
EU-154	1.098E-02	8.267E-02	8.281E-02	NOT IDENT.
EU-155	6.857E-02	9.550E-02	1.004E-01	FAIL ABUN
TB-160	4.211E-04	1.589E-01	1.589E-01	FAIL ABUN
HO-166M	-3.580E-02	4.570E-02	4.847E-02	FAIL ABUN
TM-171	-4.240E+00	9.293E+00	9.487E+00	NOT IDENT.

HF-172	-5.141E-02	2.049E-01	2.062E-01	FAIL ABUN
LU-172	-9.075E-04	4.948E-02	4.949E-02	FAIL ABUN
LU-176	1.878E-02	2.928E-02	3.048E-02	FAIL ABUN
HF-181	-8.810E-02	1.023E-01	1.097E-01	NOT IDENT.
TA-182	2.960E-02	1.524E-01	1.530E-01	FAIL ABUN
RE-183	-8.273E-02	1.663E-01	1.705E-01	NOT IDENT.
RE-184	5.852E-02	1.851E-01	1.869E-01	NOT IDENT.
W-188	2.748E-01	1.152E+01	1.152E+01	FAIL ABUN
IR-192	-4.037E-02	5.198E-02	5.507E-02	FAIL ABUN
HG-203	4.711E-02	6.918E-02	7.237E-02	NOT IDENT.
BI-207	2.608E-02	3.734E-02	3.914E-02	FAIL ABUN
PB-211	6.626E-01	8.929E-01	9.415E-01	NOT IDENT.
RN-219	-2.542E-01	5.299E-01	5.422E-01	NOT IDENT.
RA-223	-5.393E-01	7.701E-01	8.076E-01	FAIL ABUN
AC-227	-1.246E-01	2.710E-01	2.768E-01	FAIL ABUN
TH-227	-1.246E-01	2.710E-01	2.768E-01	FAIL ABUN
TH-231	-5.393E-01	7.701E-01	8.076E-01	FAIL ABUN
PA-233	-2.086E-02	7.274E-02	7.334E-02	FAIL ABUN
PA-234	-9.192E-02	2.687E-01	2.719E-01	FAIL ABUN
PA-234M	-1.229E+00	3.683E+00	3.724E+00	NOT IDENT.
U-235	2.510E-01	2.018E-01	2.314E-01	FAIL ABUN
NP-237	-2.086E-02	7.274E-02	7.334E-02	FAIL ABUN
NP-238	1.445E+05	6.778E+05	6.809E+05	SHORT HLIF
NP-239	2.684E-01	2.378E-01	2.668E-01	NOT IDENT.
PU-239	2.795E+02	3.367E+02	3.595E+02	NOT IDENT.
AM-241	-3.110E-02	9.570E-02	9.672E-02	NOT IDENT.
CM-243	-8.346E-02	9.797E-02	1.049E-01	NOT IDENT.
BK-247	8.049E-02	8.652E-02	9.382E-02	FAIL ABUN
CM-247	-2.358E-02	4.841E-02	4.956E-02	NOT IDENT.
CF-249	1.924E-02	5.548E-02	5.615E-02	NOT IDENT.
CF-251	-3.654E-03	1.356E-01	1.356E-01	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	106.5192	87.09	114.5473	136.47	132.9247
45.60	90.9315	87.57	176.7310	140.51	0.0000
46.54	108.7781	88.03	197.5758	143.76	111.1626
49.72	0.0000	88.34	204.0508	144.24	118.1047
51.35	114.4640	88.47	204.0938	145.44	148.1235
51.87	116.6818	89.96	204.5801	152.43	127.3195
52.39	126.1554	1093.63	204.8008	153.25	144.8135
52.97	139.2484	91.11	198.5483	323.87	117.1347
53.44	131.4280	92.59	179.7501	156.02	125.5056
54.07	110.6723	93.35	155.8607	158.56	118.8651
57.36	0.0000	94.56	114.2970	159.00	114.2586
57.53	138.6201	94.65	104.6530	162.33	110.5768
57.98	125.1773	94.67	104.6560	162.66	110.6163
59.27	127.0264	94.87	104.6882	163.33	120.3600
59.32	127.0395	97.43	144.8720	165.86	121.5660
59.54	127.0972	98.43	154.3748	176.31	118.2639
60.96	112.2929	98.44	154.3770	176.60	112.5972
61.17	112.3406	99.53	112.4572	177.52	112.7023
62.93	121.8800	100.11	103.8960	181.07	0.0000
63.29	121.9675	102.03	137.8353	181.52	117.4546
63.58	122.0375	103.18	141.3279	184.41	112.0460
64.28	140.5374	103.37	143.5425	143.76	128.5518
66.73	127.3945	105.21	112.3047	193.51	149.4532
67.24	142.8831	105.31	112.3210	197.03	141.7749
125.81	135.3146	106.12	126.6437	198.01	129.1707
67.75	139.9457	106.47	127.7997	201.83	149.7173
69.67	156.4037	109.28	129.4046	203.43	131.6536
70.83	142.3041	111.00	129.7155	205.31	133.7138
72.81	147.4793	111.76	0.0000	210.85	120.5817
72.87	147.4953	114.06	136.8858	215.65	99.8385
74.66	163.5490	116.30	0.0000	222.11	90.1804
74.82	163.5955	116.74	95.2811	227.09	107.3756
74.97	163.6395	119.76	123.4743	227.38	104.6001
77.11	164.2604	121.12	115.8950	228.16	0.0000
78.74	164.7274	121.22	115.9098	228.18	96.2607
79.69	164.9974	121.78	111.5336	116.74	96.2607
80.12	165.1191	122.06	108.2271	235.69	103.8319
80.19	165.1392	122.92	129.5707	235.96	103.8554
80.57	165.2457	123.07	126.2445	238.63	158.3921
81.00	165.3667	265.00	136.4073	238.98	0.0000
81.07	165.3867	125.81	153.5982	240.99	128.4712
81.75	113.5388	127.23	131.4114	242.00	128.5781
83.79	129.7510	127.91	136.0222	244.70	84.8969
84.00	129.7966	129.30	123.8723	252.40	0.0000
85.43	114.2369	131.20	155.7736	252.80	108.7215
86.55	114.4468	133.02	134.6292	254.15	0.0000
86.79	114.4907	133.52	132.4474	256.23	107.1042
86.94	114.5193	136.00	127.1712	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	85.6701	355.39	0.0000	584.27	36.8955
264.80	80.8661	356.01	85.2985	595.83	36.1521
265.00	80.8777	364.49	84.5099	427.87	38.0832
268.22	110.0339	366.42	0.0000	602.52	0.0000
269.46	98.5448	372.51	81.8147	604.72	48.0755
270.03	94.7207	375.05	90.2378	607.14	35.7045
271.23	93.8400	377.52	68.5580	609.32	45.0600
273.65	114.3629	356.01	84.4557	610.33	38.8611
276.40	91.2906	388.16	73.5894	614.28	35.8112
277.37	91.3565	388.63	86.9934	618.01	31.8127
277.60	91.3723	391.69	82.7489	620.36	35.5897
278.00	91.3996	264.66	82.1252	621.93	37.4873
279.20	91.4813	401.81	92.7145	630.19	0.0000
279.54	87.6105	402.40	91.6928	631.29	36.6910
279.70	88.5950	404.85	70.7121	633.25	34.8365
280.46	87.6695	410.95	65.6602	634.78	31.0898
283.69	82.0197	413.71	91.2188	635.95	31.1051
284.31	85.9644	414.70	81.7173	636.99	34.8898
285.41	87.0118	423.72	87.4591	645.85	24.6048
285.90	0.0000	427.09	86.5519	657.76	42.7874
287.50	73.4356	427.87	82.3130	657.90	0.0000
290.67	78.5107	433.94	78.2932	661.66	35.2349
293.27	0.0000	439.40	61.9585	664.57	0.0000
351.93	92.9452	453.88	80.2103	666.33	19.0811
295.96	92.9941	463.37	94.7660	666.50	19.0820
879.38	86.8506	468.07	87.3499	667.71	0.0000
299.98	86.9365	473.00	0.0000	677.62	23.9563
300.09	86.9432	475.06	86.5654	685.70	0.0000
300.13	86.9459	476.78	72.3829	695.00	21.2217
301.36	77.5279	477.60	68.0239	696.49	21.2341
302.85	87.1124	482.18	83.5761	696.51	21.2341
256.23	96.7258	487.02	65.0372	697.00	21.2378
304.85	88.8193	492.35	0.0000	697.30	23.1715
306.78	76.4313	497.08	69.7906	697.49	23.1732
308.46	85.4646	505.52	58.7313	702.65	30.9578
311.90	89.6512	507.63	0.0000	706.68	25.1913
316.51	89.9341	511.00	59.1090	711.68	23.2969
319.41	78.0952	514.00	55.3958	720.70	18.2616
320.08	72.1198	514.00	55.3958	721.93	0.0000
321.04	83.1925	520.40	51.5310	722.78	16.2447
323.87	106.4464	520.69	0.0000	722.91	16.2455
325.23	95.4871	522.65	0.0000	723.31	16.2480
328.76	78.5832	527.90	0.0000	724.19	16.2533
333.37	93.7771	528.26	39.3536	727.33	21.1536
333.97	88.9614	529.59	43.2035	733.00	9.7834
334.37	87.3664	529.87	0.0000	735.93	12.7321
338.28	91.2387	531.02	42.3310	333.97	16.3322
338.32	91.2401	537.26	44.2603	739.50	0.0000
311.90	105.5806	546.56	0.0000	747.24	26.5511
340.48	105.5806	552.55	34.5637	748.06	19.6733
340.55	105.5853	563.25	32.9019	752.31	14.7777
344.28	74.6291	569.33	40.5837	753.82	11.4998
345.93	76.6091	946.00	37.9684	756.73	16.4453
351.06	78.6978	569.70	37.9715	756.80	16.4457
351.93	88.3538	583.19	34.1130	884.68	24.0242

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	18.8080	1274.44	13.8433	1620.50	7.1891
766.42	19.8022	1001.03	14.9287	1621.92	5.1365
766.84	17.8247	1002.74	10.6685	1678.03	0.0000
772.60	0.0000	1004.73	19.2142	1690.97	9.3684
776.52	20.8657	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	7.3859
778.90	16.1595	1028.54	0.0000	1063.66	20.0684
783.70	0.0000	1037.84	8.9787	1771.35	2.1129
785.37	19.9331	1038.76	0.0000	1791.20	0.0000
792.07	8.3246	631.29	19.4414	1808.65	3.1906
794.95	24.9988	1048.07	12.9662	1810.72	0.0000
795.86	20.0054	1049.04	11.8884	1836.06	5.3434
810.06	20.1016	1050.41	7.5684		
810.29	20.1035	1063.66	8.6809		
344.28	20.1045	1077.00	15.2469		
810.76	17.0905	1077.34	17.4266		
815.77	12.0841	1085.87	12.0082		
1048.07	18.1428	1093.63	13.1268		
832.01	26.3244	1099.45	10.9561		
834.85	21.7163	1112.07	13.1912		
835.71	23.6529	1112.84	13.4385		
836.80	0.0000	1115.54	3.1436		
846.75	0.0000	1120.29	14.6888		
846.77	16.9564	1120.55	14.6895		
856.80	13.6090	1221.41	12.5932		
860.56	14.3069	1129.67	18.4058		
871.09	17.4312	1131.51	0.0000		
873.19	10.2605	1147.95	0.0000		
875.33	0.0000	1173.23	14.3576		
879.38	19.5334	1177.95	12.7773		
880.51	16.4551	1189.05	15.8829		
883.24	18.5278	1204.77	16.8831		
884.68	16.4766	1221.41	10.0456		
889.28	20.6255	1231.02	19.8234		
894.76	10.3306	1235.36	17.0090		
898.04	16.5457	1238.28	9.9292		
900.72	17.5943	1260.41	0.0000		
903.28	10.3579	1271.87	13.3455		
911.20	14.5366	1274.44	9.5382		
912.08	17.3100	1274.54	9.5386		
923.98	0.0000	1291.59	16.2806		
926.50	10.4319	1298.22	0.0000		
929.11	27.8405	1312.11	9.8973		
937.49	27.9108	1332.49	8.7008		
944.13	10.4875	1362.66	0.0000		
946.00	13.9912	1365.19	11.6865		
949.00	14.4412	1368.63	0.0000		
667.71	0.0000	1384.29	7.4686		
962.31	15.8163	1408.01	10.8142		
964.08	26.3745	1457.56	0.0000		
966.17	0.0000	1460.82	12.9265		
911.20	14.0866	1489.16	7.0017		
968.97	14.0866	1505.03	9.0319		
983.53	16.9758	1584.12	5.0985		
984.45	0.0000	1596.21	7.1549		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:43:41.06

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677031.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;479
Background date    : 26-JUN-2016 12:03:34
Sample date       : 11-MAY-2016 15:10:00 Acquisition date : 28-JUN-2016 11:42:50
Sample ID        : G398677031 Sample quantity : 1.42060E+02 GRAM
Detector name     : GAM02 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.37 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.12*	5	144	1.46	125.86	122	8	1.37E-03	450.5	
2	1	74.70*	96	158	1.09	149.00	146	14	2.67E-02	24.6	1.73E+00
3	1	77.09	98	154	1.17	153.79	146	14	2.71E-02	24.2	
4	3	87.03	49	119	1.16	173.65	171	21	1.37E-02	33.9	2.20E+00
5	3	89.55	55	147	1.16	178.69	171	21	1.54E-02	37.5	
6	3	92.54*	85	151	1.46	184.67	171	21	2.37E-02	32.7	
7	0	185.66*	3	151	1.09	370.78	367	9	7.21E-04	928.0	
8	0	209.90	38	99	1.38	419.24	414	9	1.06E-02	50.3	
9	3	238.50*	298	75	1.41	476.41	472	15	8.26E-02	7.8	3.03E+00
10	3	241.36	49	98	1.75	482.13	472	15	1.35E-02	47.8	
11	0	276.49	16	95	0.90	552.35	547	11	4.50E-03	119.7	
12	0	295.06*	108	78	1.25	589.47	583	12	2.99E-02	19.5	
13	0	329.23	48	71	0.76	657.76	650	13	1.33E-02	39.3	
14	0	338.52	38	102	1.21	676.34	671	12	1.06E-02	54.7	
15	1	351.78*	105	66	1.58	702.83	697	24	2.92E-02	17.9	2.06E+00
16	1	357.01	35	57	1.58	713.29	697	24	9.79E-03	41.9	
17	0	362.92	20	46	1.92	725.11	721	8	5.63E-03	62.1	
18	0	429.81*	19	98	3.34	858.82	851	14	5.26E-03	114.0	
19	0	481.55*	17	55	3.61	962.25	954	13	4.81E-03	94.2	
20	0	501.93	26	29	0.88	1002.99	998	10	7.16E-03	44.3	
21	0	511.26*	47	49	2.43	1021.64	1014	16	1.30E-02	42.4	
22	0	583.19*	92	24	1.42	1165.42	1159	12	2.55E-02	15.2	
23	0	609.05*	87	32	1.63	1217.12	1210	13	2.41E-02	18.0	
24	0	640.11	15	28	4.23	1279.22	1270	12	4.15E-03	77.1	
25	0	661.53	960	29	1.73	1322.04	1315	17	2.67E-01	3.5	
26	0	687.81	17	27	3.79	1374.57	1361	19	4.67E-03	79.6	
27	0	696.20	9	38	3.28	1391.35	1381	15	2.36E-03	160.7	
28	0	727.61	25	17	1.30	1454.14	1447	14	6.87E-03	41.1	
29	0	769.41	45	21	6.67	1537.71	1528	23	1.26E-02	31.1	
30	0	786.78	7	18	0.56	1572.42	1567	10	1.90E-03	121.2	
31	0	871.50	15	16	0.89	1741.80	1733	16	4.17E-03	65.0	
32	0	904.58	8	7	1.26	1807.94	1804	9	2.18E-03	70.1	
33	0	911.67*	65	8	1.74	1822.11	1814	18	1.81E-02	16.8	
34	0	935.12*	6	4	0.82	1869.00	1866	6	1.59E-03	83.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	2	964.72	22	2	2.29	1928.18	1922	21	6.20E-03	32.3	7.11E-01
36	2	968.63*	30	9	2.29	1935.98	1922	21	8.24E-03	32.1	
37	0	1029.16	9	15	5.50	2057.00	2047	15	2.48E-03	100.5	
38	0	1060.07	5	7	1.13	2118.82	2114	7	1.50E-03	90.9	
39	0	1083.96	16	7	4.06	2166.58	2158	15	4.49E-03	44.2	
40	0	1120.73*	36	20	2.25	2240.09	2231	20	9.87E-03	36.4	
41	0	1141.04	7	4	0.72	2280.69	2277	7	1.81E-03	61.8	
42	0	1237.52	17	7	4.73	2473.60	2465	16	4.69E-03	44.3	
43	0	1246.15	7	8	1.55	2490.86	2486	8	2.04E-03	80.7	
44	0	1250.44	8	2	0.80	2499.44	2495	9	2.11E-03	51.1	
45	0	1317.53	10	3	3.77	2633.59	2627	12	2.82E-03	46.2	
46	0	1361.17	5	4	0.79	2720.84	2714	9	1.33E-03	91.5	
47	0	1460.29*	149	3	2.33	2919.05	2912	13	4.14E-02	8.9	
48	0	1763.85*	20	3	2.10	3526.08	3520	12	5.65E-03	31.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:43:42

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677031.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:10:00 Acquisition date : 28-JUN-2016 11:42:50
Sample ID         : G398677031 Sample quantity   : 142.06 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA2 Detector geometry   : CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.37 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated : No Systematic Error    : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.046E+00	6.788E+00	6.788E+00	17.80	OK
CD-109	88.03	3.70*	5.089E+00	8.684E-01	9.332E-01	136.39	OK
SN-126	64.28	9.60	2.442E+00	1.381E-01	1.381E-01	901.02	OK
	86.94	8.90	5.089E+00	3.610E-01	3.610E-01	136.39	OK
	87.57	37.00*	5.089E+00	8.684E-02	8.684E-02	136.39	OK
BA-137M	661.66	89.90*	2.131E+00	2.731E+00	2.739E+00	7.02	OK
CS-137	661.66	85.10*	2.131E+00	2.885E+00	2.893E+00	7.02	OK
PR-144	696.51	1.34*	2.044E+00	1.684E+00	1.893E+00	321.44	OK
	1489.16	0.28	1.028E+00	----- Line	Not Found	-----	Absent
TL-208	277.37	6.60	4.052E+00	3.553E-01	3.553E-01	239.45	OK
	583.19	85.00*	2.354E+00	2.532E-01	2.532E-01	30.46	OK
	860.56	12.50	1.703E+00	----- Line	Not Found	-----	Absent
BI-212	727.33	6.67*	1.970E+00	1.018E+00	1.018E+00	82.15	OK
	785.37	1.10	1.843E+00	1.811E+00	1.811E+00	242.44	OK
	1620.50	1.47	9.595E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.922E+00	1.051E+00	1.051E+00	74.70	OK
	77.11	17.10	4.187E+00	8.840E-01	8.840E-01	48.49	OK
	238.63	43.60*	4.498E+00	9.012E-01	9.012E-01	15.56	OK
	300.09	3.30	3.822E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97	OK
	1120.29	14.92	1.334E+00	9.279E-01	9.280E-01	72.77	OK
	1764.49	15.30	9.020E-01	7.347E-01	7.347E-01	63.32	OK
PB-214	74.82	5.80	3.936E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.187E+00	1.558E+00	1.559E+00	48.49	OK
	87.09	3.41	5.094E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.453E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.868E+00	8.829E-01	8.829E-01	39.02	OK
	351.93	35.60*	3.412E+00	4.987E-01	4.987E-01	35.75	OK
RN-222	609.32	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97	OK
	1120.29	14.92	1.334E+00	9.279E-01	9.280E-01	72.77	OK
	1764.49	15.30	9.020E-01	7.347E-01	7.347E-01	63.32	OK
RA-224	240.99	4.10*	4.461E+00	1.444E-02	1.444E-02****		OK
RA-226	609.32	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97	OK
	1120.29	14.92	1.334E+00	9.279E-01	9.280E-01	72.77	OK
	1764.49	15.30	9.020E-01	7.347E-01	7.347E-01	63.32	OK
AC-228	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.507E+00	5.587E-01	5.587E-01	109.30	OK
	794.95	4.25	1.826E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.617E+00	8.275E-01	8.275E-01	33.69	OK
	968.97	15.80	1.529E+00	6.465E-01	6.465E-01	64.12	OK
RA-228	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.507E+00	5.587E-01	5.587E-01	109.30	OK
	794.95	4.25	1.826E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.617E+00	8.275E-01	8.275E-01	33.69	OK
	968.97	15.80	1.529E+00	6.465E-01	6.465E-01	64.12	OK
TH-228	74.82	10.28	3.922E+00	1.051E+00	1.051E+00	74.70	OK
	77.11	17.10	4.187E+00	8.840E-01	8.840E-01	48.49	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	238.63	43.60*	4.498E+00	9.012E-01	9.012E-01	15.56	OK
	300.09	3.30	3.822E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97	OK
	1120.29	14.92	1.334E+00	9.279E-01	9.279E-01	72.77	OK
TH-232	1764.49	15.30	9.020E-01	7.347E-01	7.347E-01	63.32	OK
	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.507E+00	5.587E-01	5.587E-01	109.30	OK
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
TH-234	911.20	25.80*	1.617E+00	8.275E-01	8.275E-01	33.69	OK
	968.97	15.80	1.529E+00	6.465E-01	6.465E-01	64.12	OK
	63.29	3.70*	2.442E+00	3.582E-01	3.582E-01	901.02	OK
	92.59	4.23	5.451E+00	2.370E+00	2.370E+00	65.47	OK
U-234	609.32	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97	OK
	1120.29	14.92	1.334E+00	9.279E-01	9.279E-01	72.77	OK
	1764.49	15.30	9.020E-01	7.347E-01	7.347E-01	63.32	OK
	89.96	3.47	5.267E+00	1.939E+00	1.939E+00	75.08	OK
U-235	93.35	5.60	5.451E+00	1.790E+00	1.790E+00	65.47	OK
	143.76	10.96*	5.997E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.691E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.304E+00	5.183E-03	5.183E-03	1856.03	OK
U-238	205.31	5.01	4.979E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	2.442E+00	3.582E-01	3.582E-01	901.02	OK
	92.59	4.23	5.451E+00	2.370E+00	2.370E+00	65.47	OK
	43.53	5.90	3.128E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	3.922E+00	1.609E-01	1.609E-01	74.70	OK
ANH-511	511.00	100.00*	2.602E+00	1.006E-01	1.006E-01	84.74	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677031.CNF;1
Acquisition date : 28-JUN-2016 11:42:50 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.37 Half life ratio : *****
Sample date : 11-MAY-2016 15:10:00 Analyst initials: MXR1
Sample ID : G398677031 Sample Quantity : 1.4206E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.788E+00	1.184E+00	6.508E-01
CD-109	9.332E-01	1.247E+00	1.875E+00
SN-126	8.684E-02	1.161E-01	1.756E-01
BA-137M	2.739E+00	1.884E-01	8.609E-02
CS-137	2.893E+00	1.990E-01	9.095E-02
PR-144	1.893E+00	5.962E+00	5.827E+00
TL-208	2.532E-01	7.557E-02	7.783E-02
BI-212	1.018E+00	8.194E-01	9.824E-01
PB-212	9.012E-01	1.374E-01	1.412E-01
BI-214	4.598E-01	1.621E-01	1.608E-01
PB-214	4.987E-01	1.747E-01	2.047E-01
RN-222	4.598E-01	1.621E-01	1.608E-01
RA-224	1.444E-02	1.593E+00	1.514E+00
RA-226	4.598E-01	1.621E-01	1.608E-01
AC-228	8.275E-01	2.732E-01	2.962E-01
RA-228	8.275E-01	2.732E-01	2.962E-01
TH-228	9.012E-01	1.374E-01	1.412E-01
TH-230	4.598E-01	1.621E-01	1.608E-01
TH-232	8.275E-01	2.732E-01	2.962E-01
TH-234	3.582E-01	3.163E+00	3.303E+00
U-234	4.598E-01	1.621E-01	1.608E-01
U-235	-1.210E-02	2.430E-01	4.672E-01
U-238	3.582E-01	3.163E+00	3.303E+00
AM-243	1.609E-01	1.178E-01	1.268E-01
ANH-511	1.006E-01	8.355E-02	6.069E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.818E-02	8.240E-01	1.345E+00	NOT IDENT.
NA-22	-6.121E-03	4.433E-02	8.480E-02	NOT IDENT.
NA-24	0.000E+00	3.682E+21	0.000E+00	SHORT HLIF
AL-26	-1.892E-02	3.456E-02	6.256E-02	NOT IDENT.
SC-46	1.318E-02	4.568E-02	9.654E-02	FAIL ABUN

V-48	-2.464E-01	2.510E-01	4.114E-01	NOT IDENT.
CR-51	-1.951E-02	1.105E+00	2.032E+00	NOT IDENT.
MN-54	-7.296E-03	4.213E-02	7.755E-02	NOT IDENT.
CO-56	2.341E-03	4.868E-02	9.493E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-8.968E-03	3.548E-02	6.295E-02	NOT IDENT.
CO-58	-2.327E-02	5.683E-02	1.012E-01	NOT IDENT.
FE-59	4.376E-02	1.517E-01	3.111E-01	NOT IDENT.
CO-60	-1.348E-03	4.684E-02	9.063E-02	NOT IDENT.
ZN-65	3.345E-02	9.774E-02	1.810E-01	NOT IDENT.
GE-68	1.828E+00	1.578E+00	3.324E+00	NOT IDENT.
AS-73	1.703E+00	1.907E+00	3.823E+00	NOT IDENT.
AS-74	-1.457E-02	4.437E-01	8.317E-01	NOT IDENT.
SE-75	2.988E-02	7.448E-02	1.418E-01	NOT IDENT.
BR-77	0.000E+00	3.007E+05	0.000E+00	SHORT HLIF
SR-82	1.485E-03	9.571E-01	1.581E+00	NOT IDENT.
RB-83	6.536E-02	1.110E-01	2.246E-01	NOT IDENT.
KR-85	7.983E+00	1.012E+01	1.832E+01	NOT IDENT.
SR-85	5.923E-02	7.564E-02	1.368E-01	NOT IDENT.
RB-86	3.752E+00	3.114E+00	6.587E+00	NOT IDENT.
Y-88	6.619E-02	4.587E-02	1.311E-01	NOT IDENT.
Y-91	3.371E+01	3.295E+01	7.237E+01	NOT IDENT.
NB-94	-4.312E-03	4.263E-02	7.435E-02	FAIL ABUN
NB-95	6.800E-02	8.155E-02	1.495E-01	NOT IDENT.
NB-95M	2.458E-01	2.517E-01	4.458E-01	NOT IDENT.
ZR-95	4.215E-02	1.140E-01	2.265E-01	NOT IDENT.
NB-97	0.000E+00	4.046E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.099E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.878E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	7.672E+40	0.000E+00	SHORT HLIF
RH-101	-1.053E-02	4.341E-02	7.669E-02	NOT IDENT.
RH-102	-7.268E-02	8.188E-02	1.217E-01	FAIL ABUN
RU-103	1.239E-02	1.069E-01	1.797E-01	FAIL ABUN
RH-106	1.204E-01	4.512E-01	8.695E-01	NOT IDENT.
RU-106	1.204E-01	4.512E-01	8.695E-01	NOT IDENT.
AG-108M	5.858E-03	5.198E-02	8.681E-02	NOT IDENT.
AG-110M	2.296E-02	4.805E-02	1.043E-01	NOT IDENT.
SN-113	-4.542E-02	7.976E-02	1.372E-01	NOT IDENT.
CD-115	0.000E+00	3.517E+05	0.000E+00	SHORT HLIF
SN-117M	2.449E-02	3.412E-01	6.553E-01	NOT IDENT.
TE-123M	-1.781E-02	4.109E-02	7.651E-02	NOT IDENT.
SB-124	4.269E-02	9.868E-02	2.495E-01	NOT IDENT.
SB-125	7.077E-02	1.631E-01	2.812E-01	NOT IDENT.
TE-125M	-3.088E+00	1.805E+01	3.245E+01	NOT IDENT.
I-126	3.040E-01	1.531E+00	2.625E+00	NOT IDENT.
SB-126	8.847E-01	1.055E+00	2.018E+00	FAIL ABUN
SB-127	0.000E+00	5.562E+02	0.000E+00	SHORT HLIF
I-131	1.391E+00	3.046E+00	5.129E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.145E+03	0.000E+00	SHORT HLIF
BA-133	9.750E-02	8.004E-02	1.177E-01	FAIL ABUN
I-133	0.000E+00	1.724E+15	0.000E+00	SHORT HLIF
CS-134	3.014E-02	4.852E-02	9.897E-02	NOT IDENT.
CS-135	3.876E-03	2.138E-01	3.958E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-3.867E-01	5.974E-01	1.053E+00	NOT IDENT.
CE-139	-4.808E-03	4.186E-02	7.926E-02	NOT IDENT.
BA-140	-3.813E-01	1.888E+00	3.533E+00	NOT IDENT.
LA-140	1.796E-01	5.915E-01	1.286E+00	FAIL ABUN
CE-141	2.375E-02	1.454E-01	2.818E-01	NOT IDENT.
CE-143	0.000E+00	2.949E+09	0.000E+00	SHORT HLIF
CE-144	-1.912E-01	2.521E-01	4.284E-01	NOT IDENT.
PM-144	2.486E-02	7.831E-02	8.304E-02	FAIL ABUN
PM-146	-4.249E-02	6.360E-02	1.142E-01	NOT IDENT.
ND-147	6.615E-01	5.420E+00	1.048E+01	FAIL ABUN
PM-147	7.402E+01	9.429E+02	1.715E+03	NOT IDENT.
PM-149	0.000E+00	3.484E+06	0.000E+00	SHORT HLIF
EU-150	3.160E-02	5.380E-02	6.968E-02	FAIL ABUN
EU-152	-1.527E-01	1.641E-01	2.332E-01	FAIL ABUN
GD-153	-6.342E-02	1.255E-01	1.960E-01	NOT IDENT.
EU-154	-1.447E-02	1.240E-01	2.381E-01	NOT IDENT.
EU-155	1.013E-01	1.271E-01	2.446E-01	FAIL ABUN
TB-160	-8.977E-02	1.944E-01	3.290E-01	FAIL ABUN
HO-166M	-2.535E-02	6.585E-02	1.186E-01	FAIL ABUN
TM-171	1.268E+01	3.342E+01	6.490E+01	NOT IDENT.
HF-172	1.596E-01	2.548E-01	4.772E-01	FAIL ABUN
LU-172	-3.490E-02	7.112E-02	1.283E-01	FAIL ABUN
LU-176	1.724E-02	3.673E-02	6.997E-02	FAIL ABUN

HF-181	9.704E-02	1.792E-01	1.899E-01	FAIL ABUN
TA-182	-5.006E-02	2.594E-01	4.811E-01	FAIL ABUN
RE-183	7.447E-02	4.005E-01	7.361E-01	NOT IDENT.
RE-184	1.709E-01	2.350E-01	4.925E-01	FAIL ABUN
W-188	1.985E+00	1.497E+01	2.458E+01	FAIL ABUN
IR-192	-2.191E-02	6.508E-02	1.164E-01	FAIL ABUN
HG-203	-6.076E-03	8.791E-02	1.420E-01	NOT IDENT.
BI-207	-6.944E-03	5.822E-02	9.648E-02	FAIL ABUN
PB-210	4.380E+00	7.163E+00	1.421E+01	NOT IDENT.
BI-211	0.000E+00	4.813E-01	8.544E-01	FAIL ABUN
PB-211	-2.040E-01	1.125E+00	1.992E+00	NOT IDENT.
RN-219	-2.255E-01	6.215E-01	1.086E+00	NOT IDENT.
RA-223	-1.911E-01	9.015E-01	1.418E+00	FAIL ABUN
AC-227	4.206E-02	3.234E-01	6.082E-01	NOT IDENT.
TH-227	4.206E-02	3.234E-01	6.082E-01	NOT IDENT.
TH-229	-7.643E-01	6.690E-01	1.172E+00	FAIL ABUN
PA-231	1.449E-01	6.798E-01	1.228E+00	NOT IDENT.
TH-231	-1.911E-01	9.015E-01	1.418E+00	FAIL ABUN
PA-233	-6.738E-03	9.109E-02	1.664E-01	NOT IDENT.
PA-234	1.255E-01	2.931E-01	6.200E-01	NOT IDENT.
PA-234M	1.660E+00	4.866E+00	1.020E+01	NOT IDENT.
NP-237	-6.738E-03	9.109E-02	1.664E-01	NOT IDENT.
NP-238	0.000E+00	7.970E+05	0.000E+00	SHORT HLIF
NP-239	9.471E-02	3.339E-01	6.164E-01	FAIL ABUN
PU-239	3.594E+02	4.176E+02	7.951E+02	NOT IDENT.
AM-241	3.018E-02	2.362E-01	4.043E-01	NOT IDENT.
CM-243	-1.516E-01	1.251E-01	2.089E-01	FAIL ABUN
BK-247	2.161E-02	1.093E-01	2.054E-01	NOT IDENT.
CM-247	1.298E-02	5.572E-02	1.026E-01	NOT IDENT.
CF-249	5.865E-02	5.676E-02	1.120E-01	NOT IDENT.
CF-251	1.577E-01	1.557E-01	3.133E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	143	10.66*	1.046E+00	6.788E+00	6.788E+00	17.80
CD-109	88.03	60	3.70*	5.089E+00	1.682E+00	1.808E+00	67.84
SN-126	64.28	6	9.60	2.442E+00	1.381E-01	1.381E-01	901.02
	86.94	60	8.90	5.089E+00	6.993E-01	6.993E-01	67.84
	87.57	60	37.00*	5.089E+00	1.682E-01	1.682E-01	67.84
BA-137M	661.66	990	89.90*	2.131E+00	2.731E+00	2.739E+00	7.02
CS-137	661.66	990	85.10*	2.131E+00	2.885E+00	2.893E+00	7.02
PR-144	696.51	9	1.34*	2.044E+00	1.684E+00	1.893E+00	321.44
	1489.16	-----	0.28	1.028E+00	-----	Line Not Found	-----
TL-208	277.37	18	6.60	4.052E+00	3.553E-01	3.553E-01	239.45
	583.19	96	85.00*	2.354E+00	2.532E-01	2.532E-01	30.46
	860.56	-----	12.50	1.703E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.707E+00	-----	Line Not Found	-----
	351.06	115	12.92*	3.412E+00	1.374E+00	1.374E+00	35.75
BI-212	727.33	25	6.67*	1.970E+00	1.018E+00	1.018E+00	82.15
	785.37	7	1.10	1.843E+00	1.811E+00	1.811E+00	242.44
	1620.50	-----	1.47	9.595E-01	-----	Line Not Found	-----
PB-212	74.82	118	10.28	3.922E+00	1.550E+00	1.550E+00	49.11
	77.11	120	17.10	4.187E+00	8.840E-01	8.840E-01	48.49
	238.63	334	43.60*	4.498E+00	9.012E-01	9.012E-01	15.56
	300.09	-----	3.30	3.822E+00	-----	Line Not Found	-----
BI-214	609.32	90	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97
	1120.29	35	14.92	1.334E+00	9.279E-01	9.280E-01	72.77
	1764.49	19	15.30	9.020E-01	7.347E-01	7.347E-01	63.32
PB-214	74.82	118	5.80	3.922E+00	2.747E+00	2.747E+00	49.11
	77.11	120	9.70	4.187E+00	1.558E+00	1.559E+00	48.49
	87.09	60	3.41	5.089E+00	1.825E+00	1.825E+00	67.84
	242.00	55	7.25	4.461E+00	8.911E-01	8.911E-01	95.67
	295.22	119	18.42	3.868E+00	8.829E-01	8.829E-01	39.02
	351.93	115	35.60*	3.412E+00	4.987E-01	4.987E-01	35.75
RN-222	609.32	90	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97
	1120.29	35	14.92	1.334E+00	9.279E-01	9.280E-01	72.77
	1764.49	19	15.30	9.020E-01	7.347E-01	7.347E-01	63.32
RA-224	240.99	55	4.10*	4.461E+00	1.576E+00	1.576E+00	95.67
RA-226	609.32	90	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97
	1120.29	35	14.92	1.334E+00	9.279E-01	9.280E-01	72.77
	1764.49	19	15.30	9.020E-01	7.347E-01	7.347E-01	63.32
AC-228	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	42	11.27	3.507E+00	5.587E-01	5.587E-01	109.30
	794.95	-----	4.25	1.826E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.617E+00	8.275E-01	8.275E-01	33.69
	968.97	30	15.80	1.529E+00	6.465E-01	6.465E-01	64.12
RA-228	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	42	11.27	3.507E+00	5.587E-01	5.587E-01	109.30
	794.95	-----	4.25	1.826E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	911.20	65	25.80*	1.617E+00	8.275E-01	8.275E-01	33.69
	968.97	30	15.80	1.529E+00	6.465E-01	6.465E-01	64.12
	74.82	118	10.28	3.922E+00	1.550E+00	1.550E+00	49.11
	77.11	120	17.10	4.187E+00	8.840E-01	8.840E-01	48.49
	238.63	334	43.60*	4.498E+00	9.012E-01	9.012E-01	15.56
TH-230	300.09	-----	3.30	3.822E+00	-----	Line Not Found	-----
	609.32	90	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97
	1120.29	35	14.92	1.334E+00	9.279E-01	9.279E-01	72.77
	1764.49	19	15.30	9.020E-01	7.347E-01	7.347E-01	63.32
TH-232	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	42	11.27	3.507E+00	5.587E-01	5.587E-01	109.30
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	65	25.80*	1.617E+00	8.275E-01	8.275E-01	33.69
TH-234	968.97	30	15.80	1.529E+00	6.465E-01	6.465E-01	64.12
	63.29	6	3.70*	2.442E+00	3.582E-01	3.582E-01	901.02
	92.59	103	4.23	5.451E+00	2.370E+00	2.370E+00	65.47
U-234	609.32	90	45.49*	2.276E+00	4.598E-01	4.598E-01	35.97
	1120.29	35	14.92	1.334E+00	9.279E-01	9.279E-01	72.77
	1764.49	19	15.30	9.020E-01	7.347E-01	7.347E-01	63.32
U-235	89.96	67	3.47	5.267E+00	1.939E+00	1.939E+00	75.08
	93.35	103	5.60	5.451E+00	1.790E+00	1.790E+00	65.47
	143.76	-----	10.96*	5.997E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.691E+00	-----	Line Not Found	-----
	185.72	3	57.20	5.304E+00	5.183E-03	5.183E-03	1856.03
U-238	205.31	-----	5.01	4.979E+00	-----	Line Not Found	-----
	63.29	6	3.70*	2.442E+00	3.582E-01	3.582E-01	901.02
	92.59	103	4.23	5.451E+00	2.370E+00	2.370E+00	65.47
AM-243	43.53	-----	5.90	3.128E-01	-----	Line Not Found	-----
	74.66	118	67.20*	3.922E+00	2.371E-01	2.371E-01	49.11
ANH-511	511.00	50	100.00*	2.602E+00	1.006E-01	1.006E-01	84.74

Flag: "*" = Keyline

Total number of lines in spectrum 48
Number of unidentified lines 13
Number of lines tentatively identified by NID 35 72.92%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.788E+00	6.788E+00	1.209E+00	17.80	
CD-109	461.40D	1.07	1.682E+00	1.808E+00	1.226E+00	67.84	
SN-126	2.30E+05Y	1.00	1.682E-01	1.682E-01	1.141E-01	67.84	
BA-137M	30.08Y	1.00	2.731E+00	2.739E+00	0.192E+00	7.02	
CS-137	30.08Y	1.00	2.885E+00	2.893E+00	0.203E+00	7.02	
PR-144	284.91D	1.12	1.684E+00	1.893E+00	6.083E+00	321.44	
TL-208	1.41E+10Y	1.00	2.532E-01	2.532E-01	0.771E-01	30.46	
BI-211	7.04E+08Y	1.00	1.374E+00	1.374E+00	0.491E+00	35.75	
BI-212	1.41E+10Y	1.00	1.018E+00	1.018E+00	0.836E+00	82.15	
PB-212	1.41E+10Y	1.00	9.012E-01	9.012E-01	1.402E-01	15.56	
BI-214	1600.00Y	1.00	4.598E-01	4.598E-01	1.654E-01	35.97	
PB-214	1600.00Y	1.00	4.987E-01	4.987E-01	1.783E-01	35.75	
RN-222	1600.00Y	1.00	4.598E-01	4.598E-01	1.654E-01	35.97	
RA-224	1.41E+10Y	1.00	1.576E+00	1.576E+00	1.507E+00	95.67	
RA-226	1600.00Y	1.00	4.598E-01	4.598E-01	1.654E-01	35.97	
AC-228	1.41E+10Y	1.00	8.275E-01	8.275E-01	2.788E-01	33.69	
RA-228	1.41E+10Y	1.00	8.275E-01	8.275E-01	2.788E-01	33.69	
TH-228	1.41E+10Y	1.00	9.012E-01	9.012E-01	1.402E-01	15.56	
TH-230	7.54E+04Y	1.00	4.598E-01	4.598E-01	1.654E-01	35.97	
TH-232	1.41E+10Y	1.00	8.275E-01	8.275E-01	2.788E-01	33.69	
TH-234	4.47E+09Y	1.00	3.582E-01	3.582E-01	32.28E-01	901.02	
U-234	2.45E+05Y	1.00	4.598E-01	4.598E-01	1.654E-01	35.97	
U-235	7.04E+08Y	1.00	5.183E-03	5.183E-03	96.20E-03	1856.03	K
U-238	4.47E+09Y	1.00	3.582E-01	3.582E-01	32.28E-01	901.02	
AM-243	7370.00Y	1.00	2.371E-01	2.371E-01	1.164E-01	49.11	
ANH-511	1.00E+09Y	1.00	1.006E-01	1.006E-01	0.853E-01	84.74	
Total Activity :			2.830E+01	2.865E+01			

Grand Total Activity : 2.830E+01 2.865E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.90	43	112	1.38	419.24	414	9	1.06E-02	****	4.91E+00	T
0	329.23	52	78	0.76	657.76	650	13	1.33E-02	78.6	3.58E+00	T
1	357.01	38	62	1.58	713.29	697	24	9.79E-03	83.8	3.38E+00	T
0	362.92	22	50	1.92	725.11	721	8	5.63E-03	****	3.34E+00	
0	429.81	20	105	3.34	858.82	851	14	5.26E-03	****	2.95E+00	
0	481.55	18	59	3.61	962.25	954	13	4.81E-03	****	2.72E+00	T
0	501.93	27	31	0.88	1002.99	998	10	7.16E-03	88.5	2.64E+00	
0	640.11	15	29	4.23	1279.22	1270	12	4.15E-03	****	2.19E+00	
0	687.81	17	28	3.79	1374.57	1361	19	4.67E-03	****	2.06E+00	
0	769.41	46	21	6.67	1537.71	1528	23	1.26E-02	62.2	1.88E+00	
0	871.50	15	16	0.89	1741.80	1733	16	4.17E-03	****	1.68E+00	T
0	904.58	8	7	1.26	1807.94	1804	9	2.18E-03	****	1.63E+00	T
0	935.12	6	4	0.82	1869.00	1866	6	1.59E-03	****	1.58E+00	
2	964.72	22	2	2.29	1928.18	1922	21	6.20E-03	64.6	1.54E+00	T
0	1029.16	9	15	5.50	2057.00	2047	15	2.48E-03	****	1.45E+00	T
0	1060.07	5	7	1.13	2118.82	2114	7	1.50E-03	****	1.41E+00	
0	1083.96	16	7	4.06	2166.58	2158	15	4.49E-03	88.4	1.38E+00	
0	1141.04	6	3	0.72	2280.69	2277	7	1.81E-03	****	1.31E+00	
0	1237.52	16	7	4.73	2473.60	2465	16	4.69E-03	88.7	1.22E+00	T
0	1246.15	7	7	1.55	2490.86	2486	8	2.04E-03	****	1.21E+00	
0	1250.44	7	2	0.80	2499.44	2495	9	2.11E-03	****	1.20E+00	
0	1317.53	10	3	3.77	2633.59	2627	12	2.82E-03	92.4	1.15E+00	
0	1361.17	5	4	0.79	2720.84	2714	9	1.33E-03	****	1.11E+00	T

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677031.CNF;1
Acquisition date : 28-JUN-2016 11:42:50 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.37 Half life ratio : *****
Sample date : 11-MAY-2016 15:10:00 Nuclide Library : SOLID
Sample ID : G398677031 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4206E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.610E-01
CD-109	8.952E-01
SN-126	8.382E-02
BA-137M	3.924E-02
CS-137	4.145E-02
PR-144	2.615E+00
TL-208	3.527E-02
BI-212	4.359E-01
PB-212	6.685E-02
BI-214	7.337E-02
PB-214	9.632E-02
RN-222	7.337E-02
RA-224	7.164E-01
RA-226	7.337E-02
AC-228	1.308E-01
RA-228	1.308E-01
TH-228	6.685E-02
TH-230	7.337E-02
TH-232	1.308E-01
TH-234	1.568E+00
U-234	7.337E-02
U-235	2.222E-01
U-238	1.568E+00
AM-243	6.052E-02
ANH-511	2.753E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.248E-01	NOT IDENT.
NA-22	3.610E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.321E-02	NOT IDENT.
SC-46	4.176E-02	FAIL ABUN
V-48	1.673E-01	NOT IDENT.

CR-51	9.484E-01	NOT IDENT.
MN-54	3.417E-02	NOT IDENT.
CO-56	4.101E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.987E-02	NOT IDENT.
CO-58	4.413E-02	NOT IDENT.
FE-59	1.357E-01	NOT IDENT.
CO-60	3.888E-02	NOT IDENT.
ZN-65	7.832E-02	NOT IDENT.
GE-68	1.479E+00	NOT IDENT.
AS-73	1.817E+00	NOT IDENT.
AS-74	3.813E-01	NOT IDENT.
SE-75	6.692E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.950E-01	NOT IDENT.
RB-83	1.030E-01	NOT IDENT.
KR-85	8.503E+00	NOT IDENT.
SR-85	6.351E-02	NOT IDENT.
RB-86	2.937E+00	NOT IDENT.
Y-88	5.440E-02	NOT IDENT.
Y-91	3.227E+01	NOT IDENT.
NB-94	3.358E-02	FAIL ABUN
NB-95	6.830E-02	NOT IDENT.
NB-95M	2.119E-01	NOT IDENT.
ZR-95	1.015E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.651E-02	NOT IDENT.
RH-102	5.481E-02	FAIL ABUN
RU-103	8.282E-02	FAIL ABUN
RH-106	3.990E-01	NOT IDENT.
RU-106	3.990E-01	NOT IDENT.
AG-108M	4.065E-02	NOT IDENT.
AG-110M	4.531E-02	NOT IDENT.
SN-113	6.384E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.105E-01	NOT IDENT.
TE-123M	3.622E-02	NOT IDENT.
SB-124	9.665E-02	NOT IDENT.
SB-125	1.320E-01	NOT IDENT.
TE-125M	1.541E+01	NOT IDENT.
I-126	1.177E+00	NOT IDENT.
SB-126	9.091E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	2.395E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.533E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.463E-02	NOT IDENT.
CS-135	1.867E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.474E-01	NOT IDENT.
CE-139	3.753E-02	NOT IDENT.
BA-140	1.605E+00	NOT IDENT.
LA-140	5.389E-01	FAIL ABUN
CE-141	1.337E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.018E-01	NOT IDENT.
PM-144	3.760E-02	FAIL ABUN
PM-146	5.305E-02	NOT IDENT.
ND-147	4.786E+00	FAIL ABUN
PM-147	8.133E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.267E-02	FAIL ABUN
EU-152	1.086E-01	FAIL ABUN
GD-153	9.275E-02	NOT IDENT.
EU-154	1.015E-01	NOT IDENT.
EU-155	1.162E-01	FAIL ABUN
TB-160	1.417E-01	FAIL ABUN
HO-166M	5.261E-02	FAIL ABUN
TM-171	3.086E+01	NOT IDENT.
HF-172	2.273E-01	FAIL ABUN
LU-172	5.534E-02	FAIL ABUN
LU-176	3.289E-02	FAIL ABUN
HF-181	8.762E-02	FAIL ABUN

TA-182	2.116E-01	FAIL ABUN
RE-183	3.477E-01	NOT IDENT.
RE-184	2.165E-01	FAIL ABUN
W-188	1.153E+01	FAIL ABUN
IR-192	5.441E-02	FAIL ABUN
HG-203	6.642E-02	NOT IDENT.
BI-207	4.132E-02	FAIL ABUN
PB-210	6.752E+00	NOT IDENT.
BI-211	4.106E-01	FAIL ABUN
PB-211	9.331E-01	NOT IDENT.
RN-219	5.072E-01	NOT IDENT.
RA-223	6.581E-01	FAIL ABUN
AC-227	2.859E-01	NOT IDENT.
TH-227	2.859E-01	NOT IDENT.
TH-229	5.534E-01	FAIL ABUN
PA-231	5.776E-01	NOT IDENT.
TH-231	6.581E-01	FAIL ABUN
PA-233	7.803E-02	NOT IDENT.
PA-234	2.715E-01	NOT IDENT.
PA-234M	4.523E+00	NOT IDENT.
NP-237	7.803E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.928E-01	FAIL ABUN
PU-239	3.783E+02	NOT IDENT.
AM-241	1.913E-01	NOT IDENT.
CM-243	9.834E-02	FAIL ABUN
BK-247	9.681E-02	NOT IDENT.
CM-247	4.799E-02	NOT IDENT.
CF-249	5.248E-02	NOT IDENT.
CF-251	1.488E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677031.CNF;1
Acquisition date : 28-JUN-2016 11:42:50 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.37 Half life ratio : *****
Sample date : 11-MAY-2016 15:10:00 Nuclide Library : SOLID
Sample ID : G398677031 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4206E+02 GRAM
Quantity Err(%) : 1.4079E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.788E+00	1.319E+00	1.319E+00
CD-109	9.332E-01	1.260E+00	1.260E+00
SN-126	8.684E-02	1.172E-01	1.172E-01
BA-137M	2.739E+00	3.027E-01	3.027E-01
CS-137	2.893E+00	3.196E-01	3.196E-01
PR-144	1.893E+00	5.964E+00	5.964E+00
TL-208	2.532E-01	7.866E-02	7.866E-02
BI-212	1.018E+00	8.260E-01	8.260E-01
PB-212	9.012E-01	1.622E-01	1.622E-01
BI-214	4.598E-01	1.669E-01	1.669E-01
PB-214	4.987E-01	1.806E-01	1.806E-01
RN-222	4.598E-01	1.669E-01	1.669E-01
RA-224	1.444E-02	1.608E+00	1.608E+00
RA-226	4.598E-01	1.669E-01	1.669E-01
AC-228	8.275E-01	2.976E-01	2.976E-01
RA-228	8.275E-01	2.976E-01	2.976E-01
TH-228	9.012E-01	1.622E-01	1.622E-01
TH-230	4.598E-01	1.669E-01	1.669E-01
TH-232	8.275E-01	2.976E-01	2.976E-01
TH-234	3.582E-01	3.164E+00	3.164E+00
U-234	4.598E-01	1.669E-01	1.669E-01
U-235	-1.210E-02	2.430E-01	2.430E-01
U-238	3.582E-01	3.164E+00	3.164E+00
AM-243	1.609E-01	1.194E-01	1.194E-01
ANH-511	1.006E-01	8.398E-02	8.398E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.818E-02	8.240E-01	8.245E-01	NOT IDENT.
NA-22	-6.121E-03	4.433E-02	4.442E-02	NOT IDENT.
NA-24	-6.912E+20	3.683E+21	0.000E+00	SHORT HLIF
AL-26	-1.892E-02	3.459E-02	3.562E-02	NOT IDENT.
SC-46	1.318E-02	4.571E-02	4.610E-02	FAIL ABUN

V-48	-2.464E-01	2.540E-01	2.773E-01	NOT IDENT.
CR-51	-1.951E-02	1.105E+00	1.105E+00	NOT IDENT.
MN-54	-7.296E-03	4.214E-02	4.227E-02	NOT IDENT.
CO-56	2.341E-03	4.869E-02	4.870E-02	FAIL ABUN
MN-56	1.000E+41	1.926E+42	0.000E+00	SHORT HLIF
CO-57	-8.968E-03	3.548E-02	3.571E-02	NOT IDENT.
CO-58	-2.327E-02	5.689E-02	5.785E-02	NOT IDENT.
FE-59	4.376E-02	1.519E-01	1.532E-01	NOT IDENT.
CO-60	-1.348E-03	4.684E-02	4.684E-02	NOT IDENT.
ZN-65	3.345E-02	9.796E-02	9.911E-02	NOT IDENT.
GE-68	1.828E+00	1.614E+00	1.812E+00	NOT IDENT.
AS-73	1.703E+00	1.947E+00	2.093E+00	NOT IDENT.
AS-74	-1.457E-02	4.437E-01	4.437E-01	NOT IDENT.
SE-75	2.988E-02	7.454E-02	7.575E-02	NOT IDENT.
BR-77	1.972E+06	2.747E+06	2.887E+06	SHORT HLIF
SR-82	1.485E-03	9.571E-01	9.571E-01	NOT IDENT.
RB-83	6.536E-02	1.114E-01	1.153E-01	NOT IDENT.
KR-85	7.983E+00	1.014E+01	1.076E+01	NOT IDENT.
SR-85	5.923E-02	7.581E-02	8.037E-02	NOT IDENT.
RB-86	3.752E+00	3.191E+00	3.611E+00	NOT IDENT.
Y-88	6.619E-02	4.614E-02	5.495E-02	NOT IDENT.
Y-91	3.371E+01	3.311E+01	3.643E+01	NOT IDENT.
NB-94	-4.312E-03	4.263E-02	4.268E-02	FAIL ABUN
NB-95	6.800E-02	8.188E-02	8.743E-02	NOT IDENT.
NB-95M	2.458E-01	2.532E-01	2.764E-01	NOT IDENT.
ZR-95	4.215E-02	1.141E-01	1.157E-01	NOT IDENT.
NB-97	1.000E+41	4.137E+40	0.000E+00	SHORT HLIF
ZR-97	1.904E+20	3.103E+20	0.000E+00	SHORT HLIF
MO-99	-2.123E+04	4.883E+04	4.976E+04	SHORT HLIF
TC-99M	-1.000E+41	7.758E+40	0.000E+00	SHORT HLIF
RH-101	-1.053E-02	4.345E-02	4.371E-02	NOT IDENT.
RH-102	-7.268E-02	8.228E-02	8.856E-02	FAIL ABUN
RU-103	1.239E-02	1.070E-01	1.071E-01	FAIL ABUN
RH-106	1.204E-01	4.514E-01	4.546E-01	NOT IDENT.
RU-106	1.204E-01	4.514E-01	4.546E-01	NOT IDENT.
AG-108M	5.858E-03	5.198E-02	5.205E-02	NOT IDENT.
AG-110M	2.296E-02	4.816E-02	4.926E-02	NOT IDENT.
SN-113	-4.542E-02	7.984E-02	8.243E-02	NOT IDENT.
CD-115	1.493E+05	3.520E+05	3.584E+05	SHORT HLIF
SN-117M	2.449E-02	3.413E-01	3.414E-01	NOT IDENT.
TE-123M	-1.781E-02	4.111E-02	4.189E-02	NOT IDENT.
SB-124	4.269E-02	9.873E-02	1.006E-01	NOT IDENT.
SB-125	7.077E-02	1.632E-01	1.663E-01	NOT IDENT.
TE-125M	-3.088E+00	1.805E+01	1.811E+01	NOT IDENT.
I-126	3.040E-01	1.531E+00	1.537E+00	NOT IDENT.
SB-126	8.847E-01	1.062E+00	1.134E+00	FAIL ABUN
SB-127	3.121E+02	5.611E+02	5.784E+02	SHORT HLIF
I-131	1.391E+00	3.048E+00	3.112E+00	NOT IDENT.
I-132	-1.000E+41	8.344E+41	0.000E+00	SHORT HLIF
TE-132	-2.371E+02	1.145E+03	1.150E+03	SHORT HLIF
BA-133	9.750E-02	8.052E-02	9.173E-02	FAIL ABUN
I-133	-6.447E+14	1.735E+15	1.759E+15	SHORT HLIF
CS-134	3.014E-02	4.864E-02	5.050E-02	NOT IDENT.
CS-135	3.876E-03	2.138E-01	2.138E-01	NOT IDENT.
I-135	-1.000E+41	5.825E+41	0.000E+00	SHORT HLIF
CS-136	-3.867E-01	6.020E-01	6.268E-01	NOT IDENT.
CE-139	-4.808E-03	4.187E-02	4.193E-02	NOT IDENT.
BA-140	-3.813E-01	1.888E+00	1.896E+00	NOT IDENT.
LA-140	1.796E-01	5.917E-01	5.972E-01	FAIL ABUN
CE-141	2.375E-02	1.454E-01	1.458E-01	NOT IDENT.
CE-143	4.583E+09	2.990E+09	3.634E+09	SHORT HLIF
CE-144	-1.912E-01	2.526E-01	2.669E-01	NOT IDENT.
PM-144	2.486E-02	7.834E-02	7.914E-02	FAIL ABUN
PM-146	-4.249E-02	6.375E-02	6.656E-02	NOT IDENT.
ND-147	6.615E-01	5.420E+00	5.428E+00	FAIL ABUN
PM-147	7.402E+01	9.429E+02	9.435E+02	NOT IDENT.
PM-149	-8.469E+05	3.487E+06	3.508E+06	SHORT HLIF
EU-150	3.160E-02	5.389E-02	5.574E-02	FAIL ABUN
EU-152	-1.527E-01	1.648E-01	1.786E-01	FAIL ABUN
GD-153	-6.342E-02	1.256E-01	1.288E-01	NOT IDENT.
EU-154	-1.447E-02	1.240E-01	1.242E-01	NOT IDENT.
EU-155	1.013E-01	1.274E-01	1.354E-01	FAIL ABUN
TB-160	-8.977E-02	1.948E-01	1.990E-01	FAIL ABUN
HO-166M	-2.535E-02	6.590E-02	6.688E-02	FAIL ABUN
TM-171	1.268E+01	3.346E+01	3.394E+01	NOT IDENT.
HF-172	1.596E-01	2.564E-01	2.663E-01	FAIL ABUN
LU-172	-3.490E-02	7.151E-02	7.322E-02	FAIL ABUN
LU-176	1.724E-02	3.677E-02	3.759E-02	FAIL ABUN

HF-181	9.704E-02	1.794E-01	1.846E-01	FAIL ABUN
TA-182	-5.006E-02	2.594E-01	2.604E-01	FAIL ABUN
RE-183	7.447E-02	4.007E-01	4.021E-01	NOT IDENT.
RE-184	1.709E-01	2.365E-01	2.487E-01	FAIL ABUN
W-188	1.985E+00	1.497E+01	1.500E+01	FAIL ABUN
IR-192	-2.191E-02	6.512E-02	6.586E-02	FAIL ABUN
HG-203	-6.076E-03	8.791E-02	8.795E-02	NOT IDENT.
BI-207	-6.944E-03	5.823E-02	5.832E-02	FAIL ABUN
PB-210	4.380E+00	7.178E+00	7.445E+00	NOT IDENT.
BI-211	1.374E+00	4.980E-01	7.947E-01	FAIL ABUN
PB-211	-2.040E-01	1.125E+00	1.128E+00	NOT IDENT.
RN-219	-2.255E-01	6.223E-01	6.306E-01	NOT IDENT.
RA-223	-1.911E-01	9.017E-01	9.058E-01	FAIL ABUN
AC-227	4.206E-02	3.235E-01	3.240E-01	NOT IDENT.
TH-227	4.206E-02	3.235E-01	3.240E-01	NOT IDENT.
TH-229	-7.643E-01	6.717E-01	7.549E-01	FAIL ABUN
PA-231	1.449E-01	6.806E-01	6.837E-01	NOT IDENT.
TH-231	-1.911E-01	9.017E-01	9.058E-01	FAIL ABUN
PA-233	-6.738E-03	9.109E-02	9.114E-02	NOT IDENT.
PA-234	1.255E-01	3.269E-01	3.317E-01	NOT IDENT.
PA-234M	1.660E+00	4.874E+00	4.931E+00	NOT IDENT.
NP-237	-6.738E-03	9.109E-02	9.114E-02	NOT IDENT.
NP-238	-7.126E+05	8.050E+05	8.667E+05	SHORT HLIF
NP-239	9.471E-02	3.340E-01	3.367E-01	FAIL ABUN
PU-239	3.594E+02	4.185E+02	4.488E+02	NOT IDENT.
AM-241	3.018E-02	2.362E-01	2.366E-01	NOT IDENT.
CM-243	-1.516E-01	1.262E-01	1.436E-01	FAIL ABUN
BK-247	2.161E-02	1.094E-01	1.098E-01	NOT IDENT.
CM-247	1.298E-02	5.577E-02	5.608E-02	NOT IDENT.
CF-249	5.865E-02	5.710E-02	6.293E-02	NOT IDENT.
CF-251	1.577E-01	1.570E-01	1.723E-01	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	117.7882	87.09	147.3340	136.47	96.5903
45.60	114.5315	87.57	147.4641	140.51	0.0000
46.54	104.9311	88.03	147.5879	143.76	114.3828
49.72	0.0000	88.34	147.6716	144.24	112.6801
51.35	96.2605	88.47	147.7069	145.44	110.1915
51.87	110.4468	89.96	148.1060	152.43	110.2863
52.39	113.6104	1093.63	148.2872	153.25	118.4779
52.97	102.7027	91.11	148.4117	323.87	115.9240
53.44	97.7844	92.59	148.8026	156.02	121.5898
54.07	107.0268	93.35	149.0018	158.56	106.6125
57.36	0.0000	94.56	92.2258	159.00	117.5179
57.53	112.0142	94.65	92.2403	162.33	105.2870
57.98	91.7468	94.67	92.2437	162.66	105.3294
59.27	87.4276	94.87	100.5147	163.33	91.7832
59.32	87.4378	97.43	115.8547	165.86	109.3790
59.54	99.7616	98.43	104.4471	176.31	103.3363
60.96	110.8728	98.44	104.4485	176.60	105.2164
61.17	97.0609	99.53	86.3706	177.52	89.6202
62.93	117.5635	100.11	83.1295	181.07	0.0000
63.29	117.6596	102.03	123.4263	181.52	126.2196
63.58	117.7367	103.18	120.3184	184.41	120.6665
64.28	122.5774	103.37	121.4707	143.76	126.8079
66.73	118.5645	105.21	91.6565	193.51	128.8221
67.24	118.6967	105.31	97.2612	197.03	124.5839
125.81	117.5597	106.12	101.8663	198.01	135.1055
67.75	117.5774	106.47	104.1638	201.83	140.3873
69.67	144.4407	109.28	122.6333	203.43	120.5313
70.83	132.2043	111.00	122.9660	205.31	124.8979
72.81	118.5287	111.76	0.0000	210.85	84.2449
72.87	118.5436	114.06	112.2159	215.65	99.0771
74.66	147.0060	116.30	0.0000	222.11	117.1292
74.82	147.0540	116.74	111.5375	227.09	113.7999
74.97	147.0986	119.76	102.8975	227.38	107.0207
77.11	147.7334	121.12	108.8329	228.16	0.0000
78.74	139.1481	121.22	109.9951	228.18	104.1812
79.69	136.2022	121.78	122.6994	116.74	104.1812
80.12	131.5052	122.06	122.7500	235.69	90.9939
80.19	131.5233	122.92	121.7562	235.96	91.0165
80.57	128.4100	123.07	121.7829	238.63	104.2192
81.00	149.4008	265.00	127.6409	238.98	0.0000
81.07	149.4214	125.81	114.1933	240.99	104.4448
81.75	167.3131	127.23	138.6972	242.00	104.1466
83.79	140.5088	127.91	134.2044	244.70	94.9109
84.00	142.1802	129.30	100.8513	252.40	0.0000
85.43	134.4615	131.20	108.0951	252.80	68.7115
86.55	152.5987	133.02	111.8652	254.15	0.0000
86.79	181.8992	133.52	109.6103	256.23	78.9069
86.94	181.9504	136.00	96.5286	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	84.5133	355.39	0.0000	584.27	24.5343
264.80	84.5229	356.01	84.5681	595.83	41.4412
265.00	84.5383	364.49	55.5477	427.87	31.8635
268.22	92.8423	366.42	0.0000	602.52	0.0000
269.46	80.8167	372.51	66.5354	604.72	36.3274
270.03	78.5455	375.05	61.1851	607.14	24.7961
271.23	84.1750	377.52	62.3785	609.32	36.4035
273.65	97.3213	356.01	65.9335	610.33	36.4205
276.40	73.1569	388.16	51.7914	614.28	34.8274
277.37	81.3513	388.63	49.6026	618.01	40.8659
277.60	86.2479	391.69	72.8935	620.36	31.9297
278.00	86.2764	264.66	71.0869	621.93	36.9440
279.20	71.6966	401.81	75.5838	630.19	0.0000
279.54	74.9769	402.40	65.6044	631.29	44.4036
279.70	74.9858	404.85	77.9553	633.25	40.1416
280.46	81.5576	410.95	59.2465	634.78	31.8004
283.69	79.7281	413.71	76.1441	635.95	33.4912
284.31	82.8354	414.70	66.1058	636.99	28.4807
285.41	79.8388	423.72	57.0804	645.85	24.6670
285.90	0.0000	427.09	55.6904	657.76	37.1912
287.50	79.9733	427.87	67.7637	657.90	0.0000
290.67	74.0094	433.94	69.5194	661.66	35.5605
293.27	0.0000	439.40	68.2269	664.57	0.0000
351.93	86.6558	453.88	72.4704	666.33	22.0576
295.96	90.8346	463.37	69.1718	666.50	22.0592
879.38	61.2325	468.07	89.6984	667.71	0.0000
299.98	54.6724	473.00	0.0000	677.62	27.2773
300.09	56.3341	475.06	75.8128	685.70	0.0000
300.13	56.3357	476.78	71.2386	695.00	24.0403
301.36	79.3720	477.60	58.8756	696.49	25.7733
302.85	92.3611	482.18	38.8316	696.51	25.7733
256.23	92.4793	487.02	44.0508	697.00	20.6230
304.85	86.2675	492.35	0.0000	697.30	27.5007
306.78	70.7818	497.08	43.8417	697.49	27.5026
308.46	85.4646	505.52	42.4655	702.65	31.0056
311.90	78.3726	507.63	0.0000	706.68	26.9160
316.51	76.5477	511.00	32.1776	711.68	25.9332
319.41	66.2050	514.00	39.4948	720.70	15.6163
320.08	66.2377	514.00	39.4948	721.93	0.0000
321.04	61.3247	520.40	31.3838	722.78	22.5754
323.87	60.7307	520.69	0.0000	722.91	27.7871
325.23	57.4140	522.65	0.0000	723.31	27.7910
328.76	67.7197	527.90	0.0000	724.19	29.5383
333.37	50.9597	528.26	33.4200	727.33	20.8770
333.97	55.2302	529.59	41.0862	733.00	17.4365
334.37	63.7454	529.87	0.0000	735.93	18.8530
338.28	73.5125	531.02	35.3785	333.97	24.1045
338.32	73.5146	537.26	36.4498	739.50	0.0000
311.90	56.3409	546.56	0.0000	747.24	17.8844
340.48	56.3409	552.55	31.8946	748.06	16.8379
340.55	56.3441	563.25	32.0622	752.31	21.0820
344.28	87.3064	569.33	26.3092	753.82	26.3678
345.93	73.6963	946.00	26.3118	756.73	20.0618
351.06	84.2810	569.70	26.3145	756.80	20.0623
351.93	84.3312	583.19	31.3883	884.68	22.9410

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	22.9574	1274.44	26.7502	1620.50	6.7026
766.42	26.4954	1001.03	11.4812	1621.92	9.5780
766.84	21.1997	1002.74	13.4019	1678.03	0.0000
772.60	0.0000	1004.73	18.1991	1690.97	1.9427
776.52	17.7311	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.9125
778.90	8.5186	1028.54	0.0000	1063.66	24.6634
783.70	0.0000	1037.84	16.4473	1771.35	16.7747
785.37	19.5691	1038.76	0.0000	1791.20	0.0000
792.07	26.7517	631.29	16.4902	1808.65	5.9625
794.95	12.8546	1048.07	17.4683	1810.72	0.0000
795.86	17.1453	1049.04	15.5313	1836.06	0.0000
810.06	25.8521	1050.41	10.6822		
810.29	23.6994	1063.66	13.3700		
344.28	23.7010	1077.00	8.3890		
810.76	20.4714	1077.34	8.3897		
815.77	17.2703	1085.87	3.3641		
1048.07	16.2070	1093.63	16.7178		
832.01	13.0286	1099.45	12.8053		
834.85	20.6495	1112.07	3.3894		
835.71	27.1790	1112.84	10.1702		
836.80	0.0000	1115.54	10.1782		
846.75	0.0000	1120.29	11.8901		
846.77	13.0969	1120.55	11.8911		
856.80	29.5715	1221.41	11.8936		
860.56	17.5469	1129.67	17.0306		
871.09	16.5103	1131.51	0.0000		
873.19	11.0146	1147.95	0.0000		
875.33	0.0000	1173.23	9.0487		
879.38	18.3968	1177.95	12.0801		
880.51	13.0499	1189.05	9.0872		
883.24	11.9735	1204.77	11.1531		
884.68	10.1364	1221.41	20.3670		
889.28	11.0752	1231.02	21.0017		
894.76	13.8696	1235.36	19.2730		
898.04	12.3421	1238.28	19.6383		
900.72	17.4710	1260.41	0.0000		
903.28	14.3067	1271.87	7.2216		
911.20	19.1258	1274.44	12.3877		
912.08	19.1313	1274.54	12.3882		
923.98	0.0000	1291.59	7.2575		
926.50	7.4754	1298.22	0.0000		
929.11	18.2368	1312.11	10.7185		
937.49	14.4687	1332.49	12.5674		
944.13	11.2776	1362.66	0.0000		
946.00	12.2245	1365.19	7.2383		
949.00	17.8840	1368.63	0.0000		
667.71	0.0000	1384.29	14.8448		
962.31	4.8614	1408.01	5.3314		
964.08	4.8641	1457.56	0.0000		
966.17	6.6250	1460.82	5.5503		
911.20	6.6309	1489.16	10.2404		
968.97	6.6309	1505.03	12.1449		
983.53	15.2256	1584.12	8.5524		
984.45	0.0000	1596.21	6.6687		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:44:44.92

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677032.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM01.CNF;388
Background date    : 26-JUN-2016 12:03:28
Sample date       : 11-MAY-2016 15:05:00 Acquisition date : 28-JUN-2016 12:44:13
Sample ID        : G398677032 Sample quantity : 1.34540E+02 GRAM
Detector name     : GAM01 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.37 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	35.26*	21	13	1.27	71.24	67	17	5.93E-03	58.6	1.71E+00
2	2	36.92*	39	27	1.21	74.56	67	17	1.08E-02	35.0	
3	2	38.64*	16	39	1.06	78.00	67	17	4.43E-03	76.2	
4	0	67.63*	23	110	1.03	135.97	133	8	6.44E-03	82.2	
5	1	74.76*	64	114	1.24	150.22	146	14	1.77E-02	30.8	5.15E-01
6	1	77.14*	99	96	1.24	154.99	146	14	2.75E-02	20.8	
7	0	87.23	37	74	1.38	175.17	173	6	1.03E-02	40.0	
8	3	90.01	37	67	1.24	180.72	178	14	1.03E-02	36.7	1.29E+00
9	3	92.72*	54	115	1.49	186.15	178	14	1.50E-02	41.6	
10	0	114.53	50	130	4.37	229.76	223	13	1.39E-02	49.1	
11	0	120.17	34	78	0.73	241.04	236	8	9.46E-03	48.1	
12	0	129.46	59	132	1.79	259.61	253	13	1.64E-02	42.2	
13	0	140.79*	19	63	1.44	282.27	280	6	5.27E-03	72.5	
14	0	185.66*	29	82	1.74	372.00	368	8	8.08E-03	62.9	
15	0	210.97	14	80	1.33	422.60	417	8	3.81E-03	118.1	
16	0	238.66*	221	104	0.93	477.97	474	8	6.13E-02	10.7	
17	0	241.87	44	71	1.20	484.39	482	7	1.23E-02	36.0	
18	0	295.28*	74	72	1.42	591.20	586	11	2.05E-02	25.4	
19	0	300.31	23	56	1.13	601.26	597	9	6.40E-03	62.3	
20	0	323.25	19	30	1.44	647.12	643	7	5.37E-03	52.0	
21	0	337.91*	90	68	1.84	676.44	668	18	2.50E-02	24.2	
22	0	352.51*	130	89	1.68	705.63	697	18	3.60E-02	19.5	
23	0	511.25*	31	47	1.32	1023.04	1016	15	8.52E-03	60.5	
24	0	537.71	24	6	1.86	1075.97	1071	9	6.56E-03	28.5	
25	0	567.92*	16	50	2.04	1136.37	1127	14	4.31E-03	104.1	
26	0	583.44*	96	28	1.25	1167.39	1160	14	2.67E-02	15.8	
27	0	609.49*	98	22	1.25	1219.49	1214	13	2.71E-02	14.5	
28	0	661.82	706	44	1.41	1324.11	1316	16	1.96E-01	4.3	
29	0	725.67	30	3	0.82	1451.78	1445	14	8.27E-03	22.6	
30	0	768.22	22	6	0.99	1536.86	1532	11	6.20E-03	29.4	
31	0	795.80	21	0	2.54	1592.00	1585	14	5.83E-03	21.8	
32	0	838.56	8	10	1.43	1677.49	1673	7	2.35E-03	74.1	
33	0	842.74	13	2	1.49	1685.85	1681	9	3.55E-03	35.1	
34	0	888.61	5	13	0.63	1777.56	1769	10	1.25E-03	154.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.74*	37	13	1.07	1823.81	1818	10	1.04E-02	25.1	
36	0	920.61	22	0	3.32	1841.55	1835	13	6.11E-03	21.3	
37	0	948.97	10	8	0.83	1898.24	1890	10	2.78E-03	60.6	
38	0	964.52	19	9	0.65	1929.35	1923	12	5.27E-03	39.1	
39	0	969.02	32	9	1.80	1938.34	1934	9	8.89E-03	24.5	
40	0	991.67	13	0	0.92	1983.62	1979	9	3.61E-03	27.7	
41	0	1001.19*	13	9	2.48	2002.64	1996	12	3.55E-03	58.7	
42	0	1120.75*	18	9	0.91	2241.69	2236	10	5.05E-03	40.9	
43	0	1175.06	12	2	1.46	2350.27	2344	11	3.21E-03	40.1	
44	0	1190.22	14	3	3.70	2380.58	2375	11	3.75E-03	36.0	
45	0	1378.07	7	4	0.91	2756.13	2752	7	1.84E-03	67.7	
46	0	1402.35	6	0	0.96	2804.67	2801	7	1.67E-03	40.8	
47	0	1460.91*	123	0	0.98	2921.74	2914	13	3.42E-02	9.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:44:46

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677032.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:05:00 Acquisition date : 28-JUN-2016 12:44:13
Sample ID        : G398677032 Sample quantity  : 134.54 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA1 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.37 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.002E+00	6.147E+00	6.147E+00	18.61	OK
SC-46	889.28	99.98*	1.537E+00	1.623E-02	2.412E-02	308.72	OK
	1120.55	99.99	1.262E+00	7.837E-02	1.165E-01	81.72	OK
CD-109	88.03	3.70*	4.668E+00	8.278E-01	8.895E-01	140.78	OK
SN-126	64.28	9.60	2.457E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.668E+00	3.441E-01	3.441E-01	140.78	OK
	87.57	37.00*	4.668E+00	8.278E-02	8.278E-02	140.78	OK
BA-137M	661.66	89.90*	1.963E+00	2.268E+00	2.275E+00	8.62	OK
CS-137	661.66	85.10*	1.963E+00	2.396E+00	2.403E+00	8.62	OK
PM-147	121.22	0.00*	5.857E+00	1.307E+03	1.353E+03	96.12	OK
TL-208	277.37	6.60	4.009E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.178E+00	2.970E-01	2.970E-01	31.54	OK
	860.56	12.50	1.579E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	3.407E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.302E+00	6.586E-02	6.586E-02	1714.40	OK
PB-212	74.82	10.28	3.600E+00	7.806E-01	7.806E-01	92.78	OK
	77.11	17.10	3.833E+00	9.971E-01	9.971E-01	41.66	OK
	238.63	43.60*	4.496E+00	6.882E-01	6.882E-01	21.35	OK
	300.09	3.30	3.763E+00	1.115E+00	1.115E+00	124.50	OK
BI-214	609.32	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06	OK
	1120.29	14.92	1.262E+00	5.252E-01	5.252E-01	81.72	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	3.607E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.833E+00	1.758E+00	1.758E+00	41.66	OK
	87.09	3.41	4.658E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.451E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.815E+00	6.314E-01	6.314E-01	50.79	OK
	351.93	35.60*	3.306E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06	OK
	1120.29	14.92	1.262E+00	5.252E-01	5.252E-01	81.72	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	4.452E+00	3.683E-01	3.683E-01	328.79	OK
RA-226	609.32	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06	OK
	1120.29	14.92	1.262E+00	5.252E-01	5.252E-01	81.72	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	5.561E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.419E+00	1.391E+00	1.391E+00	48.38	OK
	794.95	4.25	1.686E+00	1.639E+00	1.639E+00	43.64	OK
	835.71	1.61	1.619E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.505E+00	5.329E-01	5.329E-01	50.28	OK
	968.97	15.80	1.429E+00	7.804E-01	7.804E-01	48.91	OK
RA-228	105.21	1.10	5.561E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.419E+00	1.391E+00	1.391E+00	48.38	OK
	794.95	4.25	1.686E+00	1.639E+00	1.639E+00	43.64	OK
	835.71	1.61	1.619E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.505E+00	5.329E-01	5.329E-01	50.28	OK
	968.97	15.80	1.429E+00	7.804E-01	7.804E-01	48.91	OK
TH-228	74.82	10.28	3.600E+00	7.806E-01	7.806E-01	92.78	OK
	77.11	17.10	3.833E+00	9.971E-01	9.971E-01	41.66	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	238.63	43.60*	4.496E+00	6.882E-01	6.882E-01	21.35	OK
	300.09	3.30	3.763E+00	1.115E+00	1.115E+00	124.50	OK
	609.32	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06	OK
	1120.29	14.92	1.262E+00	5.252E-01	5.252E-01	81.72	OK
PA-231	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
	283.69	1.70	3.939E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.763E+00	6.877E-01	6.877E-01	124.50	OK
TH-232	105.21	1.10	5.561E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.419E+00	1.391E+00	1.391E+00	48.38	OK
	835.71	1.61	1.619E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.505E+00	5.329E-01	5.329E-01	50.28	OK
U-234	968.97	15.80	1.429E+00	7.804E-01	7.804E-01	48.91	OK
	609.32	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06	OK
	1120.29	14.92	1.262E+00	5.252E-01	5.252E-01	81.72	OK
	1764.49	15.30	8.486E-01	----- Line	Not Found	-----	Absent
U-235	89.96	3.47	4.853E+00	1.444E+00	1.444E+00	73.50	OK
	93.35	5.60	5.017E+00	1.256E+00	1.256E+00	83.23	OK
	143.76	10.96*	5.851E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.631E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.297E+00	5.972E-02	5.972E-02	125.81	OK
AM-243	205.31	5.01	4.988E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	4.117E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.600E+00	1.194E-01	1.194E-01	92.78	OK
ANH-511	511.00	100.00*	2.428E+00	7.304E-02	7.304E-02	120.95	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677032.CNF;1
Acquisition date : 28-JUN-2016 12:44:13 Sensitivity : 3.000
Detector ID : GAM01 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.37 Half life ratio : *****
Sample date : 11-MAY-2016 15:05:00 Analyst initials: MXR1
Sample ID : G398677032 Sample Quantity : 1.3454E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUL-2015 10:39:03 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;8

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.147E+00	1.121E+00	6.805E-01
SC-46	2.412E-02	7.299E-02	9.544E-02
CD-109	8.895E-01	1.227E+00	1.886E+00
SN-126	8.278E-02	1.142E-01	1.947E-01
BA-137M	2.275E+00	1.922E-01	7.221E-02
CS-137	2.403E+00	2.030E-01	7.628E-02
PM-147	1.353E+03	1.275E+03	1.704E+03
TL-208	2.970E-01	9.182E-02	8.695E-02
BI-211	6.586E-02	1.107E+00	4.952E-01
PB-212	6.882E-01	1.440E-01	1.418E-01
BI-214	5.831E-01	1.661E-01	1.410E-01
PB-214	6.553E-01	2.501E-01	3.023E-01
RN-222	5.831E-01	1.661E-01	1.410E-01
RA-224	3.683E-01	1.187E+00	1.728E+00
RA-226	5.831E-01	1.661E-01	1.410E-01
AC-228	5.329E-01	2.626E-01	3.435E-01
RA-228	5.329E-01	2.626E-01	3.435E-01
TH-228	6.882E-01	1.440E-01	1.418E-01
TH-230	5.831E-01	1.661E-01	1.410E-01
PA-231	6.877E-01	8.390E-01	9.268E-01
TH-232	5.329E-01	2.626E-01	3.435E-01
U-234	5.831E-01	1.661E-01	1.409E-01
U-235	-2.962E-02	2.622E-01	4.412E-01
AM-243	1.194E-01	1.086E-01	1.306E-01
ANH-511	7.304E-02	8.657E-02	7.060E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.326E-01	7.562E-01	1.349E+00	NOT IDENT.
NA-22	-6.308E-03	4.274E-02	8.518E-02	NOT IDENT.
NA-24	0.000E+00	4.441E+21	0.000E+00	SHORT HLIF
AL-26	-2.725E-02	3.755E-02	6.241E-02	NOT IDENT.
V-48	2.574E-01	2.825E-01	6.491E-01	NOT IDENT.

CR-51	-8.941E-01	1.168E+00	1.703E+00	NOT IDENT.
MN-54	9.404E-03	5.583E-02	9.578E-02	NOT IDENT.
CO-56	5.907E-02	5.179E-02	1.157E-01	NOT IDENT.
MN-56	0.000E+00	8.768E+40	0.000E+00	SHORT HLIF
CO-57	9.423E-03	3.714E-02	6.424E-02	NOT IDENT.
CO-58	-4.149E-02	6.129E-02	1.068E-01	NOT IDENT.
FE-59	-3.158E-02	1.704E-01	3.176E-01	NOT IDENT.
CO-60	-1.680E-02	4.161E-02	7.881E-02	NOT IDENT.
ZN-65	-3.764E-02	1.083E-01	1.646E-01	NOT IDENT.
GE-68	-1.653E-01	1.403E+00	2.689E+00	NOT IDENT.
AS-73	8.402E-01	1.727E+00	3.319E+00	NOT IDENT.
AS-74	-4.355E-01	4.576E-01	7.876E-01	NOT IDENT.
SE-75	-4.489E-02	7.102E-02	1.253E-01	FAIL ABUN
BR-77	0.000E+00	3.192E+05	0.000E+00	SHORT HLIF
SR-82	1.448E-01	9.703E-01	1.917E+00	NOT IDENT.
RB-83	5.873E-02	1.202E-01	2.340E-01	NOT IDENT.
KR-85	1.292E+01	9.640E+00	1.869E+01	NOT IDENT.
SR-85	9.634E-02	7.208E-02	1.397E-01	NOT IDENT.
RB-86	4.575E-01	2.778E+00	5.595E+00	NOT IDENT.
Y-88	-9.893E-04	5.960E-02	1.318E-01	NOT IDENT.
Y-91	3.175E+01	3.036E+01	6.929E+01	NOT IDENT.
NB-94	-4.273E-03	3.781E-02	7.231E-02	NOT IDENT.
NB-95	2.273E-02	6.546E-02	1.204E-01	NOT IDENT.
NB-95M	-1.010E-01	2.440E-01	3.820E-01	NOT IDENT.
ZR-95	6.126E-03	1.042E-01	2.073E-01	FAIL ABUN
NB-97	0.000E+00	8.044E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.658E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.285E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.422E+41	0.000E+00	SHORT HLIF
RH-101	8.877E-03	4.302E-02	7.388E-02	NOT IDENT.
RH-102	-9.696E-03	7.087E-02	1.347E-01	FAIL ABUN
RU-103	1.139E-02	1.005E-01	1.859E-01	FAIL ABUN
RH-106	-1.970E-01	3.854E-01	7.028E-01	NOT IDENT.
RU-106	-1.970E-01	3.854E-01	7.028E-01	NOT IDENT.
AG-108M	-1.838E-02	3.881E-02	6.774E-02	NOT IDENT.
AG-110M	4.789E-02	5.723E-02	1.196E-01	NOT IDENT.
SN-113	3.245E-02	7.201E-02	1.384E-01	NOT IDENT.
CD-115	0.000E+00	3.505E+05	0.000E+00	SHORT HLIF
SN-117M	-3.324E-02	3.287E-01	6.198E-01	NOT IDENT.
TE-123M	-2.232E-02	3.936E-02	7.183E-02	NOT IDENT.
SB-124	1.900E-02	1.336E-01	2.975E-01	NOT IDENT.
SB-125	8.369E-02	1.285E-01	2.509E-01	NOT IDENT.
TE-125M	-3.329E+00	1.820E+01	3.056E+01	NOT IDENT.
I-126	3.928E-01	1.605E+00	2.848E+00	NOT IDENT.
SB-126	5.544E-01	1.087E+00	2.038E+00	NOT IDENT.
SB-127	0.000E+00	4.680E+02	0.000E+00	SHORT HLIF
I-131	2.872E+00	2.656E+00	5.368E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.075E+03	0.000E+00	SHORT HLIF
BA-133	3.356E-02	6.145E-02	1.064E-01	NOT IDENT.
I-133	0.000E+00	1.583E+15	0.000E+00	SHORT HLIF
CS-134	8.516E-02	3.642E-02	9.441E-02	FAIL ABUN
CS-135	2.662E-02	2.113E-01	3.941E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	1.636E-01	6.252E-01	1.279E+00	NOT IDENT.
CE-139	1.037E-02	4.248E-02	8.140E-02	NOT IDENT.
BA-140	3.239E+00	1.808E+00	3.819E+00	FAIL ABUN
LA-140	-2.844E-01	5.330E-01	9.741E-01	NOT IDENT.
CE-141	4.346E-03	1.592E-01	2.814E-01	NOT IDENT.
CE-143	0.000E+00	2.641E+09	0.000E+00	SHORT HLIF
CE-144	-1.092E-02	2.851E-01	4.786E-01	NOT IDENT.
PM-144	-1.075E-02	4.274E-02	8.009E-02	NOT IDENT.
PR-144	-8.088E-01	3.255E+00	6.102E+00	NOT IDENT.
PM-146	-8.707E-03	6.813E-02	1.220E-01	NOT IDENT.
ND-147	3.650E+00	5.194E+00	1.055E+01	FAIL ABUN
PM-149	0.000E+00	3.327E+06	0.000E+00	SHORT HLIF
EU-150	2.247E-02	3.858E-02	6.708E-02	FAIL ABUN
EU-152	-8.179E-02	1.643E-01	2.281E-01	FAIL ABUN
GD-153	1.464E-01	1.321E-01	2.335E-01	NOT IDENT.
EU-154	1.128E-02	1.141E-01	2.394E-01	NOT IDENT.
EU-155	1.454E-02	1.359E-01	2.460E-01	FAIL ABUN
TB-160	6.013E-02	1.648E-01	3.471E-01	FAIL ABUN
HO-166M	1.320E-02	7.225E-02	1.429E-01	FAIL ABUN
TM-171	-5.422E+00	2.960E+01	5.411E+01	FAIL ABUN
HF-172	-6.762E-04	2.588E-01	4.374E-01	FAIL ABUN
LU-172	-4.719E-03	7.732E-02	1.470E-01	FAIL ABUN
LU-176	1.457E-02	3.399E-02	6.532E-02	FAIL ABUN
HF-181	7.552E-02	1.090E-01	2.128E-01	NOT IDENT.

TA-182	-4.393E-02	2.113E-01	3.956E-01	FAIL ABUN
RE-183	1.369E-01	4.295E-01	8.077E-01	FAIL ABUN
RE-184	6.428E-02	2.786E-01	5.571E-01	NOT IDENT.
W-188	-1.097E+01	1.425E+01	2.100E+01	NOT IDENT.
IR-192	2.931E-02	5.720E-02	1.115E-01	FAIL ABUN
HG-203	2.037E-02	7.516E-02	1.431E-01	NOT IDENT.
BI-207	-2.985E-03	5.113E-02	9.975E-02	FAIL ABUN
PB-210	-5.268E+00	5.744E+00	9.968E+00	NOT IDENT.
PB-211	3.906E-01	1.069E+00	2.011E+00	NOT IDENT.
BI-212	6.340E-01	4.996E-01	1.133E+00	NOT IDENT.
RN-219	-2.641E-01	6.206E-01	1.087E+00	NOT IDENT.
RA-223	8.166E-01	8.329E-01	1.559E+00	FAIL ABUN
AC-227	-2.823E-01	3.155E-01	5.455E-01	FAIL ABUN
TH-227	-2.823E-01	3.155E-01	5.455E-01	FAIL ABUN
TH-229	-5.553E-02	6.465E-01	1.205E+00	FAIL ABUN
TH-231	8.166E-01	8.329E-01	1.559E+00	FAIL ABUN
PA-233	2.970E-02	7.951E-02	1.528E-01	FAIL ABUN
PA-234	1.956E-01	4.100E-01	7.533E-01	FAIL ABUN
PA-234M	6.007E+00	6.909E+00	1.260E+01	FAIL ABUN
TH-234	1.121E+00	2.140E+00	3.800E+00	FAIL ABUN
NP-237	2.970E-02	7.951E-02	1.528E-01	FAIL ABUN
NP-238	0.000E+00	9.402E+05	0.000E+00	SHORT HLIF
U-238	1.121E+00	2.140E+00	3.800E+00	FAIL ABUN
NP-239	1.610E-01	4.411E-01	5.915E-01	NOT IDENT.
PU-239	0.000E+00	8.375E+02	8.434E+02	FAIL ABUN
AM-241	2.533E-03	2.311E-01	4.252E-01	NOT IDENT.
CM-243	9.710E-02	1.336E-01	2.534E-01	NOT IDENT.
BK-247	-6.531E-02	1.052E-01	1.859E-01	FAIL ABUN
CM-247	-1.237E-02	5.544E-02	9.909E-02	NOT IDENT.
CF-249	1.789E-02	5.143E-02	9.826E-02	NOT IDENT.
CF-251	4.387E-02	1.599E-01	3.053E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	118	10.66*	1.002E+00	6.147E+00	6.147E+00	18.61
SC-46	889.28	4	99.98*	1.537E+00	1.623E-02	2.412E-02	308.72
	1120.55	18	99.99	1.262E+00	7.837E-02	1.165E-01	81.72
CD-109	88.03	44	3.70*	4.668E+00	1.410E+00	1.515E+00	79.96
SN-126	64.28	-----	9.60	2.457E+00	-----	Line Not Found	-----
	86.94	44	8.90	4.668E+00	5.860E-01	5.860E-01	79.96
	87.57	44	37.00*	4.668E+00	1.410E-01	1.410E-01	79.96
BA-137M	661.66	717	89.90*	1.963E+00	2.268E+00	2.275E+00	8.62
CS-137	661.66	717	85.10*	1.963E+00	2.396E+00	2.403E+00	8.62
PM-147	121.22	39	0.00*	5.857E+00	1.307E+03	1.353E+03	96.12
TL-208	277.37	-----	6.60	4.009E+00	-----	Line Not Found	-----
	583.19	99	85.00*	2.178E+00	2.970E-01	2.970E-01	31.54
	860.56	-----	12.50	1.579E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.407E+00	-----	Line Not Found	-----
	351.06	138	12.92*	3.302E+00	1.806E+00	1.806E+00	38.94
PB-212	74.82	75	10.28	3.600E+00	1.137E+00	1.137E+00	61.69
	77.11	117	17.10	3.833E+00	9.971E-01	9.971E-01	41.66
	238.63	242	43.60*	4.496E+00	6.882E-01	6.882E-01	21.35
	300.09	25	3.30	3.763E+00	1.115E+00	1.115E+00	124.50
BI-214	609.32	100	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06
	1120.29	18	14.92	1.262E+00	5.252E-01	5.252E-01	81.72
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
PB-214	74.82	75	5.80	3.600E+00	2.015E+00	2.015E+00	61.69
	77.11	117	9.70	3.833E+00	1.758E+00	1.758E+00	41.66
	87.09	44	3.41	4.668E+00	1.530E+00	1.530E+00	79.96
	242.00	49	7.25	4.452E+00	8.396E-01	8.397E-01	72.05
	295.22	80	18.42	3.815E+00	6.314E-01	6.314E-01	50.79
	351.93	138	35.60*	3.302E+00	6.553E-01	6.553E-01	38.94
RN-222	609.32	100	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06
	1120.29	18	14.92	1.262E+00	5.252E-01	5.252E-01	81.72
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
RA-224	240.99	49	4.10*	4.452E+00	1.485E+00	1.485E+00	72.05
RA-226	609.32	100	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06
	1120.29	18	14.92	1.262E+00	5.252E-01	5.252E-01	81.72
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	5.561E+00	-----	Line Not Found	-----
	338.32	96	11.27	3.419E+00	1.391E+00	1.391E+00	48.38
	794.95	21	4.25	1.686E+00	1.639E+00	1.639E+00	43.64
	835.71	-----	1.61	1.619E+00	-----	Line Not Found	-----
	911.20	37	25.80*	1.505E+00	5.329E-01	5.329E-01	50.28
	968.97	32	15.80	1.429E+00	7.804E-01	7.804E-01	48.91
RA-228	105.21	-----	1.10	5.561E+00	-----	Line Not Found	-----
	338.32	96	11.27	3.419E+00	1.391E+00	1.391E+00	48.38
	794.95	21	4.25	1.686E+00	1.639E+00	1.639E+00	43.64
	835.71	-----	1.61	1.619E+00	-----	Line Not Found	-----
	911.20	37	25.80*	1.505E+00	5.329E-01	5.329E-01	50.28
	968.97	32	15.80	1.429E+00	7.804E-01	7.804E-01	48.91

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	75	10.28	3.600E+00	1.137E+00	1.137E+00	61.69
	77.11	117	17.10	3.833E+00	9.971E-01	9.971E-01	41.66
	238.63	242	43.60*	4.496E+00	6.882E-01	6.882E-01	21.35
	300.09	25	3.30	3.763E+00	1.115E+00	1.115E+00	124.50
TH-230	609.32	100	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06
	1120.29	18	14.92	1.262E+00	5.252E-01	5.252E-01	81.72
	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
	283.69	-----	1.70	3.939E+00	-----	Line Not Found	-----
PA-231	301.36	25	5.35*	3.763E+00	6.877E-01	6.877E-01	124.50
	105.21	-----	1.10	5.561E+00	-----	Line Not Found	-----
	338.32	96	11.27	3.419E+00	1.391E+00	1.391E+00	48.38
	835.71	-----	1.61	1.619E+00	-----	Line Not Found	-----
U-234	911.20	37	25.80*	1.505E+00	5.329E-01	5.329E-01	50.28
	968.97	32	15.80	1.429E+00	7.804E-01	7.804E-01	48.91
	609.32	100	45.49*	2.101E+00	5.831E-01	5.831E-01	29.06
	1120.29	18	14.92	1.262E+00	5.252E-01	5.252E-01	81.72
U-235	1764.49	-----	15.30	8.486E-01	-----	Line Not Found	-----
	89.96	44	3.47	4.853E+00	1.444E+00	1.444E+00	73.50
	93.35	63	5.60	5.017E+00	1.256E+00	1.256E+00	83.23
	143.76	-----	10.96*	5.851E+00	-----	Line Not Found	-----
AM-243	163.33	-----	5.08	5.631E+00	-----	Line Not Found	-----
	185.72	32	57.20	5.297E+00	5.972E-02	5.972E-02	125.81
	205.31	-----	5.01	4.988E+00	-----	Line Not Found	-----
	43.53	-----	5.90	4.117E-01	-----	Line Not Found	-----
ANH-511	74.66	75	67.20*	3.600E+00	1.739E-01	1.739E-01	61.69
	511.00	32	100.00*	2.428E+00	7.304E-02	7.304E-02	120.95

Flag: "*" = Keyline

Total number of lines in spectrum 47
Number of unidentified lines 10
Number of lines tentatively identified by NID 37 78.72%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.147E+00	6.147E+00	1.144E+00	18.61	
SC-46	83.79D	1.49	1.623E-02	2.412E-02	7.448E-02	308.72	
CD-109	461.40D	1.07	1.410E+00	1.515E+00	1.211E+00	79.96	
SN-126	2.30E+05Y	1.00	1.410E-01	1.410E-01	1.127E-01	79.96	
BA-137M	30.08Y	1.00	2.268E+00	2.275E+00	0.196E+00	8.62	
CS-137	30.08Y	1.00	2.396E+00	2.403E+00	0.207E+00	8.62	
PM-147	2.62Y	1.04	1.307E+03	1.353E+03	1.301E+03	96.12	
TL-208	1.41E+10Y	1.00	2.970E-01	2.970E-01	0.937E-01	31.54	
BI-211	7.04E+08Y	1.00	1.806E+00	1.806E+00	0.703E+00	38.94	
PB-212	1.41E+10Y	1.00	6.882E-01	6.882E-01	1.469E-01	21.35	
BI-214	1600.00Y	1.00	5.831E-01	5.831E-01	1.695E-01	29.06	
PB-214	1600.00Y	1.00	6.553E-01	6.553E-01	2.552E-01	38.94	
RN-222	1600.00Y	1.00	5.831E-01	5.831E-01	1.695E-01	29.06	
RA-224	1.41E+10Y	1.00	1.485E+00	1.485E+00	1.070E+00	72.05	
RA-226	1600.00Y	1.00	5.831E-01	5.831E-01	1.695E-01	29.06	
AC-228	1.41E+10Y	1.00	5.329E-01	5.329E-01	2.679E-01	50.28	
RA-228	1.41E+10Y	1.00	5.329E-01	5.329E-01	2.679E-01	50.28	
TH-228	1.41E+10Y	1.00	6.882E-01	6.882E-01	1.469E-01	21.35	
TH-230	7.54E+04Y	1.00	5.831E-01	5.831E-01	1.695E-01	29.06	
PA-231	7.04E+08Y	1.00	6.877E-01	6.877E-01	8.562E-01	124.50	
TH-232	1.41E+10Y	1.00	5.329E-01	5.329E-01	2.679E-01	50.28	
U-234	2.45E+05Y	1.00	5.831E-01	5.831E-01	1.695E-01	29.06	
U-235	7.04E+08Y	1.00	5.972E-02	5.972E-02	7.514E-02	125.81	K
AM-243	7370.00Y	1.00	1.739E-01	1.739E-01	1.073E-01	61.69	
ANH-511	1.00E+09Y	1.00	7.304E-02	7.304E-02	8.833E-02	120.95	
Total Activity :			1.331E+03	1.377E+03			

Grand Total Activity : 1.331E+03 1.377E+03

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	35.26	27	17	1.27	71.24	67	17	5.93E-03	****	8.20E-02	
2	36.92	48	34	1.21	74.56	67	17	1.08E-02	70.0	1.22E-01	
2	38.64	20	48	1.06	78.00	67	17	4.43E-03	****	1.77E-01	
0	67.63	28	132	1.03	135.97	133	8	6.44E-03	****	2.84E+00	T
0	114.53	58	150	4.37	229.76	223	13	1.39E-02	98.2	5.78E+00	T
0	129.46	68	151	1.79	259.61	253	13	1.64E-02	84.4	5.91E+00	T
0	140.79	22	72	1.44	282.27	280	6	5.27E-03	****	5.87E+00	T
0	210.97	15	89	1.33	422.60	417	8	3.81E-03	****	4.90E+00	T
0	323.25	21	32	1.44	647.12	643	7	5.37E-03	****	3.55E+00	T
0	537.71	24	7	1.86	1075.97	1071	9	6.56E-03	57.0	2.33E+00	T
0	567.92	16	52	2.04	1136.37	1127	14	4.31E-03	****	2.23E+00	T
0	725.67	30	3	0.82	1451.78	1445	14	8.27E-03	45.2	1.82E+00	T
0	768.22	22	6	0.99	1536.86	1532	11	6.20E-03	58.8	1.74E+00	T
0	838.56	8	10	1.43	1677.49	1673	7	2.35E-03	****	1.61E+00	
0	842.74	13	2	1.49	1685.85	1681	9	3.55E-03	70.2	1.61E+00	
0	920.61	22	0	3.32	1841.55	1835	13	6.11E-03	42.6	1.49E+00	
0	948.97	10	8	0.83	1898.24	1890	10	2.78E-03	****	1.45E+00	T
0	964.52	19	9	0.65	1929.35	1923	12	5.27E-03	78.2	1.43E+00	T
0	991.67	13	0	0.92	1983.62	1979	9	3.61E-03	55.5	1.40E+00	
0	1001.19	13	9	2.48	2002.64	1996	12	3.55E-03	****	1.39E+00	T
0	1175.06	11	2	1.46	2350.27	2344	11	3.21E-03	80.3	1.21E+00	
0	1190.22	13	2	3.70	2380.58	2375	11	3.75E-03	71.9	1.20E+00	T
0	1378.07	6	4	0.91	2756.13	2752	7	1.84E-03	****	1.05E+00	
0	1402.35	6	0	0.96	2804.67	2801	7	1.67E-03	81.6	1.04E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677032.CNF;1      *
* Acquisition date   : 28-JUN-2016 12:44:13 Sensitivity      : 3.000                *
* Detector ID        : GAM01 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.37 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 15:05:00 Nuclide Library : SOLID          *
* Sample ID          : G398677032 Analyst initials: MXR1          *
* Batch Number       : 1572486 Sample Quantity : 1.3454E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000          *
*                                     Dry Weight    : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 10-JUL-2015 10:39:03 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;8          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.694E-01
SC-46	4.034E-02
CD-109	8.946E-01
SN-126	9.282E-02
BA-137M	3.176E-02
CS-137	3.355E-02
PM-147	8.036E+02
TL-208	3.934E-02
BI-211	2.296E-01
PB-212	6.695E-02
BI-214	6.246E-02
PB-214	1.446E-01
RN-222	6.246E-02
RA-224	8.217E-01
RA-226	6.246E-02
AC-228	1.522E-01
RA-228	1.522E-01
TH-228	6.695E-02
TH-230	6.246E-02
PA-231	4.248E-01
TH-232	1.522E-01
U-234	6.246E-02
U-235	2.084E-01
AM-243	6.202E-02
ANH-511	3.214E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.209E-01	NOT IDENT.
NA-22	3.564E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.211E-02	NOT IDENT.
V-48	2.814E-01	NOT IDENT.
CR-51	7.788E-01	NOT IDENT.

MN-54	4.266E-02	NOT IDENT.
CO-56	5.051E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.036E-02	NOT IDENT.
CO-58	4.599E-02	NOT IDENT.
FE-59	1.367E-01	NOT IDENT.
CO-60	3.231E-02	NOT IDENT.
ZN-65	6.871E-02	NOT IDENT.
GE-68	1.141E+00	NOT IDENT.
AS-73	1.565E+00	NOT IDENT.
AS-74	3.544E-01	NOT IDENT.
SE-75	5.850E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	8.493E-01	NOT IDENT.
RB-83	1.065E-01	NOT IDENT.
KR-85	8.606E+00	NOT IDENT.
SR-85	6.433E-02	NOT IDENT.
RB-86	2.398E+00	NOT IDENT.
Y-88	5.327E-02	NOT IDENT.
Y-91	3.031E+01	NOT IDENT.
NB-94	3.205E-02	NOT IDENT.
NB-95	5.281E-02	NOT IDENT.
NB-95M	1.794E-01	NOT IDENT.
ZR-95	9.024E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.493E-02	NOT IDENT.
RH-102	6.049E-02	FAIL ABUN
RU-103	8.504E-02	FAIL ABUN
RH-106	3.106E-01	NOT IDENT.
RU-106	3.106E-01	NOT IDENT.
AG-108M	3.081E-02	NOT IDENT.
AG-110M	5.202E-02	NOT IDENT.
SN-113	6.399E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.916E-01	NOT IDENT.
TE-123M	3.375E-02	NOT IDENT.
SB-124	1.175E-01	NOT IDENT.
SB-125	1.160E-01	NOT IDENT.
TE-125M	1.436E+01	NOT IDENT.
I-126	1.268E+00	NOT IDENT.
SB-126	9.048E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.500E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.939E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.167E-02	FAIL ABUN
CS-135	1.853E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.507E-01	NOT IDENT.
CE-139	3.848E-02	NOT IDENT.
BA-140	1.727E+00	FAIL ABUN
LA-140	3.714E-01	NOT IDENT.
CE-141	1.330E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.258E-01	NOT IDENT.
PM-144	3.557E-02	NOT IDENT.
PR-144	2.711E+00	NOT IDENT.
PM-146	5.651E-02	NOT IDENT.
ND-147	4.764E+00	FAIL ABUN
PM-149	0.000E+00	SHORT HLIF
EU-150	3.120E-02	FAIL ABUN
EU-152	1.054E-01	FAIL ABUN
GD-153	1.108E-01	NOT IDENT.
EU-154	1.004E-01	NOT IDENT.
EU-155	1.161E-01	FAIL ABUN
TB-160	1.477E-01	FAIL ABUN
HO-166M	6.383E-02	FAIL ABUN
TM-171	2.549E+01	FAIL ABUN
HF-172	2.064E-01	FAIL ABUN
LU-172	6.368E-02	FAIL ABUN
LU-176	3.043E-02	FAIL ABUN
HF-181	9.822E-02	NOT IDENT.
TA-182	1.658E-01	FAIL ABUN

RE-183	3.824E-01	FAIL ABUN
RE-184	2.449E-01	NOT IDENT.
W-188	9.699E+00	NOT IDENT.
IR-192	5.167E-02	FAIL ABUN
HG-203	6.669E-02	NOT IDENT.
BI-207	4.214E-02	FAIL ABUN
PB-210	4.679E+00	NOT IDENT.
PB-211	9.363E-01	NOT IDENT.
BI-212	5.034E-01	NOT IDENT.
RN-219	5.041E-01	NOT IDENT.
RA-223	7.246E-01	FAIL ABUN
AC-227	2.536E-01	FAIL ABUN
TH-227	2.536E-01	FAIL ABUN
TH-229	5.684E-01	FAIL ABUN
TH-231	7.246E-01	FAIL ABUN
PA-233	7.090E-02	FAIL ABUN
PA-234	3.332E-01	FAIL ABUN
PA-234M	5.648E+00	FAIL ABUN
TH-234	1.809E+00	FAIL ABUN
NP-237	7.090E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.809E+00	FAIL ABUN
NP-239	2.787E-01	NOT IDENT.
PU-239	4.007E+02	FAIL ABUN
AM-241	2.010E-01	NOT IDENT.
CM-243	1.198E-01	NOT IDENT.
BK-247	8.671E-02	FAIL ABUN
CM-247	4.593E-02	NOT IDENT.
CF-249	4.530E-02	NOT IDENT.
CF-251	1.443E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677032.CNF;1
Acquisition date : 28-JUN-2016 12:44:13 Sensitivity : 3.000
Detector ID : GAM01 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.37 Half life ratio : *****
Sample date : 11-MAY-2016 15:05:00 Nuclide Library : SOLID
Sample ID : G398677032 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3454E+02 GRAM
Quantity Err(%) : 1.4865E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUL-2015 10:39:03 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM01_CAN.CNF;8

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.147E+00	1.281E+00	1.281E+00
SC-46	2.412E-02	7.304E-02	7.304E-02
CD-109	8.895E-01	1.235E+00	1.235E+00
SN-126	8.278E-02	1.148E-01	1.148E-01
BA-137M	2.275E+00	2.666E-01	2.666E-01
CS-137	2.403E+00	2.815E-01	2.815E-01
PM-147	1.353E+03	1.278E+03	1.278E+03
TL-208	2.970E-01	9.511E-02	9.511E-02
BI-211	6.586E-02	1.122E+00	1.122E+00
PB-212	6.882E-01	1.539E-01	1.539E-01
BI-214	5.831E-01	1.730E-01	1.730E-01
PB-214	6.553E-01	2.551E-01	2.551E-01
RN-222	5.831E-01	1.730E-01	1.730E-01
RA-224	3.683E-01	1.193E+00	1.193E+00
RA-226	5.831E-01	1.730E-01	1.730E-01
AC-228	5.329E-01	2.704E-01	2.704E-01
RA-228	5.329E-01	2.704E-01	2.704E-01
TH-228	6.882E-01	1.539E-01	1.539E-01
TH-230	5.831E-01	1.730E-01	1.730E-01
PA-231	6.877E-01	8.528E-01	8.528E-01
TH-232	5.329E-01	2.704E-01	2.704E-01
U-234	5.831E-01	1.730E-01	1.730E-01
U-235	-2.962E-02	2.622E-01	2.622E-01
AM-243	1.194E-01	1.093E-01	1.093E-01
ANH-511	7.304E-02	8.678E-02	8.678E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.326E-01	7.563E-01	7.587E-01	NOT IDENT.
NA-22	-6.308E-03	4.275E-02	4.284E-02	NOT IDENT.
NA-24	-2.266E+21	4.449E+21	0.000E+00	SHORT HLIF
AL-26	-2.725E-02	3.761E-02	3.956E-02	NOT IDENT.
V-48	2.574E-01	2.847E-01	3.074E-01	NOT IDENT.

CR-51	-8.941E-01	1.170E+00	1.238E+00	NOT IDENT.
MN-54	9.404E-03	5.584E-02	5.600E-02	NOT IDENT.
CO-56	5.907E-02	5.217E-02	5.857E-02	NOT IDENT.
MN-56	1.000E+41	8.833E+40	0.000E+00	SHORT HLIF
CO-57	9.423E-03	3.714E-02	3.739E-02	NOT IDENT.
CO-58	-4.149E-02	6.143E-02	6.422E-02	NOT IDENT.
FE-59	-3.158E-02	1.705E-01	1.711E-01	NOT IDENT.
CO-60	-1.680E-02	4.164E-02	4.233E-02	NOT IDENT.
ZN-65	-3.764E-02	1.085E-01	1.098E-01	NOT IDENT.
GE-68	-1.653E-01	1.404E+00	1.406E+00	NOT IDENT.
AS-73	8.402E-01	1.736E+00	1.777E+00	NOT IDENT.
AS-74	-4.355E-01	4.600E-01	5.001E-01	NOT IDENT.
SE-75	-4.489E-02	7.110E-02	7.392E-02	FAIL ABUN
BR-77	1.526E+06	2.138E+06	2.246E+06	SHORT HLIF
SR-82	1.448E-01	9.704E-01	9.726E-01	NOT IDENT.
RB-83	5.873E-02	1.206E-01	1.235E-01	NOT IDENT.
KR-85	1.292E+01	9.699E+00	1.131E+01	NOT IDENT.
SR-85	9.634E-02	7.252E-02	8.453E-02	NOT IDENT.
RB-86	4.575E-01	2.779E+00	2.786E+00	NOT IDENT.
Y-88	-9.893E-04	5.960E-02	5.960E-02	NOT IDENT.
Y-91	3.175E+01	3.050E+01	3.369E+01	NOT IDENT.
NB-94	-4.273E-03	3.781E-02	3.786E-02	NOT IDENT.
NB-95	2.273E-02	6.550E-02	6.629E-02	NOT IDENT.
NB-95M	-1.010E-01	2.442E-01	2.484E-01	NOT IDENT.
ZR-95	6.126E-03	1.042E-01	1.042E-01	FAIL ABUN
NB-97	1.000E+41	8.085E+40	0.000E+00	SHORT HLIF
ZR-97	2.712E+20	2.668E+20	0.000E+00	SHORT HLIF
MO-99	-3.233E+04	5.295E+04	5.492E+04	SHORT HLIF
TC-99M	1.000E+41	1.426E+41	0.000E+00	SHORT HLIF
RH-101	8.877E-03	4.305E-02	4.323E-02	NOT IDENT.
RH-102	-9.696E-03	7.088E-02	7.102E-02	FAIL ABUN
RU-103	1.139E-02	1.005E-01	1.006E-01	FAIL ABUN
RH-106	-1.970E-01	3.858E-01	3.959E-01	NOT IDENT.
RU-106	-1.970E-01	3.858E-01	3.959E-01	NOT IDENT.
AG-108M	-1.838E-02	3.883E-02	3.971E-02	NOT IDENT.
AG-110M	4.789E-02	5.750E-02	6.142E-02	NOT IDENT.
SN-113	3.245E-02	7.205E-02	7.352E-02	NOT IDENT.
CD-115	-2.067E+05	3.510E+05	3.632E+05	SHORT HLIF
SN-117M	-3.324E-02	3.287E-01	3.291E-01	NOT IDENT.
TE-123M	-2.232E-02	3.940E-02	4.066E-02	NOT IDENT.
SB-124	1.900E-02	1.336E-01	1.339E-01	NOT IDENT.
SB-125	8.369E-02	1.287E-01	1.341E-01	NOT IDENT.
TE-125M	-3.329E+00	1.820E+01	1.826E+01	NOT IDENT.
I-126	3.928E-01	1.605E+00	1.615E+00	NOT IDENT.
SB-126	5.544E-01	1.089E+00	1.118E+00	NOT IDENT.
SB-127	-4.472E+02	4.796E+02	5.203E+02	SHORT HLIF
I-131	2.872E+00	2.666E+00	2.964E+00	NOT IDENT.
I-132	-1.000E+41	3.667E+41	0.000E+00	SHORT HLIF
TE-132	-5.574E+01	1.075E+03	1.075E+03	SHORT HLIF
BA-133	3.356E-02	6.150E-02	6.333E-02	NOT IDENT.
I-133	-7.605E+14	1.600E+15	1.636E+15	SHORT HLIF
CS-134	8.516E-02	3.739E-02	5.359E-02	FAIL ABUN
CS-135	2.662E-02	2.113E-01	2.117E-01	NOT IDENT.
I-135	1.000E+41	7.700E+42	0.000E+00	SHORT HLIF
CS-136	1.636E-01	6.259E-01	6.302E-01	NOT IDENT.
CE-139	1.037E-02	4.254E-02	4.279E-02	NOT IDENT.
BA-140	3.239E+00	1.828E+00	2.340E+00	FAIL ABUN
LA-140	-2.844E-01	5.336E-01	5.488E-01	NOT IDENT.
CE-141	4.346E-03	1.592E-01	1.592E-01	NOT IDENT.
CE-143	4.298E+09	2.661E+09	3.292E+09	SHORT HLIF
CE-144	-1.092E-02	2.851E-01	2.851E-01	NOT IDENT.
PM-144	-1.075E-02	4.275E-02	4.302E-02	NOT IDENT.
PR-144	-8.088E-01	3.256E+00	3.276E+00	NOT IDENT.
PM-146	-8.707E-03	6.814E-02	6.825E-02	NOT IDENT.
ND-147	3.650E+00	5.203E+00	5.457E+00	FAIL ABUN
PM-149	1.805E+06	3.338E+06	3.435E+06	SHORT HLIF
EU-150	2.247E-02	3.862E-02	3.992E-02	FAIL ABUN
EU-152	-8.179E-02	1.644E-01	1.685E-01	FAIL ABUN
GD-153	1.464E-01	1.326E-01	1.481E-01	NOT IDENT.
EU-154	1.128E-02	1.141E-01	1.142E-01	NOT IDENT.
EU-155	1.454E-02	1.359E-01	1.361E-01	FAIL ABUN
TB-160	6.013E-02	1.649E-01	1.672E-01	FAIL ABUN
HO-166M	1.320E-02	7.227E-02	7.251E-02	FAIL ABUN
TM-171	-5.422E+00	2.960E+01	2.970E+01	FAIL ABUN
HF-172	-6.762E-04	2.588E-01	2.588E-01	FAIL ABUN
LU-172	-4.719E-03	7.733E-02	7.736E-02	FAIL ABUN
LU-176	1.457E-02	3.401E-02	3.463E-02	FAIL ABUN
HF-181	7.552E-02	1.091E-01	1.143E-01	NOT IDENT.

TA-182	-4.393E-02	2.114E-01	2.123E-01	FAIL ABUN
RE-183	1.369E-01	4.298E-01	4.342E-01	FAIL ABUN
RE-184	6.428E-02	2.787E-01	2.802E-01	NOT IDENT.
W-188	-1.097E+01	1.432E+01	1.515E+01	NOT IDENT.
IR-192	2.931E-02	5.724E-02	5.874E-02	FAIL ABUN
HG-203	2.037E-02	7.517E-02	7.573E-02	NOT IDENT.
BI-207	-2.985E-03	5.113E-02	5.115E-02	FAIL ABUN
PB-210	-5.268E+00	5.763E+00	6.234E+00	NOT IDENT.
PB-211	3.906E-01	1.069E+00	1.084E+00	NOT IDENT.
BI-212	6.340E-01	5.031E-01	5.786E-01	NOT IDENT.
RN-219	-2.641E-01	6.217E-01	6.330E-01	NOT IDENT.
RA-223	8.166E-01	8.360E-01	9.134E-01	FAIL ABUN
AC-227	-2.823E-01	3.181E-01	3.427E-01	FAIL ABUN
TH-227	-2.823E-01	3.181E-01	3.427E-01	FAIL ABUN
TH-229	-5.553E-02	6.465E-01	6.470E-01	FAIL ABUN
TH-231	8.166E-01	8.360E-01	9.134E-01	FAIL ABUN
PA-233	2.970E-02	7.954E-02	8.066E-02	FAIL ABUN
PA-234	1.956E-01	4.677E-01	4.759E-01	FAIL ABUN
PA-234M	6.007E+00	6.963E+00	7.471E+00	FAIL ABUN
TH-234	1.121E+00	2.155E+00	2.214E+00	FAIL ABUN
NP-237	2.970E-02	7.954E-02	8.066E-02	FAIL ABUN
NP-238	8.132E+05	9.469E+05	1.015E+06	SHORT HLIF
U-238	1.121E+00	2.155E+00	2.214E+00	FAIL ABUN
NP-239	1.610E-01	4.414E-01	4.473E-01	NOT IDENT.
PU-239	1.012E+03	8.405E+02	9.564E+02	FAIL ABUN
AM-241	2.533E-03	2.311E-01	2.311E-01	NOT IDENT.
CM-243	9.710E-02	1.340E-01	1.410E-01	NOT IDENT.
BK-247	-6.531E-02	1.061E-01	1.101E-01	FAIL ABUN
CM-247	-1.237E-02	5.549E-02	5.577E-02	NOT IDENT.
CF-249	1.789E-02	5.146E-02	5.209E-02	NOT IDENT.
CF-251	4.387E-02	1.600E-01	1.613E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	80.1708	87.09	136.9165	136.47	98.6354
45.60	80.4771	87.57	138.7102	140.51	0.0000
46.54	97.8115	88.03	113.0870	143.76	91.5500
49.72	0.0000	88.34	95.9894	144.24	84.3209
51.35	95.3841	88.47	96.0048	145.44	98.2384
51.87	101.9772	89.96	96.1791	152.43	80.5443
52.39	93.3799	1093.63	89.3825	153.25	77.8542
52.97	88.0359	91.11	89.4333	323.87	82.5025
53.44	79.4030	92.59	89.5920	156.02	97.3217
54.07	88.1964	93.35	89.6729	158.56	87.4121
57.36	0.0000	94.56	117.4322	159.00	95.7290
57.53	95.2607	94.65	117.4446	162.33	91.3842
57.98	96.4239	94.67	117.4478	162.66	84.9459
59.27	99.9129	94.87	127.8407	163.33	81.2982
59.32	99.9207	97.43	81.4385	165.86	93.5047
59.54	99.9550	98.43	83.2672	176.31	83.0980
60.96	134.2994	98.44	83.2679	176.60	80.3153
61.17	134.3425	99.53	97.2673	177.52	89.7202
62.93	92.7454	100.11	108.9184	181.07	0.0000
63.29	89.4815	102.03	116.1224	181.52	94.5031
63.58	101.1247	103.18	81.3900	184.41	94.7161
64.28	104.5493	103.37	81.4075	143.76	99.7025
66.73	131.5737	105.21	93.2271	193.51	94.6182
67.24	115.0040	105.31	93.2373	197.03	97.7130
125.81	113.4094	106.12	88.6543	198.01	93.0369
67.75	113.4203	106.47	89.2718	201.83	95.2026
69.67	122.6523	109.28	87.0861	203.43	95.3140
70.83	110.5673	111.00	84.4325	205.31	102.3157
72.81	109.7521	111.76	0.0000	210.85	101.1890
72.87	109.7610	114.06	80.4707	215.65	94.4997
74.66	119.0122	116.30	0.0000	222.11	88.8527
74.82	119.0381	116.74	70.7855	227.09	73.6494
74.97	119.0618	119.76	89.4662	227.38	67.8483
77.11	119.4047	121.12	92.4338	228.16	0.0000
78.74	103.2935	121.22	91.0207	228.18	79.5226
79.69	101.7265	121.78	91.0723	116.74	79.5226
80.12	89.9090	122.06	91.0977	235.69	92.0074
80.19	89.9171	122.92	78.3549	235.96	81.1059
80.57	98.4485	123.07	78.3666	238.63	95.3110
81.00	127.3750	265.00	71.2857	238.98	0.0000
81.07	127.3865	125.81	92.8674	240.99	125.1904
81.75	130.8980	127.23	94.4275	242.00	79.8612
83.79	109.0820	127.91	98.4278	244.70	73.7261
84.00	109.1108	129.30	98.5604	252.40	0.0000
85.43	97.3517	131.20	103.4095	252.80	55.1865
86.55	135.1146	133.02	92.0797	254.15	0.0000
86.79	136.8652	133.52	95.0023	256.23	79.0076
86.94	136.8915	136.00	98.5920	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	80.4129	355.39	0.0000	584.27	30.6372
264.80	80.4203	356.01	43.4351	595.83	42.4523
265.00	79.4373	364.49	39.8445	427.87	24.9592
268.22	79.5935	366.42	0.0000	602.52	0.0000
269.46	69.6956	372.51	49.4749	604.72	30.8577
270.03	69.7202	375.05	40.0503	607.14	16.9861
271.23	80.7343	377.52	56.9820	609.32	20.3989
273.65	77.8572	356.01	49.7460	610.33	20.4059
276.40	66.9867	388.16	40.3025	614.28	20.1242
277.37	62.0237	388.63	44.5545	618.01	18.5996
277.60	57.0296	391.69	41.4315	620.36	23.2684
278.00	62.0473	264.66	62.9414	621.93	26.0743
279.20	57.0835	401.81	64.0421	630.19	0.0000
279.54	57.0948	402.40	58.7212	631.29	28.0254
279.70	57.1009	404.85	53.4431	633.25	30.8489
280.46	59.1305	410.95	54.6645	634.78	22.4467
283.69	62.2545	413.71	52.5866	635.95	18.7129
284.31	55.2459	414.70	49.3888	636.99	15.9118
285.41	54.2760	423.72	48.5108	645.85	20.6524
285.90	0.0000	427.09	35.6280	657.76	20.4194
287.50	49.3103	427.87	37.8006	657.90	0.0000
290.67	67.7496	433.94	42.2331	661.66	17.9289
293.27	0.0000	439.40	46.6756	664.57	0.0000
351.93	45.2840	453.88	55.7050	666.33	18.9014
295.96	52.5840	463.37	51.5411	666.50	18.9023
879.38	52.6617	468.07	57.1360	667.71	0.0000
299.98	53.5146	473.00	0.0000	677.62	23.7128
300.09	53.5178	475.06	56.1999	685.70	0.0000
300.13	53.5187	476.78	47.4177	695.00	18.1210
301.36	40.5725	477.60	48.5366	696.49	21.9466
302.85	60.0979	482.18	35.3657	696.51	21.9466
256.23	60.1530	487.02	38.7571	697.00	20.9956
304.85	60.1647	492.35	0.0000	697.30	20.9978
306.78	52.9045	497.08	36.6899	697.49	20.0443
308.46	54.9904	505.52	30.3427	702.65	21.9887
311.90	47.9524	507.63	0.0000	706.68	21.0590
316.51	43.9816	511.00	34.6565	711.68	21.0917
319.41	49.1733	514.00	21.4898	720.70	14.4207
320.08	55.7497	514.00	21.4898	721.93	0.0000
321.04	52.4977	520.40	26.9290	722.78	19.2397
323.87	50.9343	520.69	0.0000	722.91	19.2407
325.23	52.6148	522.65	0.0000	723.31	19.2427
328.76	57.6560	527.90	0.0000	724.19	22.4561
333.37	46.2369	528.26	32.4123	727.33	4.8167
333.97	46.2513	529.59	32.4290	733.00	14.4749
334.37	61.1304	529.87	0.0000	735.93	12.5560
338.28	58.9787	531.02	19.1525	333.97	17.3931
338.32	58.9804	537.26	31.6196	739.50	0.0000
311.90	49.7234	546.56	0.0000	747.24	12.5985
340.48	49.7234	552.55	23.6234	748.06	14.5404
340.55	49.7249	563.25	33.4467	752.31	16.4999
344.28	62.2760	569.33	31.9973	753.82	10.6812
345.93	52.6327	946.00	31.9990	756.73	14.5778
351.06	54.1590	569.70	32.0016	756.80	14.5781
351.93	54.1828	583.19	30.3188	884.68	16.2321

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	12.9928	1274.44	5.1797	1620.50	4.8887
766.42	12.9951	1001.03	12.0999	1621.92	7.8239
766.84	14.6213	1002.74	6.9170	1678.03	0.0000
772.60	0.0000	1004.73	3.4602	1690.97	3.9567
776.52	18.5723	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.0016
778.90	15.6508	1028.54	0.0000	1063.66	14.0239
783.70	0.0000	1037.84	6.2774	1771.35	10.0187
785.37	20.5801	1038.76	0.0000	1791.20	0.0000
792.07	32.7295	631.29	11.5323	1808.65	6.0461
794.95	6.8788	1048.07	10.4873	1810.72	0.0000
795.86	6.8807	1049.04	14.6856	1836.06	3.0358
810.06	18.7514	1050.41	13.6411		
810.29	20.7267	1063.66	10.5254		
344.28	20.7272	1077.00	10.5576		
810.76	20.7293	1077.34	11.6145		
815.77	9.8850	1085.87	13.7528		
1048.07	17.8066	1093.63	14.8367		
832.01	23.5830	1099.45	14.8559		
834.85	19.8750	1112.07	10.6416		
835.71	16.5662	1112.84	11.8256		
836.80	0.0000	1115.54	12.4243		
846.75	0.0000	1120.29	10.6606		
846.77	4.9850	1120.55	11.7278		
856.80	23.9930	1221.41	5.3315		
860.56	17.0125	1129.67	8.5465		
871.09	7.0248	1131.51	0.0000		
873.19	9.0369	1147.95	0.0000		
875.33	0.0000	1173.23	10.7842		
879.38	7.8226	1177.95	12.5946		
880.51	1.4372	1189.05	14.4277		
883.24	10.0679	1204.77	6.5139		
884.68	6.7145	1221.41	10.8945		
889.28	10.0840	1231.02	6.5496		
894.76	12.1181	1235.36	14.2035		
898.04	15.1608	1238.28	13.1191		
900.72	12.1371	1260.41	0.0000		
903.28	15.1813	1271.87	5.5037		
911.20	20.2832	1274.44	8.2599		
912.08	12.1729	1274.54	10.0954		
923.98	0.0000	1291.59	6.4463		
926.50	11.8786	1298.22	0.0000		
929.11	9.1694	1312.11	8.3218		
937.49	11.2310	1332.49	10.2118		
944.13	18.7496	1362.66	0.0000		
946.00	13.6426	1365.19	8.4078		
949.00	11.9464	1368.63	0.0000		
667.71	0.0000	1384.29	1.1251		
962.31	11.9860	1408.01	2.8253		
964.08	11.9911	1457.56	0.0000		
966.17	0.0000	1460.82	4.8907		
911.20	13.7207	1489.16	8.6023		
968.97	13.7207	1505.03	7.6683		
983.53	6.1964	1584.12	7.7741		
984.45	0.0000	1596.21	6.8163		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:45:34.75

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677033.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;479
Background date : 26-JUN-2016 12:03:34
Sample date     : 11-MAY-2016 15:15:00 Acquisition date : 28-JUN-2016 12:44:44
Sample ID      : G398677033 Sample quantity : 1.42960E+02 GRAM
Detector name   : GAM02 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.35 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572486 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	60.79	27	71	1.13	121.21	119	12	7.59E-03	50.6	2.30E+00
2	1	63.27*	47	105	1.14	126.15	119	12	1.31E-02	42.3	
3	3	74.60*	91	154	1.41	148.80	143	15	2.51E-02	27.4	9.68E-01
4	3	77.14	142	125	1.20	153.89	143	15	3.94E-02	16.1	
5	0	185.76*	47	114	1.66	370.99	367	9	1.31E-02	48.1	
6	0	193.33	47	92	1.87	386.12	382	9	1.31E-02	39.7	
7	0	208.94	28	71	1.63	417.32	415	6	7.84E-03	50.7	
8	4	238.57*	253	79	1.06	476.55	472	16	7.03E-02	8.4	1.79E+00
9	4	241.19	81	106	1.93	481.79	472	16	2.24E-02	36.3	
10	0	270.28	16	96	1.07	539.94	536	8	4.44E-03	109.0	
11	0	295.36*	82	92	1.24	590.05	584	12	2.27E-02	26.7	
12	0	300.41	23	73	0.86	600.16	596	9	6.27E-03	71.2	
13	0	337.93	65	89	1.09	675.16	670	11	1.81E-02	30.6	
14	0	351.86*	137	64	1.56	703.00	695	13	3.80E-02	15.2	
15	0	374.81	13	36	1.66	748.88	742	8	3.61E-03	84.6	
16	0	463.63	21	81	1.44	926.43	921	10	5.88E-03	82.9	
17	0	510.91*	55	70	2.03	1020.93	1012	20	1.54E-02	42.9	
18	0	534.88	23	22	3.40	1068.84	1064	10	6.34E-03	44.1	
19	0	583.00*	74	25	1.41	1165.05	1159	11	2.06E-02	17.8	
20	0	609.29*	99	33	1.52	1217.61	1212	13	2.74E-02	16.6	
21	0	661.43	952	15	1.47	1321.84	1314	15	2.65E-01	3.4	
22	0	726.74	33	8	1.22	1452.41	1446	11	9.03E-03	24.5	
23	0	769.53	41	14	0.92	1537.94	1532	16	1.14E-02	26.6	
24	0	861.22	27	16	1.78	1721.26	1714	14	7.49E-03	37.9	
25	0	898.17	25	12	0.99	1795.13	1788	14	6.81E-03	37.8	
26	0	911.17*	64	14	1.35	1821.12	1815	14	1.77E-02	18.1	
27	0	927.80	5	12	1.03	1854.36	1845	12	1.39E-03	145.6	
28	0	968.86*	32	14	1.50	1936.46	1932	8	8.82E-03	28.0	
29	0	1013.20	10	0	0.66	2025.10	2022	6	2.78E-03	31.6	
30	0	1069.61	16	2	1.54	2137.89	2134	9	4.49E-03	29.7	
31	0	1079.52	9	1	0.96	2157.71	2155	6	2.43E-03	40.0	
32	0	1120.28*	25	8	2.79	2239.20	2233	12	7.01E-03	33.6	
33	0	1146.28	9	5	0.59	2291.18	2285	9	2.36E-03	56.6	
34	0	1198.12	13	8	0.79	2394.83	2385	15	3.69E-03	52.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1238.39	16	8	1.04	2475.34	2469	12	4.31E-03	45.6	
36	0	1298.37	11	0	1.50	2595.27	2591	9	3.06E-03	30.2	
37	0	1347.36	8	3	3.43	2693.24	2687	11	2.30E-03	52.1	
38	0	1460.17*	122	5	1.99	2918.80	2910	18	3.38E-02	10.4	
39	0	1763.89*	26	0	2.78	3526.15	3520	12	7.32E-03	22.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:45:36

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677033.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:15:00 Acquisition date : 28-JUN-2016 12:44:44
Sample ID         : G398677033 Sample quantity  : 142.96 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA2 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.35 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated : No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.046E+00	5.500E+00	5.500E+00	20.81	OK
BA-137M	661.66	89.90*	2.131E+00	2.698E+00	2.706E+00	6.72	OK
CS-137	661.66	85.10*	2.131E+00	2.850E+00	2.858E+00	6.72	OK
TL-208	277.37	6.60	4.043E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.355E+00	2.036E-01	2.036E-01	35.64	OK
	860.56	12.50	1.702E+00	6.716E-01	6.716E-01	75.73	OK
PB-212	74.82	10.28	3.910E+00	1.084E+00	1.084E+00	76.18	OK
	77.11	17.10	4.193E+00	1.280E+00	1.280E+00	32.28	OK
	238.63	43.60*	4.497E+00	7.642E-01	7.642E-01	16.73	OK
	300.09	3.30	3.819E+00	1.040E+00	1.040E+00	142.38	OK
BI-214	609.32	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10	OK
	1120.29	14.92	1.335E+00	6.556E-01	6.556E-01	67.29	OK
	1764.49	15.30	9.019E-01	9.461E-01	9.462E-01	45.20	OK
PB-214	74.82	5.80	3.936E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.193E+00	2.257E+00	2.257E+00	32.28	OK
	87.09	3.41	5.094E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.453E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.866E+00	6.679E-01	6.680E-01	53.31	OK
	351.93	35.60*	3.411E+00	6.459E-01	6.459E-01	30.36	OK
RN-222	609.32	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10	OK
	1120.29	14.92	1.335E+00	6.556E-01	6.556E-01	67.29	OK
	1764.49	15.30	9.019E-01	9.461E-01	9.462E-01	45.20	OK
RA-224	240.99	4.10*	4.463E+00	1.431E+00	1.431E+00	139.65	OK
RA-226	609.32	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10	OK
	1120.29	14.92	1.335E+00	6.556E-01	6.556E-01	67.29	OK
	1764.49	15.30	9.019E-01	9.461E-01	9.462E-01	45.20	OK
AC-228	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.511E+00	9.448E-01	9.448E-01	61.24	OK
	794.95	4.25	1.826E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.618E+00	8.067E-01	8.067E-01	36.24	OK
	968.97	15.80	1.529E+00	6.888E-01	6.888E-01	55.95	OK
RA-228	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.511E+00	9.448E-01	9.448E-01	61.24	OK
	794.95	4.25	1.826E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.618E+00	8.067E-01	8.067E-01	36.24	OK
	968.97	15.80	1.529E+00	6.888E-01	6.888E-01	55.95	OK
TH-228	74.82	10.28	3.910E+00	1.084E+00	1.084E+00	76.18	OK
	77.11	17.10	4.193E+00	1.280E+00	1.280E+00	32.28	OK
	238.63	43.60*	4.497E+00	7.642E-01	7.642E-01	16.73	OK
	300.09	3.30	3.819E+00	1.040E+00	1.040E+00	142.38	OK
TH-230	609.32	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10	OK
	1120.29	14.92	1.335E+00	6.556E-01	6.556E-01	67.29	OK
	1764.49	15.30	9.019E-01	9.461E-01	9.461E-01	45.20	OK
PA-231	283.69	1.70	3.978E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.819E+00	6.415E-01	6.415E-01	142.38	OK
TH-232	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.511E+00	9.448E-01	9.448E-01	61.24	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.618E+00	8.067E-01	8.067E-01	36.24	OK
	968.97	15.80	1.529E+00	6.888E-01	6.888E-01	55.95	OK
U-234	609.32	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10	OK
	1120.29	14.92	1.335E+00	6.556E-01	6.556E-01	67.29	OK
	1764.49	15.30	9.019E-01	9.461E-01	9.461E-01	45.20	OK
AM-241	59.54	35.90*	2.126E+00	2.355E-01	2.356E-01	101.26	OK
AM-243	43.53	5.90	3.128E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.910E+00	1.658E-01	1.658E-01	76.18	OK
ANH-511	511.00	100.00*	2.603E+00	1.184E-01	1.184E-01	85.87	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677033.CNF;1
Acquisition date : 28-JUN-2016 12:44:44 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.35 Half life ratio : *****
Sample date : 11-MAY-2016 15:15:00 Analyst initials: MXR1
Sample ID : G398677033 Sample Quantity : 1.4296E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.500E+00	1.122E+00	6.884E-01
BA-137M	2.706E+00	1.781E-01	7.860E-02
CS-137	2.858E+00	1.882E-01	8.303E-02
TL-208	2.036E-01	7.109E-02	9.491E-02
PB-212	7.642E-01	1.253E-01	1.287E-01
BI-214	5.212E-01	1.691E-01	1.503E-01
PB-214	6.459E-01	1.922E-01	1.651E-01
RN-222	5.212E-01	1.691E-01	1.503E-01
RA-224	1.431E+00	1.958E+00	1.379E+00
RA-226	5.212E-01	1.691E-01	1.503E-01
AC-228	8.067E-01	2.865E-01	2.638E-01
RA-228	8.067E-01	2.865E-01	2.638E-01
TH-228	7.642E-01	1.253E-01	1.287E-01
TH-230	5.212E-01	1.691E-01	1.503E-01
PA-231	6.415E-01	8.951E-01	1.218E+00
TH-232	8.067E-01	2.865E-01	2.638E-01
U-234	5.212E-01	1.691E-01	1.503E-01
AM-241	2.356E-01	2.338E-01	4.062E-01
AM-243	1.658E-01	1.238E-01	1.231E-01
ANH-511	1.184E-01	9.961E-02	6.788E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.760E-01	7.084E-01	1.368E+00	NOT IDENT.
NA-22	-1.574E-02	4.405E-02	8.075E-02	NOT IDENT.
NA-24	0.000E+00	5.453E+21	0.000E+00	SHORT HLIF
AL-26	7.408E-05	2.319E-02	5.508E-02	NOT IDENT.
SC-46	1.828E-03	5.506E-02	1.050E-01	FAIL ABUN
V-48	-7.553E-02	3.028E-01	5.755E-01	NOT IDENT.
CR-51	5.656E-02	1.189E+00	2.189E+00	NOT IDENT.
MN-54	-1.609E-02	4.610E-02	8.205E-02	NOT IDENT.
CO-56	-1.735E-03	5.333E-02	1.013E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF

CO-57	-3.958E-03	3.275E-02	5.891E-02	NOT IDENT.
CO-58	-7.253E-03	5.566E-02	1.041E-01	NOT IDENT.
FE-59	1.277E-01	1.558E-01	3.406E-01	NOT IDENT.
CO-60	3.372E-03	3.401E-02	7.116E-02	NOT IDENT.
ZN-65	2.450E-02	1.153E-01	2.014E-01	NOT IDENT.
GE-68	1.040E+00	1.792E+00	3.134E+00	NOT IDENT.
AS-73	1.104E+00	1.848E+00	3.655E+00	NOT IDENT.
AS-74	-6.247E-02	3.728E-01	6.985E-01	NOT IDENT.
SE-75	1.009E-02	8.246E-02	1.427E-01	NOT IDENT.
BR-77	0.000E+00	2.774E+05	0.000E+00	SHORT HLIF
SR-82	5.880E-01	8.892E-01	1.692E+00	NOT IDENT.
RB-83	-2.736E-02	1.292E-01	2.262E-01	NOT IDENT.
KR-85	3.876E+00	1.118E+01	1.903E+01	NOT IDENT.
SR-85	2.860E-02	8.363E-02	1.423E-01	NOT IDENT.
RB-86	2.390E+00	3.558E+00	6.322E+00	NOT IDENT.
Y-88	8.368E-03	4.267E-02	9.885E-02	FAIL ABUN
Y-91	-7.682E+00	3.521E+01	5.808E+01	NOT IDENT.
NB-94	3.632E-03	3.509E-02	6.770E-02	NOT IDENT.
NB-95	1.243E-01	7.711E-02	1.576E-01	NOT IDENT.
NB-95M	-9.842E-02	2.671E-01	4.218E-01	NOT IDENT.
ZR-95	3.676E-02	1.043E-01	2.094E-01	NOT IDENT.
NB-97	0.000E+00	3.718E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.259E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.181E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	7.446E+40	0.000E+00	SHORT HLIF
RH-101	-3.367E-02	3.983E-02	6.756E-02	NOT IDENT.
RH-102	1.183E-04	7.238E-02	1.363E-01	NOT IDENT.
RU-103	6.322E-02	9.827E-02	1.964E-01	FAIL ABUN
RH-106	-1.712E-01	4.561E-01	8.228E-01	NOT IDENT.
RU-106	-1.712E-01	4.561E-01	8.228E-01	NOT IDENT.
AG-108M	5.730E-02	4.748E-02	9.679E-02	NOT IDENT.
CD-109	7.637E-01	1.068E+00	2.034E+00	NOT IDENT.
AG-110M	-2.200E-02	5.418E-02	1.015E-01	NOT IDENT.
SN-113	6.213E-02	7.206E-02	1.416E-01	NOT IDENT.
CD-115	0.000E+00	4.269E+05	0.000E+00	SHORT HLIF
SN-117M	1.084E-02	3.501E-01	6.703E-01	NOT IDENT.
TE-123M	1.290E-02	4.058E-02	7.905E-02	NOT IDENT.
SB-124	2.299E-02	1.198E-01	2.708E-01	NOT IDENT.
SB-125	-3.767E-03	1.400E-01	2.653E-01	FAIL ABUN
TE-125M	1.522E+00	1.855E+01	3.390E+01	NOT IDENT.
I-126	4.594E-01	1.487E+00	2.611E+00	NOT IDENT.
SB-126	4.124E-01	9.869E-01	1.786E+00	NOT IDENT.
SN-126	7.603E-02	1.006E-01	1.918E-01	FAIL ABUN
SB-127	0.000E+00	4.995E+02	0.000E+00	SHORT HLIF
I-131	2.748E-01	2.767E+00	5.093E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.133E+03	0.000E+00	SHORT HLIF
BA-133	3.919E-02	6.284E-02	1.081E-01	NOT IDENT.
I-133	0.000E+00	2.025E+15	0.000E+00	SHORT HLIF
CS-134	3.114E-02	4.002E-02	8.637E-02	NOT IDENT.
CS-135	-7.352E-02	2.648E-01	4.169E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-1.067E-01	6.254E-01	1.196E+00	NOT IDENT.
CE-139	3.539E-03	4.200E-02	8.051E-02	NOT IDENT.
BA-140	-2.310E-01	2.299E+00	3.744E+00	NOT IDENT.
LA-140	-2.446E-01	5.902E-01	1.109E+00	NOT IDENT.
CE-141	-9.090E-02	1.590E-01	2.951E-01	NOT IDENT.
CE-143	0.000E+00	2.866E+09	0.000E+00	SHORT HLIF
CE-144	2.728E-02	2.591E-01	4.702E-01	NOT IDENT.
PM-144	-8.515E-03	4.216E-02	7.757E-02	NOT IDENT.
PR-144	-6.397E-01	3.211E+00	5.909E+00	NOT IDENT.
PM-146	-4.388E-02	6.350E-02	1.138E-01	NOT IDENT.
ND-147	-3.203E-02	6.234E+00	1.034E+01	NOT IDENT.
PM-147	-4.691E+02	9.118E+02	1.593E+03	NOT IDENT.
PM-149	0.000E+00	3.751E+06	0.000E+00	SHORT HLIF
EU-150	-2.385E-02	4.295E-02	6.437E-02	FAIL ABUN
EU-152	9.616E-03	1.539E-01	2.478E-01	NOT IDENT.
GD-153	-7.461E-02	1.153E-01	2.018E-01	NOT IDENT.
EU-154	-4.385E-02	1.227E-01	2.250E-01	NOT IDENT.
EU-155	3.641E-04	1.320E-01	2.411E-01	NOT IDENT.
TB-160	-7.270E-02	1.802E-01	3.379E-01	NOT IDENT.
HO-166M	-3.021E-02	6.617E-02	1.179E-01	FAIL ABUN
TM-171	-2.118E+01	3.159E+01	5.761E+01	NOT IDENT.
HF-172	7.775E-02	2.360E-01	4.366E-01	FAIL ABUN
LU-172	-2.314E-02	7.266E-02	1.347E-01	FAIL ABUN
LU-176	-1.355E-02	3.828E-02	6.844E-02	NOT IDENT.
HF-181	1.284E-02	1.066E-01	2.028E-01	NOT IDENT.
TA-182	-8.904E-02	1.873E-01	3.382E-01	FAIL ABUN

RE-183	1.597E-01	4.429E-01	7.751E-01	FAIL ABUN
RE-184	1.629E-01	3.284E-01	5.320E-01	NOT IDENT.
W-188	-7.453E+00	1.551E+01	2.380E+01	FAIL ABUN
IR-192	6.368E-03	6.646E-02	1.230E-01	FAIL ABUN
HG-203	-4.466E-02	8.909E-02	1.585E-01	NOT IDENT.
BI-207	2.353E-02	5.537E-02	1.047E-01	FAIL ABUN
PB-210	-2.688E+00	6.408E+00	1.199E+01	NOT IDENT.
BI-211	0.000E+00	5.295E-01	8.227E-01	FAIL ABUN
PB-211	-8.202E-01	1.119E+00	1.890E+00	NOT IDENT.
BI-212	0.000E+00	6.399E-01	1.286E+00	FAIL ABUN
RN-219	-1.318E-01	6.105E-01	1.082E+00	FAIL ABUN
RA-223	8.495E-03	9.211E-01	1.687E+00	FAIL ABUN
AC-227	-9.012E-02	3.271E-01	5.972E-01	FAIL ABUN
TH-227	-9.012E-02	3.271E-01	5.972E-01	FAIL ABUN
TH-229	1.246E+00	9.700E-01	1.296E+00	FAIL ABUN
TH-231	8.495E-03	9.211E-01	1.687E+00	FAIL ABUN
PA-233	-1.678E-02	9.215E-02	1.669E-01	FAIL ABUN
PA-234	4.119E-01	3.062E-01	7.129E-01	FAIL ABUN
PA-234M	-2.200E+00	5.108E+00	9.593E+00	NOT IDENT.
TH-234	3.390E+00	2.811E+00	4.050E+00	FAIL ABUN
U-235	1.901E-01	2.466E-01	4.940E-01	FAIL ABUN
NP-237	-1.678E-02	9.215E-02	1.669E-01	FAIL ABUN
NP-238	0.000E+00	9.486E+05	0.000E+00	SHORT HLIF
U-238	3.390E+00	2.811E+00	4.050E+00	FAIL ABUN
NP-239	-8.195E-02	3.240E-01	5.782E-01	NOT IDENT.
PU-239	-1.439E+02	4.176E+02	7.344E+02	FAIL ABUN
CM-243	1.247E-02	1.265E-01	2.332E-01	NOT IDENT.
BK-247	1.501E-02	1.228E-01	2.126E-01	NOT IDENT.
CM-247	7.167E-03	5.398E-02	9.881E-02	NOT IDENT.
CF-249	1.884E-03	5.401E-02	9.876E-02	NOT IDENT.
CF-251	9.809E-02	1.595E-01	3.136E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	117	10.66*	1.046E+00	5.500E+00	5.500E+00	20.81
BA-137M	661.66	984	89.90*	2.131E+00	2.698E+00	2.706E+00	6.72
CS-137	661.66	984	85.10*	2.131E+00	2.850E+00	2.858E+00	6.72
TL-208	277.37	-----	6.60	4.043E+00	-----	Line Not Found	-----
	583.19	78	85.00*	2.355E+00	2.036E-01	2.036E-01	35.64
	860.56	27	12.50	1.702E+00	6.716E-01	6.716E-01	75.73
BI-211	72.87	-----	1.23	3.707E+00	-----	Line Not Found	-----
	351.06	149	12.92*	3.411E+00	1.780E+00	1.780E+00	30.36
PB-212	74.82	112	10.28	3.910E+00	1.461E+00	1.461E+00	54.83
	77.11	175	17.10	4.193E+00	1.280E+00	1.280E+00	32.28
	238.63	285	43.60*	4.497E+00	7.642E-01	7.642E-01	16.73
	300.09	25	3.30	3.819E+00	1.040E+00	1.040E+00	142.38
BI-214	609.32	103	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10
	1120.29	25	14.92	1.335E+00	6.556E-01	6.556E-01	67.29
	1764.49	25	15.30	9.019E-01	9.461E-01	9.462E-01	45.20
PB-214	74.82	112	5.80	3.910E+00	2.589E+00	2.589E+00	54.83
	77.11	175	9.70	4.193E+00	2.257E+00	2.257E+00	32.28
	87.09	-----	3.41	5.094E+00	-----	Line Not Found	-----
	242.00	91	7.25	4.463E+00	1.477E+00	1.477E+00	72.60
	295.22	91	18.42	3.866E+00	6.679E-01	6.680E-01	53.31
	351.93	149	35.60*	3.411E+00	6.459E-01	6.459E-01	30.36
RN-222	609.32	103	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10
	1120.29	25	14.92	1.335E+00	6.556E-01	6.556E-01	67.29
	1764.49	25	15.30	9.019E-01	9.461E-01	9.462E-01	45.20
RA-224	240.99	91	4.10*	4.463E+00	2.612E+00	2.612E+00	72.60
RA-226	609.32	103	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10
	1120.29	25	14.92	1.335E+00	6.556E-01	6.556E-01	67.29
	1764.49	25	15.30	9.019E-01	9.461E-01	9.462E-01	45.20
AC-228	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.511E+00	9.448E-01	9.448E-01	61.24
	794.95	-----	4.25	1.826E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.618E+00	8.067E-01	8.067E-01	36.24
	968.97	32	15.80	1.529E+00	6.888E-01	6.888E-01	55.95
RA-228	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.511E+00	9.448E-01	9.448E-01	61.24
	794.95	-----	4.25	1.826E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.618E+00	8.067E-01	8.067E-01	36.24
	968.97	32	15.80	1.529E+00	6.888E-01	6.888E-01	55.95
TH-228	74.82	112	10.28	3.910E+00	1.461E+00	1.461E+00	54.83
	77.11	175	17.10	4.193E+00	1.280E+00	1.280E+00	32.28
	238.63	285	43.60*	4.497E+00	7.642E-01	7.642E-01	16.73
	300.09	25	3.30	3.819E+00	1.040E+00	1.040E+00	142.38
TH-230	609.32	103	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10
	1120.29	25	14.92	1.335E+00	6.556E-01	6.556E-01	67.29
	1764.49	25	15.30	9.019E-01	9.461E-01	9.461E-01	45.20

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
PA-231	283.69	-----	1.70	3.978E+00	-----	Line Not Found	-----
	301.36	25	5.35*	3.819E+00	6.415E-01	6.415E-01	142.38
TH-232	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.511E+00	9.448E-01	9.448E-01	61.24
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.618E+00	8.067E-01	8.067E-01	36.24
	968.97	32	15.80	1.529E+00	6.888E-01	6.888E-01	55.95
U-234	609.32	103	45.49*	2.275E+00	5.212E-01	5.212E-01	33.10
	1120.29	25	14.92	1.335E+00	6.556E-01	6.556E-01	67.29
	1764.49	25	15.30	9.019E-01	9.461E-01	9.461E-01	45.20
AM-241	59.54	34	35.90*	2.126E+00	2.355E-01	2.356E-01	101.26
AM-243	43.53	-----	5.90	3.128E-01	-----	Line Not Found	-----
	74.66	112	67.20*	3.910E+00	2.234E-01	2.234E-01	54.83
ANH-511	511.00	59	100.00*	2.603E+00	1.184E-01	1.184E-01	85.87

Flag: "*" = Keyline

Total number of lines in spectrum 39
Number of unidentified lines 9
Number of lines tentatively identified by NID 30 76.92%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.500E+00	5.500E+00	1.145E+00	20.81	
BA-137M	30.08Y	1.00	2.698E+00	2.706E+00	0.182E+00	6.72	
CS-137	30.08Y	1.00	2.850E+00	2.858E+00	0.192E+00	6.72	
TL-208	1.41E+10Y	1.00	2.036E-01	2.036E-01	0.725E-01	35.64	
BI-211	7.04E+08Y	1.00	1.780E+00	1.780E+00	0.540E+00	30.36	
PB-212	1.41E+10Y	1.00	7.642E-01	7.642E-01	1.279E-01	16.73	
BI-214	1600.00Y	1.00	5.212E-01	5.212E-01	1.725E-01	33.10	
PB-214	1600.00Y	1.00	6.459E-01	6.459E-01	1.961E-01	30.36	
RN-222	1600.00Y	1.00	5.212E-01	5.212E-01	1.725E-01	33.10	
RA-224	1.41E+10Y	1.00	2.612E+00	2.612E+00	1.896E+00	72.60	
RA-226	1600.00Y	1.00	5.212E-01	5.212E-01	1.725E-01	33.10	
AC-228	1.41E+10Y	1.00	8.067E-01	8.067E-01	2.924E-01	36.24	
RA-228	1.41E+10Y	1.00	8.067E-01	8.067E-01	2.924E-01	36.24	
TH-228	1.41E+10Y	1.00	7.642E-01	7.642E-01	1.279E-01	16.73	
TH-230	7.54E+04Y	1.00	5.212E-01	5.212E-01	1.725E-01	33.10	
PA-231	7.04E+08Y	1.00	6.415E-01	6.415E-01	9.134E-01	142.38	
TH-232	1.41E+10Y	1.00	8.067E-01	8.067E-01	2.924E-01	36.24	
U-234	2.45E+05Y	1.00	5.212E-01	5.212E-01	1.725E-01	33.10	
AM-241	432.60Y	1.00	2.355E-01	2.356E-01	2.386E-01	101.26	
AM-243	7370.00Y	1.00	2.234E-01	2.234E-01	1.225E-01	54.83	
ANH-511	1.00E+09Y	1.00	1.184E-01	1.184E-01	1.016E-01	85.87	

Total Activity : 2.406E+01 2.408E+01

Grand Total Activity : 2.406E+01 2.408E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	63.27	59	131	1.14	126.15	119	12	1.31E-02	84.6	2.46E+00	T
0	185.76	54	131	1.66	370.99	367	9	1.31E-02	96.1	5.30E+00	T
0	193.33	54	105	1.87	386.12	382	9	1.31E-02	79.4	5.17E+00	T
0	208.94	32	81	1.63	417.32	415	6	7.84E-03	****	4.92E+00	
0	270.28	18	107	1.07	539.94	536	8	4.44E-03	****	4.12E+00	T
0	374.81	14	39	1.66	748.88	742	8	3.61E-03	****	3.26E+00	T
0	463.63	23	86	1.44	926.43	921	10	5.88E-03	****	2.80E+00	T
0	534.88	24	23	3.40	1068.84	1064	10	6.34E-03	88.1	2.52E+00	
0	726.74	33	9	1.22	1452.41	1446	11	9.03E-03	49.1	1.97E+00	T
0	769.53	42	14	0.92	1537.94	1532	16	1.14E-02	53.1	1.88E+00	
0	898.17	25	13	0.99	1795.13	1788	14	6.81E-03	75.7	1.64E+00	T
0	927.80	5	12	1.03	1854.36	1845	12	1.39E-03	****	1.59E+00	T
0	1013.20	10	0	0.66	2025.10	2022	6	2.78E-03	63.2	1.47E+00	
0	1069.61	16	2	1.54	2137.89	2134	9	4.49E-03	59.4	1.39E+00	
0	1079.52	9	1	0.96	2157.71	2155	6	2.43E-03	80.0	1.38E+00	
0	1146.28	8	4	0.59	2291.18	2285	9	2.36E-03	****	1.31E+00	
0	1198.12	13	8	0.79	2394.83	2385	15	3.69E-03	****	1.25E+00	
0	1238.39	15	7	1.04	2475.34	2469	12	4.31E-03	91.2	1.21E+00	T
0	1298.37	11	0	1.50	2595.27	2591	9	3.06E-03	60.3	1.16E+00	T
0	1347.36	8	3	3.43	2693.24	2687	11	2.30E-03	****	1.12E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677033.CNF;1  *
* Acquisition date   : 28-JUN-2016 12:44:44 Sensitivity      : 3.000          *
* Detector ID        : GAM02 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.35 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 15:15:00 Nuclide Library : SOLID         *
* Sample ID          : G398677033 Analyst initials: MXR1          *
* Batch Number       : 1572486 Sample Quantity : 1.4296E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000         *
*                                     Dry Weight    : 0.00000         *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 18-AUG-2015 11:34:20 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.802E-01
BA-137M	3.551E-02
CS-137	3.751E-02
TL-208	4.384E-02
PB-212	6.058E-02
BI-214	6.816E-02
PB-214	7.650E-02
RN-222	6.816E-02
RA-224	6.492E-01
RA-226	6.816E-02
AC-228	1.146E-01
RA-228	1.146E-01
TH-228	6.058E-02
TH-230	6.815E-02
PA-231	5.732E-01
TH-232	1.146E-01
U-234	6.815E-02
AM-241	1.923E-01
AM-243	5.869E-02
ANH-511	3.115E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.366E-01	NOT IDENT.
NA-22	3.411E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.952E-02	NOT IDENT.
SC-46	4.601E-02	FAIL ABUN
V-48	2.496E-01	NOT IDENT.
CR-51	1.027E+00	NOT IDENT.
MN-54	3.644E-02	NOT IDENT.
CO-56	4.425E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.786E-02	NOT IDENT.

CO-58	4.559E-02	NOT IDENT.
FE-59	1.506E-01	NOT IDENT.
CO-60	2.917E-02	NOT IDENT.
ZN-65	8.860E-02	NOT IDENT.
GE-68	1.386E+00	NOT IDENT.
AS-73	1.734E+00	NOT IDENT.
AS-74	3.148E-01	NOT IDENT.
SE-75	6.742E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	7.506E-01	NOT IDENT.
RB-83	1.039E-01	NOT IDENT.
KR-85	8.866E+00	NOT IDENT.
SR-85	6.626E-02	NOT IDENT.
RB-86	2.805E+00	NOT IDENT.
Y-88	3.831E-02	FAIL ABUN
Y-91	2.515E+01	NOT IDENT.
NB-94	3.028E-02	NOT IDENT.
NB-95	7.237E-02	NOT IDENT.
NB-95M	1.999E-01	NOT IDENT.
ZR-95	9.300E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.195E-02	NOT IDENT.
RH-102	6.216E-02	NOT IDENT.
RU-103	9.119E-02	FAIL ABUN
RH-106	3.758E-01	NOT IDENT.
RU-106	3.758E-01	NOT IDENT.
AG-108M	4.566E-02	NOT IDENT.
CD-109	9.747E-01	NOT IDENT.
AG-110M	4.392E-02	NOT IDENT.
SN-113	6.605E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.181E-01	NOT IDENT.
TE-123M	3.750E-02	NOT IDENT.
SB-124	1.075E-01	NOT IDENT.
SB-125	1.241E-01	FAIL ABUN
TE-125M	1.613E+01	NOT IDENT.
I-126	1.170E+00	NOT IDENT.
SB-126	7.933E-01	NOT IDENT.
SN-126	9.196E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	2.378E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.055E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.835E-02	NOT IDENT.
CS-135	1.973E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.193E-01	NOT IDENT.
CE-139	3.816E-02	NOT IDENT.
BA-140	1.711E+00	NOT IDENT.
LA-140	4.504E-01	NOT IDENT.
CE-141	1.404E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.227E-01	NOT IDENT.
PM-144	3.489E-02	NOT IDENT.
PR-144	2.658E+00	NOT IDENT.
PM-146	5.292E-02	NOT IDENT.
ND-147	4.717E+00	NOT IDENT.
PM-147	7.524E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.002E-02	FAIL ABUN
EU-152	1.159E-01	NOT IDENT.
GD-153	9.571E-02	NOT IDENT.
EU-154	9.506E-02	NOT IDENT.
EU-155	1.145E-01	NOT IDENT.
TB-160	1.463E-01	NOT IDENT.
HO-166M	5.231E-02	FAIL ABUN
TM-171	2.722E+01	NOT IDENT.
HF-172	2.070E-01	FAIL ABUN
LU-172	5.861E-02	FAIL ABUN
LU-176	3.214E-02	NOT IDENT.
HF-181	9.414E-02	NOT IDENT.
TA-182	1.403E-01	FAIL ABUN
RE-183	3.673E-01	FAIL ABUN

RE-184	2.364E-01	NOT IDENT.
W-188	1.115E+01	FAIL ABUN
IR-192	5.771E-02	FAIL ABUN
HG-203	7.470E-02	NOT IDENT.
BI-207	4.546E-02	FAIL ABUN
PB-210	5.647E+00	NOT IDENT.
BI-211	3.949E-01	FAIL ABUN
PB-211	8.825E-01	NOT IDENT.
BI-212	5.881E-01	FAIL ABUN
RN-219	5.054E-01	FAIL ABUN
RA-223	7.927E-01	FAIL ABUN
AC-227	2.805E-01	FAIL ABUN
TH-227	2.805E-01	FAIL ABUN
TH-229	6.154E-01	FAIL ABUN
TH-231	7.927E-01	FAIL ABUN
PA-233	7.832E-02	FAIL ABUN
PA-234	3.181E-01	FAIL ABUN
PA-234M	4.220E+00	NOT IDENT.
TH-234	1.942E+00	FAIL ABUN
U-235	2.357E-01	FAIL ABUN
NP-237	7.832E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.942E+00	FAIL ABUN
NP-239	2.738E-01	NOT IDENT.
PU-239	3.480E+02	FAIL ABUN
CM-243	1.105E-01	NOT IDENT.
BK-247	1.004E-01	NOT IDENT.
CM-247	4.613E-02	NOT IDENT.
CF-249	4.590E-02	NOT IDENT.
CF-251	1.489E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677033.CNF;1
Acquisition date : 28-JUN-2016 12:44:44 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.35 Half life ratio : *****
Sample date : 11-MAY-2016 15:15:00 Nuclide Library : SOLID
Sample ID : G398677033 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4296E+02 GRAM
Quantity Err(%) : 1.3990E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.500E+00	1.216E+00	1.216E+00
BA-137M	2.706E+00	2.941E-01	2.941E-01
CS-137	2.858E+00	3.106E-01	3.106E-01
TL-208	2.036E-01	7.323E-02	7.323E-02
PB-212	7.642E-01	1.451E-01	1.451E-01
BI-214	5.212E-01	1.750E-01	1.750E-01
PB-214	6.459E-01	2.011E-01	2.011E-01
RN-222	5.212E-01	1.750E-01	1.750E-01
RA-224	1.431E+00	1.970E+00	1.970E+00
RA-226	5.212E-01	1.750E-01	1.750E-01
AC-228	8.067E-01	3.087E-01	3.087E-01
RA-228	8.067E-01	3.087E-01	3.087E-01
TH-228	7.642E-01	1.451E-01	1.451E-01
TH-230	5.212E-01	1.750E-01	1.750E-01
PA-231	6.415E-01	9.075E-01	9.075E-01
TH-232	8.067E-01	3.087E-01	3.087E-01
U-234	5.212E-01	1.750E-01	1.750E-01
AM-241	2.356E-01	2.355E-01	2.355E-01
AM-243	1.658E-01	1.252E-01	1.252E-01
ANH-511	1.184E-01	1.001E-01	1.001E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.760E-01	7.086E-01	7.130E-01	NOT IDENT.
NA-22	-1.574E-02	4.407E-02	4.464E-02	NOT IDENT.
NA-24	3.208E+19	5.453E+21	0.000E+00	SHORT HLIF
AL-26	7.408E-05	2.319E-02	2.319E-02	NOT IDENT.
SC-46	1.828E-03	5.506E-02	5.507E-02	FAIL ABUN
V-48	-7.553E-02	3.031E-01	3.050E-01	NOT IDENT.
CR-51	5.656E-02	1.189E+00	1.189E+00	NOT IDENT.
MN-54	-1.609E-02	4.614E-02	4.671E-02	NOT IDENT.
CO-56	-1.735E-03	5.333E-02	5.334E-02	FAIL ABUN
MN-56	-1.000E+41	3.074E+42	0.000E+00	SHORT HLIF

CO-57	-3.958E-03	3.275E-02	3.280E-02	NOT IDENT.
CO-58	-7.253E-03	5.567E-02	5.576E-02	NOT IDENT.
FE-59	1.277E-01	1.580E-01	1.681E-01	NOT IDENT.
CO-60	3.372E-03	3.401E-02	3.404E-02	NOT IDENT.
ZN-65	2.450E-02	1.154E-01	1.159E-01	NOT IDENT.
GE-68	1.040E+00	1.802E+00	1.862E+00	NOT IDENT.
AS-73	1.104E+00	1.865E+00	1.930E+00	NOT IDENT.
AS-74	-6.247E-02	3.728E-01	3.739E-01	NOT IDENT.
SE-75	1.009E-02	8.247E-02	8.259E-02	NOT IDENT.
BR-77	1.691E+06	2.361E+06	2.481E+06	SHORT HLIF
SR-82	5.880E-01	8.915E-01	9.301E-01	NOT IDENT.
RB-83	-2.736E-02	1.293E-01	1.299E-01	NOT IDENT.
KR-85	3.876E+00	1.119E+01	1.132E+01	NOT IDENT.
SR-85	2.860E-02	8.366E-02	8.465E-02	NOT IDENT.
RB-86	2.390E+00	3.586E+00	3.744E+00	NOT IDENT.
Y-88	8.368E-03	4.267E-02	4.284E-02	FAIL ABUN
Y-91	-7.682E+00	3.522E+01	3.539E+01	NOT IDENT.
NB-94	3.632E-03	3.510E-02	3.513E-02	NOT IDENT.
NB-95	1.243E-01	7.824E-02	9.624E-02	NOT IDENT.
NB-95M	-9.842E-02	2.673E-01	2.709E-01	NOT IDENT.
ZR-95	3.676E-02	1.043E-01	1.057E-01	NOT IDENT.
NB-97	1.000E+41	3.818E+40	0.000E+00	SHORT HLIF
ZR-97	4.945E+20	2.297E+20	0.000E+00	SHORT HLIF
MO-99	1.460E+04	5.183E+04	5.225E+04	SHORT HLIF
TC-99M	-1.000E+41	7.534E+40	0.000E+00	SHORT HLIF
RH-101	-3.367E-02	4.033E-02	4.310E-02	NOT IDENT.
RH-102	1.183E-04	7.238E-02	7.238E-02	NOT IDENT.
RU-103	6.322E-02	9.843E-02	1.025E-01	FAIL ABUN
RH-106	-1.712E-01	4.564E-01	4.629E-01	NOT IDENT.
RU-106	-1.712E-01	4.564E-01	4.629E-01	NOT IDENT.
AG-108M	5.730E-02	4.770E-02	5.425E-02	NOT IDENT.
CD-109	7.637E-01	1.072E+00	1.126E+00	NOT IDENT.
AG-110M	-2.200E-02	5.427E-02	5.516E-02	NOT IDENT.
SN-113	6.213E-02	7.222E-02	7.746E-02	NOT IDENT.
CD-115	-2.415E+05	4.276E+05	4.412E+05	SHORT HLIF
SN-117M	1.084E-02	3.501E-01	3.501E-01	NOT IDENT.
TE-123M	1.290E-02	4.059E-02	4.100E-02	NOT IDENT.
SB-124	2.299E-02	1.198E-01	1.202E-01	NOT IDENT.
SB-125	-3.767E-03	1.400E-01	1.401E-01	FAIL ABUN
TE-125M	1.522E+00	1.855E+01	1.857E+01	NOT IDENT.
I-126	4.594E-01	1.488E+00	1.503E+00	NOT IDENT.
SB-126	4.124E-01	9.884E-01	1.006E+00	NOT IDENT.
SN-126	7.603E-02	1.008E-01	1.065E-01	FAIL ABUN
SB-127	8.760E+01	4.999E+02	5.015E+02	SHORT HLIF
I-131	2.748E-01	2.768E+00	2.770E+00	NOT IDENT.
I-132	1.000E+41	4.364E+41	0.000E+00	SHORT HLIF
TE-132	-1.240E+03	1.144E+03	1.273E+03	SHORT HLIF
BA-133	3.919E-02	6.294E-02	6.537E-02	NOT IDENT.
I-133	-2.093E+14	2.026E+15	2.028E+15	SHORT HLIF
CS-134	3.114E-02	4.018E-02	4.256E-02	NOT IDENT.
CS-135	-7.352E-02	2.649E-01	2.670E-01	NOT IDENT.
I-135	1.000E+41	5.876E+41	0.000E+00	SHORT HLIF
CS-136	-1.067E-01	6.257E-01	6.276E-01	NOT IDENT.
CE-139	3.539E-03	4.200E-02	4.203E-02	NOT IDENT.
BA-140	-2.310E-01	2.299E+00	2.301E+00	NOT IDENT.
LA-140	-2.446E-01	5.905E-01	6.008E-01	NOT IDENT.
CE-141	-9.090E-02	1.591E-01	1.643E-01	NOT IDENT.
CE-143	5.985E+09	2.938E+09	3.989E+09	SHORT HLIF
CE-144	2.728E-02	2.591E-01	2.594E-01	NOT IDENT.
PM-144	-8.515E-03	4.216E-02	4.234E-02	NOT IDENT.
PR-144	-6.397E-01	3.211E+00	3.224E+00	NOT IDENT.
PM-146	-4.388E-02	6.366E-02	6.666E-02	NOT IDENT.
ND-147	-3.203E-02	6.234E+00	6.234E+00	NOT IDENT.
PM-147	-4.691E+02	9.126E+02	9.368E+02	NOT IDENT.
PM-149	-2.029E+06	3.766E+06	3.875E+06	SHORT HLIF
EU-150	-2.385E-02	4.301E-02	4.434E-02	FAIL ABUN
EU-152	9.616E-03	1.539E-01	1.540E-01	NOT IDENT.
GD-153	-7.461E-02	1.155E-01	1.203E-01	NOT IDENT.
EU-154	-4.385E-02	1.228E-01	1.244E-01	NOT IDENT.
EU-155	3.641E-04	1.320E-01	1.320E-01	NOT IDENT.
TB-160	-7.270E-02	1.805E-01	1.834E-01	NOT IDENT.
HO-166M	-3.021E-02	6.624E-02	6.763E-02	FAIL ABUN
TM-171	-2.118E+01	3.172E+01	3.312E+01	NOT IDENT.
HF-172	7.775E-02	2.364E-01	2.390E-01	FAIL ABUN
LU-172	-2.314E-02	7.282E-02	7.357E-02	FAIL ABUN
LU-176	-1.355E-02	3.830E-02	3.879E-02	NOT IDENT.
HF-181	1.284E-02	1.066E-01	1.067E-01	NOT IDENT.
TA-182	-8.904E-02	1.875E-01	1.917E-01	FAIL ABUN

RE-183	1.597E-01	4.435E-01	4.493E-01	FAIL ABUN
RE-184	1.629E-01	3.294E-01	3.374E-01	NOT IDENT.
W-188	-7.453E+00	1.555E+01	1.591E+01	FAIL ABUN
IR-192	6.368E-03	6.647E-02	6.653E-02	FAIL ABUN
HG-203	-4.466E-02	8.922E-02	9.146E-02	NOT IDENT.
BI-207	2.353E-02	5.553E-02	5.654E-02	FAIL ABUN
PB-210	-2.688E+00	6.414E+00	6.528E+00	NOT IDENT.
BI-211	1.780E+00	5.547E-01	9.754E-01	FAIL ABUN
PB-211	-8.202E-01	1.121E+00	1.180E+00	NOT IDENT.
BI-212	1.330E+00	6.543E-01	8.875E-01	FAIL ABUN
RN-219	-1.318E-01	6.108E-01	6.137E-01	FAIL ABUN
RA-223	8.495E-03	9.211E-01	9.212E-01	FAIL ABUN
AC-227	-9.012E-02	3.274E-01	3.299E-01	FAIL ABUN
TH-227	-9.012E-02	3.274E-01	3.299E-01	FAIL ABUN
TH-229	1.246E+00	9.749E-01	1.125E+00	FAIL ABUN
TH-231	8.495E-03	9.211E-01	9.212E-01	FAIL ABUN
PA-233	-1.678E-02	9.217E-02	9.248E-02	FAIL ABUN
PA-234	4.119E-01	5.651E-01	5.948E-01	FAIL ABUN
PA-234M	-2.200E+00	5.121E+00	5.216E+00	NOT IDENT.
TH-234	3.390E+00	2.926E+00	3.301E+00	FAIL ABUN
U-235	1.901E-01	2.471E-01	2.615E-01	FAIL ABUN
NP-237	-1.678E-02	9.217E-02	9.248E-02	FAIL ABUN
NP-238	2.036E+05	9.492E+05	9.536E+05	SHORT HLIF
U-238	3.390E+00	2.926E+00	3.301E+00	FAIL ABUN
NP-239	-8.195E-02	3.241E-01	3.262E-01	NOT IDENT.
PU-239	-1.439E+02	4.177E+02	4.227E+02	FAIL ABUN
CM-243	1.247E-02	1.265E-01	1.266E-01	NOT IDENT.
BK-247	1.501E-02	1.229E-01	1.231E-01	NOT IDENT.
CM-247	7.167E-03	5.400E-02	5.410E-02	NOT IDENT.
CF-249	1.884E-03	5.401E-02	5.402E-02	NOT IDENT.
CF-251	9.809E-02	1.600E-01	1.660E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	94.2306	87.09	161.4174	136.47	99.2246
45.60	71.0885	87.57	151.8013	140.51	0.0000
46.54	98.0017	88.03	150.8435	143.76	106.4026
49.72	0.0000	88.34	158.5298	144.24	119.7781
51.35	100.2713	88.47	158.5677	145.44	145.7372
51.87	111.4508	89.96	294.0340	152.43	138.9787
52.39	117.6320	1093.63	244.2378	153.25	122.9657
52.97	100.6889	91.11	189.8797	323.87	116.8227
53.44	96.7764	92.59	146.6143	156.02	108.0798
54.07	93.9009	93.35	120.5162	158.56	113.8405
57.36	0.0000	94.56	166.8847	159.00	104.8622
57.53	100.8127	94.65	219.6197	162.33	117.9940
57.98	97.8633	94.67	219.6279	162.66	118.0416
59.27	99.6981	94.87	228.4924	163.33	101.7794
59.32	99.7098	97.43	126.8885	165.86	108.4675
59.54	105.9008	98.43	116.0523	176.31	100.5684
60.96	115.4925	98.44	116.0539	176.60	101.5246
61.17	125.3062	99.53	102.9803	177.52	101.6312
62.93	125.8136	100.11	90.8883	181.07	0.0000
63.29	125.9164	102.03	117.8666	181.52	115.8251
63.58	125.9990	103.18	104.7216	184.41	102.7900
64.28	131.8871	103.37	106.9834	143.76	123.0783
66.73	112.3242	105.21	111.7762	193.51	106.2548
67.24	114.0113	105.31	118.5022	197.03	95.1368
125.81	132.8799	106.12	111.9410	198.01	95.2352
67.75	132.9001	106.47	116.4843	201.83	111.9304
69.67	136.5906	109.28	127.1336	203.43	95.0134
70.83	125.9088	111.00	144.4004	205.31	112.7127
72.81	139.0737	111.76	0.0000	210.85	94.9670
72.87	139.0912	114.06	128.0848	215.65	106.7725
74.66	139.6028	116.30	0.0000	222.11	101.6410
74.82	139.6484	116.74	113.8138	227.09	94.3469
74.97	139.6907	119.76	102.8975	227.38	104.1020
77.11	140.2936	121.12	107.6873	228.16	0.0000
78.74	108.7594	121.22	112.2867	228.18	113.9177
79.69	104.1546	121.78	104.3518	116.74	113.9177
80.12	102.6382	122.06	104.3949	235.69	122.3711
80.19	102.6523	122.92	103.3779	235.96	122.4015
80.57	104.3332	123.07	103.4006	238.63	86.5216
81.00	123.6975	265.00	113.8418	238.98	0.0000
81.07	130.1412	125.81	102.6586	240.99	86.7089
81.75	148.0078	127.23	127.1391	242.00	86.7888
83.79	144.2772	127.91	97.1825	244.70	85.4198
84.00	150.7972	129.30	119.3986	252.40	0.0000
85.43	130.6814	131.20	95.3097	252.80	81.6572
86.55	139.6116	133.02	116.5263	254.15	0.0000
86.79	152.6654	133.52	104.9460	256.23	86.8975
86.94	157.0406	136.00	101.7938	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	93.9037	355.39	0.0000	584.27	55.6111
264.80	93.9144	356.01	53.5022	595.83	30.5875
265.00	93.9315	364.49	64.0100	427.87	29.6660
268.22	114.6400	366.42	0.0000	602.52	0.0000
269.46	95.3636	372.51	58.9002	604.72	34.6761
270.03	87.9306	375.05	73.4221	607.14	44.6331
271.23	77.7000	377.52	36.7705	609.32	31.7703
273.65	92.4552	356.01	52.7468	610.33	33.1095
276.40	87.3818	388.16	57.3011	614.28	34.8274
277.37	84.4020	388.63	59.5231	618.01	28.9051
277.60	89.5026	391.69	46.3867	620.36	45.8989
278.00	87.4973	264.66	79.9728	621.93	43.9334
279.20	102.8602	401.81	72.2492	630.19	0.0000
279.54	89.6462	402.40	63.3805	631.29	36.0958
279.70	86.6005	404.85	84.6372	633.25	31.1097
280.46	83.5966	410.95	71.5430	634.78	42.1774
283.69	91.9940	413.71	63.8267	635.95	35.1658
284.31	101.2433	414.70	78.4306	636.99	32.1664
285.41	92.1217	423.72	66.6939	645.85	27.2459
285.90	0.0000	427.09	74.0532	657.76	35.5007
287.50	77.9227	427.87	71.3777	657.90	0.0000
290.67	87.1666	433.94	63.4742	661.66	29.4645
293.27	0.0000	439.40	70.0463	664.57	0.0000
351.93	70.9752	453.88	73.3877	666.33	20.3608
295.96	71.0161	463.37	78.3947	666.50	20.3623
879.38	57.9226	468.07	83.2253	667.71	0.0000
299.98	57.9858	473.00	0.0000	677.62	20.4580
300.09	84.5011	475.06	75.1939	685.70	0.0000
300.13	84.5036	476.78	70.6191	695.00	28.8483
301.36	84.5845	477.60	54.8472	696.49	29.8970
302.85	78.0400	482.18	52.1896	696.51	29.8970
256.23	84.7900	487.02	56.0647	697.00	28.8723
304.85	78.1604	492.35	0.0000	697.30	24.7506
306.78	88.4772	497.08	44.1549	697.49	22.6896
308.46	76.0844	505.52	61.3390	702.65	22.7375
311.90	82.5524	507.63	0.0000	706.68	24.8455
316.51	75.4991	511.00	41.6416	711.68	26.9706
319.41	72.5102	514.00	53.7130	720.70	15.6163
320.08	76.7516	514.00	53.7130	721.93	0.0000
321.04	86.2754	520.40	46.3625	722.78	29.5217
323.87	81.1851	520.69	0.0000	722.91	31.2605
325.23	79.1553	522.65	0.0000	723.31	31.2649
328.76	79.3591	527.90	0.0000	724.19	19.1130
333.37	81.5356	528.26	42.9686	727.33	17.3975
333.97	79.8713	529.59	39.8122	733.00	11.7697
334.37	73.0948	529.87	0.0000	735.93	18.8530
338.28	74.5779	531.02	36.6534	333.97	24.1045
338.32	74.5801	537.26	39.9668	739.50	0.0000
311.90	73.4139	546.56	0.0000	747.24	23.1446
340.48	73.4139	552.55	36.7271	748.06	23.1521
340.55	73.4181	563.25	41.7780	752.31	21.0820
344.28	68.4756	569.33	41.8998	753.82	21.0942
345.93	80.5518	946.00	41.9040	756.73	16.8941
351.06	53.7506	569.70	40.9336	756.80	16.8945
351.93	53.7827	583.19	49.0442	884.68	24.7056

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	15.8936	1274.44	20.0626	1620.50	2.8726
766.42	14.1309	1001.03	18.1786	1621.92	5.7468
766.84	12.3665	1002.74	12.4446	1678.03	0.0000
772.60	0.0000	1004.73	22.0304	1690.97	3.8853
776.52	12.4118	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.9125
778.90	17.3033	1028.54	0.0000	1063.66	26.6365
783.70	0.0000	1037.84	18.3823	1771.35	15.7879
785.37	19.2133	1038.76	0.0000	1791.20	0.0000
792.07	21.4014	631.29	20.3702	1808.65	1.9875
794.95	14.9970	1048.07	16.4978	1810.72	0.0000
795.86	9.6442	1049.04	14.5605	1836.06	2.9967
810.06	24.7750	1050.41	12.6244		
810.29	22.6222	1063.66	10.0275		
344.28	22.6237	1077.00	11.7446		
810.76	18.3165	1077.34	11.7456		
815.77	17.2703	1085.87	12.9519		
1048.07	17.2875	1093.63	16.7178		
832.01	18.4572	1099.45	10.8353		
834.85	26.0836	1112.07	9.2266		
835.71	26.0918	1112.84	11.8652		
836.80	0.0000	1115.54	15.2672		
846.75	0.0000	1120.29	20.8077		
846.77	16.3711	1120.55	16.9873		
856.80	18.2540	1221.41	15.2917		
860.56	14.2568	1129.67	19.8690		
871.09	13.7585	1131.51	0.0000		
873.19	12.8504	1147.95	0.0000		
875.33	0.0000	1173.23	10.0541		
879.38	18.3968	1177.95	15.1001		
880.51	18.4037	1189.05	19.0398		
883.24	11.9735	1204.77	16.7296		
884.68	18.4298	1221.41	12.2202		
889.28	16.6128	1231.02	14.0011		
894.76	20.6063	1235.36	14.0167		
898.04	19.4388	1238.28	16.3652		
900.72	15.8827	1260.41	0.0000		
903.28	13.9093	1271.87	9.2849		
911.20	14.8757	1274.44	13.4200		
912.08	19.1313	1274.54	13.4205		
923.98	0.0000	1291.59	4.6655		
926.50	17.6206	1298.22	0.0000		
929.11	22.4453	1312.11	10.4207		
937.49	13.1290	1332.49	6.2837		
944.13	12.2174	1362.66	0.0000		
946.00	8.4631	1365.19	8.4447		
949.00	15.0602	1368.63	0.0000		
667.71	0.0000	1384.29	6.3621		
962.31	28.3582	1408.01	5.3314		
964.08	14.5924	1457.56	0.0000		
966.17	14.6021	1460.82	6.4753		
911.20	27.4707	1489.16	7.4475		
968.97	27.4707	1505.03	7.4738		
983.53	17.1288	1584.12	7.6021		
984.45	0.0000	1596.21	9.5267		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:46:24.16

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677034.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;306
Background date    : 26-JUN-2016 12:04:02
Sample date       : 11-MAY-2016 15:00:00 Acquisition date : 28-JUN-2016 12:45:06
Sample ID        : G398677034 Sample quantity : 1.35520E+02 GRAM
Detector name     : GAM08 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.18*	31	102	1.18	126.60	123	8	8.64E-03	62.0	
2	0	77.50*	54	178	1.10	155.26	151	8	1.49E-02	46.0	
3	0	86.92	23	117	1.18	174.11	172	7	6.48E-03	79.3	
4	2	89.84	27	62	1.05	179.96	178	24	7.43E-03	43.8	1.58E+00
5	2	92.60*	53	96	1.24	185.47	178	24	1.46E-02	37.1	
6	0	142.80*	30	127	0.61	285.92	281	12	8.46E-03	77.5	
7	0	186.21*	32	94	1.23	372.79	368	9	8.86E-03	62.4	
8	0	233.21	32	135	4.97	466.81	458	15	8.89E-03	81.1	
9	4	238.65*	235	67	1.11	477.71	473	16	6.52E-02	9.1	6.07E-01
10	4	241.21	46	122	1.97	482.82	473	16	1.27E-02	60.2	
11	0	269.97	33	57	0.68	540.38	537	8	9.22E-03	42.8	
12	0	295.13	80	53	1.11	590.71	587	9	2.23E-02	19.7	
13	0	300.97	17	44	0.78	602.39	598	8	4.83E-03	72.0	
14	0	314.77	22	38	2.29	630.02	626	8	6.19E-03	52.4	
15	0	326.84	15	98	3.04	654.16	642	15	4.15E-03	146.4	
16	0	338.30*	53	68	1.50	677.08	671	10	1.47E-02	32.6	
17	0	352.18*	107	50	1.16	704.87	700	11	2.98E-02	16.3	
18	0	387.29	36	81	6.81	775.11	765	18	9.94E-03	61.3	
19	0	462.33	28	68	4.50	925.25	914	15	7.89E-03	65.8	
20	0	480.96	19	49	2.55	962.51	955	13	5.19E-03	82.4	
21	0	510.71*	56	42	2.53	1022.04	1015	14	1.55E-02	32.3	
22	0	562.56	21	13	3.88	1125.78	1120	11	5.70E-03	41.3	
23	1	566.57*	13	6	1.83	1133.81	1131	15	3.66E-03	43.3	2.39E+00
24	1	570.15	18	19	1.83	1140.98	1131	15	4.98E-03	47.8	
25	0	583.36*	78	49	1.34	1167.39	1161	14	2.18E-02	22.3	
26	0	609.22	140	13	1.70	1219.13	1210	16	3.89E-02	10.1	
27	0	618.43	46	14	8.45	1237.57	1226	26	1.29E-02	25.9	
28	0	661.65	713	34	1.59	1324.03	1317	16	1.98E-01	4.1	
29	0	701.59	8	36	3.76	1403.94	1390	16	2.22E-03	171.4	
30	0	727.04*	20	6	1.21	1454.87	1451	9	5.48E-03	34.2	
31	0	744.31	7	8	1.43	1489.41	1486	7	1.86E-03	82.2	
32	1	768.91	17	18	2.00	1538.64	1533	23	4.77E-03	53.7	1.17E+00
33	1	772.95	14	18	2.00	1546.72	1533	23	3.75E-03	69.5	
34	0	817.48	7	5	1.66	1635.81	1632	7	1.83E-03	69.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.11*	53	3	1.35	1823.12	1818	12	1.47E-02	16.3	
36	0	956.22	14	3	4.71	1913.37	1906	14	3.77E-03	39.8	
37	0	968.93	38	2	1.62	1938.80	1934	10	1.05E-02	18.0	
38	4	1037.49	12	0	2.65	2075.96	2072	13	3.41E-03	24.4	2.91E-01
39	4	1040.76	9	0	1.31	2082.50	2072	13	2.60E-03	26.2	
40	0	1120.22	26	4	0.77	2241.47	2233	16	7.30E-03	25.8	
41	0	1237.49	15	3	2.18	2476.07	2470	11	4.03E-03	34.2	
42	0	1460.83	101	8	2.77	2922.85	2915	15	2.82E-02	11.5	
43	0	1498.08	5	2	0.68	2997.37	2992	9	1.39E-03	69.5	
44	0	1765.07*	18	4	2.92	3531.46	3523	15	5.08E-03	34.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:46:26

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677034.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:00:00 Acquisition date : 28-JUN-2016 12:45:06
Sample ID        : G398677034 Sample quantity  : 135.52 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA8 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	TH-229	85.43
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	9.651E-01	5.221E+00	5.221E+00	23.08	OK
CD-109	88.03	3.70*	4.544E+00	2.149E-01	2.310E-01	680.24	OK
SN-126	64.28	9.60	2.131E+00	1.014E+00	1.014E+00	123.94	OK
	86.94	8.90	4.544E+00	8.935E-02	8.935E-02	680.24	OK
	87.57	37.00*	4.544E+00	2.149E-02	2.149E-02	680.24	OK
BA-137M	661.66	89.90*	1.935E+00	2.312E+00	2.319E+00	8.30	OK
CS-137	661.66	85.10*	1.935E+00	2.442E+00	2.450E+00	8.30	OK
TL-208	277.37	6.60	3.646E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.133E+00	2.465E-01	2.465E-01	44.64	OK
	860.56	12.50	1.556E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.484E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	3.755E+00	5.512E-01	5.512E-01	92.00	OK
	238.63	43.60*	4.058E+00	8.076E-01	8.076E-01	18.18	OK
	300.09	3.30	3.439E+00	9.174E-01	9.174E-01	144.08	OK
BI-214	609.32	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26	OK
	1120.29	14.92	1.227E+00	7.765E-01	7.766E-01	51.64	OK
	1764.49	15.30	8.332E-01	7.473E-01	7.473E-01	68.09	OK
PB-214	74.82	5.80	3.484E+00	----- Line	Not Found	-----	Absent
	77.11	9.70	3.755E+00	9.717E-01	9.718E-01	92.00	OK
	87.09	3.41	4.556E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.018E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.488E+00	7.498E-01	7.498E-01	39.31	OK
	351.93	35.60*	3.074E+00	5.796E-01	5.797E-01	32.51	OK
RN-222	609.32	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26	OK
	1120.29	14.92	1.227E+00	7.765E-01	7.766E-01	51.64	OK
	1764.49	15.30	8.332E-01	7.473E-01	7.473E-01	68.09	OK
RA-224	240.99	4.10*	4.028E+00	3.532E-01	3.532E-01	591.42	OK
RA-226	609.32	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26	OK
	1120.29	14.92	1.227E+00	7.765E-01	7.766E-01	51.64	OK
	1764.49	15.30	8.332E-01	7.473E-01	7.473E-01	68.09	OK
AC-228	105.21	1.10	5.374E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.163E+00	8.805E-01	8.805E-01	65.26	OK
	794.95	4.25	1.666E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.596E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.480E+00	7.604E-01	7.604E-01	32.60	OK
	968.97	15.80	1.401E+00	9.323E-01	9.323E-01	36.09	OK
RA-228	105.21	1.10	5.374E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.163E+00	8.805E-01	8.805E-01	65.26	OK
	794.95	4.25	1.666E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.596E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.480E+00	7.604E-01	7.604E-01	32.60	OK
	968.97	15.80	1.401E+00	9.323E-01	9.323E-01	36.09	OK
TH-228	74.82	10.28	3.484E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	3.755E+00	5.512E-01	5.512E-01	92.00	OK
	238.63	43.60*	4.058E+00	8.076E-01	8.076E-01	18.18	OK
	300.09	3.30	3.439E+00	9.174E-01	9.174E-01	144.08	OK
TH-229	85.43	14.70	4.544E+00	5.410E-02	5.410E-02	680.24	OK
	88.47	24.00	4.735E+00	1.533E-01	1.533E-01	87.54	OK
	193.51	4.41*	4.674E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	210.85	2.80	4.420E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26	OK
	1120.29	14.92	1.227E+00	7.765E-01	7.765E-01	51.64	OK
PA-231	1764.49	15.30	8.332E-01	7.473E-01	7.473E-01	68.09	OK
	283.69	1.70	3.588E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.439E+00	5.659E-01	5.659E-01	144.08	OK
TH-232	105.21	1.10	5.374E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.163E+00	8.805E-01	8.805E-01	65.26	OK
	835.71	1.61	1.596E+00	----- Line	Not Found	-----	Absent
TH-234	911.20	25.80*	1.480E+00	7.604E-01	7.604E-01	32.60	OK
	968.97	15.80	1.401E+00	9.323E-01	9.323E-01	36.09	OK
	63.29	3.70*	2.131E+00	2.632E+00	2.632E+00	123.94	OK
U-234	92.59	4.23	4.893E+00	1.651E+00	1.651E+00	74.29	OK
	609.32	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26	OK
	1120.29	14.92	1.227E+00	7.765E-01	7.765E-01	51.64	OK
U-235	1764.49	15.30	8.332E-01	7.473E-01	7.473E-01	68.09	OK
	89.96	3.47	4.735E+00	1.060E+00	1.060E+00	87.54	OK
	93.35	5.60	4.893E+00	1.247E+00	1.247E+00	74.29	OK
	143.76	10.96*	5.437E+00	3.224E-01	3.224E-01	155.08	OK
	163.33	5.08	5.148E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	4.787E+00	7.214E-02	7.214E-02	124.85	OK
U-238	205.31	5.01	4.499E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	2.131E+00	2.632E+00	2.632E+00	123.94	OK
	92.59	4.23	4.893E+00	1.651E+00	1.651E+00	74.29	OK
CF-249	252.80	2.50	3.896E+00	----- Line	Not Found	-----	Absent
	333.37	14.60	3.196E+00	----- Line	Not Found	-----	Absent
	388.16	66.00*	2.873E+00	1.109E-01	1.109E-01	122.63	OK
ANH-511	511.00	100.00*	2.355E+00	1.363E-01	1.363E-01	64.57	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677034.CNF;1
Acquisition date : 28-JUN-2016 12:45:06 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.62 Half life ratio : *****
Sample date : 11-MAY-2016 15:00:00 Analyst initials: MXR1
Sample ID : G398677034 Sample Quantity : 1.3552E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.221E+00	1.181E+00	7.082E-01
CD-109	2.310E-01	1.540E+00	1.685E+00
SN-126	2.149E-02	1.433E-01	1.779E-01
BA-137M	2.319E+00	1.885E-01	7.432E-02
CS-137	2.450E+00	1.992E-01	7.851E-02
TL-208	2.465E-01	1.078E-01	8.399E-02
PB-212	8.076E-01	1.439E-01	1.428E-01
BI-214	8.461E-01	1.680E-01	1.372E-01
PB-214	5.797E-01	1.847E-01	2.027E-01
RN-222	8.461E-01	1.680E-01	1.372E-01
RA-224	3.532E-01	2.047E+00	1.530E+00
RA-226	8.461E-01	1.680E-01	1.372E-01
AC-228	7.604E-01	2.429E-01	2.805E-01
RA-228	7.604E-01	2.429E-01	2.805E-01
TH-228	8.076E-01	1.439E-01	1.428E-01
TH-229	-3.225E-01	7.495E-01	1.359E+00
TH-230	8.461E-01	1.680E-01	1.372E-01
PA-231	5.659E-01	7.990E-01	1.246E+00
TH-232	7.604E-01	2.429E-01	2.805E-01
TH-234	2.632E+00	3.197E+00	3.692E+00
U-234	8.461E-01	1.680E-01	1.372E-01
U-235	3.224E-01	4.900E-01	4.742E-01
U-238	2.632E+00	3.197E+00	3.692E+00
CF-249	1.109E-01	1.333E-01	1.094E-01
ANH-511	1.363E-01	8.623E-02	8.211E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.622E-01	9.793E-01	1.493E+00	NOT IDENT.
NA-22	-2.724E-02	5.605E-02	9.856E-02	NOT IDENT.
NA-24	0.000E+00	3.644E+21	0.000E+00	SHORT HLIF
AL-26	-2.799E-02	3.323E-02	4.975E-02	NOT IDENT.
SC-46	-1.459E-02	6.323E-02	1.176E-01	FAIL ABUN

V-48	-3.557E-01	3.313E-01	5.280E-01	NOT IDENT.
CR-51	2.283E-01	1.534E+00	2.122E+00	NOT IDENT.
MN-54	2.294E-02	4.683E-02	9.723E-02	NOT IDENT.
CO-56	-2.842E-02	5.156E-02	9.410E-02	FAIL ABUN
MN-56	0.000E+00	1.830E+41	0.000E+00	SHORT HLIF
CO-57	4.451E-04	3.287E-02	6.352E-02	NOT IDENT.
CO-58	3.115E-02	6.139E-02	1.238E-01	NOT IDENT.
FE-59	-8.421E-03	1.593E-01	3.107E-01	NOT IDENT.
CO-60	-3.026E-03	4.112E-02	8.121E-02	NOT IDENT.
ZN-65	1.192E-01	8.112E-02	2.029E-01	NOT IDENT.
GE-68	3.059E-01	1.538E+00	3.111E+00	NOT IDENT.
AS-73	5.467E-01	2.213E+00	4.221E+00	NOT IDENT.
AS-74	1.711E-01	4.513E-01	8.852E-01	NOT IDENT.
SE-75	4.627E-02	7.747E-02	1.407E-01	NOT IDENT.
BR-77	0.000E+00	3.195E+05	0.000E+00	SHORT HLIF
SR-82	7.914E-02	1.081E+00	1.798E+00	NOT IDENT.
RB-83	1.163E-01	1.320E-01	2.705E-01	NOT IDENT.
KR-85	2.048E+01	1.290E+01	2.456E+01	NOT IDENT.
SR-85	1.529E-01	9.647E-02	1.836E-01	NOT IDENT.
RB-86	2.668E-01	3.064E+00	6.074E+00	NOT IDENT.
Y-88	3.605E-02	6.964E-02	1.561E-01	NOT IDENT.
Y-91	-5.582E+00	3.413E+01	6.407E+01	NOT IDENT.
NB-94	2.437E-02	8.186E-02	8.285E-02	FAIL ABUN
NB-95	2.411E-02	7.555E-02	1.316E-01	NOT IDENT.
NB-95M	2.206E-01	3.527E-01	4.594E-01	NOT IDENT.
ZR-95	5.587E-02	1.380E-01	2.706E-01	NOT IDENT.
NB-97	0.000E+00	5.673E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.981E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.045E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.031E-04	4.064E-02	7.796E-02	NOT IDENT.
RH-102	1.412E-02	6.453E-02	1.270E-01	NOT IDENT.
RU-103	5.436E-02	9.802E-02	1.963E-01	FAIL ABUN
RH-106	2.819E-01	4.207E-01	7.910E-01	NOT IDENT.
RU-106	2.819E-01	4.207E-01	7.910E-01	NOT IDENT.
AG-108M	-2.617E-03	4.556E-02	8.580E-02	NOT IDENT.
AG-110M	2.578E-02	5.999E-02	1.264E-01	NOT IDENT.
SN-113	4.781E-02	9.036E-02	1.593E-01	NOT IDENT.
CD-115	0.000E+00	4.182E+05	0.000E+00	SHORT HLIF
SN-117M	1.249E-01	3.665E-01	7.102E-01	NOT IDENT.
TE-123M	3.600E-02	4.275E-02	8.547E-02	NOT IDENT.
SB-124	-2.953E-02	1.009E-01	2.088E-01	NOT IDENT.
SB-125	4.392E-02	1.295E-01	2.545E-01	FAIL ABUN
TE-125M	4.099E-01	2.020E+01	3.636E+01	NOT IDENT.
I-126	6.032E-01	1.704E+00	2.988E+00	FAIL ABUN
SB-126	4.021E-01	1.085E+00	2.008E+00	NOT IDENT.
SB-127	0.000E+00	5.671E+02	0.000E+00	SHORT HLIF
I-131	5.218E-01	2.969E+00	5.472E+00	NOT IDENT.
I-132	0.000E+00	1.191E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.368E+03	0.000E+00	SHORT HLIF
BA-133	-3.029E-02	7.116E-02	1.062E-01	NOT IDENT.
I-133	0.000E+00	1.924E+15	0.000E+00	SHORT HLIF
CS-134	-1.549E-03	3.787E-02	7.645E-02	FAIL ABUN
CS-135	1.242E-01	2.552E-01	4.317E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	1.990E-01	6.750E-01	1.385E+00	FAIL ABUN
CE-139	2.242E-02	4.231E-02	8.314E-02	NOT IDENT.
BA-140	-3.793E-01	2.306E+00	4.269E+00	NOT IDENT.
LA-140	-3.589E-01	7.549E-01	1.370E+00	NOT IDENT.
CE-141	-7.517E-03	1.944E-01	3.247E-01	NOT IDENT.
CE-143	0.000E+00	3.137E+09	0.000E+00	SHORT HLIF
CE-144	-6.402E-02	2.688E-01	5.071E-01	NOT IDENT.
PM-144	1.697E-02	4.941E-02	8.605E-02	FAIL ABUN
PR-144	1.292E+00	3.762E+00	6.551E+00	NOT IDENT.
PM-146	-4.114E-02	9.105E-02	1.404E-01	NOT IDENT.
ND-147	2.653E+00	5.849E+00	1.167E+01	FAIL ABUN
PM-147	-5.810E+02	9.038E+02	1.673E+03	NOT IDENT.
PM-149	0.000E+00	3.614E+06	0.000E+00	SHORT HLIF
EU-150	-1.842E-02	4.513E-02	6.796E-02	FAIL ABUN
EU-152	-1.792E-01	1.415E-01	2.251E-01	NOT IDENT.
GD-153	-3.599E-02	1.344E-01	2.133E-01	NOT IDENT.
EU-154	-7.473E-02	1.564E-01	2.754E-01	NOT IDENT.
EU-155	1.546E-01	1.457E-01	2.819E-01	FAIL ABUN
TB-160	-6.393E-02	1.620E-01	3.066E-01	FAIL ABUN
HO-166M	2.543E-02	7.309E-02	1.446E-01	NOT IDENT.
TM-171	-2.343E+01	3.854E+01	6.949E+01	NOT IDENT.
HF-172	-9.941E-02	2.396E-01	4.490E-01	FAIL ABUN
LU-172	4.466E-02	6.508E-02	1.453E-01	FAIL ABUN

LU-176	8.087E-03	3.626E-02	6.801E-02	FAIL ABUN
HF-181	1.194E-01	1.928E-01	2.221E-01	FAIL ABUN
TA-182	-3.885E-02	2.118E-01	4.038E-01	FAIL ABUN
RE-183	-1.324E-01	4.630E-01	8.506E-01	NOT IDENT.
RE-184	1.767E-02	2.684E-01	5.140E-01	NOT IDENT.
W-188	6.876E-01	1.555E+01	2.517E+01	FAIL ABUN
IR-192	2.698E-02	8.107E-02	1.265E-01	FAIL ABUN
HG-203	9.105E-02	8.882E-02	1.761E-01	NOT IDENT.
BI-207	3.700E-03	5.415E-02	1.086E-01	FAIL ABUN
PB-210	-2.823E+00	8.131E+00	1.502E+01	NOT IDENT.
BI-211	0.000E+00	5.089E-01	8.656E-01	FAIL ABUN
PB-211	-6.623E-01	1.156E+00	2.087E+00	NOT IDENT.
BI-212	9.227E-01	6.192E-01	1.338E+00	FAIL ABUN
RN-219	5.590E-01	6.524E-01	1.310E+00	FAIL ABUN
RA-223	7.631E-01	9.596E-01	1.862E+00	FAIL ABUN
AC-227	7.732E-02	3.623E-01	6.792E-01	FAIL ABUN
TH-227	7.732E-02	3.623E-01	6.792E-01	FAIL ABUN
TH-231	7.631E-01	9.596E-01	1.862E+00	FAIL ABUN
PA-233	2.104E-02	9.935E-02	1.641E-01	FAIL ABUN
PA-234	1.704E-01	2.585E-01	5.933E-01	FAIL ABUN
PA-234M	2.786E-01	4.917E+00	1.005E+01	NOT IDENT.
NP-237	2.104E-02	9.935E-02	1.641E-01	FAIL ABUN
NP-238	0.000E+00	1.005E+06	0.000E+00	SHORT HLIF
NP-239	1.991E-01	3.537E-01	6.616E-01	NOT IDENT.
PU-239	2.264E+02	4.304E+02	8.495E+02	NOT IDENT.
AM-241	-7.376E-02	2.743E-01	4.468E-01	NOT IDENT.
AM-243	5.637E-02	9.052E-02	1.544E-01	NOT IDENT.
CM-243	-1.072E-01	1.581E-01	2.564E-01	NOT IDENT.
BK-247	6.425E-02	1.237E-01	2.121E-01	NOT IDENT.
CM-247	2.109E-02	5.803E-02	1.130E-01	NOT IDENT.
CF-251	-5.589E-02	1.762E-01	3.242E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	97	10.66*	9.651E-01	5.221E+00	5.221E+00	23.08
CD-109	88.03	27	3.70*	4.544E+00	9.059E-01	9.736E-01	158.57
SN-126	64.28	37	9.60	2.131E+00	1.014E+00	1.014E+00	123.94
	86.94	27	8.90	4.544E+00	3.766E-01	3.766E-01	158.57
	87.57	27	37.00*	4.544E+00	9.059E-02	9.059E-02	158.57
BA-137M	661.66	726	89.90*	1.935E+00	2.312E+00	2.319E+00	8.30
CS-137	661.66	726	85.10*	1.935E+00	2.442E+00	2.450E+00	8.30
TL-208	277.37	-----	6.60	3.646E+00	-----	Line Not Found	-----
	583.19	81	85.00*	2.133E+00	2.465E-01	2.465E-01	44.64
	860.56	-----	12.50	1.556E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.274E+00	-----	Line Not Found	-----
	351.06	114	12.92*	3.074E+00	1.597E+00	1.597E+00	32.51
PB-212	74.82	-----	10.28	3.484E+00	-----	Line Not Found	-----
	77.11	64	17.10	3.755E+00	5.512E-01	5.512E-01	92.00
	238.63	258	43.60*	4.058E+00	8.076E-01	8.076E-01	18.18
	300.09	19	3.30	3.439E+00	9.174E-01	9.174E-01	144.08
BI-214	609.32	143	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26
	1120.29	26	14.92	1.227E+00	7.765E-01	7.766E-01	51.64
	1764.49	17	15.30	8.332E-01	7.473E-01	7.473E-01	68.09
PB-214	74.82	-----	5.80	3.484E+00	-----	Line Not Found	-----
	77.11	64	9.70	3.755E+00	9.717E-01	9.718E-01	92.00
	87.09	27	3.41	4.544E+00	9.830E-01	9.830E-01	158.57
	242.00	50	7.25	4.028E+00	9.495E-01	9.496E-01	120.48
	295.22	87	18.42	3.488E+00	7.498E-01	7.498E-01	39.31
	351.93	114	35.60*	3.074E+00	5.796E-01	5.797E-01	32.51
RN-222	609.32	143	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26
	1120.29	26	14.92	1.227E+00	7.765E-01	7.766E-01	51.64
	1764.49	17	15.30	8.332E-01	7.473E-01	7.473E-01	68.09
RA-224	240.99	50	4.10*	4.028E+00	1.679E+00	1.679E+00	120.48
RA-226	609.32	143	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26
	1120.29	26	14.92	1.227E+00	7.765E-01	7.766E-01	51.64
	1764.49	17	15.30	8.332E-01	7.473E-01	7.473E-01	68.09
AC-228	105.21	-----	1.10	5.374E+00	-----	Line Not Found	-----
	338.32	57	11.27	3.163E+00	8.805E-01	8.805E-01	65.26
	794.95	-----	4.25	1.666E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.596E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.480E+00	7.604E-01	7.604E-01	32.60
	968.97	37	15.80	1.401E+00	9.323E-01	9.323E-01	36.09
RA-228	105.21	-----	1.10	5.374E+00	-----	Line Not Found	-----
	338.32	57	11.27	3.163E+00	8.805E-01	8.805E-01	65.26
	794.95	-----	4.25	1.666E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.596E+00	-----	Line Not Found	-----
	911.20	52	25.80*	1.480E+00	7.604E-01	7.604E-01	32.60
	968.97	37	15.80	1.401E+00	9.323E-01	9.323E-01	36.09
TH-228	74.82	-----	10.28	3.484E+00	-----	Line Not Found	-----
	77.11	64	17.10	3.755E+00	5.512E-01	5.512E-01	92.00
	238.63	258	43.60*	4.058E+00	8.076E-01	8.076E-01	18.18

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-229	300.09	19	3.30	3.439E+00	9.174E-01	9.174E-01	144.08
	85.43	27	14.70	4.544E+00	2.280E-01	2.280E-01	158.57
	88.47	31	24.00	4.735E+00	1.533E-01	1.533E-01	87.54
	193.51	-----	4.41*	4.674E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	4.420E+00	-----	Line Not Found	-----
	609.32	143	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26
	1120.29	26	14.92	1.227E+00	7.765E-01	7.765E-01	51.64
	1764.49	17	15.30	8.332E-01	7.473E-01	7.473E-01	68.09
PA-231	283.69	-----	1.70	3.588E+00	-----	Line Not Found	-----
TH-232	301.36	19	5.35*	3.439E+00	5.659E-01	5.659E-01	144.08
	105.21	-----	1.10	5.374E+00	-----	Line Not Found	-----
	338.32	57	11.27	3.163E+00	8.805E-01	8.805E-01	65.26
	835.71	-----	1.61	1.596E+00	-----	Line Not Found	-----
TH-234	911.20	52	25.80*	1.480E+00	7.604E-01	7.604E-01	32.60
	968.97	37	15.80	1.401E+00	9.323E-01	9.323E-01	36.09
	63.29	37	3.70*	2.131E+00	2.632E+00	2.632E+00	123.94
	92.59	62	4.23	4.893E+00	1.651E+00	1.651E+00	74.29
U-234	609.32	143	45.49*	2.064E+00	8.461E-01	8.461E-01	20.26
	1120.29	26	14.92	1.227E+00	7.765E-01	7.765E-01	51.64
	1764.49	17	15.30	8.332E-01	7.473E-01	7.473E-01	68.09
U-235	89.96	31	3.47	4.735E+00	1.060E+00	1.060E+00	87.54
	93.35	62	5.60	4.893E+00	1.247E+00	1.247E+00	74.29
	143.76	35	10.96*	5.437E+00	3.224E-01	3.224E-01	155.08
	163.33	-----	5.08	5.148E+00	-----	Line Not Found	-----
	185.72	36	57.20	4.787E+00	7.214E-02	7.214E-02	124.85
U-238	205.31	-----	5.01	4.499E+00	-----	Line Not Found	-----
	63.29	37	3.70*	2.131E+00	2.632E+00	2.632E+00	123.94
	92.59	62	4.23	4.893E+00	1.651E+00	1.651E+00	74.29
CF-249	252.80	-----	2.50	3.896E+00	-----	Line Not Found	-----
	333.37	-----	14.60	3.196E+00	-----	Line Not Found	-----
ANH-511	388.16	38	66.00*	2.873E+00	1.109E-01	1.109E-01	122.63
	511.00	58	100.00*	2.355E+00	1.363E-01	1.363E-01	64.57

Flag: "*" = Keyline

Total number of lines in spectrum 44
Number of unidentified lines 9
Number of lines tentatively identified by NID 35 79.55%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.221E+00	5.221E+00	1.205E+00	23.08	
CD-109	461.40D	1.07	9.059E-01	9.736E-01	15.44E-01	158.57	
SN-126	2.30E+05Y	1.00	9.059E-02	9.059E-02	14.37E-02	158.57	
BA-137M	30.08Y	1.00	2.312E+00	2.319E+00	0.192E+00	8.30	
CS-137	30.08Y	1.00	2.442E+00	2.450E+00	0.203E+00	8.30	
TL-208	1.41E+10Y	1.00	2.465E-01	2.465E-01	1.100E-01	44.64	
BI-211	7.04E+08Y	1.00	1.597E+00	1.597E+00	0.519E+00	32.51	
PB-212	1.41E+10Y	1.00	8.076E-01	8.076E-01	1.469E-01	18.18	
BI-214	1600.00Y	1.00	8.461E-01	8.461E-01	1.715E-01	20.26	
PB-214	1600.00Y	1.00	5.796E-01	5.797E-01	1.885E-01	32.51	
RN-222	1600.00Y	1.00	8.461E-01	8.461E-01	1.715E-01	20.26	
RA-224	1.41E+10Y	1.00	1.679E+00	1.679E+00	2.023E+00	120.48	
RA-226	1600.00Y	1.00	8.461E-01	8.461E-01	1.715E-01	20.26	
AC-228	1.41E+10Y	1.00	7.604E-01	7.604E-01	2.479E-01	32.60	
RA-228	1.41E+10Y	1.00	7.604E-01	7.604E-01	2.479E-01	32.60	
TH-228	1.41E+10Y	1.00	8.076E-01	8.076E-01	1.469E-01	18.18	
TH-229	7340.00Y	1.00	1.533E-01	1.533E-01	1.342E-01	87.54	K
TH-230	7.54E+04Y	1.00	8.461E-01	8.461E-01	1.714E-01	20.26	
PA-231	7.04E+08Y	1.00	5.659E-01	5.659E-01	8.153E-01	144.08	
TH-232	1.41E+10Y	1.00	7.604E-01	7.604E-01	2.479E-01	32.60	
TH-234	4.47E+09Y	1.00	2.632E+00	2.632E+00	3.262E+00	123.94	
U-234	2.45E+05Y	1.00	8.461E-01	8.461E-01	1.714E-01	20.26	
U-235	7.04E+08Y	1.00	3.224E-01	3.224E-01	5.000E-01	155.08	
U-238	4.47E+09Y	1.00	2.632E+00	2.632E+00	3.262E+00	123.94	
CF-249	351.00Y	1.00	1.109E-01	1.109E-01	1.360E-01	122.63	
ANH-511	1.00E+09Y	1.00	1.363E-01	1.363E-01	0.880E-01	64.57	
Total Activity :			2.975E+01	2.984E+01			

Grand Total Activity : 2.975E+01 2.984E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	233.21	35	149	4.97	466.81	458	15	8.89E-03	****	4.12E+00	
0	269.97	36	62	0.68	540.38	537	8	9.22E-03	85.7	3.72E+00	T
0	314.77	24	41	2.29	630.02	626	8	6.19E-03	****	3.33E+00	
0	326.84	16	105	3.04	654.16	642	15	4.15E-03	****	3.24E+00	
0	462.33	30	71	4.50	925.25	914	15	7.89E-03	****	2.53E+00	T
0	480.96	19	51	2.55	962.51	955	13	5.19E-03	****	2.46E+00	T
0	562.56	21	14	3.88	1125.78	1120	11	5.70E-03	82.6	2.19E+00	T
1	566.57	14	6	1.83	1133.81	1131	15	3.66E-03	86.7	2.18E+00	
1	570.15	18	20	1.83	1140.98	1131	15	4.98E-03	95.6	2.17E+00	T
0	618.43	47	14	8.45	1237.57	1226	26	1.29E-02	51.9	2.04E+00	T
0	701.59	8	36	3.76	1403.94	1390	16	2.22E-03	****	1.85E+00	T
0	727.04	20	6	1.21	1454.87	1451	9	5.48E-03	68.5	1.79E+00	T
0	744.31	7	8	1.43	1489.41	1486	7	1.86E-03	****	1.76E+00	
1	768.91	17	18	2.00	1538.64	1533	23	4.77E-03	****	1.71E+00	
1	772.95	14	18	2.00	1546.72	1533	23	3.75E-03	****	1.71E+00	T
0	817.48	7	5	1.66	1635.81	1632	7	1.83E-03	****	1.63E+00	T
0	956.22	13	3	4.71	1913.37	1906	14	3.77E-03	79.6	1.42E+00	
4	1037.49	12	0	2.65	2075.96	2072	13	3.41E-03	48.9	1.32E+00	T
4	1040.76	9	0	1.31	2082.50	2072	13	2.60E-03	52.3	1.31E+00	
0	1237.49	14	2	2.18	2476.07	2470	11	4.03E-03	68.4	1.12E+00	T
0	1498.08	5	2	0.68	2997.37	2992	9	1.39E-03	****	9.45E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677034.CNF;1
Acquisition date : 28-JUN-2016 12:45:06 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.62 Half life ratio : *****
Sample date : 11-MAY-2016 15:00:00 Nuclide Library : SOLID
Sample ID : G398677034 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3552E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.811E-01
CD-109	7.933E-01
SN-126	8.432E-02
BA-137M	3.277E-02
CS-137	3.462E-02
TL-208	3.780E-02
PB-212	6.702E-02
BI-214	6.050E-02
PB-214	9.434E-02
RN-222	6.050E-02
RA-224	7.184E-01
RA-226	6.050E-02
AC-228	1.204E-01
RA-228	1.204E-01
TH-228	6.702E-02
TH-229	6.422E-01
TH-230	6.050E-02
PA-231	5.813E-01
TH-232	1.204E-01
TH-234	1.746E+00
U-234	6.050E-02
U-235	2.240E-01
U-238	1.746E+00
CF-249	5.066E-02
ANH-511	3.782E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.912E-01	NOT IDENT.
NA-22	4.213E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.573E-02	NOT IDENT.
SC-46	5.138E-02	FAIL ABUN
V-48	2.202E-01	NOT IDENT.

CR-51	9.830E-01	NOT IDENT.
MN-54	4.334E-02	NOT IDENT.
CO-56	3.966E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.991E-02	NOT IDENT.
CO-58	5.445E-02	NOT IDENT.
FE-59	1.328E-01	NOT IDENT.
CO-60	3.330E-02	NOT IDENT.
ZN-65	8.758E-02	NOT IDENT.
GE-68	1.347E+00	NOT IDENT.
AS-73	1.995E+00	NOT IDENT.
AS-74	4.028E-01	NOT IDENT.
SE-75	6.579E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	7.894E-01	NOT IDENT.
RB-83	1.245E-01	NOT IDENT.
KR-85	1.152E+01	NOT IDENT.
SR-85	8.618E-02	NOT IDENT.
RB-86	2.629E+00	NOT IDENT.
Y-88	6.538E-02	NOT IDENT.
Y-91	2.758E+01	NOT IDENT.
NB-94	3.730E-02	FAIL ABUN
NB-95	5.840E-02	NOT IDENT.
NB-95M	2.169E-01	NOT IDENT.
ZR-95	1.218E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.686E-02	NOT IDENT.
RH-102	5.657E-02	NOT IDENT.
RU-103	9.003E-02	FAIL ABUN
RH-106	3.542E-01	NOT IDENT.
RU-106	3.542E-01	NOT IDENT.
AG-108M	3.971E-02	NOT IDENT.
AG-110M	5.535E-02	NOT IDENT.
SN-113	7.413E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.353E-01	NOT IDENT.
TE-123M	4.039E-02	NOT IDENT.
SB-124	7.256E-02	NOT IDENT.
SB-125	1.173E-01	FAIL ABUN
TE-125M	1.724E+01	NOT IDENT.
I-126	1.337E+00	FAIL ABUN
SB-126	8.890E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.540E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.902E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.265E-02	FAIL ABUN
CS-135	2.030E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.025E-01	FAIL ABUN
CE-139	3.915E-02	NOT IDENT.
BA-140	1.948E+00	NOT IDENT.
LA-140	5.664E-01	NOT IDENT.
CE-141	1.541E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.393E-01	NOT IDENT.
PM-144	3.852E-02	FAIL ABUN
PR-144	2.933E+00	NOT IDENT.
PM-146	6.553E-02	NOT IDENT.
ND-147	5.312E+00	FAIL ABUN
PM-147	7.857E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.147E-02	FAIL ABUN
EU-152	1.033E-01	NOT IDENT.
GD-153	1.006E-01	NOT IDENT.
EU-154	1.178E-01	NOT IDENT.
EU-155	1.339E-01	FAIL ABUN
TB-160	1.272E-01	FAIL ABUN
HO-166M	6.459E-02	NOT IDENT.
TM-171	3.279E+01	NOT IDENT.
HF-172	2.115E-01	FAIL ABUN
LU-172	6.262E-02	FAIL ABUN
LU-176	3.158E-02	FAIL ABUN

HF-181	1.026E-01	FAIL ABUN
TA-182	1.690E-01	FAIL ABUN
RE-183	4.007E-01	NOT IDENT.
RE-184	2.230E-01	NOT IDENT.
W-188	1.171E+01	FAIL ABUN
IR-192	5.888E-02	FAIL ABUN
HG-203	8.273E-02	NOT IDENT.
BI-207	4.643E-02	FAIL ABUN
PB-210	7.068E+00	NOT IDENT.
BI-211	4.136E-01	FAIL ABUN
PB-211	9.707E-01	NOT IDENT.
BI-212	6.055E-01	FAIL ABUN
RN-219	6.136E-01	FAIL ABUN
RA-223	8.719E-01	FAIL ABUN
AC-227	3.186E-01	FAIL ABUN
TH-227	3.186E-01	FAIL ABUN
TH-231	8.719E-01	FAIL ABUN
PA-233	7.608E-02	FAIL ABUN
PA-234	2.526E-01	FAIL ABUN
PA-234M	4.366E+00	NOT IDENT.
NP-237	7.608E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	3.131E-01	NOT IDENT.
PU-239	4.026E+02	NOT IDENT.
AM-241	2.104E-01	NOT IDENT.
AM-243	7.383E-02	NOT IDENT.
CM-243	1.212E-01	NOT IDENT.
BK-247	9.926E-02	NOT IDENT.
CM-247	5.269E-02	NOT IDENT.
CF-251	1.530E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677034.CNF;1
Acquisition date : 28-JUN-2016 12:45:06 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.62 Half life ratio : *****
Sample date : 11-MAY-2016 15:00:00 Nuclide Library : SOLID
Sample ID : G398677034 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3552E+02 GRAM
Quantity Err(%) : 1.4758E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.221E+00	1.262E+00	1.262E+00
CD-109	2.310E-01	1.545E+00	1.545E+00
SN-126	2.149E-02	1.437E-01	1.437E-01
BA-137M	2.319E+00	2.816E-01	2.816E-01
CS-137	2.450E+00	2.974E-01	2.974E-01
TL-208	2.465E-01	1.101E-01	1.101E-01
PB-212	8.076E-01	1.616E-01	1.616E-01
BI-214	8.461E-01	1.844E-01	1.844E-01
PB-214	5.797E-01	1.918E-01	1.918E-01
RN-222	8.461E-01	1.844E-01	1.844E-01
RA-224	3.532E-01	2.055E+00	2.055E+00
RA-226	8.461E-01	1.844E-01	1.844E-01
AC-228	7.604E-01	2.695E-01	2.695E-01
RA-228	7.604E-01	2.695E-01	2.695E-01
TH-228	8.076E-01	1.616E-01	1.616E-01
TH-229	-3.225E-01	7.499E-01	7.499E-01
TH-230	8.461E-01	1.844E-01	1.844E-01
PA-231	5.659E-01	8.095E-01	8.095E-01
TH-232	7.604E-01	2.695E-01	2.695E-01
TH-234	2.632E+00	3.254E+00	3.254E+00
U-234	8.461E-01	1.844E-01	1.844E-01
U-235	3.224E-01	4.907E-01	4.907E-01
U-238	2.632E+00	3.254E+00	3.254E+00
CF-249	1.109E-01	1.339E-01	1.339E-01
ANH-511	1.363E-01	8.703E-02	8.703E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.622E-01	9.804E-01	1.013E+00	NOT IDENT.
NA-22	-2.724E-02	5.609E-02	5.742E-02	NOT IDENT.
NA-24	-6.908E+20	3.644E+21	0.000E+00	SHORT HLIF
AL-26	-2.799E-02	3.330E-02	3.561E-02	NOT IDENT.
SC-46	-1.459E-02	6.327E-02	6.361E-02	FAIL ABUN

V-48	-3.557E-01	3.366E-01	3.728E-01	NOT IDENT.
CR-51	2.283E-01	1.534E+00	1.538E+00	NOT IDENT.
MN-54	2.294E-02	4.693E-02	4.805E-02	NOT IDENT.
CO-56	-2.842E-02	5.170E-02	5.327E-02	FAIL ABUN
MN-56	-1.000E+41	1.834E+41	0.000E+00	SHORT HLIF
CO-57	4.451E-04	3.287E-02	3.287E-02	NOT IDENT.
CO-58	3.115E-02	6.152E-02	6.310E-02	NOT IDENT.
FE-59	-8.421E-03	1.593E-01	1.593E-01	NOT IDENT.
CO-60	-3.026E-03	4.113E-02	4.115E-02	NOT IDENT.
ZN-65	1.192E-01	8.442E-02	1.001E-01	NOT IDENT.
GE-68	3.059E-01	1.539E+00	1.545E+00	NOT IDENT.
AS-73	5.467E-01	2.216E+00	2.230E+00	NOT IDENT.
AS-74	1.711E-01	4.517E-01	4.583E-01	NOT IDENT.
SE-75	4.627E-02	7.760E-02	8.035E-02	NOT IDENT.
BR-77	1.793E+06	2.506E+06	2.633E+06	SHORT HLIF
SR-82	7.914E-02	1.081E+00	1.082E+00	NOT IDENT.
RB-83	1.163E-01	1.333E-01	1.432E-01	NOT IDENT.
KR-85	2.048E+01	1.302E+01	1.596E+01	NOT IDENT.
SR-85	1.529E-01	9.738E-02	1.193E-01	NOT IDENT.
RB-86	2.668E-01	3.064E+00	3.066E+00	NOT IDENT.
Y-88	3.605E-02	6.969E-02	7.156E-02	NOT IDENT.
Y-91	-5.582E+00	3.413E+01	3.422E+01	NOT IDENT.
NB-94	2.437E-02	8.190E-02	8.263E-02	FAIL ABUN
NB-95	2.411E-02	7.560E-02	7.638E-02	NOT IDENT.
NB-95M	2.206E-01	3.535E-01	3.673E-01	NOT IDENT.
ZR-95	5.587E-02	1.381E-01	1.404E-01	NOT IDENT.
NB-97	1.000E+41	5.744E+40	0.000E+00	SHORT HLIF
ZR-97	3.757E+20	2.999E+20	0.000E+00	SHORT HLIF
MO-99	-2.016E+04	7.048E+04	7.107E+04	SHORT HLIF
TC-99M	1.000E+41	2.271E+41	0.000E+00	SHORT HLIF
RH-101	2.031E-04	4.064E-02	4.064E-02	NOT IDENT.
RH-102	1.412E-02	6.455E-02	6.486E-02	NOT IDENT.
RU-103	5.436E-02	9.814E-02	1.012E-01	FAIL ABUN
RH-106	2.819E-01	4.216E-01	4.404E-01	NOT IDENT.
RU-106	2.819E-01	4.216E-01	4.404E-01	NOT IDENT.
AG-108M	-2.617E-03	4.556E-02	4.557E-02	NOT IDENT.
AG-110M	2.578E-02	6.011E-02	6.122E-02	NOT IDENT.
SN-113	4.781E-02	9.044E-02	9.297E-02	NOT IDENT.
CD-115	-5.294E+04	4.182E+05	4.189E+05	SHORT HLIF
SN-117M	1.249E-01	3.667E-01	3.710E-01	NOT IDENT.
TE-123M	3.600E-02	4.283E-02	4.580E-02	NOT IDENT.
SB-124	-2.953E-02	1.009E-01	1.018E-01	NOT IDENT.
SB-125	4.392E-02	1.295E-01	1.310E-01	FAIL ABUN
TE-125M	4.099E-01	2.020E+01	2.020E+01	NOT IDENT.
I-126	6.032E-01	1.705E+00	1.726E+00	FAIL ABUN
SB-126	4.021E-01	1.086E+00	1.101E+00	NOT IDENT.
SB-127	-3.588E+02	5.736E+02	5.959E+02	SHORT HLIF
I-131	5.218E-01	2.970E+00	2.979E+00	NOT IDENT.
I-132	1.000E+41	3.186E+41	0.000E+00	SHORT HLIF
TE-132	-3.543E+02	1.369E+03	1.378E+03	SHORT HLIF
BA-133	-3.029E-02	7.121E-02	7.251E-02	NOT IDENT.
I-133	1.590E+15	1.985E+15	2.110E+15	SHORT HLIF
CS-134	-1.549E-03	3.787E-02	3.788E-02	FAIL ABUN
CS-135	1.242E-01	2.556E-01	2.616E-01	NOT IDENT.
I-135	-1.000E+41	2.405E+41	0.000E+00	SHORT HLIF
CS-136	1.990E-01	6.761E-01	6.820E-01	FAIL ABUN
CE-139	2.242E-02	4.257E-02	4.375E-02	NOT IDENT.
BA-140	-3.793E-01	2.306E+00	2.313E+00	NOT IDENT.
LA-140	-3.589E-01	7.554E-01	7.726E-01	NOT IDENT.
CE-141	-7.517E-03	1.944E-01	1.944E-01	NOT IDENT.
CE-143	4.765E+09	3.173E+09	3.832E+09	SHORT HLIF
CE-144	-6.402E-02	2.689E-01	2.704E-01	NOT IDENT.
PM-144	1.697E-02	4.944E-02	5.003E-02	FAIL ABUN
PR-144	1.292E+00	3.764E+00	3.809E+00	NOT IDENT.
PM-146	-4.114E-02	9.115E-02	9.302E-02	NOT IDENT.
ND-147	2.653E+00	5.854E+00	5.975E+00	FAIL ABUN
PM-147	-5.810E+02	9.054E+02	9.425E+02	NOT IDENT.
PM-149	1.703E+06	3.625E+06	3.705E+06	SHORT HLIF
EU-150	-1.842E-02	4.516E-02	4.592E-02	FAIL ABUN
EU-152	-1.792E-01	1.426E-01	1.639E-01	NOT IDENT.
GD-153	-3.599E-02	1.344E-01	1.354E-01	NOT IDENT.
EU-154	-7.473E-02	1.565E-01	1.601E-01	NOT IDENT.
EU-155	1.546E-01	1.465E-01	1.622E-01	FAIL ABUN
TB-160	-6.393E-02	1.623E-01	1.649E-01	FAIL ABUN
HO-166M	2.543E-02	7.314E-02	7.404E-02	NOT IDENT.
TM-171	-2.343E+01	3.864E+01	4.006E+01	NOT IDENT.
HF-172	-9.941E-02	2.403E-01	2.445E-01	FAIL ABUN
LU-172	4.466E-02	6.577E-02	6.878E-02	FAIL ABUN

LU-176	8.087E-03	3.627E-02	3.645E-02	FAIL ABUN
HF-181	1.194E-01	1.931E-01	2.005E-01	FAIL ABUN
TA-182	-3.885E-02	2.119E-01	2.126E-01	FAIL ABUN
RE-183	-1.324E-01	4.633E-01	4.671E-01	NOT IDENT.
RE-184	1.767E-02	2.685E-01	2.686E-01	NOT IDENT.
W-188	6.876E-01	1.555E+01	1.556E+01	FAIL ABUN
IR-192	2.698E-02	8.111E-02	8.202E-02	FAIL ABUN
HG-203	9.105E-02	8.927E-02	9.825E-02	NOT IDENT.
BI-207	3.700E-03	5.416E-02	5.418E-02	FAIL ABUN
PB-210	-2.823E+00	8.137E+00	8.235E+00	NOT IDENT.
BI-211	1.597E+00	5.291E-01	8.935E-01	FAIL ABUN
PB-211	-6.623E-01	1.157E+00	1.195E+00	NOT IDENT.
BI-212	9.227E-01	6.271E-01	7.525E-01	FAIL ABUN
RN-219	5.590E-01	6.574E-01	7.040E-01	FAIL ABUN
RA-223	7.631E-01	9.629E-01	1.022E+00	FAIL ABUN
AC-227	7.732E-02	3.625E-01	3.641E-01	FAIL ABUN
TH-227	7.732E-02	3.625E-01	3.641E-01	FAIL ABUN
TH-231	7.631E-01	9.629E-01	1.022E+00	FAIL ABUN
PA-233	2.104E-02	9.937E-02	9.983E-02	FAIL ABUN
PA-234	1.704E-01	3.248E-01	3.338E-01	FAIL ABUN
PA-234M	2.786E-01	4.917E+00	4.919E+00	NOT IDENT.
NP-237	2.104E-02	9.937E-02	9.983E-02	FAIL ABUN
NP-238	-5.790E+05	1.009E+06	1.043E+06	SHORT HLIF
NP-239	1.991E-01	3.544E-01	3.656E-01	NOT IDENT.
PU-239	2.264E+02	4.309E+02	4.428E+02	NOT IDENT.
AM-241	-7.376E-02	2.744E-01	2.764E-01	NOT IDENT.
AM-243	5.637E-02	9.063E-02	9.413E-02	NOT IDENT.
CM-243	-1.072E-01	1.586E-01	1.658E-01	NOT IDENT.
BK-247	6.425E-02	1.244E-01	1.278E-01	NOT IDENT.
CM-247	2.109E-02	5.816E-02	5.893E-02	NOT IDENT.
CF-251	-5.589E-02	1.763E-01	1.781E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	79.5856	87.09	123.9080	136.47	78.7375
45.60	89.0767	87.57	110.7914	140.51	0.0000
46.54	90.3207	88.03	86.0619	143.76	97.6047
49.72	0.0000	88.34	86.1123	144.24	97.6682
51.35	95.5947	88.47	86.1333	145.44	107.2458
51.87	102.8560	89.96	132.8815	152.43	95.9870
52.39	111.1561	1093.63	93.1345	153.25	84.1920
52.97	97.0270	91.11	93.2151	323.87	82.4634
53.44	88.9656	92.59	93.4678	156.02	119.3905
54.07	85.0141	93.35	93.5968	158.56	86.6068
57.36	0.0000	94.56	93.8015	159.00	77.4362
57.53	112.6297	94.65	93.8164	162.33	95.3468
57.98	96.2038	94.67	93.8198	162.66	97.2383
59.27	94.9525	94.87	93.8536	163.33	98.2452
59.32	94.9642	97.43	94.2808	165.86	74.3781
59.54	95.0151	98.43	94.4462	176.31	89.4336
60.96	75.0225	98.44	94.4479	176.60	90.4058
61.17	75.0602	99.53	84.4887	177.52	102.7580
62.93	102.5923	100.11	89.6478	181.07	0.0000
63.29	102.6786	102.03	105.2172	181.52	101.5289
63.58	110.0873	103.18	127.5278	184.41	109.4651
64.28	108.6912	103.37	119.7448	143.76	86.5983
66.73	117.2222	105.21	89.8590	193.51	109.4286
67.24	123.7007	105.31	89.8739	197.03	88.6491
125.81	119.0603	106.12	103.6654	198.01	95.4954
67.75	125.7476	106.47	116.2639	201.83	97.8237
69.67	121.1824	109.28	109.9312	203.43	98.9596
70.83	115.0950	111.00	103.3479	205.31	102.0720
72.81	166.9584	111.76	0.0000	210.85	91.9066
72.87	166.9799	114.06	98.0841	215.65	79.5848
74.66	135.3804	116.30	0.0000	222.11	87.0245
74.82	154.7725	116.74	88.0683	227.09	69.9617
74.97	154.8208	119.76	86.1512	227.38	69.9816
77.11	151.1896	121.12	100.3294	228.16	0.0000
78.74	130.0232	121.22	95.3858	228.18	82.7696
79.69	128.6444	121.78	93.7152	116.74	82.7696
80.12	118.9764	122.06	86.7451	235.69	72.1467
80.19	118.9931	122.92	81.5935	235.96	72.1653
80.57	133.7649	123.07	81.6116	238.63	78.7786
81.00	120.8185	265.00	86.9566	238.98	0.0000
81.07	120.8355	125.81	98.6874	240.99	78.9533
81.75	122.6332	127.23	100.6593	242.00	79.0275
83.79	124.7669	127.91	90.1541	244.70	67.9080
84.00	126.4597	129.30	94.7644	252.40	0.0000
85.43	115.2817	131.20	99.4655	252.80	76.3533
86.55	120.4802	133.02	103.2868	254.15	0.0000
86.79	118.8831	133.52	99.7961	256.23	71.4828
86.94	118.9177	136.00	76.8975	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	54.8706	355.39	0.0000	584.27	27.2129
264.80	54.8771	356.01	58.3349	595.83	28.3767
265.00	57.6312	364.49	52.2339	427.87	30.4717
268.22	69.3513	366.42	0.0000	602.52	0.0000
269.46	74.3840	372.51	53.6382	604.72	25.4425
270.03	75.4539	375.05	58.2080	607.14	18.6789
271.23	77.8082	377.52	42.6074	609.32	18.6977
273.65	89.5825	356.01	46.5404	610.33	0.0000
276.40	71.7079	388.16	52.3940	614.28	0.0000
277.37	84.2481	388.63	52.4103	618.01	15.3596
277.60	82.1842	391.69	48.2904	620.36	15.3761
278.00	73.8861	264.66	58.2852	621.93	15.3875
279.20	57.2936	401.81	54.6826	630.19	0.0000
279.54	60.4364	402.40	56.5273	631.29	19.5738
279.70	66.6973	404.85	72.1386	633.25	24.7465
280.46	78.2112	410.95	62.3347	634.78	21.6680
283.69	65.8743	413.71	58.7695	635.95	26.8411
284.31	65.9079	414.70	49.6178	636.99	23.7552
285.41	53.4023	423.72	42.5040	645.85	23.8496
285.90	0.0000	427.09	51.8506	657.76	24.3223
287.50	58.7395	427.87	40.7591	657.90	0.0000
290.67	58.8916	433.94	52.9964	661.66	18.7950
293.27	0.0000	439.40	58.7680	664.57	0.0000
351.93	61.9242	453.88	78.4027	666.33	19.1820
295.96	42.2461	463.37	66.2206	666.50	19.1833
879.38	76.2034	468.07	53.3565	667.71	0.0000
299.98	57.6398	473.00	0.0000	677.62	22.0787
300.09	57.6448	475.06	44.4416	685.70	0.0000
300.13	57.6473	476.78	57.1948	695.00	22.9478
301.36	64.4915	477.60	63.5791	696.49	19.4295
302.85	57.7718	482.18	46.2129	696.51	19.4295
256.23	54.4438	487.02	53.4135	697.00	21.2002
304.85	40.8445	492.35	0.0000	697.30	21.2031
306.78	52.1978	497.08	31.8120	697.49	21.2046
308.46	59.7333	505.52	29.0522	702.65	21.2505
311.90	49.6257	507.63	0.0000	706.68	23.9464
316.51	51.5193	511.00	45.6492	711.68	19.1966
319.41	47.3307	514.00	40.5334	720.70	15.2919
320.08	48.7899	514.00	40.5334	721.93	0.0000
321.04	53.4205	520.40	30.2591	722.78	19.6412
323.87	55.0459	520.69	0.0000	722.91	19.6421
325.23	55.1027	522.65	0.0000	723.31	23.2171
328.76	55.4648	527.90	0.0000	724.19	21.4390
333.37	64.3498	528.26	30.3832	727.33	20.3930
333.97	62.6388	529.59	25.5004	733.00	16.1364
334.37	62.6572	529.87	0.0000	735.93	23.6946
338.28	62.8365	531.02	27.4825	333.97	23.9486
338.32	62.8383	537.26	39.3867	739.50	0.0000
311.90	50.6990	546.56	0.0000	747.24	28.8503
340.48	50.6990	552.55	22.8237	748.06	28.8594
340.55	50.7019	563.25	9.9763	752.31	26.0174
344.28	67.9308	569.33	26.6829	753.82	19.5245
345.93	59.9668	946.00	26.6849	756.73	21.7188
351.06	59.8926	569.70	26.6875	756.80	21.7192
351.93	60.5910	583.19	27.1991	884.68	14.5199

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	16.3466	1274.44	10.8236	1620.50	9.8860
766.42	18.1673	1001.03	10.8398	1621.92	6.9221
766.84	23.6212	1002.74	11.8315	1678.03	0.0000
772.60	0.0000	1004.73	15.7852	1690.97	3.0092
776.52	16.4143	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.0713
778.90	21.9058	1028.54	0.0000	1063.66	1.7832
783.70	0.0000	1037.84	13.6685	1771.35	3.5671
785.37	13.1760	1038.76	0.0000	1791.20	0.0000
792.07	11.9251	631.29	7.9945	1808.65	5.1329
794.95	14.6930	1048.07	11.9971	1810.72	0.0000
795.86	11.9421	1049.04	13.0005	1836.06	5.1596
810.06	8.8656	1050.41	12.0054		
810.29	11.0830	1063.66	11.0488		
344.28	11.0837	1077.00	13.1095		
810.76	12.3166	1077.34	12.1021		
815.77	16.6582	1085.87	11.1213		
1048.07	15.7487	1093.63	7.0931		
832.01	19.5504	1099.45	12.1807		
834.85	16.7747	1112.07	3.4927		
835.71	18.6446	1112.84	3.4936		
836.80	0.0000	1115.54	1.7481		
846.75	0.0000	1120.29	14.2957		
846.77	14.9749	1120.55	14.2968		
856.80	19.7251	1221.41	10.5063		
860.56	16.9296	1129.67	8.9354		
871.09	14.1605	1131.51	0.0000		
873.19	7.5578	1147.95	0.0000		
875.33	0.0000	1173.23	14.5093		
879.38	11.3611	1177.95	7.2640		
880.51	15.1540	1189.05	9.3677		
883.24	10.4282	1204.77	14.6340		
884.68	12.3303	1221.41	10.4993		
889.28	18.0498	1231.02	7.2179		
894.76	15.2285	1235.36	12.6460		
898.04	17.1515	1238.28	12.6553		
900.72	16.2135	1260.41	0.0000		
903.28	13.7455	1271.87	12.7661		
911.20	12.4425	1274.44	15.9686		
912.08	11.4888	1274.54	15.9686		
923.98	0.0000	1291.59	5.3461		
926.50	8.6583	1298.22	0.0000		
929.11	22.1460	1312.11	5.3739		
937.49	13.5175	1332.49	7.5617		
944.13	9.6765	1362.66	0.0000		
946.00	5.8094	1365.19	1.8667		
949.00	3.3230	1368.63	0.0000		
667.71	0.0000	1384.29	8.4388		
962.31	11.6807	1408.01	8.4865		
964.08	14.6094	1457.56	0.0000		
966.17	18.3783	1460.82	5.0116		
911.20	21.4607	1489.16	6.7253		
968.97	21.4607	1505.03	3.6814		
983.53	19.6004	1584.12	12.7529		
984.45	0.0000	1596.21	11.8025		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:47:12.89

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677035.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;321
Background date    : 26-JUN-2016 12:04:07
Sample date       : 11-MAY-2016 15:35:00 Acquisition date : 28-JUN-2016 12:45:31
Sample ID        : G398677035 Sample quantity : 1.56480E+02 GRAM
Detector name     : GAM09 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.48 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.25*	20	58	0.51	92.15	90	5	5.63E-03	62.4	
2	0	63.38*	30	128	0.56	126.44	122	8	8.29E-03	70.1	
3	0	74.69	94	125	0.88	149.06	146	6	2.62E-02	21.3	
4	0	77.25	148	107	0.95	154.18	152	8	4.10E-02	15.2	
5	0	84.64*	22	83	1.06	168.97	167	5	6.06E-03	68.5	
6	0	87.17*	50	88	1.01	174.03	172	6	1.39E-02	33.4	
7	0	92.98*	63	155	1.32	185.65	182	9	1.75E-02	40.6	
8	0	155.52	21	80	1.43	310.79	309	7	5.80E-03	74.9	
9	0	185.61*	44	126	1.02	370.99	367	10	1.22E-02	52.2	
10	0	203.11*	15	53	1.39	406.01	403	6	4.27E-03	82.8	
11	4	238.54*	309	52	1.01	476.89	473	18	8.59E-02	6.9	2.30E+00
12	4	241.60	65	89	1.61	483.02	473	18	1.81E-02	32.9	
13	0	270.86	22	55	1.87	541.56	537	9	6.16E-03	63.5	
14	0	295.35*	115	72	1.00	590.57	586	11	3.18E-02	17.4	
15	0	300.20	16	49	0.83	600.27	597	7	4.57E-03	73.8	
16	0	328.43	25	43	0.80	656.75	653	8	7.08E-03	49.0	
17	6	335.46	15	11	1.52	670.83	669	13	4.07E-03	39.6	2.45E+00
18	6	338.41	83	39	1.51	676.72	669	13	2.29E-02	17.9	
19	0	351.82*	160	45	1.14	703.55	698	10	4.44E-02	11.3	
20	0	389.62	27	20	1.38	779.19	776	10	7.50E-03	36.5	
21	0	511.24*	48	54	2.40	1022.53	1014	20	1.34E-02	45.0	
22	0	583.04*	103	19	1.13	1166.21	1161	11	2.87E-02	13.0	
23	0	609.04*	119	18	1.36	1218.23	1212	12	3.31E-02	11.8	
24	0	622.70	17	30	3.95	1245.57	1231	17	4.70E-03	77.8	
25	3	661.37	523	12	1.50	1322.93	1317	20	1.45E-01	4.5	1.50E+00
26	3	665.62	15	10	1.95	1331.44	1317	20	4.19E-03	53.2	
27	0	727.54*	31	9	0.90	1455.33	1451	10	8.70E-03	26.6	
28	0	741.31	5	19	0.82	1482.90	1478	8	1.35E-03	164.1	
29	0	793.47	22	24	3.88	1587.26	1578	19	6.08E-03	57.6	
30	0	860.15*	19	5	1.25	1720.68	1717	7	5.33E-03	31.5	
31	0	911.01*	106	16	1.54	1822.46	1815	16	2.96E-02	13.0	
32	0	964.74	11	14	0.87	1929.97	1925	9	3.02E-03	68.4	
33	0	968.77	70	12	1.94	1938.03	1933	12	1.94E-02	15.5	
34	0	1077.73	10	5	1.32	2156.05	2150	10	2.78E-03	52.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1120.16	38	8	1.99	2240.96	2232	19	1.05E-02	25.2	
36	0	1155.48	14	5	2.19	2311.64	2306	10	3.89E-03	40.1	
37	0	1172.07	10	3	3.51	2344.83	2340	10	2.87E-03	42.4	
38	0	1237.50	21	12	2.73	2475.75	2469	12	5.92E-03	39.0	
39	0	1270.34	6	2	0.67	2541.47	2536	9	1.68E-03	59.6	
40	0	1277.92	13	6	0.59	2556.65	2550	13	3.65E-03	48.1	
41	0	1407.19	7	5	1.44	2815.31	2811	9	2.01E-03	64.9	
42	0	1460.03*	164	3	1.81	2921.04	2914	13	4.54E-02	8.3	
43	0	1588.77	6	4	0.70	3178.67	3172	9	1.58E-03	78.7	
44	0	1763.32*	27	3	1.05	3527.96	3521	13	7.47E-03	24.5	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:47:14

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677035.CNF;1
 Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
 Sample title : MXR1
 Sample date : 11-MAY-2016 15:35:00 Acquisition date : 28-JUN-2016 12:45:31
 Sample ID : G398677035 Sample quantity : 156.48 GRAM
 Sample type : SOLID Sample geometry :
 Detector name : GAMMA9 Detector geometry: CAN
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.48 0.0%
 Energy tolerance : 1.50 keV Half life ratio : 10.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Linear Efficiencies at : Peak Energy
 Abundance limit : 75.00

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.146E+00	6.220E+00	6.220E+00	16.56	OK
GE-68	1077.34	3.22*	1.474E+00	1.015E+00	1.147E+00	104.88	OK
RB-86	1077.00	8.64*	1.474E+00	3.782E-01	2.246E+00	104.88	OK
RH-106	621.93	9.93*	2.262E+00	3.863E-01	4.224E-01	155.52	OK
	1050.41	1.56	1.504E+00	----- Line	Not Found	-----	Absent
RU-106	621.93	9.93*	2.262E+00	3.863E-01	4.224E-01	155.52	OK
	1050.41	1.56	1.504E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	4.855E+00	9.718E-01	1.044E+00	122.57	OK
I-126	388.63	35.60	3.300E+00	1.238E-01	1.614E+00	72.95	OK
	666.33	32.90*	2.147E+00	1.086E-01	1.416E+00	106.32	OK
	753.82	4.15	1.948E+00	----- Line	Not Found	-----	Absent
SN-126	64.28	9.60	2.278E+00	8.733E-01	8.733E-01	140.24	OK
	86.94	8.90	4.855E+00	4.040E-01	4.040E-01	122.57	OK
	87.57	37.00*	4.855E+00	9.718E-02	9.718E-02	122.57	OK
BA-137M	661.66	89.90*	2.157E+00	1.372E+00	1.376E+00	9.01	OK
CS-137	661.66	85.10*	2.157E+00	1.449E+00	1.454E+00	9.01	OK
TL-208	277.37	6.60	4.352E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.382E+00	2.637E-01	2.637E-01	26.08	OK
	860.56	12.50	1.759E+00	4.317E-01	4.317E-01	63.04	OK
PB-210	46.54	4.25*	3.650E-01	8.596E+00	8.632E+00	124.80	OK
PB-212	74.82	10.28	3.655E+00	1.115E+00	1.115E+00	62.40	OK
	77.11	17.10	3.933E+00	1.381E+00	1.381E+00	30.38	OK
	238.63	43.60*	4.884E+00	8.222E-01	8.222E-01	13.74	OK
	300.09	3.30	4.086E+00	6.753E-01	6.753E-01	147.65	OK
BI-214	609.32	45.49*	2.302E+00	5.841E-01	5.842E-01	23.65	OK
	1120.29	14.92	1.429E+00	8.512E-01	8.512E-01	50.44	OK
	1764.49	15.30	9.662E-01	8.256E-01	8.257E-01	48.93	OK
PB-214	74.82	5.80	3.669E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.933E+00	2.434E+00	2.434E+00	30.38	OK
	87.09	3.41	4.849E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.832E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.139E+00	8.320E-01	8.320E-01	34.80	OK
	351.93	35.60*	3.589E+00	6.802E-01	6.802E-01	22.55	OK
RN-222	609.32	45.49*	2.302E+00	5.841E-01	5.842E-01	23.65	OK
	1120.29	14.92	1.429E+00	8.512E-01	8.512E-01	50.44	OK
	1764.49	15.30	9.662E-01	8.256E-01	8.257E-01	48.93	OK
RA-224	240.99	4.10*	4.838E+00	3.828E-01	3.828E-01	345.80	OK
RA-226	609.32	45.49*	2.302E+00	5.841E-01	5.842E-01	23.65	OK
	1120.29	14.92	1.429E+00	8.512E-01	8.512E-01	50.44	OK
	1764.49	15.30	9.662E-01	8.256E-01	8.257E-01	48.93	OK
AC-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.080E+00	1.080E+00	35.76	OK
	794.95	4.25	1.872E+00	1.372E+00	1.372E+00	115.13	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.204E+00	1.204E+00	25.98	OK
	968.97	15.80	1.603E+00	1.348E+00	1.348E+00	31.04	OK
RA-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.080E+00	1.080E+00	35.76	OK
	794.95	4.25	1.872E+00	1.372E+00	1.372E+00	115.13	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.204E+00	1.204E+00	25.98	OK
	968.97	15.80	1.603E+00	1.348E+00	1.348E+00	31.04	OK
TH-228	74.82	10.28	3.655E+00	1.115E+00	1.115E+00	62.40	OK
	77.11	17.10	3.933E+00	1.381E+00	1.381E+00	30.38	OK
	238.63	43.60*	4.884E+00	8.222E-01	8.222E-01	13.74	OK
	300.09	3.30	4.086E+00	6.753E-01	6.753E-01	147.65	OK
TH-229	85.43	14.70	4.645E+00	1.994E-01	1.995E-01	137.00	OK
	88.47	24.00	4.855E+00	1.498E-01	1.498E-01	122.57	OK
	193.51	4.41*	5.613E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.322E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.302E+00	5.841E-01	5.841E-01	23.65	OK
	1120.29	14.92	1.429E+00	8.512E-01	8.512E-01	50.44	OK
	1764.49	15.30	9.662E-01	8.256E-01	8.256E-01	48.93	OK
PA-231	283.69	1.70	4.275E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.086E+00	4.166E-01	4.166E-01	147.65	OK
TH-232	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.706E+00	1.080E+00	1.080E+00	35.76	OK
	835.71	1.61	1.799E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.682E+00	1.204E+00	1.204E+00	25.98	OK
	968.97	15.80	1.603E+00	1.348E+00	1.348E+00	31.04	OK
TH-234	63.29	3.70*	2.278E+00	2.266E+00	2.266E+00	140.24	OK
	92.59	4.23	5.275E+00	1.745E+00	1.745E+00	81.22	OK
U-234	609.32	45.49*	2.302E+00	5.841E-01	5.841E-01	23.65	OK
	1120.29	14.92	1.429E+00	8.512E-01	8.512E-01	50.44	OK
	1764.49	15.30	9.662E-01	8.256E-01	8.256E-01	48.93	OK
U-238	63.29	3.70*	2.278E+00	2.266E+00	2.266E+00	140.24	OK
	92.59	4.23	5.275E+00	1.745E+00	1.745E+00	81.22	OK
AM-243	43.53	5.90	1.969E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.655E+00	1.706E-01	1.706E-01	62.40	OK
CF-249	252.80	2.50	4.677E+00	----- Line	Not Found	-----	Absent
	333.37	14.60	3.751E+00	----- Line	Not Found	-----	Absent
	388.16	66.00*	3.300E+00	6.676E-02	6.677E-02	72.95	OK
ANH-511	511.00	100.00*	2.645E+00	9.544E-02	9.544E-02	90.04	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677035.CNF;1
Acquisition date : 28-JUN-2016 12:45:31 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.48 Half life ratio : *****
Sample date : 11-MAY-2016 15:35:00 Analyst initials: MXR1
Sample ID : G398677035 Sample Quantity : 1.5648E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.220E+00	1.009E+00	5.163E-01
GE-68	1.147E+00	1.179E+00	2.137E+00
RB-86	2.246E+00	2.308E+00	4.341E+00
RH-106	4.224E-01	6.438E-01	7.401E-01
RU-106	4.224E-01	6.438E-01	7.401E-01
CD-109	1.044E+00	1.254E+00	1.699E+00
I-126	1.416E+00	1.475E+00	2.505E+00
SN-126	9.718E-02	1.167E-01	1.537E-01
BA-137M	1.376E+00	1.216E-01	6.679E-02
CS-137	1.454E+00	1.284E-01	7.056E-02
TL-208	2.637E-01	6.740E-02	6.527E-02
PB-210	8.632E+00	1.056E+01	1.310E+01
PB-212	8.222E-01	1.107E-01	9.801E-02
BI-214	5.842E-01	1.354E-01	1.123E-01
PB-214	6.802E-01	1.503E-01	1.331E-01
RN-222	5.842E-01	1.354E-01	1.123E-01
RA-224	3.828E-01	1.297E+00	1.051E+00
RA-226	5.842E-01	1.354E-01	1.123E-01
AC-228	1.204E+00	3.067E-01	1.864E-01
RA-228	1.204E+00	3.067E-01	1.864E-01
TH-228	8.222E-01	1.107E-01	9.801E-02
TH-229	-3.397E-01	4.652E-01	8.281E-01
TH-230	5.841E-01	1.354E-01	1.123E-01
PA-231	4.166E-01	6.027E-01	8.035E-01
TH-232	1.204E+00	3.067E-01	1.864E-01
TH-234	2.266E+00	3.114E+00	2.725E+00
U-234	5.841E-01	1.354E-01	1.123E-01
U-238	2.266E+00	3.114E+00	2.725E+00
AM-243	1.706E-01	1.043E-01	1.244E-01
CF-249	6.677E-02	4.774E-02	8.252E-02
ANH-511	9.544E-02	8.421E-02	5.578E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	2.678E-01	5.384E-01	1.078E+00	NOT IDENT.
NA-22	2.464E-02	4.898E-02	7.326E-02	NOT IDENT.
NA-24	0.000E+00	3.551E+21	0.000E+00	SHORT HLIF
AL-26	-2.640E-02	3.093E-02	4.807E-02	NOT IDENT.
SC-46	8.591E-03	4.071E-02	8.476E-02	FAIL ABUN
V-48	-2.447E-02	2.071E-01	4.118E-01	NOT IDENT.
CR-51	4.405E-01	8.156E-01	1.667E+00	NOT IDENT.
MN-54	-2.051E-03	3.315E-02	6.541E-02	NOT IDENT.
CO-56	-2.621E-02	4.084E-02	7.352E-02	FAIL ABUN
MN-56	0.000E+00	1.536E+41	0.000E+00	SHORT HLIF
CO-57	-1.258E-02	2.445E-02	4.609E-02	NOT IDENT.
CO-58	1.358E-03	4.971E-02	9.889E-02	NOT IDENT.
FE-59	-5.873E-02	1.156E-01	2.069E-01	NOT IDENT.
CO-60	8.918E-03	2.583E-02	5.946E-02	FAIL ABUN
ZN-65	8.407E-02	8.783E-02	1.803E-01	NOT IDENT.
AS-73	-1.155E+00	1.629E+00	2.866E+00	NOT IDENT.
AS-74	1.240E-01	3.446E-01	6.846E-01	NOT IDENT.
SE-75	2.912E-02	5.003E-02	9.791E-02	NOT IDENT.
BR-77	0.000E+00	2.441E+05	0.000E+00	SHORT HLIF
SR-82	7.308E-03	6.288E-01	1.279E+00	NOT IDENT.
RB-83	-4.002E-02	9.969E-02	1.745E-01	NOT IDENT.
KR-85	6.891E+00	7.601E+00	1.562E+01	NOT IDENT.
SR-85	5.128E-02	5.682E-02	1.168E-01	NOT IDENT.
Y-88	1.587E-02	2.907E-02	7.921E-02	NOT IDENT.
Y-91	9.451E+00	2.714E+01	5.481E+01	NOT IDENT.
NB-94	-1.399E-03	3.290E-02	6.137E-02	NOT IDENT.
NB-95	8.521E-04	5.732E-02	1.120E-01	NOT IDENT.
NB-95M	-1.482E-01	1.798E-01	2.696E-01	NOT IDENT.
ZR-95	-2.539E-02	9.739E-02	1.864E-01	NOT IDENT.
NB-97	0.000E+00	1.950E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.954E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.179E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.602E-02	2.812E-02	5.266E-02	NOT IDENT.
RH-102	1.337E-02	4.692E-02	9.451E-02	NOT IDENT.
RU-103	1.763E-02	7.785E-02	1.518E-01	FAIL ABUN
AG-108M	1.316E-02	3.108E-02	6.222E-02	NOT IDENT.
AG-110M	1.909E-03	3.784E-02	7.838E-02	NOT IDENT.
SN-113	-3.303E-02	5.233E-02	8.155E-02	NOT IDENT.
CD-115	0.000E+00	2.683E+05	0.000E+00	SHORT HLIF
SN-117M	-4.841E-02	2.642E-01	4.470E-01	FAIL ABUN
TE-123M	-3.817E-03	3.109E-02	5.295E-02	NOT IDENT.
SB-124	1.864E-02	1.144E-01	2.488E-01	NOT IDENT.
SB-125	-1.489E-02	9.569E-02	1.818E-01	NOT IDENT.
TE-125M	5.021E-01	1.318E+01	2.604E+01	NOT IDENT.
SB-126	-6.490E-01	7.460E-01	1.264E+00	FAIL ABUN
SB-127	0.000E+00	4.634E+02	0.000E+00	SHORT HLIF
I-131	8.391E-01	2.066E+00	4.142E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.669E+02	0.000E+00	SHORT HLIF
BA-133	1.062E-02	4.108E-02	7.387E-02	NOT IDENT.
I-133	0.000E+00	1.253E+15	0.000E+00	SHORT HLIF
CS-134	2.863E-02	4.123E-02	8.078E-02	NOT IDENT.
CS-135	1.851E-02	1.628E-01	2.717E-01	NOT IDENT.
I-135	0.000E+00	1.143E+41	0.000E+00	SHORT HLIF
CS-136	-2.515E-01	4.544E-01	8.110E-01	NOT IDENT.
CE-139	-1.911E-02	3.098E-02	5.649E-02	NOT IDENT.
BA-140	-6.255E-01	1.545E+00	2.814E+00	NOT IDENT.
LA-140	-1.234E-01	4.330E-01	8.466E-01	FAIL ABUN
CE-141	3.714E-02	1.171E-01	2.312E-01	NOT IDENT.
CE-143	0.000E+00	2.244E+09	0.000E+00	SHORT HLIF
CE-144	-8.806E-02	1.899E-01	3.570E-01	NOT IDENT.
PM-144	2.368E-02	3.599E-02	7.335E-02	NOT IDENT.
PR-144	1.788E+00	2.738E+00	5.577E+00	NOT IDENT.
PM-146	-3.669E-02	4.646E-02	8.189E-02	NOT IDENT.
ND-147	3.771E-01	3.948E+00	7.749E+00	NOT IDENT.
PM-147	-4.715E+02	6.691E+02	1.246E+03	NOT IDENT.
PM-149	0.000E+00	2.557E+06	0.000E+00	SHORT HLIF
EU-150	2.240E-02	1.737E-02	5.042E-02	FAIL ABUN
EU-152	-1.142E-02	9.984E-02	1.865E-01	FAIL ABUN
GD-153	7.109E-02	9.790E-02	1.852E-01	NOT IDENT.
EU-154	6.652E-02	1.362E-01	2.027E-01	NOT IDENT.
EU-155	8.139E-02	9.343E-02	1.960E-01	FAIL ABUN
TB-160	2.919E-02	1.309E-01	2.774E-01	FAIL ABUN
HO-166M	3.211E-02	5.290E-02	1.099E-01	FAIL ABUN
TM-171	-2.337E+01	2.699E+01	4.675E+01	NOT IDENT.
HF-172	-5.325E-02	1.692E-01	3.234E-01	FAIL ABUN

LU-172	-2.147E-02	5.664E-02	1.051E-01	FAIL ABUN
LU-176	-5.440E-03	2.454E-02	4.752E-02	FAIL ABUN
HF-181	-5.039E-02	8.593E-02	1.538E-01	NOT IDENT.
TA-182	1.235E-01	1.393E-01	3.308E-01	FAIL ABUN
RE-183	1.014E-01	3.750E-01	7.136E-01	NOT IDENT.
RE-184	6.481E-02	1.923E-01	3.802E-01	FAIL ABUN
W-188	3.646E-01	1.157E+01	1.890E+01	FAIL ABUN
IR-192	7.420E-04	4.289E-02	8.474E-02	FAIL ABUN
HG-203	-2.109E-02	5.872E-02	1.046E-01	NOT IDENT.
BI-207	3.034E-02	4.923E-02	1.036E-01	FAIL ABUN
BI-211	0.000E+00	4.141E-01	7.377E-01	FAIL ABUN
PB-211	5.350E-03	7.251E-01	1.402E+00	NOT IDENT.
BI-212	1.181E+00	6.147E-01	1.224E+00	FAIL ABUN
RN-219	2.623E-01	4.260E-01	8.653E-01	FAIL ABUN
RA-223	1.400E-02	7.131E-01	1.235E+00	FAIL ABUN
AC-227	9.673E-02	2.474E-01	4.739E-01	FAIL ABUN
TH-227	9.673E-02	2.474E-01	4.739E-01	FAIL ABUN
TH-231	1.400E-02	7.131E-01	1.235E+00	FAIL ABUN
PA-233	-2.171E-02	6.089E-02	1.163E-01	FAIL ABUN
PA-234	0.000E+00	2.126E-01	4.332E-01	NOT IDENT.
PA-234M	-1.839E+00	3.769E+00	7.343E+00	NOT IDENT.
U-235	-1.243E-01	1.825E-01	3.375E-01	FAIL ABUN
NP-237	-2.171E-02	6.089E-02	1.163E-01	FAIL ABUN
NP-238	0.000E+00	6.314E+05	0.000E+00	SHORT HLIF
NP-239	-6.933E-02	2.524E-01	4.853E-01	NOT IDENT.
PU-239	1.291E+02	3.044E+02	6.088E+02	NOT IDENT.
AM-241	-1.171E-02	2.207E-01	3.745E-01	NOT IDENT.
CM-243	-1.245E-02	9.167E-02	1.805E-01	NOT IDENT.
BK-247	5.062E-02	7.519E-02	1.481E-01	FAIL ABUN
CM-247	1.715E-02	3.879E-02	7.775E-02	NOT IDENT.
CF-251	1.069E-02	1.086E-01	2.090E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	158	10.66*	1.146E+00	6.220E+00	6.220E+00	16.56
GE-68	1077.34	10	3.22*	1.474E+00	1.015E+00	1.147E+00	104.88
RB-86	1077.00	10	8.64*	1.474E+00	3.782E-01	2.246E+00	104.88
RH-106	621.93	18	9.93*	2.262E+00	3.863E-01	4.224E-01	155.52
	1050.41	-----	1.56	1.504E+00	-----	Line Not Found	-----
RU-106	621.93	18	9.93*	2.262E+00	3.863E-01	4.224E-01	155.52
	1050.41	-----	1.56	1.504E+00	-----	Line Not Found	-----
CD-109	88.03	65	3.70*	4.855E+00	1.739E+00	1.868E+00	66.77
I-126	388.63	30	35.60	3.300E+00	1.238E-01	1.614E+00	72.95
	666.33	16	32.90*	2.147E+00	1.086E-01	1.416E+00	106.32
	753.82	-----	4.15	1.948E+00	-----	Line Not Found	-----
SN-126	64.28	40	9.60	2.278E+00	8.733E-01	8.733E-01	140.24
	86.94	65	8.90	4.855E+00	7.228E-01	7.228E-01	66.77
	87.57	65	37.00*	4.855E+00	1.739E-01	1.739E-01	66.77
BA-137M	661.66	555	89.90*	2.157E+00	1.372E+00	1.376E+00	9.01
CS-137	661.66	555	85.10*	2.157E+00	1.449E+00	1.454E+00	9.01
TL-208	277.37	-----	6.60	4.352E+00	-----	Line Not Found	-----
	583.19	111	85.00*	2.382E+00	2.637E-01	2.637E-01	26.08
	860.56	20	12.50	1.759E+00	4.317E-01	4.317E-01	63.04
PB-210	46.54	28	4.25*	3.650E-01	8.596E+00	8.632E+00	124.80
BI-211	72.87	-----	1.23	3.448E+00	-----	Line Not Found	-----
	351.06	181	12.92*	3.589E+00	1.874E+00	1.874E+00	22.55
PB-212	74.82	124	10.28	3.655E+00	1.585E+00	1.585E+00	42.69
	77.11	194	17.10	3.933E+00	1.381E+00	1.381E+00	30.38
	238.63	365	43.60*	4.884E+00	8.222E-01	8.222E-01	13.74
	300.09	19	3.30	4.086E+00	6.753E-01	6.753E-01	147.65
BI-214	609.32	127	45.49*	2.302E+00	5.841E-01	5.842E-01	23.65
	1120.29	38	14.92	1.429E+00	8.512E-01	8.512E-01	50.44
	1764.49	25	15.30	9.662E-01	8.256E-01	8.257E-01	48.93
PB-214	74.82	124	5.80	3.655E+00	2.809E+00	2.809E+00	42.69
	77.11	194	9.70	3.933E+00	2.434E+00	2.434E+00	30.38
	87.09	65	3.41	4.855E+00	1.886E+00	1.887E+00	66.77
	242.00	77	7.25	4.838E+00	1.048E+00	1.049E+00	65.84
	295.22	132	18.42	4.139E+00	8.320E-01	8.320E-01	34.80
	351.93	181	35.60*	3.589E+00	6.802E-01	6.802E-01	22.55
RN-222	609.32	127	45.49*	2.302E+00	5.841E-01	5.842E-01	23.65
	1120.29	38	14.92	1.429E+00	8.512E-01	8.512E-01	50.44
	1764.49	25	15.30	9.662E-01	8.256E-01	8.257E-01	48.93
RA-224	240.99	77	4.10*	4.838E+00	1.854E+00	1.854E+00	65.84
RA-226	609.32	127	45.49*	2.302E+00	5.841E-01	5.842E-01	23.65
	1120.29	38	14.92	1.429E+00	8.512E-01	8.512E-01	50.44
	1764.49	25	15.30	9.662E-01	8.256E-01	8.257E-01	48.93
AC-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	94	11.27	3.706E+00	1.080E+00	1.080E+00	35.76
	794.95	23	4.25	1.872E+00	1.372E+00	1.372E+00	115.13
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	109	25.80*	1.682E+00	1.204E+00	1.204E+00	25.98

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	968.97	71	15.80	1.603E+00	1.348E+00	1.348E+00	31.04
	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	94	11.27	3.706E+00	1.080E+00	1.080E+00	35.76
	794.95	23	4.25	1.872E+00	1.372E+00	1.372E+00	115.13
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
TH-228	911.20	109	25.80*	1.682E+00	1.204E+00	1.204E+00	25.98
	968.97	71	15.80	1.603E+00	1.348E+00	1.348E+00	31.04
	74.82	124	10.28	3.655E+00	1.585E+00	1.585E+00	42.69
	77.11	194	17.10	3.933E+00	1.381E+00	1.381E+00	30.38
	238.63	365	43.60*	4.884E+00	8.222E-01	8.222E-01	13.74
TH-229	300.09	19	3.30	4.086E+00	6.753E-01	6.753E-01	147.65
	85.43	28	14.70	4.645E+00	1.994E-01	1.995E-01	137.00
	88.47	65	24.00	4.855E+00	2.680E-01	2.680E-01	66.77
	193.51	-----	4.41*	5.613E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.322E+00	-----	Line Not Found	-----
TH-230	609.32	127	45.49*	2.302E+00	5.841E-01	5.841E-01	23.65
	1120.29	38	14.92	1.429E+00	8.512E-01	8.512E-01	50.44
	1764.49	25	15.30	9.662E-01	8.256E-01	8.256E-01	48.93
	283.69	-----	1.70	4.275E+00	-----	Line Not Found	-----
	301.36	19	5.35*	4.086E+00	4.166E-01	4.166E-01	147.65
TH-232	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	94	11.27	3.706E+00	1.080E+00	1.080E+00	35.76
	835.71	-----	1.61	1.799E+00	-----	Line Not Found	-----
	911.20	109	25.80*	1.682E+00	1.204E+00	1.204E+00	25.98
	968.97	71	15.80	1.603E+00	1.348E+00	1.348E+00	31.04
TH-234	63.29	40	3.70*	2.278E+00	2.266E+00	2.266E+00	140.24
	92.59	81	4.23	5.275E+00	1.745E+00	1.745E+00	81.22
	609.32	127	45.49*	2.302E+00	5.841E-01	5.841E-01	23.65
	1120.29	38	14.92	1.429E+00	8.512E-01	8.512E-01	50.44
	1764.49	25	15.30	9.662E-01	8.256E-01	8.256E-01	48.93
U-238	63.29	40	3.70*	2.278E+00	2.266E+00	2.266E+00	140.24
	92.59	81	4.23	5.275E+00	1.745E+00	1.745E+00	81.22
	43.53	-----	5.90	1.969E-01	-----	Line Not Found	-----
	74.66	124	67.20*	3.655E+00	2.424E-01	2.424E-01	42.69
	252.80	-----	2.50	4.677E+00	-----	Line Not Found	-----
CF-249	333.37	-----	14.60	3.751E+00	-----	Line Not Found	-----
	388.16	30	66.00*	3.300E+00	6.676E-02	6.677E-02	72.95
	511.00	53	100.00*	2.645E+00	9.544E-02	9.544E-02	90.04

Flag: "*" = Keyline

Total number of lines in spectrum 44
Number of unidentified lines 5
Number of lines tentatively identified by NID 39 88.64%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.220E+00	6.220E+00	1.030E+00	16.56	
GE-68	270.95D	1.13	1.015E+00	1.147E+00	1.203E+00	104.88	
RB-86	18.64D	5.94	3.782E-01	2.246E+00	2.356E+00	104.88	
RH-106	371.80D	1.09	3.863E-01	4.224E-01	6.569E-01	155.52	
RU-106	371.80D	1.09	3.863E-01	4.224E-01	6.569E-01	155.52	
CD-109	461.40D	1.07	1.739E+00	1.868E+00	1.247E+00	66.77	
I-126	12.93D	13.0	1.086E-01	1.416E+00	1.505E+00	106.32	
SN-126	2.30E+05Y	1.00	1.739E-01	1.739E-01	1.161E-01	66.77	
BA-137M	30.08Y	1.00	1.372E+00	1.376E+00	0.124E+00	9.01	
CS-137	30.08Y	1.00	1.449E+00	1.454E+00	0.131E+00	9.01	
TL-208	1.41E+10Y	1.00	2.637E-01	2.637E-01	0.688E-01	26.08	
PB-210	22.20Y	1.00	8.596E+00	8.632E+00	10.77E+00	124.80	
BI-211	7.04E+08Y	1.00	1.874E+00	1.874E+00	0.423E+00	22.55	
PB-212	1.41E+10Y	1.00	8.222E-01	8.222E-01	1.130E-01	13.74	
BI-214	1600.00Y	1.00	5.841E-01	5.842E-01	1.381E-01	23.65	
PB-214	1600.00Y	1.00	6.802E-01	6.802E-01	1.534E-01	22.55	
RN-222	1600.00Y	1.00	5.841E-01	5.842E-01	1.381E-01	23.65	
RA-224	1.41E+10Y	1.00	1.854E+00	1.854E+00	1.221E+00	65.84	
RA-226	1600.00Y	1.00	5.841E-01	5.842E-01	1.381E-01	23.65	
AC-228	1.41E+10Y	1.00	1.204E+00	1.204E+00	0.313E+00	25.98	
RA-228	1.41E+10Y	1.00	1.204E+00	1.204E+00	0.313E+00	25.98	
TH-228	1.41E+10Y	1.00	8.222E-01	8.222E-01	1.130E-01	13.74	
TH-229	7340.00Y	1.00	2.680E-01	2.680E-01	1.790E-01	66.77	K
TH-230	7.54E+04Y	1.00	5.841E-01	5.841E-01	1.381E-01	23.65	
PA-231	7.04E+08Y	1.00	4.166E-01	4.166E-01	6.150E-01	147.65	
TH-232	1.41E+10Y	1.00	1.204E+00	1.204E+00	0.313E+00	25.98	
TH-234	4.47E+09Y	1.00	2.266E+00	2.266E+00	3.178E+00	140.24	
U-234	2.45E+05Y	1.00	5.841E-01	5.841E-01	1.381E-01	23.65	
U-238	4.47E+09Y	1.00	2.266E+00	2.266E+00	3.178E+00	140.24	
AM-243	7370.00Y	1.00	2.424E-01	2.424E-01	1.035E-01	42.69	
CF-249	351.00Y	1.00	6.676E-02	6.677E-02	4.872E-02	72.95	
ANH-511	1.00E+09Y	1.00	9.544E-02	9.544E-02	8.593E-02	90.04	

Total Activity : 4.030E+01 4.385E+01

Grand Total Activity : 4.030E+01 4.385E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	155.52	26	98	1.43	310.79	309	7	5.80E-03	****	6.20E+00	T
0	185.61	53	152	1.02	370.99	367	10	1.22E-02	****	5.75E+00	T
0	203.11	18	64	1.39	406.01	403	6	4.27E-03	****	5.45E+00	T
0	270.86	26	64	1.87	541.56	537	9	6.16E-03	****	4.43E+00	T
0	328.43	29	49	0.80	656.75	653	8	7.08E-03	98.1	3.80E+00	T
6	335.46	17	12	1.52	670.83	669	13	4.07E-03	79.1	3.73E+00	T
0	727.54	33	9	0.90	1455.33	1451	10	8.70E-03	53.1	2.00E+00	T
0	741.31	5	20	0.82	1482.90	1478	8	1.35E-03	****	1.97E+00	
0	964.74	11	14	0.87	1929.97	1925	9	3.02E-03	****	1.61E+00	T
0	1155.48	14	5	2.19	2311.64	2306	10	3.89E-03	80.2	1.39E+00	
0	1172.07	10	3	3.51	2344.83	2340	10	2.87E-03	84.8	1.38E+00	T
0	1237.50	21	12	2.73	2475.75	2469	12	5.92E-03	78.0	1.32E+00	T
0	1270.34	6	2	0.67	2541.47	2536	9	1.68E-03	****	1.29E+00	
0	1277.92	13	6	0.59	2556.65	2550	13	3.65E-03	96.3	1.28E+00	
0	1407.19	7	5	1.44	2815.31	2811	9	2.01E-03	****	1.18E+00	T
0	1588.77	5	4	0.70	3178.67	3172	9	1.58E-03	****	1.06E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677035.CNF;1
Acquisition date : 28-JUN-2016 12:45:31 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.48 Half life ratio : *****
Sample date : 11-MAY-2016 15:35:00 Nuclide Library : SOLID
Sample ID : G398677035 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5648E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.046E-01
GE-68	9.116E-01
RB-86	1.863E+00
RH-106	3.376E-01
RU-106	3.376E-01
CD-109	8.085E-01
I-126	1.129E+00
SN-126	7.298E-02
BA-137M	2.995E-02
CS-137	3.163E-02
TL-208	2.933E-02
PB-210	6.116E+00
PB-212	4.580E-02
BI-214	4.974E-02
PB-214	6.125E-02
RN-222	4.974E-02
RA-224	4.910E-01
RA-226	4.974E-02
AC-228	7.794E-02
RA-228	7.794E-02
TH-228	4.580E-02
TH-229	3.863E-01
TH-230	4.973E-02
PA-231	3.706E-01
TH-232	7.794E-02
TH-234	1.278E+00
U-234	4.973E-02
U-238	1.278E+00
AM-243	5.933E-02
CF-249	3.817E-02
ANH-511	2.535E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)

BE-7	4.958E-01	NOT IDENT.
NA-22	3.135E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.712E-02	NOT IDENT.
SC-46	3.663E-02	FAIL ABUN
V-48	1.725E-01	NOT IDENT.
CR-51	7.751E-01	NOT IDENT.
MN-54	2.860E-02	NOT IDENT.
CO-56	3.102E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.159E-02	NOT IDENT.
CO-58	4.365E-02	NOT IDENT.
FE-59	8.646E-02	NOT IDENT.
CO-60	2.434E-02	FAIL ABUN
ZN-65	7.975E-02	NOT IDENT.
AS-73	1.333E+00	NOT IDENT.
AS-74	3.109E-01	NOT IDENT.
SE-75	4.557E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.535E-01	NOT IDENT.
RB-83	7.882E-02	NOT IDENT.
KR-85	7.220E+00	NOT IDENT.
SR-85	5.396E-02	NOT IDENT.
Y-88	2.997E-02	NOT IDENT.
Y-91	2.410E+01	NOT IDENT.
NB-94	2.744E-02	NOT IDENT.
NB-95	5.019E-02	NOT IDENT.
NB-95M	1.254E-01	NOT IDENT.
ZR-95	8.264E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.467E-02	NOT IDENT.
RH-102	4.179E-02	NOT IDENT.
RU-103	6.954E-02	FAIL ABUN
AG-108M	2.864E-02	NOT IDENT.
AG-110M	3.313E-02	NOT IDENT.
SN-113	3.654E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.086E-01	FAIL ABUN
TE-123M	2.471E-02	NOT IDENT.
SB-124	1.007E-01	NOT IDENT.
SB-125	8.323E-02	NOT IDENT.
TE-125M	1.226E+01	NOT IDENT.
SB-126	5.415E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	1.922E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.384E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.604E-02	NOT IDENT.
CS-135	1.263E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.372E-01	NOT IDENT.
CE-139	2.643E-02	NOT IDENT.
BA-140	1.261E+00	NOT IDENT.
LA-140	3.360E-01	FAIL ABUN
CE-141	1.093E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.675E-01	NOT IDENT.
PM-144	3.313E-02	NOT IDENT.
PR-144	2.519E+00	NOT IDENT.
PM-146	3.733E-02	NOT IDENT.
ND-147	3.464E+00	NOT IDENT.
PM-147	5.826E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.332E-02	FAIL ABUN
EU-152	8.624E-02	FAIL ABUN
GD-153	8.759E-02	NOT IDENT.
EU-154	8.661E-02	NOT IDENT.
EU-155	9.229E-02	FAIL ABUN
TB-160	1.186E-01	FAIL ABUN
HO-166M	4.889E-02	FAIL ABUN
TM-171	2.167E+01	NOT IDENT.
HF-172	1.515E-01	FAIL ABUN
LU-172	4.499E-02	FAIL ABUN

LU-176	2.195E-02	FAIL ABUN
HF-181	7.033E-02	NOT IDENT.
TA-182	1.410E-01	FAIL ABUN
RE-183	3.360E-01	NOT IDENT.
RE-184	1.639E-01	FAIL ABUN
W-188	8.801E+00	FAIL ABUN
IR-192	3.908E-02	FAIL ABUN
HG-203	4.839E-02	NOT IDENT.
BI-207	4.586E-02	FAIL ABUN
BI-211	3.544E-01	FAIL ABUN
PB-211	6.452E-01	NOT IDENT.
BI-212	5.622E-01	FAIL ABUN
RN-219	4.009E-01	FAIL ABUN
RA-223	5.731E-01	FAIL ABUN
AC-227	2.214E-01	FAIL ABUN
TH-227	2.214E-01	FAIL ABUN
TH-231	5.731E-01	FAIL ABUN
PA-233	5.372E-02	FAIL ABUN
PA-234	1.828E-01	NOT IDENT.
PA-234M	3.168E+00	NOT IDENT.
U-235	1.587E-01	FAIL ABUN
NP-237	5.372E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.286E-01	NOT IDENT.
PU-239	2.871E+02	NOT IDENT.
AM-241	1.762E-01	NOT IDENT.
CM-243	8.450E-02	NOT IDENT.
BK-247	6.903E-02	FAIL ABUN
CM-247	3.596E-02	NOT IDENT.
CF-251	9.772E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677035.CNF;1
Acquisition date : 28-JUN-2016 12:45:31 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.48 Half life ratio : *****
Sample date : 11-MAY-2016 15:35:00 Nuclide Library : SOLID
Sample ID : G398677035 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5648E+02 GRAM
Quantity Err(%) : 1.2781E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.220E+00	1.060E+00	1.060E+00
GE-68	1.147E+00	1.180E+00	1.180E+00
RB-86	2.246E+00	2.310E+00	2.310E+00
RH-106	4.224E-01	6.443E-01	6.443E-01
RU-106	4.224E-01	6.443E-01	6.443E-01
CD-109	1.044E+00	1.261E+00	1.261E+00
I-126	1.416E+00	1.478E+00	1.478E+00
SN-126	9.718E-02	1.173E-01	1.173E-01
BA-137M	1.376E+00	1.352E-01	1.352E-01
CS-137	1.454E+00	1.427E-01	1.427E-01
TL-208	2.637E-01	6.833E-02	6.833E-02
PB-210	8.632E+00	1.059E+01	1.059E+01
PB-212	8.222E-01	1.189E-01	1.189E-01
BI-214	5.842E-01	1.377E-01	1.377E-01
PB-214	6.802E-01	1.529E-01	1.529E-01
RN-222	5.842E-01	1.377E-01	1.377E-01
RA-224	3.828E-01	1.301E+00	1.301E+00
RA-226	5.842E-01	1.377E-01	1.377E-01
AC-228	1.204E+00	3.128E-01	3.128E-01
RA-228	1.204E+00	3.128E-01	3.128E-01
TH-228	8.222E-01	1.189E-01	1.189E-01
TH-229	-3.397E-01	4.655E-01	4.655E-01
TH-230	5.841E-01	1.376E-01	1.376E-01
PA-231	4.166E-01	6.093E-01	6.093E-01
TH-232	1.204E+00	3.128E-01	3.128E-01
TH-234	2.266E+00	3.154E+00	3.154E+00
U-234	5.841E-01	1.376E-01	1.376E-01
U-238	2.266E+00	3.154E+00	3.154E+00
AM-243	1.706E-01	1.053E-01	1.053E-01
CF-249	6.677E-02	4.805E-02	4.805E-02
ANH-511	9.544E-02	8.430E-02	8.430E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	2.678E-01	5.385E-01	5.519E-01	NOT IDENT.
NA-22	2.464E-02	4.899E-02	5.023E-02	NOT IDENT.
NA-24	2.407E+20	3.551E+21	0.000E+00	SHORT HLIF
AL-26	-2.640E-02	3.097E-02	3.318E-02	NOT IDENT.
SC-46	8.591E-03	4.071E-02	4.090E-02	FAIL ABUN
V-48	-2.447E-02	2.071E-01	2.074E-01	NOT IDENT.
CR-51	4.405E-01	8.158E-01	8.396E-01	NOT IDENT.
MN-54	-2.051E-03	3.315E-02	3.316E-02	NOT IDENT.
CO-56	-2.621E-02	4.086E-02	4.253E-02	FAIL ABUN
MN-56	-1.000E+41	1.537E+41	0.000E+00	SHORT HLIF
CO-57	-1.258E-02	2.446E-02	2.510E-02	NOT IDENT.
CO-58	1.358E-03	4.971E-02	4.972E-02	NOT IDENT.
FE-59	-5.873E-02	1.157E-01	1.187E-01	NOT IDENT.
CO-60	8.918E-03	2.583E-02	2.614E-02	FAIL ABUN
ZN-65	8.407E-02	8.788E-02	9.571E-02	NOT IDENT.
AS-73	-1.155E+00	1.646E+00	1.727E+00	NOT IDENT.
AS-74	1.240E-01	3.447E-01	3.492E-01	NOT IDENT.
SE-75	2.912E-02	5.004E-02	5.174E-02	NOT IDENT.
BR-77	1.812E+06	2.519E+06	2.648E+06	SHORT HLIF
SR-82	7.308E-03	6.288E-01	6.288E-01	NOT IDENT.
RB-83	-4.002E-02	9.984E-02	1.015E-01	NOT IDENT.
KR-85	6.891E+00	7.606E+00	8.216E+00	NOT IDENT.
SR-85	5.128E-02	5.686E-02	6.138E-02	NOT IDENT.
Y-88	1.587E-02	2.909E-02	2.996E-02	NOT IDENT.
Y-91	9.451E+00	2.714E+01	2.747E+01	NOT IDENT.
NB-94	-1.399E-03	3.290E-02	3.291E-02	NOT IDENT.
NB-95	8.521E-04	5.732E-02	5.732E-02	NOT IDENT.
NB-95M	-1.482E-01	1.802E-01	1.922E-01	NOT IDENT.
ZR-95	-2.539E-02	9.740E-02	9.807E-02	NOT IDENT.
NB-97	1.000E+41	1.951E+41	0.000E+00	SHORT HLIF
ZR-97	5.808E+19	1.955E+20	0.000E+00	SHORT HLIF
MO-99	4.791E+04	5.186E+04	5.618E+04	SHORT HLIF
TC-99M	-1.000E+41	2.724E+41	0.000E+00	SHORT HLIF
RH-101	-1.602E-02	2.826E-02	2.917E-02	NOT IDENT.
RH-102	1.337E-02	4.693E-02	4.732E-02	NOT IDENT.
RU-103	1.763E-02	7.786E-02	7.826E-02	FAIL ABUN
AG-108M	1.316E-02	3.109E-02	3.165E-02	NOT IDENT.
AG-110M	1.909E-03	3.784E-02	3.785E-02	NOT IDENT.
SN-113	-3.303E-02	5.234E-02	5.442E-02	NOT IDENT.
CD-115	-1.562E+05	2.685E+05	2.776E+05	SHORT HLIF
SN-117M	-4.841E-02	2.642E-01	2.651E-01	FAIL ABUN
TE-123M	-3.817E-03	3.109E-02	3.114E-02	NOT IDENT.
SB-124	1.864E-02	1.144E-01	1.147E-01	NOT IDENT.
SB-125	-1.489E-02	9.569E-02	9.593E-02	NOT IDENT.
TE-125M	5.021E-01	1.318E+01	1.318E+01	NOT IDENT.
SB-126	-6.490E-01	7.489E-01	8.040E-01	FAIL ABUN
SB-127	7.335E+01	4.637E+02	4.649E+02	SHORT HLIF
I-131	8.391E-01	2.066E+00	2.100E+00	NOT IDENT.
I-132	1.000E+41	6.902E+41	0.000E+00	SHORT HLIF
TE-132	4.249E+02	7.682E+02	7.917E+02	SHORT HLIF
BA-133	1.062E-02	4.108E-02	4.136E-02	NOT IDENT.
I-133	-2.797E+14	1.256E+15	1.262E+15	SHORT HLIF
CS-134	2.863E-02	4.124E-02	4.322E-02	NOT IDENT.
CS-135	1.851E-02	1.628E-01	1.630E-01	NOT IDENT.
I-135	-1.000E+41	1.576E+41	0.000E+00	SHORT HLIF
CS-136	-2.515E-01	4.549E-01	4.688E-01	NOT IDENT.
CE-139	-1.911E-02	3.122E-02	3.239E-02	NOT IDENT.
BA-140	-6.255E-01	1.545E+00	1.571E+00	NOT IDENT.
LA-140	-1.234E-01	4.330E-01	4.366E-01	FAIL ABUN
CE-141	3.714E-02	1.172E-01	1.184E-01	NOT IDENT.
CE-143	2.240E+09	2.247E+09	2.464E+09	SHORT HLIF
CE-144	-8.806E-02	1.900E-01	1.941E-01	NOT IDENT.
PM-144	2.368E-02	3.601E-02	3.756E-02	NOT IDENT.
PR-144	1.788E+00	2.739E+00	2.855E+00	NOT IDENT.
PM-146	-3.669E-02	4.653E-02	4.939E-02	NOT IDENT.
ND-147	3.771E-01	3.948E+00	3.952E+00	NOT IDENT.
PM-147	-4.715E+02	6.695E+02	7.024E+02	NOT IDENT.
PM-149	-1.360E+06	2.563E+06	2.636E+06	SHORT HLIF
EU-150	2.240E-02	1.740E-02	2.012E-02	FAIL ABUN
EU-152	-1.142E-02	9.984E-02	9.997E-02	FAIL ABUN
GD-153	7.109E-02	9.798E-02	1.031E-01	NOT IDENT.
EU-154	6.652E-02	1.362E-01	1.395E-01	NOT IDENT.
EU-155	8.139E-02	9.361E-02	1.005E-01	FAIL ABUN
TB-160	2.919E-02	1.309E-01	1.315E-01	FAIL ABUN
HO-166M	3.211E-02	5.292E-02	5.487E-02	FAIL ABUN
TM-171	-2.337E+01	2.707E+01	2.905E+01	NOT IDENT.
HF-172	-5.325E-02	1.694E-01	1.711E-01	FAIL ABUN

LU-172	-2.147E-02	5.668E-02	5.750E-02	FAIL ABUN
LU-176	-5.440E-03	2.454E-02	2.467E-02	FAIL ABUN
HF-181	-5.039E-02	8.596E-02	8.891E-02	NOT IDENT.
TA-182	1.235E-01	1.394E-01	1.501E-01	FAIL ABUN
RE-183	1.014E-01	3.752E-01	3.779E-01	NOT IDENT.
RE-184	6.481E-02	1.924E-01	1.946E-01	FAIL ABUN
W-188	3.646E-01	1.157E+01	1.157E+01	FAIL ABUN
IR-192	7.420E-04	4.289E-02	4.289E-02	FAIL ABUN
HG-203	-2.109E-02	5.872E-02	5.949E-02	NOT IDENT.
BI-207	3.034E-02	4.925E-02	5.111E-02	FAIL ABUN
BI-211	1.874E+00	4.224E-01	9.446E-01	FAIL ABUN
PB-211	5.350E-03	7.251E-01	7.251E-01	NOT IDENT.
BI-212	1.181E+00	6.176E-01	8.154E-01	FAIL ABUN
RN-219	2.623E-01	4.273E-01	4.433E-01	FAIL ABUN
RA-223	1.400E-02	7.131E-01	7.132E-01	FAIL ABUN
AC-227	9.673E-02	2.478E-01	2.516E-01	FAIL ABUN
TH-227	9.673E-02	2.478E-01	2.516E-01	FAIL ABUN
TH-231	1.400E-02	7.131E-01	7.132E-01	FAIL ABUN
PA-233	-2.171E-02	6.090E-02	6.168E-02	FAIL ABUN
PA-234	0.000E+00	2.126E-01	0.000E+00	NOT IDENT.
PA-234M	-1.839E+00	3.770E+00	3.860E+00	NOT IDENT.
U-235	-1.243E-01	1.826E-01	1.910E-01	FAIL ABUN
NP-237	-2.171E-02	6.090E-02	6.168E-02	FAIL ABUN
NP-238	2.907E+05	6.315E+05	6.449E+05	SHORT HLIF
NP-239	-6.933E-02	2.525E-01	2.544E-01	NOT IDENT.
PU-239	1.291E+02	3.044E+02	3.099E+02	NOT IDENT.
AM-241	-1.171E-02	2.207E-01	2.207E-01	NOT IDENT.
CM-243	-1.245E-02	9.168E-02	9.185E-02	NOT IDENT.
BK-247	5.062E-02	7.588E-02	7.924E-02	FAIL ABUN
CM-247	1.715E-02	3.890E-02	3.966E-02	NOT IDENT.
CF-251	1.069E-02	1.086E-01	1.087E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	83.8177	87.09	86.5872	136.47	77.7025
45.60	51.5907	87.57	118.1985	140.51	0.0000
46.54	65.8705	88.03	127.5205	143.76	88.3053
49.72	0.0000	88.34	112.2591	144.24	82.5444
51.35	60.9370	88.47	112.2910	145.44	77.8320
51.87	70.6112	89.96	108.2544	152.43	72.2671
52.39	74.3222	1093.63	84.6147	153.25	76.7844
52.97	78.0588	91.11	108.5221	323.87	66.5421
53.44	76.9695	92.59	112.4046	156.02	83.0284
54.07	61.4535	93.35	112.5849	158.56	69.9420
57.36	0.0000	94.56	93.3180	159.00	68.4967
57.53	96.1821	94.65	98.6691	162.33	65.8315
57.98	79.2408	94.67	98.6731	162.66	64.8638
59.27	86.4706	94.87	98.7143	163.33	65.9241
59.32	86.4830	97.43	81.8031	165.86	86.2073
59.54	86.5377	98.43	82.4176	176.31	75.2436
60.96	80.3296	98.44	82.4190	176.60	76.2894
61.17	86.9383	99.53	79.0095	177.52	67.2172
62.93	76.6505	100.11	81.7981	181.07	0.0000
63.29	76.7263	102.03	83.9161	181.52	66.0367
63.58	76.7873	103.18	83.2014	184.41	73.9922
64.28	61.2164	103.37	75.0904	143.76	76.1762
66.73	63.2854	105.21	63.5564	193.51	82.1285
67.24	70.0414	105.31	66.2933	197.03	65.7807
125.81	70.1222	106.12	76.4019	198.01	67.9503
67.75	70.1350	106.47	76.4531	201.83	64.5911
69.67	81.3948	109.28	85.0977	203.43	66.2941
70.83	83.3193	111.00	79.8646	205.31	83.8452
72.81	67.2427	111.76	0.0000	210.85	72.1870
72.87	67.2528	114.06	88.6255	215.65	68.3197
74.66	142.7498	116.30	0.0000	222.11	76.3504
74.82	107.1040	116.74	94.6227	227.09	65.9623
74.97	107.1437	119.76	77.4123	227.38	65.9834
77.11	107.7006	121.12	86.9467	228.16	0.0000
78.74	84.9512	121.22	86.9619	228.18	55.2152
79.69	86.4316	121.78	82.3671	116.74	55.2152
80.12	82.6450	122.06	81.4709	235.69	81.8649
80.19	82.6582	122.92	72.2141	235.96	81.8886
80.57	82.7314	123.07	73.1710	238.63	67.8882
81.00	82.8145	265.00	75.1265	238.98	0.0000
81.07	82.8276	125.81	81.0563	240.99	68.0585
81.75	69.9958	127.23	87.8651	242.00	68.1310
83.79	95.0667	127.91	82.2911	244.70	69.4266
84.00	95.1119	129.30	80.5868	252.40	0.0000
85.43	86.2685	131.20	83.6951	252.80	54.4518
86.55	86.4840	133.02	86.8084	254.15	0.0000
86.79	86.5298	133.52	87.8335	256.23	59.1020
86.94	86.5585	136.00	72.8511	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	48.3558	355.39	0.0000	584.27	25.3674
264.80	48.3619	356.01	35.0848	595.83	24.4586
265.00	48.3715	364.49	47.8248	427.87	33.0482
268.22	55.8597	366.42	0.0000	602.52	0.0000
269.46	66.0958	372.51	40.7156	604.72	30.7679
270.03	49.7408	375.05	40.7935	607.14	27.3828
271.23	49.2322	377.52	44.5847	609.32	20.3464
273.65	64.6619	356.01	41.0620	610.33	10.2855
276.40	40.9468	388.16	50.9286	614.28	21.4709
277.37	60.3377	388.63	50.9469	618.01	24.7386
277.60	67.1840	391.69	36.0428	620.36	24.7681
278.00	62.6527	264.66	46.2904	621.93	36.2117
279.20	58.1625	401.81	41.6011	630.19	0.0000
279.54	59.3220	402.40	42.5645	631.29	16.2415
279.70	69.5992	404.85	44.5337	633.25	21.6766
280.46	63.9399	410.95	36.1608	634.78	21.6931
283.69	40.0842	413.71	37.1844	635.95	20.6201
284.31	42.3988	414.70	37.2100	636.99	22.8021
285.41	66.5315	423.72	37.4420	645.85	16.3582
285.90	0.0000	427.09	44.2635	657.76	22.8147
287.50	56.3163	427.87	42.3618	657.90	0.0000
290.67	60.5151	433.94	37.7021	661.66	25.2749
293.27	0.0000	439.40	40.7503	664.57	0.0000
351.93	55.5586	453.88	49.9549	666.33	28.1945
295.96	55.5957	463.37	42.3760	666.50	24.6723
879.38	38.3120	468.07	45.4680	667.71	0.0000
299.98	59.2842	473.00	0.0000	677.62	22.1448
300.09	47.0836	475.06	39.7113	685.70	0.0000
300.13	47.0852	476.78	40.7479	695.00	27.9053
301.36	47.1371	477.60	35.7968	696.49	20.1055
302.85	57.6876	482.18	48.8617	696.51	20.1055
256.23	51.8199	487.02	34.0052	697.00	21.2271
304.85	52.5366	492.35	0.0000	697.30	21.2300
306.78	53.5034	497.08	36.2263	697.49	17.8799
308.46	53.5826	505.52	29.1278	702.65	24.6426
311.90	55.5057	507.63	0.0000	706.68	25.8097
316.51	46.8813	511.00	33.4839	711.68	14.6210
319.41	54.9785	514.00	33.5428	720.70	22.0835
320.08	47.9117	514.00	33.5428	721.93	0.0000
321.04	55.9431	520.40	36.1465	722.78	18.0850
323.87	55.5426	520.69	0.0000	722.91	9.0430
325.23	62.7355	522.65	0.0000	723.31	9.0447
328.76	37.1808	527.90	0.0000	724.19	10.5561
333.37	33.4950	528.26	27.6724	727.33	16.6115
333.97	34.1099	529.59	21.5390	733.00	16.6531
334.37	35.9174	529.87	0.0000	735.93	22.7374
338.28	50.4449	531.02	22.5834	333.97	16.6853
338.32	50.4467	537.26	30.9045	739.50	0.0000
311.90	51.9794	546.56	0.0000	747.24	23.3575
340.48	51.9794	552.55	28.0530	748.06	22.8583
340.55	44.7631	563.25	33.4443	752.31	23.8158
344.28	52.7601	569.33	30.4089	753.82	19.2486
345.93	51.9671	946.00	30.4116	756.73	23.8615
351.06	44.5954	569.70	26.2199	756.80	23.8621
351.93	44.6261	583.19	26.4099	884.68	24.8550

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.0322	1274.44	18.0971	1620.50	2.9833
766.42	24.8814	1001.03	13.0914	1621.92	5.9685
766.84	23.0426	1002.74	12.0914	1678.03	0.0000
772.60	0.0000	1004.73	12.0996	1690.97	5.0500
776.52	13.8820	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.7588
778.90	17.6014	1028.54	0.0000	1063.66	8.2174
783.70	0.0000	1037.84	16.3117	1771.35	4.1097
785.37	12.3851	1038.76	0.0000	1791.20	0.0000
792.07	14.9035	631.29	16.3586	1808.65	7.2475
794.95	14.9211	1048.07	13.2977	1810.72	0.0000
795.86	13.9937	1049.04	9.2092	1836.06	1.0412
810.06	19.7049	1050.41	9.2131		
810.29	19.7070	1063.66	12.3375		
344.28	17.8311	1077.00	12.3902		
810.76	18.7720	1077.34	11.3588		
815.77	19.7506	1085.87	11.3899		
1048.07	16.0060	1093.63	14.5318		
832.01	14.1991	1099.45	13.5186		
834.85	17.0583	1112.07	17.3999		
835.71	12.3240	1112.84	20.8848		
836.80	0.0000	1115.54	8.7093		
846.75	0.0000	1120.29	15.6995		
846.77	16.1861	1120.55	15.7009		
856.80	9.5583	1221.41	15.7046		
860.56	22.9734	1129.67	5.8314		
871.09	8.6498	1131.51	0.0000		
873.19	9.6187	1147.95	0.0000		
875.33	0.0000	1173.23	3.5451		
879.38	9.6414	1177.95	8.8753		
880.51	6.7517	1189.05	14.9591		
883.24	17.3795	1204.77	13.9547		
884.68	9.6606	1221.41	4.3143		
889.28	11.6127	1231.02	10.8154		
894.76	10.6667	1235.36	9.0243		
898.04	12.6217	1238.28	5.4189		
900.72	10.6904	1260.41	0.0000		
903.28	9.7278	1271.87	5.4702		
911.20	8.7805	1274.44	5.4741		
912.08	8.7833	1274.54	5.4741		
923.98	0.0000	1291.59	11.9167		
926.50	18.6405	1298.22	0.0000		
929.11	18.6581	1312.11	11.0615		
937.49	13.7895	1332.49	4.6342		
944.13	8.8857	1362.66	0.0000		
946.00	9.8796	1365.19	6.5440		
949.00	9.8901	1368.63	0.0000		
667.71	0.0000	1384.29	4.6975		
962.31	6.6245	1408.01	7.5615		
964.08	23.2000	1457.56	0.0000		
966.17	0.0000	1460.82	4.9256		
911.20	11.6200	1489.16	5.7866		
968.97	11.6200	1505.03	7.7448		
983.53	10.0103	1584.12	5.0721		
984.45	0.0000	1596.21	6.9228		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:48:00.76

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677036.CNF:1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF:503
Background date : 27-JUN-2016 09:26:53
Sample date     : 11-MAY-2016 15:30:00 Acquisition date : 28-JUN-2016 12:45:52
Sample ID       : G398677036 Sample quantity  : 1.41150E+02 GRAM
Detector name   : GAM11 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.54 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572486 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.52*	61	155	2.47	126.94	122	10	1.69E-02	41.6	
2	1	74.95*	103	102	0.84	149.82	145	19	2.87E-02	17.8	8.18E-01
3	1	77.08*	173	94	0.85	154.07	145	19	4.79E-02	11.6	
4	0	83.97*	15	95	0.79	167.86	166	6	4.10E-03	110.6	
5	0	87.02	56	106	1.79	173.98	171	7	1.55E-02	33.4	
6	0	93.38*	100	202	1.39	186.70	181	13	2.77E-02	32.6	
7	0	121.26	16	137	1.26	242.50	242	10	4.38E-03	140.3	
8	0	134.95	24	105	1.66	269.91	266	8	6.76E-03	75.9	
9	0	157.31	27	78	1.79	314.65	311	7	7.36E-03	58.7	
10	0	165.30	12	104	1.29	330.65	326	9	3.30E-03	157.2	
11	0	185.98*	5	131	1.50	372.03	366	9	1.25E-03	450.5	
12	0	199.72	25	85	1.41	399.53	397	7	6.93E-03	64.3	
13	0	203.40	20	66	1.42	406.90	405	5	5.56E-03	64.9	
14	4	238.59*	270	74	0.84	477.32	472	16	7.50E-02	7.9	2.14E+00
15	4	241.39	53	146	1.71	482.92	472	16	1.48E-02	48.7	
16	5	295.02*	86	58	1.25	590.24	586	12	2.39E-02	18.9	3.44E+00
17	5	297.46	18	44	1.24	595.13	586	12	5.09E-03	73.8	
18	0	328.05	23	36	0.94	656.35	652	7	6.33E-03	48.7	
19	0	338.24*	81	76	0.70	676.74	671	13	2.25E-02	25.0	
20	0	351.82*	137	45	0.98	703.92	699	9	3.80E-02	12.5	
21	0	427.20	5	61	1.49	854.75	847	10	1.40E-03	288.3	
22	0	463.94	23	74	2.41	928.27	921	12	6.47E-03	77.1	
23	0	510.46*	51	20	1.93	1021.36	1014	14	1.41E-02	30.1	
24	0	583.08*	101	27	1.25	1166.68	1162	9	2.81E-02	13.8	
25	1	609.14*	105	27	1.63	1218.81	1214	27	2.92E-02	13.8	2.08E+00
26	1	612.88	16	29	1.65	1226.30	1214	27	4.47E-03	64.7	
27	0	661.46*	860	28	1.33	1323.49	1316	13	2.39E-01	3.7	
28	0	727.95	37	18	1.94	1456.52	1450	17	1.02E-02	30.7	
29	0	756.36	10	20	5.58	1513.36	1502	14	2.66E-03	106.3	
30	0	795.90	13	14	1.42	1592.46	1585	12	3.64E-03	64.7	
31	0	840.72	12	9	2.02	1682.15	1676	9	3.19E-03	55.2	
32	0	853.67	8	17	0.61	1708.05	1702	12	2.27E-03	108.9	
33	0	861.07*	17	9	2.45	1722.85	1716	12	4.72E-03	45.5	
34	0	911.13*	62	9	1.66	1823.00	1818	9	1.73E-02	16.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	941.68	11	4	0.56	1884.12	1880	8	2.92E-03	44.7	
36	0	964.29	19	3	3.61	1929.35	1922	12	5.18E-03	29.8	
37	0	968.79*	48	0	0.75	1938.35	1934	10	1.35E-02	14.9	
38	0	973.76	11	5	1.35	1948.30	1944	9	3.18E-03	44.7	
39	0	1001.13*	8	9	2.08	2003.05	1995	12	2.29E-03	86.9	
40	0	1120.28*	23	7	1.93	2241.38	2236	10	6.44E-03	31.2	
41	0	1140.89	13	3	1.01	2282.62	2277	12	3.58E-03	38.8	
42	0	1242.50	7	5	0.66	2485.86	2482	9	1.94E-03	67.2	
43	0	1277.83	7	2	0.87	2556.53	2551	9	1.90E-03	54.9	
44	0	1408.65	13	2	0.64	2818.16	2814	9	3.63E-03	34.3	
45	0	1460.43*	128	0	1.82	2921.72	2915	12	3.56E-02	9.1	
46	0	1763.74*	14	0	1.74	3528.28	3523	10	3.97E-03	30.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:48:02

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677036.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:30:00 Acquisition date : 28-JUN-2016 12:45:52
Sample ID         : G398677036 Sample quantity   : 141.15 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA11 Detector geometry   : CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.54 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated : No Systematic Error    : 0.00 %
Efficiency type   : Empirical Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.256E+00	4.878E+00	4.878E+00	18.19	OK
CO-57	122.06	85.60*	7.246E+00	1.598E-02	1.806E-02	280.62	OK
	136.47	10.68	7.086E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	6.485E+00	9.354E-01	1.005E+00	109.03	OK
SN-117M	156.02	2.11	6.716E+00	1.151E+00	1.323E+01	117.36	OK
	158.56	86.40*	6.716E+00	2.812E-02	3.231E-01	117.36	OK
SN-126	64.28	9.60	3.945E+00	1.058E+00	1.058E+00	83.15	OK
	86.94	8.90	6.485E+00	3.889E-01	3.889E-01	109.03	OK
	87.57	37.00*	6.485E+00	9.354E-02	9.354E-02	109.03	OK
BA-137M	661.66	89.90*	2.462E+00	2.127E+00	2.133E+00	7.30	OK
CS-137	661.66	85.10*	2.462E+00	2.247E+00	2.254E+00	7.30	OK
CE-139	165.86	80.00*	6.557E+00	1.389E-02	1.768E-02	314.47	OK
CE-144	80.12	1.36	5.961E+00	----- Line	Not Found	-----	Absent
	133.52	11.09*	7.108E+00	1.923E-01	2.161E-01	151.75	OK
PM-147	121.22	0.00*	7.246E+00	4.801E+02	4.970E+02	280.62	OK
TL-208	277.37	6.60	4.701E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.718E+00	2.423E-01	2.423E-01	27.70	OK
	860.56	12.50	1.983E+00	3.669E-01	3.669E-01	90.92	OK
PB-212	74.82	10.28	5.449E+00	8.561E-01	8.561E-01	52.15	OK
	77.11	17.10	5.673E+00	1.155E+00	1.155E+00	23.28	OK
	238.63	43.60*	5.227E+00	7.063E-01	7.063E-01	15.78	OK
	300.09	3.30	4.443E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53	OK
	1120.29	14.92	1.580E+00	5.140E-01	5.140E-01	62.46	OK
	1764.49	15.30	1.084E+00	4.320E-01	4.320E-01	61.25	OK
PB-214	74.82	5.80	5.435E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.673E+00	2.036E+00	2.036E+00	23.28	OK
	87.09	3.41	6.489E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.176E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.498E+00	6.076E-01	6.077E-01	37.73	OK
	351.93	35.60*	3.960E+00	5.606E-01	5.606E-01	25.07	OK
RN-222	609.32	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53	OK
	1120.29	14.92	1.580E+00	5.140E-01	5.140E-01	62.46	OK
	1764.49	15.30	1.084E+00	4.320E-01	4.320E-01	61.25	OK
RA-224	240.99	4.10*	5.185E+00	4.197E-01	4.197E-01	360.19	OK
RA-226	609.32	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53	OK
	1120.29	14.92	1.580E+00	5.140E-01	5.140E-01	62.46	OK
	1764.49	15.30	1.084E+00	4.320E-01	4.320E-01	61.25	OK
AC-228	105.21	1.10	7.172E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.075E+00	1.022E+00	1.022E+00	49.90	OK
	794.95	4.25	2.119E+00	7.847E-01	7.847E-01	129.44	OK
	835.71	1.61	2.034E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.890E+00	6.805E-01	6.805E-01	32.07	OK
	968.97	15.80	1.793E+00	9.064E-01	9.064E-01	29.88	OK
RA-228	105.21	1.10	7.172E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.075E+00	1.022E+00	1.022E+00	49.90	OK
	794.95	4.25	2.119E+00	7.847E-01	7.847E-01	129.44	OK
	835.71	1.61	2.034E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.890E+00	6.805E-01	6.805E-01	32.07	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	1.793E+00	9.064E-01	9.064E-01	29.88	OK
	74.82	10.28	5.449E+00	8.561E-01	8.561E-01	52.15	OK
	77.11	17.10	5.673E+00	1.155E+00	1.155E+00	23.28	OK
	238.63	43.60*	5.227E+00	7.063E-01	7.063E-01	15.78	OK
TH-229	300.09	3.30	4.443E+00	----- Line	Not Found	-----	Absent
	85.43	14.70	6.275E+00	1.032E-01	1.032E-01	221.11	OK
	88.47	24.00	6.485E+00	1.442E-01	1.442E-01	109.03	OK
	193.51	4.41*	5.998E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	5.680E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53	OK
	1120.29	14.92	1.580E+00	5.140E-01	5.140E-01	62.46	OK
	1764.49	15.30	1.084E+00	4.320E-01	4.320E-01	61.25	OK
TH-232	105.21	1.10	7.172E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.075E+00	1.022E+00	1.022E+00	49.90	OK
	835.71	1.61	2.034E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.890E+00	6.805E-01	6.805E-01	32.07	OK
TH-234	968.97	15.80	1.793E+00	9.064E-01	9.064E-01	29.88	OK
	63.29	3.70*	3.945E+00	2.746E+00	2.746E+00	83.15	OK
	92.59	4.23	6.825E+00	2.212E+00	2.212E+00	65.25	OK
	609.32	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53	OK
U-234	1120.29	14.92	1.580E+00	5.140E-01	5.140E-01	62.46	OK
	1764.49	15.30	1.084E+00	4.320E-01	4.320E-01	61.25	OK
	63.29	3.70*	3.945E+00	2.746E+00	2.746E+00	83.15	OK
	92.59	4.23	6.825E+00	2.212E+00	2.212E+00	65.25	OK
AM-243	43.53	5.90	9.036E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.449E+00	1.310E-01	1.310E-01	52.15	OK
ANH-511	511.00	100.00*	3.008E+00	9.420E-02	9.420E-02	60.22	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677036.CNF;1
Acquisition date : 28-JUN-2016 12:45:52 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.54 Half life ratio : *****
Sample date : 11-MAY-2016 15:30:00 Analyst initials: MXR1
Sample ID : G398677036 Sample Quantity : 1.4115E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.878E+00	8.697E-01	1.081E-01
CO-57	1.806E-02	4.967E-02	4.492E-02
CD-109	1.005E+00	1.074E+00	1.355E+00
SN-117M	3.231E-01	3.716E-01	4.574E-01
SN-126	9.354E-02	9.994E-02	1.289E-01
BA-137M	2.133E+00	1.527E-01	5.976E-02
CS-137	2.254E+00	1.613E-01	6.313E-02
CE-139	1.768E-02	5.449E-02	6.564E-02
CE-144	2.161E-01	3.214E-01	3.946E-01
PM-147	4.970E+02	1.367E+03	1.279E+03
TL-208	2.423E-01	6.577E-02	6.296E-02
PB-212	7.063E-01	1.093E-01	1.144E-01
BI-214	4.851E-01	1.309E-01	1.353E-01
PB-214	5.606E-01	1.377E-01	1.495E-01
RN-222	4.851E-01	1.309E-01	1.353E-01
RA-224	4.197E-01	1.481E+00	1.226E+00
RA-226	4.851E-01	1.309E-01	1.353E-01
AC-228	6.805E-01	2.139E-01	2.099E-01
RA-228	6.805E-01	2.139E-01	2.099E-01
TH-228	7.063E-01	1.093E-01	1.144E-01
TH-229	-3.483E-01	5.450E-01	9.421E-01
TH-230	4.851E-01	1.309E-01	1.353E-01
TH-232	6.805E-01	2.139E-01	2.099E-01
TH-234	2.746E+00	2.237E+00	1.958E+00
U-234	4.851E-01	1.309E-01	1.353E-01
U-238	2.746E+00	2.237E+00	1.958E+00
AM-243	1.310E-01	6.694E-02	8.391E-02
ANH-511	9.420E-02	5.560E-02	5.193E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-3.117E-01	5.732E-01	1.004E+00	NOT IDENT.
NA-22	-4.026E-03	4.026E-02	7.074E-02	NOT IDENT.

NA-24	0.000E+00	3.083E+21	0.000E+00	SHORT HLIF
AL-26	4.272E-03	2.260E-02	5.386E-02	NOT IDENT.
SC-46	-1.701E-02	3.959E-02	7.242E-02	FAIL ABUN
V-48	-7.854E-02	2.620E-01	4.812E-01	NOT IDENT.
CR-51	-1.989E-01	8.832E-01	1.648E+00	NOT IDENT.
MN-54	8.141E-03	3.701E-02	6.573E-02	NOT IDENT.
CO-56	-4.703E-04	4.727E-02	8.088E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-58	1.129E-02	4.933E-02	9.882E-02	NOT IDENT.
FE-59	-5.116E-02	1.371E-01	2.449E-01	NOT IDENT.
CO-60	-1.210E-02	3.295E-02	6.216E-02	NOT IDENT.
ZN-65	-6.530E-02	9.102E-02	1.200E-01	NOT IDENT.
GE-68	2.045E-01	1.243E+00	2.446E+00	NOT IDENT.
AS-73	-5.735E-01	8.171E-01	1.536E+00	NOT IDENT.
AS-74	3.167E-01	3.429E-01	7.013E-01	NOT IDENT.
SE-75	-1.272E-02	5.590E-02	1.055E-01	FAIL ABUN
BR-77	0.000E+00	2.411E+05	0.000E+00	SHORT HLIF
SR-82	-2.364E-01	5.653E-01	1.055E+00	NOT IDENT.
RB-83	1.814E-02	1.019E-01	1.923E-01	NOT IDENT.
KR-85	2.412E+00	8.585E+00	1.441E+01	NOT IDENT.
SR-85	1.771E-02	6.418E-02	1.076E-01	NOT IDENT.
RB-86	1.101E+00	2.380E+00	4.915E+00	NOT IDENT.
Y-88	1.224E-02	3.967E-02	9.095E-02	NOT IDENT.
Y-91	7.269E-01	2.232E+01	4.532E+01	NOT IDENT.
NB-94	4.753E-04	3.010E-02	5.870E-02	NOT IDENT.
NB-95	5.773E-03	5.027E-02	9.943E-02	NOT IDENT.
NB-95M	-1.363E-01	2.083E-01	3.077E-01	NOT IDENT.
ZR-95	7.239E-02	1.509E-01	1.851E-01	FAIL ABUN
NB-97	0.000E+00	1.255E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.817E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.525E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.403E-02	3.585E-02	5.628E-02	NOT IDENT.
RH-102	1.419E-02	5.308E-02	1.068E-01	NOT IDENT.
RU-103	-4.435E-02	7.747E-02	1.349E-01	FAIL ABUN
RH-106	-2.838E-01	4.112E-01	6.192E-01	NOT IDENT.
RU-106	-2.838E-01	4.112E-01	6.192E-01	NOT IDENT.
AG-108M	-5.547E-03	3.421E-02	6.275E-02	FAIL ABUN
AG-110M	2.985E-03	5.010E-02	9.783E-02	NOT IDENT.
SN-113	-3.669E-02	5.496E-02	9.696E-02	NOT IDENT.
CD-115	0.000E+00	3.327E+05	0.000E+00	SHORT HLIF
TE-123M	1.910E-02	3.473E-02	6.059E-02	NOT IDENT.
SB-124	-1.657E-03	6.970E-02	1.614E-01	NOT IDENT.
SB-125	2.883E-02	1.629E-01	1.926E-01	FAIL ABUN
TE-125M	6.102E+00	1.169E+01	2.311E+01	NOT IDENT.
I-126	3.977E-01	1.065E+00	1.996E+00	NOT IDENT.
SB-126	3.219E-01	9.277E-01	1.725E+00	NOT IDENT.
SB-127	0.000E+00	3.292E+02	0.000E+00	SHORT HLIF
I-131	1.638E-01	1.982E+00	3.789E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.698E+02	0.000E+00	SHORT HLIF
BA-133	7.274E-04	5.280E-02	8.757E-02	NOT IDENT.
I-133	0.000E+00	1.420E+15	0.000E+00	SHORT HLIF
CS-134	4.078E-02	5.172E-02	8.212E-02	FAIL ABUN
CS-135	-6.587E-03	1.613E-01	3.076E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	1.664E-01	4.446E-01	9.386E-01	NOT IDENT.
BA-140	-1.628E+00	1.668E+00	2.722E+00	NOT IDENT.
LA-140	3.705E-01	4.742E-01	1.119E+00	FAIL ABUN
CE-141	-6.926E-02	1.150E-01	2.043E-01	NOT IDENT.
CE-143	0.000E+00	2.259E+09	0.000E+00	SHORT HLIF
PM-144	1.863E-02	3.409E-02	7.025E-02	NOT IDENT.
PR-144	1.411E+00	2.594E+00	5.345E+00	NOT IDENT.
PM-146	-1.007E-02	5.237E-02	9.514E-02	NOT IDENT.
ND-147	5.568E-01	4.514E+00	8.539E+00	NOT IDENT.
PM-149	0.000E+00	2.725E+06	0.000E+00	SHORT HLIF
EU-150	4.293E-03	3.010E-02	5.128E-02	FAIL ABUN
EU-152	5.444E-02	1.171E-01	2.051E-01	FAIL ABUN
GD-153	8.049E-03	8.420E-02	1.458E-01	NOT IDENT.
EU-154	-1.485E-02	1.115E-01	1.945E-01	FAIL ABUN
EU-155	6.494E-03	9.231E-02	1.764E-01	FAIL ABUN
TB-160	-1.356E-02	1.627E-01	3.121E-01	FAIL ABUN
HO-166M	-1.490E-02	5.155E-02	9.726E-02	NOT IDENT.
TM-171	-8.188E+00	1.310E+01	2.479E+01	NOT IDENT.
HF-172	-1.675E-01	2.103E-01	3.261E-01	FAIL ABUN
LU-172	6.195E-02	4.849E-02	1.170E-01	FAIL ABUN
LU-176	-2.206E-02	2.820E-02	5.033E-02	FAIL ABUN
HF-181	5.833E-02	8.256E-02	1.643E-01	NOT IDENT.

TA-182	-2.019E-03	1.952E-01	3.840E-01	FAIL ABUN
RE-183	-1.527E-01	2.027E-01	3.804E-01	NOT IDENT.
RE-184	-5.858E-02	2.132E-01	3.956E-01	NOT IDENT.
W-188	4.383E+00	1.069E+01	1.894E+01	FAIL ABUN
IR-192	4.074E-03	5.165E-02	9.857E-02	FAIL ABUN
HG-203	5.623E-02	6.459E-02	1.305E-01	NOT IDENT.
BI-207	1.994E-02	4.010E-02	8.568E-02	FAIL ABUN
PB-210	-1.349E+00	2.370E+00	4.649E+00	NOT IDENT.
BI-211	0.000E+00	3.794E-01	7.026E-01	FAIL ABUN
PB-211	-1.843E-01	8.138E-01	1.489E+00	FAIL ABUN
BI-212	0.000E+00	7.897E-01	1.170E+00	FAIL ABUN
RN-219	4.815E-01	4.507E-01	9.194E-01	NOT IDENT.
RA-223	-1.816E-01	7.291E-01	1.186E+00	FAIL ABUN
AC-227	1.846E-01	2.582E-01	5.203E-01	NOT IDENT.
TH-227	1.846E-01	2.582E-01	5.203E-01	NOT IDENT.
PA-231	4.801E-01	5.638E-01	1.026E+00	NOT IDENT.
TH-231	-1.816E-01	7.291E-01	1.186E+00	FAIL ABUN
PA-233	2.725E-02	7.022E-02	1.372E-01	NOT IDENT.
PA-234	6.508E-02	2.631E-01	4.781E-01	FAIL ABUN
PA-234M	2.972E+00	5.062E+00	8.944E+00	FAIL ABUN
U-235	-5.842E-03	1.825E-01	3.416E-01	FAIL ABUN
NP-237	2.725E-02	7.022E-02	1.372E-01	FAIL ABUN
NP-238	0.000E+00	8.023E+05	0.000E+00	SHORT HLIF
NP-239	7.268E-02	2.333E-01	4.509E-01	NOT IDENT.
PU-239	1.572E+02	3.232E+02	6.233E+02	NOT IDENT.
AM-241	2.080E-02	1.211E-01	2.183E-01	NOT IDENT.
CM-243	9.853E-02	8.958E-02	1.835E-01	NOT IDENT.
BK-247	-7.474E-04	8.377E-02	1.605E-01	FAIL ABUN
CM-247	3.185E-02	4.175E-02	8.313E-02	NOT IDENT.
CF-249	-7.232E-03	4.303E-02	7.969E-02	NOT IDENT.
CF-251	-1.199E-01	1.294E-01	2.200E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	123	10.66*	1.256E+00	4.878E+00	4.878E+00	18.19
CO-57	122.06	19	85.60*	7.246E+00	1.598E-02	1.806E-02	280.62
	136.47	-----	10.68	7.086E+00	-----	Line Not Found	-----
CD-109	88.03	67	3.70*	6.485E+00	1.495E+00	1.607E+00	66.72
SN-117M	156.02	31	2.11	6.716E+00	1.151E+00	1.323E+01	117.36
	158.56	31	86.40*	6.716E+00	2.812E-02	3.231E-01	117.36
SN-126	64.28	75	9.60	3.945E+00	1.058E+00	1.058E+00	83.15
	86.94	67	8.90	6.485E+00	6.217E-01	6.217E-01	66.72
	87.57	67	37.00*	6.485E+00	1.495E-01	1.495E-01	66.72
BA-137M	661.66	885	89.90*	2.462E+00	2.127E+00	2.133E+00	7.30
CS-137	661.66	885	85.10*	2.462E+00	2.247E+00	2.254E+00	7.30
CE-139	165.86	14	80.00*	6.557E+00	1.389E-02	1.768E-02	314.47
CE-144	80.12	-----	1.36	5.961E+00	-----	Line Not Found	-----
	133.52	29	11.09*	7.108E+00	1.923E-01	2.161E-01	151.75
PM-147	121.22	19	0.00*	7.246E+00	4.801E+02	4.970E+02	280.62
TL-208	277.37	-----	6.60	4.701E+00	-----	Line Not Found	-----
	583.19	105	85.00*	2.718E+00	2.423E-01	2.423E-01	27.70
	860.56	17	12.50	1.983E+00	3.669E-01	3.669E-01	90.92
BI-211	72.87	-----	1.23	5.213E+00	-----	Line Not Found	-----
	351.06	149	12.92*	3.960E+00	1.545E+00	1.545E+00	25.07
PB-212	74.82	126	10.28	5.449E+00	1.199E+00	1.199E+00	35.64
	77.11	211	17.10	5.673E+00	1.155E+00	1.155E+00	23.28
	238.63	303	43.60*	5.227E+00	7.063E-01	7.063E-01	15.78
	300.09	-----	3.30	4.443E+00	-----	Line Not Found	-----
BI-214	609.32	109	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53
	1120.29	23	14.92	1.580E+00	5.140E-01	5.140E-01	62.46
	1764.49	13	15.30	1.084E+00	4.320E-01	4.320E-01	61.25
PB-214	74.82	126	5.80	5.449E+00	2.125E+00	2.125E+00	35.64
	77.11	211	9.70	5.673E+00	2.036E+00	2.036E+00	23.28
	87.09	67	3.41	6.485E+00	1.623E+00	1.623E+00	66.72
	242.00	60	7.25	5.185E+00	8.450E-01	8.450E-01	97.46
	295.22	95	18.42	4.498E+00	6.076E-01	6.077E-01	37.73
	351.93	149	35.60*	3.960E+00	5.606E-01	5.606E-01	25.07
RN-222	609.32	109	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53
	1120.29	23	14.92	1.580E+00	5.140E-01	5.140E-01	62.46
	1764.49	13	15.30	1.084E+00	4.320E-01	4.320E-01	61.25
RA-224	240.99	60	4.10*	5.185E+00	1.494E+00	1.494E+00	97.46
RA-226	609.32	109	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53
	1120.29	23	14.92	1.580E+00	5.140E-01	5.140E-01	62.46
	1764.49	13	15.30	1.084E+00	4.320E-01	4.320E-01	61.25
AC-228	105.21	-----	1.10	7.172E+00	-----	Line Not Found	-----
	338.32	88	11.27	4.075E+00	1.022E+00	1.022E+00	49.90
	794.95	13	4.25	2.119E+00	7.847E-01	7.847E-01	129.44
	835.71	-----	1.61	2.034E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.890E+00	6.805E-01	6.805E-01	32.07
	968.97	48	15.80	1.793E+00	9.064E-01	9.064E-01	29.88
RA-228	105.21	-----	1.10	7.172E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	88	11.27	4.075E+00	1.022E+00	1.022E+00	49.90
	794.95	13	4.25	2.119E+00	7.847E-01	7.847E-01	129.44
	835.71	-----	1.61	2.034E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.890E+00	6.805E-01	6.805E-01	32.07
	968.97	48	15.80	1.793E+00	9.064E-01	9.064E-01	29.88
TH-228	74.82	126	10.28	5.449E+00	1.199E+00	1.199E+00	35.64
	77.11	211	17.10	5.673E+00	1.155E+00	1.155E+00	23.28
	238.63	303	43.60*	5.227E+00	7.063E-01	7.063E-01	15.78
	300.09	-----	3.30	4.443E+00	-----	Line Not Found	-----
TH-229	85.43	18	14.70	6.275E+00	1.032E-01	1.032E-01	221.11
	88.47	67	24.00	6.485E+00	2.305E-01	2.305E-01	66.72
	193.51	-----	4.41*	5.998E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.680E+00	-----	Line Not Found	-----
TH-230	609.32	109	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53
	1120.29	23	14.92	1.580E+00	5.140E-01	5.140E-01	62.46
	1764.49	13	15.30	1.084E+00	4.320E-01	4.320E-01	61.25
TH-232	105.21	-----	1.10	7.172E+00	-----	Line Not Found	-----
	338.32	88	11.27	4.075E+00	1.022E+00	1.022E+00	49.90
	835.71	-----	1.61	2.034E+00	-----	Line Not Found	-----
	911.20	62	25.80*	1.890E+00	6.805E-01	6.805E-01	32.07
	968.97	48	15.80	1.793E+00	9.064E-01	9.064E-01	29.88
TH-234	63.29	75	3.70*	3.945E+00	2.746E+00	2.746E+00	83.15
	92.59	120	4.23	6.825E+00	2.212E+00	2.212E+00	65.25
U-234	609.32	109	45.49*	2.627E+00	4.851E-01	4.851E-01	27.53
	1120.29	23	14.92	1.580E+00	5.140E-01	5.140E-01	62.46
	1764.49	13	15.30	1.084E+00	4.320E-01	4.320E-01	61.25
U-238	63.29	75	3.70*	3.945E+00	2.746E+00	2.746E+00	83.15
	92.59	120	4.23	6.825E+00	2.212E+00	2.212E+00	65.25
AM-243	43.53	-----	5.90	9.036E-01	-----	Line Not Found	-----
	74.66	126	67.20*	5.449E+00	1.834E-01	1.834E-01	35.64
ANH-511	511.00	53	100.00*	3.008E+00	9.420E-02	9.420E-02	60.22

Flag: "*" = Keyline

Total number of lines in spectrum 46
Number of unidentified lines 8
Number of lines tentatively identified by NID 38 82.61%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.878E+00	4.878E+00	0.887E+00	18.19	
CO-57	271.74D	1.13	1.598E-02	1.806E-02	5.068E-02	280.62	
CD-109	461.40D	1.07	1.495E+00	1.607E+00	1.072E+00	66.72	
SN-117M	13.60D	11.5	2.812E-02	3.231E-01	3.792E-01	117.36	
SN-126	2.30E+05Y	1.00	1.495E-01	1.495E-01	0.998E-01	66.72	
BA-137M	30.08Y	1.00	2.127E+00	2.133E+00	0.156E+00	7.30	
CS-137	30.08Y	1.00	2.247E+00	2.254E+00	0.165E+00	7.30	
CE-139	137.64D	1.27	1.389E-02	1.768E-02	5.560E-02	314.47	
CE-144	284.91D	1.12	1.923E-01	2.161E-01	3.279E-01	151.75	
PM-147	2.62Y	1.04	4.801E+02	4.970E+02	13.95E+02	280.62	
TL-208	1.41E+10Y	1.00	2.423E-01	2.423E-01	0.671E-01	27.70	
BI-211	7.04E+08Y	1.00	1.545E+00	1.545E+00	0.387E+00	25.07	
PB-212	1.41E+10Y	1.00	7.063E-01	7.063E-01	1.115E-01	15.78	
BI-214	1600.00Y	1.00	4.851E-01	4.851E-01	1.335E-01	27.53	
PB-214	1600.00Y	1.00	5.606E-01	5.606E-01	1.405E-01	25.07	
RN-222	1600.00Y	1.00	4.851E-01	4.851E-01	1.335E-01	27.53	
RA-224	1.41E+10Y	1.00	1.494E+00	1.494E+00	1.456E+00	97.46	
RA-226	1600.00Y	1.00	4.851E-01	4.851E-01	1.335E-01	27.53	
AC-228	1.41E+10Y	1.00	6.805E-01	6.805E-01	2.182E-01	32.07	
RA-228	1.41E+10Y	1.00	6.805E-01	6.805E-01	2.182E-01	32.07	
TH-228	1.41E+10Y	1.00	7.063E-01	7.063E-01	1.115E-01	15.78	
TH-229	7340.00Y	1.00	2.305E-01	2.305E-01	1.538E-01	66.72	K
TH-230	7.54E+04Y	1.00	4.851E-01	4.851E-01	1.335E-01	27.53	
TH-232	1.41E+10Y	1.00	6.805E-01	6.805E-01	2.182E-01	32.07	
TH-234	4.47E+09Y	1.00	2.746E+00	2.746E+00	2.283E+00	83.15	
U-234	2.45E+05Y	1.00	4.851E-01	4.851E-01	1.335E-01	27.53	
U-238	4.47E+09Y	1.00	2.746E+00	2.746E+00	2.283E+00	83.15	
AM-243	7370.00Y	1.00	1.834E-01	1.834E-01	0.654E-01	35.64	
ANH-511	1.00E+09Y	1.00	9.420E-02	9.420E-02	5.673E-02	60.22	
Total Activity :			5.069E+02	5.243E+02			

Grand Total Activity : 5.069E+02 5.243E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	185.98	5	150	1.50	372.03	366	9	1.25E-03	****	6.14E+00	T
0	199.72	28	97	1.41	399.53	397	7	6.93E-03	****	5.88E+00	
0	203.40	23	75	1.42	406.90	405	5	5.56E-03	****	5.81E+00	T
5	297.46	20	49	1.24	595.13	586	12	5.09E-03	****	4.47E+00	T
0	328.05	25	40	0.94	656.35	652	7	6.33E-03	97.4	4.17E+00	T
0	427.20	5	65	1.49	854.75	847	10	1.40E-03	****	3.43E+00	T
0	463.94	25	78	2.41	928.27	921	12	6.47E-03	****	3.23E+00	T
1	612.88	17	30	1.65	1226.30	1214	27	4.47E-03	****	2.61E+00	T
0	727.95	37	19	1.94	1456.52	1450	17	1.02E-02	61.5	2.28E+00	T
0	756.36	10	21	5.58	1513.36	1502	14	2.66E-03	****	2.21E+00	T
0	840.72	12	9	2.02	1682.15	1676	9	3.19E-03	****	2.02E+00	
0	853.67	8	17	0.61	1708.05	1702	12	2.27E-03	****	2.00E+00	
0	941.68	10	3	0.56	1884.12	1880	8	2.92E-03	89.3	1.84E+00	
0	964.29	19	3	3.61	1929.35	1922	12	5.18E-03	59.7	1.80E+00	T
0	973.76	11	5	1.35	1948.30	1944	9	3.18E-03	89.4	1.79E+00	
0	1001.13	8	9	2.08	2003.05	1995	12	2.29E-03	****	1.74E+00	T
0	1140.89	13	3	1.01	2282.62	2277	12	3.58E-03	77.7	1.55E+00	
0	1242.50	7	5	0.66	2485.86	2482	9	1.94E-03	****	1.44E+00	
0	1277.83	7	2	0.87	2556.53	2551	9	1.90E-03	****	1.41E+00	
0	1408.65	13	2	0.64	2818.16	2814	9	3.63E-03	68.6	1.29E+00	T

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677036.CNF;1
Acquisition date : 28-JUN-2016 12:45:52 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.54 Half life ratio : *****
Sample date : 11-MAY-2016 15:30:00 Nuclide Library : SOLID
Sample ID : G398677036 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4115E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	0.000E+00
CO-57	2.109E-02
CD-109	6.437E-01
SN-117M	2.137E-01
SN-126	6.129E-02
BA-137M	2.656E-02
CS-137	2.806E-02
CE-139	3.100E-02
CE-144	1.866E-01
PM-147	6.014E+02
TL-208	2.830E-02
PB-212	5.394E-02
BI-214	6.152E-02
PB-214	6.950E-02
RN-222	6.152E-02
RA-224	5.781E-01
RA-226	6.152E-02
AC-228	9.000E-02
RA-228	9.000E-02
TH-228	5.394E-02
TH-229	4.428E-01
TH-230	6.152E-02
TH-232	9.000E-02
TH-234	9.264E-01
U-234	6.152E-02
U-238	9.264E-01
AM-243	3.987E-02
ANH-511	2.352E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.601E-01	NOT IDENT.
NA-22	3.006E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	2.016E-02	NOT IDENT.
SC-46	3.059E-02	FAIL ABUN
V-48	2.077E-01	NOT IDENT.
CR-51	7.655E-01	NOT IDENT.
MN-54	2.888E-02	NOT IDENT.
CO-56	3.486E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	4.379E-02	NOT IDENT.
FE-59	1.056E-01	NOT IDENT.
CO-60	2.566E-02	NOT IDENT.
ZN-65	4.964E-02	NOT IDENT.
GE-68	1.067E+00	NOT IDENT.
AS-73	7.198E-01	NOT IDENT.
AS-74	3.205E-01	NOT IDENT.
SE-75	4.931E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	4.445E-01	NOT IDENT.
RB-83	8.803E-02	NOT IDENT.
KR-85	6.632E+00	NOT IDENT.
SR-85	4.955E-02	NOT IDENT.
RB-86	2.152E+00	NOT IDENT.
Y-88	3.609E-02	NOT IDENT.
Y-91	1.934E+01	NOT IDENT.
NB-94	2.623E-02	NOT IDENT.
NB-95	4.409E-02	NOT IDENT.
NB-95M	1.443E-01	NOT IDENT.
ZR-95	8.232E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.656E-02	NOT IDENT.
RH-102	4.816E-02	NOT IDENT.
RU-103	6.131E-02	FAIL ABUN
RH-106	2.784E-01	NOT IDENT.
RU-106	2.784E-01	NOT IDENT.
AG-108M	2.898E-02	FAIL ABUN
AG-110M	4.301E-02	NOT IDENT.
SN-113	4.433E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
TE-123M	2.853E-02	NOT IDENT.
SB-124	5.717E-02	NOT IDENT.
SB-125	8.883E-02	FAIL ABUN
TE-125M	1.087E+01	NOT IDENT.
I-126	8.794E-01	NOT IDENT.
SB-126	7.757E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.747E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.072E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.685E-02	FAIL ABUN
CS-135	1.442E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.017E-01	NOT IDENT.
BA-140	1.220E+00	NOT IDENT.
LA-140	4.720E-01	FAIL ABUN
CE-141	9.593E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
PM-144	3.171E-02	NOT IDENT.
PR-144	2.413E+00	NOT IDENT.
PM-146	4.406E-02	NOT IDENT.
ND-147	3.874E+00	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.376E-02	FAIL ABUN
EU-152	9.560E-02	FAIL ABUN
GD-153	6.858E-02	NOT IDENT.
EU-154	8.245E-02	FAIL ABUN
EU-155	8.311E-02	FAIL ABUN
TB-160	1.364E-01	FAIL ABUN
HO-166M	4.280E-02	NOT IDENT.
TM-171	1.160E+01	NOT IDENT.
HF-172	1.533E-01	FAIL ABUN
LU-172	5.101E-02	FAIL ABUN
LU-176	2.335E-02	FAIL ABUN
HF-181	7.577E-02	NOT IDENT.
TA-182	1.676E-01	FAIL ABUN

RE-183	1.785E-01	NOT IDENT.
RE-184	1.721E-01	NOT IDENT.
W-188	8.814E+00	FAIL ABUN
IR-192	4.600E-02	FAIL ABUN
HG-203	6.126E-02	NOT IDENT.
BI-207	3.694E-02	FAIL ABUN
PB-210	2.183E+00	NOT IDENT.
BI-211	3.370E-01	FAIL ABUN
PB-211	6.900E-01	FAIL ABUN
BI-212	5.370E-01	FAIL ABUN
RN-219	4.286E-01	NOT IDENT.
RA-223	5.486E-01	FAIL ABUN
AC-227	2.444E-01	NOT IDENT.
TH-227	2.444E-01	NOT IDENT.
PA-231	4.819E-01	NOT IDENT.
TH-231	5.486E-01	FAIL ABUN
PA-233	6.415E-02	NOT IDENT.
PA-234	2.059E-01	FAIL ABUN
PA-234M	3.976E+00	FAIL ABUN
U-235	1.610E-01	FAIL ABUN
NP-237	6.415E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.124E-01	NOT IDENT.
PU-239	2.951E+02	NOT IDENT.
AM-241	1.027E-01	NOT IDENT.
CM-243	8.666E-02	NOT IDENT.
BK-247	7.514E-02	FAIL ABUN
CM-247	3.871E-02	NOT IDENT.
CF-249	3.680E-02	NOT IDENT.
CF-251	1.031E-01	NOT IDENT.

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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677036.CNF;1
Acquisition date : 28-JUN-2016 12:45:52 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.54 Half life ratio : *****
Sample date : 11-MAY-2016 15:30:00 Nuclide Library : SOLID
Sample ID : G398677036 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4115E+02 GRAM
Quantity Err(%) : 1.4169E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.878E+00	9.665E-01	9.665E-01
CO-57	1.806E-02	4.969E-02	4.969E-02
CD-109	1.005E+00	1.082E+00	1.082E+00
SN-117M	3.231E-01	3.724E-01	3.724E-01
SN-126	9.354E-02	1.006E-01	1.006E-01
BA-137M	2.133E+00	2.283E-01	2.283E-01
CS-137	2.254E+00	2.411E-01	2.411E-01
CE-139	1.768E-02	5.461E-02	5.461E-02
CE-144	2.161E-01	3.218E-01	3.218E-01
PM-147	4.970E+02	1.367E+03	1.367E+03
TL-208	2.423E-01	6.869E-02	6.869E-02
PB-212	7.063E-01	1.244E-01	1.244E-01
BI-214	4.851E-01	1.367E-01	1.367E-01
PB-214	5.606E-01	1.452E-01	1.452E-01
RN-222	4.851E-01	1.367E-01	1.367E-01
RA-224	4.197E-01	1.487E+00	1.487E+00
RA-226	4.851E-01	1.367E-01	1.367E-01
AC-228	6.805E-01	2.356E-01	2.356E-01
RA-228	6.805E-01	2.356E-01	2.356E-01
TH-228	7.063E-01	1.244E-01	1.244E-01
TH-229	-3.483E-01	5.457E-01	5.457E-01
TH-230	4.851E-01	1.367E-01	1.367E-01
TH-232	6.805E-01	2.356E-01	2.356E-01
TH-234	2.746E+00	2.321E+00	2.321E+00
U-234	4.851E-01	1.367E-01	1.367E-01
U-238	2.746E+00	2.321E+00	2.321E+00
AM-243	1.310E-01	6.812E-02	6.812E-02
ANH-511	9.420E-02	5.612E-02	5.612E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-3.117E-01	5.737E-01	5.907E-01	NOT IDENT.
NA-22	-4.026E-03	4.026E-02	4.030E-02	NOT IDENT.

NA-24	6.403E+20	3.083E+21	0.000E+00	SHORT HLIF
AL-26	4.272E-03	2.260E-02	2.268E-02	NOT IDENT.
SC-46	-1.701E-02	3.966E-02	4.039E-02	FAIL ABUN
V-48	-7.854E-02	2.623E-01	2.646E-01	NOT IDENT.
CR-51	-1.989E-01	8.834E-01	8.879E-01	NOT IDENT.
MN-54	8.141E-03	3.702E-02	3.720E-02	NOT IDENT.
CO-56	-4.703E-04	4.727E-02	4.727E-02	NOT IDENT.
MN-56	-1.000E+41	4.920E+42	0.000E+00	SHORT HLIF
CO-58	1.129E-02	4.935E-02	4.961E-02	NOT IDENT.
FE-59	-5.116E-02	1.374E-01	1.394E-01	NOT IDENT.
CO-60	-1.210E-02	3.296E-02	3.341E-02	NOT IDENT.
ZN-65	-6.530E-02	9.194E-02	9.654E-02	NOT IDENT.
GE-68	2.045E-01	1.244E+00	1.247E+00	NOT IDENT.
AS-73	-5.735E-01	8.257E-01	8.652E-01	NOT IDENT.
AS-74	3.167E-01	3.446E-01	3.730E-01	NOT IDENT.
SE-75	-1.272E-02	5.591E-02	5.620E-02	FAIL ABUN
BR-77	1.559E+06	2.172E+06	2.283E+06	SHORT HLIF
SR-82	-2.364E-01	5.659E-01	5.758E-01	NOT IDENT.
RB-83	1.814E-02	1.019E-01	1.023E-01	NOT IDENT.
KR-85	2.412E+00	8.587E+00	8.656E+00	NOT IDENT.
SR-85	1.771E-02	6.420E-02	6.469E-02	NOT IDENT.
RB-86	1.101E+00	2.389E+00	2.440E+00	NOT IDENT.
Y-88	1.224E-02	3.968E-02	4.006E-02	NOT IDENT.
Y-91	7.269E-01	2.232E+01	2.232E+01	NOT IDENT.
NB-94	4.753E-04	3.010E-02	3.010E-02	NOT IDENT.
NB-95	5.773E-03	5.027E-02	5.034E-02	NOT IDENT.
NB-95M	-1.363E-01	2.088E-01	2.177E-01	NOT IDENT.
ZR-95	7.239E-02	1.511E-01	1.546E-01	FAIL ABUN
NB-97	1.000E+41	1.258E+41	0.000E+00	SHORT HLIF
ZR-97	1.629E+20	1.822E+20	0.000E+00	SHORT HLIF
MO-99	-2.601E+04	4.533E+04	4.682E+04	SHORT HLIF
TC-99M	-1.000E+41	2.139E+41	0.000E+00	SHORT HLIF
RH-101	-2.403E-02	3.614E-02	3.772E-02	NOT IDENT.
RH-102	1.419E-02	5.310E-02	5.348E-02	NOT IDENT.
RU-103	-4.435E-02	7.757E-02	8.010E-02	FAIL ABUN
RH-106	-2.838E-01	4.121E-01	4.315E-01	NOT IDENT.
RU-106	-2.838E-01	4.121E-01	4.315E-01	NOT IDENT.
AG-108M	-5.547E-03	3.422E-02	3.431E-02	FAIL ABUN
AG-110M	2.985E-03	5.011E-02	5.012E-02	NOT IDENT.
SN-113	-3.669E-02	5.503E-02	5.746E-02	NOT IDENT.
CD-115	-2.490E+05	3.336E+05	3.519E+05	SHORT HLIF
TE-123M	1.910E-02	3.476E-02	3.581E-02	NOT IDENT.
SB-124	-1.657E-03	6.970E-02	6.971E-02	NOT IDENT.
SB-125	2.883E-02	1.629E-01	1.635E-01	FAIL ABUN
TE-125M	6.102E+00	1.170E+01	1.202E+01	NOT IDENT.
I-126	3.977E-01	1.066E+00	1.081E+00	NOT IDENT.
SB-126	3.219E-01	9.286E-01	9.399E-01	NOT IDENT.
SB-127	-9.330E+00	3.292E+02	3.292E+02	SHORT HLIF
I-131	1.638E-01	1.982E+00	1.984E+00	NOT IDENT.
I-132	1.000E+41	1.593E+42	0.000E+00	SHORT HLIF
TE-132	5.711E+02	8.726E+02	9.098E+02	SHORT HLIF
BA-133	7.274E-04	5.280E-02	5.280E-02	NOT IDENT.
I-133	2.327E+14	1.422E+15	1.426E+15	SHORT HLIF
CS-134	4.078E-02	5.192E-02	5.508E-02	FAIL ABUN
CS-135	-6.587E-03	1.613E-01	1.613E-01	NOT IDENT.
I-135	-1.000E+41	2.874E+41	0.000E+00	SHORT HLIF
CS-136	1.664E-01	4.458E-01	4.520E-01	NOT IDENT.
BA-140	-1.628E+00	1.673E+00	1.827E+00	NOT IDENT.
LA-140	3.705E-01	4.751E-01	5.036E-01	FAIL ABUN
CE-141	-6.926E-02	1.151E-01	1.192E-01	NOT IDENT.
CE-143	3.640E+09	2.282E+09	2.811E+09	SHORT HLIF
PM-144	1.863E-02	3.412E-02	3.514E-02	NOT IDENT.
PR-144	1.411E+00	2.597E+00	2.674E+00	NOT IDENT.
PM-146	-1.007E-02	5.238E-02	5.257E-02	NOT IDENT.
ND-147	5.568E-01	4.514E+00	4.521E+00	NOT IDENT.
PM-149	-3.121E+06	2.767E+06	3.104E+06	SHORT HLIF
EU-150	4.293E-03	3.011E-02	3.017E-02	FAIL ABUN
EU-152	5.444E-02	1.172E-01	1.197E-01	FAIL ABUN
GD-153	8.049E-03	8.420E-02	8.428E-02	NOT IDENT.
EU-154	-1.485E-02	1.115E-01	1.117E-01	FAIL ABUN
EU-155	6.494E-03	9.232E-02	9.236E-02	FAIL ABUN
TB-160	-1.356E-02	1.627E-01	1.628E-01	FAIL ABUN
HO-166M	-1.490E-02	5.157E-02	5.200E-02	NOT IDENT.
TM-171	-8.188E+00	1.312E+01	1.363E+01	NOT IDENT.
HF-172	-1.675E-01	2.123E-01	2.253E-01	FAIL ABUN
LU-172	6.195E-02	5.027E-02	5.750E-02	FAIL ABUN
LU-176	-2.206E-02	2.826E-02	2.996E-02	FAIL ABUN
HF-181	5.833E-02	8.270E-02	8.678E-02	NOT IDENT.

TA-182	-2.019E-03	1.952E-01	1.952E-01	FAIL ABUN
RE-183	-1.527E-01	2.034E-01	2.147E-01	NOT IDENT.
RE-184	-5.858E-02	2.134E-01	2.151E-01	NOT IDENT.
W-188	4.383E+00	1.071E+01	1.089E+01	FAIL ABUN
IR-192	4.074E-03	5.165E-02	5.169E-02	FAIL ABUN
HG-203	5.623E-02	6.477E-02	6.955E-02	NOT IDENT.
BI-207	1.994E-02	4.026E-02	4.125E-02	FAIL ABUN
PB-210	-1.349E+00	2.373E+00	2.449E+00	NOT IDENT.
BI-211	1.545E+00	4.009E-01	8.035E-01	FAIL ABUN
PB-211	-1.843E-01	8.140E-01	8.182E-01	FAIL ABUN
BI-212	1.311E+00	8.001E-01	9.947E-01	FAIL ABUN
RN-219	4.815E-01	4.559E-01	5.049E-01	NOT IDENT.
RA-223	-1.816E-01	7.293E-01	7.339E-01	FAIL ABUN
AC-227	1.846E-01	2.597E-01	2.727E-01	NOT IDENT.
TH-227	1.846E-01	2.597E-01	2.727E-01	NOT IDENT.
PA-231	4.801E-01	5.741E-01	6.135E-01	NOT IDENT.
TH-231	-1.816E-01	7.293E-01	7.339E-01	FAIL ABUN
PA-233	2.725E-02	7.026E-02	7.133E-02	NOT IDENT.
PA-234	6.508E-02	2.736E-01	2.752E-01	FAIL ABUN
PA-234M	2.972E+00	5.086E+00	5.260E+00	FAIL ABUN
U-235	-5.842E-03	1.825E-01	1.825E-01	FAIL ABUN
NP-237	2.725E-02	7.026E-02	7.133E-02	FAIL ABUN
NP-238	-5.543E+04	8.024E+05	8.027E+05	SHORT HLIF
NP-239	7.268E-02	2.334E-01	2.357E-01	NOT IDENT.
PU-239	1.572E+02	3.234E+02	3.310E+02	NOT IDENT.
AM-241	2.080E-02	1.211E-01	1.215E-01	NOT IDENT.
CM-243	9.853E-02	9.018E-02	1.005E-01	NOT IDENT.
BK-247	-7.474E-04	8.377E-02	8.377E-02	FAIL ABUN
CM-247	3.185E-02	4.215E-02	4.453E-02	NOT IDENT.
CF-249	-7.232E-03	4.304E-02	4.316E-02	NOT IDENT.
CF-251	-1.199E-01	1.302E-01	1.410E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	78.1800	87.09	119.8542	136.47	81.5226
45.60	74.4727	87.57	126.0898	140.51	0.0000
46.54	80.6356	88.03	121.4998	143.76	79.8214
49.72	0.0000	88.34	121.5772	144.24	64.3165
51.35	74.9327	88.47	98.9849	145.44	94.5649
51.87	76.7723	89.96	121.9794	152.43	91.9442
52.39	83.8002	1093.63	119.3068	153.25	77.2332
52.97	85.6718	91.11	122.2629	323.87	93.1193
53.44	88.3872	92.59	104.5640	156.02	90.1888
54.07	79.8655	93.35	104.7218	158.56	68.2747
57.36	0.0000	94.56	104.9713	159.00	71.4928
57.53	92.9120	94.65	104.9898	162.33	84.5828
57.98	96.5359	94.67	104.9937	162.66	84.6200
59.27	88.5064	94.87	105.0345	163.33	67.1176
59.32	88.5183	97.43	82.0462	165.86	96.2045
59.54	80.6387	98.43	62.0129	176.31	96.4284
60.96	70.3275	98.44	62.0143	176.60	95.3799
61.17	75.6770	99.53	86.7105	177.52	99.8304
62.93	102.2549	100.11	85.8412	181.07	0.0000
63.29	102.3495	102.03	95.8297	181.52	86.6976
63.58	102.4255	103.18	74.6932	184.41	85.3649
64.28	102.6085	103.37	68.8972	143.76	88.7899
66.73	92.9172	105.21	86.6556	193.51	96.2616
67.24	91.6858	105.31	86.6710	197.03	88.3271
125.81	105.2832	106.12	82.8976	198.01	98.4390
67.75	105.3011	106.47	91.7328	201.83	93.8455
69.67	103.0817	109.28	69.6367	203.43	102.4116
70.83	81.6060	111.00	81.6533	205.31	109.3602
72.81	112.0506	111.76	0.0000	210.85	95.9328
72.87	112.0662	114.06	68.2423	215.65	70.3447
74.66	120.7664	116.30	0.0000	222.11	78.8344
74.82	120.8107	116.74	79.4845	227.09	64.3199
74.97	120.8523	119.76	82.3846	227.38	64.3398
77.11	121.4411	121.12	84.0718	228.16	0.0000
78.74	121.8842	121.22	84.0854	228.18	63.2435
79.69	122.1400	121.78	78.1516	116.74	63.2435
80.12	122.2555	122.06	78.1873	235.69	95.6046
80.19	122.2743	122.92	86.3281	235.96	81.7215
80.57	114.0319	123.07	86.3491	238.63	90.6604
81.00	80.7324	265.00	86.4352	238.98	0.0000
81.07	80.7448	125.81	107.4079	240.99	90.8770
81.75	114.3247	127.23	115.2324	242.00	94.4679
83.79	114.8264	127.91	101.6974	244.70	85.6011
84.00	106.4720	129.30	91.2719	252.40	0.0000
85.43	50.5865	131.20	97.6479	252.80	74.2607
86.55	50.7049	133.02	102.5140	254.15	0.0000
86.79	128.2347	133.52	101.0625	256.23	63.8635
86.94	128.2749	136.00	72.2420	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	74.2106	355.39	0.0000	584.27	30.1800
264.80	74.2208	356.01	58.6708	595.83	23.4372
265.00	72.4459	364.49	45.6403	427.87	40.2737
268.22	75.3547	366.42	0.0000	602.52	0.0000
269.46	70.0531	372.51	45.9078	604.72	37.6657
270.03	70.9886	375.05	55.7780	607.14	26.9363
271.23	71.0670	377.52	51.9559	609.32	33.7061
273.65	69.4217	356.01	43.3273	610.33	33.7225
276.40	73.2110	388.16	52.3482	614.28	36.0410
277.37	63.3243	388.63	51.3779	618.01	31.5931
277.60	57.9082	391.69	50.4973	620.36	25.6045
278.00	52.4988	264.66	45.8294	621.93	39.1894
279.20	55.2738	401.81	41.8770	630.19	0.0000
279.54	67.0738	402.40	45.8835	631.29	24.5281
279.70	67.0840	404.85	57.9496	633.25	24.5511
280.46	71.6649	410.95	56.1820	634.78	28.2088
283.69	61.8647	413.71	60.3058	635.95	30.0456
284.31	53.7064	414.70	61.3518	636.99	30.9710
285.41	64.6926	423.72	38.8518	645.85	26.5269
285.90	0.0000	427.09	55.1612	657.76	26.0617
287.50	53.8586	427.87	50.3197	657.90	0.0000
290.67	51.2618	433.94	51.9432	661.66	21.5013
293.27	0.0000	439.40	45.9929	664.57	0.0000
351.93	66.1696	453.88	56.7271	666.33	13.8519
295.96	66.2113	463.37	52.9089	666.50	13.8527
879.38	63.4114	468.07	34.9576	667.71	0.0000
299.98	63.4869	473.00	0.0000	677.62	19.4922
300.09	63.4932	475.06	34.4784	685.70	0.0000
300.13	63.4953	476.78	54.3851	695.00	20.5793
301.36	57.6488	477.60	51.2729	696.49	21.5294
302.85	68.4525	482.18	34.6244	696.51	21.5294
256.23	63.9158	487.02	32.6192	697.00	22.4701
304.85	67.6411	492.35	0.0000	697.30	26.2186
306.78	72.3918	497.08	43.3948	697.49	26.2206
308.46	61.3402	505.52	27.2270	702.65	23.4650
311.90	60.5844	507.63	0.0000	706.68	19.7449
316.51	63.6213	511.00	30.9388	711.68	21.6726
319.41	54.3936	514.00	39.3269	720.70	21.6222
320.08	61.9304	514.00	39.3269	721.93	0.0000
321.04	54.4662	520.40	36.4653	722.78	25.2480
323.87	57.2264	520.69	0.0000	722.91	23.6719
325.23	51.2582	522.65	0.0000	723.31	29.9890
328.76	46.8671	527.90	0.0000	724.19	23.6847
333.37	48.5563	528.26	39.8556	727.33	19.9218
333.97	50.0970	529.59	35.5731	733.00	30.1135
334.37	45.5574	529.87	0.0000	735.93	22.2162
338.28	53.3126	531.02	30.2072	333.97	19.0547
338.32	53.3143	537.26	41.1346	739.50	0.0000
311.90	68.6624	546.56	0.0000	747.24	20.7272
340.48	68.6624	552.55	37.1086	748.06	19.1396
340.55	68.6656	563.25	27.4399	752.31	17.5756
344.28	52.0301	569.33	24.2236	753.82	22.0634
345.93	54.9057	946.00	24.2256	756.73	19.2085
351.06	59.6065	569.70	24.2283	756.80	19.2090
351.93	58.4909	583.19	26.6147	884.68	28.8984

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	19.2803	1274.44	8.7404	1620.50	6.1921
766.42	20.2494	1001.03	10.5049	1621.92	6.1938
766.84	20.2530	1002.74	19.2701	1678.03	0.0000
772.60	0.0000	1004.73	22.7886	1690.97	2.0955
776.52	13.5550	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1914
778.90	9.6914	1028.54	0.0000	1063.66	10.6506
783.70	0.0000	1037.84	7.4416	1771.35	4.2612
785.37	20.4053	1038.76	0.0000	1791.20	0.0000
792.07	24.3567	631.29	5.3301	1808.65	2.1466
794.95	12.6801	1048.07	8.5320	1810.72	0.0000
795.86	13.0098	1049.04	10.6685	1836.06	3.2374
810.06	15.6992	1050.41	14.9427		
810.29	15.7008	1063.66	8.5742		
344.28	17.6643	1077.00	11.8384		
810.76	17.6665	1077.34	13.9921		
815.77	18.6846	1085.87	11.8707		
1048.07	14.7664	1093.63	4.3268		
832.01	18.8015	1099.45	17.3383		
834.85	14.8594	1112.07	13.0529		
835.71	21.4704	1112.84	12.2404		
836.80	0.0000	1115.54	16.3337		
846.75	0.0000	1120.29	9.8139		
846.77	13.2682	1120.55	9.8147		
856.80	14.9828	1221.41	14.5436		
860.56	7.1448	1129.67	17.4961		
871.09	18.0747	1131.51	0.0000		
873.19	18.0888	1147.95	0.0000		
875.33	0.0000	1173.23	11.9976		
879.38	17.1229	1177.95	10.1657		
880.51	19.1452	1189.05	12.0521		
883.24	8.0691	1204.77	11.1748		
884.68	17.1556	1221.41	15.9043		
889.28	14.1518	1231.02	16.8853		
894.76	16.2055	1235.36	13.5240		
898.04	12.1685	1238.28	9.6680		
900.72	14.2102	1260.41	0.0000		
903.28	18.2870	1271.87	9.7567		
911.20	12.2259	1274.44	9.7634		
912.08	11.8900	1274.54	9.7634		
923.98	0.0000	1291.59	12.3964		
926.50	8.1945	1298.22	0.0000		
929.11	11.2777	1312.11	18.2161		
937.49	15.4237	1332.49	10.6021		
944.13	5.1530	1362.66	0.0000		
946.00	10.3127	1365.19	2.9158		
949.00	14.4525	1368.63	0.0000		
667.71	0.0000	1384.29	8.7894		
962.31	8.6418	1408.01	7.8587		
964.08	0.0000	1457.56	0.0000		
966.17	0.0000	1460.82	0.0000		
911.20	0.0000	1489.16	9.0157		
968.97	0.0000	1505.03	10.0545		
983.53	16.7109	1584.12	10.2376		
984.45	0.0000	1596.21	4.1060		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:49:41.72

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677037.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM12.CNF;450
Background date    : 27-JUN-2016 10:34:00
Sample date       : 11-MAY-2016 15:25:00 Acquisition date : 28-JUN-2016 12:47:30
Sample ID        : G398677037 Sample quantity : 1.57240E+02 GRAM
Detector name    : GAM12 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.46 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1572486 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	36.48*	31	14	1.78	72.89	68	25	8.49E-03	50.7	3.51E+00
2	3	41.10*	20	49	1.79	82.11	68	25	5.69E-03	82.6	
3	2	74.74	52	122	1.63	149.38	145	16	1.44E-02	39.0	2.46E+00
4	2	77.30	144	139	1.69	154.51	145	16	3.99E-02	18.3	
5	0	90.06	21	61	0.97	180.02	179	4	5.76E-03	58.3	
6	0	92.87*	36	94	0.99	185.65	183	7	9.95E-03	52.9	
7	0	98.89	11	92	0.73	197.69	197	8	3.03E-03	154.4	
8	0	115.43	27	131	4.69	230.76	229	13	7.55E-03	87.8	
9	0	125.82	19	56	1.56	251.53	247	7	5.17E-03	71.3	
10	0	186.41*	28	99	1.10	372.70	368	9	7.80E-03	70.9	
11	0	194.43	25	47	1.41	388.74	386	7	6.89E-03	49.7	
12	0	210.04	57	102	1.14	419.97	413	14	1.60E-02	40.0	
13	2	238.51*	271	58	1.39	476.90	470	21	7.53E-02	7.8	1.95E+00
14	2	241.30	94	56	1.87	482.49	470	21	2.62E-02	24.4	
15	0	270.27	76	60	1.89	540.42	532	16	2.11E-02	25.5	
16	0	295.04	103	61	1.18	589.97	584	11	2.85E-02	17.7	
17	0	338.38	77	55	0.87	676.65	669	17	2.13E-02	25.6	
18	0	351.84*	188	53	1.42	703.57	697	15	5.22E-02	11.2	
19	0	510.67*	44	26	2.35	1021.29	1014	15	1.22E-02	36.9	
20	0	569.93*	37	44	5.80	1139.84	1131	19	1.04E-02	48.2	
21	0	583.04*	111	22	1.79	1166.06	1158	14	3.09E-02	13.2	
22	4	609.26*	117	17	1.60	1218.52	1212	17	3.25E-02	11.6	2.65E-01
23	4	612.74	16	4	1.83	1225.49	1212	17	4.35E-03	41.6	
24	0	661.37	73	30	1.56	1322.77	1315	15	2.03E-02	20.1	
25	0	677.75	22	3	4.13	1355.55	1350	12	6.06E-03	26.7	
26	0	727.04	27	8	1.88	1454.17	1448	11	7.42E-03	28.4	
27	0	740.00	6	14	2.30	1480.09	1473	9	1.53E-03	127.8	
28	0	797.08	26	18	5.73	1594.32	1584	18	7.34E-03	42.3	
29	0	821.44	11	4	1.23	1643.05	1639	8	3.06E-03	43.6	
30	0	860.51	16	10	0.71	1721.24	1717	9	4.50E-03	44.2	
31	0	884.37	18	12	0.70	1768.97	1760	16	5.04E-03	48.7	
32	0	911.47*	57	5	1.90	1823.20	1818	11	1.57E-02	16.2	
33	0	932.27	28	6	0.78	1864.84	1858	13	7.70E-03	26.8	
34	0	949.61	2	11	1.25	1899.54	1893	10	5.77E-04	296.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	969.48*	30	20	1.41	1939.30	1933	12	8.22E-03	36.7	
36	0	1121.11	13	11	1.51	2242.75	2237	9	3.68E-03	53.0	
37	0	1142.52	11	3	4.39	2285.62	2279	12	3.10E-03	43.0	
38	0	1160.65	10	0	0.96	2321.90	2318	7	2.78E-03	31.6	
39	1	1235.04	15	3	2.17	2470.81	2467	17	4.15E-03	26.9	5.53E-01
40	1	1238.44	19	2	2.17	2477.61	2467	17	5.14E-03	35.7	
41	0	1461.05*	150	3	1.93	2923.24	2917	16	4.17E-02	8.8	
42	0	1728.31	8	3	0.67	3458.38	3452	11	2.32E-03	51.5	
43	0	1764.40	36	0	1.14	3530.64	3524	13	1.00E-02	16.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:49:43

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677037.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:25:00 Acquisition date : 28-JUN-2016 12:47:30
Sample ID        : G398677037 Sample quantity : 157.24 GRAM
Sample type       : SOLID Sample geometry :
Detector name     : GAMMA12 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.46 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated : No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.102E+00	5.908E+00	5.908E+00	17.64	OK
BA-137M	661.66	89.90*	2.124E+00	1.940E-01	1.945E-01	40.22	OK
CS-137	661.66	85.10*	2.124E+00	2.049E-01	2.055E-01	40.22	OK
TL-208	277.37	6.60	4.166E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.344E+00	2.868E-01	2.868E-01	26.36	OK
	860.56	12.50	1.720E+00	3.708E-01	3.708E-01	88.48	OK
BI-211	72.87	1.23	3.022E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.475E+00	1.419E-01	1.419E-01	641.48	OK
PB-212	74.82	10.28	3.221E+00	5.505E-01	5.505E-01	142.58	OK
	77.11	17.10	3.485E+00	1.515E+00	1.515E+00	36.56	OK
	238.63	43.60*	4.644E+00	7.564E-01	7.564E-01	15.56	OK
	300.09	3.30	3.927E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.265E+00	5.820E-01	5.821E-01	23.20	OK
	1120.29	14.92	1.381E+00	3.071E-01	3.071E-01	106.00	OK
	1764.49	15.30	9.412E-01	1.130E+00	1.130E+00	33.33	OK
PB-214	74.82	5.80	3.229E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.485E+00	2.671E+00	2.671E+00	36.56	OK
	87.09	3.41	4.364E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.597E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.978E+00	7.731E-01	7.731E-01	35.41	OK
	351.93	35.60*	3.474E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.265E+00	5.820E-01	5.821E-01	23.20	OK
	1120.29	14.92	1.381E+00	3.071E-01	3.071E-01	106.00	OK
	1764.49	15.30	9.412E-01	1.130E+00	1.130E+00	33.33	OK
RA-224	240.99	4.10*	4.606E+00	1.450E+00	1.450E+00	100.37	OK
RA-226	609.32	45.49*	2.265E+00	5.820E-01	5.821E-01	23.20	OK
	1120.29	14.92	1.381E+00	3.071E-01	3.071E-01	106.00	OK
	1764.49	15.30	9.412E-01	1.130E+00	1.130E+00	33.33	OK
AC-228	105.21	1.10	5.409E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.582E+00	1.034E+00	1.034E+00	51.24	OK
	794.95	4.25	1.834E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	6.538E-01	6.538E-01	32.45	OK
	968.97	15.80	1.560E+00	5.834E-01	5.834E-01	73.34	OK
RA-228	105.21	1.10	5.409E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.582E+00	1.034E+00	1.034E+00	51.24	OK
	794.95	4.25	1.834E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	6.538E-01	6.538E-01	32.45	OK
	968.97	15.80	1.560E+00	5.834E-01	5.834E-01	73.34	OK
TH-228	74.82	10.28	3.221E+00	5.505E-01	5.505E-01	142.58	OK
	77.11	17.10	3.485E+00	1.515E+00	1.515E+00	36.56	OK
	238.63	43.60*	4.644E+00	7.564E-01	7.564E-01	15.56	OK
	300.09	3.30	3.927E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.265E+00	5.820E-01	5.820E-01	23.20	OK
	1120.29	14.92	1.381E+00	3.071E-01	3.071E-01	106.00	OK
	1764.49	15.30	9.412E-01	1.130E+00	1.130E+00	33.33	OK
TH-232	105.21	1.10	5.409E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.582E+00	1.034E+00	1.034E+00	51.24	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	6.538E-01	6.538E-01	32.45	OK
	968.97	15.80	1.560E+00	5.834E-01	5.834E-01	73.34	OK
U-234	609.32	45.49*	2.265E+00	5.820E-01	5.820E-01	23.20	OK
	1120.29	14.92	1.381E+00	3.071E-01	3.071E-01	106.00	OK
	1764.49	15.30	9.412E-01	1.130E+00	1.130E+00	33.33	OK
U-235	89.96	3.47	4.586E+00	8.069E-01	8.069E-01	116.57	OK
	93.35	5.60	4.778E+00	8.269E-01	8.269E-01	105.86	OK
	143.76	10.96*	5.884E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.710E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.396E+00	5.260E-02	5.260E-02	141.79	OK
	205.31	5.01	5.116E+00	----- Line	Not Found	-----	Absent
AM-243	43.53	5.90	2.582E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.221E+00	8.422E-02	8.422E-02	142.58	OK
ANH-511	511.00	100.00*	2.600E+00	8.849E-02	8.849E-02	73.72	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677037.CNF;1
Acquisition date : 28-JUN-2016 12:47:30 Sensitivity : 3.000
Detector ID : GAM12 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.46 Half life ratio : *****
Sample date : 11-MAY-2016 15:25:00 Analyst initials: MXR1
Sample ID : G398677037 Sample Quantity : 1.5724E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 29-SEP-2015 06:02:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.908E+00	1.021E+00	6.886E-01
BA-137M	1.945E-01	7.668E-02	6.902E-02
CS-137	2.055E-01	8.100E-02	7.291E-02
TL-208	2.868E-01	7.410E-02	5.935E-02
BI-211	1.419E-01	8.921E-01	3.529E-01
PB-212	7.564E-01	1.154E-01	1.051E-01
BI-214	5.821E-01	1.324E-01	1.315E-01
PB-214	8.246E-01	1.812E-01	2.900E-01
RN-222	5.821E-01	1.324E-01	1.315E-01
RA-224	1.450E+00	1.426E+00	1.125E+00
RA-226	5.821E-01	1.324E-01	1.315E-01
AC-228	6.538E-01	2.079E-01	2.740E-01
RA-228	6.538E-01	2.079E-01	2.740E-01
TH-228	7.564E-01	1.154E-01	1.051E-01
TH-230	5.820E-01	1.324E-01	1.315E-01
TH-232	6.538E-01	2.079E-01	2.740E-01
U-234	5.820E-01	1.324E-01	1.315E-01
U-235	1.440E-02	2.297E-01	4.264E-01
AM-243	8.422E-02	1.177E-01	1.377E-01
ANH-511	8.849E-02	6.393E-02	5.898E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.452E-01	4.709E-01	9.405E-01	NOT IDENT.
NA-22	5.495E-03	3.053E-02	6.525E-02	NOT IDENT.
NA-24	0.000E+00	3.842E+21	0.000E+00	SHORT HLIF
AL-26	2.007E-02	2.925E-02	7.335E-02	NOT IDENT.
SC-46	3.483E-03	5.114E-02	9.024E-02	FAIL ABUN
V-48	1.925E-02	2.501E-01	5.087E-01	NOT IDENT.
CR-51	1.084E-01	9.059E-01	1.756E+00	NOT IDENT.
MN-54	-9.793E-03	4.082E-02	7.780E-02	NOT IDENT.
CO-56	-5.393E-03	4.942E-02	9.700E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF

CO-57	-1.726E-02	5.039E-02	5.546E-02	NOT IDENT.
CO-58	2.989E-02	5.058E-02	1.054E-01	NOT IDENT.
FE-59	-3.696E-02	1.053E-01	2.016E-01	NOT IDENT.
CO-60	-1.223E-02	3.832E-02	7.183E-02	NOT IDENT.
ZN-65	-7.573E-03	1.003E-01	1.671E-01	NOT IDENT.
GE-68	6.131E-01	1.331E+00	2.785E+00	NOT IDENT.
AS-73	-2.479E+00	2.035E+00	3.615E+00	NOT IDENT.
AS-74	-1.008E-01	3.440E-01	6.314E-01	NOT IDENT.
SE-75	-2.979E-02	5.992E-02	9.510E-02	NOT IDENT.
BR-77	0.000E+00	2.549E+05	0.000E+00	SHORT HLIF
SR-82	7.382E-02	7.980E-01	1.541E+00	NOT IDENT.
RB-83	2.850E-02	9.437E-02	1.869E-01	NOT IDENT.
KR-85	1.477E+01	9.098E+00	1.793E+01	NOT IDENT.
SR-85	1.101E-01	6.802E-02	1.340E-01	NOT IDENT.
RB-86	1.517E+00	2.585E+00	5.503E+00	NOT IDENT.
Y-88	3.061E-03	4.790E-02	1.003E-01	NOT IDENT.
Y-91	-3.880E+01	2.638E+01	3.798E+01	NOT IDENT.
NB-94	-1.610E-02	3.442E-02	6.108E-02	NOT IDENT.
NB-95	4.347E-02	6.576E-02	1.324E-01	NOT IDENT.
NB-95M	2.329E-01	2.252E-01	4.075E-01	NOT IDENT.
ZR-95	-3.174E-02	9.966E-02	1.811E-01	NOT IDENT.
NB-97	0.000E+00	1.011E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.119E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.199E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	9.458E+40	0.000E+00	SHORT HLIF
RH-101	2.880E-02	4.027E-02	7.121E-02	FAIL ABUN
RH-102	-3.462E-02	6.252E-02	1.102E-01	NOT IDENT.
RU-103	-7.454E-02	7.198E-02	1.207E-01	FAIL ABUN
RH-106	1.950E-01	3.642E-01	7.323E-01	NOT IDENT.
RU-106	1.950E-01	3.642E-01	7.323E-01	NOT IDENT.
AG-108M	-6.902E-04	2.915E-02	5.603E-02	NOT IDENT.
CD-109	1.047E+00	1.271E+00	2.220E+00	NOT IDENT.
AG-110M	8.312E-02	7.935E-02	1.151E-01	FAIL ABUN
SN-113	-1.999E-02	5.796E-02	1.074E-01	NOT IDENT.
CD-115	0.000E+00	2.757E+05	0.000E+00	SHORT HLIF
SN-117M	-1.014E-01	3.208E-01	5.806E-01	NOT IDENT.
TE-123M	-2.123E-02	3.817E-02	6.784E-02	NOT IDENT.
SB-124	1.064E-01	9.977E-02	2.697E-01	NOT IDENT.
SB-125	-1.084E-02	9.318E-02	1.770E-01	NOT IDENT.
TE-125M	5.096E+00	1.738E+01	3.326E+01	NOT IDENT.
I-126	-2.637E-01	1.424E+00	2.261E+00	NOT IDENT.
SB-126	-3.903E-01	9.916E-01	1.497E+00	NOT IDENT.
SN-126	7.312E-02	1.180E-01	2.034E-01	NOT IDENT.
SB-127	0.000E+00	4.115E+02	0.000E+00	SHORT HLIF
I-131	-2.290E-01	1.950E+00	3.721E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.990E+02	0.000E+00	SHORT HLIF
BA-133	2.258E-02	4.668E-02	8.330E-02	NOT IDENT.
I-133	0.000E+00	1.371E+15	0.000E+00	SHORT HLIF
CS-134	8.763E-02	7.271E-02	9.555E-02	FAIL ABUN
CS-135	2.127E-01	1.564E-01	3.313E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-5.936E-02	5.350E-01	1.047E+00	FAIL ABUN
CE-139	-3.150E-02	3.626E-02	6.271E-02	NOT IDENT.
BA-140	8.157E-01	1.660E+00	3.342E+00	NOT IDENT.
LA-140	1.418E-01	4.628E-01	1.020E+00	NOT IDENT.
CE-141	1.509E-02	1.435E-01	2.671E-01	NOT IDENT.
CE-143	0.000E+00	2.439E+09	0.000E+00	SHORT HLIF
CE-144	-6.130E-02	2.367E-01	4.338E-01	NOT IDENT.
PM-144	3.030E-03	4.154E-02	7.848E-02	NOT IDENT.
PR-144	2.228E-01	3.162E+00	5.972E+00	NOT IDENT.
PM-146	3.312E-02	4.135E-02	8.645E-02	NOT IDENT.
ND-147	1.121E+00	4.269E+00	8.489E+00	FAIL ABUN
PM-147	-1.210E+02	1.403E+03	1.619E+03	NOT IDENT.
PM-149	0.000E+00	2.571E+06	0.000E+00	SHORT HLIF
EU-150	8.776E-03	3.100E-02	5.368E-02	FAIL ABUN
EU-152	4.361E-02	9.565E-02	1.574E-01	NOT IDENT.
GD-153	5.167E-02	1.564E-01	2.062E-01	FAIL ABUN
EU-154	1.308E-02	8.451E-02	1.800E-01	NOT IDENT.
EU-155	-6.966E-02	1.515E-01	2.384E-01	NOT IDENT.
TB-160	5.849E-02	1.862E-01	3.432E-01	NOT IDENT.
HO-166M	-2.126E-02	5.731E-02	1.037E-01	NOT IDENT.
TM-171	-2.388E+01	3.587E+01	6.708E+01	NOT IDENT.
HF-172	1.770E-01	2.475E-01	4.044E-01	FAIL ABUN
LU-172	4.659E-02	4.895E-02	1.156E-01	FAIL ABUN
LU-176	-7.676E-03	2.593E-02	4.886E-02	NOT IDENT.
HF-181	-4.216E-03	7.616E-02	1.452E-01	NOT IDENT.
TA-182	1.765E-01	2.010E-01	4.428E-01	FAIL ABUN

RE-183	4.787E-01	4.493E-01	9.318E-01	NOT IDENT.
RE-184	4.096E-02	2.430E-01	4.799E-01	NOT IDENT.
W-188	2.603E-01	1.098E+01	1.853E+01	NOT IDENT.
IR-192	-3.603E-02	4.943E-02	8.920E-02	FAIL ABUN
HG-203	5.191E-02	6.695E-02	1.357E-01	NOT IDENT.
BI-207	-1.414E-02	4.965E-02	9.386E-02	FAIL ABUN
PB-210	1.333E+00	8.773E+00	1.530E+01	NOT IDENT.
PB-211	8.076E-02	7.630E-01	1.473E+00	NOT IDENT.
BI-212	1.020E+00	5.686E-01	1.127E+00	FAIL ABUN
RN-219	5.803E-03	4.346E-01	8.321E-01	FAIL ABUN
RA-223	-7.840E-01	7.470E-01	1.308E+00	FAIL ABUN
AC-227	1.022E-01	2.578E-01	5.128E-01	NOT IDENT.
TH-227	1.022E-01	2.578E-01	5.128E-01	NOT IDENT.
TH-229	6.137E-01	5.974E-01	1.024E+00	FAIL ABUN
PA-231	8.394E-02	5.168E-01	9.532E-01	NOT IDENT.
TH-231	-7.840E-01	7.470E-01	1.308E+00	FAIL ABUN
PA-233	2.107E-02	6.125E-02	1.224E-01	NOT IDENT.
PA-234	3.401E-01	2.298E-01	5.563E-01	FAIL ABUN
PA-234M	-1.205E-01	4.084E+00	8.246E+00	NOT IDENT.
TH-234	-1.501E+00	1.995E+00	3.726E+00	FAIL ABUN
NP-237	2.107E-02	6.125E-02	1.224E-01	FAIL ABUN
NP-238	0.000E+00	8.007E+05	0.000E+00	SHORT HLIF
U-238	-1.501E+00	1.995E+00	3.726E+00	FAIL ABUN
NP-239	3.629E-01	6.248E-01	5.769E-01	FAIL ABUN
PU-239	5.051E+02	4.243E+02	7.673E+02	NOT IDENT.
AM-241	-8.337E-02	2.563E-01	4.842E-01	NOT IDENT.
CM-243	-3.686E-02	1.466E-01	2.359E-01	FAIL ABUN
BK-247	-5.643E-02	8.829E-02	1.375E-01	NOT IDENT.
CM-247	1.165E-02	3.976E-02	7.807E-02	NOT IDENT.
CF-249	2.220E-02	4.518E-02	8.972E-02	NOT IDENT.
CF-251	-3.501E-02	1.386E-01	2.510E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	145	10.66*	1.102E+00	5.908E+00	5.908E+00	17.64
BA-137M	661.66	78	89.90*	2.124E+00	1.940E-01	1.945E-01	40.22
CS-137	661.66	78	85.10*	2.124E+00	2.049E-01	2.055E-01	40.22
TL-208	277.37	-----	6.60	4.166E+00	-----	Line Not Found	-----
	583.19	120	85.00*	2.344E+00	2.868E-01	2.868E-01	26.36
	860.56	17	12.50	1.720E+00	3.708E-01	3.708E-01	88.48
BI-211	72.87	-----	1.23	3.022E+00	-----	Line Not Found	-----
	351.06	214	12.92*	3.475E+00	2.272E+00	2.272E+00	22.42
PB-212	74.82	68	10.28	3.221E+00	9.867E-01	9.867E-01	78.00
	77.11	189	17.10	3.485E+00	1.515E+00	1.515E+00	36.56
	238.63	321	43.60*	4.644E+00	7.564E-01	7.564E-01	15.56
	300.09	-----	3.30	3.927E+00	-----	Line Not Found	-----
BI-214	609.32	126	45.49*	2.265E+00	5.820E-01	5.821E-01	23.20
	1120.29	13	14.92	1.381E+00	3.071E-01	3.071E-01	106.00
	1764.49	34	15.30	9.412E-01	1.130E+00	1.130E+00	33.33
PB-214	74.82	68	5.80	3.221E+00	1.749E+00	1.749E+00	78.00
	77.11	189	9.70	3.485E+00	2.671E+00	2.671E+00	36.56
	87.09	-----	3.41	4.364E+00	-----	Line Not Found	-----
	242.00	111	7.25	4.606E+00	1.593E+00	1.593E+00	48.72
	295.22	119	18.42	3.978E+00	7.731E-01	7.731E-01	35.41
	351.93	214	35.60*	3.475E+00	8.246E-01	8.246E-01	22.42
RN-222	609.32	126	45.49*	2.265E+00	5.820E-01	5.821E-01	23.20
	1120.29	13	14.92	1.381E+00	3.071E-01	3.071E-01	106.00
	1764.49	34	15.30	9.412E-01	1.130E+00	1.130E+00	33.33
RA-224	240.99	111	4.10*	4.606E+00	2.817E+00	2.817E+00	48.72
RA-226	609.32	126	45.49*	2.265E+00	5.820E-01	5.821E-01	23.20
	1120.29	13	14.92	1.381E+00	3.071E-01	3.071E-01	106.00
	1764.49	34	15.30	9.412E-01	1.130E+00	1.130E+00	33.33
AC-228	105.21	-----	1.10	5.409E+00	-----	Line Not Found	-----
	338.32	87	11.27	3.582E+00	1.034E+00	1.034E+00	51.24
	794.95	-----	4.25	1.834E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	58	25.80*	1.641E+00	6.538E-01	6.538E-01	32.45
	968.97	30	15.80	1.560E+00	5.834E-01	5.834E-01	73.34
RA-228	105.21	-----	1.10	5.409E+00	-----	Line Not Found	-----
	338.32	87	11.27	3.582E+00	1.034E+00	1.034E+00	51.24
	794.95	-----	4.25	1.834E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	58	25.80*	1.641E+00	6.538E-01	6.538E-01	32.45
	968.97	30	15.80	1.560E+00	5.834E-01	5.834E-01	73.34
TH-228	74.82	68	10.28	3.221E+00	9.867E-01	9.867E-01	78.00
	77.11	189	17.10	3.485E+00	1.515E+00	1.515E+00	36.56
	238.63	321	43.60*	4.644E+00	7.564E-01	7.564E-01	15.56
	300.09	-----	3.30	3.927E+00	-----	Line Not Found	-----
TH-230	609.32	126	45.49*	2.265E+00	5.820E-01	5.820E-01	23.20
	1120.29	13	14.92	1.381E+00	3.071E-01	3.071E-01	106.00
	1764.49	34	15.30	9.412E-01	1.130E+00	1.130E+00	33.33

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-232	105.21	-----	1.10	5.409E+00	-----	Line Not Found	-----
	338.32	87	11.27	3.582E+00	1.034E+00	1.034E+00	51.24
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	58	25.80*	1.641E+00	6.538E-01	6.538E-01	32.45
	968.97	30	15.80	1.560E+00	5.834E-01	5.834E-01	73.34
U-234	609.32	126	45.49*	2.265E+00	5.820E-01	5.820E-01	23.20
	1120.29	13	14.92	1.381E+00	3.071E-01	3.071E-01	106.00
	1764.49	34	15.30	9.412E-01	1.130E+00	1.130E+00	33.33
U-235	89.96	27	3.47	4.586E+00	8.069E-01	8.069E-01	116.57
	93.35	46	5.60	4.778E+00	8.269E-01	8.269E-01	105.86
	143.76	-----	10.96*	5.884E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.710E+00	-----	Line Not Found	-----
	185.72	34	57.20	5.396E+00	5.260E-02	5.260E-02	141.79
AM-243	205.31	-----	5.01	5.116E+00	-----	Line Not Found	-----
	43.53	-----	5.90	2.582E-01	-----	Line Not Found	-----
ANH-511	74.66	68	67.20*	3.221E+00	1.509E-01	1.509E-01	78.00
	511.00	48	100.00*	2.600E+00	8.849E-02	8.849E-02	73.72

Flag: "*" = Keyline

Total number of lines in spectrum 43
Number of unidentified lines 8
Number of lines tentatively identified by NID 35 81.40%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.908E+00	5.908E+00	1.042E+00	17.64	
BA-137M	30.08Y	1.00	1.940E-01	1.945E-01	0.782E-01	40.22	
CS-137	30.08Y	1.00	2.049E-01	2.055E-01	0.827E-01	40.22	
TL-208	1.41E+10Y	1.00	2.868E-01	2.868E-01	0.756E-01	26.36	
BI-211	7.04E+08Y	1.00	2.272E+00	2.272E+00	0.509E+00	22.42	
PB-212	1.41E+10Y	1.00	7.564E-01	7.564E-01	1.177E-01	15.56	
BI-214	1600.00Y	1.00	5.820E-01	5.821E-01	1.351E-01	23.20	
PB-214	1600.00Y	1.00	8.246E-01	8.246E-01	1.849E-01	22.42	
RN-222	1600.00Y	1.00	5.820E-01	5.821E-01	1.351E-01	23.20	
RA-224	1.41E+10Y	1.00	2.817E+00	2.817E+00	1.373E+00	48.72	
RA-226	1600.00Y	1.00	5.820E-01	5.821E-01	1.351E-01	23.20	
AC-228	1.41E+10Y	1.00	6.538E-01	6.538E-01	2.121E-01	32.45	
RA-228	1.41E+10Y	1.00	6.538E-01	6.538E-01	2.121E-01	32.45	
TH-228	1.41E+10Y	1.00	7.564E-01	7.564E-01	1.177E-01	15.56	
TH-230	7.54E+04Y	1.00	5.820E-01	5.820E-01	1.351E-01	23.20	
TH-232	1.41E+10Y	1.00	6.538E-01	6.538E-01	2.121E-01	32.45	
U-234	2.45E+05Y	1.00	5.820E-01	5.820E-01	1.351E-01	23.20	
U-235	7.04E+08Y	1.00	5.260E-02	5.260E-02	7.459E-02	141.79	K
AM-243	7370.00Y	1.00	1.509E-01	1.509E-01	1.177E-01	78.00	
ANH-511	1.00E+09Y	1.00	8.849E-02	8.849E-02	6.524E-02	73.72	

Total Activity : 1.918E+01 1.918E+01

Grand Total Activity : 1.918E+01 1.918E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	36.48	43	20	1.78	72.89	68	25	8.49E-03	****	5.57E-02	
3	41.10	28	68	1.79	82.11	68	25	5.69E-03	****	1.64E-01	
0	98.89	14	118	0.73	197.69	197	8	3.03E-03	****	5.13E+00	T
0	115.43	34	166	4.69	230.76	229	13	7.55E-03	****	5.71E+00	T
0	125.82	23	71	1.56	251.53	247	7	5.17E-03	****	5.86E+00	T
0	194.43	30	57	1.41	388.74	386	7	6.89E-03	99.3	5.28E+00	T
0	210.04	69	122	1.14	419.97	413	14	1.60E-02	79.9	5.05E+00	T
0	270.27	89	70	1.89	540.42	532	16	2.11E-02	51.0	4.25E+00	T
0	569.93	40	47	5.80	1139.84	1131	19	1.04E-02	96.3	2.39E+00	T
4	612.74	17	5	1.83	1225.49	1212	17	4.35E-03	83.2	2.25E+00	
0	677.75	23	3	4.13	1355.55	1350	12	6.06E-03	53.5	2.08E+00	T
0	727.04	28	9	1.88	1454.17	1448	11	7.42E-03	56.9	1.97E+00	T
0	740.00	6	14	2.30	1480.09	1473	9	1.53E-03	****	1.94E+00	T
0	797.08	27	18	5.73	1594.32	1584	18	7.34E-03	84.7	1.83E+00	T
0	821.44	11	4	1.23	1643.05	1639	8	3.06E-03	87.2	1.79E+00	
0	884.37	19	12	0.70	1768.97	1760	16	5.04E-03	97.4	1.68E+00	T
0	932.27	28	6	0.78	1864.84	1858	13	7.70E-03	53.5	1.61E+00	
0	949.61	2	11	1.25	1899.54	1893	10	5.77E-04	****	1.59E+00	T
0	1142.52	11	3	4.39	2285.62	2279	12	3.10E-03	86.1	1.36E+00	
0	1160.65	10	0	0.96	2321.90	2318	7	2.78E-03	63.2	1.34E+00	
1	1235.04	15	3	2.17	2470.81	2467	17	4.15E-03	53.7	1.27E+00	T
1	1238.44	18	2	2.17	2477.61	2467	17	5.14E-03	71.3	1.27E+00	T
0	1728.31	8	3	0.67	3458.38	3452	11	2.32E-03	****	9.57E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677037.CNF;1  *
* Acquisition date   : 28-JUN-2016 12:47:30 Sensitivity      : 3.000          *
* Detector ID        : GAM12 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.46 Half life ratio  : *****        *
* Sample date        : 11-MAY-2016 15:25:00 Nuclide Library : SOLID         *
* Sample ID          : G398677037 Analyst initials: MXR1          *
* Batch Number       : 1572486 Sample Quantity : 1.5724E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000         *
*                                     Dry Weight    : 0.00000         *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 29-SEP-2015 06:02:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.889E-01
BA-137M	3.102E-02
CS-137	3.277E-02
TL-208	2.633E-02
BI-211	1.615E-01
PB-212	4.917E-02
BI-214	5.928E-02
PB-214	1.396E-01
RN-222	5.928E-02
RA-224	5.266E-01
RA-226	5.928E-02
AC-228	1.214E-01
RA-228	1.214E-01
TH-228	4.917E-02
TH-230	5.928E-02
TH-232	1.214E-01
U-234	5.928E-02
U-235	2.025E-01
AM-243	6.559E-02
ANH-511	2.692E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.265E-01	NOT IDENT.
NA-22	2.716E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.965E-02	NOT IDENT.
SC-46	3.926E-02	FAIL ABUN
V-48	2.202E-01	NOT IDENT.
CR-51	8.173E-01	NOT IDENT.
MN-54	3.474E-02	NOT IDENT.
CO-56	4.267E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.616E-02	NOT IDENT.

CO-58	4.679E-02	NOT IDENT.
FE-59	8.334E-02	NOT IDENT.
CO-60	3.034E-02	NOT IDENT.
ZN-65	7.284E-02	NOT IDENT.
GE-68	1.231E+00	NOT IDENT.
AS-73	1.697E+00	NOT IDENT.
AS-74	2.840E-01	NOT IDENT.
SE-75	4.402E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.837E-01	NOT IDENT.
RB-83	8.491E-02	NOT IDENT.
KR-85	8.365E+00	NOT IDENT.
SR-85	6.252E-02	NOT IDENT.
RB-86	2.436E+00	NOT IDENT.
Y-88	4.039E-02	NOT IDENT.
Y-91	1.557E+01	NOT IDENT.
NB-94	2.726E-02	NOT IDENT.
NB-95	6.030E-02	NOT IDENT.
NB-95M	1.939E-01	NOT IDENT.
ZR-95	7.982E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.383E-02	FAIL ABUN
RH-102	4.958E-02	NOT IDENT.
RU-103	5.391E-02	FAIL ABUN
RH-106	3.333E-01	NOT IDENT.
RU-106	3.333E-01	NOT IDENT.
AG-108M	2.550E-02	NOT IDENT.
CD-109	1.064E+00	NOT IDENT.
AG-110M	5.138E-02	FAIL ABUN
SN-113	4.936E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.745E-01	NOT IDENT.
TE-123M	3.205E-02	NOT IDENT.
SB-124	1.106E-01	NOT IDENT.
SB-125	8.071E-02	NOT IDENT.
TE-125M	1.581E+01	NOT IDENT.
I-126	1.006E+00	NOT IDENT.
SB-126	6.570E-01	NOT IDENT.
SN-126	9.746E-02	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.708E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.847E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.337E-02	FAIL ABUN
CS-135	1.557E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.536E-01	FAIL ABUN
CE-139	2.943E-02	NOT IDENT.
BA-140	1.523E+00	NOT IDENT.
LA-140	4.197E-01	NOT IDENT.
CE-141	1.268E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.051E-01	NOT IDENT.
PM-144	3.566E-02	NOT IDENT.
PR-144	2.713E+00	NOT IDENT.
PM-146	3.955E-02	NOT IDENT.
ND-147	3.828E+00	FAIL ABUN
PM-147	7.661E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.489E-02	FAIL ABUN
EU-152	7.146E-02	NOT IDENT.
GD-153	9.767E-02	FAIL ABUN
EU-154	7.475E-02	NOT IDENT.
EU-155	1.130E-01	NOT IDENT.
TB-160	1.511E-01	NOT IDENT.
HO-166M	4.572E-02	NOT IDENT.
TM-171	3.167E+01	NOT IDENT.
HF-172	1.913E-01	FAIL ABUN
LU-172	5.003E-02	FAIL ABUN
LU-176	2.256E-02	NOT IDENT.
HF-181	6.592E-02	NOT IDENT.
TA-182	1.962E-01	FAIL ABUN
RE-183	4.419E-01	NOT IDENT.

RE-184	2.132E-01	NOT IDENT.
W-188	8.590E+00	NOT IDENT.
IR-192	4.120E-02	FAIL ABUN
HG-203	6.378E-02	NOT IDENT.
BI-207	4.082E-02	FAIL ABUN
PB-210	7.246E+00	NOT IDENT.
PB-211	6.792E-01	NOT IDENT.
BI-212	5.132E-01	FAIL ABUN
RN-219	3.835E-01	FAIL ABUN
RA-223	6.084E-01	FAIL ABUN
AC-227	2.402E-01	NOT IDENT.
TH-227	2.402E-01	NOT IDENT.
TH-229	4.825E-01	FAIL ABUN
PA-231	4.443E-01	NOT IDENT.
TH-231	6.084E-01	FAIL ABUN
PA-233	5.658E-02	NOT IDENT.
PA-234	2.437E-01	FAIL ABUN
PA-234M	3.608E+00	NOT IDENT.
TH-234	1.766E+00	FAIL ABUN
NP-237	5.658E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.766E+00	FAIL ABUN
NP-239	2.733E-01	FAIL ABUN
PU-239	3.651E+02	NOT IDENT.
AM-241	2.294E-01	NOT IDENT.
CM-243	1.117E-01	FAIL ABUN
BK-247	6.348E-02	NOT IDENT.
CM-247	3.605E-02	NOT IDENT.
CF-249	4.169E-02	NOT IDENT.
CF-251	1.184E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677037.CNF;1
Acquisition date : 28-JUN-2016 12:47:30 Sensitivity : 3.000
Detector ID : GAM12 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.46 Half life ratio : *****
Sample date : 11-MAY-2016 15:25:00 Nuclide Library : SOLID
Sample ID : G398677037 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.5724E+02 GRAM
Quantity Err(%) : 1.2719E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 29-SEP-2015 06:02:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.908E+00	1.147E+00	1.147E+00
BA-137M	1.945E-01	7.832E-02	7.832E-02
CS-137	2.055E-01	8.273E-02	8.273E-02
TL-208	2.868E-01	7.795E-02	7.795E-02
BI-211	1.419E-01	9.222E-01	9.222E-01
PB-212	7.564E-01	1.300E-01	1.300E-01
BI-214	5.821E-01	1.411E-01	1.411E-01
PB-214	8.246E-01	1.926E-01	1.926E-01
RN-222	5.821E-01	1.411E-01	1.411E-01
RA-224	1.450E+00	1.439E+00	1.439E+00
RA-226	5.821E-01	1.411E-01	1.411E-01
AC-228	6.538E-01	2.243E-01	2.243E-01
RA-228	6.538E-01	2.243E-01	2.243E-01
TH-228	7.564E-01	1.300E-01	1.300E-01
TH-230	5.820E-01	1.411E-01	1.411E-01
TH-232	6.538E-01	2.243E-01	2.243E-01
U-234	5.820E-01	1.411E-01	1.411E-01
U-235	1.440E-02	2.297E-01	2.297E-01
AM-243	8.422E-02	1.184E-01	1.184E-01
ANH-511	8.849E-02	6.437E-02	6.437E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.452E-01	4.710E-01	4.756E-01	NOT IDENT.
NA-22	5.495E-03	3.053E-02	3.064E-02	NOT IDENT.
NA-24	-2.243E+19	3.842E+21	0.000E+00	SHORT HLIF
AL-26	2.007E-02	2.928E-02	3.065E-02	NOT IDENT.
SC-46	3.483E-03	5.114E-02	5.117E-02	FAIL ABUN
V-48	1.925E-02	2.501E-01	2.502E-01	NOT IDENT.
CR-51	1.084E-01	9.059E-01	9.073E-01	NOT IDENT.
MN-54	-9.793E-03	4.083E-02	4.107E-02	NOT IDENT.
CO-56	-5.393E-03	4.943E-02	4.949E-02	FAIL ABUN
MN-56	-1.000E+41	9.167E+41	0.000E+00	SHORT HLIF

CO-57	-1.726E-02	5.041E-02	5.100E-02	NOT IDENT.
CO-58	2.989E-02	5.068E-02	5.244E-02	NOT IDENT.
FE-59	-3.696E-02	1.055E-01	1.068E-01	NOT IDENT.
CO-60	-1.223E-02	3.834E-02	3.873E-02	NOT IDENT.
ZN-65	-7.573E-03	1.003E-01	1.003E-01	NOT IDENT.
GE-68	6.131E-01	1.334E+00	1.363E+00	NOT IDENT.
AS-73	-2.479E+00	2.101E+00	2.379E+00	NOT IDENT.
AS-74	-1.008E-01	3.441E-01	3.471E-01	NOT IDENT.
SE-75	-2.979E-02	5.996E-02	6.144E-02	NOT IDENT.
BR-77	1.672E+06	2.329E+06	2.448E+06	SHORT HLIF
SR-82	7.382E-02	7.981E-01	7.988E-01	NOT IDENT.
RB-83	2.850E-02	9.448E-02	9.535E-02	NOT IDENT.
KR-85	1.477E+01	9.182E+00	1.134E+01	NOT IDENT.
SR-85	1.101E-01	6.865E-02	8.473E-02	NOT IDENT.
RB-86	1.517E+00	2.597E+00	2.686E+00	NOT IDENT.
Y-88	3.061E-03	4.790E-02	4.792E-02	NOT IDENT.
Y-91	-3.880E+01	2.664E+01	3.187E+01	NOT IDENT.
NB-94	-1.610E-02	3.445E-02	3.521E-02	NOT IDENT.
NB-95	4.347E-02	6.590E-02	6.875E-02	NOT IDENT.
NB-95M	2.329E-01	2.263E-01	2.495E-01	NOT IDENT.
ZR-95	-3.174E-02	9.971E-02	1.007E-01	NOT IDENT.
NB-97	1.000E+41	1.014E+41	0.000E+00	SHORT HLIF
ZR-97	3.983E+20	2.145E+20	0.000E+00	SHORT HLIF
MO-99	2.076E+04	5.203E+04	5.287E+04	SHORT HLIF
TC-99M	-1.000E+41	9.525E+40	0.000E+00	SHORT HLIF
RH-101	2.880E-02	4.063E-02	4.265E-02	FAIL ABUN
RH-102	-3.462E-02	6.263E-02	6.455E-02	NOT IDENT.
RU-103	-7.454E-02	7.228E-02	7.971E-02	FAIL ABUN
RH-106	1.950E-01	3.647E-01	3.752E-01	NOT IDENT.
RU-106	1.950E-01	3.647E-01	3.752E-01	NOT IDENT.
AG-108M	-6.902E-04	2.915E-02	2.916E-02	NOT IDENT.
CD-109	1.047E+00	1.277E+00	1.362E+00	NOT IDENT.
AG-110M	8.312E-02	8.001E-02	8.835E-02	FAIL ABUN
SN-113	-1.999E-02	5.799E-02	5.868E-02	NOT IDENT.
CD-115	-5.017E+04	2.758E+05	2.767E+05	SHORT HLIF
SN-117M	-1.014E-01	3.209E-01	3.242E-01	NOT IDENT.
TE-123M	-2.123E-02	3.820E-02	3.938E-02	NOT IDENT.
SB-124	1.064E-01	1.001E-01	1.110E-01	NOT IDENT.
SB-125	-1.084E-02	9.318E-02	9.331E-02	NOT IDENT.
TE-125M	5.096E+00	1.739E+01	1.754E+01	NOT IDENT.
I-126	-2.637E-01	1.424E+00	1.429E+00	NOT IDENT.
SB-126	-3.903E-01	9.929E-01	1.008E+00	NOT IDENT.
SN-126	7.312E-02	1.183E-01	1.228E-01	NOT IDENT.
SB-127	7.928E+01	4.119E+02	4.135E+02	SHORT HLIF
I-131	-2.290E-01	1.951E+00	1.953E+00	NOT IDENT.
I-132	-1.000E+41	7.491E+41	0.000E+00	SHORT HLIF
TE-132	-5.533E+02	9.014E+02	9.352E+02	SHORT HLIF
BA-133	2.258E-02	4.672E-02	4.781E-02	NOT IDENT.
I-133	2.022E+14	1.372E+15	1.375E+15	SHORT HLIF
CS-134	8.763E-02	7.328E-02	8.325E-02	FAIL ABUN
CS-135	2.127E-01	1.576E-01	1.844E-01	NOT IDENT.
I-135	-1.000E+41	4.456E+41	0.000E+00	SHORT HLIF
CS-136	-5.936E-02	5.351E-01	5.358E-01	FAIL ABUN
CE-139	-3.150E-02	3.685E-02	3.950E-02	NOT IDENT.
BA-140	8.157E-01	1.662E+00	1.702E+00	NOT IDENT.
LA-140	1.418E-01	4.629E-01	4.673E-01	NOT IDENT.
CE-141	1.509E-02	1.435E-01	1.436E-01	NOT IDENT.
CE-143	7.607E+09	2.513E+09	4.251E+09	SHORT HLIF
CE-144	-6.130E-02	2.367E-01	2.383E-01	NOT IDENT.
PM-144	3.030E-03	4.154E-02	4.157E-02	NOT IDENT.
PR-144	2.228E-01	3.162E+00	3.163E+00	NOT IDENT.
PM-146	3.312E-02	4.149E-02	4.409E-02	NOT IDENT.
ND-147	1.121E+00	4.270E+00	4.300E+00	FAIL ABUN
PM-147	-1.210E+02	1.403E+03	1.404E+03	NOT IDENT.
PM-149	-1.300E+06	2.578E+06	2.644E+06	SHORT HLIF
EU-150	8.776E-03	3.101E-02	3.126E-02	FAIL ABUN
EU-152	4.361E-02	9.572E-02	9.772E-02	NOT IDENT.
GD-153	5.167E-02	1.565E-01	1.582E-01	FAIL ABUN
EU-154	1.308E-02	8.452E-02	8.472E-02	NOT IDENT.
EU-155	-6.966E-02	1.516E-01	1.548E-01	NOT IDENT.
TB-160	5.849E-02	1.864E-01	1.882E-01	NOT IDENT.
HO-166M	-2.126E-02	5.734E-02	5.814E-02	NOT IDENT.
TM-171	-2.388E+01	3.595E+01	3.752E+01	NOT IDENT.
HF-172	1.770E-01	2.493E-01	2.618E-01	FAIL ABUN
LU-172	4.659E-02	4.976E-02	5.401E-02	FAIL ABUN
LU-176	-7.676E-03	2.593E-02	2.616E-02	NOT IDENT.
HF-181	-4.216E-03	7.616E-02	7.618E-02	NOT IDENT.
TA-182	1.765E-01	2.017E-01	2.168E-01	FAIL ABUN

RE-183	4.787E-01	4.526E-01	5.014E-01	NOT IDENT.
RE-184	4.096E-02	2.430E-01	2.437E-01	NOT IDENT.
W-188	2.603E-01	1.098E+01	1.098E+01	NOT IDENT.
IR-192	-3.603E-02	4.951E-02	5.211E-02	FAIL ABUN
HG-203	5.191E-02	6.706E-02	7.103E-02	NOT IDENT.
BI-207	-1.414E-02	4.970E-02	5.011E-02	FAIL ABUN
PB-210	1.333E+00	8.774E+00	8.795E+00	NOT IDENT.
PB-211	8.076E-02	7.630E-01	7.639E-01	NOT IDENT.
BI-212	1.020E+00	5.769E-01	7.379E-01	FAIL ABUN
RN-219	5.803E-03	4.346E-01	4.346E-01	FAIL ABUN
RA-223	-7.840E-01	7.503E-01	8.294E-01	FAIL ABUN
AC-227	1.022E-01	2.582E-01	2.623E-01	NOT IDENT.
TH-227	1.022E-01	2.582E-01	2.623E-01	NOT IDENT.
TH-229	6.137E-01	5.992E-01	6.600E-01	FAIL ABUN
PA-231	8.394E-02	5.171E-01	5.185E-01	NOT IDENT.
TH-231	-7.840E-01	7.503E-01	8.294E-01	FAIL ABUN
PA-233	2.107E-02	6.128E-02	6.201E-02	NOT IDENT.
PA-234	3.401E-01	4.539E-01	4.791E-01	FAIL ABUN
PA-234M	-1.205E-01	4.084E+00	4.085E+00	NOT IDENT.
TH-234	-1.501E+00	2.025E+00	2.135E+00	FAIL ABUN
NP-237	2.107E-02	6.128E-02	6.201E-02	FAIL ABUN
NP-238	2.653E+05	8.016E+05	8.105E+05	SHORT HLIF
U-238	-1.501E+00	2.025E+00	2.135E+00	FAIL ABUN
NP-239	3.629E-01	6.258E-01	6.469E-01	FAIL ABUN
PU-239	5.051E+02	4.258E+02	4.828E+02	NOT IDENT.
AM-241	-8.337E-02	2.564E-01	2.591E-01	NOT IDENT.
CM-243	-3.686E-02	1.467E-01	1.476E-01	FAIL ABUN
BK-247	-5.643E-02	8.908E-02	9.264E-02	NOT IDENT.
CM-247	1.165E-02	3.981E-02	4.016E-02	NOT IDENT.
CF-249	2.220E-02	4.524E-02	4.634E-02	NOT IDENT.
CF-251	-3.501E-02	1.387E-01	1.396E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	59.7872	87.09	147.2591	136.47	94.2718
45.60	110.5266	87.57	147.3175	140.51	0.0000
46.54	97.6317	88.03	147.3732	143.76	110.1196
49.72	0.0000	88.34	147.4104	144.24	111.2540
51.35	93.0566	88.47	140.6481	145.44	106.9270
51.87	100.2726	89.96	246.0079	152.43	101.8442
52.39	108.5203	1093.63	186.7294	153.25	97.4639
52.97	105.5160	91.11	168.1205	323.87	96.4114
53.44	110.6948	92.59	127.5146	156.02	95.4049
54.07	108.7191	93.35	122.4883	158.56	108.8788
57.36	0.0000	94.56	104.2996	159.00	113.3516
57.53	88.5309	94.65	104.3071	162.33	82.3941
57.98	83.4226	94.67	104.3086	162.66	85.7509
59.27	117.5660	94.87	96.5184	163.33	84.6697
59.32	117.5721	97.43	93.8669	165.86	101.5266
59.54	117.5986	98.43	125.2526	176.31	93.1413
60.96	97.1073	98.44	125.9651	176.60	90.9118
61.17	97.1279	99.53	117.9507	177.52	97.6951
62.93	111.7904	100.11	106.8867	181.07	0.0000
63.29	114.9366	102.03	116.4620	181.52	97.5311
63.58	113.9337	103.18	114.8483	184.41	105.1958
64.28	110.9028	103.37	114.8647	143.76	90.2307
66.73	118.4392	105.21	127.0394	193.51	87.5794
67.24	122.6548	105.31	127.0488	197.03	86.2254
125.81	108.1482	106.12	120.2531	198.01	80.2149
67.75	115.4348	106.47	115.9880	201.83	100.0836
69.67	126.6882	109.28	112.9977	203.43	103.1995
70.83	133.5000	111.00	117.8070	205.31	80.5109
72.81	127.0565	111.76	0.0000	210.85	90.4807
72.87	127.0634	114.06	96.7548	215.65	61.0726
74.66	136.0615	116.30	0.0000	222.11	72.5957
74.82	136.0814	116.74	108.1886	227.09	85.6623
74.97	136.0997	119.76	95.4051	227.38	87.5161
77.11	136.3596	121.12	95.4940	228.16	0.0000
78.74	136.1348	121.22	108.5232	228.18	90.3138
79.69	136.2475	121.78	108.5648	116.74	90.3138
80.12	134.6157	122.06	108.5854	235.69	95.5613
80.19	134.6235	122.92	108.6487	235.96	95.5726
80.57	132.9846	123.07	95.6206	238.63	71.3044
81.00	139.7697	265.00	108.7044	238.98	0.0000
81.07	139.7783	125.81	127.3658	240.99	71.3806
81.75	133.1196	127.23	101.1170	242.00	71.4135
83.79	180.0514	127.91	92.4419	244.70	55.7142
84.00	174.8574	129.30	89.0346	252.40	0.0000
85.43	142.4683	131.20	108.1544	252.80	69.8941
86.55	142.1176	133.02	117.0321	254.15	0.0000
86.79	148.9147	133.52	107.2234	256.23	64.3992
86.94	147.2410	136.00	94.2436	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	64.0099	355.39	0.0000	584.27	17.3291
264.80	64.0133	356.01	38.8247	595.83	31.2854
265.00	64.0191	364.49	43.8085	427.87	22.9706
268.22	51.5981	366.42	0.0000	602.52	0.0000
269.46	51.6249	372.51	45.8835	604.72	34.8405
270.03	51.6377	375.05	39.0845	607.14	31.3755
271.23	51.6639	377.52	43.0289	609.32	28.2538
273.65	72.0893	356.01	49.9827	610.33	28.2604
276.40	75.3105	388.16	48.0926	614.28	24.4470
277.37	76.6862	388.63	40.2473	618.01	32.9593
277.60	65.9292	391.69	50.1147	620.36	25.1836
278.00	68.2953	264.66	48.2936	621.93	26.2433
279.20	63.1454	401.81	46.3396	630.19	0.0000
279.54	55.6136	402.40	43.3904	631.29	35.7739
279.70	64.1011	404.85	45.3992	633.25	26.3171
280.46	62.2359	410.95	40.5456	634.78	23.1677
283.69	65.1508	413.71	40.5816	635.95	18.9606
284.31	73.6677	414.70	44.5551	636.99	25.2873
285.41	68.0317	423.72	38.7263	645.85	21.1187
285.90	0.0000	427.09	31.8098	657.76	15.8844
287.50	47.2845	427.87	37.7834	657.90	0.0000
290.67	53.6576	433.94	34.8671	661.66	26.4990
293.27	0.0000	439.40	42.9097	664.57	0.0000
351.93	72.7285	453.88	26.0616	666.33	24.7598
295.96	74.3316	463.37	36.1894	666.50	24.7609
879.38	45.9119	468.07	39.2604	667.71	0.0000
299.98	52.2735	473.00	0.0000	677.62	11.7039
300.09	52.2762	475.06	31.2721	685.70	0.0000
300.13	52.2769	476.78	33.3066	695.00	28.8444
301.36	59.4345	477.60	27.2574	696.49	32.0603
302.85	66.6060	482.18	33.3597	696.51	32.0603
256.23	56.1753	487.02	34.4192	697.00	37.4080
304.85	53.3265	492.35	0.0000	697.30	33.1350
306.78	54.3198	497.08	39.5960	697.49	29.9298
308.46	54.3553	505.52	35.6208	702.65	29.9653
311.90	43.9240	507.63	0.0000	706.68	10.7117
316.51	64.0900	511.00	36.6959	711.68	23.5931
319.41	52.6696	514.00	30.6057	720.70	23.2832
320.08	58.4303	514.00	30.6057	721.93	0.0000
321.04	56.5354	520.40	28.6166	722.78	10.7510
323.87	83.4550	520.69	0.0000	722.91	10.7515
325.23	61.4234	522.65	0.0000	723.31	10.7522
328.76	58.6217	527.90	0.0000	724.19	16.1316
333.37	56.1558	528.26	27.6552	727.33	14.3493
333.97	48.1439	529.59	24.5912	733.00	14.3675
334.37	49.7563	529.87	0.0000	735.93	16.1741
338.28	38.5767	531.02	24.6012	333.97	21.5728
338.32	38.5771	537.26	27.7238	739.50	0.0000
311.90	30.5642	546.56	0.0000	747.24	22.7006
340.48	30.5642	552.55	21.6527	748.06	18.3800
340.55	30.5650	563.25	39.6379	752.31	18.3974
344.28	24.1632	569.33	24.8566	753.82	18.4032
345.93	19.3420	946.00	24.8578	756.73	22.7478
351.06	38.7559	569.70	24.8590	756.80	22.7483
351.93	38.7681	583.19	20.7891	884.68	33.6330

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	24.9636	1274.44	16.0945	1620.50	9.3702
766.42	23.8815	1001.03	13.2660	1621.92	4.1654
766.84	23.8836	1002.74	14.2178	1678.03	0.0000
772.60	0.0000	1004.73	18.9640	1690.97	1.0506
776.52	19.5820	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.2407
778.90	16.3268	1028.54	0.0000	1063.66	1.8187
783.70	0.0000	1037.84	14.3073	1771.35	3.6378
785.37	19.6194	1038.76	0.0000	1791.20	0.0000
792.07	16.3726	631.29	10.5081	1808.65	2.1317
794.95	14.1984	1048.07	15.2884	1810.72	0.0000
795.86	14.2010	1049.04	13.3796	1836.06	5.3467
810.06	14.2435	1050.41	16.2509		
810.29	14.2441	1063.66	18.2052		
344.28	14.2448	1077.00	13.4451		
810.76	14.2457	1077.34	14.4061		
815.77	18.2829	1085.87	12.5038		
1048.07	16.4637	1093.63	5.7786		
832.01	13.7582	1099.45	10.6048		
834.85	26.6146	1112.07	12.5594		
835.71	26.6193	1112.84	10.4357		
836.80	0.0000	1115.54	16.5716		
846.75	0.0000	1120.29	12.5768		
846.77	19.3196	1120.55	11.6099		
856.80	22.1240	1221.41	13.5465		
860.56	17.5284	1129.67	9.6899		
871.09	18.4896	1131.51	0.0000		
873.19	17.5724	1147.95	0.0000		
875.33	0.0000	1173.23	14.6393		
879.38	14.2869	1177.95	12.6969		
880.51	22.2290	1189.05	9.7843		
883.24	17.6076	1204.77	22.5611		
884.68	17.6127	1221.41	10.8187		
889.28	14.3149	1231.02	13.5084		
894.76	19.5051	1235.36	10.1384		
898.04	13.9410	1238.28	6.9029		
900.72	22.3174	1260.41	0.0000		
903.28	19.2838	1271.87	14.8694		
911.20	20.4992	1274.44	6.9416		
912.08	9.5857	1274.54	6.9419		
923.98	0.0000	1291.59	11.9312		
926.50	12.8164	1298.22	0.0000		
929.11	17.6314	1312.11	13.9630		
937.49	3.2108	1332.49	13.0053		
944.13	19.2891	1362.66	0.0000		
946.00	3.2160	1365.19	7.0367		
949.00	15.0163	1368.63	0.0000		
667.71	0.0000	1384.29	12.0962		
962.31	16.1290	1408.01	12.1377		
964.08	24.2013	1457.56	0.0000		
966.17	19.3686	1460.82	9.1714		
911.20	19.7823	1489.16	6.1384		
968.97	19.7823	1505.03	12.3032		
983.53	13.2236	1584.12	7.2535		
984.45	0.0000	1596.21	5.1894		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:48:51.71

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677038.CNF:1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM14.CNF:512
Background date    : 26-JUN-2016 12:04:30
Sample date       : 11-MAY-2016 15:20:00 Acquisition date : 28-JUN-2016 12:46:23
Sample ID        : G398677038 Sample quantity : 1.33530E+02 GRAM
Detector name     : GAM14 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	42.38	22	121	1.44	85.23	81	8	6.08E-03	90.3	
2	0	63.76*	19	137	0.98	127.99	125	7	5.16E-03	109.7	
3	3	75.60	111	165	1.11	151.66	145	17	3.07E-02	21.0	6.13E-01
4	3	77.72	153	100	0.91	155.89	145	17	4.24E-02	13.2	
5	2	87.83*	66	164	1.23	176.10	172	22	1.85E-02	32.9	1.65E+00
6	2	90.61	44	146	1.24	181.67	172	22	1.24E-02	47.1	
7	2	93.47*	63	128	1.24	187.38	172	22	1.75E-02	35.6	
8	2	95.06	31	118	1.25	190.57	172	22	8.59E-03	70.5	
9	0	133.37	34	131	1.09	267.16	264	8	9.52E-03	60.4	
10	0	141.27	36	118	1.45	282.96	279	8	9.87E-03	55.9	
11	7	186.57*	46	123	1.41	373.51	367	14	1.28E-02	47.3	1.91E+00
12	7	188.68	15	108	1.32	377.74	367	14	4.04E-03	112.8	
13	0	209.78	49	155	0.79	419.93	415	10	1.36E-02	49.6	
14	0	221.09	34	102	1.12	442.53	439	8	9.38E-03	54.6	
15	0	239.07*	372	148	1.13	478.49	473	10	1.03E-01	8.1	
16	0	242.26	51	78	1.06	484.86	483	5	1.43E-02	29.4	
17	0	259.62	41	71	1.63	519.57	516	9	1.13E-02	40.5	
18	1	271.23	49	83	1.38	542.78	539	36	1.36E-02	34.4	1.26E+00
19	1	274.90	26	83	1.39	550.12	539	36	7.11E-03	64.9	
20	2	295.89	112	79	1.26	592.08	588	35	3.12E-02	16.2	1.41E+00
21	2	300.59	30	88	1.56	601.48	588	35	8.40E-03	60.7	
22	1	335.81	27	85	1.45	671.90	668	15	7.37E-03	65.0	1.15E+00
23	1	338.99*	76	60	1.19	678.26	668	15	2.11E-02	20.6	
24	0	352.54*	214	88	1.06	705.36	700	11	5.93E-02	11.0	
25	0	511.79*	35	50	1.26	1023.74	1018	12	9.77E-03	51.3	
26	0	583.89*	116	36	1.46	1167.89	1162	12	3.23E-02	14.1	
27	0	609.95*	131	46	1.19	1220.00	1213	14	3.65E-02	14.1	
28	0	649.64	9	20	1.84	1299.34	1295	8	2.62E-03	85.3	
29	0	662.29	1830	52	1.46	1324.63	1317	16	5.08E-01	2.5	
30	1	721.56	15	15	1.77	1443.13	1439	27	4.03E-03	50.3	1.99E+00
31	1	728.00*	20	11	1.61	1456.00	1439	27	5.64E-03	43.0	
32	1	731.50	19	4	1.61	1463.00	1439	27	5.20E-03	26.9	
33	0	787.43	9	16	4.30	1574.83	1566	13	2.52E-03	97.4	
34	0	861.78	18	18	0.63	1723.47	1718	13	4.93E-03	56.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	871.56	18	6	4.35	1743.03	1737	12	5.00E-03	36.0	
36	0	884.16	6	6	1.07	1768.22	1763	8	1.71E-03	79.4	
37	0	906.04	9	8	1.30	1811.96	1804	12	2.59E-03	71.1	
38	0	911.57*	89	6	1.52	1823.01	1817	11	2.46E-02	12.2	
39	0	965.55	16	5	0.91	1930.94	1926	8	4.40E-03	36.2	
40	0	969.62*	44	8	1.60	1939.08	1935	9	1.23E-02	19.5	
41	0	1095.42	5	8	0.90	2190.58	2185	10	1.47E-03	106.2	
42	0	1121.03	35	6	1.55	2241.79	2235	12	9.72E-03	21.9	
43	0	1127.02	4	3	0.70	2253.76	2250	6	1.15E-03	81.9	
44	0	1139.54	6	6	1.34	2278.79	2274	8	1.74E-03	78.4	
45	0	1240.14*	20	9	2.50	2479.91	2474	12	5.67E-03	37.0	
46	0	1294.13	8	2	0.90	2587.86	2582	9	2.31E-03	46.8	
47	0	1461.31*	151	0	2.05	2922.09	2915	15	4.20E-02	8.3	
48	0	1765.13*	22	0	0.83	3529.50	3522	13	6.04E-03	22.9	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677038.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:20:00 Acquisition date : 28-JUN-2016 12:46:23
Sample ID        : G398677038 Sample quantity  : 133.53 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA14 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.62 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.191E+00	6.389E+00	6.389E+00	16.68	OK
CD-109	88.03	3.70*	5.988E+00	1.199E+00	1.289E+00	109.71	OK
SN-126	64.28	9.60	3.218E+00	4.022E-01	4.022E-01	219.43	OK
	86.94	8.90	5.988E+00	4.987E-01	4.987E-01	109.71	OK
	87.57	37.00*	5.988E+00	1.199E-01	1.199E-01	109.71	OK
BA-137M	661.66	89.90*	2.407E+00	4.823E+00	4.838E+00	5.00	OK
CS-137	661.66	85.10*	2.407E+00	5.095E+00	5.110E+00	5.00	OK
CE-144	80.12	1.36	5.319E+00	----- Line	Not Found	-----	Absent
	133.52	11.09*	6.941E+00	2.841E-01	3.192E-01	120.87	OK
TL-208	277.37	6.60	4.639E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.665E+00	2.956E-01	2.956E-01	28.16	OK
	860.56	12.50	1.921E+00	4.132E-01	4.132E-01	112.32	OK
BI-211	72.87	1.23	4.493E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.900E+00	2.371E-01	2.371E-01	391.89	OK
PB-212	74.82	10.28	4.826E+00	1.007E+00	1.007E+00	63.32	OK
	77.11	17.10	5.066E+00	1.165E+00	1.165E+00	26.47	OK
	238.63	43.60*	5.150E+00	1.017E+00	1.017E+00	16.16	OK
	300.09	3.30	4.379E+00	1.263E+00	1.263E+00	121.32	OK
BI-214	609.32	45.49*	2.573E+00	6.440E-01	6.441E-01	28.28	OK
	1120.29	14.92	1.512E+00	8.499E-01	8.500E-01	43.89	OK
	1764.49	15.30	1.028E+00	7.313E-01	7.313E-01	45.77	OK
PB-214	74.82	5.80	4.734E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.066E+00	2.054E+00	2.054E+00	26.47	OK
	87.09	3.41	5.933E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.107E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.429E+00	8.319E-01	8.320E-01	32.50	OK
	351.93	35.60*	3.905E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.573E+00	6.440E-01	6.441E-01	28.28	OK
	1120.29	14.92	1.512E+00	8.499E-01	8.500E-01	43.89	OK
	1764.49	15.30	1.028E+00	7.313E-01	7.313E-01	45.77	OK
RA-224	240.99	4.10*	5.103E+00	3.724E-02	3.724E-02	2704.59	OK
RA-226	609.32	45.49*	2.573E+00	6.440E-01	6.441E-01	28.28	OK
	1120.29	14.92	1.512E+00	8.499E-01	8.500E-01	43.89	OK
	1764.49	15.30	1.028E+00	7.313E-01	7.313E-01	45.77	OK
AC-228	105.21	1.10	6.812E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.014E+00	1.006E+00	1.006E+00	41.10	OK
	794.95	4.25	2.062E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.827E+00	1.046E+00	1.046E+00	24.38	OK
	968.97	15.80	1.728E+00	8.992E-01	8.992E-01	38.93	OK
RA-228	105.21	1.10	6.812E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.014E+00	1.006E+00	1.006E+00	41.10	OK
	794.95	4.25	2.062E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.827E+00	1.046E+00	1.046E+00	24.38	OK
	968.97	15.80	1.728E+00	8.992E-01	8.992E-01	38.93	OK
TH-228	74.82	10.28	4.826E+00	1.007E+00	1.007E+00	63.32	OK
	77.11	17.10	5.066E+00	1.165E+00	1.165E+00	26.47	OK
	238.63	43.60*	5.150E+00	1.017E+00	1.017E+00	16.16	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	300.09	3.30	4.379E+00	1.263E+00	1.263E+00	121.32	OK
	609.32	45.49*	2.573E+00	6.440E-01	6.440E-01	28.28	OK
	1120.29	14.92	1.512E+00	8.499E-01	8.499E-01	43.89	OK
	1764.49	15.30	1.028E+00	7.313E-01	7.313E-01	45.77	OK
PA-231	283.69	1.70	4.565E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.379E+00	7.791E-01	7.791E-01	121.32	OK
TH-232	105.21	1.10	6.812E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.014E+00	1.006E+00	1.006E+00	41.10	OK
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.827E+00	1.046E+00	1.046E+00	24.38	OK
TH-234	968.97	15.80	1.728E+00	8.992E-01	8.992E-01	38.93	OK
	63.29	3.70*	3.218E+00	1.043E+00	1.043E+00	219.43	OK
	92.59	4.23	6.349E+00	1.528E+00	1.528E+00	71.18	OK
	609.32	45.49*	2.573E+00	6.440E-01	6.440E-01	28.28	OK
U-234	1120.29	14.92	1.512E+00	8.499E-01	8.499E-01	43.89	OK
	1764.49	15.30	1.028E+00	7.313E-01	7.313E-01	45.77	OK
	89.96	3.47	6.179E+00	1.358E+00	1.358E+00	94.20	OK
	93.35	5.60	6.349E+00	1.154E+00	1.154E+00	71.18	OK
U-235	143.76	10.96*	6.814E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.481E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.041E+00	8.336E-02	8.336E-02	94.68	OK
	205.31	5.01	5.698E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.218E+00	1.043E+00	1.043E+00	219.43	OK
	92.59	4.23	6.349E+00	1.528E+00	1.528E+00	71.18	OK
AM-243	43.53	5.90	4.368E-01	5.837E+00	5.837E+00	180.56	OK
	74.66	67.20*	4.826E+00	1.541E-01	1.541E-01	63.32	OK
ANH-511	511.00	100.00*	2.953E+00	6.923E-02	6.923E-02	102.52	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677038.CNF;1
Acquisition date : 28-JUN-2016 12:46:23 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.62 Half life ratio : *****
Sample date : 11-MAY-2016 15:20:00 Analyst initials: MXR1
Sample ID : G398677038 Sample Quantity : 1.3353E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.389E+00	1.044E+00	6.646E-01
CD-109	1.289E+00	1.386E+00	1.655E+00
SN-126	1.199E-01	1.290E-01	1.549E-01
BA-137M	4.838E+00	2.368E-01	5.923E-02
CS-137	5.110E+00	2.502E-01	6.257E-02
CE-144	3.192E-01	3.781E-01	4.522E-01
TL-208	2.956E-01	8.157E-02	8.607E-02
BI-211	2.371E-01	9.107E-01	4.871E-01
PB-212	1.017E+00	1.610E-01	1.506E-01
BI-214	6.441E-01	1.785E-01	1.610E-01
PB-214	9.180E-01	1.976E-01	3.292E-01
RN-222	6.441E-01	1.785E-01	1.610E-01
RA-224	3.724E-02	9.870E-01	1.557E+00
RA-226	6.441E-01	1.785E-01	1.610E-01
AC-228	1.046E+00	2.499E-01	2.126E-01
RA-228	1.046E+00	2.499E-01	2.126E-01
TH-228	1.017E+00	1.610E-01	1.506E-01
TH-230	6.440E-01	1.785E-01	1.610E-01
PA-231	7.791E-01	9.263E-01	1.111E+00
TH-232	1.046E+00	2.499E-01	2.126E-01
TH-234	1.043E+00	2.244E+00	2.765E+00
U-234	6.440E-01	1.785E-01	1.610E-01
U-235	-1.000E-01	2.696E-01	4.181E-01
U-238	1.043E+00	2.244E+00	2.765E+00
AM-243	1.541E-01	9.564E-02	1.103E-01
ANH-511	6.923E-02	6.955E-02	7.012E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.156E-01	8.466E-01	1.567E+00	NOT IDENT.
NA-22	7.708E-03	3.468E-02	7.386E-02	NOT IDENT.
NA-24	0.000E+00	3.298E+21	0.000E+00	SHORT HLIF
AL-26	-1.634E-02	3.113E-02	5.524E-02	NOT IDENT.

SC-46	-9.622E-03	5.625E-02	9.484E-02	FAIL ABUN
V-48	2.812E-03	2.415E-01	4.764E-01	NOT IDENT.
CR-51	-4.649E-02	1.141E+00	2.100E+00	NOT IDENT.
MN-54	2.608E-02	3.850E-02	8.063E-02	NOT IDENT.
CO-56	3.531E-02	4.274E-02	9.568E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	7.667E-03	3.122E-02	5.773E-02	NOT IDENT.
CO-58	-1.760E-02	4.778E-02	8.790E-02	NOT IDENT.
FE-59	-7.254E-02	1.598E-01	2.313E-01	NOT IDENT.
CO-60	1.032E-03	3.195E-02	6.674E-02	NOT IDENT.
ZN-65	-4.769E-02	1.050E-01	1.516E-01	NOT IDENT.
GE-68	-3.407E-01	1.328E+00	2.427E+00	NOT IDENT.
AS-73	-1.265E-01	1.415E+00	2.679E+00	NOT IDENT.
AS-74	-1.501E-01	3.737E-01	6.874E-01	NOT IDENT.
SE-75	-4.047E-02	7.652E-02	1.195E-01	NOT IDENT.
BR-77	0.000E+00	3.562E+05	0.000E+00	SHORT HLIF
SR-82	-6.478E-01	8.433E-01	1.446E+00	NOT IDENT.
RB-83	-1.504E-02	1.128E-01	2.028E-01	NOT IDENT.
KR-85	0.000E+00	1.092E+01	2.184E+01	NOT IDENT.
SR-85	0.000E+00	8.167E-02	1.632E-01	NOT IDENT.
RB-86	-2.737E-01	2.569E+00	4.833E+00	NOT IDENT.
Y-88	-3.377E-02	3.941E-02	5.675E-02	NOT IDENT.
Y-91	-4.306E+00	2.857E+01	5.503E+01	NOT IDENT.
NB-94	-6.127E-03	2.999E-02	5.678E-02	FAIL ABUN
NB-95	-1.212E-02	5.510E-02	1.031E-01	NOT IDENT.
NB-95M	9.060E-02	2.519E-01	4.260E-01	NOT IDENT.
ZR-95	6.533E-02	1.013E-01	2.113E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.675E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.083E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.095E+41	0.000E+00	SHORT HLIF
RH-101	-2.207E-02	3.800E-02	6.559E-02	NOT IDENT.
RH-102	-4.312E-06	6.198E-02	1.190E-01	NOT IDENT.
RU-103	-9.178E-03	1.067E-01	1.905E-01	FAIL ABUN
RH-106	-2.489E-01	3.745E-01	6.664E-01	NOT IDENT.
RU-106	-2.489E-01	3.745E-01	6.664E-01	NOT IDENT.
AG-108M	-4.822E-03	4.661E-02	8.350E-02	FAIL ABUN
AG-110M	2.879E-02	4.482E-02	9.925E-02	FAIL ABUN
SN-113	1.661E-02	7.865E-02	1.456E-01	NOT IDENT.
CD-115	0.000E+00	4.092E+05	0.000E+00	SHORT HLIF
SN-117M	-1.033E-01	3.628E-01	6.350E-01	NOT IDENT.
TE-123M	-1.132E-02	4.262E-02	7.470E-02	NOT IDENT.
SB-124	5.462E-02	1.279E-01	2.904E-01	FAIL ABUN
SB-125	-1.301E-02	1.464E-01	2.627E-01	NOT IDENT.
TE-125M	-7.026E+00	1.665E+01	2.962E+01	NOT IDENT.
I-126	9.433E-02	1.386E+00	2.367E+00	NOT IDENT.
SB-126	1.004E+00	9.899E-01	1.929E+00	FAIL ABUN
SB-127	0.000E+00	4.219E+02	0.000E+00	SHORT HLIF
I-131	9.116E-01	2.900E+00	5.417E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.045E+03	0.000E+00	SHORT HLIF
BA-133	-5.059E-02	7.011E-02	1.042E-01	FAIL ABUN
I-133	0.000E+00	1.854E+15	0.000E+00	SHORT HLIF
CS-134	1.404E-02	4.573E-02	9.132E-02	NOT IDENT.
CS-135	7.705E-02	2.194E-01	3.717E-01	NOT IDENT.
I-135	0.000E+00	1.450E+41	0.000E+00	SHORT HLIF
CS-136	-2.532E-02	5.711E-01	1.088E+00	FAIL ABUN
CE-139	4.563E-02	4.193E-02	8.016E-02	NOT IDENT.
BA-140	6.609E-01	2.046E+00	3.833E+00	NOT IDENT.
LA-140	-1.270E-01	5.436E-01	1.044E+00	NOT IDENT.
CE-141	-1.954E-02	1.769E-01	2.793E-01	NOT IDENT.
CE-143	0.000E+00	2.428E+09	0.000E+00	SHORT HLIF
PM-144	8.471E-03	3.571E-02	7.087E-02	NOT IDENT.
PR-144	6.613E-01	2.721E+00	5.403E+00	NOT IDENT.
PM-146	3.896E-02	7.179E-02	1.338E-01	NOT IDENT.
ND-147	-2.266E+00	6.251E+00	1.086E+01	FAIL ABUN
PM-147	-4.423E+02	8.831E+02	1.553E+03	NOT IDENT.
PM-149	0.000E+00	3.630E+06	0.000E+00	SHORT HLIF
EU-150	1.120E-02	4.362E-02	7.196E-02	FAIL ABUN
EU-152	4.273E-02	1.473E-01	2.567E-01	FAIL ABUN
GD-153	-1.326E-01	1.181E-01	1.751E-01	NOT IDENT.
EU-154	2.388E-02	9.722E-02	2.076E-01	NOT IDENT.
EU-155	2.129E-01	1.221E-01	2.468E-01	FAIL ABUN
TB-160	1.019E-02	1.880E-01	3.212E-01	FAIL ABUN
HO-166M	1.519E-02	5.754E-02	1.153E-01	NOT IDENT.
TM-171	6.018E+00	2.262E+01	4.390E+01	NOT IDENT.
HF-172	-2.246E-01	2.326E-01	3.910E-01	FAIL ABUN
LU-172	-2.618E-02	8.128E-02	1.221E-01	FAIL ABUN

LU-176	2.141E-02	3.637E-02	6.982E-02	FAIL ABUN
HF-181	-1.143E-01	1.162E-01	1.911E-01	FAIL ABUN
TA-182	3.925E-03	2.181E-01	4.288E-01	FAIL ABUN
RE-183	-3.300E-01	3.221E-01	5.713E-01	NOT IDENT.
RE-184	1.743E-01	2.263E-01	4.537E-01	NOT IDENT.
W-188	5.137E+00	1.365E+01	2.322E+01	FAIL ABUN
IR-192	2.815E-02	5.829E-02	1.122E-01	FAIL ABUN
HG-203	7.277E-02	8.074E-02	1.586E-01	NOT IDENT.
BI-207	3.851E-02	4.969E-02	1.072E-01	FAIL ABUN
PB-210	1.971E+00	4.766E+00	9.127E+00	NOT IDENT.
PB-211	5.581E-03	1.082E+00	1.962E+00	NOT IDENT.
BI-212	7.744E-01	6.523E-01	1.244E+00	FAIL ABUN
RN-219	-3.973E-01	6.155E-01	1.063E+00	FAIL ABUN
RA-223	1.224E-01	8.703E-01	1.620E+00	FAIL ABUN
AC-227	1.893E-02	3.481E-01	5.773E-01	FAIL ABUN
TH-227	1.893E-02	3.481E-01	5.773E-01	FAIL ABUN
TH-229	-2.007E-01	6.767E-01	1.216E+00	FAIL ABUN
TH-231	1.224E-01	8.703E-01	1.620E+00	FAIL ABUN
PA-233	9.730E-03	9.155E-02	1.511E-01	FAIL ABUN
PA-234	-2.758E-02	2.790E-01	5.312E-01	FAIL ABUN
PA-234M	2.529E+00	4.762E+00	9.797E+00	NOT IDENT.
NP-237	9.730E-03	9.155E-02	1.511E-01	FAIL ABUN
NP-238	0.000E+00	7.945E+05	0.000E+00	SHORT HLIF
NP-239	8.984E-02	3.149E-01	5.832E-01	NOT IDENT.
PU-239	3.758E+02	4.391E+02	7.584E+02	NOT IDENT.
AM-241	-3.234E-02	1.811E-01	3.233E-01	NOT IDENT.
CM-243	-6.540E-02	1.300E-01	2.306E-01	NOT IDENT.
BK-247	-1.281E-02	1.059E-01	1.821E-01	NOT IDENT.
CM-247	-6.880E-03	5.486E-02	9.875E-02	NOT IDENT.
CF-249	3.046E-03	6.090E-02	1.111E-01	NOT IDENT.
CF-251	-3.424E-02	1.609E-01	2.811E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	144	10.66*	1.191E+00	6.389E+00	6.389E+00	16.68
CD-109	88.03	77	3.70*	5.988E+00	1.966E+00	2.113E+00	65.72
SN-126	64.28	22	9.60	3.218E+00	4.022E-01	4.022E-01	219.43
	86.94	77	8.90	5.988E+00	8.174E-01	8.174E-01	65.72
	87.57	77	37.00*	5.988E+00	1.966E-01	1.966E-01	65.72
BA-137M	661.66	1856	89.90*	2.407E+00	4.823E+00	4.838E+00	5.00
CS-137	661.66	1856	85.10*	2.407E+00	5.095E+00	5.110E+00	5.00
CE-144	80.12	-----	1.36	5.319E+00	-----	Line Not Found	-----
	133.52	39	11.09*	6.941E+00	2.841E-01	3.192E-01	120.87
TL-208	277.37	-----	6.60	4.639E+00	-----	Line Not Found	-----
	583.19	119	85.00*	2.665E+00	2.956E-01	2.956E-01	28.16
	860.56	18	12.50	1.921E+00	4.132E-01	4.132E-01	112.32
BI-211	72.87	-----	1.23	4.493E+00	-----	Line Not Found	-----
	351.06	227	12.92*	3.900E+00	2.529E+00	2.529E+00	21.96
PB-212	74.82	130	10.28	4.826E+00	1.477E+00	1.477E+00	41.94
	77.11	180	17.10	5.066E+00	1.165E+00	1.165E+00	26.47
	238.63	406	43.60*	5.150E+00	1.017E+00	1.017E+00	16.16
	300.09	32	3.30	4.379E+00	1.263E+00	1.263E+00	121.32
BI-214	609.32	134	45.49*	2.573E+00	6.440E-01	6.441E-01	28.28
	1120.29	34	14.92	1.512E+00	8.499E-01	8.500E-01	43.89
	1764.49	20	15.30	1.028E+00	7.313E-01	7.313E-01	45.77
PB-214	74.82	130	5.80	4.826E+00	2.618E+00	2.618E+00	41.94
	77.11	180	9.70	5.066E+00	2.054E+00	2.054E+00	26.47
	87.09	77	3.41	5.988E+00	2.133E+00	2.134E+00	65.72
	242.00	56	7.25	5.103E+00	8.530E-01	8.530E-01	58.77
	295.22	121	18.42	4.429E+00	8.319E-01	8.320E-01	32.50
	351.93	227	35.60*	3.900E+00	9.180E-01	9.180E-01	21.96
RN-222	609.32	134	45.49*	2.573E+00	6.440E-01	6.441E-01	28.28
	1120.29	34	14.92	1.512E+00	8.499E-01	8.500E-01	43.89
	1764.49	20	15.30	1.028E+00	7.313E-01	7.313E-01	45.77
RA-224	240.99	56	4.10*	5.103E+00	1.508E+00	1.508E+00	58.77
RA-226	609.32	134	45.49*	2.573E+00	6.440E-01	6.441E-01	28.28
	1120.29	34	14.92	1.512E+00	8.499E-01	8.500E-01	43.89
	1764.49	20	15.30	1.028E+00	7.313E-01	7.313E-01	45.77
AC-228	105.21	-----	1.10	6.812E+00	-----	Line Not Found	-----
	338.32	81	11.27	4.014E+00	1.006E+00	1.006E+00	41.10
	794.95	-----	4.25	2.062E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.827E+00	1.046E+00	1.046E+00	24.38
	968.97	44	15.80	1.728E+00	8.992E-01	8.992E-01	38.93
RA-228	105.21	-----	1.10	6.812E+00	-----	Line Not Found	-----
	338.32	81	11.27	4.014E+00	1.006E+00	1.006E+00	41.10
	794.95	-----	4.25	2.062E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.827E+00	1.046E+00	1.046E+00	24.38
	968.97	44	15.80	1.728E+00	8.992E-01	8.992E-01	38.93
TH-228	74.82	130	10.28	4.826E+00	1.477E+00	1.477E+00	41.94

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	180	17.10	5.066E+00	1.165E+00	1.165E+00	26.47
	238.63	406	43.60*	5.150E+00	1.017E+00	1.017E+00	16.16
	300.09	32	3.30	4.379E+00	1.263E+00	1.263E+00	121.32
TH-230	609.32	134	45.49*	2.573E+00	6.440E-01	6.440E-01	28.28
	1120.29	34	14.92	1.512E+00	8.499E-01	8.499E-01	43.89
	1764.49	20	15.30	1.028E+00	7.313E-01	7.313E-01	45.77
PA-231	283.69	-----	1.70	4.565E+00	-----	Line Not Found	-----
	301.36	32	5.35*	4.379E+00	7.791E-01	7.791E-01	121.32
TH-232	105.21	-----	1.10	6.812E+00	-----	Line Not Found	-----
	338.32	81	11.27	4.014E+00	1.006E+00	1.006E+00	41.10
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.827E+00	1.046E+00	1.046E+00	24.38
	968.97	44	15.80	1.728E+00	8.992E-01	8.992E-01	38.93
TH-234	63.29	22	3.70*	3.218E+00	1.043E+00	1.043E+00	219.43
	92.59	73	4.23	6.349E+00	1.528E+00	1.528E+00	71.18
U-234	609.32	134	45.49*	2.573E+00	6.440E-01	6.440E-01	28.28
	1120.29	34	14.92	1.512E+00	8.499E-01	8.499E-01	43.89
	1764.49	20	15.30	1.028E+00	7.313E-01	7.313E-01	45.77
U-235	89.96	52	3.47	6.179E+00	1.358E+00	1.358E+00	94.20
	93.35	73	5.60	6.349E+00	1.154E+00	1.154E+00	71.18
	143.76	-----	10.96*	6.814E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.481E+00	-----	Line Not Found	-----
	185.72	51	57.20	6.041E+00	8.336E-02	8.336E-02	94.68
	205.31	-----	5.01	5.698E+00	-----	Line Not Found	-----
U-238	63.29	22	3.70*	3.218E+00	1.043E+00	1.043E+00	219.43
	92.59	73	4.23	6.349E+00	1.528E+00	1.528E+00	71.18
AM-243	43.53	27	5.90	4.368E-01	5.837E+00	5.837E+00	180.56
	74.66	130	67.20*	4.826E+00	2.259E-01	2.259E-01	41.94
ANH-511	511.00	36	100.00*	2.953E+00	6.923E-02	6.923E-02	102.52

Flag: "*" = Keyline

Total number of lines in spectrum 48
Number of unidentified lines 10
Number of lines tentatively identified by NID 38 79.17%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.389E+00	6.389E+00	1.065E+00	16.68	
CD-109	461.40D	1.07	1.966E+00	2.113E+00	1.389E+00	65.72	
SN-126	2.30E+05Y	1.00	1.966E-01	1.966E-01	1.292E-01	65.72	
BA-137M	30.08Y	1.00	4.823E+00	4.838E+00	0.242E+00	5.00	
CS-137	30.08Y	1.00	5.095E+00	5.110E+00	0.255E+00	5.00	
CE-144	284.91D	1.12	2.841E-01	3.192E-01	3.859E-01	120.87	
TL-208	1.41E+10Y	1.00	2.956E-01	2.956E-01	0.832E-01	28.16	
BI-211	7.04E+08Y	1.00	2.529E+00	2.529E+00	0.556E+00	21.96	
PB-212	1.41E+10Y	1.00	1.017E+00	1.017E+00	0.164E+00	16.16	
BI-214	1600.00Y	1.00	6.440E-01	6.441E-01	1.821E-01	28.28	
PB-214	1600.00Y	1.00	9.180E-01	9.180E-01	2.016E-01	21.96	
RN-222	1600.00Y	1.00	6.440E-01	6.441E-01	1.821E-01	28.28	
RA-224	1.41E+10Y	1.00	1.508E+00	1.508E+00	0.886E+00	58.77	
RA-226	1600.00Y	1.00	6.440E-01	6.441E-01	1.821E-01	28.28	
AC-228	1.41E+10Y	1.00	1.046E+00	1.046E+00	0.255E+00	24.38	
RA-228	1.41E+10Y	1.00	1.046E+00	1.046E+00	0.255E+00	24.38	
TH-228	1.41E+10Y	1.00	1.017E+00	1.017E+00	0.164E+00	16.16	
TH-230	7.54E+04Y	1.00	6.440E-01	6.440E-01	1.821E-01	28.28	
PA-231	7.04E+08Y	1.00	7.791E-01	7.791E-01	9.452E-01	121.32	
TH-232	1.41E+10Y	1.00	1.046E+00	1.046E+00	0.255E+00	24.38	
TH-234	4.47E+09Y	1.00	1.043E+00	1.043E+00	2.290E+00	219.43	
U-234	2.45E+05Y	1.00	6.440E-01	6.440E-01	1.821E-01	28.28	
U-235	7.04E+08Y	1.00	8.336E-02	8.336E-02	7.892E-02	94.68	K
U-238	4.47E+09Y	1.00	1.043E+00	1.043E+00	2.290E+00	219.43	
AM-243	7370.00Y	1.00	2.259E-01	2.259E-01	0.948E-01	41.94	
ANH-511	1.00E+09Y	1.00	6.923E-02	6.923E-02	7.097E-02	102.52	
Total Activity :			3.564E+01	3.585E+01			

Grand Total Activity : 3.564E+01 3.585E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	95.06	36	137	1.25	190.57	172	22	8.59E-03	****	6.43E+00	T
0	141.27	40	134	1.45	282.96	279	8	9.87E-03	****	6.85E+00	T
7	188.68	16	120	1.32	377.74	367	14	4.04E-03	****	6.00E+00	
0	209.78	54	171	0.79	419.93	415	10	1.36E-02	99.3	5.62E+00	T
0	221.09	37	112	1.12	442.53	439	8	9.38E-03	****	5.43E+00	T
0	259.62	44	77	1.63	519.57	516	9	1.13E-02	81.1	4.86E+00	T
1	271.23	53	90	1.38	542.78	539	36	1.36E-02	68.7	4.71E+00	T
1	274.90	28	89	1.39	550.12	539	36	7.11E-03	****	4.67E+00	T
1	335.81	28	91	1.45	671.90	668	15	7.37E-03	****	4.04E+00	T
0	649.64	10	20	1.84	1299.34	1295	8	2.62E-03	****	2.45E+00	
1	721.56	15	16	1.77	1443.13	1439	27	4.03E-03	****	2.24E+00	T
1	728.00	20	11	1.61	1456.00	1439	27	5.64E-03	86.0	2.22E+00	T
1	731.50	19	4	1.61	1463.00	1439	27	5.20E-03	53.7	2.22E+00	
0	787.43	9	16	4.30	1574.83	1566	13	2.52E-03	****	2.08E+00	
0	871.56	18	6	4.35	1743.03	1737	12	5.00E-03	72.0	1.90E+00	T
0	884.16	6	6	1.07	1768.22	1763	8	1.71E-03	****	1.88E+00	T
0	906.04	9	8	1.30	1811.96	1804	12	2.59E-03	****	1.84E+00	
0	965.55	16	5	0.91	1930.94	1926	8	4.40E-03	72.5	1.73E+00	T
0	1095.42	5	8	0.90	2190.58	2185	10	1.47E-03	****	1.54E+00	
0	1127.02	4	3	0.70	2253.76	2250	6	1.15E-03	****	1.50E+00	
0	1139.54	6	6	1.34	2278.79	2274	8	1.74E-03	****	1.49E+00	
0	1240.14	20	8	2.50	2479.91	2474	12	5.67E-03	74.1	1.38E+00	
0	1294.13	8	2	0.90	2587.86	2582	9	2.31E-03	93.5	1.33E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677038.CNF;1
Acquisition date : 28-JUN-2016 12:46:23 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.62 Half life ratio : *****
Sample date : 11-MAY-2016 15:20:00 Nuclide Library : SOLID
Sample ID : G398677038 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3353E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.724E-01
CD-109	7.894E-01
SN-126	7.384E-02
BA-137M	2.604E-02
CS-137	2.751E-02
CE-144	2.146E-01
TL-208	3.964E-02
BI-211	2.282E-01
PB-212	7.181E-02
BI-214	7.395E-02
PB-214	1.591E-01
RN-222	7.395E-02
RA-224	7.412E-01
RA-226	7.395E-02
AC-228	9.004E-02
RA-228	9.004E-02
TH-228	7.181E-02
TH-230	7.394E-02
PA-231	5.221E-01
TH-232	9.004E-02
TH-234	1.314E+00
U-234	7.394E-02
U-235	1.985E-01
U-238	1.314E+00
AM-243	5.264E-02
ANH-511	3.245E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.393E-01	NOT IDENT.
NA-22	3.105E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.010E-02	NOT IDENT.
SC-46	4.131E-02	FAIL ABUN

V-48	2.023E-01	NOT IDENT.
CR-51	9.877E-01	NOT IDENT.
MN-54	3.600E-02	NOT IDENT.
CO-56	4.179E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.738E-02	NOT IDENT.
CO-58	3.786E-02	NOT IDENT.
FE-59	9.711E-02	NOT IDENT.
CO-60	2.736E-02	NOT IDENT.
ZN-65	6.441E-02	NOT IDENT.
GE-68	1.042E+00	NOT IDENT.
AS-73	1.269E+00	NOT IDENT.
AS-74	3.114E-01	NOT IDENT.
SE-75	5.612E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.332E-01	NOT IDENT.
RB-83	9.274E-02	NOT IDENT.
KR-85	1.031E+01	NOT IDENT.
SR-85	7.706E-02	NOT IDENT.
RB-86	2.082E+00	NOT IDENT.
Y-88	1.794E-02	NOT IDENT.
Y-91	2.386E+01	NOT IDENT.
NB-94	2.502E-02	FAIL ABUN
NB-95	4.549E-02	NOT IDENT.
NB-95M	2.028E-01	NOT IDENT.
ZR-95	9.464E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.109E-02	NOT IDENT.
RH-102	5.386E-02	NOT IDENT.
RU-103	8.871E-02	FAIL ABUN
RH-106	2.997E-01	NOT IDENT.
RU-106	2.997E-01	NOT IDENT.
AG-108M	3.920E-02	FAIL ABUN
AG-110M	4.320E-02	FAIL ABUN
SN-113	6.838E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.016E-01	NOT IDENT.
TE-123M	3.547E-02	NOT IDENT.
SB-124	1.191E-01	FAIL ABUN
SB-125	1.234E-01	NOT IDENT.
TE-125M	1.405E+01	NOT IDENT.
I-126	1.056E+00	NOT IDENT.
SB-126	8.708E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	2.552E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.883E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	4.111E-02	NOT IDENT.
CS-135	1.756E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.699E-01	FAIL ABUN
CE-139	3.814E-02	NOT IDENT.
BA-140	1.766E+00	NOT IDENT.
LA-140	4.249E-01	NOT IDENT.
CE-141	1.330E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
PM-144	3.176E-02	NOT IDENT.
PR-144	2.422E+00	NOT IDENT.
PM-146	6.315E-02	NOT IDENT.
ND-147	5.009E+00	FAIL ABUN
PM-147	7.354E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.398E-02	FAIL ABUN
EU-152	1.210E-01	FAIL ABUN
GD-153	8.276E-02	NOT IDENT.
EU-154	8.743E-02	NOT IDENT.
EU-155	1.178E-01	FAIL ABUN
TB-160	1.392E-01	FAIL ABUN
HO-166M	5.138E-02	NOT IDENT.
TM-171	2.078E+01	NOT IDENT.
HF-172	1.850E-01	FAIL ABUN
LU-172	5.281E-02	FAIL ABUN
LU-176	3.299E-02	FAIL ABUN

HF-181	8.876E-02	FAIL ABUN
TA-182	1.874E-01	FAIL ABUN
RE-183	2.696E-01	NOT IDENT.
RE-184	1.990E-01	NOT IDENT.
W-188	1.092E+01	FAIL ABUN
IR-192	5.261E-02	FAIL ABUN
HG-203	7.508E-02	NOT IDENT.
BI-207	4.712E-02	FAIL ABUN
PB-210	4.330E+00	NOT IDENT.
PB-211	9.228E-01	NOT IDENT.
BI-212	5.701E-01	FAIL ABUN
RN-219	4.982E-01	FAIL ABUN
RA-223	7.629E-01	FAIL ABUN
AC-227	2.719E-01	FAIL ABUN
TH-227	2.719E-01	FAIL ABUN
TH-229	5.782E-01	FAIL ABUN
TH-231	7.629E-01	FAIL ABUN
PA-233	7.080E-02	FAIL ABUN
PA-234	2.295E-01	FAIL ABUN
PA-234M	4.356E+00	NOT IDENT.
NP-237	7.080E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.774E-01	NOT IDENT.
PU-239	3.613E+02	NOT IDENT.
AM-241	1.530E-01	NOT IDENT.
CM-243	1.097E-01	NOT IDENT.
BK-247	8.562E-02	NOT IDENT.
CM-247	4.634E-02	NOT IDENT.
CF-249	5.231E-02	NOT IDENT.
CF-251	1.333E-01	NOT IDENT.

GEL Laboratories LLC
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Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677038.CNF;1
Acquisition date : 28-JUN-2016 12:46:23 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.62 Half life ratio : *****
Sample date : 11-MAY-2016 15:20:00 Nuclide Library : SOLID
Sample ID : G398677038 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.3353E+02 GRAM
Quantity Err(%) : 1.4978E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.389E+00	1.185E+00	1.185E+00
CD-109	1.289E+00	1.399E+00	1.399E+00
SN-126	1.199E-01	1.301E-01	1.301E-01
BA-137M	4.838E+00	4.621E-01	4.621E-01
CS-137	5.110E+00	4.879E-01	4.879E-01
CE-144	3.192E-01	3.791E-01	3.791E-01
TL-208	2.956E-01	8.523E-02	8.523E-02
BI-211	2.371E-01	9.556E-01	9.556E-01
PB-212	1.017E+00	1.847E-01	1.847E-01
BI-214	6.441E-01	1.864E-01	1.864E-01
PB-214	9.180E-01	2.128E-01	2.128E-01
RN-222	6.441E-01	1.864E-01	1.864E-01
RA-224	3.724E-02	1.004E+00	1.004E+00
RA-226	6.441E-01	1.864E-01	1.864E-01
AC-228	1.046E+00	2.963E-01	2.963E-01
RA-228	1.046E+00	2.963E-01	2.963E-01
TH-228	1.017E+00	1.847E-01	1.847E-01
TH-230	6.440E-01	1.864E-01	1.864E-01
PA-231	7.791E-01	9.432E-01	9.432E-01
TH-232	1.046E+00	2.963E-01	2.963E-01
TH-234	1.043E+00	2.257E+00	2.257E+00
U-234	6.440E-01	1.864E-01	1.864E-01
U-235	-1.000E-01	2.697E-01	2.697E-01
U-238	1.043E+00	2.257E+00	2.257E+00
AM-243	1.541E-01	9.741E-02	9.741E-02
ANH-511	6.923E-02	6.979E-02	6.979E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.156E-01	8.473E-01	8.677E-01	NOT IDENT.
NA-22	7.708E-03	3.469E-02	3.486E-02	NOT IDENT.
NA-24	-1.880E+21	3.304E+21	0.000E+00	SHORT HLIF
AL-26	-1.634E-02	3.116E-02	3.202E-02	NOT IDENT.

SC-46	-9.622E-03	5.626E-02	5.643E-02	FAIL ABUN
V-48	2.812E-03	2.415E-01	2.415E-01	NOT IDENT.
CR-51	-4.649E-02	1.141E+00	1.141E+00	NOT IDENT.
MN-54	2.608E-02	3.864E-02	4.039E-02	NOT IDENT.
CO-56	3.531E-02	4.299E-02	4.584E-02	NOT IDENT.
MN-56	1.000E+41	2.096E+41	0.000E+00	SHORT HLIF
CO-57	7.667E-03	3.122E-02	3.141E-02	NOT IDENT.
CO-58	-1.760E-02	4.782E-02	4.848E-02	NOT IDENT.
FE-59	-7.254E-02	1.605E-01	1.638E-01	NOT IDENT.
CO-60	1.032E-03	3.195E-02	3.196E-02	NOT IDENT.
ZN-65	-4.769E-02	1.054E-01	1.076E-01	NOT IDENT.
GE-68	-3.407E-01	1.329E+00	1.338E+00	NOT IDENT.
AS-73	-1.265E-01	1.415E+00	1.417E+00	NOT IDENT.
AS-74	-1.501E-01	3.740E-01	3.801E-01	NOT IDENT.
SE-75	-4.047E-02	7.661E-02	7.875E-02	NOT IDENT.
BR-77	2.248E+06	3.135E+06	3.295E+06	SHORT HLIF
SR-82	-6.478E-01	8.464E-01	8.953E-01	NOT IDENT.
RB-83	-1.504E-02	1.129E-01	1.131E-01	NOT IDENT.
KR-85	2.684E+01	1.115E+01	1.645E+01	NOT IDENT.
SR-85	2.002E-01	8.335E-02	1.229E-01	NOT IDENT.
RB-86	-2.737E-01	2.570E+00	2.573E+00	NOT IDENT.
Y-88	-3.377E-02	3.949E-02	4.232E-02	NOT IDENT.
Y-91	-4.306E+00	2.857E+01	2.863E+01	NOT IDENT.
NB-94	-6.127E-03	3.000E-02	3.013E-02	FAIL ABUN
NB-95	-1.212E-02	5.511E-02	5.538E-02	NOT IDENT.
NB-95M	9.060E-02	2.521E-01	2.554E-01	NOT IDENT.
ZR-95	6.533E-02	1.015E-01	1.057E-01	NOT IDENT.
NB-97	-1.000E+41	2.222E+42	0.000E+00	SHORT HLIF
ZR-97	-2.260E+20	2.682E+20	0.000E+00	SHORT HLIF
MO-99	3.657E+04	4.102E+04	4.421E+04	SHORT HLIF
TC-99M	1.000E+41	1.102E+41	0.000E+00	SHORT HLIF
RH-101	-2.207E-02	3.823E-02	3.950E-02	NOT IDENT.
RH-102	-4.312E-06	6.198E-02	6.198E-02	NOT IDENT.
RU-103	-9.178E-03	1.067E-01	1.067E-01	FAIL ABUN
RH-106	-2.489E-01	3.753E-01	3.917E-01	NOT IDENT.
RU-106	-2.489E-01	3.753E-01	3.917E-01	NOT IDENT.
AG-108M	-4.822E-03	4.661E-02	4.666E-02	FAIL ABUN
AG-110M	2.879E-02	4.502E-02	4.685E-02	FAIL ABUN
SN-113	1.661E-02	7.866E-02	7.901E-02	NOT IDENT.
CD-115	6.896E+04	4.092E+05	4.104E+05	SHORT HLIF
SN-117M	-1.033E-01	3.629E-01	3.659E-01	NOT IDENT.
TE-123M	-1.132E-02	4.263E-02	4.293E-02	NOT IDENT.
SB-124	5.462E-02	1.280E-01	1.304E-01	FAIL ABUN
SB-125	-1.301E-02	1.464E-01	1.465E-01	NOT IDENT.
TE-125M	-7.026E+00	1.666E+01	1.696E+01	NOT IDENT.
I-126	9.433E-02	1.386E+00	1.386E+00	NOT IDENT.
SB-126	1.004E+00	9.988E-01	1.097E+00	FAIL ABUN
SB-127	-8.042E+01	4.223E+02	4.239E+02	SHORT HLIF
I-131	9.116E-01	2.901E+00	2.930E+00	NOT IDENT.
I-132	1.000E+41	3.997E+41	0.000E+00	SHORT HLIF
TE-132	-2.828E+02	1.046E+03	1.054E+03	SHORT HLIF
BA-133	-5.059E-02	7.024E-02	7.385E-02	FAIL ABUN
I-133	2.409E+14	1.855E+15	1.858E+15	SHORT HLIF
CS-134	1.404E-02	4.576E-02	4.619E-02	NOT IDENT.
CS-135	7.705E-02	2.196E-01	2.223E-01	NOT IDENT.
I-135	1.000E+41	1.812E+41	0.000E+00	SHORT HLIF
CS-136	-2.532E-02	5.711E-01	5.712E-01	FAIL ABUN
CE-139	4.563E-02	4.301E-02	4.767E-02	NOT IDENT.
BA-140	6.609E-01	2.047E+00	2.069E+00	NOT IDENT.
LA-140	-1.270E-01	5.437E-01	5.467E-01	NOT IDENT.
CE-141	-1.954E-02	1.769E-01	1.771E-01	NOT IDENT.
CE-143	1.527E+09	2.433E+09	2.528E+09	SHORT HLIF
PM-144	8.471E-03	3.572E-02	3.592E-02	NOT IDENT.
PR-144	6.613E-01	2.722E+00	2.738E+00	NOT IDENT.
PM-146	3.896E-02	7.189E-02	7.401E-02	NOT IDENT.
ND-147	-2.266E+00	6.254E+00	6.336E+00	FAIL ABUN
PM-147	-4.423E+02	8.838E+02	9.060E+02	NOT IDENT.
PM-149	1.764E+06	3.641E+06	3.727E+06	SHORT HLIF
EU-150	1.120E-02	4.363E-02	4.392E-02	FAIL ABUN
EU-152	4.273E-02	1.474E-01	1.486E-01	FAIL ABUN
GD-153	-1.326E-01	1.186E-01	1.328E-01	NOT IDENT.
EU-154	2.388E-02	9.724E-02	9.784E-02	NOT IDENT.
EU-155	2.129E-01	1.238E-01	1.567E-01	FAIL ABUN
TB-160	1.019E-02	1.880E-01	1.880E-01	FAIL ABUN
HO-166M	1.519E-02	5.756E-02	5.797E-02	NOT IDENT.
TM-171	6.018E+00	2.263E+01	2.280E+01	NOT IDENT.
HF-172	-2.246E-01	2.359E-01	2.568E-01	FAIL ABUN
LU-172	-2.618E-02	8.148E-02	8.233E-02	FAIL ABUN

LU-176	2.141E-02	3.642E-02	3.768E-02	FAIL ABUN
HF-181	-1.143E-01	1.166E-01	1.275E-01	FAIL ABUN
TA-182	3.925E-03	2.181E-01	2.182E-01	FAIL ABUN
RE-183	-3.300E-01	3.253E-01	3.577E-01	NOT IDENT.
RE-184	1.743E-01	2.281E-01	2.412E-01	NOT IDENT.
W-188	5.137E+00	1.367E+01	1.386E+01	FAIL ABUN
IR-192	2.815E-02	5.834E-02	5.971E-02	FAIL ABUN
HG-203	7.277E-02	8.102E-02	8.741E-02	NOT IDENT.
BI-207	3.851E-02	5.020E-02	5.312E-02	FAIL ABUN
PB-210	1.971E+00	4.771E+00	4.853E+00	NOT IDENT.
PB-211	5.581E-03	1.082E+00	1.082E+00	NOT IDENT.
BI-212	7.744E-01	6.570E-01	7.440E-01	FAIL ABUN
RN-219	-3.973E-01	6.181E-01	6.435E-01	FAIL ABUN
RA-223	1.224E-01	8.704E-01	8.721E-01	FAIL ABUN
AC-227	1.893E-02	3.481E-01	3.482E-01	FAIL ABUN
TH-227	1.893E-02	3.481E-01	3.482E-01	FAIL ABUN
TH-229	-2.007E-01	6.768E-01	6.829E-01	FAIL ABUN
TH-231	1.224E-01	8.704E-01	8.721E-01	FAIL ABUN
PA-233	9.730E-03	9.156E-02	9.166E-02	FAIL ABUN
PA-234	-2.758E-02	2.808E-01	2.811E-01	FAIL ABUN
PA-234M	2.529E+00	4.782E+00	4.916E+00	NOT IDENT.
NP-237	9.730E-03	9.156E-02	9.166E-02	FAIL ABUN
NP-238	1.620E+05	7.950E+05	7.983E+05	SHORT HLIF
NP-239	8.984E-02	3.151E-01	3.177E-01	NOT IDENT.
PU-239	3.758E+02	4.401E+02	4.716E+02	NOT IDENT.
AM-241	-3.234E-02	1.812E-01	1.817E-01	NOT IDENT.
CM-243	-6.540E-02	1.302E-01	1.335E-01	NOT IDENT.
BK-247	-1.281E-02	1.060E-01	1.061E-01	NOT IDENT.
CM-247	-6.880E-03	5.488E-02	5.497E-02	NOT IDENT.
CF-249	3.046E-03	6.090E-02	6.092E-02	NOT IDENT.
CF-251	-3.424E-02	1.609E-01	1.617E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	94.2922	87.09	140.3036	136.47	108.5008
45.60	101.7983	87.57	140.4230	140.51	0.0000
46.54	88.3535	88.03	140.5374	143.76	126.1255
49.72	0.0000	88.34	140.6139	144.24	129.5231
51.35	102.8525	88.47	140.6462	145.44	136.3718
51.87	102.9856	89.96	141.0133	152.43	138.6788
52.39	97.4418	1093.63	141.1803	153.25	118.6666
52.97	102.3176	91.11	141.2947	323.87	117.6849
53.44	110.9714	92.59	141.6541	156.02	121.3121
54.07	123.4900	93.35	141.8380	158.56	128.4413
57.36	0.0000	94.56	142.1286	159.00	126.2541
57.53	109.1824	94.65	142.1497	162.33	110.9060
57.98	123.6768	94.67	142.1546	162.66	114.3452
59.27	124.6206	94.87	142.2023	163.33	124.6318
59.32	124.6347	97.43	138.1533	165.86	95.4528
59.54	109.6872	98.43	127.4969	176.31	100.0344
60.96	99.9040	98.44	127.4994	176.60	98.9161
61.17	94.1566	99.53	108.4117	177.52	117.4384
62.93	123.6084	100.11	100.8226	181.07	0.0000
63.29	122.2506	102.03	142.8400	181.52	109.2791
63.58	125.2406	103.18	143.1020	184.41	114.8404
64.28	144.3917	103.37	143.1459	143.76	125.4551
66.73	136.3532	105.21	93.2629	193.51	132.5087
67.24	126.2252	105.31	93.2778	197.03	150.7470
125.81	138.0948	106.12	112.2850	198.01	140.3090
67.75	138.1149	106.47	121.7959	201.83	140.8524
69.67	154.8933	109.28	127.5981	203.43	139.9373
70.83	124.2081	111.00	106.7865	205.31	108.0959
72.81	151.4273	111.76	0.0000	210.85	122.9878
72.87	151.4459	114.06	134.8942	215.65	116.1367
74.66	146.0235	116.30	0.0000	222.11	105.5274
74.82	146.0691	116.74	117.3008	227.09	99.8470
74.97	146.1125	119.76	128.5266	227.38	108.0444
77.11	146.7211	121.12	131.9969	228.16	0.0000
78.74	147.1787	121.22	122.3560	228.18	103.5813
79.69	118.8574	121.78	121.3792	116.74	103.5813
80.12	126.4826	122.06	105.3093	235.69	120.0281
80.19	126.4992	122.92	105.4374	235.96	125.9136
80.57	126.5890	123.07	111.9166	238.63	142.3598
81.00	126.6909	265.00	103.3965	238.98	0.0000
81.07	134.2496	125.81	131.7925	240.99	132.3633
81.75	152.5434	127.23	126.6396	242.00	108.9296
83.79	133.4079	127.91	125.6758	244.70	112.1399
84.00	133.4589	129.30	105.8333	252.40	0.0000
85.43	141.4079	131.20	125.6972	252.80	93.7990
86.55	149.3096	133.02	140.7342	254.15	0.0000
86.79	167.6637	133.52	115.7186	256.23	86.4364
86.94	167.7090	136.00	107.3390	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	94.5538	355.39	0.0000	584.27	45.5212
264.80	90.0615	356.01	96.3662	595.83	37.5246
265.00	86.3230	364.49	80.7581	427.87	43.1090
268.22	87.3059	366.42	0.0000	602.52	0.0000
269.46	88.9004	372.51	72.0476	604.72	39.8188
270.03	101.0022	375.05	82.3299	607.14	50.5944
271.23	81.1079	377.52	65.1543	609.32	42.3568
273.65	81.2667	356.01	77.6827	610.33	42.3759
276.40	81.4478	388.16	86.0931	614.28	41.5272
277.37	81.5108	388.63	87.1439	618.01	34.9195
277.60	81.5265	391.69	74.9838	620.36	40.7129
278.00	81.5515	264.66	99.1567	621.93	37.0371
279.20	81.6302	401.81	91.9904	630.19	0.0000
279.54	81.6525	402.40	80.6505	631.29	30.6805
279.70	81.6630	404.85	83.8773	633.25	35.3597
280.46	81.7129	410.95	82.1076	634.78	27.9338
283.69	81.9215	413.71	88.4902	635.95	32.6057
284.31	81.9609	414.70	87.5004	636.99	31.6882
285.41	64.1002	423.72	84.8265	645.85	31.1849
285.90	0.0000	427.09	87.0933	657.76	26.6414
287.50	82.5491	427.87	82.9334	657.90	0.0000
290.67	72.0261	433.94	81.1193	661.66	17.8946
293.27	0.0000	439.40	83.4867	664.57	0.0000
351.93	93.8083	453.88	80.9750	666.33	22.0186
295.96	81.7445	463.37	95.3257	666.50	23.5931
879.38	81.9080	468.07	110.6037	667.71	0.0000
299.98	81.9949	473.00	0.0000	677.62	19.9090
300.09	82.0013	475.06	103.4780	685.70	0.0000
300.13	82.0039	476.78	80.9177	695.00	19.0952
301.36	82.0805	477.60	79.8738	696.49	21.9730
302.85	82.1725	482.18	80.0692	696.51	21.9730
256.23	82.2737	487.02	59.6640	697.00	21.0219
304.85	82.2958	492.35	0.0000	697.30	23.8916
306.78	82.4138	497.08	63.2516	697.49	21.9820
308.46	82.5175	505.52	63.0896	702.65	21.0692
311.90	71.6324	507.63	0.0000	706.68	22.0623
316.51	64.4521	511.00	51.6243	711.68	19.2227
319.41	96.8821	514.00	35.2019	720.70	16.0758
320.08	85.1800	514.00	35.2021	721.93	0.0000
321.04	82.3004	520.40	40.8335	722.78	18.3413
323.87	84.4319	520.69	0.0000	722.91	18.3422
325.23	111.0464	522.65	0.0000	723.31	18.3450
328.76	76.8443	527.90	0.0000	724.19	18.3515
333.37	94.8853	528.26	44.3188	727.33	18.3738
333.97	88.5965	529.59	41.0220	733.00	16.1528
334.37	72.7959	529.87	0.0000	735.93	17.7882
338.28	76.3667	531.02	54.3639	333.97	16.1804
338.32	76.3691	537.26	40.0638	739.50	0.0000
311.90	79.4629	546.56	0.0000	747.24	13.6425
340.48	79.4629	552.55	34.7567	748.06	13.6469
340.55	79.4666	563.25	47.7815	752.31	23.4322
344.28	80.9995	569.33	45.2063	753.82	17.5843
345.93	82.0396	946.00	46.1142	756.73	16.6256
351.06	73.6359	569.70	46.1179	756.80	16.6261
351.93	70.0758	583.19	45.4980	884.68	21.5735

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.5886	1274.44	19.0811	1620.50	6.1799
766.42	18.6489	1001.03	13.8004	1621.92	7.2122
766.84	18.6516	1002.74	9.5592	1678.03	0.0000
772.60	0.0000	1004.73	20.1926	1690.97	4.1784
776.52	26.6005	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.2976
778.90	15.4952	1028.54	0.0000	1063.66	3.6366
783.70	0.0000	1037.84	13.9521	1771.35	16.9746
785.37	15.8145	1038.76	0.0000	1791.20	0.0000
792.07	31.3760	631.29	12.9117	1808.65	5.3418
794.95	14.8781	1048.07	13.9940	1810.72	0.0000
795.86	20.8359	1049.04	16.1514	1836.06	5.3689
810.06	15.9563	1050.41	11.8492		
810.29	16.9548	1063.66	9.7317		
344.28	16.9556	1077.00	14.1108		
810.76	16.9577	1077.34	15.1977		
815.77	16.9880	1085.87	18.4991		
1048.07	18.0044	1093.63	18.1755		
832.01	19.0951	1099.45	14.5645		
834.85	15.0901	1112.07	8.7695		
835.71	15.0945	1112.84	9.5934		
836.80	0.0000	1115.54	16.4583		
846.75	0.0000	1120.29	6.8668		
846.77	8.0813	1120.55	6.8671		
856.80	11.8259	1221.41	5.4949		
860.56	18.6073	1129.67	15.7359		
871.09	16.2969	1131.51	0.0000		
873.19	13.5905	1147.95	0.0000		
875.33	0.0000	1173.23	13.0025		
879.38	13.6188	1177.95	10.2288		
880.51	13.6237	1189.05	13.0566		
883.24	16.3637	1204.77	15.9195		
884.68	13.6429	1221.41	15.9880		
889.28	17.5677	1231.02	15.0846		
894.76	12.3196	1235.36	6.4721		
898.04	22.0229	1238.28	17.8113		
900.72	12.0008	1260.41	0.0000		
903.28	8.5793	1271.87	9.5256		
911.20	10.3218	1274.44	7.6250		
912.08	15.4871	1274.54	7.6253		
923.98	0.0000	1291.59	3.2818		
926.50	12.4474	1298.22	0.0000		
929.11	21.8008	1312.11	9.6200		
937.49	15.6138	1332.49	6.7670		
944.13	12.5174	1362.66	0.0000		
946.00	14.6122	1365.19	4.8710		
949.00	17.7599	1368.63	0.0000		
667.71	0.0000	1384.29	14.6783		
962.31	20.9814	1408.01	3.9357		
964.08	13.9954	1457.56	0.0000		
966.17	31.5095	1460.82	6.9698		
911.20	14.0166	1489.16	6.0115		
968.97	14.0166	1505.03	10.0537		
983.53	10.5596	1584.12	11.2457		
984.45	0.0000	1596.21	8.1992		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:50:30.63

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*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                    *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677039.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM17.CNF;468
Background date  : 26-JUN-2016 12:04:46
Sample date      : 11-MAY-2016 15:40:00 Acquisition date : 28-JUN-2016 12:47:55
Sample ID        : G398677039 Sample quantity : 1.41530E+02 GRAM
Detector name    : GAM17 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.44 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1572486 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	40.33	39	96	2.63	80.80	76	9	1.08E-02	48.5	
2	0	46.23*	43	125	1.28	92.60	89	10	1.19E-02	53.4	
3	0	59.39	28	157	3.00	118.94	113	10	7.79E-03	85.8	
4	0	63.27*	36	143	0.82	126.70	123	9	1.00E-02	64.6	
5	1	74.90	134	144	1.27	149.98	145	15	3.72E-02	18.1	2.51E+00
6	1	77.28	224	145	1.46	154.73	145	15	6.23E-02	12.6	
7	2	87.18*	85	152	1.63	174.57	162	30	2.35E-02	29.5	1.84E+00
8	2	92.71*	71	144	1.64	185.63	162	30	1.97E-02	36.8	
9	0	167.62	30	65	2.30	335.54	331	8	8.44E-03	49.6	
10	0	186.23*	30	110	1.56	372.80	366	12	8.47E-03	73.8	
11	0	209.56	32	73	1.79	419.48	415	9	8.85E-03	51.8	
12	1	238.73*	250	58	1.60	477.85	470	22	6.94E-02	8.9	1.05E+00
13	1	241.96*	28	70	1.70	484.31	470	22	7.83E-03	66.1	
14	0	269.19	12	91	2.33	538.81	534	11	3.23E-03	161.6	
15	0	296.06*	81	116	1.62	592.59	585	17	2.24E-02	32.9	
16	0	305.02	15	26	1.29	610.52	607	7	4.03E-03	62.8	
17	0	338.72*	40	59	1.04	677.95	672	12	1.11E-02	42.4	
18	4	351.78*	131	30	1.62	704.09	700	15	3.63E-02	11.7	8.00E+00
19	4	355.30	17	32	2.01	711.13	700	15	4.69E-03	58.1	
20	0	379.47	43	61	5.92	759.50	750	18	1.20E-02	45.7	
21	0	390.33	19	60	2.76	781.24	771	15	5.40E-03	89.7	
22	0	511.10*	5	72	2.25	1022.92	1016	14	1.52E-03	368.2	
23	0	573.68	13	29	3.64	1148.15	1135	17	3.50E-03	103.0	
24	0	583.41*	67	25	2.27	1167.61	1160	15	1.86E-02	21.1	
25	0	609.51*	85	24	1.14	1219.83	1214	11	2.35E-02	16.1	
26	0	661.64	398	30	1.62	1324.16	1318	15	1.11E-01	5.8	
27	0	768.19	12	4	1.10	1537.35	1534	8	3.27E-03	44.9	
28	0	779.27	9	8	1.47	1559.52	1555	9	2.49E-03	68.0	
29	5	791.05	10	1	1.55	1583.10	1581	16	2.78E-03	27.5	4.05E-01
30	5	794.78	27	2	3.12	1590.55	1581	16	7.40E-03	24.8	
31	0	817.95	13	0	1.39	1636.92	1633	8	3.61E-03	27.7	
32	0	834.26	6	3	1.38	1669.55	1666	6	1.70E-03	60.1	
33	0	860.88	9	10	2.36	1722.82	1718	8	2.56E-03	67.8	
34	0	892.96	10	10	1.48	1787.00	1782	10	2.78E-03	67.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.45*	50	16	1.49	1824.00	1816	16	1.38E-02	23.5	
36	0	970.37	20	33	0.97	1941.88	1932	13	5.55E-03	65.1	
37	0	1099.75	6	4	0.90	2200.75	2196	8	1.67E-03	70.7	
38	0	1226.64	14	7	1.30	2454.63	2448	13	3.75E-03	47.5	
39	0	1460.82*	102	0	1.33	2923.13	2917	13	2.84E-02	10.2	
40	0	1764.52*	20	0	1.48	3530.65	3523	14	5.55E-03	24.6	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677039.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:40:00 Acquisition date : 28-JUN-2016 12:47:55
Sample ID         : G398677039 Sample quantity   : 141.53 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA17 Detector geometry   : CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.44 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated : No Systematic Error      : 0.00 %
Efficiency type   : Linear Efficiencies at    : Peak Energy
Abundance limit   : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	7.898E-01	6.172E+00	6.172E+00	20.37	OK
MN-54	834.85	99.98*	1.301E+00	2.516E-02	2.799E-02	120.25	OK
CD-109	88.03	3.70*	6.705E+00	1.528E+00	1.642E+00	88.54	OK
SN-113	391.69	64.94*	2.540E+00	6.737E-02	8.990E-02	179.41	OK
SN-126	64.28	9.60	6.716E+00	3.679E-01	3.679E-01	129.25	OK
	86.94	8.90	6.705E+00	6.352E-01	6.352E-01	88.54	OK
	87.57	37.00*	6.705E+00	1.528E-01	1.528E-01	88.54	OK
CS-135	268.22	16.00*	3.584E+00	1.194E-01	1.194E-01	323.28	OK
BA-137M	661.66	89.90*	1.587E+00	1.525E+00	1.529E+00	11.68	OK
CS-137	661.66	85.10*	1.587E+00	1.611E+00	1.616E+00	11.68	OK
TL-208	277.37	6.60	3.487E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.770E+00	2.462E-01	2.462E-01	42.10	OK
	860.56	12.50	1.266E+00	3.107E-01	3.107E-01	135.61	OK
PB-210	46.54	4.25*	6.801E+00	9.954E-01	9.995E-01	106.83	OK
BI-211	72.87	1.23	6.698E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	2.797E+00	1.000E-01	1.000E-01	1273.28	OK
PB-212	74.82	10.28	6.701E+00	8.567E-01	8.567E-01	60.23	OK
	77.11	17.10	6.704E+00	1.270E+00	1.270E+00	25.14	OK
	238.63	43.60*	3.995E+00	8.539E-01	8.539E-01	17.73	OK
	300.09	3.30	3.242E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	1.704E+00	6.009E-01	6.010E-01	32.25	OK
	1120.29	14.92	1.008E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	6.535E-01	9.991E-01	9.991E-01	49.11	OK
PB-214	74.82	5.80	6.701E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.704E+00	2.238E+00	2.239E+00	25.14	OK
	87.09	3.41	6.705E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.947E+00	5.855E-01	5.856E-01	132.19	OK
	295.22	18.42	3.283E+00	7.790E-01	7.791E-01	65.72	OK
	351.93	35.60*	2.795E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.704E+00	6.009E-01	6.010E-01	32.25	OK
	1120.29	14.92	1.008E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	6.535E-01	9.991E-01	9.991E-01	49.11	OK
RA-226	609.32	45.49*	1.704E+00	6.009E-01	6.010E-01	32.25	OK
	1120.29	14.92	1.008E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	6.535E-01	9.991E-01	9.991E-01	49.11	OK
AC-228	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.897E+00	7.064E-01	7.064E-01	84.83	OK
	794.95	4.25	1.356E+00	2.486E+00	2.486E+00	49.57	OK
	835.71	1.61	1.301E+00	1.563E+00	1.563E+00	120.25	OK
	911.20	25.80*	1.206E+00	8.494E-01	8.494E-01	46.99	OK
	968.97	15.80	1.143E+00	5.851E-01	5.851E-01	130.13	OK
RA-228	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.897E+00	7.064E-01	7.064E-01	84.83	OK
	794.95	4.25	1.356E+00	2.486E+00	2.486E+00	49.57	OK
	835.71	1.61	1.301E+00	1.563E+00	1.563E+00	120.25	OK
	911.20	25.80*	1.206E+00	8.494E-01	8.494E-01	46.99	OK
	968.97	15.80	1.143E+00	5.851E-01	5.851E-01	130.13	OK
TH-228	74.82	10.28	6.701E+00	8.567E-01	8.567E-01	60.23	OK
	77.11	17.10	6.704E+00	1.270E+00	1.270E+00	25.14	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	238.63	43.60*	3.995E+00	8.539E-01	8.539E-01	17.73	OK
	300.09	3.30	3.242E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	1.704E+00	6.009E-01	6.009E-01	32.25	OK
	1120.29	14.92	1.008E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	6.535E-01	9.991E-01	9.991E-01	49.11	OK
TH-232	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.897E+00	7.064E-01	7.064E-01	84.83	OK
	835.71	1.61	1.301E+00	1.563E+00	1.563E+00	120.25	OK
	911.20	25.80*	1.206E+00	8.494E-01	8.494E-01	46.99	OK
	968.97	15.80	1.143E+00	5.851E-01	5.851E-01	130.13	OK
TH-234	63.29	3.70*	6.716E+00	9.545E-01	9.545E-01	129.25	OK
	92.59	4.23	6.685E+00	1.608E+00	1.608E+00	73.60	OK
U-234	609.32	45.49*	1.704E+00	6.009E-01	6.009E-01	32.25	OK
	1120.29	14.92	1.008E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	6.535E-01	9.991E-01	9.991E-01	49.11	OK
U-238	63.29	3.70*	6.716E+00	9.545E-01	9.545E-01	129.25	OK
	92.59	4.23	6.685E+00	1.608E+00	1.608E+00	73.60	OK
AM-241	59.54	35.90*	6.752E+00	7.647E-02	7.648E-02	171.67	OK
AM-243	43.53	5.90	6.544E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.701E+00	1.311E-01	1.311E-01	60.23	OK
ANH-511	511.00	100.00*	1.989E+00	1.536E-02	1.536E-02	736.45	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677039.CNF;1
Acquisition date : 28-JUN-2016 12:47:55 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.44 Half life ratio : *****
Sample date : 11-MAY-2016 15:40:00 Analyst initials: MXR1
Sample ID : G398677039 Sample Quantity : 1.4153E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.172E+00	1.232E+00	1.039E+00
MN-54	2.799E-02	3.298E-02	1.027E-01
CD-109	1.642E+00	1.425E+00	1.270E+00
SN-113	8.990E-02	1.581E-01	1.611E-01
SN-126	1.528E-01	1.326E-01	1.182E-01
CS-135	1.194E-01	3.783E-01	3.567E-01
BA-137M	1.529E+00	1.751E-01	9.580E-02
CS-137	1.616E+00	1.850E-01	1.012E-01
TL-208	2.462E-01	1.016E-01	9.905E-02
PB-210	9.995E-01	1.046E+00	9.922E-01
BI-211	1.000E-01	1.248E+00	5.760E-01
PB-212	8.539E-01	1.484E-01	1.299E-01
BI-214	6.010E-01	1.899E-01	1.962E-01
PB-214	7.565E-01	1.733E-01	3.486E-01
RN-222	6.010E-01	1.899E-01	1.962E-01
RA-226	6.010E-01	1.899E-01	1.962E-01
AC-228	8.494E-01	3.912E-01	3.480E-01
RA-228	8.494E-01	3.912E-01	3.480E-01
TH-228	8.539E-01	1.484E-01	1.299E-01
TH-230	6.009E-01	1.899E-01	1.962E-01
TH-232	8.494E-01	3.912E-01	3.480E-01
TH-234	9.545E-01	1.209E+00	1.331E+00
U-234	6.009E-01	1.899E-01	1.962E-01
U-238	9.545E-01	1.209E+00	1.331E+00
AM-241	7.648E-02	1.287E-01	1.243E-01
AM-243	1.311E-01	7.735E-02	7.782E-02
ANH-511	1.536E-02	1.109E-01	9.028E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-2.219E-01	8.964E-01	1.617E+00	NOT IDENT.
NA-22	-1.292E-02	5.052E-02	9.860E-02	NOT IDENT.
NA-24	0.000E+00	5.434E+21	0.000E+00	SHORT HLIF

AL-26	2.465E-02	4.361E-02	1.094E-01	NOT IDENT.
SC-46	2.033E-02	7.477E-02	1.351E-01	NOT IDENT.
V-48	-8.192E-02	3.652E-01	6.921E-01	NOT IDENT.
CR-51	4.071E-02	1.193E+00	2.261E+00	NOT IDENT.
CO-56	4.477E-02	7.505E-02	1.577E-01	NOT IDENT.
MN-56	0.000E+00	1.676E+41	0.000E+00	SHORT HLIF
CO-57	1.085E-02	3.266E-02	6.170E-02	NOT IDENT.
CO-58	4.742E-02	7.709E-02	1.577E-01	NOT IDENT.
FE-59	1.142E-01	1.583E-01	3.829E-01	FAIL ABUN
CO-60	-1.582E-02	5.158E-02	9.925E-02	NOT IDENT.
ZN-65	-9.110E-02	1.206E-01	2.013E-01	NOT IDENT.
GE-68	1.183E+00	1.454E+00	3.377E+00	NOT IDENT.
AS-73	2.195E-01	3.947E-01	6.938E-01	NOT IDENT.
AS-74	3.108E-01	4.872E-01	9.832E-01	NOT IDENT.
SE-75	-1.258E-02	7.908E-02	1.288E-01	NOT IDENT.
BR-77	0.000E+00	3.269E+05	0.000E+00	SHORT HLIF
SR-82	-1.954E-01	1.314E+00	2.141E+00	NOT IDENT.
RB-83	1.005E-01	1.587E-01	3.125E-01	NOT IDENT.
KR-85	7.668E+00	1.441E+01	2.443E+01	NOT IDENT.
SR-85	5.690E-02	1.077E-01	1.826E-01	NOT IDENT.
RB-86	2.731E+00	2.942E+00	6.886E+00	NOT IDENT.
Y-88	-2.330E-03	8.668E-02	1.748E-01	NOT IDENT.
Y-91	1.829E+01	4.189E+01	8.551E+01	NOT IDENT.
NB-94	-1.623E-02	5.032E-02	9.379E-02	NOT IDENT.
NB-95	2.692E-02	1.010E-01	1.754E-01	NOT IDENT.
NB-95M	2.566E-01	2.467E-01	4.490E-01	NOT IDENT.
ZR-95	1.391E-02	1.448E-01	2.855E-01	NOT IDENT.
NB-97	0.000E+00	4.588E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.648E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.091E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	3.759E-03	4.009E-02	7.422E-02	NOT IDENT.
RH-102	5.500E-02	7.392E-02	1.585E-01	FAIL ABUN
RU-103	-7.922E-02	1.077E-01	1.841E-01	FAIL ABUN
RH-106	-2.254E-01	4.659E-01	8.590E-01	NOT IDENT.
RU-106	-2.254E-01	4.659E-01	8.590E-01	NOT IDENT.
AG-108M	-1.344E-02	4.789E-02	8.694E-02	NOT IDENT.
AG-110M	5.859E-03	7.530E-02	1.460E-01	NOT IDENT.
CD-115	0.000E+00	4.905E+05	0.000E+00	SHORT HLIF
SN-117M	-1.810E-01	3.537E-01	6.235E-01	NOT IDENT.
TE-123M	-2.249E-02	4.162E-02	7.319E-02	NOT IDENT.
SB-124	-5.713E-02	1.115E-01	2.088E-01	NOT IDENT.
SB-125	1.316E-01	1.491E-01	3.009E-01	NOT IDENT.
TE-125M	8.883E-01	1.632E+01	3.041E+01	NOT IDENT.
I-126	-7.672E-01	2.035E+00	3.187E+00	NOT IDENT.
SB-126	-4.017E-01	1.251E+00	2.339E+00	NOT IDENT.
SB-127	0.000E+00	6.473E+02	0.000E+00	SHORT HLIF
I-131	2.530E+00	2.825E+00	5.760E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.048E+03	0.000E+00	SHORT HLIF
BA-133	5.703E-02	6.492E-02	1.090E-01	FAIL ABUN
I-133	0.000E+00	2.237E+15	0.000E+00	SHORT HLIF
CS-134	1.292E-01	6.274E-02	1.374E-01	FAIL ABUN
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-3.024E-01	7.981E-01	1.453E+00	FAIL ABUN
CE-139	1.666E-02	5.172E-02	8.480E-02	NOT IDENT.
BA-140	-7.841E-02	2.694E+00	4.973E+00	FAIL ABUN
LA-140	-2.564E-01	6.843E-01	1.303E+00	NOT IDENT.
CE-141	1.996E-02	1.526E-01	2.824E-01	NOT IDENT.
CE-143	0.000E+00	3.215E+09	0.000E+00	SHORT HLIF
CE-144	-7.909E-02	2.630E-01	4.744E-01	NOT IDENT.
PM-144	2.036E-02	5.386E-02	1.087E-01	NOT IDENT.
PR-144	1.526E+00	4.097E+00	8.264E+00	NOT IDENT.
PM-146	2.817E-02	7.114E-02	1.373E-01	NOT IDENT.
ND-147	6.993E-01	6.875E+00	1.300E+01	NOT IDENT.
PM-147	4.420E+02	8.620E+02	1.652E+03	NOT IDENT.
PM-149	0.000E+00	3.552E+06	0.000E+00	SHORT HLIF
EU-150	2.932E-02	4.372E-02	7.735E-02	FAIL ABUN
EU-152	-5.089E-02	1.470E-01	2.303E-01	FAIL ABUN
GD-153	-6.500E-02	1.050E-01	1.643E-01	NOT IDENT.
EU-154	-2.917E-02	1.423E-01	2.803E-01	NOT IDENT.
EU-155	-3.131E-02	1.167E-01	2.135E-01	FAIL ABUN
TB-160	1.418E-01	2.709E-01	5.608E-01	FAIL ABUN
HO-166M	-7.193E-02	7.639E-02	1.295E-01	NOT IDENT.
TM-171	3.586E+00	5.953E+00	1.051E+01	NOT IDENT.
HF-172	-3.291E-01	2.486E-01	4.188E-01	FAIL ABUN
LU-172	-2.701E-02	1.090E-01	1.690E-01	FAIL ABUN
LU-176	3.224E-03	4.256E-02	7.060E-02	FAIL ABUN

HF-181	7.994E-02	1.330E-01	2.598E-01	NOT IDENT.
TA-182	7.586E-02	2.369E-01	4.555E-01	NOT IDENT.
RE-183	1.286E-01	2.164E-01	2.274E-01	FAIL ABUN
RE-184	5.175E-01	3.226E-01	7.403E-01	FAIL ABUN
W-188	2.469E+00	1.558E+01	2.613E+01	FAIL ABUN
IR-192	5.648E-02	7.113E-02	1.422E-01	FAIL ABUN
HG-203	7.661E-03	8.347E-02	1.595E-01	NOT IDENT.
BI-207	-4.216E-02	6.414E-02	1.102E-01	FAIL ABUN
PB-211	9.351E-01	1.096E+00	2.209E+00	NOT IDENT.
BI-212	1.047E+00	7.593E-01	1.684E+00	NOT IDENT.
RN-219	-5.121E-01	6.370E-01	1.100E+00	NOT IDENT.
RA-223	-4.512E-01	8.667E-01	1.565E+00	FAIL ABUN
RA-224	1.035E+00	1.341E+00	2.538E+00	FAIL ABUN
AC-227	1.512E-01	3.298E-01	6.497E-01	FAIL ABUN
TH-227	1.512E-01	3.298E-01	6.497E-01	FAIL ABUN
TH-229	-1.745E-01	6.631E-01	1.180E+00	FAIL ABUN
PA-231	6.936E-01	8.408E-01	1.170E+00	NOT IDENT.
TH-231	-4.512E-01	8.667E-01	1.565E+00	FAIL ABUN
PA-233	-2.974E-02	9.474E-02	1.742E-01	NOT IDENT.
PA-234	-2.786E-01	3.866E-01	6.629E-01	NOT IDENT.
PA-234M	5.678E-01	5.661E+00	1.130E+01	NOT IDENT.
U-235	2.140E-01	2.460E-01	4.767E-01	FAIL ABUN
NP-237	-2.974E-02	9.474E-02	1.742E-01	NOT IDENT.
NP-238	0.000E+00	1.194E+06	0.000E+00	SHORT HLIF
NP-239	5.455E-02	2.967E-01	5.576E-01	NOT IDENT.
PU-239	1.047E+02	4.186E+02	7.824E+02	NOT IDENT.
CM-243	-2.346E-02	1.127E-01	2.074E-01	NOT IDENT.
BK-247	4.816E-03	1.166E-01	1.945E-01	NOT IDENT.
CM-247	-3.029E-02	5.834E-02	1.038E-01	NOT IDENT.
CF-249	1.183E-02	6.754E-02	1.212E-01	NOT IDENT.
CF-251	-1.786E-02	1.664E-01	3.003E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	98	10.66*	7.898E-01	6.172E+00	6.172E+00	20.37
MN-54	834.85	6	99.98*	1.301E+00	2.516E-02	2.799E-02	120.25
CD-109	88.03	102	3.70*	6.705E+00	2.192E+00	2.355E+00	59.06
SN-113	391.69	21	64.94*	2.540E+00	6.737E-02	8.990E-02	179.41
SN-126	64.28	45	9.60	6.716E+00	3.679E-01	3.679E-01	129.25
	86.94	102	8.90	6.705E+00	9.111E-01	9.111E-01	59.06
	87.57	102	37.00*	6.705E+00	2.192E-01	2.192E-01	59.06
CS-135	268.22	13	16.00*	3.584E+00	1.194E-01	1.194E-01	323.28
BA-137M	661.66	410	89.90*	1.587E+00	1.525E+00	1.529E+00	11.68
CS-137	661.66	410	85.10*	1.587E+00	1.611E+00	1.616E+00	11.68
TL-208	277.37	-----	6.60	3.487E+00	-----	Line Not Found	-----
	583.19	70	85.00*	1.770E+00	2.462E-01	2.462E-01	42.10
	860.56	9	12.50	1.266E+00	3.107E-01	3.107E-01	135.61
PB-210	46.54	54	4.25*	6.801E+00	9.954E-01	9.995E-01	106.83
BI-211	72.87	-----	1.23	6.698E+00	-----	Line Not Found	-----
	351.06	142	12.92*	2.797E+00	2.084E+00	2.084E+00	23.37
PB-212	74.82	164	10.28	6.701E+00	1.263E+00	1.263E+00	36.13
	77.11	274	17.10	6.704E+00	1.270E+00	1.270E+00	25.14
	238.63	280	43.60*	3.995E+00	8.539E-01	8.539E-01	17.73
	300.09	-----	3.30	3.242E+00	-----	Line Not Found	-----
BI-214	609.32	88	45.49*	1.704E+00	6.009E-01	6.010E-01	32.25
	1120.29	-----	14.92	1.008E+00	-----	Line Not Found	-----
	1764.49	19	15.30	6.535E-01	9.991E-01	9.991E-01	49.11
PB-214	74.82	164	5.80	6.701E+00	2.239E+00	2.239E+00	36.13
	77.11	274	9.70	6.704E+00	2.238E+00	2.239E+00	25.14
	87.09	102	3.41	6.705E+00	2.378E+00	2.378E+00	59.06
	242.00	32	7.25	3.947E+00	5.855E-01	5.856E-01	132.19
	295.22	89	18.42	3.283E+00	7.790E-01	7.791E-01	65.72
	351.93	142	35.60*	2.797E+00	7.564E-01	7.565E-01	23.37
RN-222	609.32	88	45.49*	1.704E+00	6.009E-01	6.010E-01	32.25
	1120.29	-----	14.92	1.008E+00	-----	Line Not Found	-----
	1764.49	19	15.30	6.535E-01	9.991E-01	9.991E-01	49.11
RA-224	240.99	32	4.10*	3.947E+00	1.035E+00	1.035E+00	132.19
RA-226	609.32	88	45.49*	1.704E+00	6.009E-01	6.010E-01	32.25
	1120.29	-----	14.92	1.008E+00	-----	Line Not Found	-----
	1764.49	19	15.30	6.535E-01	9.991E-01	9.991E-01	49.11
AC-228	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	43	11.27	2.897E+00	7.064E-01	7.064E-01	84.83
	794.95	27	4.25	1.356E+00	2.486E+00	2.486E+00	49.57
	835.71	6	1.61	1.301E+00	1.563E+00	1.563E+00	120.25
	911.20	50	25.80*	1.206E+00	8.494E-01	8.494E-01	46.99
	968.97	20	15.80	1.143E+00	5.851E-01	5.851E-01	130.13
RA-228	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	43	11.27	2.897E+00	7.064E-01	7.064E-01	84.83
	794.95	27	4.25	1.356E+00	2.486E+00	2.486E+00	49.57
	835.71	6	1.61	1.301E+00	1.563E+00	1.563E+00	120.25
	911.20	50	25.80*	1.206E+00	8.494E-01	8.494E-01	46.99

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	20	15.80	1.143E+00	5.851E-01	5.851E-01	130.13
	74.82	164	10.28	6.701E+00	1.263E+00	1.263E+00	36.13
	77.11	274	17.10	6.704E+00	1.270E+00	1.270E+00	25.14
	238.63	280	43.60*	3.995E+00	8.539E-01	8.539E-01	17.73
TH-230	300.09	-----	3.30	3.242E+00	-----	Line Not Found	-----
	609.32	88	45.49*	1.704E+00	6.009E-01	6.009E-01	32.25
	1120.29	-----	14.92	1.008E+00	-----	Line Not Found	-----
	1764.49	19	15.30	6.535E-01	9.991E-01	9.991E-01	49.11
TH-232	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	43	11.27	2.897E+00	7.064E-01	7.064E-01	84.83
	835.71	6	1.61	1.301E+00	1.563E+00	1.563E+00	120.25
	911.20	50	25.80*	1.206E+00	8.494E-01	8.494E-01	46.99
TH-234	968.97	20	15.80	1.143E+00	5.851E-01	5.851E-01	130.13
	63.29	45	3.70*	6.716E+00	9.545E-01	9.545E-01	129.25
	92.59	86	4.23	6.685E+00	1.608E+00	1.608E+00	73.60
U-234	609.32	88	45.49*	1.704E+00	6.009E-01	6.009E-01	32.25
	1120.29	-----	14.92	1.008E+00	-----	Line Not Found	-----
	1764.49	19	15.30	6.535E-01	9.991E-01	9.991E-01	49.11
U-238	63.29	45	3.70*	6.716E+00	9.545E-01	9.545E-01	129.25
	92.59	86	4.23	6.685E+00	1.608E+00	1.608E+00	73.60
	59.54	35	35.90*	6.752E+00	7.647E-02	7.648E-02	171.67
AM-241	43.53	-----	5.90	6.544E+00	-----	Line Not Found	-----
AM-243	74.66	164	67.20*	6.701E+00	1.932E-01	1.932E-01	36.13
ANH-511	511.00	6	100.00*	1.989E+00	1.536E-02	1.536E-02	736.45

Flag: "*" = Keyline

Total number of lines in spectrum 40
Number of unidentified lines 6
Number of lines tentatively identified by NID 34 85.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.172E+00	6.172E+00	1.257E+00	20.37	
MN-54	312.05D	1.11	2.516E-02	2.799E-02	3.366E-02	120.25	
CD-109	461.40D	1.07	2.192E+00	2.355E+00	1.391E+00	59.06	
SN-113	115.09D	1.33	6.737E-02	8.990E-02	16.13E-02	179.41	
SN-126	2.30E+05Y	1.00	2.192E-01	2.192E-01	1.294E-01	59.06	
CS-135	2.30E+06Y	1.00	1.194E-01	1.194E-01	3.860E-01	323.28	
BA-137M	30.08Y	1.00	1.525E+00	1.529E+00	0.179E+00	11.68	
CS-137	30.08Y	1.00	1.611E+00	1.616E+00	0.189E+00	11.68	
TL-208	1.41E+10Y	1.00	2.462E-01	2.462E-01	1.037E-01	42.10	
PB-210	22.20Y	1.00	9.954E-01	9.995E-01	10.68E-01	106.83	
BI-211	7.04E+08Y	1.00	2.084E+00	2.084E+00	0.487E+00	23.37	
PB-212	1.41E+10Y	1.00	8.539E-01	8.539E-01	1.514E-01	17.73	
BI-214	1600.00Y	1.00	6.009E-01	6.010E-01	1.938E-01	32.25	
PB-214	1600.00Y	1.00	7.564E-01	7.565E-01	1.768E-01	23.37	
RN-222	1600.00Y	1.00	6.009E-01	6.010E-01	1.938E-01	32.25	
RA-224	1.41E+10Y	1.00	1.035E+00	1.035E+00	1.369E+00	132.19	
RA-226	1600.00Y	1.00	6.009E-01	6.010E-01	1.938E-01	32.25	
AC-228	1.41E+10Y	1.00	8.494E-01	8.494E-01	3.991E-01	46.99	
RA-228	1.41E+10Y	1.00	8.494E-01	8.494E-01	3.991E-01	46.99	
TH-228	1.41E+10Y	1.00	8.539E-01	8.539E-01	1.514E-01	17.73	
TH-230	7.54E+04Y	1.00	6.009E-01	6.009E-01	1.938E-01	32.25	
TH-232	1.41E+10Y	1.00	8.494E-01	8.494E-01	3.991E-01	46.99	
TH-234	4.47E+09Y	1.00	9.545E-01	9.545E-01	12.34E-01	129.25	
U-234	2.45E+05Y	1.00	6.009E-01	6.009E-01	1.938E-01	32.25	
U-238	4.47E+09Y	1.00	9.545E-01	9.545E-01	12.34E-01	129.25	
AM-241	432.60Y	1.00	7.647E-02	7.648E-02	13.13E-02	171.67	
AM-243	7370.00Y	1.00	1.932E-01	1.932E-01	0.698E-01	36.13	
ANH-511	1.00E+09Y	1.00	1.536E-02	1.536E-02	11.31E-02	736.45	
Total Activity :			2.650E+01	2.671E+01			

Grand Total Activity : 2.650E+01 2.671E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	40.33	50	123	2.63	80.80	76	9	1.08E-02	97.0	5.78E+00	
0	167.62	35	75	2.30	335.54	331	8	8.44E-03	99.1	5.32E+00	
0	186.23	35	126	1.56	372.80	366	12	8.47E-03	****	4.92E+00	T
0	209.56	36	83	1.79	419.48	415	9	8.85E-03	****	4.47E+00	T
0	305.02	16	28	1.29	610.52	607	7	4.03E-03	****	3.19E+00	T
4	355.30	18	34	2.01	711.13	700	15	4.69E-03	****	2.77E+00	T
0	379.47	47	66	5.92	759.50	750	18	1.20E-02	91.4	2.61E+00	
0	573.68	13	31	3.64	1148.15	1135	17	3.50E-03	****	1.80E+00	
0	768.19	12	4	1.10	1537.35	1534	8	3.27E-03	89.8	1.40E+00	T
0	779.27	9	8	1.47	1559.52	1555	9	2.49E-03	****	1.38E+00	T
5	791.05	10	1	1.55	1583.10	1581	16	2.78E-03	55.0	1.36E+00	T
0	817.95	13	0	1.39	1636.92	1633	8	3.61E-03	55.5	1.32E+00	T
0	892.96	10	10	1.48	1787.00	1782	10	2.78E-03	****	1.23E+00	
0	1099.75	6	4	0.90	2200.75	2196	8	1.67E-03	****	1.02E+00	T
0	1226.64	13	6	1.30	2454.63	2448	13	3.75E-03	95.0	9.29E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677039.CNF;1
Acquisition date : 28-JUN-2016 12:47:55 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.44 Half life ratio : *****
Sample date : 11-MAY-2016 15:40:00 Nuclide Library : SOLID
Sample ID : G398677039 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4153E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	4.341E-01
MN-54	4.510E-02
CD-109	6.024E-01
SN-113	7.457E-02
SN-126	5.603E-02
CS-135	1.655E-01
BA-137M	4.276E-02
CS-137	4.518E-02
TL-208	4.466E-02
PB-210	4.695E-01
BI-211	2.676E-01
PB-212	6.069E-02
BI-214	8.869E-02
PB-214	1.669E-01
RN-222	8.869E-02
RA-226	8.869E-02
AC-228	1.506E-01
RA-228	1.506E-01
TH-228	6.069E-02
TH-230	8.868E-02
TH-232	1.506E-01
TH-234	6.350E-01
U-234	8.868E-02
U-238	6.350E-01
AM-241	5.902E-02
AM-243	3.723E-02
ANH-511	4.146E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.462E-01	NOT IDENT.
NA-22	4.096E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.342E-02	NOT IDENT.

SC-46	5.879E-02	NOT IDENT.
V-48	2.946E-01	NOT IDENT.
CR-51	1.049E+00	NOT IDENT.
CO-56	7.013E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.928E-02	NOT IDENT.
CO-58	7.006E-02	NOT IDENT.
FE-59	1.651E-01	FAIL ABUN
CO-60	4.110E-02	NOT IDENT.
ZN-65	8.443E-02	NOT IDENT.
GE-68	1.445E+00	NOT IDENT.
AS-73	3.305E-01	NOT IDENT.
AS-74	4.454E-01	NOT IDENT.
SE-75	5.981E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	9.409E-01	NOT IDENT.
RB-83	1.440E-01	NOT IDENT.
KR-85	1.136E+01	NOT IDENT.
SR-85	8.487E-02	NOT IDENT.
RB-86	2.966E+00	NOT IDENT.
Y-88	7.166E-02	NOT IDENT.
Y-91	3.757E+01	NOT IDENT.
NB-94	4.204E-02	NOT IDENT.
NB-95	7.895E-02	NOT IDENT.
NB-95M	2.121E-01	NOT IDENT.
ZR-95	1.268E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.528E-02	NOT IDENT.
RH-102	7.118E-02	FAIL ABUN
RU-103	8.282E-02	FAIL ABUN
RH-106	3.814E-01	NOT IDENT.
RU-106	3.814E-01	NOT IDENT.
AG-108M	3.994E-02	NOT IDENT.
AG-110M	6.375E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.937E-01	NOT IDENT.
TE-123M	3.446E-02	NOT IDENT.
SB-124	6.599E-02	NOT IDENT.
SB-125	1.395E-01	NOT IDENT.
TE-125M	1.444E+01	NOT IDENT.
I-126	1.410E+00	NOT IDENT.
SB-126	1.034E+00	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.671E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.016E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	6.213E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	6.206E-01	FAIL ABUN
CE-139	4.018E-02	NOT IDENT.
BA-140	2.273E+00	FAIL ABUN
LA-140	5.110E-01	NOT IDENT.
CE-141	1.338E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.247E-01	NOT IDENT.
PM-144	4.905E-02	NOT IDENT.
PR-144	3.729E+00	NOT IDENT.
PM-146	6.344E-02	NOT IDENT.
ND-147	5.901E+00	NOT IDENT.
PM-147	7.830E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.605E-02	FAIL ABUN
EU-152	1.053E-01	FAIL ABUN
GD-153	7.767E-02	NOT IDENT.
EU-154	1.169E-01	NOT IDENT.
EU-155	1.012E-01	FAIL ABUN
TB-160	2.497E-01	FAIL ABUN
HO-166M	5.568E-02	NOT IDENT.
TM-171	5.009E+00	NOT IDENT.
HF-172	1.982E-01	FAIL ABUN
LU-172	7.279E-02	FAIL ABUN
LU-176	3.281E-02	FAIL ABUN
HF-181	1.204E-01	NOT IDENT.

TA-182	1.894E-01	NOT IDENT.
RE-183	1.084E-01	FAIL ABUN
RE-184	3.301E-01	FAIL ABUN
W-188	1.218E+01	FAIL ABUN
IR-192	6.653E-02	FAIL ABUN
HG-203	7.440E-02	NOT IDENT.
BI-207	4.585E-02	FAIL ABUN
PB-211	1.025E+00	NOT IDENT.
BI-212	7.673E-01	NOT IDENT.
RN-219	5.048E-01	NOT IDENT.
RA-223	7.212E-01	FAIL ABUN
RA-224	1.224E+00	FAIL ABUN
AC-227	3.040E-01	FAIL ABUN
TH-227	3.040E-01	FAIL ABUN
TH-229	5.544E-01	FAIL ABUN
PA-231	5.422E-01	NOT IDENT.
TH-231	7.212E-01	FAIL ABUN
PA-233	8.096E-02	NOT IDENT.
PA-234	2.796E-01	NOT IDENT.
PA-234M	4.876E+00	NOT IDENT.
U-235	2.267E-01	FAIL ABUN
NP-237	8.096E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.640E-01	NOT IDENT.
PU-239	3.719E+02	NOT IDENT.
CM-243	9.819E-02	NOT IDENT.
BK-247	9.044E-02	NOT IDENT.
CM-247	4.775E-02	NOT IDENT.
CF-249	5.623E-02	NOT IDENT.
CF-251	1.417E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677039.CNF;1
Acquisition date : 28-JUN-2016 12:47:55 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.44 Half life ratio : *****
Sample date : 11-MAY-2016 15:40:00 Nuclide Library : SOLID
Sample ID : G398677039 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4153E+02 GRAM
Quantity Err(%) : 1.4131E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.172E+00	1.274E+00	1.274E+00
MN-54	2.799E-02	3.300E-02	3.300E-02
CD-109	1.642E+00	1.434E+00	1.434E+00
SN-113	8.990E-02	1.581E-01	1.581E-01
SN-126	1.528E-01	1.332E-01	1.332E-01
CS-135	1.194E-01	3.784E-01	3.784E-01
BA-137M	1.529E+00	1.871E-01	1.871E-01
CS-137	1.616E+00	1.976E-01	1.976E-01
TL-208	2.462E-01	1.021E-01	1.021E-01
PB-210	9.995E-01	1.050E+00	1.050E+00
BI-211	1.004E-01	1.253E+00	1.253E+00
PB-212	8.539E-01	1.551E-01	1.551E-01
BI-214	6.010E-01	1.917E-01	1.917E-01
PB-214	7.565E-01	1.761E-01	1.761E-01
RN-222	6.010E-01	1.917E-01	1.917E-01
RA-226	6.010E-01	1.917E-01	1.917E-01
AC-228	8.494E-01	3.936E-01	3.936E-01
RA-228	8.494E-01	3.936E-01	3.936E-01
TH-228	8.539E-01	1.551E-01	1.551E-01
TH-230	6.009E-01	1.917E-01	1.917E-01
TH-232	8.494E-01	3.936E-01	3.936E-01
TH-234	9.545E-01	1.227E+00	1.227E+00
U-234	6.009E-01	1.917E-01	1.917E-01
U-238	9.545E-01	1.227E+00	1.227E+00
AM-241	7.648E-02	1.288E-01	1.288E-01
AM-243	1.311E-01	7.815E-02	7.815E-02
ANH-511	1.536E-02	1.109E-01	1.109E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-2.219E-01	8.965E-01	9.020E-01	NOT IDENT.
NA-22	-1.292E-02	5.052E-02	5.086E-02	NOT IDENT.
NA-24	6.691E+20	5.435E+21	0.000E+00	SHORT HLIF

AL-26	2.465E-02	4.364E-02	4.503E-02	NOT IDENT.
SC-46	2.033E-02	7.478E-02	7.534E-02	NOT IDENT.
V-48	-8.192E-02	3.652E-01	3.671E-01	NOT IDENT.
CR-51	4.071E-02	1.193E+00	1.193E+00	NOT IDENT.
CO-56	4.477E-02	7.507E-02	7.774E-02	NOT IDENT.
MN-56	1.000E+41	1.677E+41	0.000E+00	SHORT HLIF
CO-57	1.085E-02	3.267E-02	3.303E-02	NOT IDENT.
CO-58	4.742E-02	7.711E-02	8.002E-02	NOT IDENT.
FE-59	1.142E-01	1.585E-01	1.667E-01	FAIL ABUN
CO-60	-1.582E-02	5.158E-02	5.207E-02	NOT IDENT.
ZN-65	-9.110E-02	1.206E-01	1.274E-01	NOT IDENT.
GE-68	1.183E+00	1.455E+00	1.550E+00	NOT IDENT.
AS-73	2.195E-01	3.972E-01	4.094E-01	NOT IDENT.
AS-74	3.108E-01	4.878E-01	5.075E-01	NOT IDENT.
SE-75	-1.258E-02	7.908E-02	7.929E-02	NOT IDENT.
BR-77	1.881E+06	2.623E+06	2.757E+06	SHORT HLIF
SR-82	-1.954E-01	1.314E+00	1.317E+00	NOT IDENT.
RB-83	1.005E-01	1.593E-01	1.656E-01	NOT IDENT.
KR-85	7.668E+00	1.441E+01	1.482E+01	NOT IDENT.
SR-85	5.690E-02	1.078E-01	1.108E-01	NOT IDENT.
RB-86	2.731E+00	2.944E+00	3.191E+00	NOT IDENT.
Y-88	-2.330E-03	8.668E-02	8.669E-02	NOT IDENT.
Y-91	1.829E+01	4.189E+01	4.270E+01	NOT IDENT.
NB-94	-1.623E-02	5.033E-02	5.086E-02	NOT IDENT.
NB-95	2.692E-02	1.011E-01	1.018E-01	NOT IDENT.
NB-95M	2.566E-01	2.475E-01	2.732E-01	NOT IDENT.
ZR-95	1.391E-02	1.448E-01	1.449E-01	NOT IDENT.
NB-97	1.000E+41	4.608E+40	0.000E+00	SHORT HLIF
ZR-97	4.049E+20	3.651E+20	0.000E+00	SHORT HLIF
MO-99	-4.051E+04	6.096E+04	6.363E+04	SHORT HLIF
TC-99M	-1.000E+41	4.076E+41	0.000E+00	SHORT HLIF
RH-101	3.759E-03	4.010E-02	4.013E-02	NOT IDENT.
RH-102	5.500E-02	7.406E-02	7.810E-02	FAIL ABUN
RU-103	-7.922E-02	1.077E-01	1.135E-01	FAIL ABUN
RH-106	-2.254E-01	4.661E-01	4.771E-01	NOT IDENT.
RU-106	-2.254E-01	4.661E-01	4.771E-01	NOT IDENT.
AG-108M	-1.344E-02	4.789E-02	4.827E-02	NOT IDENT.
AG-110M	5.859E-03	7.530E-02	7.535E-02	NOT IDENT.
CD-115	-3.736E+05	4.911E+05	5.192E+05	SHORT HLIF
SN-117M	-1.810E-01	3.538E-01	3.631E-01	NOT IDENT.
TE-123M	-2.249E-02	4.163E-02	4.284E-02	NOT IDENT.
SB-124	-5.713E-02	1.116E-01	1.145E-01	NOT IDENT.
SB-125	1.316E-01	1.492E-01	1.605E-01	NOT IDENT.
TE-125M	8.883E-01	1.632E+01	1.633E+01	NOT IDENT.
I-126	-7.672E-01	2.036E+00	2.065E+00	NOT IDENT.
SB-126	-4.017E-01	1.252E+00	1.265E+00	NOT IDENT.
SB-127	-1.824E+02	6.486E+02	6.538E+02	SHORT HLIF
I-131	2.530E+00	2.827E+00	3.048E+00	NOT IDENT.
I-132	1.000E+41	2.494E+42	0.000E+00	SHORT HLIF
TE-132	-7.187E+02	1.051E+03	1.100E+03	SHORT HLIF
BA-133	5.703E-02	6.496E-02	6.986E-02	FAIL ABUN
I-133	-1.446E+15	2.277E+15	2.369E+15	SHORT HLIF
CS-134	1.292E-01	6.299E-02	8.578E-02	FAIL ABUN
I-135	1.000E+41	2.821E+41	0.000E+00	SHORT HLIF
CS-136	-3.024E-01	7.985E-01	8.100E-01	FAIL ABUN
CE-139	1.666E-02	5.183E-02	5.237E-02	NOT IDENT.
BA-140	-7.841E-02	2.694E+00	2.694E+00	FAIL ABUN
LA-140	-2.564E-01	6.845E-01	6.941E-01	NOT IDENT.
CE-141	1.996E-02	1.526E-01	1.529E-01	NOT IDENT.
CE-143	6.617E+09	3.232E+09	4.398E+09	SHORT HLIF
CE-144	-7.909E-02	2.631E-01	2.655E-01	NOT IDENT.
PM-144	2.036E-02	5.386E-02	5.464E-02	NOT IDENT.
PR-144	1.526E+00	4.098E+00	4.155E+00	NOT IDENT.
PM-146	2.817E-02	7.117E-02	7.230E-02	NOT IDENT.
ND-147	6.993E-01	6.875E+00	6.882E+00	NOT IDENT.
PM-147	4.420E+02	8.622E+02	8.849E+02	NOT IDENT.
PM-149	4.361E+05	3.553E+06	3.558E+06	SHORT HLIF
EU-150	2.932E-02	4.373E-02	4.569E-02	FAIL ABUN
EU-152	-5.089E-02	1.471E-01	1.488E-01	FAIL ABUN
GD-153	-6.500E-02	1.051E-01	1.091E-01	NOT IDENT.
EU-154	-2.917E-02	1.424E-01	1.430E-01	NOT IDENT.
EU-155	-3.131E-02	1.167E-01	1.176E-01	FAIL ABUN
TB-160	1.418E-01	2.711E-01	2.785E-01	FAIL ABUN
HO-166M	-7.193E-02	7.649E-02	8.308E-02	NOT IDENT.
TM-171	3.586E+00	5.961E+00	6.176E+00	NOT IDENT.
HF-172	-3.291E-01	2.543E-01	2.944E-01	FAIL ABUN
LU-172	-2.701E-02	1.091E-01	1.097E-01	FAIL ABUN
LU-176	3.224E-03	4.256E-02	4.258E-02	FAIL ABUN

HF-181	7.994E-02	1.331E-01	1.379E-01	NOT IDENT.
TA-182	7.586E-02	2.369E-01	2.394E-01	NOT IDENT.
RE-183	1.286E-01	2.168E-01	2.244E-01	FAIL ABUN
RE-184	5.175E-01	3.254E-01	4.004E-01	FAIL ABUN
W-188	2.469E+00	1.558E+01	1.562E+01	FAIL ABUN
IR-192	5.648E-02	7.118E-02	7.559E-02	FAIL ABUN
HG-203	7.661E-03	8.347E-02	8.354E-02	NOT IDENT.
BI-207	-4.216E-02	6.416E-02	6.692E-02	FAIL ABUN
PB-211	9.351E-01	1.097E+00	1.175E+00	NOT IDENT.
BI-212	1.047E+00	7.611E-01	8.955E-01	NOT IDENT.
RN-219	-5.121E-01	6.402E-01	6.806E-01	NOT IDENT.
RA-223	-4.512E-01	8.671E-01	8.907E-01	FAIL ABUN
RA-224	1.035E+00	1.342E+00	1.421E+00	FAIL ABUN
AC-227	1.512E-01	3.304E-01	3.374E-01	FAIL ABUN
TH-227	1.512E-01	3.304E-01	3.374E-01	FAIL ABUN
TH-229	-1.745E-01	6.632E-01	6.678E-01	FAIL ABUN
PA-231	6.936E-01	8.537E-01	9.092E-01	NOT IDENT.
TH-231	-4.512E-01	8.671E-01	8.907E-01	FAIL ABUN
PA-233	-2.974E-02	9.475E-02	9.569E-02	NOT IDENT.
PA-234	-2.786E-01	5.010E-01	5.165E-01	NOT IDENT.
PA-234M	5.678E-01	5.661E+00	5.666E+00	NOT IDENT.
U-235	2.140E-01	2.463E-01	2.645E-01	FAIL ABUN
NP-237	-2.974E-02	9.475E-02	9.569E-02	NOT IDENT.
NP-238	7.046E+05	1.195E+06	1.236E+06	SHORT HLIF
NP-239	5.455E-02	2.967E-01	2.977E-01	NOT IDENT.
PU-239	1.047E+02	4.187E+02	4.213E+02	NOT IDENT.
CM-243	-2.346E-02	1.127E-01	1.132E-01	NOT IDENT.
BK-247	4.816E-03	1.166E-01	1.166E-01	NOT IDENT.
CM-247	-3.029E-02	5.856E-02	6.013E-02	NOT IDENT.
CF-249	1.183E-02	6.755E-02	6.776E-02	NOT IDENT.
CF-251	-1.786E-02	1.664E-01	1.666E-01	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	87.0589	87.09	111.8491	136.47	109.8006
45.60	93.0947	87.57	111.9163	140.51	0.0000
46.54	103.7216	88.03	111.9800	143.76	93.3747
49.72	0.0000	88.34	112.0231	144.24	93.4159
51.35	119.7672	88.47	112.0412	145.44	104.2673
51.87	129.0946	89.96	112.2468	152.43	99.5132
52.39	113.8265	1093.63	112.3401	153.25	84.4306
52.97	109.3189	91.11	112.4043	323.87	102.9184
53.44	115.5686	92.59	112.6056	156.02	93.3158
54.07	124.9454	93.35	112.7082	158.56	102.2208
57.36	0.0000	94.56	101.1757	159.00	101.1710
57.53	133.4089	94.65	94.6585	162.33	90.7677
57.98	124.1902	94.67	94.6606	162.66	85.5550
59.27	159.4440	94.87	94.6831	163.33	82.1094
59.32	159.4565	97.43	112.9795	165.86	98.0403
59.54	116.7158	98.43	98.3573	176.31	89.3922
60.96	116.9744	98.44	98.3584	176.60	94.9325
61.17	117.0124	99.53	109.0340	177.52	96.1074
62.93	117.3280	100.11	105.7339	181.07	0.0000
63.29	142.4356	102.03	101.8502	181.52	113.4789
63.58	142.4981	103.18	110.2233	184.41	111.9596
64.28	148.9183	103.37	112.3077	143.76	95.6188
66.73	188.7920	105.21	118.7337	193.51	88.3621
67.24	176.3371	105.31	118.7473	197.03	86.3533
125.81	174.8745	106.12	124.0215	198.01	85.2942
67.75	167.0141	106.47	125.1030	201.83	99.0416
69.67	151.6781	109.28	117.1921	203.43	91.4318
70.83	158.2581	111.00	104.9415	205.31	94.7807
72.81	198.3727	111.76	0.0000	210.85	83.0768
72.87	198.3894	114.06	106.3272	215.65	85.2551
74.66	161.7557	116.30	0.0000	222.11	73.9936
74.82	161.7911	116.74	100.3546	227.09	73.3306
74.97	161.8246	119.76	109.0575	227.38	72.4284
77.11	162.2944	121.12	94.5082	228.16	0.0000
78.74	127.9854	121.22	94.5178	228.18	77.0545
79.69	128.1465	121.78	97.7237	116.74	77.0545
80.12	128.2188	122.06	105.1094	235.69	67.6104
80.19	128.2305	122.92	114.6688	235.96	61.4750
80.57	128.2944	123.07	109.4253	238.63	67.4341
81.00	128.3667	265.00	102.1230	238.98	0.0000
81.07	128.3784	125.81	145.5979	240.99	67.5393
81.75	116.4456	127.23	120.4455	242.00	67.5838
83.79	111.3839	127.91	102.5535	244.70	64.9205
84.00	111.4139	129.30	115.3975	252.40	0.0000
85.43	111.6165	131.20	109.2481	252.80	73.6498
86.55	111.7736	133.02	121.1276	254.15	0.0000
86.79	111.8069	133.52	115.8707	256.23	60.7294
86.94	111.8284	136.00	109.7510	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	61.0494	355.39	0.0000	584.27	18.1352
264.80	61.0541	356.01	51.0568	595.83	21.8521
265.00	57.9307	364.49	37.7115	427.87	27.3608
268.22	54.9075	366.42	0.0000	602.52	0.0000
269.46	63.1127	372.51	39.8535	604.72	34.7073
270.03	67.5322	375.05	58.1923	607.14	25.5949
271.23	77.0121	377.52	63.6722	609.32	29.6400
273.65	80.2727	356.01	45.0824	610.33	16.4722
276.40	67.2674	388.16	51.4496	614.28	31.1570
277.37	66.2548	388.63	51.4615	618.01	21.1039
277.60	62.4768	391.69	51.9549	620.36	24.7939
278.00	59.6516	264.66	56.5503	621.93	27.5641
279.20	62.5364	401.81	57.5907	630.19	0.0000
279.54	62.5493	402.40	54.5748	631.29	16.5912
279.70	62.5550	404.85	39.4599	633.25	21.2139
280.46	66.3761	410.95	54.7904	634.78	18.4562
283.69	60.8031	413.71	43.6845	635.95	25.8490
284.31	62.7258	414.70	37.6061	636.99	24.9346
285.41	58.9621	423.72	45.9240	645.85	23.1562
285.90	0.0000	427.09	42.9270	657.76	20.7237
287.50	57.1304	427.87	37.8297	657.90	0.0000
290.67	58.8257	433.94	48.1836	661.66	23.2778
293.27	0.0000	439.40	47.2713	664.57	0.0000
351.93	47.8217	453.88	42.3979	666.33	25.5781
295.96	47.8418	463.37	40.4925	666.50	25.5792
879.38	36.4140	468.07	59.2982	667.71	0.0000
299.98	28.7710	473.00	0.0000	677.62	26.2067
300.09	28.7728	475.06	52.1674	685.70	0.0000
300.13	33.5687	476.78	43.8519	695.00	19.7644
301.36	28.7933	477.60	53.2667	696.49	23.5397
302.85	28.8175	482.18	41.8564	696.51	23.5402
256.23	49.2756	487.02	49.2789	697.00	25.4273
304.85	44.4772	492.35	0.0000	697.30	25.4295
306.78	56.1579	497.08	38.9521	697.49	26.3730
308.46	51.3926	505.52	51.0550	702.65	28.3026
311.90	64.6854	507.63	0.0000	706.68	20.7817
316.51	54.2021	511.00	42.3438	711.68	23.6521
319.41	66.8909	514.00	45.9266	720.70	23.7183
320.08	55.2772	514.00	45.9266	721.93	0.0000
321.04	58.2173	520.40	35.0625	722.78	34.1763
323.87	56.3631	520.69	0.0000	722.91	34.1777
325.23	60.2941	522.65	0.0000	723.31	29.4346
328.76	51.6388	527.90	0.0000	724.19	27.5427
333.37	56.9747	528.26	40.4975	727.33	16.1613
333.97	47.2224	529.59	38.3862	733.00	24.7601
334.37	47.2324	529.87	0.0000	735.93	15.2507
338.28	51.8995	531.02	30.9392	333.97	16.2114
338.32	51.9001	537.26	38.4987	739.50	0.0000
311.90	37.5804	546.56	0.0000	747.24	11.4771
340.48	37.5804	552.55	22.5873	748.06	19.1333
340.55	42.4838	563.25	32.3950	752.31	19.1577
344.28	45.8401	569.33	25.2525	753.82	20.1246
345.93	35.3927	946.00	25.2542	756.73	20.1421
351.06	57.5002	569.70	30.3071	756.80	20.1425
351.93	50.9515	583.19	28.2801	884.68	16.4777

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	23.0815	1274.44	15.3421	1620.50	2.9810
766.42	28.0323	1001.03	12.2878	1621.92	2.9817
766.84	28.0359	1002.74	15.3662	1678.03	0.0000
772.60	0.0000	1004.73	13.3237	1690.97	3.0159
776.52	19.8465	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.0688
778.90	12.5506	1028.54	0.0000	1063.66	8.9087
783.70	0.0000	1037.84	11.3634	1771.35	23.4211
785.37	26.1156	1038.76	0.0000	1791.20	0.0000
792.07	11.6294	631.29	19.6680	1808.65	2.0485
794.95	14.9643	1048.07	15.5328	1810.72	0.0000
795.86	9.9789	1049.04	14.5007	1836.06	7.2000
810.06	15.9398	1050.41	10.3609		
810.29	14.8781	1063.66	14.5503		
344.28	12.8595	1077.00	5.2124		
810.76	14.0300	1077.34	5.2128		
815.77	16.7257	1085.87	10.4460		
1048.07	18.5520	1093.63	16.1455		
832.01	17.6422	1099.45	11.5264		
834.85	17.6561	1112.07	11.5590		
835.71	20.1830	1112.84	13.6628		
836.80	0.0000	1115.54	16.8262		
846.75	0.0000	1120.29	10.5273		
846.77	14.7617	1120.55	10.5282		
856.80	8.4584	1221.41	13.6887		
860.56	15.8050	1129.67	10.5493		
871.09	20.8030	1131.51	0.0000		
873.19	20.8150	1147.95	0.0000		
875.33	0.0000	1173.23	18.1054		
879.38	15.8854	1177.95	12.7930		
880.51	19.8625	1189.05	16.0297		
883.24	17.8894	1204.77	12.8662		
884.68	15.1845	1221.41	5.5333		
889.28	11.9453	1231.02	18.4814		
894.76	13.6716	1235.36	12.9487		
898.04	27.3666	1238.28	9.7174		
900.72	16.3383	1260.41	0.0000		
903.28	5.1383	1271.87	12.1140		
911.20	14.0165	1274.44	10.2557		
912.08	14.0197	1274.54	10.2561		
923.98	0.0000	1291.59	13.0977		
926.50	17.0875	1298.22	0.0000		
929.11	21.1222	1312.11	12.2120		
937.49	19.1511	1332.49	10.3747		
944.13	14.1353	1362.66	0.0000		
946.00	17.1722	1365.19	6.6440		
949.00	12.1309	1368.63	0.0000		
667.71	0.0000	1384.29	13.3364		
962.31	20.8652	1408.01	8.6120		
964.08	24.3535	1457.56	0.0000		
966.17	20.8853	1460.82	8.6965		
911.20	13.9333	1489.16	13.5972		
968.97	13.9333	1505.03	7.7919		
983.53	13.2552	1584.12	4.9377		
984.45	0.0000	1596.21	6.9270		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:51:19.46

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677040.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;342
Background date    : 26-JUN-2016 12:05:18
Sample date       : 11-MAY-2016 00:00:00 Acquisition date : 28-JUN-2016 12:48:19
Sample ID        : G398677040 Sample quantity : 1.64249E+02 GRAM
Detector name     : GAM25 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.71 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.51*	28	180	0.57	92.61	88	8	7.65E-03	90.3	
2	1	63.32*	57	193	1.13	126.21	122	18	1.58E-02	44.9	1.00E+00
3	1	68.22	40	193	1.14	136.02	122	18	1.12E-02	59.1	
4	2	75.02*	242	232	1.28	149.60	144	14	6.71E-02	13.2	6.57E+00
5	2	77.24*	350	203	1.12	154.04	144	14	9.72E-02	8.7	
6	3	87.35	85	238	1.28	174.26	169	26	2.36E-02	30.2	3.31E+00
7	3	90.04	46	152	0.98	179.63	169	26	1.29E-02	43.2	
8	3	92.84*	136	182	1.46	185.24	169	26	3.78E-02	22.0	
9	0	185.89*	68	221	1.13	371.28	367	11	1.89E-02	45.0	
10	0	210.74	56	264	3.27	420.95	411	14	1.56E-02	63.2	
11	2	238.78*	331	131	1.14	477.02	471	18	9.19E-02	8.0	1.32E+00
12	2	241.86	81	202	1.65	483.17	471	18	2.26E-02	35.8	
13	0	295.40	93	154	1.30	590.24	584	11	2.59E-02	27.8	
14	0	300.39	26	105	1.31	600.22	597	8	7.36E-03	69.5	
15	0	319.00	25	64	1.56	637.42	635	6	6.97E-03	54.0	
16	0	338.47	112	166	1.21	676.36	670	13	3.12E-02	25.4	
17	0	351.91*	173	137	1.20	703.23	697	13	4.81E-02	16.0	
18	0	448.06	12	113	0.48	895.51	889	9	3.46E-03	157.1	
19	0	450.98	27	95	0.98	901.36	898	9	7.36E-03	68.9	
20	0	463.77	32	137	1.58	926.93	920	11	8.90E-03	73.5	
21	0	510.73*	32	91	2.45	1020.84	1014	14	8.93E-03	72.1	
22	0	584.64*	58	97	1.36	1168.67	1159	15	1.62E-02	39.5	
23	0	600.75	14	37	1.52	1200.88	1195	10	3.93E-03	85.0	
24	0	609.34	133	36	1.58	1218.06	1213	11	3.68E-02	12.3	
25	0	634.29	12	9	1.02	1267.97	1265	6	3.44E-03	47.4	
26	0	641.80	9	9	0.68	1282.99	1280	5	2.62E-03	57.0	
27	0	661.67	2788	56	1.50	1322.72	1315	15	7.74E-01	2.0	
28	0	693.42*	8	8	1.11	1386.24	1382	8	2.15E-03	80.7	
29	0	728.57	18	27	1.08	1456.53	1449	12	4.90E-03	63.6	
30	0	772.34	19	29	5.86	1544.09	1534	18	5.16E-03	74.1	
31	0	795.36	23	9	0.74	1590.14	1584	16	6.34E-03	35.1	
32	0	806.90	6	12	0.65	1613.22	1606	10	1.64E-03	119.2	
33	0	860.86	27	14	1.57	1721.16	1716	13	7.56E-03	35.6	
34	0	911.33*	74	18	2.21	1822.13	1812	18	2.06E-02	18.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	964.59	17	18	2.26	1928.68	1925	21	4.63E-03	38.4	2.56E+00
36	1	968.95*	35	16	2.21	1937.41	1925	21	9.68E-03	30.8	
37	0	1003.13	5	13	0.50	2005.79	1995	13	1.45E-03	148.6	
38	0	1120.43	27	7	1.61	2240.49	2235	13	7.42E-03	30.3	
39	0	1268.60	5	5	0.72	2536.98	2527	11	1.28E-03	109.0	
40	0	1460.42*	183	0	2.08	2920.87	2913	14	5.07E-02	7.5	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:51:21

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677040.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 00:00:00 Acquisition date : 28-JUN-2016 12:48:19
Sample ID        : G398677040 Sample quantity  : 164.25 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.71 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.149E+00	6.636E+00	6.636E+00	15.08	OK
CR-51	320.08	9.91*	4.372E+00	3.103E-01	1.046E+00	107.93	OK
CD-109	88.03	3.70*	9.544E+00	9.337E-01	1.004E+00	100.71	OK
SN-126	64.28	9.60	9.796E+00	3.829E-01	3.829E-01	89.77	OK
	86.94	8.90	9.544E+00	3.882E-01	3.882E-01	100.71	OK
	87.57	37.00*	9.544E+00	9.337E-02	9.337E-02	100.71	OK
BA-137M	661.66	89.90*	2.339E+00	6.522E+00	6.542E+00	3.97	OK
CS-137	661.66	85.10*	2.339E+00	6.890E+00	6.911E+00	3.97	OK
TL-208	277.37	6.60	4.895E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.607E+00	1.318E-01	1.318E-01	79.03	OK
	860.56	12.50	1.854E+00	5.595E-01	5.595E-01	71.17	OK
PB-210	46.54	4.25*	9.001E+00	4.684E-01	4.703E-01	180.69	OK
BI-211	72.87	1.23	9.809E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	4.030E+00	1.443E-01	1.443E-01	735.37	OK
PB-212	74.82	10.28	9.786E+00	1.163E+00	1.163E+00	37.38	OK
	77.11	17.10	9.755E+00	1.300E+00	1.300E+00	17.36	OK
	238.63	43.60*	5.502E+00	7.625E-01	7.625E-01	16.02	OK
	300.09	3.30	4.591E+00	9.425E-01	9.425E-01	139.02	OK
BI-214	609.32	45.49*	2.515E+00	5.759E-01	5.760E-01	24.66	OK
	1120.29	14.92	1.464E+00	5.634E-01	5.634E-01	60.66	OK
	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	9.788E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	9.755E+00	2.292E+00	2.292E+00	17.36	OK
	87.09	3.41	9.550E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.446E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.654E+00	5.864E-01	5.865E-01	55.64	OK
	351.93	35.60*	4.030E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.515E+00	5.759E-01	5.760E-01	24.66	OK
	1120.29	14.92	1.464E+00	5.634E-01	5.634E-01	60.66	OK
	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	5.448E+00	9.709E-01	9.709E-01	159.40	OK
RA-226	609.32	45.49*	2.515E+00	5.759E-01	5.760E-01	24.66	OK
	1120.29	14.92	1.464E+00	5.634E-01	5.634E-01	60.66	OK
	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	9.011E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.163E+00	1.275E+00	1.275E+00	50.83	OK
	794.95	4.25	1.989E+00	1.298E+00	1.298E+00	70.14	OK
	835.71	1.61	1.904E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.762E+00	7.725E-01	7.725E-01	35.95	OK
	968.97	15.80	1.669E+00	6.201E-01	6.201E-01	61.60	OK
RA-228	105.21	1.10	9.011E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.163E+00	1.275E+00	1.275E+00	50.83	OK
	794.95	4.25	1.989E+00	1.298E+00	1.298E+00	70.14	OK
	835.71	1.61	1.904E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.762E+00	7.725E-01	7.725E-01	35.95	OK
	968.97	15.80	1.669E+00	6.201E-01	6.201E-01	61.60	OK
TH-228	74.82	10.28	9.786E+00	1.163E+00	1.163E+00	37.38	OK
	77.11	17.10	9.755E+00	1.300E+00	1.300E+00	17.36	OK
	238.63	43.60*	5.502E+00	7.625E-01	7.625E-01	16.02	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	300.09	3.30	4.591E+00	9.425E-01	9.425E-01	139.02	OK
	609.32	45.49*	2.515E+00	5.759E-01	5.759E-01	24.66	OK
	1120.29	14.92	1.464E+00	5.634E-01	5.634E-01	60.66	OK
PA-231	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
	283.69	1.70	4.808E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.591E+00	5.814E-01	5.814E-01	139.02	OK
TH-232	105.21	1.10	9.011E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.163E+00	1.275E+00	1.275E+00	50.83	OK
	835.71	1.61	1.904E+00	----- Line	Not Found	-----	Absent
TH-234	911.20	25.80*	1.762E+00	7.725E-01	7.725E-01	35.95	OK
	968.97	15.80	1.669E+00	6.201E-01	6.201E-01	61.60	OK
	63.29	3.70*	9.796E+00	9.934E-01	9.934E-01	89.77	OK
U-234	92.59	4.23	9.394E+00	2.087E+00	2.087E+00	44.03	OK
	609.32	45.49*	2.515E+00	5.759E-01	5.759E-01	24.66	OK
	1120.29	14.92	1.464E+00	5.634E-01	5.634E-01	60.66	OK
U-235	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
	89.96	3.47	9.473E+00	8.599E-01	8.599E-01	86.44	OK
	93.35	5.60	9.394E+00	1.576E+00	1.576E+00	44.03	OK
	143.76	10.96*	7.756E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	7.183E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.597E+00	1.026E-01	1.026E-01	89.96	OK
U-238	205.31	5.01	6.153E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	9.796E+00	9.934E-01	9.934E-01	89.77	OK
	92.59	4.23	9.394E+00	2.087E+00	2.087E+00	44.03	OK
AM-243	43.53	5.90	8.693E+00	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	9.786E+00	1.779E-01	1.779E-01	37.38	OK
	511.00	100.00*	2.933E+00	5.561E-02	5.561E-02	144.24	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677040.CNF;1
Acquisition date : 28-JUN-2016 12:48:19 Sensitivity : 3.000
Detector ID : GAM25 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.71 Half life ratio : *****
Sample date : 11-MAY-2016 00:00:00 Analyst initials: MXR1
Sample ID : G398677040 Sample Quantity : 1.6425E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUL-2015 12:07:25 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.636E+00	9.807E-01	4.339E-01
CR-51	1.046E+00	1.106E+00	1.975E+00
CD-109	1.004E+00	9.912E-01	9.471E-01
SN-126	9.337E-02	9.215E-02	8.791E-02
BA-137M	6.542E+00	2.542E-01	5.992E-02
CS-137	6.911E+00	2.686E-01	6.329E-02
TL-208	1.318E-01	1.021E-01	8.350E-02
PB-210	4.703E-01	8.329E-01	8.021E-01
BI-211	1.443E-01	1.040E+00	4.990E-01
PB-212	7.625E-01	1.197E-01	1.272E-01
BI-214	5.760E-01	1.392E-01	1.434E-01
PB-214	6.389E-01	2.004E-01	2.698E-01
RN-222	5.760E-01	1.392E-01	1.434E-01
RA-224	9.709E-01	1.517E+00	1.364E+00
RA-226	5.760E-01	1.392E-01	1.434E-01
AC-228	7.725E-01	2.722E-01	2.083E-01
RA-228	7.725E-01	2.722E-01	2.083E-01
TH-228	7.625E-01	1.197E-01	1.272E-01
TH-230	5.759E-01	1.392E-01	1.434E-01
PA-231	5.814E-01	7.921E-01	1.125E+00
TH-232	7.725E-01	2.722E-01	2.083E-01
TH-234	9.934E-01	8.739E-01	9.145E-01
U-234	5.759E-01	1.392E-01	1.434E-01
U-235	1.145E-01	1.945E-01	3.874E-01
U-238	9.934E-01	8.739E-01	9.145E-01
AM-243	1.779E-01	6.517E-02	5.394E-02
ANH-511	5.561E-02	7.861E-02	7.287E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.303E-01	8.540E-01	1.593E+00	NOT IDENT.
NA-22	1.027E-02	2.908E-02	6.157E-02	NOT IDENT.
NA-24	0.000E+00	7.763E+21	0.000E+00	SHORT HLIF

AL-26	-4.172E-03	2.481E-02	5.282E-02	NOT IDENT.
SC-46	-1.331E-02	4.241E-02	7.957E-02	FAIL ABUN
V-48	-1.777E-02	2.400E-01	4.663E-01	NOT IDENT.
MN-54	-2.136E-02	3.336E-02	5.945E-02	NOT IDENT.
CO-56	8.034E-03	4.618E-02	9.259E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.190E-02	2.637E-02	4.713E-02	NOT IDENT.
CO-58	-2.656E-02	6.126E-02	9.406E-02	NOT IDENT.
FE-59	-2.743E-02	1.068E-01	2.009E-01	NOT IDENT.
CO-60	1.452E-02	3.060E-02	6.791E-02	NOT IDENT.
ZN-65	-8.155E-03	9.942E-02	1.589E-01	NOT IDENT.
GE-68	7.866E-01	1.170E+00	2.496E+00	NOT IDENT.
AS-73	1.626E-01	2.410E-01	4.862E-01	NOT IDENT.
AS-74	-7.425E-02	4.358E-01	6.864E-01	FAIL ABUN
SE-75	-6.654E-03	6.271E-02	1.158E-01	NOT IDENT.
BR-77	0.000E+00	3.191E+05	0.000E+00	SHORT HLIF
SR-82	-8.098E-01	8.801E-01	1.208E+00	NOT IDENT.
RB-83	-3.373E-02	1.164E-01	2.127E-01	NOT IDENT.
KR-85	1.101E+01	1.014E+01	1.820E+01	NOT IDENT.
SR-85	8.261E-02	7.637E-02	1.370E-01	NOT IDENT.
RB-86	6.319E-01	2.498E+00	4.976E+00	NOT IDENT.
Y-88	4.101E-02	4.197E-02	1.085E-01	NOT IDENT.
Y-91	1.069E+01	2.620E+01	5.441E+01	NOT IDENT.
NB-94	3.042E-02	2.974E-02	6.466E-02	NOT IDENT.
NB-95	8.907E-02	5.811E-02	1.238E-01	NOT IDENT.
NB-95M	5.158E-02	2.242E-01	3.733E-01	NOT IDENT.
ZR-95	1.868E-02	8.992E-02	1.778E-01	NOT IDENT.
NB-97	0.000E+00	2.111E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	5.425E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.965E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	9.256E+40	0.000E+00	SHORT HLIF
RH-101	-1.261E-03	3.001E-02	5.882E-02	NOT IDENT.
RH-102	2.690E-02	6.307E-02	1.098E-01	NOT IDENT.
RU-103	8.384E-03	1.025E-01	1.921E-01	FAIL ABUN
RH-106	-1.527E-01	3.432E-01	6.079E-01	NOT IDENT.
RU-106	-1.527E-01	3.432E-01	6.079E-01	NOT IDENT.
AG-108M	4.713E-05	4.591E-02	8.594E-02	NOT IDENT.
AG-110M	-3.841E-03	4.339E-02	8.469E-02	NOT IDENT.
SN-113	-7.924E-02	7.997E-02	1.426E-01	NOT IDENT.
CD-115	0.000E+00	4.555E+05	0.000E+00	SHORT HLIF
SN-117M	-3.621E-01	2.906E-01	5.260E-01	NOT IDENT.
TE-123M	-1.632E-02	3.278E-02	6.184E-02	NOT IDENT.
SB-124	-2.855E-02	8.968E-02	1.820E-01	NOT IDENT.
SB-125	-6.863E-02	1.442E-01	2.627E-01	FAIL ABUN
TE-125M	-4.718E+00	1.264E+01	2.291E+01	NOT IDENT.
I-126	-1.820E-01	1.460E+00	2.311E+00	NOT IDENT.
SB-126	-2.630E-01	8.513E-01	1.434E+00	NOT IDENT.
SB-127	0.000E+00	4.659E+02	0.000E+00	SHORT HLIF
I-131	2.876E-01	2.699E+00	5.188E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.152E+03	0.000E+00	SHORT HLIF
BA-133	2.244E-02	6.130E-02	1.053E-01	NOT IDENT.
I-133	0.000E+00	2.883E+15	0.000E+00	SHORT HLIF
CS-134	6.750E-02	4.640E-02	7.777E-02	FAIL ABUN
CS-135	-1.017E-01	1.857E-01	3.326E-01	NOT IDENT.
I-135	0.000E+00	1.640E+41	0.000E+00	SHORT HLIF
CS-136	4.850E-01	4.886E-01	1.105E+00	NOT IDENT.
CE-139	1.205E-02	3.273E-02	6.451E-02	NOT IDENT.
BA-140	2.848E-01	2.068E+00	3.907E+00	NOT IDENT.
LA-140	7.151E-02	4.671E-01	9.857E-01	NOT IDENT.
CE-141	-2.014E-02	1.236E-01	2.377E-01	NOT IDENT.
CE-143	0.000E+00	3.657E+09	0.000E+00	SHORT HLIF
CE-144	-5.262E-02	2.010E-01	3.889E-01	NOT IDENT.
PM-144	-2.519E-02	4.044E-02	6.221E-02	NOT IDENT.
PR-144	-1.932E+00	3.078E+00	4.732E+00	NOT IDENT.
PM-146	-4.870E-02	8.001E-02	1.226E-01	FAIL ABUN
ND-147	6.331E-01	5.660E+00	1.071E+01	FAIL ABUN
PM-147	-3.137E+02	7.195E+02	1.288E+03	NOT IDENT.
PM-149	0.000E+00	4.049E+06	0.000E+00	SHORT HLIF
EU-150	-1.308E-03	3.987E-02	6.305E-02	FAIL ABUN
EU-152	4.382E-02	1.425E-01	2.323E-01	FAIL ABUN
GD-153	-4.772E-02	7.769E-02	1.240E-01	FAIL ABUN
EU-154	2.816E-02	8.089E-02	1.711E-01	NOT IDENT.
EU-155	6.216E-02	9.146E-02	1.762E-01	FAIL ABUN
TB-160	5.328E-02	1.517E-01	3.137E-01	FAIL ABUN
HO-166M	-9.283E-03	5.225E-02	1.009E-01	FAIL ABUN
TM-171	-3.213E-01	3.658E+00	7.097E+00	FAIL ABUN
HF-172	-2.454E-02	1.844E-01	3.597E-01	FAIL ABUN

LU-172	3.600E-02	5.406E-02	1.161E-01	FAIL ABUN
LU-176	2.918E-02	3.370E-02	6.510E-02	FAIL ABUN
HF-181	-1.609E-02	1.182E-01	2.177E-01	NOT IDENT.
TA-182	5.166E-02	1.721E-01	3.587E-01	FAIL ABUN
RE-183	4.573E-02	8.209E-02	1.572E-01	FAIL ABUN
RE-184	3.704E-02	2.283E-01	3.991E-01	NOT IDENT.
W-188	4.713E-01	1.464E+01	2.357E+01	FAIL ABUN
IR-192	3.347E-02	6.314E-02	1.065E-01	FAIL ABUN
HG-203	3.073E-02	7.438E-02	1.410E-01	NOT IDENT.
BI-207	-2.332E-02	3.739E-02	6.488E-02	FAIL ABUN
PB-211	1.636E-01	1.003E+00	1.911E+00	NOT IDENT.
BI-212	5.985E-01	7.463E-01	1.116E+00	FAIL ABUN
RN-219	-3.394E-01	5.460E-01	9.942E-01	NOT IDENT.
RA-223	1.597E-01	9.512E-01	1.615E+00	FAIL ABUN
AC-227	2.718E-02	2.843E-01	5.335E-01	FAIL ABUN
TH-227	2.718E-02	2.843E-01	5.335E-01	FAIL ABUN
TH-229	1.292E-01	6.236E-01	1.192E+00	FAIL ABUN
TH-231	1.597E-01	9.512E-01	1.615E+00	FAIL ABUN
PA-233	-3.368E-02	7.652E-02	1.363E-01	FAIL ABUN
PA-234	1.534E-01	2.464E-01	5.280E-01	NOT IDENT.
PA-234M	2.656E+00	3.682E+00	7.964E+00	NOT IDENT.
NP-237	-3.368E-02	7.652E-02	1.363E-01	FAIL ABUN
NP-238	0.000E+00	9.134E+05	0.000E+00	SHORT HLIF
NP-239	-6.485E-02	2.525E-01	4.581E-01	NOT IDENT.
PU-239	2.012E+02	3.192E+02	6.433E+02	NOT IDENT.
AM-241	3.338E-02	5.320E-02	9.607E-02	NOT IDENT.
CM-243	-6.585E-02	9.293E-02	1.659E-01	NOT IDENT.
BK-247	-2.502E-02	9.334E-02	1.706E-01	NOT IDENT.
CM-247	-4.428E-02	5.140E-02	9.211E-02	NOT IDENT.
CF-249	5.153E-02	5.598E-02	1.114E-01	NOT IDENT.
CF-251	1.281E-01	1.361E-01	2.725E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	178	10.66*	1.149E+00	6.636E+00	6.636E+00	15.08
CR-51	320.08	29	9.91*	4.372E+00	3.103E-01	1.046E+00	107.93
CD-109	88.03	114	3.70*	9.544E+00	1.474E+00	1.586E+00	60.44
SN-126	64.28	79	9.60	9.796E+00	3.829E-01	3.829E-01	89.77
	86.94	114	8.90	9.544E+00	6.129E-01	6.129E-01	60.44
	87.57	114	37.00*	9.544E+00	1.474E-01	1.474E-01	60.44
BA-137M	661.66	3001	89.90*	2.339E+00	6.522E+00	6.542E+00	3.97
CS-137	661.66	3001	85.10*	2.339E+00	6.890E+00	6.911E+00	3.97
TL-208	277.37	-----	6.60	4.895E+00	-----	Line Not Found	-----
	583.19	64	85.00*	2.607E+00	1.318E-01	1.318E-01	79.03
	860.56	28	12.50	1.854E+00	5.595E-01	5.595E-01	71.17
PB-210	46.54	39	4.25*	9.001E+00	4.684E-01	4.703E-01	180.69
BI-211	72.87	-----	1.23	9.809E+00	-----	Line Not Found	-----
	351.06	201	12.92*	4.030E+00	1.760E+00	1.760E+00	32.01
PB-212	74.82	329	10.28	9.786E+00	1.494E+00	1.494E+00	26.36
	77.11	475	17.10	9.755E+00	1.300E+00	1.300E+00	17.36
	238.63	400	43.60*	5.502E+00	7.625E-01	7.625E-01	16.02
	300.09	31	3.30	4.591E+00	9.425E-01	9.425E-01	139.02
BI-214	609.32	144	45.49*	2.515E+00	5.759E-01	5.760E-01	24.66
	1120.29	27	14.92	1.464E+00	5.634E-01	5.634E-01	60.66
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
PB-214	74.82	329	5.80	9.786E+00	2.648E+00	2.648E+00	26.36
	77.11	475	9.70	9.755E+00	2.292E+00	2.292E+00	17.36
	87.09	114	3.41	9.544E+00	1.600E+00	1.600E+00	60.44
	242.00	98	7.25	5.448E+00	1.135E+00	1.136E+00	71.52
	295.22	110	18.42	4.654E+00	5.864E-01	5.865E-01	55.64
	351.93	201	35.60*	4.030E+00	6.388E-01	6.389E-01	32.01
RN-222	609.32	144	45.49*	2.515E+00	5.759E-01	5.760E-01	24.66
	1120.29	27	14.92	1.464E+00	5.634E-01	5.634E-01	60.66
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
RA-224	240.99	98	4.10*	5.448E+00	2.008E+00	2.008E+00	71.52
RA-226	609.32	144	45.49*	2.515E+00	5.759E-01	5.760E-01	24.66
	1120.29	27	14.92	1.464E+00	5.634E-01	5.634E-01	60.66
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	9.011E+00	-----	Line Not Found	-----
	338.32	131	11.27	4.163E+00	1.275E+00	1.275E+00	50.83
	794.95	24	4.25	1.989E+00	1.298E+00	1.298E+00	70.14
	835.71	-----	1.61	1.904E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.762E+00	7.725E-01	7.725E-01	35.95
	968.97	36	15.80	1.669E+00	6.201E-01	6.201E-01	61.60
RA-228	105.21	-----	1.10	9.011E+00	-----	Line Not Found	-----
	338.32	131	11.27	4.163E+00	1.275E+00	1.275E+00	50.83
	794.95	24	4.25	1.989E+00	1.298E+00	1.298E+00	70.14
	835.71	-----	1.61	1.904E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.762E+00	7.725E-01	7.725E-01	35.95
	968.97	36	15.80	1.669E+00	6.201E-01	6.201E-01	61.60
TH-228	74.82	329	10.28	9.786E+00	1.494E+00	1.494E+00	26.36

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	475	17.10	9.755E+00	1.300E+00	1.300E+00	17.36
	238.63	400	43.60*	5.502E+00	7.625E-01	7.625E-01	16.02
	300.09	31	3.30	4.591E+00	9.425E-01	9.425E-01	139.02
TH-230	609.32	144	45.49*	2.515E+00	5.759E-01	5.759E-01	24.66
	1120.29	27	14.92	1.464E+00	5.634E-01	5.634E-01	60.66
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
PA-231	283.69	-----	1.70	4.808E+00	-----	Line Not Found	-----
	301.36	31	5.35*	4.591E+00	5.814E-01	5.814E-01	139.02
TH-232	105.21	-----	1.10	9.011E+00	-----	Line Not Found	-----
	338.32	131	11.27	4.163E+00	1.275E+00	1.275E+00	50.83
	835.71	-----	1.61	1.904E+00	-----	Line Not Found	-----
	911.20	77	25.80*	1.762E+00	7.725E-01	7.725E-01	35.95
	968.97	36	15.80	1.669E+00	6.201E-01	6.201E-01	61.60
TH-234	63.29	79	3.70*	9.796E+00	9.934E-01	9.934E-01	89.77
	92.59	181	4.23	9.394E+00	2.087E+00	2.087E+00	44.03
U-234	609.32	144	45.49*	2.515E+00	5.759E-01	5.759E-01	24.66
	1120.29	27	14.92	1.464E+00	5.634E-01	5.634E-01	60.66
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
U-235	89.96	62	3.47	9.473E+00	8.599E-01	8.599E-01	86.44
	93.35	181	5.60	9.394E+00	1.576E+00	1.576E+00	44.03
	143.76	-----	10.96*	7.756E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.183E+00	-----	Line Not Found	-----
	185.72	85	57.20	6.597E+00	1.026E-01	1.026E-01	89.96
	205.31	-----	5.01	6.153E+00	-----	Line Not Found	-----
U-238	63.29	79	3.70*	9.796E+00	9.934E-01	9.934E-01	89.77
	92.59	181	4.23	9.394E+00	2.087E+00	2.087E+00	44.03
AM-243	43.53	-----	5.90	8.693E+00	-----	Line Not Found	-----
	74.66	329	67.20*	9.786E+00	2.285E-01	2.285E-01	26.36
ANH-511	511.00	36	100.00*	2.933E+00	5.561E-02	5.561E-02	144.24

Flag: "*" = Keyline

Total number of lines in spectrum 40
Number of unidentified lines 6
Number of lines tentatively identified by NID 34 85.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.636E+00	6.636E+00	1.001E+00	15.08	
CR-51	27.70D	3.37	3.103E-01	1.046E+00	1.129E+00	107.93	
CD-109	461.40D	1.08	1.474E+00	1.586E+00	0.958E+00	60.44	
SN-126	2.30E+05Y	1.00	1.474E-01	1.474E-01	0.891E-01	60.44	
BA-137M	30.08Y	1.00	6.522E+00	6.542E+00	0.259E+00	3.97	
CS-137	30.08Y	1.00	6.890E+00	6.911E+00	0.274E+00	3.97	
TL-208	1.41E+10Y	1.00	1.318E-01	1.318E-01	1.042E-01	79.03	
PB-210	22.20Y	1.00	4.684E-01	4.703E-01	8.499E-01	180.69	
BI-211	7.04E+08Y	1.00	1.760E+00	1.760E+00	0.563E+00	32.01	
PB-212	1.41E+10Y	1.00	7.625E-01	7.625E-01	1.222E-01	16.02	
BI-214	1600.00Y	1.00	5.759E-01	5.760E-01	1.421E-01	24.66	
PB-214	1600.00Y	1.00	6.388E-01	6.389E-01	2.045E-01	32.01	
RN-222	1600.00Y	1.00	5.759E-01	5.760E-01	1.421E-01	24.66	
RA-224	1.41E+10Y	1.00	2.008E+00	2.008E+00	1.436E+00	71.52	
RA-226	1600.00Y	1.00	5.759E-01	5.760E-01	1.421E-01	24.66	
AC-228	1.41E+10Y	1.00	7.725E-01	7.725E-01	2.777E-01	35.95	
RA-228	1.41E+10Y	1.00	7.725E-01	7.725E-01	2.777E-01	35.95	
TH-228	1.41E+10Y	1.00	7.625E-01	7.625E-01	1.222E-01	16.02	
TH-230	7.54E+04Y	1.00	5.759E-01	5.759E-01	1.420E-01	24.66	
PA-231	7.04E+08Y	1.00	5.814E-01	5.814E-01	8.082E-01	139.02	
TH-232	1.41E+10Y	1.00	7.725E-01	7.725E-01	2.777E-01	35.95	
TH-234	4.47E+09Y	1.00	9.934E-01	9.934E-01	8.918E-01	89.77	
U-234	2.45E+05Y	1.00	5.759E-01	5.759E-01	1.420E-01	24.66	
U-235	7.04E+08Y	1.00	1.026E-01	1.026E-01	0.923E-01	89.96	K
U-238	4.47E+09Y	1.00	9.934E-01	9.934E-01	8.918E-01	89.77	
AM-243	7370.00Y	1.00	2.285E-01	2.285E-01	0.602E-01	26.36	
ANH-511	1.00E+09Y	1.00	5.561E-02	5.561E-02	8.022E-02	144.24	
Total Activity :			3.666E+01	3.755E+01			

Grand Total Activity : 3.666E+01 3.755E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	68.22	55	264	1.14	136.02	122	18	1.12E-02	****	9.83E+00	T
0	210.74	69	324	3.27	420.95	411	14	1.56E-02	****	6.04E+00	T
0	448.06	14	127	0.48	895.51	889	9	3.46E-03	****	3.28E+00	
0	450.98	30	106	0.98	901.36	898	9	7.36E-03	****	3.27E+00	
0	463.77	36	154	1.58	926.93	920	11	8.90E-03	****	3.19E+00	T
0	600.75	15	40	1.52	1200.88	1195	10	3.93E-03	****	2.55E+00	T
0	634.29	13	9	1.02	1267.97	1265	6	3.44E-03	94.9	2.43E+00	T
0	641.80	10	9	0.68	1282.99	1280	5	2.62E-03	****	2.40E+00	
0	693.42	8	9	1.11	1386.24	1382	8	2.15E-03	****	2.24E+00	
0	728.57	19	29	1.08	1456.53	1449	12	4.90E-03	****	2.15E+00	T
0	772.34	20	31	5.86	1544.09	1534	18	5.16E-03	****	2.04E+00	T
0	806.90	6	13	0.65	1613.22	1606	10	1.64E-03	****	1.96E+00	
1	964.59	17	18	2.26	1928.68	1925	21	4.63E-03	76.9	1.68E+00	T
0	1003.13	5	13	0.50	2005.79	1995	13	1.45E-03	****	1.62E+00	T
0	1268.60	5	5	0.72	2536.98	2527	11	1.28E-03	****	1.31E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677040.CNF;1
Acquisition date : 28-JUN-2016 12:48:19 Sensitivity : 3.000
Detector ID : GAM25 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.71 Half life ratio : *****
Sample date : 11-MAY-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G398677040 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.6425E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUL-2015 12:07:25 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.659E-01
CR-51	9.366E-01
CD-109	4.531E-01
SN-126	4.205E-02
BA-137M	2.691E-02
CS-137	2.843E-02
TL-208	3.887E-02
PB-210	3.831E-01
BI-211	2.371E-01
PB-212	6.089E-02
BI-214	6.610E-02
PB-214	1.304E-01
RN-222	6.610E-02
RA-224	6.530E-01
RA-226	6.610E-02
AC-228	9.022E-02
RA-228	9.022E-02
TH-228	6.089E-02
TH-230	6.610E-02
PA-231	5.360E-01
TH-232	9.022E-02
TH-234	4.385E-01
U-234	6.610E-02
U-235	1.859E-01
U-238	4.385E-01
AM-243	2.595E-02
ANH-511	3.425E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.594E-01	NOT IDENT.
NA-22	2.579E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.977E-02	NOT IDENT.

SC-46	3.453E-02	FAIL ABUN
V-48	2.016E-01	NOT IDENT.
MN-54	2.601E-02	NOT IDENT.
CO-56	4.108E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.252E-02	NOT IDENT.
CO-58	4.178E-02	NOT IDENT.
FE-59	8.449E-02	NOT IDENT.
CO-60	2.886E-02	NOT IDENT.
ZN-65	6.976E-02	NOT IDENT.
GE-68	1.102E+00	NOT IDENT.
AS-73	2.325E-01	NOT IDENT.
AS-74	3.151E-01	FAIL ABUN
SE-75	5.502E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.258E-01	NOT IDENT.
RB-83	9.904E-02	NOT IDENT.
KR-85	8.592E+00	NOT IDENT.
SR-85	6.466E-02	NOT IDENT.
RB-86	2.196E+00	NOT IDENT.
Y-88	4.497E-02	NOT IDENT.
Y-91	2.408E+01	NOT IDENT.
NB-94	2.945E-02	NOT IDENT.
NB-95	5.666E-02	NOT IDENT.
NB-95M	1.786E-01	NOT IDENT.
ZR-95	7.935E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.820E-02	NOT IDENT.
RH-102	5.009E-02	NOT IDENT.
RU-103	9.054E-02	FAIL ABUN
RH-106	2.754E-01	NOT IDENT.
RU-106	2.754E-01	NOT IDENT.
AG-108M	4.086E-02	NOT IDENT.
AG-110M	3.683E-02	NOT IDENT.
SN-113	6.769E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.505E-01	NOT IDENT.
TE-123M	2.949E-02	NOT IDENT.
SB-124	6.813E-02	NOT IDENT.
SB-125	1.248E-01	FAIL ABUN
TE-125M	1.095E+01	NOT IDENT.
I-126	1.043E+00	NOT IDENT.
SB-126	6.335E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.460E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.001E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.498E-02	FAIL ABUN
CS-135	1.582E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.873E-01	NOT IDENT.
CE-139	3.077E-02	NOT IDENT.
BA-140	1.823E+00	NOT IDENT.
LA-140	4.063E-01	NOT IDENT.
CE-141	1.138E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.861E-01	NOT IDENT.
PM-144	2.796E-02	NOT IDENT.
PR-144	2.126E+00	NOT IDENT.
PM-146	5.819E-02	FAIL ABUN
ND-147	4.983E+00	FAIL ABUN
PM-147	6.155E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.992E-02	FAIL ABUN
EU-152	1.102E-01	FAIL ABUN
GD-153	5.915E-02	FAIL ABUN
EU-154	7.166E-02	NOT IDENT.
EU-155	8.450E-02	FAIL ABUN
TB-160	1.384E-01	FAIL ABUN
HO-166M	4.507E-02	FAIL ABUN
TM-171	3.387E+00	FAIL ABUN
HF-172	1.724E-01	FAIL ABUN
LU-172	5.102E-02	FAIL ABUN

LU-176	3.101E-02	FAIL ABUN
HF-181	1.031E-01	NOT IDENT.
TA-182	1.563E-01	FAIL ABUN
RE-183	7.530E-02	FAIL ABUN
RE-184	1.753E-01	NOT IDENT.
W-188	1.123E+01	FAIL ABUN
IR-192	5.044E-02	FAIL ABUN
HG-203	6.712E-02	NOT IDENT.
BI-207	2.691E-02	FAIL ABUN
PB-211	9.079E-01	NOT IDENT.
BI-212	5.139E-01	FAIL ABUN
RN-219	4.700E-01	NOT IDENT.
RA-223	7.701E-01	FAIL ABUN
AC-227	2.535E-01	FAIL ABUN
TH-227	2.535E-01	FAIL ABUN
TH-229	5.727E-01	FAIL ABUN
TH-231	7.701E-01	FAIL ABUN
PA-233	6.436E-02	FAIL ABUN
PA-234	2.331E-01	NOT IDENT.
PA-234M	3.518E+00	NOT IDENT.
NP-237	6.436E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.193E-01	NOT IDENT.
PU-239	3.088E+02	NOT IDENT.
AM-241	4.609E-02	NOT IDENT.
CM-243	7.940E-02	NOT IDENT.
BK-247	8.102E-02	NOT IDENT.
CM-247	4.356E-02	NOT IDENT.
CF-249	5.308E-02	NOT IDENT.
CF-251	1.307E-01	NOT IDENT.

GEL Laboratories LLC
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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677040.CNF;1
Acquisition date : 28-JUN-2016 12:48:19 Sensitivity : 3.000
Detector ID : GAM25 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.71 Half life ratio : *****
Sample date : 11-MAY-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G398677040 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.6425E+02 GRAM
Quantity Err(%) : 1.2177E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUL-2015 12:07:25 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.636E+00	1.174E+00	1.174E+00
CR-51	1.046E+00	1.110E+00	1.110E+00
CD-109	1.004E+00	1.001E+00	1.001E+00
SN-126	9.337E-02	9.292E-02	9.292E-02
BA-137M	6.542E+00	6.053E-01	6.053E-01
CS-137	6.911E+00	6.391E-01	6.391E-01
TL-208	1.318E-01	1.027E-01	1.027E-01
PB-210	4.703E-01	8.339E-01	8.339E-01
BI-211	1.443E-01	1.060E+00	1.060E+00
PB-212	7.625E-01	1.517E-01	1.517E-01
BI-214	5.760E-01	1.476E-01	1.476E-01
PB-214	6.389E-01	2.077E-01	2.077E-01
RN-222	5.760E-01	1.476E-01	1.476E-01
RA-224	9.709E-01	1.529E+00	1.529E+00
RA-226	5.760E-01	1.476E-01	1.476E-01
AC-228	7.725E-01	2.905E-01	2.905E-01
RA-228	7.725E-01	2.905E-01	2.905E-01
TH-228	7.625E-01	1.517E-01	1.517E-01
TH-230	5.759E-01	1.476E-01	1.476E-01
PA-231	5.814E-01	8.031E-01	8.031E-01
TH-232	7.725E-01	2.905E-01	2.905E-01
TH-234	9.934E-01	9.022E-01	9.022E-01
U-234	5.759E-01	1.476E-01	1.476E-01
U-235	1.145E-01	1.951E-01	1.951E-01
U-238	9.934E-01	9.022E-01	9.022E-01
AM-243	1.779E-01	6.724E-02	6.724E-02
ANH-511	5.561E-02	7.875E-02	7.875E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.303E-01	8.540E-01	8.561E-01	NOT IDENT.
NA-22	1.027E-02	2.910E-02	2.946E-02	NOT IDENT.
NA-24	-6.326E+21	7.798E+21	0.000E+00	SHORT HLIF

AL-26	-4.172E-03	2.481E-02	2.488E-02	NOT IDENT.
SC-46	-1.331E-02	4.244E-02	4.286E-02	FAIL ABUN
V-48	-1.777E-02	2.400E-01	2.402E-01	NOT IDENT.
MN-54	-2.136E-02	3.345E-02	3.481E-02	NOT IDENT.
CO-56	8.034E-03	4.618E-02	4.633E-02	NOT IDENT.
MN-56	1.000E+41	5.547E+41	0.000E+00	SHORT HLIF
CO-57	-1.190E-02	2.640E-02	2.694E-02	NOT IDENT.
CO-58	-2.656E-02	6.133E-02	6.249E-02	NOT IDENT.
FE-59	-2.743E-02	1.069E-01	1.077E-01	NOT IDENT.
CO-60	1.452E-02	3.063E-02	3.132E-02	NOT IDENT.
ZN-65	-8.155E-03	9.943E-02	9.950E-02	NOT IDENT.
GE-68	7.866E-01	1.177E+00	1.230E+00	NOT IDENT.
AS-73	1.626E-01	2.434E-01	2.541E-01	NOT IDENT.
AS-74	-7.425E-02	4.359E-01	4.372E-01	FAIL ABUN
SE-75	-6.654E-03	6.271E-02	6.278E-02	NOT IDENT.
BR-77	2.032E+06	2.876E+06	3.019E+06	SHORT HLIF
SR-82	-8.098E-01	8.840E-01	9.564E-01	NOT IDENT.
RB-83	-3.373E-02	1.165E-01	1.175E-01	NOT IDENT.
KR-85	1.101E+01	1.019E+01	1.133E+01	NOT IDENT.
SR-85	8.261E-02	7.668E-02	8.524E-02	NOT IDENT.
RB-86	6.319E-01	2.500E+00	2.516E+00	NOT IDENT.
Y-88	4.101E-02	4.208E-02	4.597E-02	NOT IDENT.
Y-91	1.069E+01	2.622E+01	2.666E+01	NOT IDENT.
NB-94	3.042E-02	2.987E-02	3.287E-02	NOT IDENT.
NB-95	8.907E-02	5.881E-02	7.120E-02	NOT IDENT.
NB-95M	5.158E-02	2.243E-01	2.255E-01	NOT IDENT.
ZR-95	1.868E-02	8.994E-02	9.033E-02	NOT IDENT.
NB-97	1.000E+41	2.272E+40	0.000E+00	SHORT HLIF
ZR-97	3.081E+20	5.431E+20	0.000E+00	SHORT HLIF
MO-99	-3.769E+04	4.980E+04	5.262E+04	SHORT HLIF
TC-99M	-1.000E+41	9.378E+40	0.000E+00	SHORT HLIF
RH-101	-1.261E-03	3.002E-02	3.002E-02	NOT IDENT.
RH-102	2.690E-02	6.314E-02	6.430E-02	NOT IDENT.
RU-103	8.384E-03	1.025E-01	1.026E-01	FAIL ABUN
RH-106	-1.527E-01	3.435E-01	3.504E-01	NOT IDENT.
RU-106	-1.527E-01	3.435E-01	3.504E-01	NOT IDENT.
AG-108M	4.713E-05	4.591E-02	4.591E-02	NOT IDENT.
AG-110M	-3.841E-03	4.339E-02	4.343E-02	NOT IDENT.
SN-113	-7.924E-02	8.020E-02	8.780E-02	NOT IDENT.
CD-115	3.555E+05	4.568E+05	4.841E+05	SHORT HLIF
SN-117M	-3.621E-01	2.949E-01	3.371E-01	NOT IDENT.
TE-123M	-1.632E-02	3.286E-02	3.367E-02	NOT IDENT.
SB-124	-2.855E-02	8.971E-02	9.063E-02	NOT IDENT.
SB-125	-6.863E-02	1.443E-01	1.476E-01	FAIL ABUN
TE-125M	-4.718E+00	1.264E+01	1.282E+01	NOT IDENT.
I-126	-1.820E-01	1.460E+00	1.463E+00	NOT IDENT.
SB-126	-2.630E-01	8.520E-01	8.602E-01	NOT IDENT.
SB-127	-6.705E+00	4.659E+02	4.659E+02	SHORT HLIF
I-131	2.876E-01	2.699E+00	2.702E+00	NOT IDENT.
I-132	1.000E+41	7.493E+41	0.000E+00	SHORT HLIF
TE-132	1.758E+02	1.152E+03	1.155E+03	SHORT HLIF
BA-133	2.244E-02	6.133E-02	6.216E-02	NOT IDENT.
I-133	1.459E+15	2.918E+15	2.991E+15	SHORT HLIF
CS-134	6.750E-02	4.695E-02	5.595E-02	FAIL ABUN
CS-135	-1.017E-01	1.860E-01	1.916E-01	NOT IDENT.
I-135	-1.000E+41	1.976E+41	0.000E+00	SHORT HLIF
CS-136	4.850E-01	4.963E-01	5.423E-01	NOT IDENT.
CE-139	1.205E-02	3.286E-02	3.330E-02	NOT IDENT.
BA-140	2.848E-01	2.069E+00	2.073E+00	NOT IDENT.
LA-140	7.151E-02	4.671E-01	4.682E-01	NOT IDENT.
CE-141	-2.014E-02	1.236E-01	1.239E-01	NOT IDENT.
CE-143	4.915E+09	3.687E+09	4.301E+09	SHORT HLIF
CE-144	-5.262E-02	2.011E-01	2.025E-01	NOT IDENT.
PM-144	-2.519E-02	4.050E-02	4.206E-02	NOT IDENT.
PR-144	-1.932E+00	3.083E+00	3.204E+00	NOT IDENT.
PM-146	-4.870E-02	8.016E-02	8.311E-02	FAIL ABUN
ND-147	6.331E-01	5.660E+00	5.667E+00	FAIL ABUN
PM-147	-3.137E+02	7.203E+02	7.341E+02	NOT IDENT.
PM-149	2.687E+06	4.072E+06	4.248E+06	SHORT HLIF
EU-150	-1.308E-03	3.987E-02	3.988E-02	FAIL ABUN
EU-152	4.382E-02	1.426E-01	1.439E-01	FAIL ABUN
GD-153	-4.772E-02	7.781E-02	8.073E-02	FAIL ABUN
EU-154	2.816E-02	8.094E-02	8.193E-02	NOT IDENT.
EU-155	6.216E-02	9.171E-02	9.589E-02	FAIL ABUN
TB-160	5.328E-02	1.519E-01	1.537E-01	FAIL ABUN
HO-166M	-9.283E-03	5.226E-02	5.243E-02	FAIL ABUN
TM-171	-3.213E-01	3.659E+00	3.661E+00	FAIL ABUN
HF-172	-2.454E-02	1.845E-01	1.848E-01	FAIL ABUN

LU-172	3.600E-02	5.453E-02	5.689E-02	FAIL ABUN
LU-176	2.918E-02	3.380E-02	3.627E-02	FAIL ABUN
HF-181	-1.609E-02	1.182E-01	1.184E-01	NOT IDENT.
TA-182	5.166E-02	1.722E-01	1.738E-01	FAIL ABUN
RE-183	4.573E-02	8.224E-02	8.478E-02	FAIL ABUN
RE-184	3.704E-02	2.284E-01	2.290E-01	NOT IDENT.
W-188	4.713E-01	1.464E+01	1.464E+01	FAIL ABUN
IR-192	3.347E-02	6.322E-02	6.499E-02	FAIL ABUN
HG-203	3.073E-02	7.444E-02	7.572E-02	NOT IDENT.
BI-207	-2.332E-02	3.760E-02	3.904E-02	FAIL ABUN
PB-211	1.636E-01	1.003E+00	1.006E+00	NOT IDENT.
BI-212	5.985E-01	7.486E-01	7.958E-01	FAIL ABUN
RN-219	-3.394E-01	5.481E-01	5.691E-01	NOT IDENT.
RA-223	1.597E-01	9.513E-01	9.540E-01	FAIL ABUN
AC-227	2.718E-02	2.843E-01	2.846E-01	FAIL ABUN
TH-227	2.718E-02	2.843E-01	2.846E-01	FAIL ABUN
TH-229	1.292E-01	6.239E-01	6.266E-01	FAIL ABUN
TH-231	1.597E-01	9.513E-01	9.540E-01	FAIL ABUN
PA-233	-3.368E-02	7.659E-02	7.808E-02	FAIL ABUN
PA-234	1.534E-01	3.032E-01	3.110E-01	NOT IDENT.
PA-234M	2.656E+00	3.704E+00	3.893E+00	NOT IDENT.
NP-237	-3.368E-02	7.659E-02	7.808E-02	FAIL ABUN
NP-238	-4.378E+04	9.135E+05	9.137E+05	SHORT HLIF
NP-239	-6.485E-02	2.527E-01	2.543E-01	NOT IDENT.
PU-239	2.012E+02	3.200E+02	3.326E+02	NOT IDENT.
AM-241	3.338E-02	5.326E-02	5.535E-02	NOT IDENT.
CM-243	-6.585E-02	9.327E-02	9.788E-02	NOT IDENT.
BK-247	-2.502E-02	9.351E-02	9.418E-02	NOT IDENT.
CM-247	-4.428E-02	5.202E-02	5.572E-02	NOT IDENT.
CF-249	5.153E-02	5.625E-02	6.086E-02	NOT IDENT.
CF-251	1.281E-01	1.380E-01	1.496E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	89.8634	87.09	161.0635	136.47	155.7002
45.60	138.1930	87.57	161.2329	140.51	0.0000
46.54	150.8349	88.03	161.3955	143.76	160.2077
49.72	0.0000	88.34	161.5039	144.24	161.2324
51.35	146.7598	88.47	161.5498	145.44	169.6970
51.87	154.9447	89.96	162.0707	152.43	182.4936
52.39	145.2466	1093.63	162.3071	153.25	156.0871
52.97	132.5508	91.11	162.4697	323.87	148.9520
53.44	132.7423	92.59	162.9793	156.02	166.8621
54.07	135.9969	93.35	163.2398	158.56	176.7280
57.36	0.0000	94.56	163.6515	159.00	157.3958
57.53	160.6405	94.65	163.6824	162.33	151.6311
57.98	150.5309	94.67	163.6892	162.66	147.0485
59.27	144.6932	94.87	163.7569	163.33	142.5293
59.32	144.7139	97.43	156.8328	165.86	130.8815
59.54	160.0471	98.43	147.1196	176.31	158.3552
60.96	186.7064	98.44	147.1230	176.60	153.6733
61.17	189.8783	99.53	140.7432	177.52	147.2117
62.93	181.5729	100.11	149.2939	181.07	0.0000
63.29	181.7518	102.03	166.1394	181.52	180.2568
63.58	181.8957	103.18	191.2664	184.41	168.6644
64.28	182.2414	103.37	193.5883	143.76	160.3097
66.73	183.4369	105.21	158.1345	193.51	192.9103
67.24	183.6827	105.31	158.1651	197.03	181.0929
125.81	183.8943	106.12	158.4115	198.01	170.5874
67.75	183.9276	106.47	160.7821	201.83	184.6683
69.67	209.9066	109.28	171.8834	203.43	163.2681
70.83	210.5262	111.00	172.4356	205.31	177.7957
72.81	212.6267	111.76	0.0000	210.85	174.2061
72.87	212.6585	114.06	153.8845	215.65	163.2305
74.66	211.4827	116.30	0.0000	222.11	158.4123
74.82	211.5651	116.74	177.7092	227.09	139.1276
74.97	211.6424	119.76	147.3392	227.38	139.1718
77.11	212.7370	121.12	169.7860	228.16	0.0000
78.74	180.9930	121.22	169.8154	228.18	142.3221
79.69	173.3700	121.78	171.1449	116.74	142.3221
80.12	170.3301	122.06	171.2286	235.69	154.6800
80.19	170.3576	122.92	170.3163	235.96	154.7241
80.57	167.2909	123.07	175.0282	238.63	165.3729
81.00	185.1694	265.00	177.8399	238.98	0.0000
81.07	185.1992	125.81	179.3669	240.99	165.7870
81.75	222.5875	127.23	179.7969	242.00	165.9625
83.79	189.5930	127.91	164.1205	244.70	138.0770
84.00	189.6832	129.30	168.9232	252.40	0.0000
85.43	178.9061	131.20	170.3438	252.80	139.8532
86.55	160.8723	133.02	180.6405	254.15	0.0000
86.79	160.9566	133.52	173.6629	256.23	119.5475
86.94	161.0101	136.00	163.6294	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	123.6969	355.39	0.0000	584.27	60.9113
264.80	123.7149	356.01	107.4721	595.83	45.7835
265.00	126.8842	364.49	108.7894	427.87	45.5437
268.22	144.1159	366.42	0.0000	602.52	0.0000
269.46	123.2235	372.51	101.1766	604.72	31.8420
270.03	129.6158	375.05	129.9396	607.14	42.5088
271.23	120.2709	377.52	131.1021	609.32	46.8123
273.65	163.9046	356.01	134.5020	610.33	56.7708
276.40	129.3476	388.16	107.0109	614.28	46.2194
277.37	116.7323	388.63	109.8414	618.01	35.2639
277.60	110.3889	391.69	147.4017	620.36	41.7250
278.00	112.5538	264.66	123.9417	621.93	37.4746
279.20	117.9968	401.81	117.4652	630.19	0.0000
279.54	125.4794	402.40	126.9168	631.29	28.6855
279.70	129.7516	404.85	115.8350	633.25	39.8400
280.46	135.1662	410.95	121.0625	634.78	40.9474
283.69	125.9674	413.71	139.3001	635.95	25.1580
284.31	111.0856	414.70	125.1712	636.99	10.7874
285.41	118.6844	423.72	125.9495	645.85	28.8913
285.90	0.0000	427.09	131.0196	657.76	34.5063
287.50	123.1982	427.87	135.8724	657.90	0.0000
290.67	134.0854	433.94	124.8997	661.66	26.2008
293.27	0.0000	439.40	138.8549	664.57	0.0000
351.93	128.0244	453.88	139.5260	666.33	31.0007
295.96	107.9575	463.37	125.6858	666.50	31.0027
879.38	129.8547	468.07	140.7928	667.71	0.0000
299.98	123.0817	473.00	0.0000	677.62	17.5992
300.09	123.0938	475.06	133.1889	685.70	0.0000
300.13	123.0990	476.78	134.3199	695.00	26.9289
301.36	135.3841	477.60	133.3998	696.49	34.8730
302.85	125.1352	482.18	111.9765	696.51	34.8730
256.23	135.7592	487.02	106.3456	697.00	31.7104
304.85	130.5780	492.35	0.0000	697.30	33.3003
306.78	107.9096	497.08	86.9968	697.49	33.3032
308.46	122.2590	505.52	80.4004	702.65	20.3999
311.90	108.3930	507.63	0.0000	706.68	31.5845
316.51	89.6970	511.00	81.6684	711.68	26.0694
319.41	131.1313	514.00	63.9684	720.70	23.8378
320.08	113.5647	514.00	63.9688	721.93	0.0000
321.04	114.7609	520.40	67.9242	722.78	30.4761
323.87	132.7332	520.69	0.0000	722.91	27.2698
325.23	150.6011	522.65	0.0000	723.31	27.2746
328.76	117.7272	527.90	0.0000	724.19	20.8652
333.37	115.9463	528.26	53.9743	727.33	21.5639
333.97	116.0034	529.59	54.0158	733.00	17.7238
334.37	121.3973	529.87	0.0000	735.93	28.7464
338.28	115.2935	531.02	58.1397	333.97	31.0771
338.32	115.2966	537.26	61.4165	739.50	0.0000
311.90	114.8266	546.56	0.0000	747.24	25.5350
340.48	114.8266	552.55	52.6510	748.06	28.3820
340.55	114.8328	563.25	51.9214	752.31	24.6427
344.28	102.5805	569.33	42.7167	753.82	18.0197
345.93	106.3210	946.00	43.7616	756.73	18.9917
351.06	121.2298	569.70	45.8509	756.80	18.9925
351.93	121.3132	583.19	60.8759	884.68	11.4302

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	13.0734	1274.44	21.3951	1620.50	10.5765
766.42	16.3459	1001.03	11.4590	1621.92	10.5800
766.84	16.3487	1002.74	16.0818	1678.03	0.0000
772.60	0.0000	1004.73	19.6686	1690.97	4.6997
776.52	29.5476	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.6832
778.90	27.9339	1028.54	0.0000	1063.66	17.2057
783.70	0.0000	1037.84	14.7645	1771.35	12.4291
785.37	24.0275	1038.76	0.0000	1791.20	0.0000
792.07	19.8260	631.29	8.4609	1808.65	3.8539
794.95	22.1928	1048.07	8.4648	1810.72	0.0000
795.86	22.2008	1049.04	13.7601	1836.06	1.9377
810.06	19.9717	1050.41	22.2373		
810.29	24.9672	1063.66	13.8252		
344.28	24.9688	1077.00	16.0205		
810.76	28.3015	1077.34	11.7493		
815.77	21.4078	1085.87	16.0657		
1048.07	17.5345	1093.63	10.7365		
832.01	14.6909	1099.45	11.8316		
834.85	24.5122	1112.07	12.9580		
835.71	24.5204	1112.84	12.9614		
836.80	0.0000	1115.54	18.5317		
846.75	0.0000	1120.29	17.3216		
846.77	18.7163	1120.55	17.3229		
856.80	13.5622	1221.41	9.2822		
860.56	22.0703	1129.67	13.0283		
871.09	15.9092	1131.51	0.0000		
873.19	17.9121	1147.95	0.0000		
875.33	0.0000	1173.23	10.3716		
879.38	14.9619	1177.95	16.9955		
880.51	14.9683	1189.05	14.2090		
883.24	14.9835	1204.77	15.2260		
884.68	15.9912	1221.41	12.4305		
889.28	18.0209	1231.02	13.4233		
894.76	14.0450	1235.36	17.2799		
898.04	17.0754	1238.28	15.3728		
900.72	28.9564	1260.41	0.0000		
903.28	15.5271	1271.87	6.7891		
911.20	14.1305	1274.44	6.1761		
912.08	6.9233	1274.54	6.1763		
923.98	0.0000	1291.59	13.6519		
926.50	11.1645	1298.22	0.0000		
929.11	21.3341	1312.11	8.8248		
937.49	14.2655	1332.49	6.9014		
944.13	17.3635	1362.66	0.0000		
946.00	12.2646	1365.19	7.9554		
949.00	14.3239	1368.63	0.0000		
667.71	0.0000	1384.29	18.9874		
962.31	19.3839	1408.01	12.0649		
964.08	21.1595	1457.56	0.0000		
966.17	17.4987	1460.82	3.5657		
911.20	17.5157	1489.16	7.1807		
968.97	17.5157	1505.03	10.2972		
983.53	14.4973	1584.12	5.2448		
984.45	0.0000	1596.21	6.3112		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:52:08.15

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561990.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;261
Background date    : 26-JUN-2016 12:05:51
Sample date       : 7-JUN-2016 00:00:00. Acquisition date : 28-JUN-2016 12:48:44
Sample ID        : G1203561990. Sample quantity : 1.64249E+02 GRAM
Detector name    : GAM32. Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.29 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572486 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	70.36	23	21	0.89	141.82	139	6	6.50E-03	37.1	
2	0	93.47*	2	47	0.87	188.05	183	9	5.68E-04	731.0	
3	0	126.18	36	18	1.95	253.50	248	11	9.93E-03	28.9	
4	0	160.04	36	42	5.70	321.22	314	15	1.01E-02	41.9	
5	0	186.47*	19	32	1.02	374.09	369	11	5.40E-03	68.6	
6	0	196.80*	48	83	9.64	394.76	380	30	1.32E-02	58.1	
7	0	215.35	16	60	6.66	431.86	415	18	4.38E-03	120.3	
8	0	225.78	20	15	1.86	452.75	450	8	5.69E-03	38.8	
9	0	353.74*	1	25	1.70	708.72	701	10	3.49E-04	784.5	
10	1	356.27	14	13	1.58	713.79	711	14	3.95E-03	38.2	1.74E+00
11	1	359.88	17	12	1.58	721.00	711	14	4.80E-03	42.9	
12	0	511.40*	24	27	2.38	1024.12	1017	16	6.73E-03	65.3	
13	0	709.89	7	8	3.55	1421.22	1413	11	2.03E-03	84.1	
14	0	820.08	9	0	1.50	1641.67	1638	8	2.50E-03	33.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:52:09

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561990.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 28-JUN-2016 12:48:44
Sample ID	: G1203561990	Sample quantity	: 164.25 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA32	Detector geometry	: CAN
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:00.29 0.0%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RH-101	127.23	46	68.00*	6.273E+00	4.952E-02	5.014E-02	57.85
	198.01	59	73.00	5.269E+00	6.989E-02	7.077E-02	116.21
	325.23	-----	11.80	3.760E+00	-----	Line Not Found	-----
SN-117M	156.02	-----	2.11	5.965E+00	-----	Line Not Found	-----
	158.56	46	86.40*	5.900E+00	4.122E-02	1.237E-01	83.73
TE-123M	159.00	46	84.00*	5.900E+00	4.240E-02	4.806E-02	83.73
ANH-511	511.00	27	100.00*	2.756E+00	4.461E-02	4.461E-02	130.59

Flag: "*" = Keyline

```

*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*                                     DETECTOR AND SAMPLE DATA                      *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561990.CNF;1      *
* Acquisition date   : 28-JUN-2016 12:48:44 Sensitivity      : 3.000                *
* Detector ID        : GAM32 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.29 Half life ratio : *****      *
* Sample date       : 7-JUN-2016 00:00:00 Analyst initials: MXR1      *
* Sample ID         : G1203561990 Sample Quantity : 1.6425E+02 GRAM  *
* Batch Number      : 1572486 Wet Weight : 0.00000          *
* Wet wt corr       : 1.00000 Dry Weight : 0.00000           *
* Nuclide Library    : SOLID.NLB;6
*****
*                                     CALIBRATION INFORMATION                      *
*
* Eff. Cal. date    : 6-AUG-2015 09:24:00 Eff. Geometry    : CAN          *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
RH-101	5.014E-02	2.843E-02	3.443E-02
SN-117M	1.237E-01	1.015E-01	7.964E-02
TE-123M	4.806E-02	3.944E-02	3.099E-02
ANH-511	4.461E-02	5.709E-02	4.019E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.766E-01	2.790E-01	6.171E-01	NOT IDENT.
NA-22	-5.827E-03	2.441E-02	4.934E-02	NOT IDENT.
NA-24	0.000E+00	5.187E+08	0.000E+00	SHORT HLIF
AL-26	4.054E-03	2.513E-02	5.725E-02	NOT IDENT.
K-40	1.852E-01	3.091E-01	7.507E-01	NOT IDENT.
SC-46	4.226E-03	1.440E-02	3.608E-02	NOT IDENT.
V-48	3.051E-02	4.677E-02	1.140E-01	NOT IDENT.
CR-51	1.723E-01	2.997E-01	6.259E-01	NOT IDENT.
MN-54	3.269E-02	2.310E-02	5.758E-02	NOT IDENT.
CO-56	-1.832E-03	2.662E-02	5.324E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-5.532E-03	1.652E-02	2.841E-02	NOT IDENT.
CO-58	9.152E-03	2.284E-02	5.133E-02	NOT IDENT.
FE-59	-4.605E-03	4.384E-02	9.565E-02	NOT IDENT.
CO-60	3.797E-04	2.064E-02	4.609E-02	NOT IDENT.
ZN-65	-2.623E-05	4.288E-02	9.341E-02	NOT IDENT.
GE-68	-2.582E-01	8.143E-01	1.522E+00	NOT IDENT.
AS-73	-7.603E-02	1.024E+00	2.021E+00	NOT IDENT.
AS-74	-1.409E-02	5.846E-02	1.179E-01	NOT IDENT.
SE-75	-1.706E-03	3.117E-02	6.086E-02	NOT IDENT.
BR-77	-2.543E+01	4.102E+01	7.654E+01	NOT IDENT.
SR-82	-8.271E-02	2.492E-01	4.749E-01	NOT IDENT.
RB-83	-9.341E-03	4.362E-02	8.503E-02	NOT IDENT.
KR-85	1.182E+01	6.823E+00	1.442E+01	NOT IDENT.
SR-85	6.687E-02	3.867E-02	8.169E-02	NOT IDENT.
RB-86	-2.313E-01	6.331E-01	1.170E+00	NOT IDENT.

Y-88	-1.766E-02	3.391E-02	6.071E-02	NOT IDENT.
Y-91	-2.794E+00	1.019E+01	2.085E+01	NOT IDENT.
NB-94	4.209E-03	2.936E-02	5.163E-02	NOT IDENT.
NB-95	-7.524E-03	2.076E-02	4.021E-02	NOT IDENT.
NB-95M	-1.469E-02	8.468E-02	1.631E-01	NOT IDENT.
ZR-95	1.328E-02	4.655E-02	9.991E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	6.929E+08	0.000E+00	SHORT HLIF
MO-99	-4.200E+00	4.098E+01	8.125E+01	NOT IDENT.
TC-99M	0.000E+00	1.074E+24	0.000E+00	SHORT HLIF
RH-102	-1.723E-02	3.198E-02	5.947E-02	NOT IDENT.
RU-103	-4.962E-03	2.630E-02	5.291E-02	NOT IDENT.
RH-106	-1.530E-01	2.098E-01	3.742E-01	NOT IDENT.
RU-106	-1.530E-01	2.098E-01	3.742E-01	NOT IDENT.
AG-108M	-1.202E-02	1.967E-02	3.441E-02	NOT IDENT.
CD-109	1.031E-01	4.858E-01	9.158E-01	NOT IDENT.
AG-110M	-2.783E-02	2.534E-02	3.588E-02	NOT IDENT.
SN-113	1.479E-02	2.558E-02	5.586E-02	NOT IDENT.
CD-115	-4.597E+00	4.299E+01	8.916E+01	NOT IDENT.
SB-124	3.680E-02	4.165E-02	1.329E-01	NOT IDENT.
SB-125	-1.339E-02	5.389E-02	1.019E-01	NOT IDENT.
TE-125M	-1.188E+00	6.606E+00	1.327E+01	NOT IDENT.
I-126	1.513E-01	1.845E-01	4.263E-01	NOT IDENT.
SB-126	-4.874E-02	1.185E-01	2.241E-01	NOT IDENT.
SN-126	4.004E-02	4.192E-02	9.040E-02	NOT IDENT.
SB-127	-2.440E-01	1.911E+00	3.980E+00	NOT IDENT.
I-131	-1.000E-01	1.463E-01	2.120E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-5.078E-01	1.958E+00	3.269E+00	NOT IDENT.
BA-133	3.445E-02	2.578E-02	5.649E-02	FAIL ABUN
I-133	0.000E+00	5.523E+05	0.000E+00	SHORT HLIF
CS-134	8.004E-03	2.279E-02	5.023E-02	NOT IDENT.
CS-135	-5.011E-02	1.071E-01	1.981E-01	NOT IDENT.
I-135	0.000E+00	3.872E+22	0.000E+00	SHORT HLIF
CS-136	2.012E-02	8.309E-02	1.815E-01	NOT IDENT.
BA-137M	-4.087E-03	2.066E-02	4.027E-02	NOT IDENT.
CS-137	-4.318E-03	2.182E-02	4.254E-02	NOT IDENT.
CE-139	8.424E-03	1.888E-02	3.588E-02	NOT IDENT.
BA-140	2.530E-02	2.586E-01	5.316E-01	NOT IDENT.
LA-140	1.638E-02	7.798E-02	1.818E-01	NOT IDENT.
CE-141	1.115E-02	4.319E-02	8.815E-02	NOT IDENT.
CE-143	0.000E+00	1.882E+03	0.000E+00	SHORT HLIF
CE-144	9.741E-03	1.177E-01	2.409E-01	NOT IDENT.
PM-144	-2.682E-03	2.587E-02	5.045E-02	NOT IDENT.
PR-144	-1.999E-02	1.919E+00	3.799E+00	NOT IDENT.
PM-146	-1.197E-02	2.435E-02	4.682E-02	NOT IDENT.
ND-147	-6.782E-02	4.671E-01	9.517E-01	NOT IDENT.
PM-147	-4.224E+01	4.890E+02	8.716E+02	NOT IDENT.
PM-149	4.610E+01	4.335E+02	8.705E+02	NOT IDENT.
EU-150	1.476E-03	1.741E-02	3.451E-02	NOT IDENT.
EU-152	1.649E-02	6.154E-02	1.254E-01	NOT IDENT.
GD-153	-1.903E-02	5.302E-02	9.233E-02	FAIL ABUN
EU-154	-2.730E-02	7.135E-02	1.383E-01	NOT IDENT.
EU-155	-3.969E-02	5.649E-02	1.085E-01	NOT IDENT.
TB-160	4.736E-02	1.084E-01	2.291E-01	FAIL ABUN
HO-166M	5.479E-03	3.737E-02	7.005E-02	NOT IDENT.
TM-171	5.825E+00	2.230E+01	4.553E+01	NOT IDENT.
HF-172	0.000E+00	1.727E-01	2.405E-01	FAIL ABUN
LU-172	2.466E-03	3.037E-02	6.844E-02	NOT IDENT.
LU-176	9.471E-03	1.665E-02	3.527E-02	NOT IDENT.
HF-181	-1.204E-02	3.305E-02	6.397E-02	NOT IDENT.
TA-182	-4.129E-02	9.908E-02	1.916E-01	NOT IDENT.
RE-183	3.830E-02	1.832E-01	3.755E-01	NOT IDENT.
RE-184	-2.611E-02	7.301E-02	1.398E-01	NOT IDENT.
W-188	-7.961E-01	4.309E+00	8.374E+00	FAIL ABUN
IR-192	-6.361E-06	2.601E-02	5.068E-02	NOT IDENT.
HG-203	7.660E-03	2.780E-02	5.631E-02	FAIL ABUN
BI-207	-6.420E-03	2.801E-02	5.486E-02	NOT IDENT.
TL-208	2.164E-05	2.527E-02	5.198E-02	NOT IDENT.
PB-210	-4.730E+00	5.428E+00	1.010E+01	NOT IDENT.
BI-211	6.936E-02	1.544E-01	2.844E-01	NOT IDENT.
PB-211	1.843E-01	4.614E-01	9.530E-01	NOT IDENT.
BI-212	-2.603E-01	2.850E-01	4.742E-01	NOT IDENT.
PB-212	-2.087E-02	4.037E-02	7.618E-02	NOT IDENT.
BI-214	-3.561E-02	4.910E-02	9.167E-02	NOT IDENT.
PB-214	-4.243E-03	6.011E-02	1.027E-01	NOT IDENT.
RN-219	-2.701E-01	2.731E-01	4.467E-01	NOT IDENT.
RN-222	-3.561E-02	4.910E-02	9.167E-02	NOT IDENT.

RA-223	-5.609E-02	4.142E-01	7.975E-01	FAIL ABUN
RA-224	1.443E-01	3.984E-01	8.122E-01	NOT IDENT.
RA-226	-3.561E-02	4.910E-02	9.167E-02	NOT IDENT.
AC-227	-8.879E-02	1.618E-01	2.979E-01	NOT IDENT.
TH-227	-8.879E-02	1.618E-01	2.979E-01	NOT IDENT.
AC-228	2.797E-02	9.940E-02	2.098E-01	NOT IDENT.
RA-228	2.797E-02	9.940E-02	2.098E-01	NOT IDENT.
TH-228	-2.087E-02	4.037E-02	7.618E-02	NOT IDENT.
TH-229	1.637E-01	3.664E-01	6.811E-01	NOT IDENT.
TH-230	-3.561E-02	4.910E-02	9.167E-02	NOT IDENT.
PA-231	-1.504E-01	3.140E-01	5.769E-01	NOT IDENT.
TH-231	-5.609E-02	4.142E-01	7.975E-01	FAIL ABUN
TH-232	2.797E-02	9.940E-02	2.098E-01	NOT IDENT.
PA-233	1.114E-02	4.393E-02	8.867E-02	NOT IDENT.
PA-234	4.133E-04	1.621E-01	3.383E-01	FAIL ABUN
PA-234M	-2.754E+00	3.034E+00	5.094E+00	NOT IDENT.
TH-234	7.525E-01	1.096E+00	2.348E+00	FAIL ABUN
U-234	-3.561E-02	4.910E-02	9.167E-02	NOT IDENT.
U-235	-6.587E-02	1.238E-01	2.337E-01	FAIL ABUN
NP-237	1.114E-02	4.393E-02	8.867E-02	FAIL ABUN
NP-238	0.000E+00	9.378E+01	0.000E+00	SHORT HLIF
U-238	7.525E-01	1.096E+00	2.348E+00	FAIL ABUN
NP-239	-1.039E-01	1.520E-01	2.904E-01	NOT IDENT.
PU-239	-6.645E+01	2.003E+02	3.443E+02	NOT IDENT.
AM-241	-3.109E-02	1.352E-01	2.608E-01	NOT IDENT.
AM-243	1.248E-02	3.257E-02	6.397E-02	NOT IDENT.
CM-243	-5.042E-02	5.666E-02	1.065E-01	NOT IDENT.
BK-247	7.276E-03	5.445E-02	1.085E-01	NOT IDENT.
CM-247	-2.246E-02	2.541E-02	4.249E-02	NOT IDENT.
CF-249	5.315E-03	2.476E-02	5.027E-02	NOT IDENT.
CF-251	2.700E-02	7.415E-02	1.548E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RH-101	127.23	46	68.00*	6.273E+00	4.952E-02	5.014E-02	57.85
	198.01	59	73.00	5.269E+00	6.989E-02	7.077E-02	116.21
	325.23	-----	11.80	3.760E+00	-----	Line Not Found	-----
SN-117M	156.02	-----	2.11	5.965E+00	-----	Line Not Found	-----
	158.56	46	86.40*	5.900E+00	4.122E-02	1.237E-01	83.73
TE-123M	159.00	46	84.00*	5.900E+00	4.240E-02	4.806E-02	83.73
ANH-511	511.00	27	100.00*	2.756E+00	4.461E-02	4.461E-02	130.59

Flag: "*" = Keyline

Total number of lines in spectrum 14
Number of unidentified lines 4
Number of lines tentatively identified by NID 10 71.43%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RH-101	3.30Y	1.01	4.952E-02	5.014E-02	2.901E-02	57.85	
SN-117M	13.60D	3.00	4.122E-02	1.237E-01	1.035E-01	83.73	
TE-123M	119.20D	1.13	4.240E-02	4.806E-02	4.024E-02	83.73	
ANH-511	1.00E+09Y	1.00	4.461E-02	4.461E-02	5.825E-02	130.59	

Total Activity : 1.777E-01 2.665E-01

Grand Total Activity : 1.777E-01 2.665E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	70.36	32	28	0.89	141.82	139	6	6.50E-03	74.2	3.09E+00	T
0	93.47	3	62	0.87	188.05	183	9	5.68E-04	****	5.43E+00	T
0	186.47	24	40	1.02	374.09	369	11	5.40E-03	****	5.44E+00	T
0	215.35	19	74	6.66	431.86	415	18	4.38E-03	****	4.97E+00	T
0	225.78	25	18	1.86	452.75	450	8	5.69E-03	77.5	4.82E+00	T
0	353.74	1	29	1.70	708.72	701	10	3.49E-04	****	3.55E+00	
1	356.27	16	15	1.58	713.79	711	14	3.95E-03	76.3	3.53E+00	T
1	359.88	20	14	1.58	721.00	711	14	4.80E-03	85.9	3.51E+00	
0	709.89	8	8	3.55	1421.22	1413	11	2.03E-03	****	2.15E+00	
0	820.08	9	0	1.50	1641.67	1638	8	2.50E-03	66.7	1.90E+00	

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561990.CNF;1      *
* Acquisition date   : 28-JUN-2016 12:48:44 Sensitivity      : 3.000                *
* Detector ID        : GAM32 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.29 Half life ratio  : ***** *
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID   *
* Sample ID          : G1203561990 Analyst initials: MXR1        *
* Batch Number       : 1572486 Sample Quantity  : 1.6425E+02 GRAM *
* Wet wt corr        : 1.00000 Wet Weight       : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 6-AUG-2015 09:24:00 Eff. Geometry    : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
RH-101	1.563E-02
SN-117M	3.592E-02
TE-123M	1.398E-02
ANH-511	1.776E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	2.803E-01	NOT IDENT.
NA-22	1.962E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.218E-02	NOT IDENT.
K-40	3.231E-01	NOT IDENT.
SC-46	1.375E-02	NOT IDENT.
V-48	4.699E-02	NOT IDENT.
CR-51	2.832E-01	NOT IDENT.
MN-54	2.523E-02	NOT IDENT.
CO-56	2.244E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	1.288E-02	NOT IDENT.
CO-58	2.155E-02	NOT IDENT.
FE-59	3.706E-02	NOT IDENT.
CO-60	1.784E-02	NOT IDENT.
ZN-65	3.745E-02	NOT IDENT.
GE-68	6.211E-01	NOT IDENT.
AS-73	9.223E-01	NOT IDENT.
AS-74	4.868E-02	NOT IDENT.
SE-75	2.752E-02	NOT IDENT.
BR-77	3.497E+01	NOT IDENT.
SR-82	1.992E-01	NOT IDENT.
RB-83	3.626E-02	NOT IDENT.
KR-85	6.668E+00	NOT IDENT.
SR-85	3.778E-02	NOT IDENT.
RB-86	4.748E-01	NOT IDENT.
Y-88	2.284E-02	NOT IDENT.

Y-91	8.076E+00	NOT IDENT.
NB-94	2.286E-02	NOT IDENT.
NB-95	1.610E-02	NOT IDENT.
NB-95M	7.438E-02	NOT IDENT.
ZR-95	4.268E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	3.480E+01	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-102	2.482E-02	NOT IDENT.
RU-103	2.276E-02	NOT IDENT.
RH-106	1.589E-01	NOT IDENT.
RU-106	1.589E-01	NOT IDENT.
AG-108M	1.489E-02	NOT IDENT.
CD-109	4.204E-01	NOT IDENT.
AG-110M	1.271E-02	NOT IDENT.
SN-113	2.449E-02	NOT IDENT.
CD-115	3.746E+01	NOT IDENT.
SB-124	4.975E-02	NOT IDENT.
SB-125	4.386E-02	NOT IDENT.
TE-125M	6.104E+00	NOT IDENT.
I-126	1.858E-01	NOT IDENT.
SB-126	9.326E-02	NOT IDENT.
SN-126	4.154E-02	NOT IDENT.
SB-127	1.609E+00	NOT IDENT.
I-131	9.125E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.468E+00	NOT IDENT.
BA-133	2.527E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	2.122E-02	NOT IDENT.
CS-135	8.951E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.456E-02	NOT IDENT.
BA-137M	1.700E-02	NOT IDENT.
CS-137	1.796E-02	NOT IDENT.
CE-139	1.634E-02	NOT IDENT.
BA-140	2.338E-01	NOT IDENT.
LA-140	7.071E-02	NOT IDENT.
CE-141	4.050E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.103E-01	NOT IDENT.
PM-144	2.216E-02	NOT IDENT.
PR-144	1.669E+00	NOT IDENT.
PM-146	2.006E-02	NOT IDENT.
ND-147	4.044E-01	NOT IDENT.
PM-147	3.976E+02	NOT IDENT.
PM-149	3.911E+02	NOT IDENT.
EU-150	1.541E-02	NOT IDENT.
EU-152	5.590E-02	NOT IDENT.
GD-153	4.179E-02	FAIL ABUN
EU-154	5.490E-02	NOT IDENT.
EU-155	4.887E-02	NOT IDENT.
TB-160	1.001E-01	FAIL ABUN
HO-166M	2.951E-02	NOT IDENT.
TM-171	2.091E+01	NOT IDENT.
HF-172	1.106E-01	FAIL ABUN
LU-172	2.720E-02	NOT IDENT.
LU-176	1.585E-02	NOT IDENT.
HF-181	2.801E-02	NOT IDENT.
TA-182	7.560E-02	NOT IDENT.
RE-183	1.704E-01	NOT IDENT.
RE-184	5.533E-02	NOT IDENT.
W-188	3.690E+00	FAIL ABUN
IR-192	2.282E-02	NOT IDENT.
HG-203	2.550E-02	FAIL ABUN
BI-207	2.177E-02	NOT IDENT.
TL-208	2.298E-02	NOT IDENT.
PB-210	4.578E+00	NOT IDENT.
BI-211	1.281E-01	NOT IDENT.
PB-211	4.236E-01	NOT IDENT.
BI-212	1.916E-01	NOT IDENT.
PB-212	3.484E-02	NOT IDENT.
BI-214	4.002E-02	NOT IDENT.
PB-214	4.620E-02	NOT IDENT.
RN-219	1.931E-01	NOT IDENT.
RN-222	4.002E-02	NOT IDENT.
RA-223	3.554E-01	FAIL ABUN

RA-224	3.714E-01	NOT IDENT.
RA-226	4.002E-02	NOT IDENT.
AC-227	1.333E-01	NOT IDENT.
TH-227	1.333E-01	NOT IDENT.
AC-228	9.069E-02	NOT IDENT.
RA-228	9.069E-02	NOT IDENT.
TH-228	3.484E-02	NOT IDENT.
TH-229	3.124E-01	NOT IDENT.
TH-230	4.002E-02	NOT IDENT.
PA-231	2.576E-01	NOT IDENT.
TH-231	3.554E-01	FAIL ABUN
TH-232	9.069E-02	NOT IDENT.
PA-233	3.995E-02	NOT IDENT.
PA-234	1.375E-01	FAIL ABUN
PA-234M	2.072E+00	NOT IDENT.
TH-234	1.087E+00	FAIL ABUN
U-234	4.002E-02	NOT IDENT.
U-235	1.070E-01	FAIL ABUN
NP-237	3.995E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.087E+00	FAIL ABUN
NP-239	1.316E-01	NOT IDENT.
PU-239	1.552E+02	NOT IDENT.
AM-241	1.187E-01	NOT IDENT.
AM-243	2.921E-02	NOT IDENT.
CM-243	4.779E-02	NOT IDENT.
BK-247	4.921E-02	NOT IDENT.
CM-247	1.847E-02	NOT IDENT.
CF-249	2.218E-02	NOT IDENT.
CF-251	7.055E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561990.CNF;1
Acquisition date : 28-JUN-2016 12:48:44 Sensitivity : 3.000
Detector ID : GAM32 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.29 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561990 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.6425E+02 GRAM
Quantity Err(%) : 1.2177E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 6-AUG-2015 09:24:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
RH-101	5.014E-02	3.005E-02	3.005E-02
SN-117M	1.237E-01	1.019E-01	1.019E-01
TE-123M	4.806E-02	3.959E-02	3.959E-02
ANH-511	4.461E-02	5.722E-02	5.722E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.766E-01	2.800E-01	3.065E-01	NOT IDENT.
NA-22	-5.827E-03	2.441E-02	2.455E-02	NOT IDENT.
NA-24	3.972E+08	5.198E+08	5.498E+08	SHORT HLIF
AL-26	4.054E-03	2.514E-02	2.520E-02	NOT IDENT.
K-40	1.852E-01	3.095E-01	3.206E-01	NOT IDENT.
SC-46	4.226E-03	1.442E-02	1.454E-02	NOT IDENT.
V-48	3.051E-02	4.706E-02	4.903E-02	NOT IDENT.
CR-51	1.723E-01	3.002E-01	3.101E-01	NOT IDENT.
MN-54	3.269E-02	2.351E-02	2.775E-02	NOT IDENT.
CO-56	-1.832E-03	2.663E-02	2.664E-02	NOT IDENT.
MN-56	-1.000E+41	1.362E+42	0.000E+00	SHORT HLIF
CO-57	-5.532E-03	1.652E-02	1.671E-02	NOT IDENT.
CO-58	9.152E-03	2.287E-02	2.324E-02	NOT IDENT.
FE-59	-4.605E-03	4.385E-02	4.390E-02	NOT IDENT.
CO-60	3.797E-04	2.064E-02	2.064E-02	NOT IDENT.
ZN-65	-2.623E-05	4.288E-02	4.288E-02	NOT IDENT.
GE-68	-2.582E-01	8.159E-01	8.241E-01	NOT IDENT.
AS-73	-7.603E-02	1.024E+00	1.025E+00	NOT IDENT.
AS-74	-1.409E-02	5.848E-02	5.883E-02	NOT IDENT.
SE-75	-1.706E-03	3.118E-02	3.118E-02	NOT IDENT.
BR-77	-2.543E+01	4.403E+01	4.549E+01	NOT IDENT.
SR-82	-8.271E-02	2.494E-01	2.522E-01	NOT IDENT.
RB-83	-9.341E-03	4.364E-02	4.385E-02	NOT IDENT.
KR-85	1.182E+01	6.899E+00	8.718E+00	NOT IDENT.
SR-85	6.687E-02	3.910E-02	4.937E-02	NOT IDENT.
RB-86	-2.313E-01	6.347E-01	6.432E-01	NOT IDENT.

Y-88	-1.766E-02	3.394E-02	3.486E-02	NOT IDENT.
Y-91	-2.794E+00	1.020E+01	1.028E+01	NOT IDENT.
NB-94	4.209E-03	2.936E-02	2.942E-02	NOT IDENT.
NB-95	-7.524E-03	2.078E-02	2.106E-02	NOT IDENT.
NB-95M	-1.469E-02	8.470E-02	8.496E-02	NOT IDENT.
ZR-95	1.328E-02	4.658E-02	4.696E-02	NOT IDENT.
NB-97	-1.000E+41	4.157E+42	0.000E+00	SHORT HLIF
ZR-97	8.537E+08	6.968E+08	7.960E+08	SHORT HLIF
MO-99	-4.200E+00	4.098E+01	4.103E+01	NOT IDENT.
TC-99M	-1.442E+23	1.074E+24	0.000E+00	SHORT HLIF
RH-102	-1.723E-02	3.204E-02	3.297E-02	NOT IDENT.
RU-103	-4.962E-03	2.630E-02	2.640E-02	NOT IDENT.
RH-106	-1.530E-01	2.104E-01	2.214E-01	NOT IDENT.
RU-106	-1.530E-01	2.104E-01	2.214E-01	NOT IDENT.
AG-108M	-1.202E-02	1.969E-02	2.043E-02	NOT IDENT.
CD-109	1.031E-01	4.859E-01	4.881E-01	NOT IDENT.
AG-110M	-2.783E-02	2.568E-02	2.858E-02	NOT IDENT.
SN-113	1.479E-02	2.561E-02	2.646E-02	NOT IDENT.
CD-115	-4.597E+00	4.300E+01	4.305E+01	NOT IDENT.
SB-124	3.680E-02	4.175E-02	4.492E-02	NOT IDENT.
SB-125	-1.339E-02	5.391E-02	5.424E-02	NOT IDENT.
TE-125M	-1.188E+00	6.607E+00	6.628E+00	NOT IDENT.
I-126	1.513E-01	1.852E-01	1.973E-01	NOT IDENT.
SB-126	-4.874E-02	1.186E-01	1.207E-01	NOT IDENT.
SN-126	4.004E-02	4.205E-02	4.576E-02	NOT IDENT.
SB-127	-2.440E-01	1.911E+00	1.914E+00	NOT IDENT.
I-131	-1.000E-01	1.465E-01	1.533E-01	NOT IDENT.
I-132	1.000E+41	4.054E+41	0.000E+00	SHORT HLIF
TE-132	-5.078E-01	1.958E+00	1.972E+00	NOT IDENT.
BA-133	3.445E-02	2.596E-02	3.025E-02	FAIL ABUN
I-133	-4.047E+05	5.563E+05	5.855E+05	SHORT HLIF
CS-134	8.004E-03	2.281E-02	2.309E-02	NOT IDENT.
CS-135	-5.011E-02	1.073E-01	1.096E-01	NOT IDENT.
I-135	2.947E+21	3.875E+22	0.000E+00	SHORT HLIF
CS-136	2.012E-02	8.319E-02	8.369E-02	NOT IDENT.
BA-137M	-4.087E-03	2.066E-02	2.074E-02	NOT IDENT.
CS-137	-4.318E-03	2.183E-02	2.191E-02	NOT IDENT.
CE-139	8.424E-03	1.896E-02	1.933E-02	NOT IDENT.
BA-140	2.530E-02	2.586E-01	2.589E-01	NOT IDENT.
LA-140	1.638E-02	7.799E-02	7.834E-02	NOT IDENT.
CE-141	1.115E-02	4.320E-02	4.349E-02	NOT IDENT.
CE-143	-8.206E+02	1.884E+03	1.920E+03	SHORT HLIF
CE-144	9.741E-03	1.177E-01	1.177E-01	NOT IDENT.
PM-144	-2.682E-03	2.587E-02	2.590E-02	NOT IDENT.
PR-144	-1.999E-02	1.919E+00	1.919E+00	NOT IDENT.
PM-146	-1.197E-02	2.438E-02	2.497E-02	NOT IDENT.
ND-147	-6.782E-02	4.672E-01	4.682E-01	NOT IDENT.
PM-147	-4.224E+01	4.890E+02	4.893E+02	NOT IDENT.
PM-149	4.610E+01	4.336E+02	4.341E+02	NOT IDENT.
EU-150	1.476E-03	1.741E-02	1.743E-02	NOT IDENT.
EU-152	1.649E-02	6.156E-02	6.201E-02	NOT IDENT.
GD-153	-1.903E-02	5.304E-02	5.373E-02	FAIL ABUN
EU-154	-2.730E-02	7.139E-02	7.244E-02	NOT IDENT.
EU-155	-3.969E-02	5.661E-02	5.937E-02	NOT IDENT.
TB-160	4.736E-02	1.087E-01	1.108E-01	FAIL ABUN
HO-166M	5.479E-03	3.738E-02	3.746E-02	NOT IDENT.
TM-171	5.825E+00	2.232E+01	2.247E+01	NOT IDENT.
HF-172	3.046E-01	1.811E-01	2.273E-01	FAIL ABUN
LU-172	2.466E-03	3.037E-02	3.039E-02	NOT IDENT.
LU-176	9.471E-03	1.668E-02	1.722E-02	NOT IDENT.
HF-181	-1.204E-02	3.306E-02	3.351E-02	NOT IDENT.
TA-182	-4.129E-02	9.914E-02	1.009E-01	NOT IDENT.
RE-183	3.830E-02	1.832E-01	1.841E-01	NOT IDENT.
RE-184	-2.611E-02	7.314E-02	7.408E-02	NOT IDENT.
W-188	-7.961E-01	4.311E+00	4.326E+00	FAIL ABUN
IR-192	-6.361E-06	2.601E-02	2.601E-02	NOT IDENT.
HG-203	7.660E-03	2.782E-02	2.803E-02	FAIL ABUN
BI-207	-6.420E-03	2.804E-02	2.819E-02	NOT IDENT.
TL-208	2.164E-05	2.527E-02	2.527E-02	NOT IDENT.
PB-210	-4.730E+00	5.456E+00	5.858E+00	NOT IDENT.
BI-211	6.936E-02	1.545E-01	1.577E-01	NOT IDENT.
PB-211	1.843E-01	4.617E-01	4.691E-01	NOT IDENT.
BI-212	-2.603E-01	2.864E-01	3.095E-01	NOT IDENT.
PB-212	-2.087E-02	4.042E-02	4.150E-02	NOT IDENT.
BI-214	-3.561E-02	4.920E-02	5.176E-02	NOT IDENT.
PB-214	-4.243E-03	6.011E-02	6.014E-02	NOT IDENT.
RN-219	-2.701E-01	2.758E-01	3.015E-01	NOT IDENT.
RN-222	-3.561E-02	4.920E-02	5.176E-02	NOT IDENT.

RA-223	-5.609E-02	4.142E-01	4.150E-01	FAIL ABUN
RA-224	1.443E-01	3.987E-01	4.039E-01	NOT IDENT.
RA-226	-3.561E-02	4.920E-02	5.176E-02	NOT IDENT.
AC-227	-8.879E-02	1.624E-01	1.672E-01	NOT IDENT.
TH-227	-8.879E-02	1.624E-01	1.672E-01	NOT IDENT.
AC-228	2.797E-02	9.950E-02	1.003E-01	NOT IDENT.
RA-228	2.797E-02	9.950E-02	1.003E-01	NOT IDENT.
TH-228	-2.087E-02	4.042E-02	4.150E-02	NOT IDENT.
TH-229	1.637E-01	3.666E-01	3.740E-01	NOT IDENT.
TH-230	-3.561E-02	4.920E-02	5.176E-02	NOT IDENT.
PA-231	-1.504E-01	3.159E-01	3.231E-01	NOT IDENT.
TH-231	-5.609E-02	4.142E-01	4.150E-01	FAIL ABUN
TH-232	2.797E-02	9.950E-02	1.003E-01	NOT IDENT.
PA-233	1.114E-02	4.395E-02	4.423E-02	NOT IDENT.
PA-234	4.133E-04	1.621E-01	1.621E-01	FAIL ABUN
PA-234M	-2.754E+00	3.073E+00	3.314E+00	NOT IDENT.
TH-234	7.525E-01	1.111E+00	1.161E+00	FAIL ABUN
U-234	-3.561E-02	4.920E-02	5.176E-02	NOT IDENT.
U-235	-6.587E-02	1.239E-01	1.274E-01	FAIL ABUN
NP-237	1.114E-02	4.395E-02	4.423E-02	FAIL ABUN
NP-238	3.726E+00	9.378E+01	9.380E+01	SHORT HLIF
U-238	7.525E-01	1.111E+00	1.161E+00	FAIL ABUN
NP-239	-1.039E-01	1.524E-01	1.595E-01	NOT IDENT.
PU-239	-6.645E+01	2.004E+02	2.026E+02	NOT IDENT.
AM-241	-3.109E-02	1.353E-01	1.360E-01	NOT IDENT.
AM-243	1.248E-02	3.259E-02	3.307E-02	NOT IDENT.
CM-243	-5.042E-02	5.694E-02	6.131E-02	NOT IDENT.
BK-247	7.276E-03	5.448E-02	5.457E-02	NOT IDENT.
CM-247	-2.246E-02	2.574E-02	2.766E-02	NOT IDENT.
CF-249	5.315E-03	2.477E-02	2.488E-02	NOT IDENT.
CF-251	2.700E-02	7.422E-02	7.521E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	30.6783	87.09	34.1519	136.47	35.2655
45.60	41.7992	87.57	26.9697	140.51	38.1966
46.54	36.3630	88.03	38.0142	143.76	45.7895
49.72	41.0070	88.34	38.0292	144.24	43.0050
51.35	34.4563	88.47	38.0355	145.44	35.5656
51.87	34.4876	89.96	35.2840	152.43	30.1416
52.39	37.8592	90.64	36.7264	153.25	30.1638
52.97	32.3240	91.11	36.7478	154.21	31.6992
53.44	37.9276	92.59	38.9389	156.02	34.7740
54.07	32.3847	93.35	38.9752	158.56	28.4120
57.36	0.0000	94.56	32.6454	159.00	28.4228
57.53	28.0794	94.65	32.6491	162.33	33.4461
57.98	29.2239	94.67	32.6498	162.66	33.4557
59.27	31.5377	94.87	32.6578	163.33	41.0830
59.32	31.5402	97.43	37.0310	165.86	27.4480
59.54	38.3123	98.43	33.2724	176.31	30.7651
60.96	51.9517	98.44	33.2728	176.60	26.9259
61.17	48.5796	99.53	33.9104	177.52	29.8331
62.93	27.1890	100.11	28.5756	181.07	33.9727
63.29	28.3376	102.03	29.5344	181.52	33.9848
63.58	23.8143	103.18	39.4314	184.41	32.5151
64.28	38.5979	103.37	39.4401	185.72	29.4491
66.73	49.5661	105.21	38.6248	193.51	32.7476
67.24	42.7620	105.31	38.6290	197.03	32.8361
67.68	30.8088	106.12	35.0678	198.01	32.8607
67.75	30.8120	106.47	35.0816	201.83	32.9555
69.67	40.0547	109.28	47.8250	203.43	28.8052
70.83	41.2683	111.00	37.0669	205.31	27.5343
72.81	27.5903	111.76	35.2881	210.85	32.5836
72.87	27.5928	114.06	41.7259	215.65	25.3650
74.66	30.4287	116.30	47.2819	222.11	28.6671
74.82	30.4354	116.74	42.7556	227.09	27.1689
74.97	32.2868	119.76	34.4180	227.38	28.7730
77.11	35.8521	121.12	38.0179	228.16	30.3879
78.74	31.2955	121.22	38.0218	228.18	25.5900
79.69	27.8540	121.78	32.1911	235.69	39.1860
80.12	26.7089	122.06	38.0550	235.96	39.1931
80.19	26.7113	122.92	42.4837	238.63	37.2504
80.57	30.2107	123.07	32.2339	238.98	38.2661
81.00	31.3907	123.68	33.7203	240.99	32.2673
81.07	31.3937	125.81	32.1407	242.00	29.2620
81.75	23.2756	127.23	32.3706	244.70	36.3906
83.79	42.0086	127.91	41.2275	252.40	25.3988
84.00	35.8922	129.30	33.9124	252.80	22.3567
85.43	32.4505	131.20	35.4539	254.15	0.0000
86.55	36.8887	133.02	38.8472	256.23	32.5908
86.79	36.9000	133.52	37.9408	260.90	31.6665
86.94	34.1454	136.00	37.1048	264.66	30.7178

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	29.6965	364.49	22.5253	600.60	14.3540
265.00	29.7000	366.42	24.9320	602.52	0.0000
268.22	36.9432	372.51	20.6589	604.72	16.2919
269.46	32.8638	375.05	15.2416	607.14	19.1831
270.03	25.6840	377.52	15.2603	609.32	17.2780
271.23	34.9561	383.85	17.4946	610.33	13.4432
273.65	33.9784	388.16	16.4355	614.28	19.2314
276.40	23.7219	388.63	14.2473	618.01	13.4798
277.37	29.9279	391.69	10.9758	620.36	20.2361
277.60	31.9962	400.66	18.7388	621.93	18.3190
278.00	34.0690	401.81	26.4694	630.19	0.0000
279.20	26.8617	402.40	26.4767	631.29	13.5420
279.54	31.0007	404.85	16.5669	633.25	8.7113
279.70	27.9031	410.95	17.7219	634.78	5.8106
280.46	31.0176	413.71	22.1808	635.95	10.6571
283.69	20.7187	414.70	24.4103	636.99	9.6917
284.31	31.0895	423.72	15.5981	645.85	14.5814
285.41	22.8141	427.09	11.1586	657.76	8.7840
285.90	21.7835	427.87	15.6276	657.90	0.0000
287.50	20.7660	433.94	21.2672	661.66	10.7500
290.67	20.8047	439.40	17.9529	664.57	0.0000
293.27	0.0000	453.88	17.1640	666.33	7.8303
295.22	25.0327	463.37	13.6062	666.50	8.8095
295.96	27.1303	468.07	9.0890	667.71	0.0000
298.58	26.1265	473.00	23.6806	677.62	9.8242
299.98	24.0560	475.06	22.7896	685.70	6.8951
300.09	25.1034	476.78	19.1571	695.00	13.8315
300.13	25.1041	477.60	19.1638	696.49	18.7806
301.36	30.3554	482.18	21.0291	696.51	17.7921
302.85	24.0957	487.02	11.9099	697.00	15.8176
304.50	23.0699	492.35	13.7725	697.30	16.8078
304.85	23.0742	497.08	14.7191	697.49	16.8091
306.78	18.8998	505.52	18.4619	702.65	18.1570
308.46	27.3259	507.63	0.0000	706.68	19.8330
311.90	24.2196	511.00	19.4276	711.68	8.2770
316.51	27.4496	514.00	20.0681	720.70	11.9525
319.41	30.6660	514.00	20.0686	721.93	0.0000
320.08	22.2148	520.40	13.4130	722.78	5.9802
321.04	16.9343	520.69	14.8590	722.91	5.9804
323.87	24.3810	522.65	0.0000	723.31	3.9874
325.23	30.7643	527.90	10.2446	724.19	6.9800
328.76	18.0690	528.26	10.2462	727.33	13.9737
333.37	18.1139	529.59	12.1151	733.00	10.9984
333.97	22.3833	529.87	0.0000	735.93	14.0109
334.37	26.6525	531.02	12.1221	737.46	8.0100
338.28	18.1616	537.26	16.8249	739.50	13.0244
338.32	18.1618	546.56	0.0000	747.24	10.0425
340.48	26.7395	552.55	11.2822	748.06	10.0449
340.55	21.3922	563.25	11.3279	752.31	14.0810
344.28	19.2910	569.33	10.4073	753.82	9.0562
345.93	19.6141	569.50	8.5157	756.73	9.0642
351.06	20.6502	569.70	8.5162	756.80	9.0644
351.93	24.1025	583.19	14.2643	763.94	7.0653
355.39	0.0000	584.27	16.1724	765.81	8.0791
356.01	25.8787	595.83	9.5530	766.42	9.0907

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	8.0816	1002.74	8.6133	1678.03	0.0000
772.60	0.0000	1004.73	6.4632	1690.97	0.0000
776.52	12.1573	1021.30	0.0000	1750.46	0.0000
777.92	13.1758	1025.87	0.0000	1764.49	2.0827
778.90	11.1520	1028.54	0.0000	1770.23	3.1268
783.70	11.1678	1037.84	7.6009	1771.35	2.0850
785.37	8.1262	1038.76	0.0000	1791.20	0.0000
792.07	7.1242	1046.59	6.5288	1808.65	3.1459
794.95	8.1488	1048.07	5.4426	1810.72	0.0000
795.86	7.1321	1049.04	6.5326	1836.06	6.3186
801.95	9.1861	1050.41	3.2673		
810.06	8.1846	1063.66	6.5552		
810.29	8.1852	1077.00	7.6716		
810.45	7.1624	1077.34	7.6720		
810.76	6.1397	1085.87	7.6874		
815.77	5.1238	1093.63	4.5839		
818.51	6.8371	1099.45	4.5900		
832.01	11.3241	1112.07	10.1272		
834.85	4.1212	1112.84	9.2082		
835.71	8.2443	1115.54	5.5283		
836.80	0.0000	1120.29	5.5342		
846.75	0.0000	1120.55	5.5347		
846.77	10.3374	1121.30	4.6130		
856.80	9.3296	1129.67	2.7729		
860.56	4.1508	1131.51	0.0000		
871.09	13.5288	1147.95	0.0000		
873.19	12.4954	1173.23	5.5996		
875.33	0.0000	1177.95	4.6712		
879.38	11.4732	1189.05	7.4919		
880.51	5.2167	1204.77	5.6379		
883.24	12.5294	1221.41	7.5439		
884.68	9.4006	1231.02	7.5592		
889.28	2.0916	1235.36	6.6203		
894.76	10.4734	1238.28	2.8390		
898.04	4.1931	1260.41	0.0000		
900.72	8.3920	1271.87	2.8588		
903.28	7.3479	1274.44	7.6276		
911.20	8.4154	1274.54	6.6742		
912.08	8.4172	1291.59	0.9568		
923.98	0.0000	1298.22	0.0000		
926.50	0.0000	1312.11	7.6859		
929.11	9.5117	1332.49	3.8586		
937.49	9.5324	1362.66	0.0000		
944.13	8.4877	1365.19	4.8543		
946.00	6.3688	1368.63	0.0000		
949.00	5.3114	1384.29	3.8978		
954.55	0.0000	1408.01	7.8311		
962.31	7.4613	1457.56	0.0000		
964.08	7.4645	1460.82	2.9657		
966.17	7.4684	1489.16	6.9561		
968.97	7.4737	1505.03	4.9829		
983.53	3.2147	1584.12	3.0319		
984.45	0.0000	1596.21	3.0382		
996.26	7.5247	1620.50	2.0339		
1001.03	11.8384	1621.92	1.0172		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:52:57.03

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561991.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33.CNF;221
Background date    : 27-JUN-2016 10:34:06
Sample date       : 11-MAY-2016 15:10:00 Acquisition date : 28-JUN-2016 12:49:09
Sample ID        : G1203561991 Sample quantity : 1.42060E+02 GRAM
Detector name     : GAM33 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:01.09 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572486 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.30*	3	123	0.57	126.72	123	8	9.01E-04	620.7	
2	0	76.16	191	221	2.79	152.39	145	13	5.30E-02	17.6	
3	0	92.81*	52	143	1.21	185.64	182	10	1.44E-02	49.5	
4	0	109.79*	12	74	0.85	219.56	217	6	3.21E-03	127.2	
5	0	185.84*	50	89	1.77	371.49	367	8	1.39E-02	39.5	
6	0	209.20	19	107	1.36	418.14	415	9	5.29E-03	100.2	
7	5	238.61*	264	70	1.20	476.90	471	16	7.32E-02	8.2	1.28E+00
8	5	241.65	61	83	1.51	482.98	471	16	1.70E-02	33.4	
9	0	270.70	28	95	0.86	541.00	536	10	7.78E-03	67.8	
10	3	295.23	79	56	1.69	590.01	585	25	2.20E-02	21.9	1.81E+00
11	3	300.73	32	59	1.70	601.00	585	25	8.84E-03	48.3	
12	0	328.46	41	61	1.57	656.41	651	10	1.14E-02	39.3	
13	0	338.72	56	85	1.25	676.92	674	11	1.56E-02	33.4	
14	0	351.87*	161	86	1.48	703.19	698	13	4.46E-02	14.3	
15	0	463.32	30	60	1.83	925.91	919	10	8.23E-03	52.9	
16	0	480.79	18	73	4.79	960.82	950	17	5.03E-03	110.2	
17	0	510.97*	23	56	1.81	1021.15	1013	14	6.27E-03	83.4	
18	0	582.84*	91	9	1.26	1164.79	1158	13	2.53E-02	13.0	
19	0	609.35*	107	24	1.06	1217.78	1212	11	2.98E-02	13.5	
20	0	622.71	24	13	0.56	1244.49	1237	14	6.55E-03	39.3	
21	0	629.68	6	16	1.03	1258.43	1252	8	1.64E-03	124.4	
22	0	661.63	915	19	1.54	1322.29	1316	13	2.54E-01	3.5	
23	0	695.99	13	6	0.54	1390.98	1387	8	3.52E-03	46.6	
24	0	727.23*	27	13	1.17	1453.45	1447	10	7.58E-03	32.2	
25	0	730.32	10	4	1.30	1459.62	1457	6	2.74E-03	46.2	
26	0	793.74*	22	0	0.75	1586.44	1580	13	6.03E-03	23.8	
27	0	841.28	9	30	5.58	1681.50	1663	20	2.50E-03	152.8	
28	0	859.70	23	16	1.45	1718.34	1710	16	6.47E-03	43.6	
29	0	911.17*	61	7	1.62	1821.28	1814	13	1.70E-02	16.2	
30	0	933.97	15	2	0.51	1866.88	1861	10	4.12E-03	32.5	
31	0	968.96*	34	7	1.38	1936.86	1932	11	9.39E-03	24.1	
32	0	978.91	9	4	0.94	1956.75	1951	9	2.39E-03	55.8	
33	0	1001.45*	9	6	1.95	2001.84	1997	8	2.45E-03	66.6	
34	0	1064.05	8	4	0.95	2127.06	2123	8	2.22E-03	55.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1120.50*	17	5	0.99	2240.00	2234	11	4.71E-03	37.3	
36	0	1124.27*	6	8	1.63	2247.53	2244	7	1.77E-03	82.4	
37	0	1252.42	9	4	1.11	2503.94	2500	7	2.36E-03	50.1	
38	0	1460.92*	125	8	1.65	2921.24	2914	15	3.48E-02	10.3	
39	0	1764.71*	18	0	2.17	3529.50	3523	11	5.05E-03	24.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:52:58

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561991.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 15:10:00 Acquisition date : 28-JUN-2016 12:49:09
Sample ID         : G1203561991 Sample quantity  : 142.06 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA33 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:01.09 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated : No Systematic Error   : 0.00 %
Efficiency type   : Linear Efficiencies at  : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	74.82	TH-228	77.11
PB-214	74.82	PB-212	77.11
PB-214	74.82	PB-214	77.11
PB-214	77.11	AM-243	74.66
PB-214	77.11	TH-228	74.82
PB-214	77.11	PB-212	74.82
PB-214	77.11	TH-228	77.11
PB-214	77.11	PB-212	77.11
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.133E+00	5.262E+00	5.262E+00	20.69	OK
RH-106	621.93	9.93*	2.217E+00	5.866E-01	6.415E-01	78.70	OK
	1050.41	1.56	1.480E+00	----- Line	Not Found	-----	Absent
RU-106	621.93	9.93*	2.217E+00	5.866E-01	6.415E-01	78.70	OK
	1050.41	1.56	1.480E+00	----- Line	Not Found	-----	Absent
TE-125M	109.28	0.27*	5.975E+00	4.522E+00	8.067E+00	254.41	OK
BA-137M	661.66	89.90*	2.115E+00	2.623E+00	2.631E+00	6.90	OK
CS-137	661.66	85.10*	2.115E+00	2.771E+00	2.779E+00	6.90	OK
PR-144	696.51	1.34*	2.033E+00	2.526E+00	2.839E+00	93.28	OK
	1489.16	0.28	1.115E+00	----- Line	Not Found	-----	Absent
TL-208	277.37	6.60	4.258E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.335E+00	2.531E-01	2.531E-01	26.06	OK
	860.56	12.50	1.728E+00	5.739E-01	5.739E-01	87.18	OK
BI-211	72.87	1.23	3.591E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.513E+00	3.270E-01	3.270E-01	290.03	OK
PB-212	74.82	10.28	3.937E+00	2.125E+00	2.125E+00	52.63	OK
	77.11	17.10	3.937E+00	1.277E+00	1.277E+00	52.63	OK
	238.63	43.60*	4.776E+00	7.519E-01	7.519E-01	16.39	OK
	300.09	3.30	3.992E+00	1.407E+00	1.407E+00	96.55	OK
BI-214	609.32	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07	OK
	1120.29	14.92	1.407E+00	4.196E-01	4.197E-01	74.64	OK
	1764.49	15.30	9.591E-01	6.175E-01	6.176E-01	49.76	OK
PB-214	74.82	5.80	3.800E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.033E+00	----- Line	Not Found	-----	<<INT Reject
	87.09	3.41	4.892E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.727E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.052E+00	6.201E-01	6.201E-01	43.75	OK
	351.93	35.60*	3.512E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07	OK
	1120.29	14.92	1.407E+00	4.196E-01	4.197E-01	74.64	OK
	1764.49	15.30	9.591E-01	6.175E-01	6.176E-01	49.76	OK
RA-224	240.99	4.10*	4.732E+00	7.730E-01	7.730E-01	172.99	OK
RA-226	609.32	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07	OK
	1120.29	14.92	1.407E+00	4.196E-01	4.197E-01	74.64	OK
	1764.49	15.30	9.591E-01	6.175E-01	6.176E-01	49.76	OK
AC-228	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.624E+00	7.936E-01	7.936E-01	66.89	OK
	794.95	4.25	1.838E+00	1.491E+00	1.491E+00	47.53	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	7.615E-01	7.615E-01	32.33	OK
	968.97	15.80	1.576E+00	7.151E-01	7.151E-01	48.12	OK
RA-228	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.624E+00	7.936E-01	7.936E-01	66.89	OK
	794.95	4.25	1.838E+00	1.491E+00	1.491E+00	47.53	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	7.615E-01	7.615E-01	32.33	OK
	968.97	15.80	1.576E+00	7.151E-01	7.151E-01	48.12	OK
TH-228	74.82	10.28	3.937E+00	2.125E+00	2.125E+00	52.63	OK
	77.11	17.10	3.937E+00	1.277E+00	1.277E+00	52.63	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	238.63	43.60*	4.776E+00	7.519E-01	7.519E-01	16.39	OK
	300.09	3.30	3.992E+00	1.407E+00	1.407E+00	96.55	OK
	609.32	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07	OK
	1120.29	14.92	1.407E+00	4.196E-01	4.196E-01	74.64	OK
PA-231	1764.49	15.30	9.591E-01	6.175E-01	6.175E-01	49.76	OK
	283.69	1.70	4.183E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.992E+00	8.680E-01	8.680E-01	96.55	OK
TH-232	105.21	1.10	5.839E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.624E+00	7.936E-01	7.936E-01	66.89	OK
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	7.615E-01	7.615E-01	32.33	OK
TH-234	968.97	15.80	1.576E+00	7.151E-01	7.151E-01	48.12	OK
	63.29	3.70*	2.455E+00	2.347E-01	2.347E-01	1241.46	OK
	92.59	4.23	5.270E+00	1.484E+00	1.484E+00	99.09	OK
U-234	609.32	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07	OK
	1120.29	14.92	1.407E+00	4.196E-01	4.196E-01	74.64	OK
	1764.49	15.30	9.591E-01	6.175E-01	6.175E-01	49.76	OK
U-238	63.29	3.70*	2.455E+00	2.347E-01	2.347E-01	1241.46	OK
	92.59	4.23	5.270E+00	1.484E+00	1.484E+00	99.09	OK
	43.53	5.90	2.461E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	3.937E+00	3.250E-01	3.250E-01	52.63	OK
	511.00	100.00*	2.593E+00	4.854E-02	4.854E-02	166.89	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561991.CNF;1
* Acquisition date   : 28-JUN-2016 12:49:09 Sensitivity      : 3.000
* Detector ID        : GAM33 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:01.09 Half life ratio : *****
* Sample date        : 11-MAY-2016 15:10:00 Analyst initials: MXR1
* Sample ID          : G1203561991 Sample Quantity : 1.4206E+02 GRAM
* Batch Number       : 1572486 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.262E+00	1.067E+00	6.877E-01
RH-106	6.415E-01	4.947E-01	6.874E-01
RU-106	6.415E-01	4.947E-01	6.874E-01
TE-125M	8.067E+00	2.011E+01	3.033E+01
BA-137M	2.631E+00	1.780E-01	6.611E-02
CS-137	2.779E+00	1.881E-01	6.984E-02
PR-144	2.839E+00	2.595E+00	5.196E+00
TL-208	2.531E-01	6.464E-02	6.891E-02
BI-211	3.270E-01	9.294E-01	4.712E-01
PB-212	7.519E-01	1.208E-01	1.124E-01
BI-214	5.745E-01	1.524E-01	1.619E-01
PB-214	7.388E-01	2.076E-01	3.117E-01
RN-222	5.745E-01	1.524E-01	1.619E-01
RA-224	7.730E-01	1.311E+00	1.205E+00
RA-226	5.745E-01	1.524E-01	1.619E-01
AC-228	7.615E-01	2.413E-01	2.377E-01
RA-228	7.615E-01	2.413E-01	2.377E-01
TH-228	7.519E-01	1.208E-01	1.124E-01
TH-230	5.745E-01	1.524E-01	1.619E-01
PA-231	8.680E-01	8.213E-01	1.036E+00
TH-232	7.615E-01	2.413E-01	2.377E-01
TH-234	2.347E-01	2.856E+00	2.863E+00
U-234	5.745E-01	1.524E-01	1.619E-01
U-238	2.347E-01	2.856E+00	2.863E+00
AM-243	3.250E-01	1.676E-01	1.187E-01
ANH-511	4.854E-02	7.939E-02	5.929E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	6.163E-01	6.662E-01	1.334E+00	NOT IDENT.
NA-22	-1.419E-02	3.234E-02	6.127E-02	NOT IDENT.
NA-24	0.000E+00	3.514E+21	0.000E+00	SHORT HLIF
AL-26	-1.716E-02	3.797E-02	6.929E-02	NOT IDENT.

SC-46	-4.674E-02	4.301E-02	6.693E-02	FAIL ABUN
V-48	4.384E-02	3.120E-01	5.473E-01	NOT IDENT.
CR-51	-4.111E-01	9.482E-01	1.727E+00	NOT IDENT.
MN-54	1.744E-02	3.493E-02	7.414E-02	NOT IDENT.
CO-56	4.396E-03	5.029E-02	1.001E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-3.310E-02	2.973E-02	5.030E-02	NOT IDENT.
CO-58	1.018E-02	4.455E-02	9.282E-02	NOT IDENT.
FE-59	-3.678E-02	1.192E-01	2.215E-01	NOT IDENT.
CO-60	-4.650E-03	3.758E-02	7.468E-02	NOT IDENT.
ZN-65	-5.132E-02	8.459E-02	1.190E-01	NOT IDENT.
GE-68	1.366E+00	1.222E+00	2.832E+00	NOT IDENT.
AS-73	-5.939E-01	1.544E+00	2.920E+00	NOT IDENT.
AS-74	2.049E-01	3.104E-01	6.447E-01	NOT IDENT.
SE-75	2.278E-02	6.324E-02	1.157E-01	NOT IDENT.
BR-77	0.000E+00	2.678E+05	0.000E+00	SHORT HLIF
SR-82	-1.946E-01	7.155E-01	1.363E+00	NOT IDENT.
RB-83	2.839E-02	1.151E-01	2.181E-01	NOT IDENT.
KR-85	7.575E+00	9.164E+00	1.665E+01	NOT IDENT.
SR-85	5.640E-02	6.853E-02	1.244E-01	NOT IDENT.
RB-86	2.033E+00	2.482E+00	5.482E+00	NOT IDENT.
Y-88	3.049E-02	4.941E-02	1.181E-01	NOT IDENT.
Y-91	-1.183E+01	2.788E+01	4.929E+01	NOT IDENT.
NB-94	2.250E-02	2.921E-02	6.403E-02	NOT IDENT.
NB-95	-7.320E-03	6.452E-02	1.242E-01	NOT IDENT.
NB-95M	-1.538E-01	2.100E-01	3.281E-01	NOT IDENT.
ZR-95	4.771E-02	9.192E-02	1.960E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.343E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.368E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.121E-02	3.819E-02	7.142E-02	NOT IDENT.
RH-102	-3.089E-02	7.414E-02	1.170E-01	NOT IDENT.
RU-103	3.206E-02	8.944E-02	1.720E-01	FAIL ABUN
AG-108M	4.044E-02	4.532E-02	8.895E-02	NOT IDENT.
CD-109	1.503E+00	1.051E+00	2.038E+00	NOT IDENT.
AG-110M	-7.783E-03	4.562E-02	8.842E-02	NOT IDENT.
SN-113	2.512E-02	6.801E-02	1.310E-01	NOT IDENT.
CD-115	0.000E+00	3.934E+05	0.000E+00	SHORT HLIF
SN-117M	1.543E-01	3.135E-01	5.913E-01	NOT IDENT.
TE-123M	8.510E-03	3.734E-02	6.907E-02	NOT IDENT.
SB-124	-2.077E-02	1.147E-01	2.326E-01	NOT IDENT.
SB-125	-1.154E-01	1.317E-01	2.239E-01	FAIL ABUN
I-126	3.551E-01	1.391E+00	2.503E+00	NOT IDENT.
SB-126	2.917E-01	9.570E-01	1.743E+00	FAIL ABUN
SN-126	9.790E-02	9.508E-02	1.875E-01	FAIL ABUN
SB-127	0.000E+00	4.270E+02	0.000E+00	SHORT HLIF
I-131	1.284E+00	2.517E+00	4.903E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.828E+02	0.000E+00	SHORT HLIF
BA-133	1.160E-03	6.139E-02	1.009E-01	NOT IDENT.
I-133	0.000E+00	1.689E+15	0.000E+00	SHORT HLIF
CS-134	1.208E-02	4.016E-02	7.735E-02	NOT IDENT.
CS-135	7.496E-02	2.055E-01	3.550E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-5.876E-02	5.882E-01	1.119E+00	NOT IDENT.
CE-139	-6.555E-03	3.848E-02	6.887E-02	NOT IDENT.
BA-140	5.776E-01	1.822E+00	3.522E+00	NOT IDENT.
LA-140	-1.726E-01	4.318E-01	8.222E-01	FAIL ABUN
CE-141	7.691E-02	1.437E-01	2.712E-01	NOT IDENT.
CE-143	0.000E+00	2.568E+09	0.000E+00	SHORT HLIF
CE-144	-4.537E-02	2.440E-01	4.416E-01	NOT IDENT.
PM-144	3.729E-02	3.409E-02	6.749E-02	FAIL ABUN
PM-146	-5.859E-03	6.244E-02	1.137E-01	NOT IDENT.
ND-147	-2.902E+00	5.289E+00	9.162E+00	NOT IDENT.
PM-147	-6.982E+02	8.187E+02	1.418E+03	NOT IDENT.
PM-149	0.000E+00	3.157E+06	0.000E+00	SHORT HLIF
EU-150	2.851E-03	3.716E-02	6.183E-02	FAIL ABUN
EU-152	6.923E-02	1.399E-01	2.423E-01	NOT IDENT.
GD-153	-4.982E-02	1.150E-01	1.860E-01	NOT IDENT.
EU-154	-3.953E-02	9.010E-02	1.707E-01	NOT IDENT.
EU-155	1.191E-02	1.219E-01	2.184E-01	NOT IDENT.
TB-160	1.177E-01	1.610E-01	3.560E-01	NOT IDENT.
HO-166M	-1.119E-02	5.615E-02	1.079E-01	FAIL ABUN
TM-171	-2.130E+00	2.660E+01	5.146E+01	NOT IDENT.
HF-172	-2.022E-01	2.286E-01	3.941E-01	FAIL ABUN
LU-172	6.701E-02	5.342E-02	1.292E-01	FAIL ABUN
LU-176	-1.419E-02	3.496E-02	5.538E-02	NOT IDENT.

HF-181	1.013E-01	2.189E-01	1.750E-01	FAIL ABUN
TA-182	1.382E-01	1.933E-01	4.292E-01	FAIL ABUN
RE-183	1.772E-01	3.573E-01	7.127E-01	NOT IDENT.
RE-184	1.169E-01	2.151E-01	4.365E-01	NOT IDENT.
W-188	-1.027E+00	1.363E+01	2.246E+01	FAIL ABUN
IR-192	4.019E-02	5.153E-02	1.043E-01	FAIL ABUN
HG-203	2.737E-02	6.959E-02	1.360E-01	NOT IDENT.
BI-207	3.833E-02	4.199E-02	1.000E-01	FAIL ABUN
PB-210	-1.203E+00	6.748E+00	1.301E+01	NOT IDENT.
PB-211	1.334E-02	9.434E-01	1.752E+00	NOT IDENT.
BI-212	1.125E+00	7.100E-01	1.360E+00	FAIL ABUN
RN-219	-3.109E-01	5.359E-01	9.436E-01	FAIL ABUN
RA-223	2.989E-01	7.684E-01	1.344E+00	FAIL ABUN
AC-227	-2.223E-01	2.761E-01	4.945E-01	FAIL ABUN
TH-227	-2.223E-01	2.761E-01	4.945E-01	FAIL ABUN
TH-229	1.004E-01	5.874E-01	1.140E+00	NOT IDENT.
TH-231	2.989E-01	7.684E-01	1.344E+00	FAIL ABUN
PA-233	-5.002E-02	6.991E-02	1.243E-01	FAIL ABUN
PA-234	1.148E-01	2.787E-01	5.831E-01	FAIL ABUN
PA-234M	3.583E+00	4.678E+00	1.038E+01	FAIL ABUN
U-235	7.641E-02	2.302E-01	4.317E-01	FAIL ABUN
NP-237	-5.002E-02	6.991E-02	1.243E-01	FAIL ABUN
NP-238	0.000E+00	8.365E+05	0.000E+00	SHORT HLIF
NP-239	-1.081E-01	2.915E-01	5.259E-01	NOT IDENT.
PU-239	5.208E+02	4.090E+02	8.083E+02	NOT IDENT.
AM-241	6.853E-02	2.060E-01	3.676E-01	NOT IDENT.
CM-243	-3.858E-03	1.140E-01	2.127E-01	NOT IDENT.
BK-247	5.563E-02	9.507E-02	1.771E-01	NOT IDENT.
CM-247	-2.016E-02	4.908E-02	8.782E-02	NOT IDENT.
CF-249	-2.157E-02	5.300E-02	9.508E-02	NOT IDENT.
CF-251	-1.004E-01	1.411E-01	2.403E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	120	10.66*	1.133E+00	5.262E+00	5.262E+00	20.69
RH-106	621.93	24	9.93*	2.217E+00	5.866E-01	6.415E-01	78.70
	1050.41	-----	1.56	1.480E+00	-----	Line Not Found	-----
RU-106	621.93	24	9.93*	2.217E+00	5.866E-01	6.415E-01	78.70
	1050.41	-----	1.56	1.480E+00	-----	Line Not Found	-----
TE-125M	109.28	14	0.27*	5.975E+00	4.522E+00	8.067E+00	254.41
BA-137M	661.66	944	89.90*	2.115E+00	2.623E+00	2.631E+00	6.90
CS-137	661.66	944	85.10*	2.115E+00	2.771E+00	2.779E+00	6.90
PR-144	696.51	13	1.34*	2.033E+00	2.526E+00	2.839E+00	93.28
	1489.16	-----	0.28	1.115E+00	-----	Line Not Found	-----
TL-208	277.37	-----	6.60	4.258E+00	-----	Line Not Found	-----
	583.19	95	85.00*	2.335E+00	2.531E-01	2.531E-01	26.06
	860.56	23	12.50	1.728E+00	5.739E-01	5.739E-01	87.18
BI-211	72.87	-----	1.23	3.591E+00	-----	Line Not Found	-----
	351.06	175	12.92*	3.513E+00	2.036E+00	2.036E+00	28.67
PB-212	74.82	234	10.28	3.937E+00	3.060E+00	3.060E+00	35.22
	77.11	234	17.10	3.937E+00	1.839E+00	1.839E+00	35.22
	238.63	296	43.60*	4.776E+00	7.519E-01	7.519E-01	16.39
	300.09	35	3.30	3.992E+00	1.407E+00	1.407E+00	96.55
BI-214	609.32	112	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07
	1120.29	17	14.92	1.407E+00	4.196E-01	4.197E-01	74.64
	1764.49	17	15.30	9.591E-01	6.175E-01	6.176E-01	49.76
PB-214	74.82	234	5.80	3.937E+00	5.423E+00	5.424E+00	35.22
	77.11	234	9.70	3.937E+00	3.243E+00	3.243E+00	35.22
	87.09	-----	3.41	4.892E+00	-----	Line Not Found	-----
	242.00	69	7.25	4.732E+00	1.057E+00	1.057E+00	66.77
	295.22	88	18.42	4.052E+00	6.201E-01	6.201E-01	43.75
	351.93	175	35.60*	3.513E+00	7.388E-01	7.388E-01	28.67
RN-222	609.32	112	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07
	1120.29	17	14.92	1.407E+00	4.196E-01	4.197E-01	74.64
	1764.49	17	15.30	9.591E-01	6.175E-01	6.176E-01	49.76
RA-224	240.99	69	4.10*	4.732E+00	1.870E+00	1.870E+00	66.77
RA-226	609.32	112	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07
	1120.29	17	14.92	1.407E+00	4.196E-01	4.197E-01	74.64
	1764.49	17	15.30	9.591E-01	6.175E-01	6.176E-01	49.76
AC-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	61	11.27	3.624E+00	7.936E-01	7.936E-01	66.89
	794.95	22	4.25	1.838E+00	1.491E+00	1.491E+00	47.53
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.653E+00	7.615E-01	7.615E-01	32.33
	968.97	34	15.80	1.576E+00	7.151E-01	7.151E-01	48.12
RA-228	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	61	11.27	3.624E+00	7.936E-01	7.936E-01	66.89
	794.95	22	4.25	1.838E+00	1.491E+00	1.491E+00	47.53
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.653E+00	7.615E-01	7.615E-01	32.33
	968.97	34	15.80	1.576E+00	7.151E-01	7.151E-01	48.12

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	234	10.28	3.937E+00	3.060E+00	3.060E+00	35.22
	77.11	234	17.10	3.937E+00	1.839E+00	1.839E+00	35.22
	238.63	296	43.60*	4.776E+00	7.519E-01	7.519E-01	16.39
	300.09	35	3.30	3.992E+00	1.407E+00	1.407E+00	96.55
TH-230	609.32	112	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07
	1120.29	17	14.92	1.407E+00	4.196E-01	4.196E-01	74.64
	1764.49	17	15.30	9.591E-01	6.175E-01	6.175E-01	49.76
	283.69	-----	1.70	4.183E+00	-----	Line Not Found	-----
PA-231	301.36	35	5.35*	3.992E+00	8.680E-01	8.680E-01	96.55
	105.21	-----	1.10	5.839E+00	-----	Line Not Found	-----
	338.32	61	11.27	3.624E+00	7.936E-01	7.936E-01	66.89
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
TH-232	911.20	61	25.80*	1.653E+00	7.615E-01	7.615E-01	32.33
	968.97	34	15.80	1.576E+00	7.151E-01	7.151E-01	48.12
	63.29	4	3.70*	2.455E+00	2.347E-01	2.347E-01	1241.46
	92.59	63	4.23	5.270E+00	1.484E+00	1.484E+00	99.09
U-234	609.32	112	45.49*	2.255E+00	5.745E-01	5.745E-01	27.07
	1120.29	17	14.92	1.407E+00	4.196E-01	4.196E-01	74.64
	1764.49	17	15.30	9.591E-01	6.175E-01	6.175E-01	49.76
	63.29	4	3.70*	2.455E+00	2.347E-01	2.347E-01	1241.46
U-238	92.59	63	4.23	5.270E+00	1.484E+00	1.484E+00	99.09
	43.53	-----	5.90	2.461E-01	-----	Line Not Found	-----
	74.66	234	67.20*	3.937E+00	4.681E-01	4.681E-01	35.22
	511.00	24	100.00*	2.593E+00	4.854E-02	4.854E-02	166.89

Flag: "*" = Keyline

Total number of lines in spectrum 39
Number of unidentified lines 7
Number of lines tentatively identified by NID 32 82.05%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.262E+00	5.262E+00	1.089E+00	20.69	
RH-106	371.80D	1.09	5.866E-01	6.415E-01	5.048E-01	78.70	
RU-106	371.80D	1.09	5.866E-01	6.415E-01	5.048E-01	78.70	
TE-125M	57.40D	1.78	4.522E+00	8.067E+00	20.52E+00	254.41	
BA-137M	30.08Y	1.00	2.623E+00	2.631E+00	0.182E+00	6.90	
CS-137	30.08Y	1.00	2.771E+00	2.779E+00	0.192E+00	6.90	
PR-144	284.91D	1.12	2.526E+00	2.839E+00	2.648E+00	93.28	
TL-208	1.41E+10Y	1.00	2.531E-01	2.531E-01	0.660E-01	26.06	
BI-211	7.04E+08Y	1.00	2.036E+00	2.036E+00	0.584E+00	28.67	
PB-212	1.41E+10Y	1.00	7.519E-01	7.519E-01	1.232E-01	16.39	
BI-214	1600.00Y	1.00	5.745E-01	5.745E-01	1.555E-01	27.07	
PB-214	1600.00Y	1.00	7.388E-01	7.388E-01	2.118E-01	28.67	
RN-222	1600.00Y	1.00	5.745E-01	5.745E-01	1.555E-01	27.07	
RA-224	1.41E+10Y	1.00	1.870E+00	1.870E+00	1.248E+00	66.77	
RA-226	1600.00Y	1.00	5.745E-01	5.745E-01	1.555E-01	27.07	
AC-228	1.41E+10Y	1.00	7.615E-01	7.615E-01	2.462E-01	32.33	
RA-228	1.41E+10Y	1.00	7.615E-01	7.615E-01	2.462E-01	32.33	
TH-228	1.41E+10Y	1.00	7.519E-01	7.519E-01	1.232E-01	16.39	
TH-230	7.54E+04Y	1.00	5.745E-01	5.745E-01	1.555E-01	27.07	
PA-231	7.04E+08Y	1.00	8.680E-01	8.680E-01	8.380E-01	96.55	
TH-232	1.41E+10Y	1.00	7.615E-01	7.615E-01	2.462E-01	32.33	
TH-234	4.47E+09Y	1.00	2.347E-01	2.347E-01	29.14E-01	1241.46	
U-234	2.45E+05Y	1.00	5.745E-01	5.745E-01	1.555E-01	27.07	
U-238	4.47E+09Y	1.00	2.347E-01	2.347E-01	29.14E-01	1241.46	
AM-243	7370.00Y	1.00	4.681E-01	4.681E-01	1.649E-01	35.22	
ANH-511	1.00E+09Y	1.00	4.854E-02	4.854E-02	8.101E-02	166.89	
Total Activity :			3.229E+01	3.627E+01			

Grand Total Activity : 3.229E+01 3.627E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	185.84	57	102	1.77	371.49	367	8	1.39E-02	79.0	5.62E+00	T
0	209.20	22	122	1.36	418.14	415	9	5.29E-03	****	5.23E+00	
0	270.70	31	106	0.86	541.00	536	10	7.78E-03	****	4.34E+00	T
0	328.46	45	67	1.57	656.41	651	10	1.14E-02	78.6	3.72E+00	T
0	463.32	32	64	1.83	925.91	919	10	8.23E-03	****	2.81E+00	T
0	480.79	19	77	4.79	960.82	950	17	5.03E-03	****	2.72E+00	T
0	629.68	6	17	1.03	1258.43	1252	8	1.64E-03	****	2.20E+00	T
0	727.23	28	13	1.17	1453.45	1447	10	7.58E-03	64.4	1.97E+00	T
0	730.32	10	4	1.30	1459.62	1457	6	2.74E-03	92.4	1.96E+00	
0	841.28	9	30	5.58	1681.50	1663	20	2.50E-03	****	1.76E+00	
0	933.97	15	2	0.51	1866.88	1861	10	4.12E-03	65.1	1.62E+00	
0	978.91	9	4	0.94	1956.75	1951	9	2.39E-03	****	1.56E+00	
0	1001.45	9	6	1.95	2001.84	1997	8	2.45E-03	****	1.54E+00	T
0	1064.05	8	4	0.95	2127.06	2123	8	2.22E-03	****	1.47E+00	T
0	1124.27	6	7	1.63	2247.53	2244	7	1.77E-03	****	1.40E+00	
0	1252.42	8	3	1.11	2503.94	2500	7	2.36E-03	****	1.29E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561991.CNF;1
Acquisition date : 28-JUN-2016 12:49:09 Sensitivity : 3.000
Detector ID : GAM33 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:01.09 Half life ratio : *****
Sample date : 11-MAY-2016 15:10:00 Nuclide Library : SOLID
Sample ID : G1203561991 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4206E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUN-2016 07:00:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.845E-01
RH-106	3.075E-01
RU-106	3.075E-01
TE-125M	1.433E+01
BA-137M	2.921E-02
CS-137	3.086E-02
PR-144	2.298E+00
TL-208	3.078E-02
BI-211	2.194E-01
PB-212	5.265E-02
BI-214	7.383E-02
PB-214	1.500E-01
RN-222	7.383E-02
RA-224	5.644E-01
RA-226	7.383E-02
AC-228	1.019E-01
RA-228	1.019E-01
TH-228	5.265E-02
TH-230	7.382E-02
PA-231	4.834E-01
TH-232	1.019E-01
TH-234	1.348E+00
U-234	7.382E-02
U-238	1.348E+00
AM-243	5.639E-02
ANH-511	2.682E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.194E-01	NOT IDENT.
NA-22	2.476E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.701E-02	NOT IDENT.
SC-46	2.706E-02	FAIL ABUN

V-48	2.365E-01	NOT IDENT.
CR-51	7.984E-01	NOT IDENT.
MN-54	3.250E-02	NOT IDENT.
CO-56	4.368E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.355E-02	NOT IDENT.
CO-58	3.996E-02	NOT IDENT.
FE-59	9.187E-02	NOT IDENT.
CO-60	3.137E-02	NOT IDENT.
ZN-65	4.791E-02	NOT IDENT.
GE-68	1.242E+00	NOT IDENT.
AS-73	1.367E+00	NOT IDENT.
AS-74	2.874E-01	NOT IDENT.
SE-75	5.410E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.859E-01	NOT IDENT.
RB-83	9.971E-02	NOT IDENT.
KR-85	7.665E+00	NOT IDENT.
SR-85	5.730E-02	NOT IDENT.
RB-86	2.399E+00	NOT IDENT.
Y-88	4.841E-02	NOT IDENT.
Y-91	2.097E+01	NOT IDENT.
NB-94	2.840E-02	NOT IDENT.
NB-95	5.565E-02	NOT IDENT.
NB-95M	1.536E-01	NOT IDENT.
ZR-95	8.622E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.389E-02	NOT IDENT.
RH-102	5.242E-02	NOT IDENT.
RU-103	7.892E-02	FAIL ABUN
AG-108M	4.174E-02	NOT IDENT.
CD-109	9.750E-01	NOT IDENT.
AG-110M	3.747E-02	NOT IDENT.
SN-113	6.083E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.792E-01	NOT IDENT.
TE-123M	3.258E-02	NOT IDENT.
SB-124	9.010E-02	NOT IDENT.
SB-125	1.035E-01	FAIL ABUN
I-126	1.114E+00	NOT IDENT.
SB-126	7.710E-01	FAIL ABUN
SN-126	8.961E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	2.286E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.700E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.384E-02	NOT IDENT.
CS-135	1.669E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.837E-01	NOT IDENT.
CE-139	3.243E-02	NOT IDENT.
BA-140	1.598E+00	NOT IDENT.
LA-140	3.143E-01	FAIL ABUN
CE-141	1.286E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.086E-01	NOT IDENT.
PM-144	2.980E-02	FAIL ABUN
PM-146	5.284E-02	NOT IDENT.
ND-147	4.123E+00	NOT IDENT.
PM-147	6.647E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.881E-02	FAIL ABUN
EU-152	1.134E-01	NOT IDENT.
GD-153	8.757E-02	NOT IDENT.
EU-154	6.900E-02	NOT IDENT.
EU-155	1.030E-01	NOT IDENT.
TB-160	1.556E-01	NOT IDENT.
HO-166M	4.723E-02	FAIL ABUN
TM-171	2.415E+01	NOT IDENT.
HF-172	1.858E-01	FAIL ABUN
LU-172	5.624E-02	FAIL ABUN
LU-176	2.568E-02	NOT IDENT.
HF-181	8.017E-02	FAIL ABUN

TA-182	1.875E-01	FAIL ABUN
RE-183	3.362E-01	NOT IDENT.
RE-184	1.891E-01	NOT IDENT.
W-188	1.051E+01	FAIL ABUN
IR-192	4.848E-02	FAIL ABUN
HG-203	6.363E-02	NOT IDENT.
BI-207	4.341E-02	FAIL ABUN
PB-210	6.120E+00	NOT IDENT.
PB-211	8.141E-01	NOT IDENT.
BI-212	6.248E-01	FAIL ABUN
RN-219	4.365E-01	FAIL ABUN
RA-223	6.226E-01	FAIL ABUN
AC-227	2.300E-01	FAIL ABUN
TH-227	2.300E-01	FAIL ABUN
TH-229	5.395E-01	NOT IDENT.
TH-231	6.226E-01	FAIL ABUN
PA-233	5.719E-02	FAIL ABUN
PA-234	2.540E-01	FAIL ABUN
PA-234M	4.632E+00	FAIL ABUN
U-235	2.048E-01	FAIL ABUN
NP-237	5.719E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.475E-01	NOT IDENT.
PU-239	3.851E+02	NOT IDENT.
AM-241	1.731E-01	NOT IDENT.
CM-243	1.001E-01	NOT IDENT.
BK-247	8.299E-02	NOT IDENT.
CM-247	4.067E-02	NOT IDENT.
CF-249	4.411E-02	NOT IDENT.
CF-251	1.127E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561991.CNF;1
Acquisition date : 28-JUN-2016 12:49:09 Sensitivity : 3.000
Detector ID : GAM33 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:01.09 Half life ratio : *****
Sample date : 11-MAY-2016 15:10:00 Nuclide Library : SOLID
Sample ID : G1203561991 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.4206E+02 GRAM
Quantity Err(%) : 1.4079E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUN-2016 07:00:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.262E+00	1.102E+00	1.102E+00
RH-106	6.415E-01	4.963E-01	4.963E-01
RU-106	6.415E-01	4.963E-01	4.963E-01
TE-125M	8.067E+00	2.012E+01	2.012E+01
BA-137M	2.631E+00	2.108E-01	2.108E-01
CS-137	2.779E+00	2.226E-01	2.226E-01
PR-144	2.839E+00	2.598E+00	2.598E+00
TL-208	2.531E-01	6.552E-02	6.552E-02
BI-211	3.270E-01	9.353E-01	9.353E-01
PB-212	7.519E-01	1.271E-01	1.271E-01
BI-214	5.745E-01	1.544E-01	1.544E-01
PB-214	7.388E-01	2.098E-01	2.098E-01
RN-222	5.745E-01	1.544E-01	1.544E-01
RA-224	7.730E-01	1.313E+00	1.313E+00
RA-226	5.745E-01	1.544E-01	1.544E-01
AC-228	7.615E-01	2.444E-01	2.444E-01
RA-228	7.615E-01	2.444E-01	2.444E-01
TH-228	7.519E-01	1.271E-01	1.271E-01
TH-230	5.745E-01	1.543E-01	1.543E-01
PA-231	8.680E-01	8.419E-01	8.419E-01
TH-232	7.615E-01	2.444E-01	2.444E-01
TH-234	2.347E-01	2.856E+00	2.856E+00
U-234	5.745E-01	1.543E-01	1.543E-01
U-238	2.347E-01	2.856E+00	2.856E+00
AM-243	3.250E-01	1.694E-01	1.694E-01
ANH-511	4.854E-02	7.941E-02	7.941E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	6.163E-01	6.666E-01	7.222E-01	NOT IDENT.
NA-22	-1.419E-02	3.234E-02	3.297E-02	NOT IDENT.
NA-24	-8.773E+20	3.514E+21	0.000E+00	SHORT HLIF
AL-26	-1.716E-02	3.799E-02	3.877E-02	NOT IDENT.

SC-46	-4.674E-02	4.305E-02	4.793E-02	FAIL ABUN
V-48	4.384E-02	3.120E-01	3.127E-01	NOT IDENT.
CR-51	-4.111E-01	9.483E-01	9.663E-01	NOT IDENT.
MN-54	1.744E-02	3.494E-02	3.581E-02	NOT IDENT.
CO-56	4.396E-03	5.029E-02	5.033E-02	NOT IDENT.
MN-56	-1.000E+41	1.589E+42	0.000E+00	SHORT HLIF
CO-57	-3.310E-02	2.977E-02	3.330E-02	NOT IDENT.
CO-58	1.018E-02	4.456E-02	4.479E-02	NOT IDENT.
FE-59	-3.678E-02	1.192E-01	1.203E-01	NOT IDENT.
CO-60	-4.650E-03	3.758E-02	3.764E-02	NOT IDENT.
ZN-65	-5.132E-02	8.461E-02	8.772E-02	NOT IDENT.
GE-68	1.366E+00	1.223E+00	1.369E+00	NOT IDENT.
AS-73	-5.939E-01	1.549E+00	1.572E+00	NOT IDENT.
AS-74	2.049E-01	3.108E-01	3.243E-01	NOT IDENT.
SE-75	2.278E-02	6.325E-02	6.408E-02	NOT IDENT.
BR-77	1.667E+06	2.323E+06	2.441E+06	SHORT HLIF
SR-82	-1.946E-01	7.156E-01	7.209E-01	NOT IDENT.
RB-83	2.839E-02	1.152E-01	1.159E-01	NOT IDENT.
KR-85	7.575E+00	9.169E+00	9.785E+00	NOT IDENT.
SR-85	5.640E-02	6.857E-02	7.313E-02	NOT IDENT.
RB-86	2.033E+00	2.483E+00	2.647E+00	NOT IDENT.
Y-88	3.049E-02	4.945E-02	5.132E-02	NOT IDENT.
Y-91	-1.183E+01	2.788E+01	2.839E+01	NOT IDENT.
NB-94	2.250E-02	2.923E-02	3.094E-02	NOT IDENT.
NB-95	-7.320E-03	6.452E-02	6.460E-02	NOT IDENT.
NB-95M	-1.538E-01	2.103E-01	2.215E-01	NOT IDENT.
ZR-95	4.771E-02	9.195E-02	9.443E-02	NOT IDENT.
NB-97	1.000E+41	2.642E+41	0.000E+00	SHORT HLIF
ZR-97	1.653E+20	2.344E+20	0.000E+00	SHORT HLIF
MO-99	5.130E+03	4.368E+04	4.374E+04	SHORT HLIF
TC-99M	1.000E+41	2.609E+41	0.000E+00	SHORT HLIF
RH-101	1.121E-02	3.824E-02	3.858E-02	NOT IDENT.
RH-102	-3.089E-02	7.419E-02	7.548E-02	NOT IDENT.
RU-103	3.206E-02	8.945E-02	9.061E-02	FAIL ABUN
AG-108M	4.044E-02	4.534E-02	4.887E-02	NOT IDENT.
CD-109	1.503E+00	1.058E+00	1.257E+00	NOT IDENT.
AG-110M	-7.783E-03	4.562E-02	4.576E-02	NOT IDENT.
SN-113	2.512E-02	6.802E-02	6.895E-02	NOT IDENT.
CD-115	-1.031E+05	3.935E+05	3.962E+05	SHORT HLIF
SN-117M	1.543E-01	3.136E-01	3.212E-01	NOT IDENT.
TE-123M	8.510E-03	3.735E-02	3.754E-02	NOT IDENT.
SB-124	-2.077E-02	1.147E-01	1.151E-01	NOT IDENT.
SB-125	-1.154E-01	1.318E-01	1.417E-01	FAIL ABUN
I-126	3.551E-01	1.392E+00	1.401E+00	NOT IDENT.
SB-126	2.917E-01	9.575E-01	9.665E-01	FAIL ABUN
SN-126	9.790E-02	9.528E-02	1.050E-01	FAIL ABUN
SB-127	9.052E+01	4.275E+02	4.294E+02	SHORT HLIF
I-131	1.284E+00	2.517E+00	2.583E+00	NOT IDENT.
I-132	1.000E+41	3.560E+41	0.000E+00	SHORT HLIF
TE-132	-7.150E+01	9.829E+02	9.834E+02	SHORT HLIF
BA-133	1.160E-03	6.139E-02	6.140E-02	NOT IDENT.
I-133	8.696E+14	1.708E+15	1.753E+15	SHORT HLIF
CS-134	1.208E-02	4.016E-02	4.053E-02	NOT IDENT.
CS-135	7.496E-02	2.056E-01	2.083E-01	NOT IDENT.
I-135	-1.000E+41	5.203E+41	0.000E+00	SHORT HLIF
CS-136	-5.876E-02	5.882E-01	5.888E-01	NOT IDENT.
CE-139	-6.555E-03	3.850E-02	3.861E-02	NOT IDENT.
BA-140	5.776E-01	1.822E+00	1.840E+00	NOT IDENT.
LA-140	-1.726E-01	4.319E-01	4.388E-01	FAIL ABUN
CE-141	7.691E-02	1.437E-01	1.479E-01	NOT IDENT.
CE-143	2.644E+09	2.571E+09	2.834E+09	SHORT HLIF
CE-144	-4.537E-02	2.440E-01	2.449E-01	NOT IDENT.
PM-144	3.729E-02	3.412E-02	3.804E-02	FAIL ABUN
PM-146	-5.859E-03	6.244E-02	6.250E-02	NOT IDENT.
ND-147	-2.902E+00	5.291E+00	5.450E+00	NOT IDENT.
PM-147	-6.982E+02	8.194E+02	8.777E+02	NOT IDENT.
PM-149	1.111E+06	3.161E+06	3.201E+06	SHORT HLIF
EU-150	2.851E-03	3.716E-02	3.719E-02	FAIL ABUN
EU-152	6.923E-02	1.399E-01	1.433E-01	NOT IDENT.
GD-153	-4.982E-02	1.150E-01	1.172E-01	NOT IDENT.
EU-154	-3.953E-02	9.012E-02	9.186E-02	NOT IDENT.
EU-155	1.191E-02	1.219E-01	1.220E-01	NOT IDENT.
TB-160	1.177E-01	1.611E-01	1.696E-01	NOT IDENT.
HO-166M	-1.119E-02	5.616E-02	5.638E-02	FAIL ABUN
TM-171	-2.130E+00	2.660E+01	2.662E+01	NOT IDENT.
HF-172	-2.022E-01	2.309E-01	2.482E-01	FAIL ABUN
LU-172	6.701E-02	5.384E-02	6.174E-02	FAIL ABUN
LU-176	-1.419E-02	3.496E-02	3.554E-02	NOT IDENT.

HF-181	1.013E-01	2.190E-01	2.237E-01	FAIL ABUN
TA-182	1.382E-01	1.933E-01	2.031E-01	FAIL ABUN
RE-183	1.772E-01	3.578E-01	3.666E-01	NOT IDENT.
RE-184	1.169E-01	2.154E-01	2.217E-01	NOT IDENT.
W-188	-1.027E+00	1.363E+01	1.364E+01	FAIL ABUN
IR-192	4.019E-02	5.156E-02	5.465E-02	FAIL ABUN
HG-203	2.737E-02	6.961E-02	7.069E-02	NOT IDENT.
BI-207	3.833E-02	4.202E-02	4.543E-02	FAIL ABUN
PB-210	-1.203E+00	6.749E+00	6.771E+00	NOT IDENT.
PB-211	1.334E-02	9.434E-01	9.434E-01	NOT IDENT.
BI-212	1.125E+00	7.123E-01	8.745E-01	FAIL ABUN
RN-219	-3.109E-01	5.373E-01	5.553E-01	FAIL ABUN
RA-223	2.989E-01	7.686E-01	7.803E-01	FAIL ABUN
AC-227	-2.223E-01	2.777E-01	2.952E-01	FAIL ABUN
TH-227	-2.223E-01	2.777E-01	2.952E-01	FAIL ABUN
TH-229	1.004E-01	5.874E-01	5.891E-01	NOT IDENT.
TH-231	2.989E-01	7.686E-01	7.803E-01	FAIL ABUN
PA-233	-5.002E-02	6.995E-02	7.349E-02	FAIL ABUN
PA-234	1.148E-01	3.081E-01	3.124E-01	FAIL ABUN
PA-234M	3.583E+00	4.681E+00	4.952E+00	FAIL ABUN
U-235	7.641E-02	2.303E-01	2.328E-01	FAIL ABUN
NP-237	-5.002E-02	6.995E-02	7.349E-02	FAIL ABUN
NP-238	8.482E+05	8.372E+05	9.204E+05	SHORT HLIF
NP-239	-1.081E-01	2.916E-01	2.956E-01	NOT IDENT.
PU-239	5.208E+02	4.096E+02	4.721E+02	NOT IDENT.
AM-241	6.853E-02	2.061E-01	2.084E-01	NOT IDENT.
CM-243	-3.858E-03	1.140E-01	1.140E-01	NOT IDENT.
BK-247	5.563E-02	9.573E-02	9.896E-02	NOT IDENT.
CM-247	-2.016E-02	4.920E-02	5.003E-02	NOT IDENT.
CF-249	-2.157E-02	5.303E-02	5.392E-02	NOT IDENT.
CF-251	-1.004E-01	1.415E-01	1.486E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	85.1190	87.09	134.9084	136.47	99.7821
45.60	80.8647	87.57	121.7189	140.51	0.0000
46.54	89.5358	88.03	113.0083	143.76	95.1385
49.72	0.0000	88.34	107.5357	144.24	94.0868
51.35	79.1307	88.47	107.5587	145.44	97.5462
51.87	80.1804	89.96	175.5949	152.43	98.3447
52.39	80.2761	1093.63	158.8268	153.25	92.8448
52.97	86.1241	91.11	126.5403	323.87	101.9047
53.44	81.4263	92.59	113.4353	156.02	96.5042
54.07	78.6640	93.35	113.5729	158.56	82.1503
57.36	0.0000	94.56	74.4811	159.00	86.6947
57.53	81.1996	94.65	74.4917	162.33	91.5353
57.98	80.3106	94.67	74.4939	162.66	84.7855
59.27	77.1361	94.87	72.9649	163.33	90.5046
59.32	77.1444	97.43	93.5191	165.86	91.8888
59.54	77.1804	98.43	81.1746	176.31	84.8850
60.96	92.0167	98.44	81.1760	176.60	79.1734
61.17	84.7507	99.53	74.0143	177.52	94.1794
62.93	86.0364	100.11	74.0797	181.07	0.0000
63.29	86.0996	102.03	99.4082	181.52	74.3852
63.58	86.1504	103.18	94.3378	184.41	74.6037
64.28	104.4095	103.37	85.9768	143.76	83.3884
66.73	113.7870	105.21	88.3135	193.51	98.0402
67.24	113.9009	105.31	88.3263	197.03	98.3751
125.81	113.9990	106.12	93.1688	198.01	95.8307
67.75	104.2417	106.47	86.8967	201.83	97.9448
69.67	98.6851	109.28	98.3546	203.43	79.5355
70.83	110.2231	111.00	84.2840	205.31	94.9025
72.81	116.6144	111.76	0.0000	210.85	72.6121
72.87	116.6275	114.06	89.4388	215.65	85.8010
74.66	119.0139	116.30	0.0000	222.11	81.8043
74.82	119.0490	116.74	95.1143	227.09	90.2901
74.97	119.0817	119.76	81.5556	227.38	90.3122
77.11	119.5441	121.12	93.5305	228.16	0.0000
78.74	98.2315	121.22	97.8442	228.18	86.7605
79.69	86.2858	121.78	96.8413	116.74	86.7605
80.12	83.3212	122.06	101.1831	235.69	93.1445
80.19	83.3313	122.92	79.7459	235.96	88.7992
80.57	72.7738	123.07	79.7617	238.63	72.9510
81.00	95.5875	265.00	80.9048	238.98	0.0000
81.07	95.5993	125.81	116.8292	240.99	73.0957
81.75	132.6804	127.23	106.2075	242.00	71.6942
83.79	114.8507	127.91	99.7930	244.70	65.9899
84.00	114.8921	129.30	96.7116	252.40	0.0000
85.43	119.2471	131.20	128.5355	252.80	70.1199
86.55	121.5131	133.02	102.6289	254.15	0.0000
86.79	134.8410	133.52	102.6935	256.23	77.7156
86.94	134.8749	136.00	100.8197	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	60.8512	355.39	0.0000	584.27	26.8616
264.80	60.8572	356.01	61.9753	595.83	14.6238
265.00	59.6250	364.49	52.9207	427.87	26.1517
268.22	73.2249	366.42	0.0000	602.52	0.0000
269.46	76.2871	372.51	62.2148	604.72	24.0898
270.03	71.0830	375.05	51.2568	607.14	31.6504
271.23	62.9098	377.52	54.3535	609.32	36.2061
273.65	81.0356	356.01	50.5196	610.33	33.2032
276.40	71.9680	388.16	63.8190	614.28	19.9552
277.37	61.1369	388.63	60.7974	618.01	33.3106
277.60	63.0292	391.69	48.7258	620.36	25.7656
278.00	63.0487	264.66	61.2286	621.93	24.2663
279.20	62.1640	401.81	63.3122	630.19	0.0000
279.54	68.7739	402.40	61.2909	631.29	31.9734
279.70	65.0139	404.85	57.2860	633.25	25.9047
280.46	66.9363	410.95	58.5134	634.78	27.4453
283.69	74.6592	413.71	67.8591	635.95	25.6279
284.31	72.8032	414.70	52.4661	636.99	29.3023
285.41	70.0231	423.72	54.8010	645.85	21.1374
285.90	0.0000	427.09	64.2270	657.76	23.0859
287.50	65.3940	427.87	68.4009	657.90	0.0000
290.67	72.9563	433.94	57.1912	661.66	19.4229
293.27	0.0000	439.40	60.4913	664.57	0.0000
351.93	64.8115	453.88	59.9128	666.33	18.5322
295.96	64.8457	463.37	40.5645	666.50	21.6226
879.38	64.9692	468.07	52.2413	667.71	0.0000
299.98	65.0345	473.00	0.0000	677.62	15.8229
300.09	65.0397	475.06	44.2114	685.70	0.0000
300.13	65.0418	476.78	49.3566	695.00	13.1188
301.36	65.0989	477.60	38.3099	696.49	19.6896
302.85	65.1684	482.18	32.4262	696.51	19.6896
256.23	56.8008	487.02	47.0474	697.00	14.0669
304.85	56.8152	492.35	0.0000	697.30	14.0684
306.78	64.5811	497.08	35.4633	697.49	14.0695
308.46	53.8817	505.52	31.0790	702.65	12.2177
311.90	58.8341	507.63	0.0000	706.68	24.4728
316.51	43.5409	511.00	30.2967	711.68	18.8608
319.41	59.1403	514.00	29.4736	720.70	15.7707
320.08	59.1673	514.00	29.4736	721.93	0.0000
321.04	57.2652	520.40	32.6083	722.78	18.9395
323.87	45.1228	520.69	0.0000	722.91	18.9404
325.23	49.8359	522.65	0.0000	723.31	17.3647
328.76	68.6877	527.90	0.0000	724.19	17.3706
333.37	46.9775	528.26	36.0031	727.33	9.4858
333.97	61.0946	529.59	30.5677	733.00	15.8431
334.37	64.6364	529.87	0.0000	735.93	16.6532
338.28	51.8429	531.02	36.0504	333.97	18.0908
338.32	51.8445	537.26	27.3911	739.50	0.0000
311.90	64.8972	546.56	0.0000	747.24	20.0669
340.48	64.8972	552.55	28.6890	748.06	16.2496
340.55	78.6670	563.25	25.5030	752.31	15.3172
344.28	58.3554	569.33	20.0132	753.82	18.1989
345.93	63.1553	946.00	25.5746	756.73	12.4652
351.06	61.3841	569.70	25.5767	756.80	12.4655
351.93	61.4182	583.19	23.4930	884.68	20.1879

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	22.1257	1274.44	18.9926	1620.50	5.0051
766.42	23.0924	1001.03	11.4114	1621.92	6.0078
766.84	24.0582	1002.74	8.6493	1678.03	0.0000
772.60	0.0000	1004.73	5.1925	1690.97	5.0739
776.52	15.4504	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.1151
778.90	16.4297	1028.54	0.0000	1063.66	21.6272
783.70	0.0000	1037.84	10.4834	1771.35	11.3308
785.37	17.2205	1038.76	0.0000	1791.20	0.0000
792.07	9.7092	631.29	5.2546	1808.65	7.2592
794.95	12.9587	1048.07	14.7191	1810.72	0.0000
795.86	9.7222	1049.04	11.5683	1836.06	3.1263
810.06	14.6547	1050.41	14.7287		
810.29	11.7246	1063.66	7.3914		
344.28	13.6794	1077.00	8.4785		
810.76	10.7492	1077.34	6.3595		
815.77	15.6621	1085.87	5.3118		
1048.07	10.7776	1093.63	4.2584		
832.01	11.4830	1099.45	10.6626		
834.85	11.8222	1112.07	6.4192		
835.71	11.8257	1112.84	2.6753		
836.80	0.0000	1115.54	10.7085		
846.75	0.0000	1120.29	14.2962		
846.77	14.8363	1120.55	0.0000		
856.80	8.2697	1221.41	0.0000		
860.56	12.9165	1129.67	18.4269		
871.09	7.9760	1131.51	0.0000		
873.19	9.9766	1147.95	0.0000		
875.33	0.0000	1173.23	11.9582		
879.38	8.9969	1177.95	9.7954		
880.51	8.0002	1189.05	14.1889		
883.24	15.0132	1204.77	15.3412		
884.68	12.0161	1221.41	9.1695		
889.28	16.0449	1231.02	8.2720		
894.76	7.0320	1235.36	21.1619		
898.04	9.0505	1238.28	12.8903		
900.72	15.0967	1260.41	0.0000		
903.28	8.6337	1271.87	4.6413		
911.20	12.1172	1274.44	9.2883		
912.08	8.4170	1274.54	9.2887		
923.98	0.0000	1291.59	11.1914		
926.50	6.3409	1298.22	0.0000		
929.11	6.7692	1312.11	6.5599		
937.49	8.4833	1332.49	10.3573		
944.13	11.2205	1362.66	0.0000		
946.00	11.2269	1365.19	2.8458		
949.00	15.3234	1368.63	0.0000		
667.71	0.0000	1384.29	7.6217		
962.31	14.6519	1408.01	4.7886		
964.08	20.5234	1457.56	0.0000		
966.17	18.8252	1460.82	7.7503		
911.20	21.5814	1489.16	5.8479		
968.97	21.5814	1505.03	8.8008		
983.53	12.0412	1584.12	14.9072		
984.45	0.0000	1596.21	5.9773		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 12:52:36.23

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561992.CNF;1
Background file     : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM30.CNF;285
Background date      : 26-JUN-2016 12:05:40
Sample date         : 7-JUN-2016 00:00:00. Acquisition date : 28-JUN-2016 12:36:58
Sample ID          : G1203561992. Sample quantity : 1.15000E+02 GRAM
Detector name      : GAM30. Detector geometry: CAN
Elapsed live time   : 0 00:15:00.00. Elapsed real time: 0 00:15:06.73 0.7%
Energy tolerance    : 1.50000 keV. Analyst Initials : MXR1
Abundance limit     : 75.00000. Sensitivity : 3.00000
Batch ID           : 1572486. Detector SN# :
Matrix Spike ID    : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.51*	10822	4707	0.96	92.75	87	10	1.20E+01	1.5	
2	10	58.19	749	3146	1.62	116.10	113	11	8.32E-01	15.6	3.99E+00
3	10	59.59	21886	2016	0.96	118.91	113	11	2.43E+01	0.8	
4	2	85.85*	101	473	1.13	171.42	170	12	1.12E-01	28.8	3.45E+00
5	2	88.09*	3826	866	0.98	175.89	170	12	4.25E+00	2.0	
6	0	121.94	312	1089	0.87	243.61	239	9	3.47E-01	19.9	
7	0	197.40*	49	740	1.30	394.54	392	7	5.44E-02	93.0	
8	0	323.66	44	691	1.45	647.08	644	9	4.92E-02	108.7	
9	0	474.92	110	626	1.73	949.64	946	9	1.22E-01	42.3	
10	0	618.12*	20	302	1.64	1236.09	1235	8	2.25E-02	150.2	
11	0	624.32*	37	300	1.34	1248.50	1246	8	4.11E-02	83.6	
12	0	629.36	62	407	3.72	1258.58	1253	12	6.92E-02	65.8	
13	0	661.91	15398	538	1.45	1323.70	1316	15	1.71E+01	0.9	
14	0	757.18	95	255	3.13	1514.28	1510	10	1.05E-01	33.3	
15	0	765.08	102	380	4.91	1530.09	1523	14	1.14E-01	41.8	
16	4	807.86	50	240	1.85	1615.68	1612	12	5.56E-02	51.7	2.27E+00
17	4	810.19	74	170	1.26	1620.35	1612	12	8.20E-02	30.8	
18	0	831.19	20	307	1.21	1662.36	1658	8	2.22E-02	154.2	
19	0	862.67	44	401	1.42	1725.33	1719	11	4.88E-02	89.7	
20	0	867.50	26	309	0.69	1734.99	1734	8	2.85E-02	120.1	
21	0	894.36	39	524	3.60	1788.73	1784	12	4.34E-02	118.6	
22	0	1173.69	9804	285	1.79	2347.61	2341	15	1.09E+01	1.1	
23	0	1196.76	24	134	4.84	2393.77	2382	14	2.71E-02	106.5	
24	0	1303.02	13	68	0.50	2606.39	2596	15	1.49E-02	136.3	
25	0	1332.99	8989	48	1.77	2666.35	2660	16	9.99E+00	1.1	
26	0	1377.23	17	18	3.90	2754.88	2748	14	1.92E-02	56.9	
27	0	1452.78	16	11	1.45	2906.06	2900	11	1.78E-02	47.3	
28	0	1520.08	19	11	3.25	3040.73	3033	12	2.07E-02	43.5	
29	0	1547.23	16	16	3.81	3095.08	3089	11	1.80E-02	54.2	
30	0	1612.16	9	7	2.30	3225.01	3221	9	1.01E-02	61.4	
31	0	1617.09	11	7	1.04	3234.88	3230	9	1.27E-02	50.3	
32	0	1706.29	8	12	1.31	3413.38	3409	10	9.06E-03	87.8	
33	0	1757.65	6	7	0.85	3516.17	3512	7	6.67E-03	83.7	
34	0	2030.75	10	7	3.98	4062.77	4057	13	1.12E-02	61.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 12:52:38

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561992.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 28-JUN-2016 12:36:58
Sample ID	: G1203561992	Sample quantity	: 115.00 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA30	Detector geometry	: CAN
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:06.73 0.7%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	327	85.60*	7.377E+00	1.353E+00	1.429E+00	39.74
	136.47	-----	10.68	7.235E+00	-----	Line Not Found	-----
CO-58	810.76	71	99.45*	2.163E+00	8.675E-01	1.071E+00	61.62
CO-60	1173.23	9338	99.85	1.580E+00	1.546E+02	1.558E+02	2.16
	1332.49	8513	99.98*	1.415E+00	1.572E+02	1.584E+02	2.14
NB-95	765.81	99	99.81*	2.266E+00	1.146E+00	1.447E+00	83.67
CD-109	88.03	4063	3.70*	6.606E+00	4.340E+02	4.483E+02	4.06
SN-126	64.28	-----	9.60	4.032E+00	-----	Line Not Found	-----
	86.94	107	8.90	6.456E+00	4.866E+00	4.866E+00	57.67
	87.57	4063	37.00*	6.606E+00	4.340E+01	4.340E+01	4.06
BA-137M	661.66	15039	89.90*	2.541E+00	1.719E+02	1.722E+02	1.74
CS-137	661.66	15039	85.10*	2.541E+00	1.816E+02	1.819E+02	1.74
PM-147	121.22	327	0.00*	7.377E+00	4.063E+04	4.126E+04	39.74
PB-210	46.54	11782	4.25*	1.249E+00	5.794E+03	5.805E+03	3.05
TH-229	85.43	107	14.70	6.456E+00	2.946E+00	2.946E+00	57.67
	88.47	4063	24.00	6.606E+00	6.691E+01	6.691E+01	4.06
	193.51	-----	4.41*	6.145E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.821E+00	-----	Line Not Found	-----
AM-241	59.54	23600	35.90*	3.295E+00	5.210E+02	5.211E+02	1.52

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561992.CNF;1
Acquisition date : 28-JUN-2016 12:36:58 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:06.73 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561992 Sample Quantity : 1.1500E+02 GRAM
Batch Number : 1572486 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	1.429E+00	5.565E-01	5.887E-01
CO-58	1.071E+00	6.466E-01	1.343E+00
CO-60	1.584E+02	3.318E+00	6.841E-01
NB-95	1.447E+00	1.186E+00	1.187E+00
CD-109	4.483E+02	1.784E+01	1.651E+01
SN-126	4.340E+01	1.727E+00	1.605E+00
BA-137M	1.722E+02	2.936E+00	1.014E+00
CS-137	1.819E+02	3.101E+00	1.072E+00
PM-147	4.126E+04	1.607E+04	1.698E+04
PB-210	5.805E+03	1.734E+02	1.220E+02
TH-229	6.355E+00	8.475E+00	1.301E+01
AM-241	5.211E+02	7.784E+00	4.905E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.548E+00	7.771E+00	1.190E+01	NOT IDENT.
NA-22	-8.055E-02	3.713E-01	6.465E-01	NOT IDENT.
NA-24	0.000E+00	6.958E+09	0.000E+00	SHORT HLIF
AL-26	-1.339E-02	2.901E-01	5.456E-01	NOT IDENT.
K-40	8.135E-01	2.602E+00	5.157E+00	NOT IDENT.
SC-46	2.604E-01	1.034E+00	1.581E+00	NOT IDENT.
V-48	1.300E-01	2.008E+00	3.482E+00	NOT IDENT.
CR-51	-3.353E+00	8.109E+00	1.237E+01	NOT IDENT.
MN-54	-2.695E-02	7.861E-01	1.196E+00	NOT IDENT.
CO-56	-2.591E-02	8.264E-01	1.445E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
FE-59	-2.180E-01	2.118E+00	3.621E+00	NOT IDENT.
ZN-65	0.000E+00	1.894E+00	3.443E+00	NOT IDENT.
GE-68	3.276E+00	2.670E+01	4.612E+01	NOT IDENT.
AS-73	-9.466E+00	1.960E+01	3.441E+01	NOT IDENT.
AS-74	2.170E-01	1.922E+00	3.288E+00	NOT IDENT.
SE-75	-3.010E-01	6.950E-01	1.223E+00	FAIL ABUN
BR-77	3.126E+02	7.971E+02	1.440E+03	NOT IDENT.

SR-82	1.430E+00	7.012E+00	1.247E+01	NOT IDENT.
RB-83	-1.501E-01	1.298E+00	2.217E+00	NOT IDENT.
KR-85	2.332E+01	1.182E+02	2.039E+02	NOT IDENT.
SR-85	1.329E-01	6.703E-01	1.156E+00	NOT IDENT.
RB-86	8.961E+00	2.108E+01	3.679E+01	NOT IDENT.
Y-88	-1.822E-04	2.543E-01	4.995E-01	NOT IDENT.
Y-91	9.517E+00	2.466E+02	4.316E+02	NOT IDENT.
NB-94	1.410E-03	5.079E-01	9.051E-01	NOT IDENT.
NB-95M	-8.793E-01	1.760E+00	3.111E+00	NOT IDENT.
ZR-95	0.000E+00	1.592E+00	2.329E+00	FAIL ABUN
NB-97	0.000E+00	8.983E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.609E+10	0.000E+00	SHORT HLIF
MO-99	-1.275E+01	1.004E+03	1.780E+03	NOT IDENT.
TC-99M	0.000E+00	2.118E+25	0.000E+00	SHORT HLIF
RH-101	2.812E-01	4.043E-01	7.078E-01	FAIL ABUN
RH-102	1.133E-01	1.067E+00	1.588E+00	FAIL ABUN
RU-103	2.278E-01	8.403E-01	1.453E+00	NOT IDENT.
RH-106	-3.340E+00	9.372E+00	9.583E+00	NOT IDENT.
RU-106	-3.340E+00	9.372E+00	9.583E+00	NOT IDENT.
AG-108M	-8.472E-02	5.803E-01	9.979E-01	NOT IDENT.
AG-110M	2.994E-01	1.083E+00	1.904E+00	FAIL ABUN
SN-113	5.189E-01	8.344E-01	1.475E+00	NOT IDENT.
CD-115	9.661E+02	1.503E+03	2.627E+03	NOT IDENT.
SN-117M	-2.526E-01	9.584E-01	1.620E+00	NOT IDENT.
TE-123M	-2.547E-01	3.753E-01	6.265E-01	NOT IDENT.
SB-124	-7.032E-02	7.039E-01	1.328E+00	NOT IDENT.
SB-125	5.336E-01	1.786E+00	3.110E+00	NOT IDENT.
TE-125M	9.574E+00	1.330E+02	2.307E+02	NOT IDENT.
I-126	1.648E+00	5.340E+00	8.036E+00	NOT IDENT.
SB-126	1.524E+00	3.256E+00	5.885E+00	NOT IDENT.
SB-127	-1.835E+01	6.978E+01	1.164E+02	NOT IDENT.
I-131	-7.059E-01	3.483E+00	6.052E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	3.995E+00	4.247E+01	7.619E+01	NOT IDENT.
BA-133	-2.179E-01	7.115E-01	1.234E+00	NOT IDENT.
I-133	0.000E+00	1.740E+07	0.000E+00	SHORT HLIF
CS-134	1.826E-01	7.223E-01	1.284E+00	NOT IDENT.
CS-135	1.571E+00	2.229E+00	4.035E+00	NOT IDENT.
I-135	0.000E+00	5.893E+23	0.000E+00	SHORT HLIF
CS-136	-1.737E-01	3.062E+00	5.269E+00	NOT IDENT.
CE-139	-1.708E-02	3.940E-01	6.684E-01	NOT IDENT.
BA-140	1.466E+00	6.458E+00	1.114E+01	NOT IDENT.
LA-140	7.526E-01	1.037E+00	2.105E+00	NOT IDENT.
CE-141	3.257E-01	8.952E-01	1.546E+00	NOT IDENT.
CE-143	0.000E+00	4.581E+04	0.000E+00	SHORT HLIF
CE-144	-8.607E-01	2.562E+00	4.358E+00	NOT IDENT.
PM-144	-1.858E-01	5.240E-01	9.225E-01	FAIL ABUN
PR-144	-1.375E+01	3.936E+01	6.930E+01	NOT IDENT.
PM-146	4.850E-01	8.726E-01	1.523E+00	NOT IDENT.
ND-147	9.426E+00	1.486E+01	2.598E+01	NOT IDENT.
PM-149	-7.356E+03	1.036E+04	1.803E+04	NOT IDENT.
EU-150	-2.957E-02	4.270E-01	7.490E-01	NOT IDENT.
EU-152	-3.722E-01	1.597E+00	2.782E+00	FAIL ABUN
GD-153	2.582E-01	1.035E+00	1.814E+00	NOT IDENT.
EU-154	-2.990E-01	1.042E+00	1.803E+00	FAIL ABUN
EU-155	-1.746E+00	1.321E+00	2.214E+00	FAIL ABUN
TB-160	-1.216E+00	3.012E+00	5.184E+00	FAIL ABUN
HO-166M	3.177E-01	9.514E-01	1.713E+00	FAIL ABUN
TM-171	2.871E+00	3.841E+02	6.790E+02	NOT IDENT.
HF-172	1.438E+00	2.743E+00	4.286E+00	FAIL ABUN
LU-172	8.160E-01	1.355E+00	2.377E+00	FAIL ABUN
LU-176	-1.047E-01	4.085E-01	7.165E-01	FAIL ABUN
HF-181	-2.460E-01	9.470E-01	1.613E+00	FAIL ABUN
TA-182	-4.141E-01	2.011E+00	3.467E+00	NOT IDENT.
RE-183	0.000E+00	7.574E+00	1.543E+01	FAIL ABUN
RE-184	-1.210E+00	3.085E+00	5.298E+00	FAIL ABUN
W-188	4.928E+01	1.183E+02	2.116E+02	NOT IDENT.
IR-192	3.207E-01	5.950E-01	1.063E+00	NOT IDENT.
HG-203	2.133E-01	6.170E-01	1.105E+00	NOT IDENT.
BI-207	4.127E-01	1.060E+00	1.852E+00	NOT IDENT.
TL-208	-1.667E-02	5.684E-01	9.692E-01	NOT IDENT.
BI-211	1.432E-01	3.306E+00	5.801E+00	NOT IDENT.
PB-211	-2.969E+00	1.299E+01	2.240E+01	FAIL ABUN
BI-212	2.163E+00	7.757E+00	1.393E+01	NOT IDENT.
PB-212	2.420E-01	7.918E-01	1.428E+00	NOT IDENT.
BI-214	-1.164E-01	1.094E+00	1.855E+00	NOT IDENT.
PB-214	-3.060E-01	1.210E+00	2.105E+00	FAIL ABUN
RN-219	8.175E-01	7.420E+00	1.291E+01	NOT IDENT.

RN-222	-1.164E-01	1.094E+00	1.855E+00	NOT IDENT.
RA-223	6.761E+00	1.440E+01	1.847E+01	FAIL ABUN
RA-224	-1.234E+00	8.552E+00	1.523E+01	NOT IDENT.
RA-226	-1.164E-01	1.094E+00	1.855E+00	NOT IDENT.
AC-227	-7.960E-01	3.770E+00	6.682E+00	NOT IDENT.
TH-227	-7.960E-01	3.770E+00	6.682E+00	NOT IDENT.
AC-228	1.195E+00	3.162E+00	5.553E+00	NOT IDENT.
RA-228	1.195E+00	3.162E+00	5.553E+00	NOT IDENT.
TH-228	2.420E-01	7.918E-01	1.428E+00	NOT IDENT.
TH-230	-1.164E-01	1.094E+00	1.855E+00	NOT IDENT.
PA-231	6.071E+00	7.119E+00	1.286E+01	NOT IDENT.
TH-231	6.761E+00	1.440E+01	1.847E+01	FAIL ABUN
TH-232	1.195E+00	3.162E+00	5.553E+00	NOT IDENT.
PA-233	5.586E-01	1.020E+00	1.825E+00	NOT IDENT.
PA-234	-1.446E+00	7.181E+00	1.235E+01	NOT IDENT.
PA-234M	4.398E+01	9.486E+01	1.664E+02	FAIL ABUN
TH-234	-7.005E+00	1.735E+01	2.720E+01	NOT IDENT.
U-234	-1.164E-01	1.094E+00	1.855E+00	NOT IDENT.
U-235	-2.384E-01	2.523E+00	4.304E+00	NOT IDENT.
NP-237	5.586E-01	1.020E+00	1.825E+00	NOT IDENT.
NP-238	0.000E+00	3.595E+03	0.000E+00	SHORT HLIF
U-238	-7.005E+00	1.735E+01	2.720E+01	NOT IDENT.
NP-239	-2.701E+00	3.588E+00	5.768E+00	NOT IDENT.
PU-239	-1.831E+03	4.276E+03	7.265E+03	NOT IDENT.
AM-243	2.873E-01	6.323E-01	1.121E+00	NOT IDENT.
CM-243	4.525E-01	1.331E+00	2.331E+00	NOT IDENT.
BK-247	-5.693E-01	1.201E+00	2.111E+00	NOT IDENT.
CM-247	2.657E-01	6.809E-01	1.194E+00	NOT IDENT.
CF-249	7.322E-03	7.042E-01	1.226E+00	NOT IDENT.
CF-251	-3.582E-01	1.728E+00	2.907E+00	NOT IDENT.
ANH-511	-2.915E-01	5.257E-01	8.945E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	327	85.60*	7.377E+00	1.353E+00	1.429E+00	39.74
	136.47	-----	10.68	7.235E+00	-----	Line Not Found	-----
CO-58	810.76	71	99.45*	2.163E+00	8.675E-01	1.071E+00	61.62
CO-60	1173.23	9338	99.85	1.580E+00	1.546E+02	1.558E+02	2.16
	1332.49	8513	99.98*	1.415E+00	1.572E+02	1.584E+02	2.14
NB-95	765.81	99	99.81*	2.266E+00	1.146E+00	1.447E+00	83.67
CD-109	88.03	4063	3.70*	6.606E+00	4.340E+02	4.483E+02	4.06
SN-126	64.28	-----	9.60	4.032E+00	-----	Line Not Found	-----
	86.94	107	8.90	6.456E+00	4.866E+00	4.866E+00	57.67
	87.57	4063	37.00*	6.606E+00	4.340E+01	4.340E+01	4.06
BA-137M	661.66	15039	89.90*	2.541E+00	1.719E+02	1.722E+02	1.74
CS-137	661.66	15039	85.10*	2.541E+00	1.816E+02	1.819E+02	1.74
PM-147	121.22	327	0.00*	7.377E+00	4.063E+04	4.126E+04	39.74
PB-210	46.54	11782	4.25*	1.249E+00	5.794E+03	5.805E+03	3.05
TH-229	85.43	107	14.70	6.456E+00	2.946E+00	2.946E+00	57.67
	88.47	4063	24.00	6.606E+00	6.691E+01	6.691E+01	4.06
	193.51	-----	4.41*	6.145E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.821E+00	-----	Line Not Found	-----
AM-241	59.54	23600	35.90*	3.295E+00	5.210E+02	5.211E+02	1.52

Flag: "*" = Keyline

Total number of lines in spectrum 34
Number of unidentified lines 15
Number of lines tentatively identified by NID 19 55.88%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.06	1.353E+00	1.429E+00	0.568E+00	39.74	
CO-58	70.86D	1.23	8.675E-01	1.071E+00	0.660E+00	61.62	
CO-60	5.27Y	1.01	1.572E+02	1.584E+02	0.034E+02	2.14	
NB-95	64.03D	1.26	1.146E+00	1.447E+00	1.210E+00	83.67	
CD-109	461.40D	1.03	4.340E+02	4.483E+02	0.182E+02	4.06	
SN-126	2.30E+05Y	1.00	4.340E+01	4.340E+01	0.176E+01	4.06	
BA-137M	30.08Y	1.00	1.719E+02	1.722E+02	0.030E+02	1.74	
CS-137	30.08Y	1.00	1.816E+02	1.819E+02	0.032E+02	1.74	
PM-147	2.62Y	1.02	4.063E+04	4.126E+04	1.640E+04	39.74	
PB-210	22.20Y	1.00	5.794E+03	5.805E+03	0.177E+03	3.05	
TH-229	7340.00Y	1.00	6.691E+01	6.691E+01	0.272E+01	4.06	K
AM-241	432.60Y	1.00	5.210E+02	5.211E+02	0.079E+02	1.52	
Total Activity :			4.800E+04	4.866E+04			

Grand Total Activity : 4.800E+04 4.866E+04

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
10	58.19	808	3396	1.62	116.10	113	11	8.32E-01	31.1	3.07E+00	T
0	197.40	50	761	1.30	394.54	392	7	5.44E-02	****	6.07E+00	T
0	323.66	45	695	1.45	647.08	644	9	4.92E-02	****	4.31E+00	T
0	474.92	109	620	1.73	949.64	946	9	1.22E-01	84.6	3.26E+00	T
0	618.12	20	296	1.64	1236.09	1235	8	2.25E-02	****	2.68E+00	T
0	624.32	36	294	1.34	1248.50	1246	8	4.11E-02	****	2.66E+00	
0	629.36	61	398	3.72	1258.58	1253	12	6.92E-02	****	2.64E+00	T
0	757.18	92	248	3.13	1514.28	1510	10	1.05E-01	66.5	2.28E+00	T
4	807.86	48	232	1.85	1615.68	1612	12	5.56E-02	****	2.17E+00	
0	831.19	19	297	1.21	1662.36	1658	8	2.22E-02	****	2.12E+00	T
0	862.67	42	387	1.42	1725.33	1719	11	4.88E-02	****	2.05E+00	
0	867.50	25	299	0.69	1734.99	1734	8	2.85E-02	****	2.04E+00	
0	894.36	38	505	3.60	1788.73	1784	12	4.34E-02	****	1.99E+00	T
0	1196.76	23	127	4.84	2393.77	2382	14	2.71E-02	****	1.55E+00	
0	1303.02	13	64	0.50	2606.39	2596	15	1.49E-02	****	1.44E+00	
0	1377.23	16	17	3.90	2754.88	2748	14	1.92E-02	****	1.38E+00	
0	1452.78	15	10	1.45	2906.06	2900	11	1.78E-02	94.6	1.31E+00	
0	1520.08	18	11	3.25	3040.73	3033	12	2.07E-02	87.0	1.26E+00	
0	1547.23	15	15	3.81	3095.08	3089	11	1.80E-02	****	1.25E+00	
0	1612.16	9	6	2.30	3225.01	3221	9	1.01E-02	****	1.20E+00	
0	1617.09	11	6	1.04	3234.88	3230	9	1.27E-02	****	1.20E+00	
0	1706.29	8	11	1.31	3413.38	3409	10	9.06E-03	****	1.15E+00	
0	1757.65	6	7	0.85	3516.17	3512	7	6.67E-03	****	1.13E+00	
0	2030.75	9	6	3.98	4062.77	4057	13	1.12E-02	****	1.02E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561992.CNF;1
* Acquisition date   : 28-JUN-2016 12:36:58 Sensitivity      : 3.000
* Detector ID        : GAM30 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:06.73 Half life ratio : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203561992 Analyst initials: MXR1
* Batch Number       : 1572486 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                                     Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	2.885E-01
CO-58	6.515E-01
CO-60	3.171E-01
NB-95	5.739E-01
CD-109	8.105E+00
SN-126	7.880E-01
BA-137M	4.919E-01
CS-137	5.196E-01
PM-147	8.323E+03
PB-210	6.036E+01
TH-229	6.375E+00
AM-241	2.423E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.816E+00	NOT IDENT.
NA-22	2.991E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.409E-01	NOT IDENT.
K-40	2.327E+00	NOT IDENT.
SC-46	7.697E-01	NOT IDENT.
V-48	1.693E+00	NOT IDENT.
CR-51	6.046E+00	NOT IDENT.
MN-54	5.808E-01	NOT IDENT.
CO-56	7.024E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
FE-59	1.759E+00	NOT IDENT.
ZN-65	1.678E+00	NOT IDENT.
GE-68	2.239E+01	NOT IDENT.
AS-73	1.703E+01	NOT IDENT.
AS-74	1.594E+00	NOT IDENT.
SE-75	5.981E-01	FAIL ABUN
BR-77	7.049E+02	NOT IDENT.
SR-82	6.048E+00	NOT IDENT.

RB-83	1.078E+00	NOT IDENT.
KR-85	9.933E+01	NOT IDENT.
SR-85	5.631E-01	NOT IDENT.
RB-86	1.787E+01	NOT IDENT.
Y-88	2.124E-01	NOT IDENT.
Y-91	2.046E+02	NOT IDENT.
NB-94	4.382E-01	NOT IDENT.
NB-95M	1.523E+00	NOT IDENT.
ZR-95	1.129E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	8.620E+02	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.468E-01	FAIL ABUN
RH-102	7.703E-01	FAIL ABUN
RU-103	7.089E-01	NOT IDENT.
RH-106	4.655E+00	NOT IDENT.
RU-106	4.655E+00	NOT IDENT.
AG-108M	4.880E-01	NOT IDENT.
AG-110M	9.268E-01	FAIL ABUN
SN-113	7.212E-01	NOT IDENT.
CD-115	1.279E+03	NOT IDENT.
SN-117M	7.920E-01	NOT IDENT.
TE-123M	3.063E-01	NOT IDENT.
SB-124	5.827E-01	NOT IDENT.
SB-125	1.522E+00	NOT IDENT.
TE-125M	1.131E+02	NOT IDENT.
I-126	3.885E+00	NOT IDENT.
SB-126	2.851E+00	NOT IDENT.
SB-127	5.637E+01	NOT IDENT.
I-131	2.957E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	3.734E+01	NOT IDENT.
BA-133	6.032E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.229E-01	NOT IDENT.
CS-135	1.973E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	2.557E+00	NOT IDENT.
CE-139	3.269E-01	NOT IDENT.
BA-140	5.417E+00	NOT IDENT.
LA-140	9.550E-01	NOT IDENT.
CE-141	7.566E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.133E+00	NOT IDENT.
PM-144	4.463E-01	FAIL ABUN
PR-144	3.352E+01	NOT IDENT.
PM-146	7.453E-01	NOT IDENT.
ND-147	1.265E+01	NOT IDENT.
PM-149	8.810E+03	NOT IDENT.
EU-150	3.659E-01	NOT IDENT.
EU-152	1.359E+00	FAIL ABUN
GD-153	8.888E-01	NOT IDENT.
EU-154	8.329E-01	FAIL ABUN
EU-155	1.084E+00	FAIL ABUN
TB-160	2.522E+00	FAIL ABUN
HO-166M	8.299E-01	FAIL ABUN
TM-171	3.360E+02	NOT IDENT.
HF-172	2.100E+00	FAIL ABUN
LU-172	1.155E+00	FAIL ABUN
LU-176	3.500E-01	FAIL ABUN
HF-181	7.876E-01	FAIL ABUN
TA-182	1.637E+00	NOT IDENT.
RE-183	7.679E+00	FAIL ABUN
RE-184	2.579E+00	FAIL ABUN
W-188	1.035E+02	NOT IDENT.
IR-192	5.198E-01	NOT IDENT.
HG-203	5.401E-01	NOT IDENT.
BI-207	8.988E-01	NOT IDENT.
TL-208	4.699E-01	NOT IDENT.
BI-211	2.834E+00	NOT IDENT.
PB-211	1.095E+01	FAIL ABUN
BI-212	6.744E+00	NOT IDENT.
PB-212	6.989E-01	NOT IDENT.
BI-214	8.991E-01	NOT IDENT.
PB-214	1.028E+00	FAIL ABUN
RN-219	6.315E+00	NOT IDENT.
RN-222	8.991E-01	NOT IDENT.

RA-223	9.031E+00	FAIL ABUN
RA-224	7.455E+00	NOT IDENT.
RA-226	8.991E-01	NOT IDENT.
AC-227	3.269E+00	NOT IDENT.
TH-227	3.269E+00	NOT IDENT.
AC-228	2.708E+00	NOT IDENT.
RA-228	2.708E+00	NOT IDENT.
TH-228	6.989E-01	NOT IDENT.
TH-230	8.990E-01	NOT IDENT.
PA-231	6.289E+00	NOT IDENT.
TH-231	9.031E+00	FAIL ABUN
TH-232	2.708E+00	NOT IDENT.
PA-233	8.921E-01	NOT IDENT.
PA-234	6.022E+00	NOT IDENT.
PA-234M	8.094E+01	FAIL ABUN
TH-234	1.336E+01	NOT IDENT.
U-234	8.990E-01	NOT IDENT.
U-235	2.107E+00	NOT IDENT.
NP-237	8.921E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.336E+01	NOT IDENT.
NP-239	2.824E+00	NOT IDENT.
PU-239	3.556E+03	NOT IDENT.
AM-243	5.508E-01	NOT IDENT.
CM-243	1.142E+00	NOT IDENT.
BK-247	1.032E+00	NOT IDENT.
CM-247	5.839E-01	NOT IDENT.
CF-249	5.990E-01	NOT IDENT.
CF-251	1.422E+00	NOT IDENT.
ANH-511	4.360E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561992.CNF;1
Acquisition date : 28-JUN-2016 12:36:58 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:06.73 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561992 Analyst initials: MXR1
Batch Number : 1572486 Sample Quantity : 1.1500E+02 GRAM
Quantity Err(%) : 1.7391E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	1.429E+00	5.653E-01	5.653E-01
CO-58	1.071E+00	6.574E-01	6.574E-01
CO-60	1.584E+02	1.364E+01	1.364E+01
NB-95	1.447E+00	1.195E+00	1.195E+00
CD-109	4.483E+02	4.674E+01	4.674E+01
SN-126	4.340E+01	3.897E+00	3.897E+00
BA-137M	1.722E+02	1.383E+01	1.383E+01
CS-137	1.819E+02	1.460E+01	1.460E+01
PM-147	4.126E+04	1.632E+04	1.632E+04
PB-210	5.805E+03	5.267E+02	5.267E+02
TH-229	6.355E+00	8.488E+00	8.488E+00
AM-241	5.211E+02	4.201E+01	4.201E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.548E+00	7.776E+00	7.939E+00	NOT IDENT.
NA-22	-8.055E-02	3.714E-01	3.731E-01	NOT IDENT.
NA-24	-5.625E+06	6.958E+09	6.958E+09	SHORT HLIF
AL-26	-1.339E-02	2.901E-01	2.902E-01	NOT IDENT.
K-40	8.135E-01	2.603E+00	2.629E+00	NOT IDENT.
SC-46	2.604E-01	1.035E+00	1.041E+00	NOT IDENT.
V-48	1.300E-01	2.009E+00	2.009E+00	NOT IDENT.
CR-51	-3.353E+00	8.113E+00	8.253E+00	NOT IDENT.
MN-54	-2.695E-02	7.861E-01	7.862E-01	NOT IDENT.
CO-56	-2.591E-02	8.264E-01	8.265E-01	NOT IDENT.
MN-56	-1.000E+41	3.049E+42	0.000E+00	SHORT HLIF
FE-59	-2.180E-01	2.119E+00	2.121E+00	NOT IDENT.
ZN-65	3.591E+00	2.024E+00	2.592E+00	NOT IDENT.
GE-68	3.276E+00	2.670E+01	2.674E+01	NOT IDENT.
AS-73	-9.466E+00	1.970E+01	2.016E+01	NOT IDENT.
AS-74	2.170E-01	1.922E+00	1.924E+00	NOT IDENT.
SE-75	-3.010E-01	6.955E-01	7.086E-01	FAIL ABUN
BR-77	3.126E+02	8.208E+02	8.328E+02	NOT IDENT.

SR-82	1.430E+00	7.014E+00	7.043E+00	NOT IDENT.
RB-83	-1.501E-01	1.299E+00	1.300E+00	NOT IDENT.
KR-85	2.332E+01	1.183E+02	1.187E+02	NOT IDENT.
SR-85	1.329E-01	6.704E-01	6.731E-01	NOT IDENT.
RB-86	8.961E+00	2.114E+01	2.153E+01	NOT IDENT.
Y-88	-1.822E-04	2.543E-01	2.543E-01	NOT IDENT.
Y-91	9.517E+00	2.466E+02	2.466E+02	NOT IDENT.
NB-94	1.410E-03	5.079E-01	5.079E-01	NOT IDENT.
NB-95M	-8.793E-01	1.762E+00	1.806E+00	NOT IDENT.
ZR-95	2.441E+00	1.610E+00	1.950E+00	FAIL ABUN
NB-97	1.000E+41	9.017E+40	0.000E+00	SHORT HLIF
ZR-97	5.673E+09	1.610E+10	1.630E+10	SHORT HLIF
MO-99	-1.275E+01	1.004E+03	1.004E+03	NOT IDENT.
TC-99M	1.388E+24	2.118E+25	0.000E+00	SHORT HLIF
RH-101	2.812E-01	4.076E-01	4.269E-01	FAIL ABUN
RH-102	1.133E-01	1.067E+00	1.069E+00	FAIL ABUN
RU-103	2.278E-01	8.405E-01	8.467E-01	NOT IDENT.
RH-106	-3.340E+00	9.377E+00	9.497E+00	NOT IDENT.
RU-106	-3.340E+00	9.377E+00	9.497E+00	NOT IDENT.
AG-108M	-8.472E-02	5.804E-01	5.816E-01	NOT IDENT.
AG-110M	2.994E-01	1.084E+00	1.092E+00	FAIL ABUN
SN-113	5.189E-01	8.355E-01	8.676E-01	NOT IDENT.
CD-115	9.661E+02	1.506E+03	1.568E+03	NOT IDENT.
SN-117M	-2.526E-01	9.585E-01	9.653E-01	NOT IDENT.
TE-123M	-2.547E-01	3.758E-01	3.929E-01	NOT IDENT.
SB-124	-7.032E-02	7.039E-01	7.046E-01	NOT IDENT.
SB-125	5.336E-01	1.787E+00	1.803E+00	NOT IDENT.
TE-125M	9.574E+00	1.330E+02	1.331E+02	NOT IDENT.
I-126	1.648E+00	5.342E+00	5.393E+00	NOT IDENT.
SB-126	1.524E+00	3.262E+00	3.333E+00	NOT IDENT.
SB-127	-1.835E+01	6.982E+01	7.031E+01	NOT IDENT.
I-131	-7.059E-01	3.483E+00	3.498E+00	NOT IDENT.
I-132	-1.000E+41	1.633E+42	0.000E+00	SHORT HLIF
TE-132	3.995E+00	4.247E+01	4.251E+01	NOT IDENT.
BA-133	-2.179E-01	7.117E-01	7.184E-01	NOT IDENT.
I-133	4.553E+06	1.742E+07	1.754E+07	SHORT HLIF
CS-134	1.826E-01	7.225E-01	7.272E-01	NOT IDENT.
CS-135	1.571E+00	2.234E+00	2.344E+00	NOT IDENT.
I-135	-3.185E+22	5.895E+23	0.000E+00	SHORT HLIF
CS-136	-1.737E-01	3.062E+00	3.063E+00	NOT IDENT.
CE-139	-1.708E-02	3.940E-01	3.941E-01	NOT IDENT.
BA-140	1.466E+00	6.459E+00	6.493E+00	NOT IDENT.
LA-140	7.526E-01	1.039E+00	1.093E+00	NOT IDENT.
CE-141	3.257E-01	8.955E-01	9.074E-01	NOT IDENT.
CE-143	-2.968E+04	4.589E+04	4.780E+04	SHORT HLIF
CE-144	-8.607E-01	2.563E+00	2.592E+00	NOT IDENT.
PM-144	-1.858E-01	5.243E-01	5.309E-01	FAIL ABUN
PR-144	-1.375E+01	3.938E+01	3.986E+01	NOT IDENT.
PM-146	4.850E-01	8.740E-01	9.009E-01	NOT IDENT.
ND-147	9.426E+00	1.488E+01	1.548E+01	NOT IDENT.
PM-149	-7.356E+03	1.042E+04	1.094E+04	NOT IDENT.
EU-150	-2.957E-02	4.270E-01	4.273E-01	NOT IDENT.
EU-152	-3.722E-01	1.597E+00	1.606E+00	FAIL ABUN
GD-153	2.582E-01	1.036E+00	1.042E+00	NOT IDENT.
EU-154	-2.990E-01	1.042E+00	1.051E+00	FAIL ABUN
EU-155	-1.746E+00	1.329E+00	1.545E+00	FAIL ABUN
TB-160	-1.216E+00	3.016E+00	3.066E+00	FAIL ABUN
HO-166M	3.177E-01	9.519E-01	9.626E-01	FAIL ABUN
TM-171	2.871E+00	3.841E+02	3.841E+02	NOT IDENT.
HF-172	1.438E+00	2.754E+00	2.829E+00	FAIL ABUN
LU-172	8.160E-01	1.367E+00	1.415E+00	FAIL ABUN
LU-176	-1.047E-01	4.086E-01	4.113E-01	FAIL ABUN
HF-181	-2.460E-01	9.472E-01	9.537E-01	FAIL ABUN
TA-182	-4.141E-01	2.011E+00	2.020E+00	NOT IDENT.
RE-183	2.484E+01	8.028E+00	1.378E+01	FAIL ABUN
RE-184	-1.210E+00	3.090E+00	3.138E+00	FAIL ABUN
W-188	4.928E+01	1.185E+02	1.206E+02	NOT IDENT.
IR-192	3.207E-01	5.956E-01	6.129E-01	NOT IDENT.
HG-203	2.133E-01	6.173E-01	6.247E-01	NOT IDENT.
BI-207	4.127E-01	1.063E+00	1.079E+00	NOT IDENT.
TL-208	-1.667E-02	5.684E-01	5.685E-01	NOT IDENT.
BI-211	1.432E-01	3.306E+00	3.307E+00	NOT IDENT.
PB-211	-2.969E+00	1.299E+01	1.306E+01	FAIL ABUN
BI-212	2.163E+00	7.760E+00	7.821E+00	NOT IDENT.
PB-212	2.420E-01	7.921E-01	7.996E-01	NOT IDENT.
BI-214	-1.164E-01	1.094E+00	1.095E+00	NOT IDENT.
PB-214	-3.060E-01	1.210E+00	1.218E+00	FAIL ABUN
RN-219	8.175E-01	7.421E+00	7.430E+00	NOT IDENT.

RN-222	-1.164E-01	1.094E+00	1.095E+00	NOT IDENT.
RA-223	6.761E+00	1.442E+01	1.474E+01	FAIL ABUN
RA-224	-1.234E+00	8.553E+00	8.571E+00	NOT IDENT.
RA-226	-1.164E-01	1.094E+00	1.095E+00	NOT IDENT.
AC-227	-7.960E-01	3.771E+00	3.788E+00	NOT IDENT.
TH-227	-7.960E-01	3.771E+00	3.788E+00	NOT IDENT.
AC-228	1.195E+00	3.166E+00	3.212E+00	NOT IDENT.
RA-228	1.195E+00	3.166E+00	3.212E+00	NOT IDENT.
TH-228	2.420E-01	7.921E-01	7.996E-01	NOT IDENT.
TH-230	-1.164E-01	1.094E+00	1.095E+00	NOT IDENT.
PA-231	6.071E+00	7.249E+00	7.749E+00	NOT IDENT.
TH-231	6.761E+00	1.442E+01	1.474E+01	FAIL ABUN
TH-232	1.195E+00	3.166E+00	3.212E+00	NOT IDENT.
PA-233	5.586E-01	1.021E+00	1.052E+00	NOT IDENT.
PA-234	-1.446E+00	7.372E+00	7.401E+00	NOT IDENT.
PA-234M	4.398E+01	9.513E+01	9.717E+01	FAIL ABUN
TH-234	-7.005E+00	1.742E+01	1.771E+01	NOT IDENT.
U-234	-1.164E-01	1.094E+00	1.095E+00	NOT IDENT.
U-235	-2.384E-01	2.523E+00	2.525E+00	NOT IDENT.
NP-237	5.586E-01	1.021E+00	1.052E+00	NOT IDENT.
NP-238	-2.660E+03	3.619E+03	3.812E+03	SHORT HLIF
U-238	-7.005E+00	1.742E+01	1.771E+01	NOT IDENT.
NP-239	-2.701E+00	3.597E+00	3.798E+00	NOT IDENT.
PU-239	-1.831E+03	4.278E+03	4.357E+03	NOT IDENT.
AM-243	2.873E-01	6.326E-01	6.458E-01	NOT IDENT.
CM-243	4.525E-01	1.332E+00	1.348E+00	NOT IDENT.
BK-247	-5.693E-01	1.207E+00	1.234E+00	NOT IDENT.
CM-247	2.657E-01	6.826E-01	6.931E-01	NOT IDENT.
CF-249	7.322E-03	7.042E-01	7.042E-01	NOT IDENT.
CF-251	-3.582E-01	1.729E+00	1.736E+00	NOT IDENT.
ANH-511	-2.915E-01	5.263E-01	5.425E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2731.5513	87.09	950.3282	136.47	687.1928
45.60	2629.9045	87.57	951.0389	140.51	700.1279
46.54	2635.6213	88.03	951.7159	143.76	712.4718
49.72	2687.4524	88.34	952.1720	144.24	720.4478
51.35	2632.8875	88.47	952.3593	145.44	673.6155
51.87	2719.8926	89.96	856.9618	152.43	730.2640
52.39	2762.6416	90.64	842.6666	153.25	712.2798
52.97	2905.2070	91.11	840.2249	154.21	691.0748
53.44	2929.8928	92.59	749.2084	156.02	694.6188
54.07	2916.2280	93.35	771.4037	158.56	659.0203
57.36	0.0000	94.56	803.3347	159.00	680.2729
57.53	3189.3386	94.65	803.4390	162.33	672.6816
57.98	2094.6675	94.67	803.4631	162.66	641.9271
59.27	2100.0588	94.87	787.4017	163.33	584.7778
59.32	2100.2705	97.43	741.2768	165.86	650.7077
59.54	2101.1838	98.43	755.6572	176.31	633.9869
60.96	958.2716	98.44	755.6685	176.60	652.1297
61.17	958.6617	99.53	760.9531	177.52	678.5538
62.93	915.5579	100.11	781.0848	181.07	658.3486
63.29	981.4219	102.03	743.0716	181.52	640.5889
63.58	967.4584	103.18	770.0398	184.41	717.0035
64.28	973.0966	103.37	747.5604	185.72	716.7677
66.73	981.4359	105.21	809.4282	193.51	718.5809
67.24	965.8033	105.31	809.5397	197.03	751.7966
67.68	958.7854	106.12	808.3737	198.01	705.5074
67.75	958.9055	106.47	756.9818	201.83	749.8865
69.67	972.0227	109.28	770.2695	203.43	713.5576
70.83	1005.3869	111.00	776.2122	205.31	715.9024
72.81	1008.8937	111.76	781.1684	210.85	763.4100
72.87	1017.8490	114.06	761.5733	215.65	797.9886
74.66	1000.2863	116.30	770.0900	222.11	776.3398
74.82	1000.5648	116.74	774.7258	227.09	732.8813
74.97	1009.7005	119.76	697.1038	227.38	748.9185
77.11	1097.5742	121.12	773.7831	228.16	765.2681
78.74	1009.1838	121.22	773.8800	228.18	765.2813
79.69	1030.6675	121.78	774.4244	235.69	724.7360
80.12	1083.1633	122.06	774.6965	235.96	724.8918
80.19	1083.2852	122.92	783.9921	238.63	677.5400
80.57	1075.9900	123.07	784.1391	238.98	672.3954
81.00	1114.6335	123.68	786.3231	240.99	708.2106
81.07	1114.7587	125.81	715.1279	242.00	688.2752
81.75	1090.0394	127.23	709.4559	244.70	679.0146
83.79	1023.0119	127.91	731.3370	252.40	692.9718
84.00	1029.3657	129.30	736.8304	252.80	695.8867
85.43	1064.8368	131.20	673.3228	254.15	0.0000
86.55	949.5264	133.02	691.9147	256.23	676.9755
86.79	949.8817	133.52	721.2582	260.90	664.8937
86.94	950.1074	136.00	676.0739	264.66	664.9523

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	660.4832	364.49	601.8022	600.60	319.8309
265.00	660.5831	366.42	593.7621	602.52	0.0000
268.22	594.8530	372.51	605.6186	604.72	349.8007
269.46	612.6892	375.05	615.2963	607.14	333.7817
270.03	622.0536	1093.63	610.3134	609.32	332.9887
271.23	670.9082	383.85	618.4158	610.33	321.1049
273.65	603.6104	388.16	594.3929	614.28	332.5649
276.40	607.5555	388.63	592.5844	618.01	340.0778
277.37	639.1127	391.69	593.6149	620.36	386.0205
277.60	645.6296	400.66	586.6932	621.93	408.2032
278.00	647.6447	401.81	621.7234	630.19	0.0000
279.20	599.6131	402.40	612.0214	631.29	333.0756
279.54	604.3381	404.85	629.7097	633.25	359.7891
279.70	608.0771	410.95	606.9377	634.78	305.3011
280.46	615.7523	413.71	622.7875	635.95	328.0938
283.69	610.7268	414.70	600.1904	636.99	345.5246
284.31	639.5154	423.72	623.1389	645.85	315.7109
285.41	638.1721	427.09	646.3289	657.76	334.7465
285.90	653.1334	427.87	639.5660	657.90	0.0000
287.50	636.3464	433.94	642.6242	661.66	338.8179
290.67	621.1201	439.40	666.6669	664.57	0.0000
293.27	0.0000	453.88	662.4731	666.33	262.6046
295.22	586.9178	463.37	704.4861	666.50	262.6189
295.96	630.8179	468.07	745.0818	667.71	0.0000
298.58	617.0795	473.00	708.4667	677.62	304.9956
299.98	598.1324	475.06	645.8331	685.70	317.1639
300.09	594.4603	476.78	563.2145	695.00	297.0398
300.13	594.4799	477.60	558.4976	696.49	308.0405
301.36	562.3884	482.18	570.6779	696.51	308.0489
302.85	597.4360	487.02	510.9828	697.00	306.2918
304.50	605.5657	492.35	516.4349	697.30	305.4213
304.85	601.0477	497.08	500.9679	697.49	305.4460
306.78	588.7408	505.52	521.7438	702.65	302.4021
308.46	570.6929	507.63	0.0000	706.68	294.6899
311.90	577.6222	511.00	497.9675	711.68	297.0383
316.51	592.5476	514.00	455.7092	720.70	297.0930
319.41	651.3434	514.00	455.7092	721.93	0.0000
320.08	645.5945	520.40	421.3266	722.78	311.9080
321.04	641.4636	520.69	410.8793	722.91	311.9247
323.87	580.2720	522.65	0.0000	723.31	326.5614
325.23	587.2100	527.90	419.6077	724.19	323.9288
328.76	570.3340	528.26	410.1785	727.33	290.4933
333.37	601.8600	529.59	422.0337	733.00	314.8742
333.97	585.9219	529.87	0.0000	735.93	273.9690
334.37	593.6836	531.02	401.1987	737.46	305.2852
338.28	601.8167	537.26	386.4424	739.50	306.4222
338.32	601.8263	546.56	0.0000	747.24	335.7715
340.48	575.9029	552.55	367.7417	748.06	318.3859
340.55	575.9213	563.25	339.4729	752.31	321.0092
344.28	603.1027	569.33	358.6158	753.82	330.3910
345.93	565.3867	569.50	361.8575	756.73	319.9642
351.06	585.4340	569.70	351.1498	756.80	319.9642
351.93	603.0532	583.19	335.8853	763.94	284.5201
355.39	0.0000	584.27	355.4863	765.81	284.7003
356.01	619.9727	595.83	330.0601	766.42	279.3583

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	277.8516	1002.74	392.3936	1678.03	0.0000
772.60	0.0000	1004.73	400.5769	1690.97	18.3954
776.52	336.3790	1021.30	0.0000	1750.46	0.0000
777.92	348.6237	1025.87	0.0000	1764.49	12.8438
778.90	349.6726	1028.54	0.0000	1770.23	21.6061
783.70	325.0915	1037.84	386.1375	1771.35	15.7168
785.37	359.7546	1038.76	0.0000	1791.20	0.0000
792.07	345.6194	1046.59	367.8872	1808.65	19.7754
794.95	345.0186	1048.07	359.9808	1810.72	0.0000
795.86	341.3766	1049.04	351.9992	1836.06	10.9279
801.95	352.1129	1050.41	365.2523		
810.06	352.3773	1063.66	340.2164		
810.29	352.4048	1077.00	355.6396		
810.45	347.7241	1077.34	359.7387		
810.76	347.7603	1085.87	355.4586		
815.77	331.8543	1093.63	356.1743		
818.51	363.7220	1099.45	389.4088		
832.01	342.2854	1112.07	492.2109		
834.85	371.0124	1112.84	431.7922		
835.71	330.0577	1115.54	364.3430		
836.80	0.0000	1120.29	391.5110		
846.75	0.0000	1120.55	391.5296		
846.77	395.5656	1121.30	356.6577		
856.80	386.3221	1129.67	265.7476		
860.56	397.9187	1131.51	0.0000		
871.09	435.9602	1147.95	0.0000		
873.19	386.7017	1173.23	197.8486		
875.33	0.0000	1177.95	172.0093		
879.38	444.7671	1189.05	146.3438		
880.51	456.4453	1204.77	109.1289		
883.24	410.6643	1221.41	101.1375		
884.68	425.2847	1231.02	100.3113		
889.28	433.5864	1235.36	73.9888		
894.76	447.8235	1238.28	74.0400		
898.04	436.3612	1260.41	0.0000		
900.72	444.7715	1271.87	60.7657		
903.28	462.5257	1274.44	55.4684		
911.20	484.0032	1274.54	55.4684		
912.08	494.7971	1291.59	54.6158		
923.98	0.0000	1298.22	0.0000		
926.50	473.5415	1312.11	51.6422		
929.11	499.2625	1332.49	54.0405		
937.49	530.8037	1362.66	0.0000		
944.13	529.8657	1365.19	27.2156		
946.00	524.2765	1368.63	0.0000		
949.00	509.0407	1384.29	39.0398		
954.55	0.0000	1408.01	27.4670		
962.31	497.2203	1457.56	0.0000		
964.08	531.9448	1460.82	23.1445		
966.17	492.8467	1489.16	20.4854		
968.97	451.8054	1505.03	23.3541		
983.53	402.1640	1584.12	23.7223		
984.45	0.0000	1596.21	21.8751		
996.26	389.6936	1620.50	13.1044		
1001.03	386.2286	1621.92	14.7462		

Batch# 1572231 Product: Y solid Date: 6/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (If required). Blank correction reported included (If required).			N/A
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			N/A
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		At 15:45 6/29/16
Sample was correctly preserved if required.			N/A
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs Initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are Included and properly statused.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hlt notification complete (If necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			N/A
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			N/A
Aliquot Correction completed If required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)			N/A

Primary Review Performed By: [Signature] 6/29/16

Secondary Review Performed By: [Signature] 6/29/16

BRKL
7/3

Gamma Spec Queue Sheet

06/08/2016

Batch #: 1572231 Analyst: MXR1 First Client Due Date: 06/29/2016 Internal Due Date: 06/29/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 1.0 mL
 Initials: M.S. Prep Date: 6/7/16 Library: 8021D Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Aliquot (1/g F)	Detector	Sealing Date/Time (if Applicable)
398677001-1	37801-001	SAMPLE		BRKL007	SOIL	11-MAY-16 10:00:00	CAN	161.97 g	30	6/7/16
398677002-1	37801-002	SAMPLE		BRKL007	SOIL	11-MAY-16 10:05:00		162.52 g	41	
398677003-1	37801-003	SAMPLE		BRKL007	SOIL	11-MAY-16 10:10:00		161.19 g	43	
398677004-1	37801-004	SAMPLE		BRKL007	SOIL	11-MAY-16 10:15:00		143.49 g	5	
398677005-1	37801-005	SAMPLE		BRKL007	SOIL	11-MAY-16 10:19:00		133.83 g	19	
398677006-1	37801-006	SAMPLE		BRKL007	SOIL	11-MAY-16 10:24:00		150.45 g	28	
398677007-1	37801-007	SAMPLE		BRKL007	SOIL	11-MAY-16 10:30:00		147.58 g	31	
398677008-1	37801-008	SAMPLE		BRKL007	SOIL	11-MAY-16 10:35:00		150.78 g	16	
398677009-1	37801-009	SAMPLE		BRKL007	SOIL	11-MAY-16 10:40:00		151.84 g	14	
398677010-1	37801-010	SAMPLE		BRKL007	SOIL	11-MAY-16 10:50:00		157.34 g	16	
398677011-1	37801-011	SAMPLE		BRKL007	SOIL	11-MAY-16 10:55:00		160.2 g	17	
398677012-1	37801-012	SAMPLE		BRKL007	SOIL	11-MAY-16 11:00:00		151.63 g	19	
398677013-1	37801-013	SAMPLE		BRKL007	SOIL	11-MAY-16 11:03:00		158.93 g	25	
398677014-1	37801-014	SAMPLE		BRKL007	SOIL	11-MAY-16 11:10:00		153.48 g	27	
398677015-1	37801-015	SAMPLE		BRKL007	SOIL	11-MAY-16 11:15:00		148.82 g	28	
398677016-1	37801-016	SAMPLE		BRKL007	SOIL	11-MAY-16 11:25:00		152.71 g	27	
398677017-1	37801-017	SAMPLE		BRKL007	SOIL	11-MAY-16 11:35:00		149.63 g	30	
398677018-1	37801-018	SAMPLE		BRKL007	SOIL	11-MAY-16 11:40:00		154.99 g	31	
398677019-1	37801-019	SAMPLE		BRKL007	SOIL	11-MAY-16 00:00:00		146.48 g	32	
398677020-1	37801-020	SAMPLE		BRKL007	SOIL	11-MAY-16 11:20:00		153.92 g	33	
1203561373-1	MB	MB		QC ACCOUNT	SOIL	6/7/16		142.52	41	
1203561374-1	DUP 37801-017(398677016)	DUP		QC ACCOUNT	SOIL	11-MAY-16 11:25:00		152.71	43	
1203561375-1	LCS	LCS		QC ACCOUNT	SOIL	6/7/16		115	30	

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: B. Williams 6/29/16
 Page 1 of 1
 6/29/16

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 14:12:00.88

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677001.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM30.CNF;285
Background date    : 26-JUN-2016 12:05:40
Sample date       : 11-MAY-2016 10:00:00 Acquisition date : 28-JUN-2016 13:11:09
Sample ID        : G398677001 Sample quantity : 1.61970E+02 GRAM
Detector name    : GAM30 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:01.32 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	74.94	88	106	1.11	149.60	145	15	2.44E-02	22.0	1.83E+00
2	2	77.21*	130	73	0.89	154.15	145	15	3.62E-02	13.2	
3	0	86.74*	20	158	0.75	173.20	169	9	5.43E-03	118.8	
4	2	185.90*	41	48	1.37	371.52	367	21	1.15E-02	37.0	1.38E+00
5	2	190.37	19	48	1.38	380.48	367	21	5.25E-03	68.6	
6	0	197.41*	11	72	1.52	394.55	389	9	3.18E-03	140.5	
7	3	238.70*	282	39	1.17	477.14	470	24	7.83E-02	7.2	1.23E+00
8	3	241.51	57	58	1.58	482.77	470	24	1.58E-02	33.0	
9	0	295.20*	104	31	1.30	590.15	586	10	2.90E-02	14.3	
10	0	338.34	52	60	0.99	676.45	670	12	1.44E-02	32.9	
11	0	352.05*	153	30	1.19	703.87	699	10	4.24E-02	10.7	
12	0	463.32*	22	23	0.81	926.45	921	10	6.12E-03	47.2	
13	0	486.96	30	8	1.88	973.73	968	10	8.44E-03	24.8	
14	0	583.35*	94	12	1.27	1166.54	1160	12	2.61E-02	13.0	
15	0	609.45*	116	20	1.58	1218.76	1211	14	3.22E-02	12.8	
16	1	657.21	12	8	1.63	1314.30	1310	18	3.46E-03	47.5	4.53E-01
17	1	661.91	87	8	1.63	1323.70	1310	18	2.43E-02	11.9	
18	0	728.00	16	17	1.23	1455.91	1451	12	4.53E-03	54.1	
19	0	769.62	19	26	0.69	1539.19	1531	17	5.14E-03	66.7	
20	0	785.60	27	25	6.06	1571.15	1556	25	7.61E-03	52.7	
21	0	802.82*	7	6	0.97	1605.61	1601	9	1.86E-03	87.0	
22	0	806.79	11	8	2.26	1613.54	1609	8	3.04E-03	54.0	
23	0	911.30*	50	3	1.35	1822.62	1817	12	1.39E-02	17.0	
24	0	926.21	12	2	0.54	1852.45	1847	9	3.20E-03	37.8	
25	0	947.06	23	0	2.13	1894.17	1888	12	6.39E-03	20.9	
26	0	969.01*	38	17	4.69	1938.09	1930	14	1.07E-02	28.7	
27	0	1011.90	7	4	0.79	2023.89	2018	9	1.89E-03	67.4	
28	0	1104.51	11	6	3.16	2209.19	2204	11	2.92E-03	53.1	
29	0	1240.01	29	6	5.89	2480.30	2470	22	8.15E-03	27.5	
30	0	1323.66	16	0	1.24	2647.69	2641	13	4.44E-03	25.0	
31	0	1378.42	11	3	0.63	2757.26	2754	7	3.10E-03	40.3	
32	0	1440.25	6	2	0.87	2880.99	2876	7	1.68E-03	54.9	
33	0	1461.22*	153	12	1.91	2922.96	2917	12	4.26E-02	9.4	
34	0	1765.38	39	0	1.01	3531.64	3526	12	1.08E-02	16.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 14:12:02

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677001.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:00:00 Acquisition date : 28-JUN-2016 13:11:09
Sample ID         : G398677001 Sample quantity  : 161.97 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA30 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:01.32 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.307E+00	4.951E+00	4.951E+00	18.78	OK
BA-137M	661.66	89.90*	2.541E+00	1.900E-01	1.906E-01	23.80	OK
CS-137	661.66	85.10*	2.541E+00	2.007E-01	2.013E-01	23.80	OK
TL-208	277.37	6.60	4.820E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.799E+00	1.988E-01	1.988E-01	26.09	OK
	860.56	12.50	2.059E+00	----- Line	Not Found	-----	Absent
BI-212	727.33	6.67*	2.358E+00	5.097E-01	5.097E-01	108.24	OK
	785.37	1.10	2.218E+00	5.467E+00	5.467E+00	105.32	OK
	1620.50	1.47	1.200E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	5.455E+00	6.004E-01	6.004E-01	73.58	OK
	77.11	17.10	5.702E+00	8.319E-01	8.319E-01	26.50	OK
	238.63	43.60*	5.356E+00	6.718E-01	6.718E-01	14.43	OK
	300.09	3.30	4.556E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59	OK
	1120.29	14.92	1.645E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.121E+00	9.987E-01	9.987E-01	32.03	OK
PB-214	74.82	5.80	5.442E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.702E+00	1.467E+00	1.467E+00	26.50	OK
	87.09	3.41	6.518E+00	5.419E-01	5.420E-01	237.66	OK
	242.00	7.25	5.305E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.610E+00	6.689E-01	6.689E-01	28.55	OK
	351.93	35.60*	4.059E+00	5.637E-01	5.637E-01	21.44	OK
RN-222	609.32	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59	OK
	1120.29	14.92	1.645E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.121E+00	9.987E-01	9.987E-01	32.03	OK
RA-224	240.99	4.10*	5.313E+00	2.649E-01	2.649E-01	383.03	OK
RA-226	609.32	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59	OK
	1120.29	14.92	1.645E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.121E+00	9.987E-01	9.987E-01	32.03	OK
AC-228	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.178E+00	5.921E-01	5.921E-01	65.72	OK
	794.95	4.25	2.197E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.963E+00	4.712E-01	4.712E-01	34.05	OK
	968.97	15.80	1.864E+00	6.193E-01	6.193E-01	57.45	OK
RA-228	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.178E+00	5.921E-01	5.921E-01	65.72	OK
	794.95	4.25	2.197E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.963E+00	4.712E-01	4.712E-01	34.05	OK
	968.97	15.80	1.864E+00	6.193E-01	6.193E-01	57.45	OK
TH-228	74.82	10.28	5.455E+00	6.004E-01	6.004E-01	73.58	OK
	77.11	17.10	5.702E+00	8.319E-01	8.319E-01	26.50	OK
	238.63	43.60*	5.356E+00	6.718E-01	6.718E-01	14.43	OK
	300.09	3.30	4.556E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59	OK
	1120.29	14.92	1.645E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.121E+00	9.987E-01	9.987E-01	32.03	OK
TH-232	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	338.32	11.27	4.178E+00	5.921E-01	5.921E-01	65.72	OK
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.963E+00	4.712E-01	4.712E-01	34.05	OK
	968.97	15.80	1.864E+00	6.193E-01	6.193E-01	57.45	OK
U-234	609.32	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59	OK
	1120.29	14.92	1.645E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.121E+00	9.987E-01	9.987E-01	32.03	OK
AM-243	43.53	5.90	8.765E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.455E+00	9.185E-02	9.185E-02	73.58	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677001.CNF;1  *
* Acquisition date   : 28-JUN-2016 13:11:09 Sensitivity      : 3.000          *
* Detector ID        : GAM30 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:01.32 Half life ratio : *****      *
* Sample date        : 11-MAY-2016 10:00:00 Analyst initials: MXR1      *
* Sample ID          : G398677001 Sample Quantity : 1.6197E+02 GRAM    *
* Batch Number       : 1572231 Wet Weight : 0.00000         *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.951E+00	9.114E-01	6.331E-01
BA-137M	1.906E-01	4.444E-02	4.495E-02
CS-137	2.013E-01	4.695E-02	4.749E-02
TL-208	1.988E-01	5.082E-02	4.812E-02
BI-212	5.097E-01	5.407E-01	5.097E-01
PB-212	6.718E-01	9.503E-02	7.878E-02
BI-214	4.722E-01	1.184E-01	9.957E-02
PB-214	5.637E-01	1.184E-01	9.908E-02
RN-222	4.722E-01	1.184E-01	9.957E-02
RA-224	2.649E-01	9.943E-01	8.440E-01
RA-226	4.722E-01	1.184E-01	9.957E-02
AC-228	4.712E-01	1.573E-01	1.544E-01
RA-228	4.712E-01	1.573E-01	1.544E-01
TH-228	6.718E-01	9.503E-02	7.878E-02
TH-230	4.722E-01	1.184E-01	9.957E-02
TH-232	4.712E-01	1.573E-01	1.544E-01
U-234	4.722E-01	1.184E-01	9.957E-02
AM-243	9.185E-02	6.623E-02	6.612E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.549E-01	3.950E-01	8.234E-01	NOT IDENT.
NA-22	-3.824E-02	3.250E-02	4.806E-02	NOT IDENT.
NA-24	0.000E+00	4.611E+21	0.000E+00	SHORT HLIF
AL-26	-4.077E-03	1.837E-02	3.933E-02	NOT IDENT.
SC-46	-1.547E-02	3.168E-02	5.892E-02	NOT IDENT.
V-48	6.015E-02	2.277E-01	4.654E-01	NOT IDENT.
CR-51	1.158E-02	5.483E-01	1.092E+00	NOT IDENT.
MN-54	3.116E-02	2.903E-02	6.531E-02	NOT IDENT.
CO-56	5.568E-03	4.076E-02	8.216E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.641E-03	1.917E-02	3.715E-02	NOT IDENT.
CO-58	-2.216E-02	3.434E-02	5.048E-02	NOT IDENT.

FE-59	-1.059E-01	1.295E-01	1.726E-01	NOT IDENT.
CO-60	-4.859E-03	2.997E-02	5.719E-02	NOT IDENT.
ZN-65	-5.038E-02	7.876E-02	1.369E-01	NOT IDENT.
GE-68	-5.578E-01	9.358E-01	1.657E+00	NOT IDENT.
AS-73	6.330E-01	6.511E-01	1.414E+00	NOT IDENT.
AS-74	-1.309E-01	2.516E-01	4.457E-01	NOT IDENT.
SE-75	-6.040E-03	3.816E-02	7.465E-02	NOT IDENT.
BR-77	0.000E+00	2.254E+05	0.000E+00	SHORT HLIF
SR-82	7.285E-02	7.370E-01	9.462E-01	NOT IDENT.
RB-83	2.241E-02	6.878E-02	1.384E-01	NOT IDENT.
KR-85	-1.224E+01	8.144E+00	1.310E+01	NOT IDENT.
SR-85	-9.202E-02	6.106E-02	9.820E-02	NOT IDENT.
RB-86	-1.139E+00	1.762E+00	3.087E+00	NOT IDENT.
Y-88	4.694E-02	3.253E-02	9.338E-02	NOT IDENT.
Y-91	1.867E+01	1.879E+01	4.355E+01	NOT IDENT.
NB-94	4.205E-03	2.316E-02	4.710E-02	NOT IDENT.
NB-95	-3.055E-03	4.602E-02	7.917E-02	NOT IDENT.
NB-95M	6.790E-02	1.277E-01	2.378E-01	NOT IDENT.
ZR-95	-8.008E-03	7.565E-02	1.489E-01	NOT IDENT.
NB-97	0.000E+00	9.311E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.457E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.676E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.576E+41	0.000E+00	SHORT HLIF
RH-101	2.554E-02	2.355E-02	4.862E-02	FAIL ABUN
RH-102	1.907E-02	3.833E-02	7.982E-02	NOT IDENT.
RU-103	-2.617E-02	5.025E-02	9.075E-02	FAIL ABUN
RH-106	8.595E-02	2.767E-01	5.460E-01	NOT IDENT.
RU-106	8.595E-02	2.767E-01	5.460E-01	NOT IDENT.
AG-108M	5.292E-03	2.380E-02	4.704E-02	NOT IDENT.
CD-109	5.369E-01	1.251E+00	1.261E+00	FAIL ABUN
AG-110M	2.275E-02	3.425E-02	7.688E-02	FAIL ABUN
SN-113	-6.312E-03	3.793E-02	7.295E-02	NOT IDENT.
CD-115	0.000E+00	2.126E+05	0.000E+00	SHORT HLIF
SN-117M	-6.193E-02	2.109E-01	3.886E-01	NOT IDENT.
TE-123M	-1.851E-02	2.520E-02	4.454E-02	NOT IDENT.
SB-124	1.510E-02	4.915E-02	1.367E-01	NOT IDENT.
SB-125	-2.704E-02	6.224E-02	1.154E-01	FAIL ABUN
TE-125M	2.225E+00	1.017E+01	1.996E+01	NOT IDENT.
I-126	-2.411E-01	1.036E+00	1.641E+00	NOT IDENT.
SB-126	6.933E-01	6.472E-01	1.449E+00	NOT IDENT.
SN-126	4.994E-02	1.163E-01	1.179E-01	FAIL ABUN
SB-127	0.000E+00	3.732E+02	0.000E+00	SHORT HLIF
I-131	7.082E-01	1.384E+00	2.878E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	6.065E+02	0.000E+00	SHORT HLIF
BA-133	1.017E-02	2.940E-02	5.438E-02	NOT IDENT.
I-133	0.000E+00	1.118E+15	0.000E+00	SHORT HLIF
CS-134	4.377E-03	2.737E-02	5.542E-02	FAIL ABUN
CS-135	-2.777E-02	1.086E-01	2.101E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	7.923E-02	4.213E-01	8.619E-01	NOT IDENT.
CE-139	-5.721E-03	2.682E-02	4.950E-02	NOT IDENT.
BA-140	2.912E-01	1.089E+00	2.203E+00	NOT IDENT.
LA-140	-8.349E-02	2.993E-01	6.117E-01	FAIL ABUN
CE-141	3.169E-02	9.638E-02	1.867E-01	NOT IDENT.
CE-143	0.000E+00	1.782E+09	0.000E+00	SHORT HLIF
CE-144	1.891E-02	1.428E-01	2.771E-01	NOT IDENT.
PM-144	7.195E-03	2.578E-02	5.346E-02	NOT IDENT.
PR-144	5.287E-01	1.960E+00	4.061E+00	NOT IDENT.
PM-146	-1.766E-02	3.077E-02	5.550E-02	NOT IDENT.
ND-147	5.801E-01	3.023E+00	6.070E+00	NOT IDENT.
PM-147	1.445E+02	5.226E+02	1.029E+03	NOT IDENT.
PM-149	0.000E+00	2.239E+06	0.000E+00	SHORT HLIF
EU-150	-3.515E-04	2.155E-02	3.720E-02	FAIL ABUN
EU-152	-5.725E-03	7.721E-02	1.390E-01	NOT IDENT.
GD-153	1.578E-02	5.764E-02	1.153E-01	NOT IDENT.
EU-154	-1.047E-01	9.090E-02	1.356E-01	NOT IDENT.
EU-155	2.255E-02	7.393E-02	1.465E-01	FAIL ABUN
TB-160	-6.964E-02	1.169E-01	2.124E-01	FAIL ABUN
HO-166M	-1.914E-03	4.088E-02	8.199E-02	FAIL ABUN
TM-171	6.129E+00	1.090E+01	2.297E+01	NOT IDENT.
HF-172	5.172E-03	1.485E-01	2.841E-01	NOT IDENT.
LU-172	4.041E-03	4.180E-02	8.530E-02	FAIL ABUN
LU-176	-3.740E-03	1.773E-02	3.442E-02	NOT IDENT.
HF-181	-4.283E-02	6.728E-02	1.007E-01	NOT IDENT.
TA-182	2.353E-04	1.373E-01	2.726E-01	NOT IDENT.
RE-183	6.941E-02	1.646E-01	3.411E-01	NOT IDENT.
RE-184	1.235E-01	1.715E-01	3.760E-01	NOT IDENT.

W-188	-3.944E+00	8.899E+00	1.454E+01	NOT IDENT.
IR-192	-8.859E-03	3.083E-02	5.937E-02	FAIL ABUN
HG-203	-2.081E-02	4.678E-02	8.853E-02	NOT IDENT.
BI-207	3.811E-03	3.584E-02	7.245E-02	FAIL ABUN
PB-210	1.252E+00	1.778E+00	3.819E+00	NOT IDENT.
BI-211	0.000E+00	3.263E-01	6.027E-01	FAIL ABUN
PB-211	1.021E-01	4.834E-01	9.720E-01	NOT IDENT.
RN-219	-8.341E-02	3.045E-01	5.743E-01	NOT IDENT.
RA-223	2.771E-01	4.561E-01	9.491E-01	FAIL ABUN
AC-227	1.496E-01	1.807E-01	3.826E-01	NOT IDENT.
TH-227	1.496E-01	1.807E-01	3.826E-01	NOT IDENT.
TH-229	6.256E-02	4.921E-01	6.621E-01	FAIL ABUN
PA-231	4.449E-01	3.824E-01	7.986E-01	NOT IDENT.
TH-231	2.771E-01	4.561E-01	9.491E-01	FAIL ABUN
PA-233	-2.918E-03	4.332E-02	8.531E-02	NOT IDENT.
PA-234	4.800E-01	1.962E-01	4.879E-01	FAIL ABUN
PA-234M	-2.410E+00	3.148E+00	5.420E+00	NOT IDENT.
TH-234	-2.989E-01	8.657E-01	1.728E+00	NOT IDENT.
U-235	3.024E-02	1.520E-01	2.912E-01	FAIL ABUN
NP-237	-2.918E-03	4.332E-02	8.531E-02	NOT IDENT.
NP-238	0.000E+00	7.763E+05	0.000E+00	SHORT HLIF
U-238	-2.989E-01	8.657E-01	1.728E+00	NOT IDENT.
NP-239	9.123E-02	1.809E-01	3.634E-01	NOT IDENT.
PU-239	1.149E+01	2.416E+02	4.635E+02	NOT IDENT.
AM-241	1.093E-02	9.591E-02	1.933E-01	NOT IDENT.
CM-243	3.912E-03	7.376E-02	1.436E-01	NOT IDENT.
BK-247	-7.066E-03	5.526E-02	1.086E-01	NOT IDENT.
CM-247	1.020E-02	2.676E-02	5.443E-02	NOT IDENT.
CF-249	-1.568E-02	2.768E-02	5.068E-02	NOT IDENT.
CF-251	3.373E-02	1.007E-01	1.935E-01	NOT IDENT.
ANH-511	-2.343E-02	3.824E-02	8.157E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	149	10.66*	1.307E+00	4.951E+00	4.951E+00	18.78
CD-109	88.03	26	3.70*	6.518E+00	4.994E-01	5.369E-01	237.66
SN-126	64.28	-----	9.60	4.032E+00	-----	Line Not Found	-----
	86.94	26	8.90	6.518E+00	2.076E-01	2.076E-01	237.66
	87.57	26	37.00*	6.518E+00	4.994E-02	4.994E-02	237.66
BA-137M	661.66	94	89.90*	2.541E+00	1.900E-01	1.906E-01	23.80
CS-137	661.66	94	85.10*	2.541E+00	2.007E-01	2.013E-01	23.80
TL-208	277.37	-----	6.60	4.820E+00	-----	Line Not Found	-----
	583.19	102	85.00*	2.799E+00	1.988E-01	1.988E-01	26.09
	860.56	-----	12.50	2.059E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	5.213E+00	-----	Line Not Found	-----
	351.06	176	12.92*	4.059E+00	1.553E+00	1.553E+00	21.44
BI-212	727.33	17	6.67*	2.358E+00	5.097E-01	5.097E-01	108.24
	785.37	29	1.10	2.218E+00	5.467E+00	5.467E+00	105.32
	1620.50	-----	1.47	1.200E+00	-----	Line Not Found	-----
PB-212	74.82	118	10.28	5.455E+00	9.763E-01	9.763E-01	43.92
	77.11	175	17.10	5.702E+00	8.319E-01	8.319E-01	26.50
	238.63	338	43.60*	5.356E+00	6.718E-01	6.718E-01	14.43
	300.09	-----	3.30	4.556E+00	-----	Line Not Found	-----
BI-214	609.32	125	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59
	1120.29	-----	14.92	1.645E+00	-----	Line Not Found	-----
	1764.49	37	15.30	1.121E+00	9.987E-01	9.987E-01	32.03
PB-214	74.82	118	5.80	5.455E+00	1.730E+00	1.730E+00	43.92
	77.11	175	9.70	5.702E+00	1.467E+00	1.467E+00	26.50
	87.09	26	3.41	6.518E+00	5.419E-01	5.420E-01	237.66
	242.00	68	7.25	5.313E+00	8.187E-01	8.187E-01	66.09
	295.22	123	18.42	4.610E+00	6.689E-01	6.689E-01	28.55
	351.93	176	35.60*	4.059E+00	5.637E-01	5.637E-01	21.44
RN-222	609.32	125	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59
	1120.29	-----	14.92	1.645E+00	-----	Line Not Found	-----
	1764.49	37	15.30	1.121E+00	9.987E-01	9.987E-01	32.03
RA-224	240.99	68	4.10*	5.313E+00	1.448E+00	1.448E+00	66.09
RA-226	609.32	125	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59
	1120.29	-----	14.92	1.645E+00	-----	Line Not Found	-----
	1764.49	37	15.30	1.121E+00	9.987E-01	9.987E-01	32.03
AC-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	60	11.27	4.178E+00	5.921E-01	5.921E-01	65.72
	794.95	-----	4.25	2.197E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.963E+00	4.712E-01	4.712E-01	34.05
	968.97	39	15.80	1.864E+00	6.193E-01	6.193E-01	57.45
RA-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	60	11.27	4.178E+00	5.921E-01	5.921E-01	65.72
	794.95	-----	4.25	2.197E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.963E+00	4.712E-01	4.712E-01	34.05
	968.97	39	15.80	1.864E+00	6.193E-01	6.193E-01	57.45

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	118	10.28	5.455E+00	9.763E-01	9.763E-01	43.92
	77.11	175	17.10	5.702E+00	8.319E-01	8.319E-01	26.50
	238.63	338	43.60*	5.356E+00	6.718E-01	6.718E-01	14.43
	300.09	-----	3.30	4.556E+00	-----	Line Not Found	-----
TH-230	609.32	125	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59
	1120.29	-----	14.92	1.645E+00	-----	Line Not Found	-----
	1764.49	37	15.30	1.121E+00	9.987E-01	9.987E-01	32.03
TH-232	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	60	11.27	4.178E+00	5.921E-01	5.921E-01	65.72
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.963E+00	4.712E-01	4.712E-01	34.05
U-234	968.97	39	15.80	1.864E+00	6.193E-01	6.193E-01	57.45
	609.32	125	45.49*	2.707E+00	4.722E-01	4.722E-01	25.59
	1120.29	-----	14.92	1.645E+00	-----	Line Not Found	-----
AM-243	1764.49	37	15.30	1.121E+00	9.987E-01	9.987E-01	32.03
	43.53	-----	5.90	8.765E-01	-----	Line Not Found	-----
	74.66	118	67.20*	5.455E+00	1.493E-01	1.493E-01	43.92

Flag: "*" = Keyline

Total number of lines in spectrum 34
Number of unidentified lines 9
Number of lines tentatively identified by NID 25 73.53%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.951E+00	4.951E+00	0.930E+00	18.78	
CD-109	461.40D	1.08	4.994E-01	5.369E-01	12.76E-01	237.66	
SN-126	2.30E+05Y	1.00	4.994E-02	4.994E-02	11.87E-02	237.66	
BA-137M	30.08Y	1.00	1.900E-01	1.906E-01	0.453E-01	23.80	
CS-137	30.08Y	1.00	2.007E-01	2.013E-01	0.479E-01	23.80	
TL-208	1.41E+10Y	1.00	1.988E-01	1.988E-01	0.519E-01	26.09	
BI-211	7.04E+08Y	1.00	1.553E+00	1.553E+00	0.333E+00	21.44	
BI-212	1.41E+10Y	1.00	5.097E-01	5.097E-01	5.518E-01	108.24	
PB-212	1.41E+10Y	1.00	6.718E-01	6.718E-01	0.970E-01	14.43	
BI-214	1600.00Y	1.00	4.722E-01	4.722E-01	1.208E-01	25.59	
PB-214	1600.00Y	1.00	5.637E-01	5.637E-01	1.208E-01	21.44	
RN-222	1600.00Y	1.00	4.722E-01	4.722E-01	1.208E-01	25.59	
RA-224	1.41E+10Y	1.00	1.448E+00	1.448E+00	0.957E+00	66.09	
RA-226	1600.00Y	1.00	4.722E-01	4.722E-01	1.208E-01	25.59	
AC-228	1.41E+10Y	1.00	4.712E-01	4.712E-01	1.605E-01	34.05	
RA-228	1.41E+10Y	1.00	4.712E-01	4.712E-01	1.605E-01	34.05	
TH-228	1.41E+10Y	1.00	6.718E-01	6.718E-01	0.970E-01	14.43	
TH-230	7.54E+04Y	1.00	4.722E-01	4.722E-01	1.208E-01	25.59	
TH-232	1.41E+10Y	1.00	4.712E-01	4.712E-01	1.605E-01	34.05	
U-234	2.45E+05Y	1.00	4.722E-01	4.722E-01	1.208E-01	25.59	
AM-243	7370.00Y	1.00	1.493E-01	1.493E-01	0.656E-01	43.92	

Total Activity : 1.543E+01 1.547E+01

Grand Total Activity : 1.543E+01 1.547E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	185.90	51	59	1.37	371.52	367	21	1.15E-02	73.9	6.29E+00	T
2	190.37	23	59	1.38	380.48	367	21	5.25E-03	****	6.21E+00	
0	197.41	14	89	1.52	394.55	389	9	3.18E-03	****	6.07E+00	T
0	463.32	25	25	0.81	926.45	921	10	6.12E-03	94.3	3.32E+00	T
0	486.96	34	8	1.88	973.73	968	10	8.44E-03	49.6	3.20E+00	T
1	657.21	13	9	1.63	1314.30	1310	18	3.46E-03	95.0	2.55E+00	T
0	769.62	19	27	0.69	1539.19	1531	17	5.14E-03	****	2.26E+00	
0	802.82	7	7	0.97	1605.61	1601	9	1.86E-03	****	2.18E+00	T
0	806.79	11	8	2.26	1613.54	1609	8	3.04E-03	****	2.17E+00	
0	926.21	12	3	0.54	1852.45	1847	9	3.20E-03	75.7	1.94E+00	T
0	947.06	24	0	2.13	1894.17	1888	12	6.39E-03	41.7	1.90E+00	T
0	1011.90	7	4	0.79	2023.89	2018	9	1.89E-03	****	1.80E+00	
0	1104.51	11	6	3.16	2209.19	2204	11	2.92E-03	****	1.67E+00	
0	1240.01	29	6	5.89	2480.30	2470	22	8.15E-03	55.0	1.51E+00	
0	1323.66	16	0	1.24	2647.69	2641	13	4.44E-03	50.0	1.42E+00	
0	1378.42	11	3	0.63	2757.26	2754	7	3.10E-03	80.5	1.37E+00	
0	1440.25	6	2	0.87	2880.99	2876	7	1.68E-03	****	1.32E+00	

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677001.CNF;1  *
* Acquisition date   : 28-JUN-2016 13:11:09 Sensitivity      : 3.000          *
* Detector ID        : GAM30 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:01.32 Half life ratio : *****      *
* Sample date        : 11-MAY-2016 10:00:00 Nuclide Library : SOLID       *
* Sample ID          : G398677001 Analyst initials: MXR1         *
* Batch Number       : 1572231 Sample Quantity : 1.6197E+02 GRAM    *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN         *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.712E-01
BA-137M	1.963E-02
CS-137	2.074E-02
TL-208	2.133E-02
BI-212	2.138E-01
PB-212	3.654E-02
BI-214	4.452E-02
PB-214	4.498E-02
RN-222	4.452E-02
RA-224	3.915E-01
RA-226	4.452E-02
AC-228	6.450E-02
RA-228	6.450E-02
TH-228	3.654E-02
TH-230	4.452E-02
TH-232	6.450E-02
U-234	4.452E-02
AM-243	3.118E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.757E-01	NOT IDENT.
NA-22	1.955E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.393E-02	NOT IDENT.
SC-46	2.468E-02	NOT IDENT.
V-48	2.046E-01	NOT IDENT.
CR-51	4.949E-01	NOT IDENT.
MN-54	2.927E-02	NOT IDENT.
CO-56	3.633E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	1.736E-02	NOT IDENT.
CO-58	2.044E-02	NOT IDENT.
FE-59	7.199E-02	NOT IDENT.

CO-60	2.403E-02	NOT IDENT.
ZN-65	5.972E-02	NOT IDENT.
GE-68	6.966E-01	NOT IDENT.
AS-73	6.625E-01	NOT IDENT.
AS-74	1.967E-01	NOT IDENT.
SE-75	3.434E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	4.018E-01	NOT IDENT.
RB-83	6.220E-02	NOT IDENT.
KR-85	6.060E+00	NOT IDENT.
SR-85	4.541E-02	NOT IDENT.
RB-86	1.283E+00	NOT IDENT.
Y-88	3.874E-02	NOT IDENT.
Y-91	1.898E+01	NOT IDENT.
NB-94	2.088E-02	NOT IDENT.
NB-95	3.478E-02	NOT IDENT.
NB-95M	1.106E-01	NOT IDENT.
ZR-95	6.571E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.292E-02	FAIL ABUN
RH-102	3.541E-02	NOT IDENT.
RU-103	4.005E-02	FAIL ABUN
RH-106	2.462E-01	NOT IDENT.
RU-106	2.462E-01	NOT IDENT.
AG-108M	2.145E-02	NOT IDENT.
CD-109	6.007E-01	FAIL ABUN
AG-110M	3.342E-02	FAIL ABUN
SN-113	3.288E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	1.811E-01	NOT IDENT.
TE-123M	2.072E-02	NOT IDENT.
SB-124	4.842E-02	NOT IDENT.
SB-125	5.125E-02	FAIL ABUN
TE-125M	9.368E+00	NOT IDENT.
I-126	7.178E-01	NOT IDENT.
SB-126	6.492E-01	NOT IDENT.
SN-126	5.615E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	1.309E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.453E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	2.412E-02	FAIL ABUN
CS-135	9.665E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.731E-01	NOT IDENT.
CE-139	2.316E-02	NOT IDENT.
BA-140	9.788E-01	NOT IDENT.
LA-140	2.311E-01	FAIL ABUN
CE-141	8.787E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.292E-01	NOT IDENT.
PM-144	2.381E-02	NOT IDENT.
PR-144	1.808E+00	NOT IDENT.
PM-146	2.472E-02	NOT IDENT.
ND-147	2.689E+00	NOT IDENT.
PM-147	4.813E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.697E-02	FAIL ABUN
EU-152	6.344E-02	NOT IDENT.
GD-153	5.382E-02	NOT IDENT.
EU-154	5.532E-02	NOT IDENT.
EU-155	6.875E-02	FAIL ABUN
TB-160	8.944E-02	FAIL ABUN
HO-166M	3.602E-02	FAIL ABUN
TM-171	1.076E+01	NOT IDENT.
HF-172	1.335E-01	NOT IDENT.
LU-172	3.632E-02	FAIL ABUN
LU-176	1.564E-02	NOT IDENT.
HF-181	4.482E-02	NOT IDENT.
TA-182	1.156E-01	NOT IDENT.
RE-183	1.599E-01	NOT IDENT.
RE-184	1.661E-01	NOT IDENT.
W-188	6.699E+00	NOT IDENT.

IR-192	2.682E-02	FAIL ABUN
HG-203	4.080E-02	NOT IDENT.
BI-207	3.124E-02	FAIL ABUN
PB-210	1.779E+00	NOT IDENT.
BI-211	2.889E-01	FAIL ABUN
PB-211	4.387E-01	NOT IDENT.
RN-219	2.602E-01	NOT IDENT.
RA-223	4.362E-01	FAIL ABUN
AC-227	1.776E-01	NOT IDENT.
TH-227	1.776E-01	NOT IDENT.
TH-229	3.064E-01	FAIL ABUN
PA-231	3.721E-01	NOT IDENT.
TH-231	4.362E-01	FAIL ABUN
PA-233	3.878E-02	NOT IDENT.
PA-234	2.159E-01	FAIL ABUN
PA-234M	2.290E+00	NOT IDENT.
TH-234	8.160E-01	NOT IDENT.
U-235	1.370E-01	FAIL ABUN
NP-237	3.878E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	8.160E-01	NOT IDENT.
NP-239	1.701E-01	NOT IDENT.
PU-239	2.172E+02	NOT IDENT.
AM-241	9.079E-02	NOT IDENT.
CM-243	6.731E-02	NOT IDENT.
BK-247	4.985E-02	NOT IDENT.
CM-247	2.474E-02	NOT IDENT.
CF-249	2.270E-02	NOT IDENT.
CF-251	9.078E-02	NOT IDENT.
ANH-511	3.869E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677001.CNF;1
Acquisition date : 28-JUN-2016 13:11:09 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:01.32 Half life ratio : *****
Sample date : 11-MAY-2016 10:00:00 Nuclide Library : SOLID
Sample ID : G398677001 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.6197E+02 GRAM
Quantity Err(%) : 1.2348E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.951E+00	1.013E+00	1.013E+00
BA-137M	1.906E-01	4.689E-02	4.689E-02
CS-137	2.013E-01	4.953E-02	4.953E-02
TL-208	1.988E-01	5.336E-02	5.336E-02
BI-212	5.097E-01	5.429E-01	5.429E-01
PB-212	6.718E-01	1.098E-01	1.098E-01
BI-214	4.722E-01	1.245E-01	1.245E-01
PB-214	5.637E-01	1.272E-01	1.272E-01
RN-222	4.722E-01	1.245E-01	1.245E-01
RA-224	2.649E-01	1.004E+00	1.004E+00
RA-226	4.722E-01	1.245E-01	1.245E-01
AC-228	4.712E-01	1.705E-01	1.705E-01
RA-228	4.712E-01	1.705E-01	1.705E-01
TH-228	6.718E-01	1.098E-01	1.098E-01
TH-230	4.722E-01	1.244E-01	1.244E-01
TH-232	4.712E-01	1.705E-01	1.705E-01
U-234	4.722E-01	1.244E-01	1.244E-01
AM-243	9.187E-02	6.713E-02	6.713E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.549E-01	3.955E-01	4.119E-01	NOT IDENT.
NA-22	-3.824E-02	3.268E-02	3.695E-02	NOT IDENT.
NA-24	-3.698E+21	4.628E+21	0.000E+00	SHORT HLIF
AL-26	-4.077E-03	1.837E-02	1.846E-02	NOT IDENT.
SC-46	-1.547E-02	3.175E-02	3.251E-02	NOT IDENT.
V-48	6.015E-02	2.279E-01	2.295E-01	NOT IDENT.
CR-51	1.158E-02	5.483E-01	5.483E-01	NOT IDENT.
MN-54	3.116E-02	2.926E-02	3.246E-02	NOT IDENT.
CO-56	5.568E-03	4.077E-02	4.084E-02	NOT IDENT.
MN-56	1.000E+41	6.829E+41	0.000E+00	SHORT HLIF
CO-57	1.641E-03	1.917E-02	1.919E-02	NOT IDENT.
CO-58	-2.216E-02	3.443E-02	3.585E-02	NOT IDENT.

FE-59	-1.059E-01	1.313E-01	1.397E-01	NOT IDENT.
CO-60	-4.859E-03	2.997E-02	3.005E-02	NOT IDENT.
ZN-65	-5.038E-02	7.939E-02	8.258E-02	NOT IDENT.
GE-68	-5.578E-01	9.415E-01	9.745E-01	NOT IDENT.
AS-73	6.330E-01	6.641E-01	7.228E-01	NOT IDENT.
AS-74	-1.309E-01	2.520E-01	2.588E-01	NOT IDENT.
SE-75	-6.040E-03	3.817E-02	3.826E-02	NOT IDENT.
BR-77	1.593E+06	2.229E+06	2.342E+06	SHORT HLIF
SR-82	7.285E-02	7.370E-01	7.377E-01	NOT IDENT.
RB-83	2.241E-02	6.886E-02	6.960E-02	NOT IDENT.
KR-85	-1.224E+01	8.206E+00	9.890E+00	NOT IDENT.
SR-85	-9.202E-02	6.153E-02	7.421E-02	NOT IDENT.
RB-86	-1.139E+00	1.775E+00	1.847E+00	NOT IDENT.
Y-88	4.694E-02	3.271E-02	3.896E-02	NOT IDENT.
Y-91	1.867E+01	1.888E+01	2.067E+01	NOT IDENT.
NB-94	4.205E-03	2.317E-02	2.324E-02	NOT IDENT.
NB-95	-3.055E-03	4.602E-02	4.605E-02	NOT IDENT.
NB-95M	6.790E-02	1.278E-01	1.314E-01	NOT IDENT.
ZR-95	-8.008E-03	7.565E-02	7.574E-02	NOT IDENT.
NB-97	1.000E+41	9.344E+40	0.000E+00	SHORT HLIF
ZR-97	-4.258E+20	2.482E+20	0.000E+00	SHORT HLIF
MO-99	3.178E+04	3.690E+04	3.958E+04	SHORT HLIF
TC-99M	-1.000E+41	1.580E+41	0.000E+00	SHORT HLIF
RH-101	2.554E-02	2.402E-02	2.664E-02	FAIL ABUN
RH-102	1.907E-02	3.838E-02	3.933E-02	NOT IDENT.
RU-103	-2.617E-02	5.030E-02	5.167E-02	FAIL ABUN
RH-106	8.595E-02	2.768E-01	2.795E-01	NOT IDENT.
RU-106	8.595E-02	2.768E-01	2.795E-01	NOT IDENT.
AG-108M	5.292E-03	2.380E-02	2.392E-02	NOT IDENT.
CD-109	5.369E-01	1.252E+00	1.275E+00	FAIL ABUN
AG-110M	2.275E-02	3.438E-02	3.588E-02	FAIL ABUN
SN-113	-6.312E-03	3.793E-02	3.804E-02	NOT IDENT.
CD-115	-2.019E+05	2.135E+05	2.321E+05	SHORT HLIF
SN-117M	-6.193E-02	2.109E-01	2.127E-01	NOT IDENT.
TE-123M	-1.851E-02	2.523E-02	2.657E-02	NOT IDENT.
SB-124	1.510E-02	4.916E-02	4.963E-02	NOT IDENT.
SB-125	-2.704E-02	6.228E-02	6.346E-02	FAIL ABUN
TE-125M	2.225E+00	1.017E+01	1.022E+01	NOT IDENT.
I-126	-2.411E-01	1.036E+00	1.042E+00	NOT IDENT.
SB-126	6.933E-01	6.533E-01	7.242E-01	NOT IDENT.
SN-126	4.994E-02	1.164E-01	1.186E-01	FAIL ABUN
SB-127	-5.449E+01	3.734E+02	3.742E+02	SHORT HLIF
I-131	7.082E-01	1.385E+00	1.422E+00	NOT IDENT.
I-132	1.000E+41	4.209E+41	0.000E+00	SHORT HLIF
TE-132	-5.193E+02	6.097E+02	6.531E+02	SHORT HLIF
BA-133	1.017E-02	2.942E-02	2.977E-02	NOT IDENT.
I-133	1.857E+14	1.119E+15	1.122E+15	SHORT HLIF
CS-134	4.377E-03	2.738E-02	2.745E-02	FAIL ABUN
CS-135	-2.777E-02	1.086E-01	1.093E-01	NOT IDENT.
I-135	1.000E+41	2.906E+41	0.000E+00	SHORT HLIF
CS-136	7.923E-02	4.215E-01	4.230E-01	NOT IDENT.
CE-139	-5.721E-03	2.685E-02	2.697E-02	NOT IDENT.
BA-140	2.912E-01	1.090E+00	1.098E+00	NOT IDENT.
LA-140	-8.349E-02	2.994E-01	3.017E-01	FAIL ABUN
CE-141	3.169E-02	9.640E-02	9.745E-02	NOT IDENT.
CE-143	3.456E+09	1.807E+09	2.386E+09	SHORT HLIF
CE-144	1.891E-02	1.428E-01	1.431E-01	NOT IDENT.
PM-144	7.195E-03	2.579E-02	2.600E-02	NOT IDENT.
PR-144	5.287E-01	1.961E+00	1.975E+00	NOT IDENT.
PM-146	-1.766E-02	3.083E-02	3.184E-02	NOT IDENT.
ND-147	5.801E-01	3.024E+00	3.035E+00	NOT IDENT.
PM-147	1.445E+02	5.227E+02	5.268E+02	NOT IDENT.
PM-149	-9.684E+05	2.244E+06	2.286E+06	SHORT HLIF
EU-150	-3.515E-04	2.155E-02	2.155E-02	FAIL ABUN
EU-152	-5.725E-03	7.721E-02	7.726E-02	NOT IDENT.
GD-153	1.578E-02	5.766E-02	5.809E-02	NOT IDENT.
EU-154	-1.047E-01	9.140E-02	1.029E-01	NOT IDENT.
EU-155	2.255E-02	7.395E-02	7.465E-02	FAIL ABUN
TB-160	-6.964E-02	1.173E-01	1.214E-01	FAIL ABUN
HO-166M	-1.914E-03	4.088E-02	4.089E-02	FAIL ABUN
TM-171	6.129E+00	1.091E+01	1.126E+01	NOT IDENT.
HF-172	5.172E-03	1.485E-01	1.485E-01	NOT IDENT.
LU-172	4.041E-03	4.180E-02	4.184E-02	FAIL ABUN
LU-176	-3.740E-03	1.774E-02	1.782E-02	NOT IDENT.
HF-181	-4.283E-02	6.738E-02	7.009E-02	NOT IDENT.
TA-182	2.353E-04	1.373E-01	1.373E-01	NOT IDENT.
RE-183	6.941E-02	1.648E-01	1.678E-01	NOT IDENT.
RE-184	1.235E-01	1.725E-01	1.812E-01	NOT IDENT.

W-188	-3.944E+00	8.914E+00	9.089E+00	NOT IDENT.
IR-192	-8.859E-03	3.083E-02	3.109E-02	FAIL ABUN
HG-203	-2.081E-02	4.681E-02	4.774E-02	NOT IDENT.
BI-207	3.811E-03	3.585E-02	3.589E-02	FAIL ABUN
PB-210	1.252E+00	1.781E+00	1.868E+00	NOT IDENT.
BI-211	1.553E+00	3.515E-01	7.834E-01	FAIL ABUN
PB-211	1.021E-01	4.835E-01	4.856E-01	NOT IDENT.
RN-219	-8.341E-02	3.047E-01	3.070E-01	NOT IDENT.
RA-223	2.771E-01	4.569E-01	4.737E-01	FAIL ABUN
AC-227	1.496E-01	1.820E-01	1.941E-01	NOT IDENT.
TH-227	1.496E-01	1.820E-01	1.941E-01	NOT IDENT.
TH-229	6.256E-02	4.921E-01	4.929E-01	FAIL ABUN
PA-231	4.449E-01	3.952E-01	4.432E-01	NOT IDENT.
TH-231	2.771E-01	4.569E-01	4.737E-01	FAIL ABUN
PA-233	-2.918E-03	4.332E-02	4.334E-02	NOT IDENT.
PA-234	4.800E-01	5.870E-01	6.256E-01	FAIL ABUN
PA-234M	-2.410E+00	3.172E+00	3.353E+00	NOT IDENT.
TH-234	-2.989E-01	8.683E-01	8.787E-01	NOT IDENT.
U-235	3.024E-02	1.520E-01	1.527E-01	FAIL ABUN
NP-237	-2.918E-03	4.332E-02	4.334E-02	NOT IDENT.
NP-238	2.414E+05	7.772E+05	7.848E+05	SHORT HLIF
U-238	-2.989E-01	8.683E-01	8.787E-01	NOT IDENT.
NP-239	9.123E-02	1.811E-01	1.857E-01	NOT IDENT.
PU-239	1.149E+01	2.416E+02	2.416E+02	NOT IDENT.
AM-241	1.093E-02	9.592E-02	9.604E-02	NOT IDENT.
CM-243	3.912E-03	7.376E-02	7.378E-02	NOT IDENT.
BK-247	-7.066E-03	5.528E-02	5.537E-02	NOT IDENT.
CM-247	1.020E-02	2.682E-02	2.721E-02	NOT IDENT.
CF-249	-1.568E-02	2.773E-02	2.861E-02	NOT IDENT.
CF-251	3.373E-02	1.008E-01	1.020E-01	NOT IDENT.
ANH-511	-2.343E-02	3.828E-02	3.972E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	63.9447	87.09	118.7910	136.47	62.3743
45.60	53.0824	87.57	142.0514	140.51	0.0000
46.54	41.0649	88.03	124.0054	143.76	73.7414
49.72	0.0000	88.34	124.0648	144.24	81.3759
51.35	64.1477	88.47	113.4962	145.44	77.1398
51.87	66.1085	89.96	178.9761	152.43	61.3115
52.39	60.5096	1093.63	150.3135	153.25	77.8029
52.97	54.9045	91.11	136.7455	323.87	72.3983
53.44	53.0640	92.59	99.4884	156.02	70.3411
54.07	67.3669	93.35	94.5198	158.56	69.4286
57.36	0.0000	94.56	98.7623	159.00	77.1785
57.53	60.2032	94.65	98.7751	162.33	64.1703
57.98	65.0399	94.67	98.7781	162.66	59.7656
59.27	78.6323	94.87	95.7513	163.33	70.8822
59.32	78.6403	97.43	60.3246	165.86	75.5087
59.54	77.7150	98.43	65.5313	176.31	62.8376
60.96	93.3256	98.44	65.5322	176.60	63.9783
61.17	93.3636	99.53	62.5581	177.52	68.5294
62.93	79.1938	100.11	62.6100	181.07	0.0000
63.29	89.8791	102.03	73.0721	181.52	59.2094
63.58	91.8626	103.18	64.9431	184.41	62.7661
64.28	97.7938	103.37	73.2094	143.76	64.5431
66.73	96.2955	105.21	70.2952	193.51	47.9054
67.24	88.5969	105.31	70.3048	197.03	63.5079
125.81	83.7963	106.12	74.5236	198.01	72.1542
67.75	83.8068	106.47	77.6657	201.83	63.4387
69.67	96.2244	109.28	72.7650	203.43	64.4504
70.83	88.1918	111.00	70.8489	205.31	65.7108
72.81	98.8244	111.76	0.0000	210.85	69.5062
72.87	94.4092	114.06	65.9054	215.65	47.6932
74.66	91.7422	116.30	0.0000	222.11	64.0371
74.82	91.7678	116.74	60.8863	227.09	60.7798
74.97	91.7910	119.76	67.4447	227.38	63.4378
77.11	92.1249	121.12	63.3383	228.16	0.0000
78.74	80.4566	121.22	63.3463	228.18	57.3079
79.69	77.5985	121.78	69.7299	116.74	57.3079
80.12	80.6399	122.06	66.5837	235.69	46.8373
80.19	80.6490	122.92	69.8293	235.96	46.8474
80.57	92.6547	123.07	73.0170	238.63	55.1279
81.00	92.7200	265.00	76.2495	238.98	0.0000
81.07	92.7304	125.81	80.6974	240.99	55.2315
81.75	87.8420	127.23	63.8191	242.00	55.2760
83.79	76.6132	127.91	63.8722	244.70	55.3933
84.00	69.1253	129.30	72.5101	252.40	0.0000
85.43	88.8619	131.20	72.6761	252.80	54.8438
86.55	118.6908	133.02	59.9802	254.15	0.0000
86.79	118.7352	133.52	60.0155	256.23	40.5644
86.94	118.7634	136.00	69.8645	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	47.1726	355.39	0.0000	584.27	17.2881
264.80	44.4556	356.01	23.1405	595.83	26.0574
265.00	44.4623	364.49	26.1653	427.87	22.8451
268.22	49.1163	366.42	0.0000	602.52	0.0000
269.46	48.2504	372.51	25.3152	604.72	8.7178
270.03	47.3599	375.05	33.1538	607.14	26.1790
271.23	46.4896	377.52	39.0601	609.32	24.0189
273.65	57.5302	356.01	33.3219	610.33	26.2126
276.40	47.5797	388.16	33.4039	614.28	19.2538
277.37	43.9504	388.63	35.3782	618.01	25.1991
277.60	53.1156	391.69	30.5175	620.36	21.9330
278.00	48.5504	264.66	41.5533	621.93	20.8491
279.20	55.0104	401.81	35.6402	630.19	0.0000
279.54	54.1061	402.40	27.7291	631.29	13.2173
279.70	50.4438	404.85	25.7834	633.25	17.6367
280.46	58.7305	410.95	29.8494	634.78	27.5742
283.69	42.3094	413.71	30.8903	635.95	24.2760
284.31	57.9705	414.70	23.9279	636.99	22.0782
285.41	61.6992	423.72	25.0458	645.85	17.7241
285.90	0.0000	427.09	30.1085	657.76	13.3542
287.50	46.1121	427.87	27.1088	657.90	0.0000
290.67	56.1966	433.94	32.2319	661.66	16.0493
293.27	0.0000	439.40	31.3131	664.57	0.0000
351.93	46.3600	453.88	30.5287	666.33	19.6507
295.96	46.3837	463.37	16.3596	666.50	19.6518
879.38	62.4514	468.07	18.0377	667.71	0.0000
299.98	46.1390	473.00	0.0000	677.62	21.3048
300.09	40.1889	475.06	34.9655	685.70	0.0000
300.13	40.1902	476.78	27.7902	695.00	17.1543
301.36	39.3725	477.60	23.6826	696.49	18.9702
302.85	51.2621	482.18	33.0229	696.51	18.9708
256.23	42.9214	487.02	23.1701	697.00	19.8773
304.85	47.5985	492.35	0.0000	697.30	21.6867
306.78	36.4459	497.08	25.9838	697.49	21.6885
308.46	38.3580	505.52	40.6960	702.65	17.2025
311.90	34.6948	507.63	0.0000	706.68	19.9482
316.51	33.8599	511.00	37.6614	711.68	18.1675
319.41	32.9818	514.00	85.9038	720.70	12.1510
320.08	31.1107	514.00	85.9038	721.93	0.0000
321.04	36.7898	520.40	22.0645	722.78	19.7603
323.87	33.0774	520.69	0.0000	722.91	19.7613
325.23	47.2946	522.65	0.0000	723.31	19.7640
328.76	37.9211	527.90	0.0000	724.19	21.2911
333.37	34.9896	528.26	23.1978	727.33	9.1350
333.97	36.5250	529.59	14.7712	733.00	13.7300
334.37	33.4898	529.87	0.0000	735.93	20.3619
338.28	36.2425	531.02	17.9484	333.97	24.7529
338.32	36.2431	537.26	17.9987	739.50	0.0000
311.90	47.3711	546.56	0.0000	747.24	13.7988
340.48	47.3711	552.55	22.3843	748.06	15.6432
340.55	47.3726	563.25	22.4887	752.31	20.2743
344.28	38.2922	569.33	22.5477	753.82	19.3624
345.93	36.1409	946.00	21.4752	756.73	20.3054
351.06	38.4521	569.70	20.4032	756.80	20.3054
351.93	32.7014	583.19	20.5203	884.68	23.1317

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	18.5171	1274.44	10.9353	1620.50	2.8666
766.42	15.4342	1001.03	17.9178	1621.92	2.8673
766.84	20.0671	1002.74	8.9633	1678.03	0.0000
772.60	0.0000	1004.73	17.0822	1690.97	0.9682
776.52	9.2922	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.0000
778.90	6.1999	1028.54	0.0000	1063.66	0.0000
783.70	0.0000	1037.84	7.0390	1771.35	23.5752
785.37	11.1841	1038.76	0.0000	1791.20	0.0000
792.07	17.1253	631.29	8.0633	1808.65	2.9663
794.95	12.4668	1048.07	12.1002	1810.72	0.0000
795.86	13.5096	1049.04	17.1461	1836.06	0.0000
810.06	15.6612	1050.41	19.1707		
810.29	15.6624	1063.66	12.1506		
344.28	14.0969	1077.00	14.2256		
810.76	12.5319	1077.34	15.2432		
815.77	9.4143	1085.87	13.2406		
1048.07	11.3074	1093.63	10.2056		
832.01	20.8210	1099.45	18.7380		
834.85	12.3145	1112.07	13.6725		
835.71	18.0031	1112.84	14.3589		
836.80	0.0000	1115.54	23.6053		
846.75	0.0000	1120.29	14.3862		
846.77	18.0667	1120.55	14.3869		
856.80	20.0315	1221.41	16.4453		
860.56	14.3251	1129.67	15.4504		
871.09	16.2886	1131.51	0.0000		
873.19	18.2165	1147.95	0.0000		
875.33	0.0000	1173.23	8.3305		
879.38	15.3699	1177.95	15.6372		
880.51	16.3359	1189.05	14.6344		
883.24	7.6939	1204.77	6.2959		
884.68	8.6596	1221.41	10.5352		
889.28	13.4894	1231.02	1.7598		
894.76	9.6514	1235.36	7.0465		
898.04	13.5256	1238.28	11.6349		
900.72	13.5365	1260.41	0.0000		
903.28	11.6115	1271.87	3.1982		
911.20	8.7295	1274.44	18.1339		
912.08	11.3189	1274.54	18.1339		
923.98	0.0000	1291.59	7.4963		
926.50	6.4958	1298.22	0.0000		
929.11	14.6268	1312.11	4.3035		
937.49	16.6182	1332.49	10.8081		
944.13	9.7942	1362.66	0.0000		
946.00	3.2665	1365.19	8.7090		
949.00	16.3468	1368.63	0.0000		
667.71	0.0000	1384.29	6.8320		
962.31	24.6149	1408.01	9.8881		
964.08	16.4180	1457.56	0.0000		
966.17	19.7139	1460.82	12.0352		
911.20	20.7160	1489.16	0.9312		
968.97	20.7160	1505.03	7.4733		
983.53	14.8583	1584.12	7.5911		
984.45	0.0000	1596.21	4.7555		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:54:33.42

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677002.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;102
Background date : 26-JUN-2016 12:06:12
Sample date : 11-MAY-2016 10:05:00 Acquisition date : 28-JUN-2016 12:50:40
Sample ID : G398677002 Sample quantity : 1.62520E+02 GRAM
Detector name : GAM41 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:05.60 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID : 1572231 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.42*	18	92	0.78	127.13	124	6	4.98E-03	104.5	
2	5	74.82*	112	131	1.15	149.91	145	14	3.12E-02	19.0	6.71E-01
3	5	77.17*	182	76	0.90	154.61	145	14	5.05E-02	10.7	
4	3	84.36*	33	102	1.66	168.99	165	27	9.27E-03	58.3	1.05E+00
5	3	87.25	56	107	1.40	174.78	165	27	1.55E-02	35.6	
6	3	89.84	53	83	0.98	179.94	165	27	1.48E-02	29.9	
7	3	92.70*	7	101	1.13	185.67	165	27	2.06E-03	272.5	
8	0	129.13	32	85	2.18	258.51	252	11	8.80E-03	59.2	
9	0	185.85*	37	52	0.82	371.92	367	10	1.03E-02	44.8	
10	3	238.75*	242	27	1.16	477.69	472	22	6.72E-02	7.5	3.47E+00
11	3	241.50	32	59	1.93	483.18	472	22	8.77E-03	69.2	
12	0	295.29*	74	30	1.56	590.75	586	8	2.05E-02	17.7	
13	0	304.13	70	66	10.05	608.43	596	27	1.96E-02	34.6	
14	0	338.28	45	47	1.16	676.71	670	13	1.24E-02	34.6	
15	0	352.09*	91	30	1.16	704.32	699	10	2.52E-02	15.8	
16	0	464.89	20	44	2.31	929.89	921	16	5.69E-03	75.7	
17	0	511.29*	21	51	1.86	1022.69	1016	17	5.79E-03	91.5	
18	0	563.59	8	16	0.50	1127.27	1121	9	2.33E-03	92.1	
19	0	582.94*	52	10	1.24	1165.96	1159	14	1.43E-02	20.5	
20	0	609.30*	60	16	1.50	1218.68	1213	11	1.66E-02	18.9	
21	0	661.71	98	26	1.40	1323.50	1316	15	2.71E-02	15.3	
22	0	727.65	26	6	1.51	1455.38	1448	12	7.13E-03	27.6	
23	0	766.72*	8	8	0.71	1533.53	1525	11	2.12E-03	84.0	
24	0	838.68	11	0	1.04	1677.45	1674	7	3.06E-03	30.2	
25	0	911.48*	51	7	1.08	1823.08	1816	15	1.42E-02	18.7	
26	0	966.28	6	12	0.99	1932.69	1926	9	1.78E-03	102.6	
27	0	969.11	19	6	2.54	1938.35	1934	11	5.14E-03	33.8	
28	0	992.50	7	5	0.65	1985.14	1978	10	1.94E-03	70.7	
29	0	1122.48	8	18	0.59	2245.14	2234	14	2.33E-03	111.4	
30	0	1187.25	18	0	1.18	2374.72	2367	14	5.00E-03	23.6	
31	0	1244.68	8	4	3.97	2489.61	2484	11	2.22E-03	65.1	
32	0	1411.81	5	3	0.86	2823.99	2816	11	1.44E-03	76.0	
33	0	1460.72*	102	3	2.01	2921.84	2915	13	2.83E-02	10.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:54:35

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677002.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:05:00 Acquisition date : 28-JUN-2016 12:50:40
Sample ID         : G398677002 Sample quantity  : 162.52 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA41 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:05.60 0.2%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated : No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.932E-01	4.813E+00	4.813E+00	21.38	OK
NB-95	765.81	99.81*	1.595E+00	2.340E-02	3.940E-02	167.92	OK
CD-109	88.03	3.70*	7.450E+00	7.085E-01	7.617E-01	127.79	OK
SN-126	64.28	9.60	7.794E+00	1.519E-01	1.519E-01	209.03	OK
	86.94	8.90	7.450E+00	2.946E-01	2.946E-01	127.79	OK
	87.57	37.00*	7.450E+00	7.085E-02	7.085E-02	127.79	OK
BA-137M	661.66	89.90*	1.827E+00	2.948E-01	2.957E-01	30.54	OK
CS-137	661.66	85.10*	1.827E+00	3.114E-01	3.123E-01	30.54	OK
TL-208	277.37	6.60	3.907E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.053E+00	1.487E-01	1.487E-01	40.93	OK
	860.56	12.50	1.434E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	7.683E+00	5.572E-01	5.572E-01	63.72	OK
	77.11	17.10	7.646E+00	8.649E-01	8.649E-01	21.41	OK
	238.63	43.60*	4.384E+00	7.033E-01	7.033E-01	15.06	OK
	300.09	3.30	3.668E+00	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	7.683E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	7.646E+00	1.525E+00	1.525E+00	21.41	OK
	87.09	3.41	7.454E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.347E+00	5.556E-01	5.557E-01	138.42	OK
	295.22	18.42	3.717E+00	5.847E-01	5.848E-01	35.37	OK
	351.93	35.60*	3.212E+00	4.225E-01	4.225E-01	31.65	OK
AC-228	105.21	1.10	7.028E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.323E+00	6.402E-01	6.402E-01	69.14	OK
	794.95	4.25	1.543E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.360E+00	6.955E-01	6.955E-01	37.37	OK
	968.97	15.80	1.286E+00	4.308E-01	4.308E-01	67.62	OK
RA-228	105.21	1.10	7.028E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.323E+00	6.402E-01	6.402E-01	69.14	OK
	794.95	4.25	1.543E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.360E+00	6.955E-01	6.955E-01	37.37	OK
	968.97	15.80	1.286E+00	4.308E-01	4.308E-01	67.62	OK
TH-228	74.82	10.28	7.683E+00	5.572E-01	5.572E-01	63.72	OK
	77.11	17.10	7.646E+00	8.649E-01	8.649E-01	21.41	OK
	238.63	43.60*	4.384E+00	7.033E-01	7.033E-01	15.06	OK
	300.09	3.30	3.668E+00	----- Line	Not Found	-----	Absent
TH-229	85.43	14.70	7.511E+00	1.863E-01	1.863E-01	116.55	OK
	88.47	24.00	7.450E+00	1.092E-01	1.092E-01	127.79	OK
	193.51	4.41*	5.088E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.797E+00	----- Line	Not Found	-----	Absent
TH-232	105.21	1.10	7.028E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.323E+00	6.402E-01	6.402E-01	69.14	OK
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.360E+00	6.955E-01	6.955E-01	37.37	OK
	968.97	15.80	1.286E+00	4.308E-01	4.308E-01	67.62	OK
TH-234	63.29	3.70*	7.794E+00	3.942E-01	3.942E-01	209.03	OK
	92.59	4.23	7.329E+00	1.462E-01	1.462E-01	544.91	OK
U-235	89.96	3.47	7.394E+00	1.274E+00	1.274E+00	59.88	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	93.35	5.60	7.329E+00	1.104E-01	1.104E-01	544.91	OK
	143.76	10.96*	6.093E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.667E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.226E+00	7.074E-02	7.074E-02	89.60	OK
	205.31	5.01	4.887E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	7.794E+00	3.942E-01	3.942E-01	209.03	OK
	92.59	4.23	7.329E+00	1.462E-01	1.462E-01	544.91	OK
AM-243	43.53	5.90	7.421E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	7.683E+00	8.524E-02	8.524E-02	63.72	OK
ANH-511	511.00	100.00*	2.313E+00	4.601E-02	4.601E-02	182.95	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677002.CNF;1
Acquisition date : 28-JUN-2016 12:50:40 Sensitivity : 3.000
Detector ID : GAM41 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:05.60 Half life ratio : *****
Sample date : 11-MAY-2016 10:05:00 Analyst initials: MXR1
Sample ID : G398677002 Sample Quantity : 1.6252E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.813E+00	1.008E+00	6.365E-01
NB-95	3.940E-02	6.483E-02	1.109E-01
CD-109	7.617E-01	9.539E-01	9.726E-01
SN-126	7.085E-02	8.873E-02	9.034E-02
BA-137M	2.957E-01	8.848E-02	6.896E-02
CS-137	3.123E-01	9.347E-02	7.285E-02
TL-208	1.487E-01	5.964E-02	6.111E-02
PB-212	7.033E-01	1.038E-01	8.975E-02
PB-214	4.225E-01	1.311E-01	1.309E-01
AC-228	6.955E-01	2.547E-01	2.207E-01
RA-228	6.955E-01	2.547E-01	2.207E-01
TH-228	7.033E-01	1.038E-01	8.975E-02
TH-229	-4.858E-01	5.016E-01	8.776E-01
TH-232	6.955E-01	2.547E-01	2.207E-01
TH-234	3.942E-01	8.076E-01	9.593E-01
U-235	3.696E-02	1.747E-01	3.448E-01
U-238	3.942E-01	8.076E-01	9.593E-01
AM-243	8.524E-02	5.323E-02	5.546E-02
ANH-511	4.601E-02	8.250E-02	5.606E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	9.158E-02	5.142E-01	1.024E+00	NOT IDENT.
NA-22	1.219E-02	4.561E-02	9.410E-02	NOT IDENT.
NA-24	0.000E+00	7.171E+21	0.000E+00	SHORT HLIF
AL-26	-1.821E-02	3.187E-02	5.781E-02	NOT IDENT.
SC-46	-1.844E-02	4.936E-02	9.371E-02	NOT IDENT.
V-48	2.985E-01	2.755E-01	6.413E-01	NOT IDENT.
CR-51	-5.902E-01	7.635E-01	1.398E+00	NOT IDENT.
MN-54	-2.932E-02	3.949E-02	5.579E-02	NOT IDENT.
CO-56	3.653E-02	5.801E-02	1.245E-01	NOT IDENT.
MN-56	0.000E+00	1.581E+41	0.000E+00	SHORT HLIF
CO-57	5.728E-03	2.206E-02	4.268E-02	NOT IDENT.

CO-58	-6.030E-03	4.335E-02	8.773E-02	NOT IDENT.
FE-59	-4.652E-02	1.290E-01	2.445E-01	NOT IDENT.
CO-60	3.445E-03	3.801E-02	7.857E-02	NOT IDENT.
ZN-65	-1.243E-01	1.252E-01	1.570E-01	NOT IDENT.
GE-68	-7.120E-04	1.153E+00	2.358E+00	NOT IDENT.
AS-73	1.076E-01	2.313E-01	4.816E-01	NOT IDENT.
AS-74	1.321E-02	3.343E-01	6.522E-01	NOT IDENT.
SE-75	-1.250E-02	5.284E-02	9.704E-02	NOT IDENT.
BR-77	0.000E+00	2.449E+05	0.000E+00	SHORT HLIF
SR-82	2.966E-01	7.854E-01	1.671E+00	NOT IDENT.
RB-83	8.195E-03	8.901E-02	1.677E-01	NOT IDENT.
KR-85	1.700E+01	8.239E+00	1.782E+01	NOT IDENT.
SR-85	1.270E-01	6.173E-02	1.335E-01	NOT IDENT.
RB-86	-3.632E-01	2.317E+00	4.582E+00	NOT IDENT.
Y-88	-4.832E-02	6.013E-02	1.135E-01	NOT IDENT.
Y-91	-5.565E+00	2.674E+01	5.137E+01	NOT IDENT.
NB-94	-1.781E-02	3.426E-02	6.066E-02	NOT IDENT.
NB-95M	-6.537E-02	1.710E-01	2.682E-01	NOT IDENT.
ZR-95	1.558E-02	1.110E-01	2.167E-01	NOT IDENT.
NB-97	0.000E+00	1.769E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.427E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.323E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.093E-02	2.816E-02	5.208E-02	NOT IDENT.
RH-102	-1.585E-03	4.744E-02	9.342E-02	FAIL ABUN
RU-103	-3.675E-02	7.496E-02	1.337E-01	FAIL ABUN
RH-106	-5.262E-02	3.299E-01	6.266E-01	NOT IDENT.
RU-106	-5.262E-02	3.299E-01	6.266E-01	NOT IDENT.
AG-108M	5.201E-03	2.940E-02	5.862E-02	NOT IDENT.
AG-110M	3.064E-02	5.030E-02	1.117E-01	NOT IDENT.
SN-113	-7.142E-03	5.105E-02	9.895E-02	NOT IDENT.
CD-115	0.000E+00	3.217E+05	0.000E+00	SHORT HLIF
SN-117M	-8.071E-02	2.483E-01	4.665E-01	NOT IDENT.
TE-123M	7.899E-03	2.817E-02	5.569E-02	NOT IDENT.
SB-124	4.486E-02	1.173E-01	2.824E-01	NOT IDENT.
SB-125	-8.918E-03	8.480E-02	1.652E-01	NOT IDENT.
TE-125M	3.692E+00	1.195E+01	2.381E+01	NOT IDENT.
I-126	-3.411E-01	1.559E+00	2.470E+00	NOT IDENT.
SB-126	4.428E-01	8.947E-01	1.699E+00	NOT IDENT.
SB-127	0.000E+00	4.859E+02	0.000E+00	SHORT HLIF
I-131	-6.048E-01	1.761E+00	3.362E+00	NOT IDENT.
I-132	0.000E+00	1.365E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.239E+02	0.000E+00	SHORT HLIF
BA-133	1.415E-02	4.655E-02	8.289E-02	FAIL ABUN
I-133	0.000E+00	1.705E+15	0.000E+00	SHORT HLIF
CS-134	2.928E-02	3.650E-02	8.312E-02	FAIL ABUN
CS-135	1.679E-01	1.492E-01	3.084E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	3.929E-01	5.868E-01	1.301E+00	NOT IDENT.
CE-139	1.244E-02	3.106E-02	6.147E-02	NOT IDENT.
BA-140	3.075E-01	1.516E+00	3.051E+00	FAIL ABUN
LA-140	-3.042E-02	5.151E-01	1.085E+00	NOT IDENT.
CE-141	6.017E-02	1.067E-01	2.148E-01	NOT IDENT.
CE-143	0.000E+00	2.287E+09	0.000E+00	SHORT HLIF
CE-144	-1.318E-01	2.049E-01	3.253E-01	NOT IDENT.
PM-144	-1.709E-02	3.861E-02	6.921E-02	NOT IDENT.
PR-144	-1.284E+00	2.943E+00	5.280E+00	NOT IDENT.
PM-146	3.645E-02	3.882E-02	8.477E-02	NOT IDENT.
ND-147	1.171E+00	4.196E+00	8.551E+00	FAIL ABUN
PM-147	1.239E+02	5.840E+02	1.163E+03	NOT IDENT.
PM-149	0.000E+00	2.398E+06	0.000E+00	SHORT HLIF
EU-150	-1.923E-02	2.863E-02	4.445E-02	FAIL ABUN
EU-152	-8.106E-05	9.731E-02	1.680E-01	NOT IDENT.
GD-153	4.935E-02	7.424E-02	1.365E-01	NOT IDENT.
EU-154	7.434E-02	1.178E-01	2.614E-01	NOT IDENT.
EU-155	1.815E-02	8.112E-02	1.617E-01	FAIL ABUN
TB-160	2.419E-02	1.711E-01	3.545E-01	FAIL ABUN
HO-166M	-1.000E-02	6.910E-02	1.288E-01	FAIL ABUN
TM-171	2.087E+00	3.578E+00	7.496E+00	NOT IDENT.
HF-172	-9.911E-02	1.787E-01	2.880E-01	FAIL ABUN
LU-172	-2.672E-02	5.866E-02	1.082E-01	FAIL ABUN
LU-176	2.144E-02	2.417E-02	4.876E-02	FAIL ABUN
HF-181	-6.128E-02	8.177E-02	1.448E-01	NOT IDENT.
TA-182	3.538E-02	1.945E-01	4.026E-01	FAIL ABUN
RE-183	-3.293E-02	8.006E-02	1.520E-01	NOT IDENT.
RE-184	1.298E-01	2.136E-01	4.586E-01	NOT IDENT.
W-188	-2.137E+00	9.706E+00	1.545E+01	FAIL ABUN
IR-192	4.341E-02	4.190E-02	9.107E-02	FAIL ABUN

HG-203	4.140E-03	5.786E-02	1.096E-01	NOT IDENT.
BI-207	-1.034E-02	5.620E-02	1.077E-01	FAIL ABUN
PB-210	-2.997E-01	4.187E-01	8.820E-01	NOT IDENT.
BI-211	0.000E+00	3.611E-01	6.407E-01	FAIL ABUN
PB-211	1.930E-01	7.221E-01	1.446E+00	NOT IDENT.
BI-212	1.126E+00	6.084E-01	1.210E+00	FAIL ABUN
BI-214	0.000E+00	1.236E-01	2.394E-01	FAIL ABUN
RN-219	-1.563E-01	4.008E-01	7.523E-01	NOT IDENT.
RN-222	0.000E+00	1.236E-01	2.394E-01	FAIL ABUN
RA-223	-2.936E-02	5.949E-01	1.169E+00	FAIL ABUN
RA-224	9.825E-01	1.333E+00	1.893E+00	FAIL ABUN
RA-226	0.000E+00	1.236E-01	2.394E-01	FAIL ABUN
AC-227	6.708E-02	2.347E-01	4.551E-01	FAIL ABUN
TH-227	6.708E-02	2.347E-01	4.551E-01	FAIL ABUN
TH-230	0.000E+00	1.236E-01	2.394E-01	FAIL ABUN
PA-231	7.777E-01	4.583E-01	9.793E-01	NOT IDENT.
TH-231	-2.936E-02	5.949E-01	1.169E+00	FAIL ABUN
PA-233	-7.421E-02	6.361E-02	9.023E-02	NOT IDENT.
PA-234	-4.138E-02	2.652E-01	5.261E-01	NOT IDENT.
PA-234M	6.159E-01	5.175E+00	1.050E+01	FAIL ABUN
U-234	0.000E+00	1.236E-01	2.394E-01	FAIL ABUN
NP-237	-7.421E-02	6.361E-02	9.023E-02	NOT IDENT.
NP-238	0.000E+00	9.024E+05	0.000E+00	SHORT HLIF
NP-239	2.629E-02	2.053E-01	4.064E-01	NOT IDENT.
PU-239	4.615E+02	5.353E+02	5.941E+02	FAIL ABUN
AM-241	6.091E-02	5.061E-02	9.888E-02	NOT IDENT.
CM-243	-3.660E-02	7.763E-02	1.480E-01	NOT IDENT.
BK-247	-1.710E-02	7.958E-02	1.463E-01	FAIL ABUN
CM-247	-1.462E-02	3.820E-02	7.163E-02	NOT IDENT.
CF-249	1.263E-02	3.782E-02	7.691E-02	NOT IDENT.
CF-251	-5.365E-03	1.132E-01	2.162E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	99	10.66*	8.932E-01	4.813E+00	4.813E+00	21.38
NB-95	765.81	8	99.81*	1.595E+00	2.340E-02	3.940E-02	167.92
CD-109	88.03	74	3.70*	7.450E+00	1.246E+00	1.339E+00	71.17
SN-126	64.28	25	9.60	7.794E+00	1.519E-01	1.519E-01	209.03
	86.94	74	8.90	7.450E+00	5.178E-01	5.178E-01	71.17
	87.57	74	37.00*	7.450E+00	1.246E-01	1.246E-01	71.17
BA-137M	661.66	105	89.90*	1.827E+00	2.948E-01	2.957E-01	30.54
CS-137	661.66	105	85.10*	1.827E+00	3.114E-01	3.123E-01	30.54
TL-208	277.37	-----	6.60	3.907E+00	-----	Line Not Found	-----
	583.19	56	85.00*	2.053E+00	1.487E-01	1.487E-01	40.93
	860.56	-----	12.50	1.434E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	7.711E+00	-----	Line Not Found	-----
	351.06	105	12.92*	3.212E+00	1.164E+00	1.164E+00	31.65
PB-212	74.82	151	10.28	7.683E+00	8.860E-01	8.860E-01	38.00
	77.11	245	17.10	7.646E+00	8.649E-01	8.649E-01	21.41
	238.63	291	43.60*	4.384E+00	7.033E-01	7.033E-01	15.06
	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
PB-214	74.82	151	5.80	7.683E+00	1.570E+00	1.570E+00	38.00
	77.11	245	9.70	7.646E+00	1.525E+00	1.525E+00	21.41
	87.09	74	3.41	7.450E+00	1.352E+00	1.352E+00	71.17
	242.00	38	7.25	4.347E+00	5.556E-01	5.557E-01	138.42
	295.22	87	18.42	3.717E+00	5.847E-01	5.848E-01	35.37
	351.93	105	35.60*	3.212E+00	4.225E-01	4.225E-01	31.65
RA-224	240.99	38	4.10*	4.347E+00	9.825E-01	9.825E-01	138.42
AC-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	52	11.27	3.323E+00	6.402E-01	6.402E-01	69.14
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	53	25.80*	1.360E+00	6.955E-01	6.955E-01	37.37
	968.97	19	15.80	1.286E+00	4.308E-01	4.308E-01	67.62
RA-228	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	52	11.27	3.323E+00	6.402E-01	6.402E-01	69.14
	794.95	-----	4.25	1.543E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	53	25.80*	1.360E+00	6.955E-01	6.955E-01	37.37
	968.97	19	15.80	1.286E+00	4.308E-01	4.308E-01	67.62
TH-228	74.82	151	10.28	7.683E+00	8.860E-01	8.860E-01	38.00
	77.11	245	17.10	7.646E+00	8.649E-01	8.649E-01	21.41
	238.63	291	43.60*	4.384E+00	7.033E-01	7.033E-01	15.06
	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
TH-229	85.43	45	14.70	7.511E+00	1.863E-01	1.863E-01	116.55
	88.47	74	24.00	7.450E+00	1.920E-01	1.920E-01	71.17
	193.51	-----	4.41*	5.088E+00	-----	Line Not Found	-----
	210.85	-----	2.80	4.797E+00	-----	Line Not Found	-----
TH-232	105.21	-----	1.10	7.028E+00	-----	Line Not Found	-----
	338.32	52	11.27	3.323E+00	6.402E-01	6.402E-01	69.14
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-234	911.20	53	25.80*	1.360E+00	6.955E-01	6.955E-01	37.37
	968.97	19	15.80	1.286E+00	4.308E-01	4.308E-01	67.62
	63.29	25	3.70*	7.794E+00	3.942E-01	3.942E-01	209.03
	92.59	10	4.23	7.329E+00	1.462E-01	1.462E-01	544.91
U-235	89.96	71	3.47	7.394E+00	1.274E+00	1.274E+00	59.88
	93.35	10	5.60	7.329E+00	1.104E-01	1.104E-01	544.91
	143.76	-----	10.96*	6.093E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.667E+00	-----	Line Not Found	-----
U-238	185.72	46	57.20	5.226E+00	7.074E-02	7.074E-02	89.60
	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
	63.29	25	3.70*	7.794E+00	3.942E-01	3.942E-01	209.03
	92.59	10	4.23	7.329E+00	1.462E-01	1.462E-01	544.91
AM-243	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
ANH-511	74.66	151	67.20*	7.683E+00	1.355E-01	1.355E-01	38.00
	511.00	23	100.00*	2.313E+00	4.601E-02	4.601E-02	182.95

Flag: "*" = Keyline

Total number of lines in spectrum 33
Number of unidentified lines 6
Number of lines tentatively identified by NID 27 81.82%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.813E+00	4.813E+00	1.029E+00	21.38	
NB-95	64.03D	1.68	2.340E-02	3.940E-02	6.615E-02	167.92	
CD-109	461.40D	1.07	1.246E+00	1.339E+00	0.953E+00	71.17	
SN-126	2.30E+05Y	1.00	1.246E-01	1.246E-01	0.887E-01	71.17	
BA-137M	30.08Y	1.00	2.948E-01	2.957E-01	0.903E-01	30.54	
CS-137	30.08Y	1.00	3.114E-01	3.123E-01	0.954E-01	30.54	
TL-208	1.41E+10Y	1.00	1.487E-01	1.487E-01	0.609E-01	40.93	
BI-211	7.04E+08Y	1.00	1.164E+00	1.164E+00	0.368E+00	31.65	
PB-212	1.41E+10Y	1.00	7.033E-01	7.033E-01	1.059E-01	15.06	
PB-214	1600.00Y	1.00	4.225E-01	4.225E-01	1.337E-01	31.65	
RA-224	1.41E+10Y	1.00	9.825E-01	9.825E-01	13.60E-01	138.42	
AC-228	1.41E+10Y	1.00	6.955E-01	6.955E-01	2.599E-01	37.37	
RA-228	1.41E+10Y	1.00	6.955E-01	6.955E-01	2.599E-01	37.37	
TH-228	1.41E+10Y	1.00	7.033E-01	7.033E-01	1.059E-01	15.06	
TH-229	7340.00Y	1.00	1.920E-01	1.920E-01	1.367E-01	71.17	K
TH-232	1.41E+10Y	1.00	6.955E-01	6.955E-01	2.599E-01	37.37	
TH-234	4.47E+09Y	1.00	3.942E-01	3.942E-01	8.241E-01	209.03	
U-235	7.04E+08Y	1.00	7.074E-02	7.074E-02	6.338E-02	89.60	K
U-238	4.47E+09Y	1.00	3.942E-01	3.942E-01	8.241E-01	209.03	
AM-243	7370.00Y	1.00	1.355E-01	1.355E-01	0.515E-01	38.00	
ANH-511	1.00E+09Y	1.00	4.601E-02	4.601E-02	8.418E-02	182.95	

Total Activity : 1.426E+01 1.437E+01

Grand Total Activity : 1.426E+01 1.437E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.13	41	109	2.18	258.51	252	11	8.80E-03	****	6.44E+00	T
0	304.13	82	77	10.05	608.43	596	27	1.96E-02	69.1	3.63E+00	T
0	464.89	23	49	2.31	929.89	921	16	5.69E-03	****	2.52E+00	
0	563.59	9	17	0.50	1127.27	1121	9	2.33E-03	****	2.12E+00	T
0	609.30	65	17	1.50	1218.68	1213	11	1.66E-02	37.8	1.97E+00	T
0	727.65	27	7	1.51	1455.38	1448	12	7.13E-03	55.1	1.67E+00	T
0	838.68	11	0	1.04	1677.45	1674	7	3.06E-03	60.3	1.47E+00	
0	966.28	7	12	0.99	1932.69	1926	9	1.78E-03	****	1.29E+00	T
0	992.50	7	5	0.65	1985.14	1978	10	1.94E-03	****	1.26E+00	
0	1122.48	8	18	0.59	2245.14	2234	14	2.33E-03	****	1.13E+00	T
0	1187.25	18	0	1.18	2374.72	2367	14	5.00E-03	47.1	1.07E+00	
0	1244.68	8	4	3.97	2489.61	2484	11	2.22E-03	****	1.03E+00	
0	1411.81	5	3	0.86	2823.99	2816	11	1.44E-03	****	9.20E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677002.CNF;1
Acquisition date : 28-JUN-2016 12:50:40 Sensitivity : 3.000
Detector ID : GAM41 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:05.60 Half life ratio : *****
Sample date : 11-MAY-2016 10:05:00 Nuclide Library : SOLID
Sample ID : G398677002 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.6252E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.520E-01
NB-95	4.867E-02
CD-109	4.597E-01
SN-126	4.270E-02
BA-137M	3.054E-02
CS-137	3.226E-02
TL-208	2.684E-02
PB-212	4.141E-02
PB-214	5.970E-02
AC-228	9.211E-02
RA-228	9.211E-02
TH-228	4.141E-02
TH-229	4.091E-01
TH-232	9.211E-02
TH-234	4.559E-01
U-235	1.623E-01
U-238	4.559E-01
AM-243	2.641E-02
ANH-511	2.522E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.644E-01	NOT IDENT.
NA-22	4.053E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.048E-02	NOT IDENT.
SC-46	4.000E-02	NOT IDENT.
V-48	2.801E-01	NOT IDENT.
CR-51	6.355E-01	NOT IDENT.
MN-54	2.305E-02	NOT IDENT.
CO-56	5.548E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	1.999E-02	NOT IDENT.
CO-58	3.704E-02	NOT IDENT.

FE-59	1.015E-01	NOT IDENT.
CO-60	3.263E-02	NOT IDENT.
ZN-65	6.575E-02	NOT IDENT.
GE-68	9.877E-01	NOT IDENT.
AS-73	2.277E-01	NOT IDENT.
AS-74	2.905E-01	NOT IDENT.
SE-75	4.486E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	7.348E-01	NOT IDENT.
RB-83	7.451E-02	NOT IDENT.
KR-85	8.256E+00	NOT IDENT.
SR-85	6.183E-02	NOT IDENT.
RB-86	1.913E+00	NOT IDENT.
Y-88	4.506E-02	NOT IDENT.
Y-91	2.160E+01	NOT IDENT.
NB-94	2.659E-02	NOT IDENT.
NB-95M	1.239E-01	NOT IDENT.
ZR-95	9.604E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.447E-02	NOT IDENT.
RH-102	4.051E-02	FAIL ABUN
RU-103	5.979E-02	FAIL ABUN
RH-106	2.765E-01	NOT IDENT.
RU-106	2.765E-01	NOT IDENT.
AG-108M	2.662E-02	NOT IDENT.
AG-110M	4.867E-02	NOT IDENT.
SN-113	4.488E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.176E-01	NOT IDENT.
TE-123M	2.601E-02	NOT IDENT.
SB-124	1.121E-01	NOT IDENT.
SB-125	7.425E-02	NOT IDENT.
TE-125M	1.126E+01	NOT IDENT.
I-126	1.092E+00	NOT IDENT.
SB-126	7.439E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.517E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.810E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.647E-02	FAIL ABUN
CS-135	1.439E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.668E-01	NOT IDENT.
CE-139	2.884E-02	NOT IDENT.
BA-140	1.361E+00	FAIL ABUN
LA-140	4.335E-01	NOT IDENT.
CE-141	1.010E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.519E-01	NOT IDENT.
PM-144	3.053E-02	NOT IDENT.
PR-144	2.330E+00	NOT IDENT.
PM-146	3.843E-02	NOT IDENT.
ND-147	3.813E+00	FAIL ABUN
PM-147	5.448E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.018E-02	FAIL ABUN
EU-152	7.643E-02	NOT IDENT.
GD-153	6.456E-02	NOT IDENT.
EU-154	1.125E-01	NOT IDENT.
EU-155	7.622E-02	FAIL ABUN
TB-160	1.532E-01	FAIL ABUN
HO-166M	5.745E-02	FAIL ABUN
TM-171	3.549E+00	NOT IDENT.
HF-172	1.344E-01	FAIL ABUN
LU-172	4.490E-02	FAIL ABUN
LU-176	2.243E-02	FAIL ABUN
HF-181	6.509E-02	NOT IDENT.
TA-182	1.712E-01	FAIL ABUN
RE-183	7.188E-02	NOT IDENT.
RE-184	1.979E-01	NOT IDENT.
W-188	7.021E+00	FAIL ABUN
IR-192	4.198E-02	FAIL ABUN
HG-203	5.055E-02	NOT IDENT.

BI-207	4.659E-02	FAIL ABUN
PB-210	4.194E-01	NOT IDENT.
BI-211	3.047E-01	FAIL ABUN
PB-211	6.624E-01	NOT IDENT.
BI-212	5.476E-01	FAIL ABUN
BI-214	1.125E-01	FAIL ABUN
RN-219	3.416E-01	NOT IDENT.
RN-222	1.125E-01	FAIL ABUN
RA-223	5.368E-01	FAIL ABUN
RA-224	9.097E-01	FAIL ABUN
RA-226	1.125E-01	FAIL ABUN
AC-227	2.108E-01	FAIL ABUN
TH-227	2.108E-01	FAIL ABUN
TH-230	1.125E-01	FAIL ABUN
PA-231	4.560E-01	NOT IDENT.
TH-231	5.368E-01	FAIL ABUN
PA-233	4.030E-02	NOT IDENT.
PA-234	2.225E-01	NOT IDENT.
PA-234M	4.645E+00	FAIL ABUN
U-234	1.125E-01	FAIL ABUN
NP-237	4.030E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.906E-01	NOT IDENT.
PU-239	2.805E+02	FAIL ABUN
AM-241	4.699E-02	NOT IDENT.
CM-243	6.942E-02	NOT IDENT.
BK-247	6.773E-02	FAIL ABUN
CM-247	3.264E-02	NOT IDENT.
CF-249	3.510E-02	NOT IDENT.
CF-251	1.010E-01	NOT IDENT.

GEL Laboratories LLC
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Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677002.CNF;1
Acquisition date : 28-JUN-2016 12:50:40 Sensitivity : 3.000
Detector ID : GAM41 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:05.60 Half life ratio : *****
Sample date : 11-MAY-2016 10:05:00 Nuclide Library : SOLID
Sample ID : G398677002 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.6252E+02 GRAM
Quantity Err(%) : 1.2306E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.813E+00	1.088E+00	1.088E+00
NB-95	3.940E-02	6.494E-02	6.494E-02
CD-109	7.618E-01	9.612E-01	9.612E-01
SN-126	7.086E-02	8.933E-02	8.933E-02
BA-137M	2.957E-01	9.171E-02	9.171E-02
CS-137	3.123E-01	9.688E-02	9.688E-02
TL-208	1.487E-01	6.098E-02	6.098E-02
PB-212	7.033E-01	1.234E-01	1.234E-01
PB-214	4.225E-01	1.359E-01	1.359E-01
AC-228	6.955E-01	2.677E-01	2.677E-01
RA-228	6.955E-01	2.677E-01	2.677E-01
TH-228	7.033E-01	1.234E-01	1.234E-01
TH-229	-4.858E-01	5.036E-01	5.036E-01
TH-232	6.955E-01	2.677E-01	2.677E-01
TH-234	3.942E-01	8.135E-01	8.135E-01
U-235	3.696E-02	1.747E-01	1.747E-01
U-238	3.942E-01	8.135E-01	8.135E-01
AM-243	8.525E-02	5.469E-02	5.469E-02
ANH-511	4.601E-02	8.259E-02	8.259E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	9.158E-02	5.143E-01	5.159E-01	NOT IDENT.
NA-22	1.219E-02	4.562E-02	4.595E-02	NOT IDENT.
NA-24	-1.715E+20	7.171E+21	0.000E+00	SHORT HLIF
AL-26	-1.821E-02	3.190E-02	3.294E-02	NOT IDENT.
SC-46	-1.844E-02	4.940E-02	5.010E-02	NOT IDENT.
V-48	2.985E-01	2.785E-01	3.093E-01	NOT IDENT.
CR-51	-5.902E-01	7.652E-01	8.101E-01	NOT IDENT.
MN-54	-2.932E-02	3.960E-02	4.175E-02	NOT IDENT.
CO-56	3.653E-02	5.814E-02	6.043E-02	NOT IDENT.
MN-56	1.000E+41	1.584E+41	0.000E+00	SHORT HLIF
CO-57	5.728E-03	2.207E-02	2.222E-02	NOT IDENT.

CO-58	-6.030E-03	4.335E-02	4.344E-02	NOT IDENT.
FE-59	-4.652E-02	1.293E-01	1.310E-01	NOT IDENT.
CO-60	3.445E-03	3.801E-02	3.804E-02	NOT IDENT.
ZN-65	-1.243E-01	1.272E-01	1.390E-01	NOT IDENT.
GE-68	-7.120E-04	1.153E+00	1.153E+00	NOT IDENT.
AS-73	1.076E-01	2.326E-01	2.376E-01	NOT IDENT.
AS-74	1.321E-02	3.343E-01	3.344E-01	NOT IDENT.
SE-75	-1.250E-02	5.286E-02	5.316E-02	NOT IDENT.
BR-77	1.659E+06	2.323E+06	2.441E+06	SHORT HLIF
SR-82	2.966E-01	7.859E-01	7.972E-01	NOT IDENT.
RB-83	8.195E-03	8.902E-02	8.910E-02	NOT IDENT.
KR-85	1.700E+01	8.367E+00	1.135E+01	NOT IDENT.
SR-85	1.270E-01	6.268E-02	8.489E-02	NOT IDENT.
RB-86	-3.632E-01	2.318E+00	2.324E+00	NOT IDENT.
Y-88	-4.832E-02	6.024E-02	6.406E-02	NOT IDENT.
Y-91	-5.565E+00	2.675E+01	2.686E+01	NOT IDENT.
NB-94	-1.781E-02	3.429E-02	3.522E-02	NOT IDENT.
NB-95M	-6.537E-02	1.711E-01	1.737E-01	NOT IDENT.
ZR-95	1.558E-02	1.110E-01	1.112E-01	NOT IDENT.
NB-97	1.000E+41	1.771E+41	0.000E+00	SHORT HLIF
ZR-97	3.237E+20	2.442E+20	0.000E+00	SHORT HLIF
MO-99	-8.252E+03	5.324E+04	5.337E+04	SHORT HLIF
TC-99M	-1.000E+41	3.758E+41	0.000E+00	SHORT HLIF
RH-101	2.093E-02	2.849E-02	3.001E-02	NOT IDENT.
RH-102	-1.585E-03	4.744E-02	4.745E-02	FAIL ABUN
RU-103	-3.675E-02	7.503E-02	7.684E-02	FAIL ABUN
RH-106	-5.262E-02	3.299E-01	3.308E-01	NOT IDENT.
RU-106	-5.262E-02	3.299E-01	3.308E-01	NOT IDENT.
AG-108M	5.201E-03	2.940E-02	2.949E-02	NOT IDENT.
AG-110M	3.064E-02	5.042E-02	5.228E-02	NOT IDENT.
SN-113	-7.142E-03	5.105E-02	5.115E-02	NOT IDENT.
CD-115	3.483E+05	3.236E+05	3.597E+05	SHORT HLIF
SN-117M	-8.071E-02	2.484E-01	2.510E-01	NOT IDENT.
TE-123M	7.899E-03	2.818E-02	2.840E-02	NOT IDENT.
SB-124	4.486E-02	1.174E-01	1.191E-01	NOT IDENT.
SB-125	-8.918E-03	8.480E-02	8.490E-02	NOT IDENT.
TE-125M	3.692E+00	1.196E+01	1.207E+01	NOT IDENT.
I-126	-3.411E-01	1.559E+00	1.567E+00	NOT IDENT.
SB-126	4.428E-01	8.964E-01	9.184E-01	NOT IDENT.
SB-127	-2.468E+02	4.894E+02	5.019E+02	SHORT HLIF
I-131	-6.048E-01	1.761E+00	1.782E+00	NOT IDENT.
I-132	1.000E+41	3.267E+41	0.000E+00	SHORT HLIF
TE-132	-3.678E+02	8.253E+02	8.418E+02	SHORT HLIF
BA-133	1.415E-02	4.656E-02	4.700E-02	FAIL ABUN
I-133	2.705E+14	1.707E+15	1.712E+15	SHORT HLIF
CS-134	2.928E-02	3.661E-02	3.892E-02	FAIL ABUN
CS-135	1.679E-01	1.502E-01	1.682E-01	NOT IDENT.
I-135	1.000E+41	2.418E+42	0.000E+00	SHORT HLIF
CS-136	3.929E-01	5.908E-01	6.168E-01	NOT IDENT.
CE-139	1.244E-02	3.117E-02	3.167E-02	NOT IDENT.
BA-140	3.075E-01	1.516E+00	1.523E+00	FAIL ABUN
LA-140	-3.042E-02	5.151E-01	5.153E-01	NOT IDENT.
CE-141	6.017E-02	1.069E-01	1.103E-01	NOT IDENT.
CE-143	4.779E+09	2.327E+09	3.171E+09	SHORT HLIF
CE-144	-1.318E-01	2.055E-01	2.139E-01	NOT IDENT.
PM-144	-1.709E-02	3.864E-02	3.940E-02	NOT IDENT.
PR-144	-1.284E+00	2.945E+00	3.001E+00	NOT IDENT.
PM-146	3.645E-02	3.900E-02	4.232E-02	NOT IDENT.
ND-147	1.171E+00	4.197E+00	4.231E+00	FAIL ABUN
PM-147	1.239E+02	5.842E+02	5.868E+02	NOT IDENT.
PM-149	2.171E+06	2.422E+06	2.612E+06	SHORT HLIF
EU-150	-1.923E-02	2.867E-02	2.996E-02	FAIL ABUN
EU-152	-8.106E-05	9.731E-02	9.731E-02	NOT IDENT.
GD-153	4.935E-02	7.438E-02	7.764E-02	NOT IDENT.
EU-154	7.434E-02	1.180E-01	1.226E-01	NOT IDENT.
EU-155	1.815E-02	8.114E-02	8.155E-02	FAIL ABUN
TB-160	2.419E-02	1.711E-01	1.715E-01	FAIL ABUN
HO-166M	-1.000E-02	6.910E-02	6.925E-02	FAIL ABUN
TM-171	2.087E+00	3.589E+00	3.710E+00	NOT IDENT.
HF-172	-9.911E-02	1.797E-01	1.852E-01	FAIL ABUN
LU-172	-2.672E-02	5.889E-02	6.011E-02	FAIL ABUN
LU-176	2.144E-02	2.425E-02	2.610E-02	FAIL ABUN
HF-181	-6.128E-02	8.194E-02	8.647E-02	NOT IDENT.
TA-182	3.538E-02	1.946E-01	1.952E-01	FAIL ABUN
RE-183	-3.293E-02	8.022E-02	8.158E-02	NOT IDENT.
RE-184	1.298E-01	2.143E-01	2.221E-01	NOT IDENT.
W-188	-2.137E+00	9.710E+00	9.758E+00	FAIL ABUN
IR-192	4.341E-02	4.207E-02	4.640E-02	FAIL ABUN

HG-203	4.140E-03	5.786E-02	5.789E-02	NOT IDENT.
BI-207	-1.034E-02	5.622E-02	5.642E-02	FAIL ABUN
PB-210	-2.997E-01	4.203E-01	4.415E-01	NOT IDENT.
BI-211	1.164E+00	3.750E-01	6.450E-01	FAIL ABUN
PB-211	1.930E-01	7.223E-01	7.275E-01	NOT IDENT.
BI-212	1.126E+00	6.174E-01	7.993E-01	FAIL ABUN
BI-214	3.339E-01	1.268E-01	1.968E-01	FAIL ABUN
RN-219	-1.563E-01	4.014E-01	4.075E-01	NOT IDENT.
RN-222	3.339E-01	1.268E-01	1.968E-01	FAIL ABUN
RA-223	-2.936E-02	5.949E-01	5.951E-01	FAIL ABUN
RA-224	9.825E-01	1.336E+00	1.408E+00	FAIL ABUN
RA-226	3.339E-01	1.268E-01	1.968E-01	FAIL ABUN
AC-227	6.708E-02	2.349E-01	2.369E-01	FAIL ABUN
TH-227	6.708E-02	2.349E-01	2.369E-01	FAIL ABUN
TH-230	3.339E-01	1.268E-01	1.968E-01	FAIL ABUN
PA-231	7.777E-01	4.910E-01	6.033E-01	NOT IDENT.
TH-231	-2.936E-02	5.949E-01	5.951E-01	FAIL ABUN
PA-233	-7.421E-02	6.396E-02	7.218E-02	NOT IDENT.
PA-234	-4.138E-02	2.694E-01	2.701E-01	NOT IDENT.
PA-234M	6.159E-01	5.175E+00	5.183E+00	FAIL ABUN
U-234	3.339E-01	1.268E-01	1.968E-01	FAIL ABUN
NP-237	-7.421E-02	6.396E-02	7.218E-02	NOT IDENT.
NP-238	3.602E+05	9.037E+05	9.182E+05	SHORT HLIF
NP-239	2.629E-02	2.053E-01	2.056E-01	NOT IDENT.
PU-239	4.615E+02	5.379E+02	5.767E+02	FAIL ABUN
AM-241	6.091E-02	5.129E-02	5.817E-02	NOT IDENT.
CM-243	-3.660E-02	7.776E-02	7.950E-02	NOT IDENT.
BK-247	-1.710E-02	7.966E-02	8.004E-02	FAIL ABUN
CM-247	-1.462E-02	3.829E-02	3.886E-02	NOT IDENT.
CF-249	1.263E-02	3.785E-02	3.827E-02	NOT IDENT.
CF-251	-5.365E-03	1.132E-01	1.133E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	123.5440	87.09	99.5469	136.47	66.6631
45.60	88.6595	87.57	99.6115	140.51	0.0000
46.54	91.4642	88.03	99.6734	143.76	73.1671
49.72	0.0000	88.34	99.7151	144.24	75.2071
51.35	94.0894	88.47	99.7325	145.44	69.2727
51.87	90.6266	89.96	99.9310	152.43	61.6562
52.39	84.4883	1093.63	100.0212	153.25	67.7734
52.97	86.3592	91.11	100.0834	323.87	66.8228
53.44	82.8693	92.59	100.2779	156.02	64.9082
54.07	88.3167	93.35	100.3770	158.56	72.1787
57.36	0.0000	94.56	101.6724	159.00	61.0208
57.53	109.5068	94.65	101.6843	162.33	72.4295
57.98	111.9021	94.67	101.6871	162.66	72.4512
59.27	99.3930	94.87	109.3039	163.33	65.3481
59.32	93.6390	97.43	80.7228	165.86	67.5449
59.54	85.0275	98.43	67.0997	176.31	64.0401
60.96	117.0145	98.44	67.1005	176.60	66.1226
61.17	117.0557	99.53	85.8990	177.52	67.2093
62.93	122.2915	100.11	85.0060	181.07	0.0000
63.29	122.3643	102.03	99.5689	181.52	56.4420
63.58	121.5157	103.18	88.2041	184.41	66.5645
64.28	113.3028	103.37	83.4300	143.76	68.7201
66.73	138.5438	105.21	83.6162	193.51	86.9793
67.24	154.7112	105.31	83.6261	197.03	69.3616
125.81	154.5758	106.12	93.3293	198.01	57.8467
67.75	154.5926	106.47	96.2563	201.83	80.1777
69.67	121.6058	109.28	92.7144	203.43	71.8287
70.83	121.8237	111.00	84.1920	205.31	72.9930
72.81	151.6364	111.76	0.0000	210.85	70.1205
72.87	151.6503	114.06	77.6923	215.65	68.2456
74.66	132.8665	116.30	0.0000	222.11	58.9343
74.82	132.8983	116.74	73.0588	227.09	63.4532
74.97	132.9280	119.76	77.2159	227.38	60.2396
77.11	133.3477	121.12	64.6067	228.16	0.0000
78.74	98.3916	121.22	67.5507	228.18	60.2750
79.69	107.8207	121.78	67.1728	116.74	60.2750
80.12	96.7264	122.06	67.1934	235.69	58.8716
80.19	96.7359	122.92	72.1889	235.96	53.6873
80.57	107.9561	123.07	72.2007	238.63	47.7165
81.00	93.1225	265.00	61.2543	238.98	0.0000
81.07	93.1320	125.81	80.2867	240.99	47.7960
81.75	108.1367	127.23	61.4890	242.00	47.8303
83.79	97.2274	127.91	72.9730	244.70	48.7918
84.00	99.1259	129.30	67.9449	252.40	0.0000
85.43	99.3216	131.20	72.8313	252.80	38.3323
86.55	99.4741	133.02	88.8330	254.15	0.0000
86.79	99.5060	133.52	84.1174	256.23	47.2038
86.94	99.5266	136.00	68.6199	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	55.1987	355.39	0.0000	584.27	17.2241
264.80	55.2040	356.01	37.3042	595.83	21.7972
265.00	56.3151	364.49	33.7267	427.87	27.0353
268.22	42.0496	366.42	0.0000	602.52	0.0000
269.46	46.5136	372.51	35.7516	604.72	20.8286
270.03	50.9625	375.05	36.7410	607.14	22.5844
271.23	46.5668	377.52	39.6180	609.32	34.7729
273.65	68.8503	356.01	37.8550	610.33	33.0467
276.40	43.3858	388.16	31.2992	614.28	22.6437
277.37	35.6206	388.63	32.2552	618.01	30.3495
277.60	34.5127	391.69	34.2057	620.36	23.0436
278.00	33.4081	264.66	43.9044	621.93	20.9604
279.20	45.6927	401.81	39.1547	630.19	0.0000
279.54	45.7021	402.40	42.0315	631.29	14.7222
279.70	45.7071	404.85	35.3876	633.25	13.6802
280.46	45.7290	410.95	30.6977	634.78	14.7407
283.69	41.3523	413.71	40.3450	635.95	12.6401
284.31	40.2506	414.70	43.2471	636.99	18.9672
285.41	32.4462	423.72	31.8531	645.85	19.0270
285.90	0.0000	427.09	29.9707	657.76	17.6917
287.50	39.2110	427.87	28.0474	657.90	0.0000
290.67	37.7169	433.94	30.0680	661.66	20.1958
293.27	0.0000	439.40	25.2827	664.57	0.0000
351.93	37.5229	453.88	18.5997	666.33	23.0674
295.96	40.5428	463.37	25.5617	666.50	23.0690
879.38	40.6082	468.07	22.9884	667.71	0.0000
299.98	28.3855	473.00	0.0000	677.62	16.0320
300.09	28.3874	475.06	31.6246	685.70	0.0000
300.13	28.3880	476.78	22.7476	695.00	18.2767
301.36	28.4092	477.60	26.7133	696.49	24.7396
302.85	28.4346	482.18	38.6634	696.51	24.7402
256.23	28.4630	487.02	27.8168	697.00	23.6683
304.85	28.4691	492.35	0.0000	697.30	20.4426
306.78	28.5021	497.08	29.9330	697.49	20.4440
308.46	28.5305	505.52	15.0203	702.65	23.7128
311.90	45.4828	507.63	0.0000	706.68	24.8238
316.51	29.1879	511.00	27.0990	711.68	24.8648
319.41	46.5973	514.00	16.7488	720.70	10.8430
320.08	46.6153	514.00	16.7488	721.93	0.0000
321.04	49.3851	520.40	20.1519	722.78	14.4671
323.87	43.0533	520.69	0.0000	722.91	14.4678
325.23	45.8374	522.65	0.0000	723.31	18.0868
328.76	45.0116	527.90	0.0000	724.19	18.0920
333.37	47.5861	528.26	17.1847	727.33	10.8662
333.97	46.0663	529.59	20.2280	733.00	18.1437
334.37	41.4690	529.87	0.0000	735.93	13.0758
338.28	36.0188	531.02	19.2282	333.97	15.2626
338.32	36.0198	537.26	20.2915	739.50	0.0000
311.90	50.8582	546.56	0.0000	747.24	16.4041
340.48	50.8582	552.55	18.3744	748.06	17.5023
340.55	50.8602	563.25	17.4267	752.31	15.3351
344.28	33.9771	569.33	22.8342	753.82	17.5344
345.93	35.2446	946.00	22.8353	756.73	18.6473
351.06	24.8027	569.70	22.8375	756.80	18.6477
351.93	36.2911	583.19	17.5615	884.68	20.1555

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	17.2861	1274.44	20.1257	1620.50	1.9132
766.42	18.8613	1001.03	13.7132	1621.92	1.9137
766.84	20.4354	1002.74	20.5787	1678.03	0.0000
772.60	0.0000	1004.73	25.4917	1690.97	2.9051
776.52	13.7961	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.9804
778.90	13.8062	1028.54	0.0000	1063.66	8.8318
783.70	0.0000	1037.84	7.9092	1771.35	5.8889
785.37	10.1447	1038.76	0.0000	1791.20	0.0000
792.07	12.9379	631.29	11.8896	1808.65	4.9374
794.95	8.3245	1048.07	8.9205	1810.72	0.0000
795.86	9.2521	1049.04	9.9141	1836.06	6.9429
810.06	10.2210	1050.41	14.8761		
810.29	10.2216	1063.66	15.9193		
344.28	10.2221	1077.00	9.9821		
810.76	11.1523	1077.34	8.9846		
815.77	8.3769	1085.87	10.0033		
1048.07	13.9728	1093.63	12.0264		
832.01	14.9639	1099.45	9.0322		
834.85	16.0460	1112.07	4.0264		
835.71	16.0502	1112.84	10.3556		
836.80	0.0000	1115.54	22.4508		
846.75	0.0000	1120.29	13.1111		
846.77	15.0286	1120.55	13.1116		
856.80	18.8399	1221.41	13.8348		
860.56	16.0312	1129.67	17.6420		
871.09	18.9172	1131.51	0.0000		
873.19	15.1426	1147.95	0.0000		
875.33	0.0000	1173.23	8.1673		
879.38	12.3250	1177.95	9.8113		
880.51	16.1225	1189.05	7.0257		
883.24	13.2874	1204.77	11.3097		
884.68	9.4948	1221.41	9.2875		
889.28	15.2113	1231.02	14.4779		
894.76	9.5217	1235.36	15.5267		
898.04	14.2955	1238.28	19.5316		
900.72	11.4448	1260.41	0.0000		
903.28	7.6353	1271.87	9.3896		
911.20	8.6085	1274.44	7.3070		
912.08	8.6105	1274.54	10.4386		
923.98	0.0000	1291.59	3.1429		
926.50	9.6049	1298.22	0.0000		
929.11	13.4565	1312.11	11.5738		
937.49	10.5969	1332.49	7.3962		
944.13	10.6157	1362.66	0.0000		
946.00	11.5867	1365.19	11.7000		
949.00	15.4613	1368.63	0.0000		
667.71	0.0000	1384.29	6.4063		
962.31	9.9743	1408.01	9.1950		
964.08	14.9684	1457.56	0.0000		
966.17	46.5947	1460.82	4.8772		
911.20	16.6532	1489.16	6.5378		
968.97	16.6532	1505.03	7.4941		
983.53	5.8507	1584.12	7.6035		
984.45	0.0000	1596.21	5.7150		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:55:20.48

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677003.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;136
Background date  : 26-JUN-2016 12:06:18
Sample date     : 11-MAY-2016 10:10:00 Acquisition date : 28-JUN-2016 12:51:00
Sample ID      : G398677003 Sample quantity : 1.61190E+02 GRAM
Detector name   : GAM43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572231 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	55.50	34	58	2.40	110.78	106	9	9.44E-03	44.0	
2	3	74.73*	55	88	1.49	149.26	143	21	1.53E-02	35.3	1.65E+00
3	3	77.04	101	68	1.34	153.88	143	21	2.80E-02	18.0	
4	0	87.08*	20	102	1.10	173.96	170	8	5.59E-03	91.2	
5	0	93.06*	26	86	1.24	185.92	181	9	7.15E-03	73.7	
6	0	154.50	31	75	1.63	308.85	305	9	8.73E-03	52.6	
7	0	185.77*	48	64	1.06	371.41	368	8	1.33E-02	34.1	
8	0	209.34	32	51	1.05	418.55	414	9	8.87E-03	44.2	
9	0	226.89	28	46	1.68	453.66	448	10	7.78E-03	49.5	
10	5	238.59*	209	43	1.25	477.08	473	21	5.80E-02	8.7	1.52E+00
11	5	242.08*	65	66	2.30	484.05	473	21	1.80E-02	37.0	
12	0	272.34	25	66	0.65	544.59	537	13	6.96E-03	70.5	
13	0	295.08*	44	61	1.40	590.09	584	11	1.21E-02	38.6	
14	0	338.25*	37	51	0.97	676.43	671	12	1.03E-02	42.3	
15	0	351.94*	72	41	0.94	703.83	700	9	2.00E-02	20.4	
16	0	388.08	16	42	1.64	776.13	768	14	4.44E-03	89.5	
17	0	415.49	23	23	1.54	830.96	825	10	6.52E-03	43.1	
18	8	427.92	12	8	2.27	855.83	854	10	3.24E-03	41.1	4.37E+00
19	8	430.41	17	14	1.20	860.80	854	10	4.61E-03	44.4	
20	0	449.29	16	16	1.45	898.57	894	9	4.32E-03	54.7	
21	0	543.33	9	14	0.80	1086.71	1082	9	2.36E-03	85.1	
22	0	583.32*	68	12	1.30	1166.70	1159	16	1.88E-02	17.2	
23	0	609.11*	77	17	1.64	1218.28	1211	14	2.13E-02	16.7	
24	0	634.68	11	11	4.03	1269.44	1262	12	2.95E-03	71.6	
25	0	661.53	242	20	1.75	1323.14	1316	13	6.72E-02	7.5	
26	0	793.27	21	8	5.15	1586.67	1579	16	5.83E-03	37.2	
27	0	860.32	10	6	1.41	1720.79	1715	11	2.64E-03	57.8	
28	0	911.51*	18	5	1.04	1823.19	1819	10	4.97E-03	35.5	
29	0	963.47	14	8	4.10	1927.11	1918	15	3.75E-03	51.9	
30	0	968.51	29	5	1.87	1937.21	1932	11	8.11E-03	24.0	
31	0	986.78	12	0	0.88	1973.75	1968	12	3.33E-03	28.9	
32	0	1020.57	8	3	4.17	2041.33	2034	12	2.25E-03	55.3	
33	0	1023.53	8	0	0.62	2047.25	2045	7	2.22E-03	35.4	
34	0	1210.85	7	9	3.77	2421.92	2411	13	1.81E-03	105.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1238.85*	17	7	0.73	2477.93	2470	13	4.60E-03	40.9	
36	0	1378.17	13	2	0.47	2756.58	2751	10	3.50E-03	36.6	
37	0	1460.50*	111	9	2.04	2921.24	2914	13	3.07E-02	11.3	
38	0	1763.63*	9	0	2.50	3527.50	3522	10	2.62E-03	37.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:55:22

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677003.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:10:00 Acquisition date : 28-JUN-2016 12:51:00
Sample ID        : G398677003 Sample quantity  : 161.19 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.017E+00	4.613E+00	4.613E+00	22.56	OK
CD-109	88.03	3.70*	4.654E+00	4.155E-01	4.467E-01	321.30	OK
SN-126	64.28	9.60	1.984E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.654E+00	1.727E-01	1.727E-01	321.30	OK
	87.57	37.00*	4.654E+00	4.155E-02	4.155E-02	321.30	OK
BA-137M	661.66	89.90*	2.125E+00	6.308E-01	6.328E-01	14.92	OK
CS-137	661.66	85.10*	2.125E+00	6.664E-01	6.684E-01	14.92	OK
TL-208	277.37	6.60	4.073E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.355E+00	1.715E-01	1.715E-01	34.31	OK
	860.56	12.50	1.683E+00	2.182E-01	2.182E-01	115.55	OK
PB-212	74.82	10.28	3.334E+00	8.200E-01	8.200E-01	88.52	OK
	77.11	17.10	3.613E+00	1.018E+00	1.018E+00	36.09	OK
	238.63	43.60*	4.536E+00	5.890E-01	5.890E-01	17.43	OK
	300.09	3.30	3.848E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49	OK
	1120.29	14.92	1.304E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	8.858E-01	3.074E-01	3.074E-01	74.74	OK
PB-214	74.82	5.80	3.345E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.613E+00	1.794E+00	1.794E+00	36.09	OK
	87.09	3.41	4.655E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.490E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.895E+00	3.312E-01	3.313E-01	77.25	OK
	351.93	35.60*	3.430E+00	3.164E-01	3.164E-01	40.90	OK
RN-222	609.32	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49	OK
	1120.29	14.92	1.304E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	8.858E-01	3.074E-01	3.074E-01	74.74	OK
RA-224	240.99	4.10*	4.489E+00	1.380E+00	1.380E+00	110.42	OK
RA-226	609.32	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49	OK
	1120.29	14.92	1.304E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	8.858E-01	3.074E-01	3.074E-01	74.74	OK
AC-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.530E+00	5.021E-01	5.021E-01	84.60	OK
	794.95	4.25	1.810E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.593E+00	2.087E-01	2.087E-01	71.09	OK
	968.97	15.80	1.503E+00	5.857E-01	5.857E-01	48.00	OK
RA-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.530E+00	5.021E-01	5.021E-01	84.60	OK
	794.95	4.25	1.810E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.593E+00	2.087E-01	2.087E-01	71.09	OK
	968.97	15.80	1.503E+00	5.857E-01	5.857E-01	48.00	OK
TH-228	74.82	10.28	3.334E+00	8.200E-01	8.200E-01	88.52	OK
	77.11	17.10	3.613E+00	1.018E+00	1.018E+00	36.09	OK
	238.63	43.60*	4.536E+00	5.890E-01	5.890E-01	17.43	OK
	300.09	3.30	3.848E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49	OK
	1120.29	14.92	1.304E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	8.858E-01	3.074E-01	3.074E-01	74.74	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.530E+00	5.021E-01	5.021E-01	84.60	OK
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.593E+00	2.087E-01	2.087E-01	71.09	OK
	968.97	15.80	1.503E+00	5.857E-01	5.857E-01	48.00	OK
U-234	609.32	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49	OK
	1120.29	14.92	1.304E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	8.858E-01	3.074E-01	3.074E-01	74.74	OK
AM-243	43.53	5.90	1.429E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.334E+00	1.254E-01	1.254E-01	88.52	OK
CF-249	252.80	2.50	4.353E+00	----- Line	Not Found	-----	Absent
	333.37	14.60	3.567E+00	----- Line	Not Found	-----	Absent
	388.16	66.00*	3.197E+00	4.016E-02	4.017E-02	178.97	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677003.CNF;1
Acquisition date : 28-JUN-2016 12:51:00 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.53 Half life ratio : *****
Sample date : 11-MAY-2016 10:10:00 Analyst initials: MXR1
Sample ID : G398677003 Sample Quantity : 1.6119E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.613E+00	1.020E+00	7.292E-01
CD-109	4.467E-01	1.406E+00	1.515E+00
SN-126	4.155E-02	1.308E-01	1.587E-01
BA-137M	6.328E-01	9.252E-02	5.417E-02
CS-137	6.684E-01	9.774E-02	5.722E-02
TL-208	1.715E-01	5.764E-02	5.489E-02
PB-212	5.890E-01	1.006E-01	1.010E-01
BI-214	3.727E-01	1.223E-01	1.209E-01
PB-214	3.164E-01	1.268E-01	1.367E-01
RN-222	3.727E-01	1.223E-01	1.209E-01
RA-224	1.380E+00	1.494E+00	1.083E+00
RA-226	3.727E-01	1.223E-01	1.209E-01
AC-228	2.087E-01	1.454E-01	1.547E-01
RA-228	2.087E-01	1.454E-01	1.547E-01
TH-228	5.890E-01	1.006E-01	1.010E-01
TH-230	3.727E-01	1.223E-01	1.209E-01
TH-232	2.087E-01	1.454E-01	1.547E-01
U-234	3.727E-01	1.223E-01	1.209E-01
AM-243	1.254E-01	1.088E-01	9.352E-02
CF-249	4.017E-02	7.046E-02	7.092E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.321E-01	4.490E-01	9.413E-01	NOT IDENT.
NA-22	3.408E-03	3.567E-02	7.353E-02	NOT IDENT.
NA-24	0.000E+00	4.144E+21	0.000E+00	SHORT HLIF
AL-26	1.085E-02	2.952E-02	7.031E-02	NOT IDENT.
SC-46	-2.444E-02	4.570E-02	8.163E-02	NOT IDENT.
V-48	-2.545E-02	2.736E-01	4.525E-01	NOT IDENT.
CR-51	6.538E-02	8.010E-01	1.582E+00	NOT IDENT.
MN-54	-1.844E-02	3.752E-02	6.765E-02	NOT IDENT.
CO-56	1.351E-02	4.808E-02	9.803E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF

CO-57	2.104E-02	2.213E-02	4.711E-02	NOT IDENT.
CO-58	-2.492E-02	4.703E-02	8.500E-02	NOT IDENT.
FE-59	5.830E-02	1.184E-01	2.608E-01	NOT IDENT.
CO-60	-1.785E-02	3.400E-02	6.135E-02	NOT IDENT.
ZN-65	-1.037E-01	9.928E-02	1.646E-01	NOT IDENT.
GE-68	-1.958E-02	1.060E+00	2.165E+00	NOT IDENT.
AS-73	7.666E-01	2.124E+00	3.907E+00	NOT IDENT.
AS-74	-1.447E-01	2.900E-01	5.142E-01	FAIL ABUN
SE-75	-2.727E-02	5.293E-02	8.617E-02	NOT IDENT.
BR-77	0.000E+00	2.372E+05	0.000E+00	SHORT HLIF
SR-82	-2.233E-01	6.227E-01	1.176E+00	NOT IDENT.
RB-83	3.010E-03	8.402E-02	1.624E-01	NOT IDENT.
KR-85	-9.872E+00	8.466E+00	1.400E+01	NOT IDENT.
SR-85	-7.417E-02	6.346E-02	1.049E-01	NOT IDENT.
RB-86	1.234E-01	2.126E+00	4.390E+00	NOT IDENT.
Y-88	6.157E-03	4.300E-02	9.591E-02	NOT IDENT.
Y-91	2.176E+01	2.657E+01	5.526E+01	NOT IDENT.
NB-94	-1.111E-02	2.742E-02	5.132E-02	NOT IDENT.
NB-95	1.051E-03	4.626E-02	9.224E-02	NOT IDENT.
NB-95M	1.845E-01	1.881E-01	3.414E-01	NOT IDENT.
ZR-95	6.713E-02	8.976E-02	1.948E-01	NOT IDENT.
NB-97	0.000E+00	6.491E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.591E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.648E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-4.684E-03	2.594E-02	5.072E-02	NOT IDENT.
RH-102	3.064E-03	4.907E-02	8.685E-02	NOT IDENT.
RU-103	3.573E-02	5.979E-02	1.252E-01	FAIL ABUN
RH-106	8.622E-02	2.885E-01	5.969E-01	NOT IDENT.
RU-106	8.622E-02	2.885E-01	5.969E-01	NOT IDENT.
AG-108M	-2.258E-02	3.615E-02	5.437E-02	NOT IDENT.
AG-110M	1.750E-02	4.183E-02	8.988E-02	NOT IDENT.
SN-113	1.207E-02	5.304E-02	9.349E-02	NOT IDENT.
CD-115	0.000E+00	3.160E+05	0.000E+00	SHORT HLIF
SN-117M	5.952E-02	2.745E-01	4.813E-01	NOT IDENT.
TE-123M	6.269E-03	3.250E-02	5.679E-02	NOT IDENT.
SB-124	-2.355E-03	1.258E-01	2.731E-01	NOT IDENT.
SB-125	7.123E-02	5.736E-02	1.855E-01	FAIL ABUN
TE-125M	3.110E+00	1.249E+01	2.536E+01	NOT IDENT.
I-126	3.769E-01	1.011E+00	1.929E+00	FAIL ABUN
SB-126	-1.091E-01	8.122E-01	1.571E+00	FAIL ABUN
SB-127	0.000E+00	3.632E+02	0.000E+00	SHORT HLIF
I-131	1.844E+00	1.750E+00	3.793E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.245E+03	0.000E+00	SHORT HLIF
BA-133	1.148E-02	3.962E-02	7.099E-02	NOT IDENT.
I-133	0.000E+00	1.558E+15	0.000E+00	SHORT HLIF
CS-134	2.947E-02	3.995E-02	7.842E-02	NOT IDENT.
CS-135	1.592E-01	1.670E-01	3.054E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-4.942E-02	5.301E-01	1.053E+00	FAIL ABUN
CE-139	4.064E-03	3.200E-02	6.238E-02	NOT IDENT.
BA-140	5.350E-01	1.569E+00	2.794E+00	NOT IDENT.
LA-140	-4.805E-02	4.458E-01	9.324E-01	NOT IDENT.
CE-141	4.861E-02	1.074E-01	2.166E-01	NOT IDENT.
CE-143	0.000E+00	2.342E+09	0.000E+00	SHORT HLIF
CE-144	-1.015E-01	1.827E-01	3.451E-01	NOT IDENT.
PM-144	4.834E-03	3.249E-02	6.517E-02	NOT IDENT.
PR-144	3.680E-01	2.474E+00	4.962E+00	NOT IDENT.
PM-146	2.588E-02	4.427E-02	8.122E-02	FAIL ABUN
ND-147	3.571E+00	4.029E+00	8.619E+00	NOT IDENT.
PM-147	2.969E+01	6.165E+02	1.232E+03	NOT IDENT.
PM-149	0.000E+00	2.474E+06	0.000E+00	SHORT HLIF
EU-150	-5.692E-03	2.865E-02	4.752E-02	FAIL ABUN
EU-152	-1.050E-01	1.047E-01	1.522E-01	FAIL ABUN
GD-153	-8.017E-03	8.490E-02	1.503E-01	NOT IDENT.
EU-154	7.157E-03	9.884E-02	2.031E-01	NOT IDENT.
EU-155	-3.905E-02	8.803E-02	1.711E-01	FAIL ABUN
TB-160	-3.583E-02	1.454E-01	2.770E-01	FAIL ABUN
HO-166M	1.617E-02	5.068E-02	1.050E-01	FAIL ABUN
TM-171	-1.287E+01	3.872E+01	6.546E+01	NOT IDENT.
HF-172	-1.539E-01	1.636E-01	3.011E-01	FAIL ABUN
LU-172	-3.196E-02	4.112E-02	7.119E-02	FAIL ABUN
LU-176	7.025E-03	2.306E-02	4.688E-02	FAIL ABUN
HF-181	-1.886E-02	7.001E-02	1.305E-01	NOT IDENT.
TA-182	2.146E-02	1.546E-01	3.260E-01	NOT IDENT.
RE-183	2.995E-02	4.490E-01	7.896E-01	NOT IDENT.
RE-184	-9.239E-02	1.979E-01	3.488E-01	FAIL ABUN

W-188	2.186E+00	1.102E+01	1.840E+01	FAIL ABUN
IR-192	-1.426E-02	4.593E-02	8.759E-02	FAIL ABUN
HG-203	-2.787E-03	5.648E-02	1.056E-01	NOT IDENT.
BI-207	4.088E-02	4.507E-02	1.030E-01	FAIL ABUN
PB-210	5.051E-02	9.482E+00	1.879E+01	NOT IDENT.
BI-211	0.000E+00	3.494E-01	6.187E-01	FAIL ABUN
PB-211	1.764E-02	6.801E-01	1.320E+00	FAIL ABUN
BI-212	4.602E-01	4.709E-01	1.027E+00	NOT IDENT.
RN-219	-2.993E-02	3.670E-01	7.080E-01	FAIL ABUN
RA-223	-1.979E-01	6.010E-01	1.143E+00	FAIL ABUN
AC-227	4.306E-02	2.460E-01	4.695E-01	NOT IDENT.
TH-227	4.306E-02	2.460E-01	4.695E-01	NOT IDENT.
TH-229	2.570E-01	4.791E-01	9.534E-01	FAIL ABUN
PA-231	1.991E-01	4.450E-01	8.594E-01	NOT IDENT.
TH-231	-1.979E-01	6.010E-01	1.143E+00	FAIL ABUN
PA-233	-1.662E-02	6.281E-02	1.195E-01	NOT IDENT.
PA-234	5.923E-02	2.636E-01	5.357E-01	NOT IDENT.
PA-234M	3.970E+00	3.976E+00	8.987E+00	NOT IDENT.
TH-234	-1.240E+00	1.772E+00	3.296E+00	FAIL ABUN
U-235	-6.764E-03	1.746E-01	3.400E-01	FAIL ABUN
NP-237	-1.662E-02	6.281E-02	1.195E-01	NOT IDENT.
NP-238	0.000E+00	8.829E+05	0.000E+00	SHORT HLIF
U-238	-1.240E+00	1.772E+00	3.296E+00	FAIL ABUN
NP-239	4.139E-02	2.095E-01	4.252E-01	FAIL ABUN
PU-239	1.610E+02	2.720E+02	5.616E+02	NOT IDENT.
AM-241	1.350E-01	2.298E-01	4.271E-01	NOT IDENT.
CM-243	-3.961E-02	8.603E-02	1.674E-01	FAIL ABUN
BK-247	-6.501E-03	7.702E-02	1.329E-01	NOT IDENT.
CM-247	-6.868E-03	3.367E-02	6.409E-02	NOT IDENT.
CF-251	6.932E-02	1.127E-01	2.276E-01	FAIL ABUN
ANH-511	-3.402E-02	3.983E-02	8.281E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	107	10.66*	1.017E+00	4.613E+00	4.613E+00	22.56
CD-109	88.03	27	3.70*	4.654E+00	7.208E-01	7.748E-01	182.30
SN-126	64.28	-----	9.60	1.984E+00	-----	Line Not Found	-----
	86.94	27	8.90	4.654E+00	2.997E-01	2.997E-01	182.30
	87.57	27	37.00*	4.654E+00	7.208E-02	7.208E-02	182.30
BA-137M	661.66	259	89.90*	2.125E+00	6.308E-01	6.328E-01	14.92
CS-137	661.66	259	85.10*	2.125E+00	6.664E-01	6.684E-01	14.92
TL-208	277.37	-----	6.60	4.073E+00	-----	Line Not Found	-----
	583.19	74	85.00*	2.355E+00	1.715E-01	1.715E-01	34.31
	860.56	10	12.50	1.683E+00	2.182E-01	2.182E-01	115.55
BI-211	72.87	-----	1.23	3.101E+00	-----	Line Not Found	-----
	351.06	83	12.92*	3.430E+00	8.717E-01	8.717E-01	40.90
PB-212	74.82	74	10.28	3.334E+00	1.007E+00	1.007E+00	70.65
	77.11	135	17.10	3.613E+00	1.018E+00	1.018E+00	36.09
	238.63	250	43.60*	4.536E+00	5.890E-01	5.890E-01	17.43
	300.09	-----	3.30	3.848E+00	-----	Line Not Found	-----
BI-214	609.32	83	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49
	1120.29	-----	14.92	1.304E+00	-----	Line Not Found	-----
	1764.49	9	15.30	8.858E-01	3.074E-01	3.074E-01	74.74
PB-214	74.82	74	5.80	3.334E+00	1.785E+00	1.785E+00	70.65
	77.11	135	9.70	3.613E+00	1.794E+00	1.794E+00	36.09
	87.09	27	3.41	4.654E+00	7.821E-01	7.821E-01	182.30
	242.00	78	7.25	4.489E+00	1.112E+00	1.112E+00	74.03
	295.22	51	18.42	3.895E+00	3.312E-01	3.313E-01	77.25
	351.93	83	35.60*	3.430E+00	3.164E-01	3.164E-01	40.90
RN-222	609.32	83	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49
	1120.29	-----	14.92	1.304E+00	-----	Line Not Found	-----
	1764.49	9	15.30	8.858E-01	3.074E-01	3.074E-01	74.74
RA-224	240.99	78	4.10*	4.489E+00	1.966E+00	1.966E+00	74.03
RA-226	609.32	83	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49
	1120.29	-----	14.92	1.304E+00	-----	Line Not Found	-----
	1764.49	9	15.30	8.858E-01	3.074E-01	3.074E-01	74.74
AC-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	43	11.27	3.530E+00	5.021E-01	5.021E-01	84.60
	794.95	-----	4.25	1.810E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	18	25.80*	1.593E+00	2.087E-01	2.087E-01	71.09
	968.97	30	15.80	1.503E+00	5.857E-01	5.857E-01	48.00
RA-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	43	11.27	3.530E+00	5.021E-01	5.021E-01	84.60
	794.95	-----	4.25	1.810E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	18	25.80*	1.593E+00	2.087E-01	2.087E-01	71.09
	968.97	30	15.80	1.503E+00	5.857E-01	5.857E-01	48.00
TH-228	74.82	74	10.28	3.334E+00	1.007E+00	1.007E+00	70.65
	77.11	135	17.10	3.613E+00	1.018E+00	1.018E+00	36.09
	238.63	250	43.60*	4.536E+00	5.890E-01	5.890E-01	17.43

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	300.09	-----	3.30	3.848E+00	-----	Line Not Found	-----
	609.32	83	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49
	1120.29	-----	14.92	1.304E+00	-----	Line Not Found	-----
TH-232	1764.49	9	15.30	8.858E-01	3.074E-01	3.074E-01	74.74
	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	43	11.27	3.530E+00	5.021E-01	5.021E-01	84.60
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	18	25.80*	1.593E+00	2.087E-01	2.087E-01	71.09
U-234	968.97	30	15.80	1.503E+00	5.857E-01	5.857E-01	48.00
	609.32	83	45.49*	2.275E+00	3.727E-01	3.727E-01	33.49
	1120.29	-----	14.92	1.304E+00	-----	Line Not Found	-----
AM-243	1764.49	9	15.30	8.858E-01	3.074E-01	3.074E-01	74.74
	43.53	-----	5.90	1.429E-01	-----	Line Not Found	-----
	74.66	74	67.20*	3.334E+00	1.540E-01	1.540E-01	70.65
CF-249	252.80	-----	2.50	4.353E+00	-----	Line Not Found	-----
	333.37	-----	14.60	3.567E+00	-----	Line Not Found	-----
	388.16	18	66.00*	3.197E+00	4.016E-02	4.017E-02	178.97

Flag: "*" = Keyline

Total number of lines in spectrum 38
Number of unidentified lines 8
Number of lines tentatively identified by NID 30 78.95%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.613E+00	4.613E+00	1.041E+00	22.56	
CD-109	461.40D	1.07	7.208E-01	7.748E-01	14.13E-01	182.30	
SN-126	2.30E+05Y	1.00	7.208E-02	7.208E-02	13.14E-02	182.30	
BA-137M	30.08Y	1.00	6.308E-01	6.328E-01	0.944E-01	14.92	
CS-137	30.08Y	1.00	6.664E-01	6.684E-01	0.997E-01	14.92	
TL-208	1.41E+10Y	1.00	1.715E-01	1.715E-01	0.588E-01	34.31	
BI-211	7.04E+08Y	1.00	8.717E-01	8.717E-01	3.565E-01	40.90	
PB-212	1.41E+10Y	1.00	5.890E-01	5.890E-01	1.027E-01	17.43	
BI-214	1600.00Y	1.00	3.727E-01	3.727E-01	1.248E-01	33.49	
PB-214	1600.00Y	1.00	3.164E-01	3.164E-01	1.294E-01	40.90	
RN-222	1600.00Y	1.00	3.727E-01	3.727E-01	1.248E-01	33.49	
RA-224	1.41E+10Y	1.00	1.966E+00	1.966E+00	1.455E+00	74.03	
RA-226	1600.00Y	1.00	3.727E-01	3.727E-01	1.248E-01	33.49	
AC-228	1.41E+10Y	1.00	2.087E-01	2.087E-01	1.484E-01	71.09	
RA-228	1.41E+10Y	1.00	2.087E-01	2.087E-01	1.484E-01	71.09	
TH-228	1.41E+10Y	1.00	5.890E-01	5.890E-01	1.027E-01	17.43	
TH-230	7.54E+04Y	1.00	3.727E-01	3.727E-01	1.248E-01	33.49	
TH-232	1.41E+10Y	1.00	2.087E-01	2.087E-01	1.484E-01	71.09	
U-234	2.45E+05Y	1.00	3.727E-01	3.727E-01	1.248E-01	33.49	
AM-243	7370.00Y	1.00	1.540E-01	1.540E-01	1.088E-01	70.65	
CF-249	351.00Y	1.00	4.016E-02	4.017E-02	7.189E-02	178.97	

Total Activity : 1.389E+01 1.395E+01

Grand Total Activity : 1.389E+01 1.395E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	55.50	47	80	2.40	110.78	106	9	9.44E-03	88.0	9.47E-01	T
0	93.06	34	113	1.24	185.92	181	9	7.15E-03	****	5.12E+00	T
0	154.50	39	93	1.63	308.85	305	9	8.73E-03	****	5.87E+00	T
0	185.77	59	79	1.06	371.41	368	8	1.33E-02	68.2	5.35E+00	T
0	209.34	39	62	1.05	418.55	414	9	8.87E-03	88.5	4.96E+00	
0	226.89	34	55	1.68	453.66	448	10	7.78E-03	99.1	4.70E+00	T
0	272.34	30	78	0.65	544.59	537	13	6.96E-03	****	4.13E+00	T
0	415.49	26	25	1.54	830.96	825	10	6.52E-03	86.1	3.04E+00	T
8	427.92	13	9	2.27	855.83	854	10	3.24E-03	82.2	2.98E+00	T
8	430.41	19	16	1.20	860.80	854	10	4.61E-03	88.9	2.97E+00	
0	449.29	17	18	1.45	898.57	894	9	4.32E-03	****	2.87E+00	
0	543.33	9	15	0.80	1086.71	1082	9	2.36E-03	****	2.49E+00	
0	634.68	11	12	4.03	1269.44	1262	12	2.95E-03	****	2.20E+00	T
0	793.27	22	8	5.15	1586.67	1579	16	5.83E-03	74.4	1.81E+00	T
0	963.47	14	8	4.10	1927.11	1918	15	3.75E-03	****	1.51E+00	T
0	986.78	12	0	0.88	1973.75	1968	12	3.33E-03	57.7	1.48E+00	
0	1020.57	8	3	4.17	2041.33	2034	12	2.25E-03	****	1.43E+00	T
0	1023.53	8	0	0.62	2047.25	2045	7	2.22E-03	70.7	1.42E+00	
0	1210.85	6	9	3.77	2421.92	2411	13	1.81E-03	****	1.21E+00	
0	1238.85	16	7	0.73	2477.93	2470	13	4.60E-03	81.7	1.18E+00	T
0	1378.17	12	2	0.47	2756.58	2751	10	3.50E-03	73.2	1.07E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677003.CNF;1
Acquisition date : 28-JUN-2016 12:51:00 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.53 Half life ratio : *****
Sample date : 11-MAY-2016 10:10:00 Nuclide Library : SOLID
Sample ID : G398677003 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.6119E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.060E-01
CD-109	7.158E-01
SN-126	7.540E-02
BA-137M	2.367E-02
CS-137	2.500E-02
TL-208	2.418E-02
PB-212	4.713E-02
BI-214	5.414E-02
PB-214	6.294E-02
RN-222	5.414E-02
RA-224	5.052E-01
RA-226	5.414E-02
AC-228	6.167E-02
RA-228	6.167E-02
TH-228	4.713E-02
TH-230	5.413E-02
TH-232	6.167E-02
U-234	5.413E-02
AM-243	4.368E-02
CF-249	3.234E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.279E-01	NOT IDENT.
NA-22	3.102E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.790E-02	NOT IDENT.
SC-46	3.493E-02	NOT IDENT.
V-48	1.912E-01	NOT IDENT.
CR-51	7.304E-01	NOT IDENT.
MN-54	2.967E-02	NOT IDENT.
CO-56	4.319E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.208E-02	NOT IDENT.

CO-58	3.665E-02	NOT IDENT.
FE-59	1.123E-01	NOT IDENT.
CO-60	2.479E-02	NOT IDENT.
ZN-65	7.122E-02	NOT IDENT.
GE-68	9.164E-01	NOT IDENT.
AS-73	1.817E+00	NOT IDENT.
AS-74	2.259E-01	FAIL ABUN
SE-75	3.954E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.012E-01	NOT IDENT.
RB-83	7.289E-02	NOT IDENT.
KR-85	6.415E+00	NOT IDENT.
SR-85	4.807E-02	NOT IDENT.
RB-86	1.867E+00	NOT IDENT.
Y-88	3.791E-02	NOT IDENT.
Y-91	2.405E+01	NOT IDENT.
NB-94	2.244E-02	NOT IDENT.
NB-95	4.029E-02	NOT IDENT.
NB-95M	1.608E-01	NOT IDENT.
ZR-95	8.682E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.368E-02	NOT IDENT.
RH-102	3.803E-02	NOT IDENT.
RU-103	5.630E-02	FAIL ABUN
RH-106	2.664E-01	NOT IDENT.
RU-106	2.664E-01	NOT IDENT.
AG-108M	2.472E-02	NOT IDENT.
AG-110M	3.875E-02	NOT IDENT.
SN-113	4.248E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.250E-01	NOT IDENT.
TE-123M	2.657E-02	NOT IDENT.
SB-124	1.111E-01	NOT IDENT.
SB-125	8.511E-02	FAIL ABUN
TE-125M	1.191E+01	NOT IDENT.
I-126	8.409E-01	FAIL ABUN
SB-126	6.948E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	1.742E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.234E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.484E-02	NOT IDENT.
CS-135	1.427E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.537E-01	FAIL ABUN
CE-139	2.931E-02	NOT IDENT.
BA-140	1.251E+00	NOT IDENT.
LA-140	3.700E-01	NOT IDENT.
CE-141	1.018E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.613E-01	NOT IDENT.
PM-144	2.907E-02	NOT IDENT.
PR-144	2.214E+00	NOT IDENT.
PM-146	3.701E-02	FAIL ABUN
ND-147	3.899E+00	NOT IDENT.
PM-147	5.753E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.182E-02	FAIL ABUN
EU-152	6.893E-02	FAIL ABUN
GD-153	7.012E-02	NOT IDENT.
EU-154	8.553E-02	NOT IDENT.
EU-155	7.984E-02	FAIL ABUN
TB-160	1.179E-01	FAIL ABUN
HO-166M	4.648E-02	FAIL ABUN
TM-171	3.037E+01	NOT IDENT.
HF-172	1.402E-01	FAIL ABUN
LU-172	2.758E-02	FAIL ABUN
LU-176	2.157E-02	FAIL ABUN
HF-181	5.870E-02	NOT IDENT.
TA-182	1.366E-01	NOT IDENT.
RE-183	3.680E-01	NOT IDENT.
RE-184	1.474E-01	FAIL ABUN
W-188	8.524E+00	FAIL ABUN

IR-192	4.040E-02	FAIL ABUN
HG-203	4.867E-02	NOT IDENT.
BI-207	4.521E-02	FAIL ABUN
PB-210	8.775E+00	NOT IDENT.
BI-211	2.945E-01	FAIL ABUN
PB-211	6.037E-01	FAIL ABUN
BI-212	4.640E-01	NOT IDENT.
RN-219	3.220E-01	FAIL ABUN
RA-223	5.261E-01	FAIL ABUN
AC-227	2.185E-01	NOT IDENT.
TH-227	2.185E-01	NOT IDENT.
TH-229	4.476E-01	FAIL ABUN
PA-231	3.974E-01	NOT IDENT.
TH-231	5.261E-01	FAIL ABUN
PA-233	5.515E-02	NOT IDENT.
PA-234	2.330E-01	NOT IDENT.
PA-234M	3.968E+00	NOT IDENT.
TH-234	1.548E+00	FAIL ABUN
U-235	1.598E-01	FAIL ABUN
NP-237	5.515E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.548E+00	FAIL ABUN
NP-239	1.984E-01	FAIL ABUN
PU-239	2.632E+02	NOT IDENT.
AM-241	1.997E-01	NOT IDENT.
CM-243	7.795E-02	FAIL ABUN
BK-247	6.117E-02	NOT IDENT.
CM-247	2.911E-02	NOT IDENT.
CF-251	1.067E-01	FAIL ABUN
ANH-511	3.891E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677003.CNF;1
Acquisition date : 28-JUN-2016 12:51:00 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.53 Half life ratio : *****
Sample date : 11-MAY-2016 10:10:00 Nuclide Library : SOLID
Sample ID : G398677003 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.6119E+02 GRAM
Quantity Err(%) : 1.2408E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.613E+00	1.093E+00	1.093E+00
CD-109	4.467E-01	1.408E+00	1.408E+00
SN-126	4.155E-02	1.310E-01	1.310E-01
BA-137M	6.328E-01	1.086E-01	1.086E-01
CS-137	6.684E-01	1.147E-01	1.147E-01
TL-208	1.715E-01	5.965E-02	5.965E-02
PB-212	5.890E-01	1.141E-01	1.141E-01
BI-214	3.727E-01	1.268E-01	1.268E-01
PB-214	3.164E-01	1.299E-01	1.299E-01
RN-222	3.727E-01	1.268E-01	1.268E-01
RA-224	1.380E+00	1.501E+00	1.501E+00
RA-226	3.727E-01	1.268E-01	1.268E-01
AC-228	2.087E-01	1.491E-01	1.491E-01
RA-228	2.087E-01	1.491E-01	1.491E-01
TH-228	5.890E-01	1.141E-01	1.141E-01
TH-230	3.727E-01	1.268E-01	1.268E-01
TH-232	2.087E-01	1.491E-01	1.491E-01
U-234	3.727E-01	1.268E-01	1.268E-01
AM-243	1.254E-01	1.096E-01	1.096E-01
CF-249	4.017E-02	7.059E-02	7.059E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.321E-01	4.499E-01	4.742E-01	NOT IDENT.
NA-22	3.408E-03	3.567E-02	3.570E-02	NOT IDENT.
NA-24	1.590E+21	4.147E+21	0.000E+00	SHORT HLIF
AL-26	1.085E-02	2.953E-02	2.993E-02	NOT IDENT.
SC-46	-2.444E-02	4.584E-02	4.715E-02	NOT IDENT.
V-48	-2.545E-02	2.736E-01	2.738E-01	NOT IDENT.
CR-51	6.538E-02	8.010E-01	8.016E-01	NOT IDENT.
MN-54	-1.844E-02	3.760E-02	3.850E-02	NOT IDENT.
CO-56	1.351E-02	4.811E-02	4.850E-02	FAIL ABUN
MN-56	1.000E+41	3.787E+41	0.000E+00	SHORT HLIF

CO-57	2.104E-02	2.221E-02	2.415E-02	NOT IDENT.
CO-58	-2.492E-02	4.714E-02	4.846E-02	NOT IDENT.
FE-59	5.830E-02	1.190E-01	1.219E-01	NOT IDENT.
CO-60	-1.785E-02	3.403E-02	3.497E-02	NOT IDENT.
ZN-65	-1.037E-01	1.015E-01	1.117E-01	NOT IDENT.
GE-68	-1.958E-02	1.060E+00	1.060E+00	NOT IDENT.
AS-73	7.666E-01	2.132E+00	2.159E+00	NOT IDENT.
AS-74	-1.447E-01	2.904E-01	2.976E-01	FAIL ABUN
SE-75	-2.727E-02	5.299E-02	5.440E-02	NOT IDENT.
BR-77	1.388E+06	1.947E+06	2.045E+06	SHORT HLIF
SR-82	-2.233E-01	6.233E-01	6.314E-01	NOT IDENT.
RB-83	3.010E-03	8.402E-02	8.403E-02	NOT IDENT.
KR-85	-9.872E+00	8.510E+00	9.603E+00	NOT IDENT.
SR-85	-7.417E-02	6.379E-02	7.202E-02	NOT IDENT.
RB-86	1.234E-01	2.126E+00	2.127E+00	NOT IDENT.
Y-88	6.157E-03	4.300E-02	4.309E-02	NOT IDENT.
Y-91	2.176E+01	2.663E+01	2.838E+01	NOT IDENT.
NB-94	-1.111E-02	2.744E-02	2.789E-02	NOT IDENT.
NB-95	1.051E-03	4.626E-02	4.626E-02	NOT IDENT.
NB-95M	1.845E-01	1.891E-01	2.066E-01	NOT IDENT.
ZR-95	6.713E-02	9.008E-02	9.503E-02	NOT IDENT.
NB-97	1.000E+41	6.553E+40	0.000E+00	SHORT HLIF
ZR-97	-2.935E+20	2.603E+20	0.000E+00	SHORT HLIF
MO-99	-2.224E+04	4.654E+04	4.761E+04	SHORT HLIF
TC-99M	-1.000E+41	2.208E+41	0.000E+00	SHORT HLIF
RH-101	-4.684E-03	2.595E-02	2.604E-02	NOT IDENT.
RH-102	3.064E-03	4.907E-02	4.909E-02	NOT IDENT.
RU-103	3.573E-02	5.987E-02	6.200E-02	FAIL ABUN
RH-106	8.622E-02	2.886E-01	2.913E-01	NOT IDENT.
RU-106	8.622E-02	2.886E-01	2.913E-01	NOT IDENT.
AG-108M	-2.258E-02	3.619E-02	3.760E-02	NOT IDENT.
AG-110M	1.750E-02	4.191E-02	4.265E-02	NOT IDENT.
SN-113	1.207E-02	5.305E-02	5.333E-02	NOT IDENT.
CD-115	-2.749E+04	3.160E+05	3.163E+05	SHORT HLIF
SN-117M	5.952E-02	2.745E-01	2.758E-01	NOT IDENT.
TE-123M	6.269E-03	3.251E-02	3.263E-02	NOT IDENT.
SB-124	-2.355E-03	1.258E-01	1.258E-01	NOT IDENT.
SB-125	7.123E-02	5.766E-02	6.600E-02	FAIL ABUN
TE-125M	3.110E+00	1.250E+01	1.257E+01	NOT IDENT.
I-126	3.769E-01	1.011E+00	1.026E+00	FAIL ABUN
SB-126	-1.091E-01	8.123E-01	8.138E-01	FAIL ABUN
SB-127	-3.063E+01	3.632E+02	3.635E+02	SHORT HLIF
I-131	1.844E+00	1.757E+00	1.944E+00	NOT IDENT.
I-132	1.000E+41	4.324E+41	0.000E+00	SHORT HLIF
TE-132	1.282E+03	1.255E+03	1.382E+03	SHORT HLIF
BA-133	1.148E-02	3.963E-02	3.997E-02	NOT IDENT.
I-133	1.399E+15	1.616E+15	1.735E+15	SHORT HLIF
CS-134	2.947E-02	4.011E-02	4.226E-02	NOT IDENT.
CS-135	1.592E-01	1.679E-01	1.826E-01	NOT IDENT.
I-135	-1.000E+41	4.813E+41	0.000E+00	SHORT HLIF
CS-136	-4.942E-02	5.302E-01	5.307E-01	FAIL ABUN
CE-139	4.064E-03	3.201E-02	3.206E-02	NOT IDENT.
BA-140	5.350E-01	1.570E+00	1.588E+00	NOT IDENT.
LA-140	-4.805E-02	4.458E-01	4.463E-01	NOT IDENT.
CE-141	4.861E-02	1.075E-01	1.097E-01	NOT IDENT.
CE-143	4.140E+09	2.378E+09	3.023E+09	SHORT HLIF
CE-144	-1.015E-01	1.829E-01	1.886E-01	NOT IDENT.
PM-144	4.834E-03	3.250E-02	3.257E-02	NOT IDENT.
PR-144	3.680E-01	2.474E+00	2.480E+00	NOT IDENT.
PM-146	2.588E-02	4.435E-02	4.586E-02	FAIL ABUN
ND-147	3.571E+00	4.042E+00	4.351E+00	NOT IDENT.
PM-147	2.969E+01	6.165E+02	6.166E+02	NOT IDENT.
PM-149	-2.020E+05	2.474E+06	2.476E+06	SHORT HLIF
EU-150	-5.692E-03	2.866E-02	2.877E-02	FAIL ABUN
EU-152	-1.050E-01	1.053E-01	1.154E-01	FAIL ABUN
GD-153	-8.017E-03	8.490E-02	8.498E-02	NOT IDENT.
EU-154	7.157E-03	9.884E-02	9.889E-02	NOT IDENT.
EU-155	-3.905E-02	8.811E-02	8.985E-02	FAIL ABUN
TB-160	-3.583E-02	1.455E-01	1.464E-01	FAIL ABUN
HO-166M	1.617E-02	5.071E-02	5.123E-02	FAIL ABUN
TM-171	-1.287E+01	3.878E+01	3.921E+01	NOT IDENT.
HF-172	-1.539E-01	1.659E-01	1.798E-01	FAIL ABUN
LU-172	-3.196E-02	4.171E-02	4.413E-02	FAIL ABUN
LU-176	7.025E-03	2.307E-02	2.328E-02	FAIL ABUN
HF-181	-1.886E-02	7.003E-02	7.054E-02	NOT IDENT.
TA-182	2.146E-02	1.547E-01	1.550E-01	NOT IDENT.
RE-183	2.995E-02	4.490E-01	4.492E-01	NOT IDENT.
RE-184	-9.239E-02	1.985E-01	2.029E-01	FAIL ABUN

W-188	2.186E+00	1.102E+01	1.106E+01	FAIL ABUN
IR-192	-1.426E-02	4.595E-02	4.640E-02	FAIL ABUN
HG-203	-2.787E-03	5.648E-02	5.650E-02	NOT IDENT.
BI-207	4.088E-02	4.574E-02	4.931E-02	FAIL ABUN
PB-210	5.051E-02	9.482E+00	9.482E+00	NOT IDENT.
BI-211	8.717E-01	3.582E-01	5.317E-01	FAIL ABUN
PB-211	1.764E-02	6.801E-01	6.801E-01	FAIL ABUN
BI-212	4.602E-01	4.735E-01	5.170E-01	NOT IDENT.
RN-219	-2.993E-02	3.670E-01	3.673E-01	FAIL ABUN
RA-223	-1.979E-01	6.014E-01	6.080E-01	FAIL ABUN
AC-227	4.306E-02	2.461E-01	2.469E-01	NOT IDENT.
TH-227	4.306E-02	2.461E-01	2.469E-01	NOT IDENT.
TH-229	2.570E-01	4.795E-01	4.933E-01	FAIL ABUN
PA-231	1.991E-01	4.474E-01	4.563E-01	NOT IDENT.
TH-231	-1.979E-01	6.014E-01	6.080E-01	FAIL ABUN
PA-233	-1.662E-02	6.283E-02	6.328E-02	NOT IDENT.
PA-234	5.923E-02	2.724E-01	2.737E-01	NOT IDENT.
PA-234M	3.970E+00	4.037E+00	4.416E+00	NOT IDENT.
TH-234	-1.240E+00	1.797E+00	1.882E+00	FAIL ABUN
U-235	-6.764E-03	1.746E-01	1.746E-01	FAIL ABUN
NP-237	-1.662E-02	6.283E-02	6.328E-02	NOT IDENT.
NP-238	1.569E+05	8.833E+05	8.861E+05	SHORT HLIF
U-238	-1.240E+00	1.797E+00	1.882E+00	FAIL ABUN
NP-239	4.139E-02	2.096E-01	2.104E-01	FAIL ABUN
PU-239	1.610E+02	2.724E+02	2.819E+02	NOT IDENT.
AM-241	1.350E-01	2.305E-01	2.384E-01	NOT IDENT.
CM-243	-3.961E-02	8.614E-02	8.797E-02	FAIL ABUN
BK-247	-6.501E-03	7.703E-02	7.709E-02	NOT IDENT.
CM-247	-6.868E-03	3.370E-02	3.384E-02	NOT IDENT.
CF-251	6.932E-02	1.130E-01	1.173E-01	FAIL ABUN
ANH-511	-3.402E-02	3.994E-02	4.278E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	88.3866	87.09	118.4991	136.47	84.7760
45.60	61.0480	87.57	122.0724	140.51	0.0000
46.54	66.4204	88.03	96.8293	143.76	81.8992
49.72	0.0000	88.34	93.4313	144.24	72.4276
51.35	66.3548	88.47	93.4564	145.44	70.6459
51.87	64.8749	89.96	97.2151	152.43	70.9732
52.39	63.3894	1093.63	79.9659	153.25	74.1451
52.97	50.7977	91.11	97.4429	323.87	88.1656
53.44	50.8671	92.59	91.9163	156.02	68.2301
54.07	54.1446	93.35	62.9245	158.56	63.8017
57.36	0.0000	94.56	60.2724	159.00	65.3974
57.53	57.8912	94.65	61.6851	162.33	72.3418
57.98	61.1828	94.67	61.6875	162.66	74.3301
59.27	48.4724	94.87	61.7117	163.33	76.3552
59.32	48.4789	97.43	67.6594	165.86	77.5963
59.54	54.9754	98.43	70.6146	176.31	65.7150
60.96	82.2361	98.44	70.6158	176.60	61.7550
61.17	85.5301	99.53	63.6872	177.52	61.8273
62.93	80.4877	100.11	50.4747	181.07	0.0000
63.29	87.0952	102.03	70.2102	181.52	80.1788
63.58	89.3395	103.18	71.2515	184.41	74.0290
64.28	81.8604	103.37	71.2769	143.76	83.6187
66.73	90.0579	105.21	75.0954	193.51	66.1034
67.24	81.3749	105.31	75.1092	197.03	74.5489
125.81	91.3718	106.12	68.9520	198.01	81.7908
67.75	85.8822	106.47	66.3079	201.83	69.8314
69.67	96.2444	109.28	74.7505	203.43	61.7294
70.83	71.5537	111.00	80.3996	205.31	75.8843
72.81	81.9234	111.76	0.0000	210.85	58.1003
72.87	81.9350	114.06	67.2084	215.65	58.4101
74.66	67.1661	116.30	0.0000	222.11	53.7797
74.82	67.1912	116.74	61.1320	227.09	54.0660
74.97	67.2144	119.76	70.6163	227.38	62.5330
77.11	67.5449	121.12	65.2616	228.16	0.0000
78.74	67.7936	121.22	66.1919	228.18	67.6602
79.69	67.9373	121.78	54.2911	116.74	67.6602
80.12	68.0020	122.06	54.3162	235.69	61.3723
80.19	79.9146	122.92	51.6276	235.96	64.7999
80.57	79.9816	123.07	51.6404	238.63	65.1909
81.00	97.0912	265.00	57.2305	238.98	0.0000
81.07	97.1060	125.81	83.3656	240.99	65.3477
81.75	84.1699	127.23	70.5587	242.00	65.4143
83.79	68.5480	127.91	54.8359	244.70	37.8498
84.00	68.5788	129.30	61.4777	252.40	0.0000
85.43	68.7878	131.20	65.4002	252.80	46.6087
86.55	108.5970	133.02	88.0734	254.15	0.0000
86.79	118.4242	133.52	81.5784	256.23	56.5521
86.94	118.4619	136.00	80.9498	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	52.6238	355.39	0.0000	584.27	18.5282
264.80	52.6311	356.01	29.9906	595.83	24.1184
265.00	46.7917	364.49	25.7334	427.87	21.9785
268.22	45.7603	366.42	0.0000	602.52	0.0000
269.46	42.2889	372.51	33.5551	604.72	22.0234
270.03	54.6519	375.05	44.1823	607.14	22.0503
271.23	58.4637	377.52	43.2988	609.32	24.8329
273.65	45.9913	356.01	45.1064	610.33	33.1274
276.40	46.1075	388.16	35.8722	614.28	20.5474
277.37	46.1481	388.63	33.9447	618.01	26.7869
277.60	49.7082	391.69	29.1577	620.36	27.7423
278.00	49.7267	264.66	32.2737	621.93	19.4346
279.20	47.7805	401.81	35.2358	630.19	0.0000
279.54	45.5720	402.40	36.2290	631.29	15.9368
279.70	43.3555	404.85	38.2516	633.25	12.7614
280.46	41.1604	410.95	44.3194	634.78	12.7706
283.69	47.9741	413.71	39.4683	635.95	7.9862
284.31	53.5825	414.70	38.5068	636.99	14.3824
285.41	56.9867	423.72	29.7986	645.85	16.8501
285.90	0.0000	427.09	21.5691	657.76	20.9785
287.50	42.5401	427.87	28.2199	657.90	0.0000
290.67	48.4965	433.94	46.6638	661.66	16.1666
293.27	0.0000	439.40	33.1140	664.57	0.0000
351.93	54.1003	453.88	25.3171	666.33	11.3411
295.96	55.6385	463.37	20.3728	666.50	11.3418
879.38	46.7220	468.07	46.9928	667.71	0.0000
299.98	42.2512	473.00	0.0000	677.62	10.4497
300.09	46.7826	475.06	38.9848	685.70	0.0000
300.13	46.7838	476.78	28.7554	695.00	16.2761
301.36	39.6575	477.60	22.6045	696.49	21.0771
302.85	49.9183	482.18	30.9089	696.51	21.0771
256.23	57.2599	487.02	13.4323	697.00	21.0815
304.85	51.8218	492.35	0.0000	697.30	20.1263
306.78	39.1577	497.08	18.7084	697.49	20.1280
308.46	41.0367	505.52	51.1772	702.65	21.1344
311.90	51.2155	507.63	0.0000	706.68	20.2096
316.51	53.2471	511.00	30.3834	711.68	16.3961
319.41	44.1721	514.00	64.0187	720.70	21.3013
320.08	46.9583	514.00	64.0187	721.93	0.0000
321.04	47.9165	520.40	25.2785	722.78	26.1661
323.87	50.7978	520.69	0.0000	722.91	25.1986
325.23	55.4766	522.65	0.0000	723.31	24.2335
328.76	50.0713	527.90	0.0000	724.19	24.2427
333.37	52.7369	528.26	29.6215	727.33	16.5071
333.97	46.5546	529.59	19.0564	733.00	24.3342
334.37	38.8082	529.87	0.0000	735.93	15.5934
338.28	39.2391	531.02	18.0119	333.97	18.5292
338.32	39.2402	537.26	19.4913	739.50	0.0000
311.90	37.4346	546.56	0.0000	747.24	21.5435
340.48	37.4346	552.55	20.3675	748.06	22.5302
340.55	37.4370	563.25	20.4834	752.31	20.6078
344.28	51.6249	569.33	27.0380	753.82	19.6387
345.93	42.2924	946.00	29.2036	756.73	13.7639
351.06	48.7491	569.70	29.2063	756.80	15.7305
351.93	45.3193	583.19	18.5178	884.68	20.7073

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	15.7891	1274.44	16.1118	1620.50	2.8556
766.42	16.7800	1001.03	6.4548	1621.92	4.7609
766.84	17.7704	1002.74	10.7642	1678.03	0.0000
772.60	0.0000	1004.73	16.1569	1690.97	4.8323
776.52	14.8672	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.9626
778.90	15.8737	1028.54	0.0000	1063.66	12.7723
783.70	0.0000	1037.84	10.2653	1771.35	10.8097
785.37	10.2311	1038.76	0.0000	1791.20	0.0000
792.07	10.2587	631.29	15.9090	1808.65	2.9703
794.95	10.2704	1048.07	14.0437	1810.72	0.0000
795.86	11.9866	1049.04	11.2387	1836.06	3.9821
810.06	21.0944	1050.41	10.3064		
810.29	20.0920	1063.66	8.4679		
344.28	20.0932	1077.00	10.3927		
810.76	19.0908	1077.34	10.3938		
815.77	12.0811	1085.87	5.6842		
1048.07	16.1253	1093.63	9.4964		
832.01	15.1965	1099.45	8.5621		
834.85	23.3266	1112.07	10.5047		
835.71	17.2473	1112.84	13.3730		
836.80	0.0000	1115.54	26.7676		
846.75	0.0000	1120.29	17.2322		
846.77	15.2823	1120.55	20.1057		
856.80	19.2845	1221.41	18.1955		
860.56	12.2893	1129.67	11.5204		
871.09	12.3376	1131.51	0.0000		
873.19	9.2604	1147.95	0.0000		
875.33	0.0000	1173.23	8.7514		
879.38	13.4065	1177.95	13.6318		
880.51	15.4755	1189.05	14.6521		
883.24	10.3274	1204.77	6.8684		
884.68	9.2996	1221.41	7.8862		
889.28	17.5952	1231.02	6.9189		
894.76	11.4078	1235.36	12.1227		
898.04	20.7658	1238.28	13.8657		
900.72	9.3538	1260.41	0.0000		
903.28	14.7528	1271.87	7.9961		
911.20	5.2161	1274.44	9.0019		
912.08	11.4789	1274.54	9.0022		
923.98	0.0000	1291.59	10.0481		
926.50	11.5376	1298.22	0.0000		
929.11	12.5979	1312.11	10.1029		
937.49	12.6350	1332.49	10.1569		
944.13	14.7747	1362.66	0.0000		
946.00	12.6721	1365.19	8.1939		
949.00	15.8566	1368.63	0.0000		
667.71	0.0000	1384.29	10.8065		
962.31	7.2819	1408.01	9.3177		
964.08	0.0000	1457.56	0.0000		
966.17	0.0000	1460.82	9.1763		
911.20	9.1230	1489.16	9.5022		
968.97	9.1230	1505.03	4.2390		
983.53	11.0014	1584.12	9.4421		
984.45	0.0000	1596.21	5.6807		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 14:07:53.78

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677004.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;461
Background date  : 26-JUN-2016 12:03:45
Sample date      : 11-MAY-2016 10:15:00 Acquisition date : 28-JUN-2016 13:07:29
Sample ID        : G398677004 Sample quantity : 1.43490E+02 GRAM
Detector name    : GAM05 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.72 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.22	302	223	1.15	65.95	60	10	8.38E-02	10.9	
2	0	36.96	74	173	1.31	75.42	72	8	2.04E-02	33.0	
3	0	46.91*	45	168	0.68	95.33	92	7	1.25E-02	52.7	
4	0	63.65*	19	275	0.84	128.80	125	9	5.39E-03	159.9	
5	2	75.14*	179	171	0.79	151.80	148	16	4.97E-02	12.8	3.34E+00
6	2	77.43*	301	159	1.02	156.37	148	16	8.35E-02	9.0	
7	0	84.54*	20	184	0.83	170.58	166	8	5.54E-03	121.7	
8	0	86.62	55	223	1.04	174.75	174	7	1.52E-02	46.7	
9	0	90.17	76	117	1.18	181.85	180	5	2.10E-02	24.6	
10	0	93.28*	115	232	1.63	188.08	185	11	3.20E-02	28.2	
11	0	186.12*	24	214	1.26	373.78	369	9	6.66E-03	114.2	
12	0	209.34	46	70	0.98	420.21	418	5	1.28E-02	31.2	
13	0	231.97	35	154	1.69	465.49	462	9	9.84E-03	65.2	
14	0	238.67*	324	198	1.06	478.89	474	9	9.00E-02	9.6	
15	0	241.62	48	127	2.52	484.79	483	6	1.33E-02	40.1	
16	0	295.18*	74	106	1.05	591.90	589	8	2.07E-02	26.8	
17	0	338.14*	68	156	1.44	677.82	670	12	1.88E-02	39.3	
18	0	352.03*	146	141	0.92	705.61	700	12	4.06E-02	18.5	
19	0	461.85	69	124	0.60	925.27	918	13	1.91E-02	35.8	
20	3	466.77	29	55	1.88	935.09	931	27	8.01E-03	49.7	1.58E+00
21	3	474.82	30	108	1.89	951.20	931	27	8.21E-03	70.2	
22	0	510.57*	48	119	1.91	1022.70	1015	17	1.33E-02	57.8	
23	0	582.69*	130	42	1.10	1166.93	1161	12	3.62E-02	13.4	
24	0	608.73*	123	44	1.73	1219.02	1211	13	3.42E-02	14.6	
25	0	661.23	2923	30	1.41	1324.00	1317	15	8.12E-01	1.9	
26	0	726.66	36	14	1.43	1454.85	1449	13	1.01E-02	26.5	
27	0	763.36	16	10	0.93	1528.26	1524	9	4.51E-03	44.1	
28	0	785.06	25	13	4.43	1571.65	1564	17	6.90E-03	38.6	
29	0	860.53	13	15	0.97	1722.57	1718	8	3.51E-03	61.3	
30	0	910.60*	64	22	1.75	1822.69	1814	14	1.78E-02	19.9	
31	0	968.78	42	31	0.78	1939.04	1934	13	1.17E-02	31.9	
32	0	1045.40	8	0	0.56	2092.25	2089	6	2.22E-03	35.4	
33	0	1112.61	10	7	0.92	2226.64	2220	10	2.81E-03	59.1	
34	0	1119.70	33	9	1.66	2240.83	2235	12	9.09E-03	25.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1173.46	25	20	1.10	2348.33	2339	16	7.01E-03	44.3	
36	0	1245.99	6	5	1.52	2493.36	2489	7	1.58E-03	79.1	
37	0	1293.18	10	6	0.95	2587.70	2580	12	2.78E-03	58.3	
38	0	1459.66*	164	9	1.81	2920.58	2914	12	4.56E-02	8.8	
39	0	1763.54*	14	4	2.37	3528.13	3523	10	3.95E-03	42.0	
40	0	1848.01	6	5	1.41	3697.00	3690	10	1.53E-03	86.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677004.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:15:00 Acquisition date : 28-JUN-2016 13:07:29
Sample ID        : G398677004 Sample quantity  : 143.49 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA5 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.72 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.289E+00	6.006E+00	6.006E+00	17.54	OK
CD-109	88.03	3.70*	9.373E+00	5.595E-01	6.014E-01	173.50	OK
SN-126	64.28	9.60	9.504E+00	1.394E-01	1.394E-01	319.85	OK
	86.94	8.90	9.373E+00	2.326E-01	2.326E-01	173.50	OK
	87.57	37.00*	9.373E+00	5.595E-02	5.595E-02	173.50	OK
BA-137M	661.66	89.90*	2.544E+00	6.918E+00	6.939E+00	3.79	OK
CS-137	661.66	85.10*	2.544E+00	7.308E+00	7.330E+00	3.79	OK
TL-208	277.37	6.60	5.062E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.822E+00	2.974E-01	2.974E-01	26.86	OK
	860.56	12.50	2.043E+00	2.616E-01	2.616E-01	122.54	OK
PB-210	46.54	4.25*	8.675E+00	8.204E-01	8.237E-01	105.48	OK
BI-211	72.87	1.23	9.556E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	4.223E+00	1.953E-01	1.953E-01	468.89	OK
BI-212	727.33	6.67*	2.353E+00	1.241E+00	1.241E+00	52.95	OK
	785.37	1.10	2.206E+00	5.458E+00	5.458E+00	77.26	OK
	1620.50	1.47	1.171E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	9.543E+00	9.058E-01	9.058E-01	37.14	OK
	77.11	17.10	9.522E+00	1.192E+00	1.192E+00	18.00	OK
	238.63	43.60*	5.644E+00	7.779E-01	7.779E-01	19.23	OK
	300.09	3.30	4.772E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18	OK
	1120.29	14.92	1.632E+00	6.929E-01	6.929E-01	50.78	OK
	1764.49	15.30	1.081E+00	4.241E-01	4.242E-01	84.03	OK
PB-214	74.82	5.80	9.545E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	9.522E+00	2.102E+00	2.102E+00	18.00	OK
	87.09	3.41	9.363E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.589E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.832E+00	4.857E-01	4.858E-01	53.65	OK
	351.93	35.60*	4.224E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18	OK
	1120.29	14.92	1.632E+00	6.929E-01	6.929E-01	50.78	OK
	1764.49	15.30	1.081E+00	4.241E-01	4.242E-01	84.03	OK
RA-224	240.99	4.10*	5.595E+00	3.756E-01	3.756E-01	291.00	OK
RA-226	609.32	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18	OK
	1120.29	14.92	1.632E+00	6.929E-01	6.929E-01	50.78	OK
	1764.49	15.30	1.081E+00	4.241E-01	4.242E-01	84.03	OK
AC-228	105.21	1.10	8.898E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.356E+00	7.896E-01	7.896E-01	78.57	OK
	794.95	4.25	2.183E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.093E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.947E+00	6.705E-01	6.705E-01	39.84	OK
	968.97	15.80	1.848E+00	7.511E-01	7.511E-01	63.71	OK
RA-228	105.21	1.10	8.898E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.356E+00	7.896E-01	7.896E-01	78.57	OK
	794.95	4.25	2.183E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.093E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.947E+00	6.705E-01	6.705E-01	39.84	OK
	968.97	15.80	1.848E+00	7.511E-01	7.511E-01	63.71	OK
TH-228	74.82	10.28	9.543E+00	9.058E-01	9.058E-01	37.14	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	9.522E+00	1.192E+00	1.192E+00	18.00	OK
	238.63	43.60*	5.644E+00	7.779E-01	7.779E-01	19.23	OK
	300.09	3.30	4.772E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18	OK
	1120.29	14.92	1.632E+00	6.929E-01	6.929E-01	50.78	OK
	1764.49	15.30	1.081E+00	4.241E-01	4.241E-01	84.03	OK
TH-232	105.21	1.10	8.898E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.356E+00	7.896E-01	7.896E-01	78.57	OK
	835.71	1.61	2.093E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.947E+00	6.705E-01	6.705E-01	39.84	OK
	968.97	15.80	1.848E+00	7.511E-01	7.511E-01	63.71	OK
TH-234	63.29	3.70*	9.504E+00	3.617E-01	3.617E-01	319.85	OK
	92.59	4.23	9.221E+00	1.882E+00	1.882E+00	56.38	OK
U-234	609.32	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18	OK
	1120.29	14.92	1.632E+00	6.929E-01	6.929E-01	50.78	OK
	1764.49	15.30	1.081E+00	4.241E-01	4.241E-01	84.03	OK
U-235	89.96	3.47	9.296E+00	1.498E+00	1.498E+00	49.15	OK
	93.35	5.60	9.221E+00	1.422E+00	1.422E+00	56.38	OK
	143.76	10.96*	7.760E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	7.228E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.674E+00	3.786E-02	3.786E-02	228.42	OK
	205.31	5.01	6.261E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	9.504E+00	3.617E-01	3.617E-01	319.85	OK
	92.59	4.23	9.221E+00	1.882E+00	1.882E+00	56.38	OK
AM-243	43.53	5.90	8.322E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	9.543E+00	1.386E-01	1.386E-01	37.14	OK
ANH-511	511.00	100.00*	3.142E+00	8.428E-02	8.428E-02	115.66	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677004.CNF;1
Acquisition date : 28-JUN-2016 13:07:29 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.72 Half life ratio : *****
Sample date : 11-MAY-2016 10:15:00 Analyst initials: MXR1
Sample ID : G398677004 Sample Quantity : 1.4349E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.006E+00	1.032E+00	5.770E-01
CD-109	6.014E-01	1.023E+00	1.120E+00
SN-126	5.595E-02	9.513E-02	1.040E-01
BA-137M	6.939E+00	2.576E-01	5.613E-02
CS-137	7.330E+00	2.722E-01	5.930E-02
TL-208	2.974E-01	7.829E-02	7.184E-02
PB-210	8.237E-01	8.515E-01	8.461E-01
BI-211	1.953E-01	8.974E-01	4.615E-01
BI-212	1.241E+00	6.438E-01	7.733E-01
PB-212	7.779E-01	1.466E-01	1.316E-01
BI-214	5.421E-01	1.550E-01	1.593E-01
PB-214	5.567E-01	2.021E-01	2.675E-01
RN-222	5.421E-01	1.550E-01	1.593E-01
RA-224	3.756E-01	1.071E+00	1.503E+00
RA-226	5.421E-01	1.550E-01	1.593E-01
AC-228	6.705E-01	2.618E-01	1.588E-01
RA-228	6.705E-01	2.618E-01	1.588E-01
TH-228	7.779E-01	1.466E-01	1.316E-01
TH-230	5.421E-01	1.550E-01	1.593E-01
TH-232	6.705E-01	2.618E-01	1.588E-01
TH-234	3.617E-01	1.134E+00	9.758E-01
U-234	5.421E-01	1.550E-01	1.593E-01
U-235	-1.099E-01	2.011E-01	3.596E-01
U-238	3.617E-01	1.134E+00	9.758E-01
AM-243	1.386E-01	5.043E-02	5.689E-02
ANH-511	8.428E-02	9.553E-02	6.631E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.119E-01	9.139E-01	1.454E+00	NOT IDENT.
NA-22	-2.189E-02	3.667E-02	6.488E-02	NOT IDENT.
NA-24	0.000E+00	5.301E+21	0.000E+00	SHORT HLIF
AL-26	5.411E-03	2.141E-02	5.352E-02	NOT IDENT.

SC-46	-1.458E-02	4.513E-02	8.259E-02	FAIL ABUN
V-48	-6.955E-02	2.933E-01	5.341E-01	NOT IDENT.
CR-51	5.048E-01	1.074E+00	2.064E+00	NOT IDENT.
MN-54	1.595E-02	3.103E-02	6.495E-02	NOT IDENT.
CO-56	6.753E-03	4.766E-02	9.344E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.123E-02	2.668E-02	4.866E-02	NOT IDENT.
CO-58	-1.119E-02	4.966E-02	9.251E-02	NOT IDENT.
FE-59	-2.236E-02	1.280E-01	2.470E-01	NOT IDENT.
CO-60	4.179E-02	3.723E-02	8.588E-02	FAIL ABUN
ZN-65	5.646E-02	4.510E-02	1.248E-01	NOT IDENT.
GE-68	-7.663E-01	1.030E+00	1.810E+00	NOT IDENT.
AS-73	1.283E-01	2.614E-01	5.272E-01	NOT IDENT.
AS-74	1.916E-01	3.396E-01	6.907E-01	NOT IDENT.
SE-75	-2.026E-02	6.345E-02	1.180E-01	NOT IDENT.
BR-77	0.000E+00	3.463E+05	0.000E+00	SHORT HLIF
SR-82	-1.008E-01	7.211E-01	1.293E+00	NOT IDENT.
RB-83	-2.174E-02	1.232E-01	2.196E-01	NOT IDENT.
KR-85	4.300E+00	1.046E+01	1.727E+01	NOT IDENT.
SR-85	3.207E-02	7.843E-02	1.294E-01	NOT IDENT.
RB-86	-1.730E+00	2.065E+00	3.557E+00	NOT IDENT.
Y-88	-5.595E-03	3.993E-02	8.329E-02	NOT IDENT.
Y-91	-8.867E-01	2.058E+01	4.123E+01	NOT IDENT.
NB-94	7.037E-03	3.017E-02	5.978E-02	NOT IDENT.
NB-95	2.523E-02	6.109E-02	1.089E-01	NOT IDENT.
NB-95M	-1.291E-01	3.019E-01	3.492E-01	NOT IDENT.
ZR-95	-2.205E-02	9.788E-02	1.719E-01	NOT IDENT.
NB-97	0.000E+00	1.603E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.321E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.820E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.584E+41	0.000E+00	SHORT HLIF
RH-101	-1.224E-02	3.105E-02	5.652E-02	NOT IDENT.
RH-102	-7.459E-04	5.537E-02	1.067E-01	FAIL ABUN
RU-103	-5.442E-02	1.038E-01	1.796E-01	NOT IDENT.
RH-106	-4.066E-02	3.650E-01	6.916E-01	NOT IDENT.
RU-106	-4.066E-02	3.650E-01	6.916E-01	NOT IDENT.
AG-108M	-2.332E-03	4.915E-02	8.862E-02	NOT IDENT.
AG-110M	3.692E-03	5.439E-02	1.042E-01	FAIL ABUN
SN-113	2.276E-02	7.756E-02	1.449E-01	NOT IDENT.
CD-115	0.000E+00	4.010E+05	0.000E+00	SHORT HLIF
SN-117M	-7.427E-02	3.141E-01	5.671E-01	NOT IDENT.
TE-123M	1.789E-03	3.615E-02	6.644E-02	NOT IDENT.
SB-124	2.250E-02	8.653E-02	2.071E-01	NOT IDENT.
SB-125	8.434E-02	1.422E-01	2.684E-01	NOT IDENT.
TE-125M	-1.288E+00	1.240E+01	2.324E+01	NOT IDENT.
I-126	9.766E-02	1.325E+00	2.261E+00	NOT IDENT.
SB-126	-7.135E-01	9.313E-01	1.325E+00	NOT IDENT.
SB-127	0.000E+00	5.075E+02	0.000E+00	SHORT HLIF
I-131	3.396E+00	2.681E+00	5.359E+00	NOT IDENT.
I-132	0.000E+00	1.616E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.245E+03	0.000E+00	SHORT HLIF
BA-133	-9.559E-04	5.966E-02	9.719E-02	NOT IDENT.
I-133	0.000E+00	2.140E+15	0.000E+00	SHORT HLIF
CS-134	1.398E-02	3.676E-02	7.446E-02	NOT IDENT.
CS-135	7.641E-02	1.770E-01	3.435E-01	NOT IDENT.
I-135	0.000E+00	1.328E+41	0.000E+00	SHORT HLIF
CS-136	-1.506E-02	6.383E-01	1.036E+00	NOT IDENT.
CE-139	-4.169E-02	3.669E-02	6.215E-02	NOT IDENT.
BA-140	-8.782E-01	1.935E+00	3.361E+00	NOT IDENT.
LA-140	-5.322E-01	4.925E-01	7.080E-01	NOT IDENT.
CE-141	7.077E-02	1.277E-01	2.430E-01	NOT IDENT.
CE-143	0.000E+00	2.798E+09	0.000E+00	SHORT HLIF
CE-144	-1.874E-01	2.061E-01	3.619E-01	NOT IDENT.
PM-144	9.319E-03	3.185E-02	6.388E-02	NOT IDENT.
PR-144	7.168E-01	2.426E+00	4.867E+00	NOT IDENT.
PM-146	1.792E-02	7.386E-02	1.306E-01	NOT IDENT.
ND-147	-4.655E-01	5.436E+00	9.824E+00	FAIL ABUN
PM-147	1.515E+02	7.208E+02	1.364E+03	NOT IDENT.
PM-149	0.000E+00	3.376E+06	0.000E+00	SHORT HLIF
EU-150	1.022E-02	3.759E-02	6.315E-02	NOT IDENT.
EU-152	9.475E-02	1.354E-01	2.609E-01	FAIL ABUN
GD-153	-1.137E-02	7.944E-02	1.340E-01	NOT IDENT.
EU-154	-6.306E-02	1.017E-01	1.792E-01	NOT IDENT.
EU-155	8.551E-02	8.654E-02	1.730E-01	FAIL ABUN
TB-160	-1.060E-01	1.808E-01	3.151E-01	FAIL ABUN
HO-166M	-1.144E-02	5.292E-02	9.979E-02	NOT IDENT.
TM-171	3.438E+00	3.808E+00	7.869E+00	NOT IDENT.
HF-172	-1.365E-01	1.843E-01	3.289E-01	FAIL ABUN

LU-172	5.109E-02	6.063E-02	1.319E-01	FAIL ABUN
LU-176	1.845E-02	3.311E-02	6.411E-02	NOT IDENT.
HF-181	2.040E-02	1.139E-01	2.084E-01	NOT IDENT.
TA-182	-1.602E-02	1.704E-01	3.326E-01	NOT IDENT.
RE-183	-4.196E-02	7.758E-02	1.483E-01	NOT IDENT.
RE-184	-6.727E-02	2.692E-01	4.187E-01	NOT IDENT.
W-188	-5.955E+00	1.342E+01	2.140E+01	FAIL ABUN
IR-192	6.035E-03	6.039E-02	1.135E-01	FAIL ABUN
HG-203	-3.877E-02	7.268E-02	1.328E-01	NOT IDENT.
BI-207	2.789E-02	3.850E-02	8.661E-02	FAIL ABUN
PB-211	4.226E-02	1.033E+00	1.893E+00	NOT IDENT.
RN-219	1.936E-01	5.698E-01	1.067E+00	NOT IDENT.
RA-223	-1.145E-01	8.380E-01	1.547E+00	FAIL ABUN
AC-227	8.506E-02	2.951E-01	5.692E-01	NOT IDENT.
TH-227	8.506E-02	2.951E-01	5.692E-01	NOT IDENT.
TH-229	4.898E-01	6.052E-01	1.143E+00	FAIL ABUN
PA-231	-1.647E-02	5.847E-01	1.094E+00	NOT IDENT.
TH-231	-1.145E-01	8.380E-01	1.547E+00	FAIL ABUN
PA-233	6.694E-02	8.249E-02	1.617E-01	NOT IDENT.
PA-234	-4.492E-02	2.236E-01	4.222E-01	FAIL ABUN
PA-234M	-1.374E+00	4.357E+00	7.823E+00	NOT IDENT.
NP-237	6.694E-02	8.249E-02	1.617E-01	FAIL ABUN
NP-238	0.000E+00	9.653E+05	0.000E+00	SHORT HLIF
NP-239	-7.393E-02	2.329E-01	4.297E-01	NOT IDENT.
PU-239	1.312E+02	3.296E+02	6.268E+02	NOT IDENT.
AM-241	-2.009E-02	5.327E-02	9.165E-02	NOT IDENT.
CM-243	-1.063E-01	8.357E-02	1.462E-01	NOT IDENT.
BK-247	1.035E-02	9.208E-02	1.758E-01	FAIL ABUN
CM-247	2.463E-03	5.260E-02	9.660E-02	NOT IDENT.
CF-249	-3.493E-02	5.781E-02	1.018E-01	NOT IDENT.
CF-251	1.129E-02	1.430E-01	2.609E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	158	10.66*	1.289E+00	6.006E+00	6.006E+00	17.54
CD-109	88.03	67	3.70*	9.373E+00	1.007E+00	1.083E+00	93.39
SN-126	64.28	24	9.60	9.504E+00	1.394E-01	1.394E-01	319.85
	86.94	67	8.90	9.373E+00	4.187E-01	4.187E-01	93.39
	87.57	67	37.00*	9.373E+00	1.007E-01	1.007E-01	93.39
BA-137M	661.66	3023	89.90*	2.544E+00	6.918E+00	6.939E+00	3.79
CS-137	661.66	3023	85.10*	2.544E+00	7.308E+00	7.330E+00	3.79
TL-208	277.37	-----	6.60	5.062E+00	-----	Line Not Found	-----
	583.19	136	85.00*	2.822E+00	2.974E-01	2.974E-01	26.86
	860.56	13	12.50	2.043E+00	2.616E-01	2.616E-01	122.54
PB-210	46.54	58	4.25*	8.675E+00	8.204E-01	8.237E-01	105.48
BI-211	72.87	-----	1.23	9.556E+00	-----	Line Not Found	-----
	351.06	160	12.92*	4.223E+00	1.534E+00	1.534E+00	37.05
BI-212	727.33	37	6.67*	2.353E+00	1.241E+00	1.241E+00	52.95
	785.37	25	1.10	2.206E+00	5.458E+00	5.458E+00	77.26
	1620.50	-----	1.47	1.171E+00	-----	Line Not Found	-----
PB-212	74.82	221	10.28	9.543E+00	1.180E+00	1.180E+00	25.64
	77.11	371	17.10	9.522E+00	1.192E+00	1.192E+00	18.00
	238.63	366	43.60*	5.644E+00	7.779E-01	7.779E-01	19.23
	300.09	-----	3.30	4.772E+00	-----	Line Not Found	-----
BI-214	609.32	128	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18
	1120.29	32	14.92	1.632E+00	6.929E-01	6.929E-01	50.78
	1764.49	13	15.30	1.081E+00	4.241E-01	4.242E-01	84.03
PB-214	74.82	221	5.80	9.543E+00	2.091E+00	2.091E+00	25.64
	77.11	371	9.70	9.522E+00	2.102E+00	2.102E+00	18.00
	87.09	67	3.41	9.373E+00	1.093E+00	1.093E+00	93.39
	242.00	54	7.25	5.595E+00	6.981E-01	6.982E-01	80.28
	295.22	83	18.42	4.832E+00	4.857E-01	4.858E-01	53.65
RN-222	351.93	160	35.60*	4.223E+00	5.566E-01	5.567E-01	37.05
	609.32	128	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18
	1120.29	32	14.92	1.632E+00	6.929E-01	6.929E-01	50.78
	1764.49	13	15.30	1.081E+00	4.241E-01	4.242E-01	84.03
RA-224	240.99	54	4.10*	5.595E+00	1.235E+00	1.235E+00	80.28
RA-226	609.32	128	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18
	1120.29	32	14.92	1.632E+00	6.929E-01	6.929E-01	50.78
	1764.49	13	15.30	1.081E+00	4.241E-01	4.242E-01	84.03
AC-228	105.21	-----	1.10	8.898E+00	-----	Line Not Found	-----
	338.32	74	11.27	4.356E+00	7.896E-01	7.896E-01	78.57
	794.95	-----	4.25	2.183E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.093E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.947E+00	6.705E-01	6.705E-01	39.84
	968.97	42	15.80	1.848E+00	7.511E-01	7.511E-01	63.71
RA-228	105.21	-----	1.10	8.898E+00	-----	Line Not Found	-----
	338.32	74	11.27	4.356E+00	7.896E-01	7.896E-01	78.57
	794.95	-----	4.25	2.183E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.093E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.947E+00	6.705E-01	6.705E-01	39.84

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	42	15.80	1.848E+00	7.511E-01	7.511E-01	63.71
	74.82	221	10.28	9.543E+00	1.180E+00	1.180E+00	25.64
	77.11	371	17.10	9.522E+00	1.192E+00	1.192E+00	18.00
	238.63	366	43.60*	5.644E+00	7.779E-01	7.779E-01	19.23
TH-230	300.09	-----	3.30	4.772E+00	-----	Line Not Found	-----
	609.32	128	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18
	1120.29	32	14.92	1.632E+00	6.929E-01	6.929E-01	50.78
	1764.49	13	15.30	1.081E+00	4.241E-01	4.241E-01	84.03
TH-232	105.21	-----	1.10	8.898E+00	-----	Line Not Found	-----
	338.32	74	11.27	4.356E+00	7.896E-01	7.896E-01	78.57
	835.71	-----	1.61	2.093E+00	-----	Line Not Found	-----
	911.20	64	25.80*	1.947E+00	6.705E-01	6.705E-01	39.84
TH-234	968.97	42	15.80	1.848E+00	7.511E-01	7.511E-01	63.71
	63.29	24	3.70*	9.504E+00	3.617E-01	3.617E-01	319.85
	92.59	140	4.23	9.221E+00	1.882E+00	1.882E+00	56.38
	609.32	128	45.49*	2.723E+00	5.421E-01	5.421E-01	29.18
U-234	1120.29	32	14.92	1.632E+00	6.929E-01	6.929E-01	50.78
	1764.49	13	15.30	1.081E+00	4.241E-01	4.241E-01	84.03
	89.96	92	3.47	9.296E+00	1.498E+00	1.498E+00	49.15
	93.35	140	5.60	9.221E+00	1.422E+00	1.422E+00	56.38
U-235	143.76	-----	10.96*	7.760E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.228E+00	-----	Line Not Found	-----
	185.72	28	57.20	6.674E+00	3.786E-02	3.786E-02	228.42
	205.31	-----	5.01	6.261E+00	-----	Line Not Found	-----
U-238	63.29	24	3.70*	9.504E+00	3.617E-01	3.617E-01	319.85
	92.59	140	4.23	9.221E+00	1.882E+00	1.882E+00	56.38
	43.53	-----	5.90	8.322E+00	-----	Line Not Found	-----
	74.66	221	67.20*	9.543E+00	1.805E-01	1.805E-01	25.64
ANH-511	511.00	51	100.00*	3.142E+00	8.428E-02	8.428E-02	115.66

Flag: "*" = Keyline

Total number of lines in spectrum 40
Number of unidentified lines 8
Number of lines tentatively identified by NID 32 80.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.006E+00	6.006E+00	1.053E+00	17.54	
CD-109	461.40D	1.08	1.007E+00	1.083E+00	1.011E+00	93.39	
SN-126	2.30E+05Y	1.00	1.007E-01	1.007E-01	0.941E-01	93.39	
BA-137M	30.08Y	1.00	6.918E+00	6.939E+00	0.263E+00	3.79	
CS-137	30.08Y	1.00	7.308E+00	7.330E+00	0.278E+00	3.79	
TL-208	1.41E+10Y	1.00	2.974E-01	2.974E-01	0.799E-01	26.86	
PB-210	22.20Y	1.00	8.204E-01	8.237E-01	8.689E-01	105.48	
BI-211	7.04E+08Y	1.00	1.534E+00	1.534E+00	0.568E+00	37.05	
BI-212	1.41E+10Y	1.00	1.241E+00	1.241E+00	0.657E+00	52.95	
PB-212	1.41E+10Y	1.00	7.779E-01	7.779E-01	1.496E-01	19.23	
BI-214	1600.00Y	1.00	5.421E-01	5.421E-01	1.582E-01	29.18	
PB-214	1600.00Y	1.00	5.566E-01	5.567E-01	2.062E-01	37.05	
RN-222	1600.00Y	1.00	5.421E-01	5.421E-01	1.582E-01	29.18	
RA-224	1.41E+10Y	1.00	1.235E+00	1.235E+00	0.991E+00	80.28	
RA-226	1600.00Y	1.00	5.421E-01	5.421E-01	1.582E-01	29.18	
AC-228	1.41E+10Y	1.00	6.705E-01	6.705E-01	2.671E-01	39.84	
RA-228	1.41E+10Y	1.00	6.705E-01	6.705E-01	2.671E-01	39.84	
TH-228	1.41E+10Y	1.00	7.779E-01	7.779E-01	1.496E-01	19.23	
TH-230	7.54E+04Y	1.00	5.421E-01	5.421E-01	1.582E-01	29.18	
TH-232	1.41E+10Y	1.00	6.705E-01	6.705E-01	2.671E-01	39.84	
TH-234	4.47E+09Y	1.00	3.617E-01	3.617E-01	11.57E-01	319.85	
U-234	2.45E+05Y	1.00	5.421E-01	5.421E-01	1.582E-01	29.18	
U-235	7.04E+08Y	1.00	3.786E-02	3.786E-02	8.647E-02	228.42	K
U-238	4.47E+09Y	1.00	3.617E-01	3.617E-01	11.57E-01	319.85	
AM-243	7370.00Y	1.00	1.805E-01	1.805E-01	0.463E-01	25.64	
ANH-511	1.00E+09Y	1.00	8.428E-02	8.428E-02	9.748E-02	115.66	

Total Activity : 3.433E+01 3.445E+01

Grand Total Activity : 3.433E+01 3.445E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	32.22	397	294	1.15	65.95	60	10	8.38E-02	21.8	6.44E+00	
0	36.96	96	225	1.31	75.42	72	8	2.04E-02	66.1	7.37E+00	
0	84.54	24	226	0.83	170.58	166	8	5.54E-03	****	9.41E+00	T
0	209.34	52	80	0.98	420.21	418	5	1.28E-02	62.4	6.18E+00	
0	231.97	40	174	1.69	465.49	462	9	9.84E-03	****	5.76E+00	
0	461.85	73	133	0.60	925.27	918	13	1.91E-02	71.5	3.41E+00	
3	466.77	31	59	1.88	935.09	931	27	8.01E-03	99.4	3.38E+00	T
3	474.82	31	116	1.89	951.20	931	27	8.21E-03	****	3.33E+00	T
0	763.36	17	10	0.93	1528.26	1524	9	4.51E-03	88.2	2.26E+00	T
0	1045.40	8	0	0.56	2092.25	2089	6	2.22E-03	70.7	1.73E+00	T
0	1112.61	10	7	0.92	2226.64	2220	10	2.81E-03	****	1.64E+00	T
0	1173.46	25	19	1.10	2348.33	2339	16	7.01E-03	88.6	1.57E+00	T
0	1245.99	6	5	1.52	2493.36	2489	7	1.58E-03	****	1.49E+00	
0	1293.18	10	6	0.95	2587.70	2580	12	2.78E-03	****	1.44E+00	
0	1848.01	5	4	1.41	3697.00	3690	10	1.53E-03	****	1.03E+00	

Flags: "T" = Tentatively associated


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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
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*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677004.CNF;1  *
* Acquisition date   : 28-JUN-2016 13:07:29 Sensitivity      : 3.000          *
* Detector ID        : GAM05 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.72 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 10:15:00 Nuclide Library : SOLID          *
* Sample ID          : G398677004 Analyst initials: MXR1          *
* Batch Number       : 1572231 Sample Quantity : 1.4349E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 17-SEP-2015 12:25:23 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.368E-01
CD-109	5.366E-01
SN-126	4.985E-02
BA-137M	2.490E-02
CS-137	2.630E-02
TL-208	3.290E-02
PB-210	4.023E-01
BI-211	2.174E-01
BI-212	3.407E-01
PB-212	6.281E-02
BI-214	7.381E-02
PB-214	1.289E-01
RN-222	7.381E-02
RA-224	7.198E-01
RA-226	7.381E-02
AC-228	6.509E-02
RA-228	6.509E-02
TH-228	6.281E-02
TH-230	7.381E-02
TH-232	6.509E-02
TH-234	4.665E-01
U-234	7.381E-02
U-235	1.711E-01
U-238	4.665E-01
AM-243	2.728E-02
ANH-511	3.085E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.878E-01	NOT IDENT.
NA-22	2.737E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.003E-02	NOT IDENT.
SC-46	3.591E-02	FAIL ABUN

V-48	2.353E-01	NOT IDENT.
CR-51	9.779E-01	NOT IDENT.
MN-54	2.866E-02	NOT IDENT.
CO-56	4.138E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.316E-02	NOT IDENT.
CO-58	4.087E-02	NOT IDENT.
FE-59	1.073E-01	NOT IDENT.
CO-60	3.777E-02	FAIL ABUN
ZN-65	5.253E-02	NOT IDENT.
GE-68	7.563E-01	NOT IDENT.
AS-73	2.514E-01	NOT IDENT.
AS-74	3.165E-01	NOT IDENT.
SE-75	5.586E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.667E-01	NOT IDENT.
RB-83	1.022E-01	NOT IDENT.
KR-85	8.095E+00	NOT IDENT.
SR-85	6.068E-02	NOT IDENT.
RB-86	1.485E+00	NOT IDENT.
Y-88	3.227E-02	NOT IDENT.
Y-91	1.744E+01	NOT IDENT.
NB-94	2.691E-02	NOT IDENT.
NB-95	4.909E-02	NOT IDENT.
NB-95M	1.658E-01	NOT IDENT.
ZR-95	7.617E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.690E-02	NOT IDENT.
RH-102	4.837E-02	FAIL ABUN
RU-103	8.399E-02	NOT IDENT.
RH-106	3.161E-01	NOT IDENT.
RU-106	3.161E-01	NOT IDENT.
AG-108M	4.208E-02	NOT IDENT.
AG-110M	4.643E-02	FAIL ABUN
SN-113	6.861E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.700E-01	NOT IDENT.
TE-123M	3.163E-02	NOT IDENT.
SB-124	8.048E-02	NOT IDENT.
SB-125	1.273E-01	NOT IDENT.
TE-125M	1.106E+01	NOT IDENT.
I-126	1.016E+00	NOT IDENT.
SB-126	5.784E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.541E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.577E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.320E-02	NOT IDENT.
CS-135	1.630E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.529E-01	NOT IDENT.
CE-139	2.943E-02	NOT IDENT.
BA-140	1.546E+00	NOT IDENT.
LA-140	2.682E-01	NOT IDENT.
CE-141	1.159E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.716E-01	NOT IDENT.
PM-144	2.868E-02	NOT IDENT.
PR-144	2.185E+00	NOT IDENT.
PM-146	6.205E-02	NOT IDENT.
ND-147	4.533E+00	FAIL ABUN
PM-147	6.501E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.984E-02	NOT IDENT.
EU-152	1.240E-01	FAIL ABUN
GD-153	6.373E-02	NOT IDENT.
EU-154	7.547E-02	NOT IDENT.
EU-155	8.245E-02	FAIL ABUN
TB-160	1.387E-01	FAIL ABUN
HO-166M	4.433E-02	NOT IDENT.
TM-171	3.749E+00	NOT IDENT.
HF-172	1.561E-01	FAIL ABUN
LU-172	5.881E-02	FAIL ABUN

LU-176	3.040E-02	NOT IDENT.
HF-181	9.820E-02	NOT IDENT.
TA-182	1.429E-01	NOT IDENT.
RE-183	7.037E-02	NOT IDENT.
RE-184	1.847E-01	NOT IDENT.
W-188	1.010E+01	FAIL ABUN
IR-192	5.375E-02	FAIL ABUN
HG-203	6.275E-02	NOT IDENT.
BI-207	3.767E-02	FAIL ABUN
PB-211	8.960E-01	NOT IDENT.
RN-219	5.047E-01	NOT IDENT.
RA-223	7.331E-01	FAIL ABUN
AC-227	2.702E-01	NOT IDENT.
TH-227	2.702E-01	NOT IDENT.
TH-229	5.457E-01	FAIL ABUN
PA-231	5.183E-01	NOT IDENT.
TH-231	7.331E-01	FAIL ABUN
PA-233	7.676E-02	NOT IDENT.
PA-234	1.794E-01	FAIL ABUN
PA-234M	3.438E+00	NOT IDENT.
NP-237	7.676E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.039E-01	NOT IDENT.
PU-239	2.990E+02	NOT IDENT.
AM-241	4.359E-02	NOT IDENT.
CM-243	6.910E-02	NOT IDENT.
BK-247	8.326E-02	FAIL ABUN
CM-247	4.565E-02	NOT IDENT.
CF-249	4.809E-02	NOT IDENT.
CF-251	1.242E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677004.CNF;1
Acquisition date : 28-JUN-2016 13:07:29 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.72 Half life ratio : *****
Sample date : 11-MAY-2016 10:15:00 Nuclide Library : SOLID
Sample ID : G398677004 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.4349E+02 GRAM
Quantity Err(%) : 1.3938E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.006E+00	1.162E+00	1.162E+00
CD-109	6.014E-01	1.028E+00	1.028E+00
SN-126	5.595E-02	9.554E-02	9.554E-02
BA-137M	6.939E+00	6.094E-01	6.094E-01
CS-137	7.330E+00	6.433E-01	6.433E-01
TL-208	2.974E-01	8.227E-02	8.227E-02
PB-210	8.237E-01	8.543E-01	8.543E-01
BI-211	1.953E-01	9.182E-01	9.182E-01
BI-212	1.241E+00	6.557E-01	6.557E-01
PB-212	7.779E-01	1.805E-01	1.805E-01
BI-214	5.421E-01	1.615E-01	1.615E-01
PB-214	5.567E-01	2.091E-01	2.091E-01
RN-222	5.421E-01	1.615E-01	1.615E-01
RA-224	3.756E-01	1.082E+00	1.082E+00
RA-226	5.421E-01	1.615E-01	1.615E-01
AC-228	6.705E-01	2.816E-01	2.816E-01
RA-228	6.705E-01	2.816E-01	2.816E-01
TH-228	7.779E-01	1.805E-01	1.805E-01
TH-230	5.421E-01	1.615E-01	1.615E-01
TH-232	6.705E-01	2.816E-01	2.816E-01
TH-234	3.617E-01	1.137E+00	1.137E+00
U-234	5.421E-01	1.615E-01	1.615E-01
U-235	-1.099E-01	2.017E-01	2.017E-01
U-238	3.617E-01	1.137E+00	1.137E+00
AM-243	1.386E-01	5.202E-02	5.202E-02
ANH-511	8.428E-02	9.581E-02	9.581E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.119E-01	9.140E-01	9.153E-01	NOT IDENT.
NA-22	-2.189E-02	3.672E-02	3.802E-02	NOT IDENT.
NA-24	5.320E+20	5.301E+21	0.000E+00	SHORT HLIF
AL-26	5.411E-03	2.142E-02	2.156E-02	NOT IDENT.

SC-46	-1.458E-02	4.518E-02	4.566E-02	FAIL ABUN
V-48	-6.955E-02	2.936E-01	2.952E-01	NOT IDENT.
CR-51	5.048E-01	1.076E+00	1.099E+00	NOT IDENT.
MN-54	1.595E-02	3.110E-02	3.192E-02	NOT IDENT.
CO-56	6.753E-03	4.767E-02	4.777E-02	NOT IDENT.
MN-56	1.000E+41	6.614E+41	0.000E+00	SHORT HLIF
CO-57	-1.123E-02	2.671E-02	2.719E-02	NOT IDENT.
CO-58	-1.119E-02	4.968E-02	4.993E-02	NOT IDENT.
FE-59	-2.236E-02	1.281E-01	1.285E-01	NOT IDENT.
CO-60	4.179E-02	3.739E-02	4.187E-02	FAIL ABUN
ZN-65	5.646E-02	4.646E-02	5.297E-02	NOT IDENT.
GE-68	-7.663E-01	1.040E+00	1.096E+00	NOT IDENT.
AS-73	1.283E-01	2.627E-01	2.690E-01	NOT IDENT.
AS-74	1.916E-01	3.402E-01	3.510E-01	NOT IDENT.
SE-75	-2.026E-02	6.350E-02	6.415E-02	NOT IDENT.
BR-77	1.838E+06	2.589E+06	2.718E+06	SHORT HLIF
SR-82	-1.008E-01	7.212E-01	7.226E-01	NOT IDENT.
RB-83	-2.174E-02	1.232E-01	1.236E-01	NOT IDENT.
KR-85	4.300E+00	1.047E+01	1.065E+01	NOT IDENT.
SR-85	3.207E-02	7.848E-02	7.980E-02	NOT IDENT.
RB-86	-1.730E+00	2.091E+00	2.231E+00	NOT IDENT.
Y-88	-5.595E-03	3.993E-02	4.001E-02	NOT IDENT.
Y-91	-8.867E-01	2.058E+01	2.059E+01	NOT IDENT.
NB-94	7.037E-03	3.017E-02	3.034E-02	NOT IDENT.
NB-95	2.523E-02	6.115E-02	6.220E-02	NOT IDENT.
NB-95M	-1.291E-01	3.025E-01	3.080E-01	NOT IDENT.
ZR-95	-2.205E-02	9.790E-02	9.841E-02	NOT IDENT.
NB-97	1.000E+41	1.790E+40	0.000E+00	SHORT HLIF
ZR-97	4.352E+20	3.342E+20	0.000E+00	SHORT HLIF
MO-99	-1.689E+04	4.823E+04	4.883E+04	SHORT HLIF
TC-99M	1.000E+41	1.592E+41	0.000E+00	SHORT HLIF
RH-101	-1.224E-02	3.115E-02	3.163E-02	NOT IDENT.
RH-102	-7.459E-04	5.537E-02	5.537E-02	FAIL ABUN
RU-103	-5.442E-02	1.039E-01	1.068E-01	NOT IDENT.
RH-106	-4.066E-02	3.650E-01	3.655E-01	NOT IDENT.
RU-106	-4.066E-02	3.650E-01	3.655E-01	NOT IDENT.
AG-108M	-2.332E-03	4.915E-02	4.916E-02	NOT IDENT.
AG-110M	3.692E-03	5.439E-02	5.442E-02	FAIL ABUN
SN-113	2.276E-02	7.759E-02	7.826E-02	NOT IDENT.
CD-115	-1.090E+05	4.011E+05	4.041E+05	SHORT HLIF
SN-117M	-7.427E-02	3.143E-01	3.161E-01	NOT IDENT.
TE-123M	1.789E-03	3.615E-02	3.616E-02	NOT IDENT.
SB-124	2.250E-02	8.655E-02	8.714E-02	NOT IDENT.
SB-125	8.434E-02	1.424E-01	1.474E-01	NOT IDENT.
TE-125M	-1.288E+00	1.240E+01	1.241E+01	NOT IDENT.
I-126	9.766E-02	1.325E+00	1.325E+00	NOT IDENT.
SB-126	-7.135E-01	9.360E-01	9.897E-01	NOT IDENT.
SB-127	3.805E+02	5.154E+02	5.432E+02	SHORT HLIF
I-131	3.396E+00	2.701E+00	3.104E+00	NOT IDENT.
I-132	-1.000E+41	3.380E+41	0.000E+00	SHORT HLIF
TE-132	-2.474E+02	1.246E+03	1.251E+03	SHORT HLIF
BA-133	-9.559E-04	5.966E-02	5.966E-02	NOT IDENT.
I-133	-1.475E+15	2.187E+15	2.286E+15	SHORT HLIF
CS-134	1.398E-02	3.680E-02	3.734E-02	NOT IDENT.
CS-135	7.641E-02	1.773E-01	1.806E-01	NOT IDENT.
I-135	-1.000E+41	1.720E+41	0.000E+00	SHORT HLIF
CS-136	-1.506E-02	6.383E-01	6.383E-01	NOT IDENT.
CE-139	-4.169E-02	3.814E-02	4.252E-02	NOT IDENT.
BA-140	-8.782E-01	1.937E+00	1.977E+00	NOT IDENT.
LA-140	-5.322E-01	4.944E-01	5.495E-01	NOT IDENT.
CE-141	7.077E-02	1.281E-01	1.320E-01	NOT IDENT.
CE-143	2.231E+09	2.809E+09	2.983E+09	SHORT HLIF
CE-144	-1.874E-01	2.075E-01	2.240E-01	NOT IDENT.
PM-144	9.319E-03	3.186E-02	3.214E-02	NOT IDENT.
PR-144	7.168E-01	2.427E+00	2.448E+00	NOT IDENT.
PM-146	1.792E-02	7.388E-02	7.432E-02	NOT IDENT.
ND-147	-4.655E-01	5.436E+00	5.440E+00	FAIL ABUN
PM-147	1.515E+02	7.210E+02	7.242E+02	NOT IDENT.
PM-149	-3.754E+05	3.376E+06	3.380E+06	SHORT HLIF
EU-150	1.022E-02	3.761E-02	3.789E-02	NOT IDENT.
EU-152	9.475E-02	1.358E-01	1.424E-01	FAIL ABUN
GD-153	-1.137E-02	7.945E-02	7.961E-02	NOT IDENT.
EU-154	-6.306E-02	1.019E-01	1.058E-01	NOT IDENT.
EU-155	8.551E-02	8.703E-02	9.518E-02	FAIL ABUN
TB-160	-1.060E-01	1.815E-01	1.877E-01	FAIL ABUN
HO-166M	-1.144E-02	5.294E-02	5.319E-02	NOT IDENT.
TM-171	3.438E+00	3.819E+00	4.122E+00	NOT IDENT.
HF-172	-1.365E-01	1.862E-01	1.961E-01	FAIL ABUN

LU-172	5.109E-02	6.161E-02	6.577E-02	FAIL ABUN
LU-176	1.845E-02	3.316E-02	3.419E-02	NOT IDENT.
HF-181	2.040E-02	1.140E-01	1.143E-01	NOT IDENT.
TA-182	-1.602E-02	1.704E-01	1.706E-01	NOT IDENT.
RE-183	-4.196E-02	7.771E-02	7.998E-02	NOT IDENT.
RE-184	-6.727E-02	2.694E-01	2.711E-01	NOT IDENT.
W-188	-5.955E+00	1.345E+01	1.371E+01	FAIL ABUN
IR-192	6.035E-03	6.040E-02	6.046E-02	FAIL ABUN
HG-203	-3.877E-02	7.281E-02	7.488E-02	NOT IDENT.
BI-207	2.789E-02	3.885E-02	4.083E-02	FAIL ABUN
PB-211	4.226E-02	1.033E+00	1.034E+00	NOT IDENT.
RN-219	1.936E-01	5.705E-01	5.771E-01	NOT IDENT.
RA-223	-1.145E-01	8.381E-01	8.397E-01	FAIL ABUN
AC-227	8.506E-02	2.954E-01	2.979E-01	NOT IDENT.
TH-227	8.506E-02	2.954E-01	2.979E-01	NOT IDENT.
TH-229	4.898E-01	6.097E-01	6.484E-01	FAIL ABUN
PA-231	-1.647E-02	5.847E-01	5.848E-01	NOT IDENT.
TH-231	-1.145E-01	8.381E-01	8.397E-01	FAIL ABUN
PA-233	6.694E-02	8.280E-02	8.813E-02	NOT IDENT.
PA-234	-4.492E-02	2.295E-01	2.304E-01	FAIL ABUN
PA-234M	-1.374E+00	4.364E+00	4.408E+00	NOT IDENT.
NP-237	6.694E-02	8.280E-02	8.813E-02	FAIL ABUN
NP-238	-2.086E+05	9.659E+05	9.705E+05	SHORT HLIF
NP-239	-7.393E-02	2.331E-01	2.355E-01	NOT IDENT.
PU-239	1.312E+02	3.299E+02	3.352E+02	NOT IDENT.
AM-241	-2.009E-02	5.329E-02	5.406E-02	NOT IDENT.
CM-243	-1.063E-01	8.455E-02	9.718E-02	NOT IDENT.
BK-247	1.035E-02	9.211E-02	9.223E-02	FAIL ABUN
CM-247	2.463E-03	5.260E-02	5.261E-02	NOT IDENT.
CF-249	-3.493E-02	5.794E-02	6.005E-02	NOT IDENT.
CF-251	1.129E-02	1.430E-01	1.431E-01	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	110.4518	87.09	106.1664	136.47	115.6278
45.60	102.9615	87.57	176.2031	140.51	0.0000
46.54	124.9569	88.03	176.3848	143.76	139.7653
49.72	0.0000	88.34	168.1018	144.24	128.4742
51.35	130.3613	88.47	168.1503	145.44	126.6403
51.87	129.7315	89.96	194.0120	152.43	130.1064
52.39	101.9196	1093.63	132.3503	153.25	126.0657
52.97	116.5721	91.11	115.5734	323.87	114.6738
53.44	120.1535	92.59	115.9450	156.02	135.0273
54.07	133.1980	93.35	124.6322	158.56	139.7706
57.36	0.0000	94.56	124.9545	159.00	130.3246
57.53	124.2583	94.65	124.9786	162.33	129.8918
57.98	130.4728	94.67	124.9840	162.66	124.6279
59.27	145.7157	94.87	125.0370	163.33	123.6819
59.32	139.2309	97.43	132.8538	165.86	142.3204
59.54	139.3205	98.43	114.5203	176.31	120.5142
60.96	125.5133	98.44	114.5227	176.60	124.9062
61.17	125.5891	99.53	130.8495	177.52	130.4993
62.93	156.8970	100.11	111.0858	181.07	0.0000
63.29	157.0556	102.03	118.2491	181.52	123.0011
63.58	157.1831	103.18	136.8301	184.41	144.8732
64.28	157.4899	103.37	136.8821	143.76	153.9168
66.73	174.0513	105.21	107.3912	193.51	123.2626
67.24	156.9942	105.31	107.4121	197.03	142.7721
125.81	129.2070	106.12	103.7063	198.01	142.9466
67.75	129.2315	106.47	116.3861	201.83	129.0369
69.67	181.2233	109.28	131.6492	203.43	149.5262
70.83	186.6975	111.00	124.2547	205.31	116.6270
72.81	148.5007	111.76	0.0000	210.85	119.1066
72.87	160.6752	114.06	117.0995	215.65	133.4710
74.66	180.1207	116.30	0.0000	222.11	111.4843
74.82	180.1927	116.74	124.6029	227.09	116.5069
74.97	180.2596	119.76	125.2874	227.38	104.0579
77.11	181.2170	121.12	129.5801	228.16	0.0000
78.74	181.9364	121.22	129.6033	228.18	126.7174
79.69	140.0601	121.78	132.7267	116.74	126.7174
80.12	112.7131	122.06	143.7751	235.69	140.0269
80.19	112.7319	122.92	133.9946	235.96	140.0684
80.57	112.8338	123.07	126.0282	238.63	147.4986
81.00	140.4975	265.00	114.1479	238.98	0.0000
81.07	140.5208	125.81	139.6992	240.99	168.9990
81.75	140.7465	127.23	142.0567	242.00	126.8866
83.79	146.0396	127.91	119.0239	244.70	123.0107
84.00	146.1103	129.30	130.4277	252.40	0.0000
85.43	119.6843	131.20	136.9350	252.80	112.2957
86.55	119.9894	133.02	137.3538	254.15	0.0000
86.79	156.3494	133.52	140.5226	256.23	109.1161
86.94	106.1305	136.00	100.2012	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	114.5608	355.39	0.0000	584.27	36.2891
264.80	102.8498	356.01	87.6627	595.83	31.0358
265.00	102.8689	364.49	77.8090	427.87	38.8923
268.22	101.3889	366.42	0.0000	602.52	0.0000
269.46	105.1392	372.51	119.9181	604.72	30.5697
270.03	111.5457	375.05	103.2716	607.14	50.5031
271.23	108.9532	377.52	108.4395	609.32	53.6237
273.65	129.2335	356.01	85.9672	610.33	56.7180
276.40	109.5044	388.16	114.3235	614.28	42.1317
277.37	101.3864	388.63	112.3572	618.01	53.5565
277.60	101.4084	391.69	97.5299	620.36	43.4520
278.00	102.3613	264.66	96.1466	621.93	39.7855
279.20	113.4592	401.81	92.1761	630.19	0.0000
279.54	114.4123	402.40	97.2817	631.29	31.6077
279.70	116.2603	404.85	102.5288	633.25	31.6384
280.46	109.0168	410.95	100.9381	634.78	36.3188
283.69	99.2444	413.71	109.3086	635.95	35.4088
284.31	96.5437	414.70	117.5620	636.99	27.9690
285.41	112.2919	423.72	99.7885	645.85	28.0920
285.90	0.0000	427.09	103.1143	657.76	25.1165
287.50	98.6798	427.87	94.9157	657.90	0.0000
290.67	108.0368	433.94	119.1395	661.66	20.7604
293.27	0.0000	439.40	119.5799	664.57	0.0000
351.93	109.6077	453.88	111.5873	666.33	25.2207
295.96	124.9254	463.37	63.3829	666.50	25.2227
879.38	104.3540	468.07	88.1575	667.71	0.0000
299.98	82.0972	473.00	0.0000	677.62	25.6744
300.09	82.1052	475.06	88.5498	685.70	0.0000
300.13	88.0794	476.78	112.5126	695.00	30.6781
301.36	109.2894	477.60	98.9257	696.49	22.0651
302.85	121.5953	482.18	84.4570	696.51	22.0651
256.23	104.9146	487.02	86.8572	697.00	24.9488
304.85	95.5783	492.35	0.0000	697.30	23.9929
306.78	95.7433	497.08	83.0802	697.49	23.9948
308.46	119.3881	505.52	79.8194	702.65	24.0521
311.90	94.2932	507.63	0.0000	706.68	26.0244
316.51	102.2487	511.00	59.8436	711.68	24.1516
319.41	97.7601	514.00	64.5278	720.70	27.4839
320.08	95.9173	514.00	64.5278	721.93	0.0000
321.04	118.8087	520.40	63.4605	722.78	16.1825
323.87	112.4273	520.69	0.0000	722.91	12.9466
325.23	107.7893	522.65	0.0000	723.31	12.9489
328.76	98.5459	527.90	0.0000	724.19	14.5734
333.37	106.0353	528.26	52.7607	727.33	18.4856
333.97	90.7139	529.59	48.4016	733.00	21.1335
334.37	90.7442	529.87	0.0000	735.93	18.5565
338.28	109.5560	531.02	49.5428	333.97	25.4103
338.32	109.5594	537.26	53.0347	739.50	0.0000
311.90	134.4889	546.56	0.0000	747.24	26.5010
340.48	134.4889	552.55	51.2671	748.06	18.6558
340.55	126.7677	563.25	38.1193	752.31	21.6417
344.28	103.7020	569.33	42.7465	753.82	20.6714
345.93	126.8086	946.00	44.1012	756.73	23.4079
351.06	88.6797	569.70	44.1060	756.80	23.4085
351.93	88.7422	583.19	39.8954	884.68	25.7055

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.4382	1274.44	18.3738	1620.50	7.4953
766.42	21.4440	1001.03	21.6519	1621.92	7.4977
766.84	23.0975	1002.74	16.2484	1678.03	0.0000
772.60	0.0000	1004.73	13.0075	1690.97	2.7969
776.52	18.6374	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.6301
778.90	18.2416	1028.54	0.0000	1063.66	2.9503
783.70	0.0000	1037.84	8.7691	1771.35	3.6216
785.37	16.9610	1038.76	0.0000	1791.20	0.0000
792.07	13.3402	631.29	10.9932	1808.65	1.9118
794.95	18.0308	1048.07	16.4978	1810.72	0.0000
795.86	18.0374	1049.04	14.1454	1836.06	4.8064
810.06	22.1751	1050.41	5.5034		
810.29	22.1772	1063.66	8.2910		
344.28	22.1789	1077.00	16.6538		
810.76	22.1815	1077.34	15.7307		
815.77	21.2169	1085.87	15.7736		
1048.07	15.1718	1093.63	13.0219		
832.01	22.3733	1099.45	16.7739		
834.85	13.2355	1112.07	14.9694		
835.71	19.3507	1112.84	0.0000		
836.80	0.0000	1115.54	0.0000		
846.75	0.0000	1120.29	19.2958		
846.77	18.4131	1120.55	19.2974		
856.80	27.3861	1221.41	20.9101		
860.56	10.2849	1129.67	12.2293		
871.09	19.6211	1131.51	0.0000		
873.19	16.5363	1147.95	0.0000		
875.33	0.0000	1173.23	18.1125		
879.38	25.8997	1177.95	9.8191		
880.51	22.8014	1189.05	19.1561		
883.24	19.7125	1204.77	10.5846		
884.68	21.7993	1221.41	13.5369		
889.28	18.7181	1231.02	18.4225		
894.76	13.5465	1235.36	12.6207		
898.04	15.6500	1238.28	16.3235		
900.72	24.0208	1260.41	0.0000		
903.28	22.6500	1271.87	10.7901		
911.20	6.9897	1274.44	15.7057		
912.08	10.4880	1274.54	15.7064		
923.98	0.0000	1291.59	11.8354		
926.50	10.5439	1298.22	0.0000		
929.11	25.3295	1312.11	10.9105		
937.49	24.3482	1332.49	6.9815		
944.13	16.9785	1362.66	0.0000		
946.00	12.7424	1365.19	7.0424		
949.00	11.6931	1368.63	0.0000		
667.71	0.0000	1384.29	8.0889		
962.31	22.8871	1408.01	6.1038		
964.08	23.1563	1457.56	0.0000		
966.17	26.7383	1460.82	7.0692		
911.20	27.8351	1489.16	11.4198		
968.97	27.8351	1505.03	7.2954		
983.53	21.5210	1584.12	12.7422		
984.45	0.0000	1596.21	11.7130		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 14:08:45.30

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677005.CNF:1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM19.CNF:546
Background date    : 26-JUN-2016 12:04:57
Sample date       : 11-MAY-2016 10:19:00 Acquisition date : 28-JUN-2016 13:07:49
Sample ID        : G398677005 Sample quantity : 1.33830E+02 GRAM
Detector name     : GAM19 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.80 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	57.60	22	73	1.11	115.97	114	11	5.98E-03	63.0	9.12E-01
2	3	59.99	38	131	1.54	120.77	114	11	1.05E-02	57.7	
3	0	63.33*	43	178	1.58	127.44	124	10	1.20E-02	60.9	
4	1	74.71	125	173	1.30	150.22	145	17	3.46E-02	21.0	1.97E+00
5	1	77.10	213	153	1.18	155.00	145	17	5.92E-02	12.2	
6	5	87.20	69	245	1.26	175.20	170	22	1.91E-02	38.4	3.54E+00
7	5	90.02	50	152	1.06	180.85	170	22	1.39E-02	41.0	
8	5	92.75*	76	228	1.77	186.32	170	22	2.12E-02	44.3	
9	0	119.89	35	103	1.17	240.61	238	7	9.84E-03	50.1	
10	0	129.32	21	137	0.58	259.49	256	7	5.69E-03	97.1	
11	0	185.73*	48	161	1.14	372.35	368	9	1.33E-02	51.7	
12	0	202.24	24	133	1.07	405.39	401	8	6.78E-03	84.9	
13	0	208.57	29	170	1.21	418.04	413	9	8.15E-03	82.3	
14	3	238.53*	386	96	1.15	478.00	472	17	1.07E-01	6.7	7.70E-01
15	3	241.56	93	130	1.86	484.06	472	17	2.58E-02	32.6	
16	0	256.09	26	89	1.10	513.12	510	8	7.23E-03	65.5	
17	0	294.95*	131	82	1.09	590.88	585	11	3.65E-02	16.2	
18	0	327.46	39	111	1.83	655.94	652	10	1.09E-02	52.3	
19	0	338.25	83	98	1.62	677.52	673	10	2.29E-02	24.9	
20	0	351.57*	178	162	1.53	704.18	696	14	4.93E-02	17.2	
21	0	425.07	22	64	1.30	851.23	848	8	6.11E-03	66.5	
22	0	463.97	12	62	0.64	929.06	924	7	3.30E-03	116.0	
23	0	511.10*	18	122	2.38	1023.36	1015	14	4.87E-03	148.6	
24	0	569.36*	45	45	1.56	1139.94	1133	16	1.24E-02	45.0	
25	0	582.93*	104	42	1.31	1167.09	1161	12	2.89E-02	16.1	
26	0	596.20	18	62	4.92	1193.64	1176	21	4.89E-03	115.1	
27	0	608.64*	108	60	1.35	1218.52	1212	15	3.01E-02	18.6	
28	0	648.90	6	22	1.36	1299.07	1294	7	1.57E-03	145.5	
29	0	661.32	1659	44	1.32	1323.94	1316	16	4.61E-01	2.6	
30	0	729.08	23	36	2.93	1459.51	1448	13	6.42E-03	57.3	
31	0	768.25	17	13	1.40	1537.89	1532	9	4.71E-03	45.8	
32	0	781.91	10	20	5.16	1565.22	1556	13	2.85E-03	94.1	
33	0	860.42	27	17	1.00	1722.30	1713	18	7.47E-03	41.5	
34	0	912.00*	29	49	0.93	1825.51	1816	13	8.16E-03	53.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	927.74	8	10	1.45	1857.00	1850	10	2.22E-03	82.0	
36	0	963.61	23	14	3.21	1928.78	1920	14	6.39E-03	40.3	
37	0	968.39*	50	10	1.43	1938.35	1934	10	1.38E-02	18.9	
38	0	978.98	7	6	3.36	1959.54	1951	11	2.03E-03	72.6	
39	0	1000.16*	7	3	1.78	2001.90	1999	6	2.05E-03	59.6	
40	0	1005.46	15	3	1.28	2012.51	2008	10	4.26E-03	32.1	
41	0	1063.09*	26	9	1.70	2127.81	2118	17	7.13E-03	55.4	
42	0	1072.41	3	8	0.61	2146.46	2142	6	8.96E-04	146.2	
43	0	1111.65	16	6	3.53	2224.99	2218	14	4.49E-03	42.1	
44	0	1120.10	46	5	4.70	2241.89	2233	20	1.27E-02	19.1	
45	0	1151.91	7	7	0.59	2305.54	2300	9	1.93E-03	77.6	
46	0	1173.45*	21	7	1.35	2348.65	2342	14	5.76E-03	36.4	
47	0	1180.88	10	3	1.42	2363.50	2360	8	2.78E-03	45.8	
48	0	1228.90	7	5	0.55	2459.59	2452	12	1.90E-03	80.2	
49	0	1460.12*	176	0	2.11	2922.23	2916	13	4.88E-02	7.7	
50	0	1507.48	16	0	3.50	3017.00	3012	11	4.44E-03	25.0	
51	0	1763.88*	24	6	0.95	3530.04	3525	11	6.53E-03	29.2	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 14:08:47

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677005.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:19:00 Acquisition date : 28-JUN-2016 13:07:49
Sample ID        : G398677005 Sample quantity  : 133.83 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.80 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	74.82	BI-207	74.97
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.161E+00	7.602E+00	7.602E+00	15.38	OK
AS-74	595.83	59.00*	2.350E+00	7.288E-02	4.765E-01	230.14	OK
	634.78	15.40	2.236E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	5.485E+00	1.272E+00	1.368E+00	135.85	OK
SN-126	64.28	9.60	3.310E+00	9.080E-01	9.080E-01	121.86	OK
	86.94	8.90	5.485E+00	5.289E-01	5.289E-01	135.85	OK
	87.57	37.00*	5.485E+00	1.272E-01	1.272E-01	135.85	OK
BA-137M	661.66	89.90*	2.164E+00	4.854E+00	4.869E+00	5.23	OK
CS-137	661.66	85.10*	2.164E+00	5.128E+00	5.144E+00	5.23	OK
PM-147	121.22	0.00*	6.505E+00	1.227E+03	1.271E+03	100.29	OK
BI-207	72.81	21.40	4.355E+00	----- Line	Not Found	-----	Absent
	74.97	35.70	4.534E+00	3.431E-01	3.441E-01	64.32	OK
	569.70	97.76	2.438E+00	1.076E-01	1.079E-01	90.06	OK
	1063.66	74.60*	1.497E+00	1.262E-01	1.265E-01	110.78	OK
	1770.23	6.87	9.833E-01	----- Line	Not Found	-----	Absent
TL-208	277.37	6.60	4.415E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.393E+00	2.935E-01	2.935E-01	32.17	OK
	860.56	12.50	1.763E+00	6.814E-01	6.814E-01	83.10	OK
PB-212	74.82	10.28	4.534E+00	1.192E+00	1.192E+00	64.32	OK
	77.11	17.10	4.746E+00	1.736E+00	1.736E+00	24.38	OK
	238.63	43.60*	4.961E+00	1.093E+00	1.093E+00	13.47	OK
	300.09	3.30	4.142E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14	OK
	1120.29	14.92	1.437E+00	1.162E+00	1.162E+00	38.25	OK
	1764.49	15.30	9.864E-01	8.217E-01	8.218E-01	58.48	OK
PB-214	74.82	5.80	4.544E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.746E+00	3.061E+00	3.061E+00	24.38	OK
	87.09	3.41	5.478E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.908E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.201E+00	1.025E+00	1.025E+00	32.41	OK
	351.93	35.60*	3.632E+00	8.188E-01	8.188E-01	34.32	OK
RN-222	609.32	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14	OK
	1120.29	14.92	1.437E+00	1.162E+00	1.162E+00	38.25	OK
	1764.49	15.30	9.864E-01	8.217E-01	8.218E-01	58.48	OK
RA-224	240.99	4.10*	4.915E+00	1.005E+00	1.005E+00	192.16	OK
RA-226	609.32	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14	OK
	1120.29	14.92	1.437E+00	1.162E+00	1.162E+00	38.25	OK
	1764.49	15.30	9.864E-01	8.217E-01	8.218E-01	58.48	OK
AC-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.751E+00	1.168E+00	1.168E+00	49.89	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.686E+00	3.751E-01	3.751E-01	106.15	OK
	968.97	15.80	1.609E+00	1.083E+00	1.083E+00	37.77	OK
RA-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.751E+00	1.168E+00	1.168E+00	49.89	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.686E+00	3.751E-01	3.751E-01	106.15	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	1.609E+00	1.083E+00	1.083E+00	37.77	OK
	74.82	10.28	4.534E+00	1.192E+00	1.192E+00	64.32	OK
	77.11	17.10	4.746E+00	1.736E+00	1.736E+00	24.38	OK
	238.63	43.60*	4.961E+00	1.093E+00	1.093E+00	13.47	OK
TH-230	300.09	3.30	4.142E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14	OK
	1120.29	14.92	1.437E+00	1.162E+00	1.162E+00	38.25	OK
	1764.49	15.30	9.864E-01	8.217E-01	8.217E-01	58.48	OK
TH-232	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.751E+00	1.168E+00	1.168E+00	49.89	OK
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.686E+00	3.751E-01	3.751E-01	106.15	OK
TH-234	968.97	15.80	1.609E+00	1.083E+00	1.083E+00	37.77	OK
	63.29	3.70*	3.310E+00	2.356E+00	2.356E+00	121.86	OK
	92.59	4.23	5.791E+00	2.039E+00	2.039E+00	88.59	OK
	609.32	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14	OK
U-234	1120.29	14.92	1.437E+00	1.162E+00	1.162E+00	38.25	OK
	1764.49	15.30	9.864E-01	8.217E-01	8.217E-01	58.48	OK
	89.96	3.47	5.648E+00	1.665E+00	1.665E+00	81.90	OK
	93.35	5.60	5.791E+00	1.540E+00	1.540E+00	88.59	OK
U-235	143.76	10.96*	6.462E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.216E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.846E+00	8.915E-02	8.915E-02	103.39	OK
	205.31	5.01	5.506E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.310E+00	2.356E+00	2.356E+00	121.86	OK
	92.59	4.23	5.791E+00	2.039E+00	2.039E+00	88.59	OK
	59.54	35.90*	2.880E+00	2.453E-01	2.454E-01	115.35	OK
	43.53	5.90	5.190E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	4.534E+00	1.823E-01	1.823E-01	64.32	OK
	511.00	100.00*	2.661E+00	3.823E-02	3.823E-02	297.19	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677005.CNF;1
Acquisition date : 28-JUN-2016 13:07:49 Sensitivity : 3.000
Detector ID : GAM19 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.80 Half life ratio : *****
Sample date : 11-MAY-2016 10:19:00 Analyst initials: MXR1
Sample ID : G398677005 Sample Quantity : 1.3383E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 10:35:16 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	7.602E+00	1.146E+00	6.630E-01
AS-74	4.765E-01	1.075E+00	9.091E-01
CD-109	1.368E+00	1.821E+00	1.978E+00
SN-126	1.272E-01	1.694E-01	1.849E-01
BA-137M	4.869E+00	2.493E-01	8.230E-02
CS-137	5.144E+00	2.634E-01	8.694E-02
PM-147	1.271E+03	1.249E+03	1.860E+03
BI-207	1.265E-01	1.374E-01	1.063E-01
TL-208	2.935E-01	9.254E-02	8.397E-02
PB-212	1.093E+00	1.443E-01	1.409E-01
BI-214	5.901E-01	2.148E-01	1.947E-01
PB-214	8.188E-01	2.754E-01	2.411E-01
RN-222	5.901E-01	2.148E-01	1.947E-01
RA-224	1.005E+00	1.892E+00	1.511E+00
RA-226	5.901E-01	2.148E-01	1.947E-01
AC-228	3.751E-01	3.902E-01	3.146E-01
RA-228	3.751E-01	3.902E-01	3.146E-01
TH-228	1.093E+00	1.443E-01	1.409E-01
TH-230	5.901E-01	2.148E-01	1.947E-01
TH-232	3.751E-01	3.902E-01	3.146E-01
TH-234	2.356E+00	2.813E+00	2.782E+00
U-234	5.901E-01	2.148E-01	1.947E-01
U-235	-1.737E-01	2.651E-01	4.675E-01
U-238	2.356E+00	2.813E+00	2.782E+00
AM-241	2.454E-01	2.774E-01	3.395E-01
AM-243	1.823E-01	1.149E-01	1.220E-01
ANH-511	3.823E-02	1.113E-01	9.557E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.820E-01	9.225E-01	1.713E+00	NOT IDENT.
NA-22	-5.531E-03	5.210E-02	9.736E-02	NOT IDENT.
NA-24	0.000E+00	6.152E+21	0.000E+00	SHORT HLIF

AL-26	2.973E-02	4.128E-02	9.730E-02	NOT IDENT.
SC-46	-3.169E-02	5.859E-02	1.054E-01	FAIL ABUN
V-48	-1.055E-01	3.762E-01	5.903E-01	NOT IDENT.
CR-51	-8.908E-02	1.335E+00	2.360E+00	NOT IDENT.
MN-54	-2.924E-02	5.012E-02	8.958E-02	NOT IDENT.
CO-56	9.788E-03	6.896E-02	1.344E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.361E-02	4.045E-02	7.187E-02	NOT IDENT.
CO-58	1.466E-02	6.488E-02	1.291E-01	NOT IDENT.
FE-59	-1.303E-01	1.677E-01	2.831E-01	NOT IDENT.
CO-60	9.841E-04	4.782E-02	9.204E-02	FAIL ABUN
ZN-65	1.592E-01	7.342E-02	1.994E-01	NOT IDENT.
GE-68	5.084E-01	1.336E+00	2.593E+00	NOT IDENT.
AS-73	-5.892E-01	1.596E+00	2.665E+00	NOT IDENT.
SE-75	5.218E-02	8.449E-02	1.571E-01	FAIL ABUN
BR-77	0.000E+00	3.407E+05	0.000E+00	SHORT HLIF
SR-82	4.051E-01	1.173E+00	1.997E+00	NOT IDENT.
RB-83	1.680E-02	1.490E-01	2.772E-01	NOT IDENT.
KR-85	1.849E+01	1.351E+01	2.440E+01	NOT IDENT.
SR-85	1.382E-01	1.012E-01	1.829E-01	NOT IDENT.
RB-86	8.245E-01	2.602E+00	4.998E+00	NOT IDENT.
Y-88	7.786E-03	5.735E-02	1.214E-01	NOT IDENT.
Y-91	8.037E+00	3.085E+01	6.181E+01	NOT IDENT.
NB-94	2.248E-02	4.335E-02	8.476E-02	NOT IDENT.
NB-95	3.095E-02	8.515E-02	1.440E-01	NOT IDENT.
NB-95M	-6.438E-02	3.156E-01	4.860E-01	NOT IDENT.
ZR-95	-2.483E-02	1.183E-01	2.170E-01	NOT IDENT.
NB-97	0.000E+00	2.110E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.730E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.532E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.096E-02	5.098E-02	8.193E-02	NOT IDENT.
RH-102	3.381E-03	7.556E-02	1.409E-01	FAIL ABUN
RU-103	1.387E-03	1.146E-01	2.119E-01	NOT IDENT.
RH-106	-1.898E-01	4.703E-01	8.321E-01	NOT IDENT.
RU-106	-1.898E-01	4.703E-01	8.321E-01	NOT IDENT.
AG-108M	-4.358E-03	5.591E-02	1.022E-01	NOT IDENT.
AG-110M	1.423E-02	6.452E-02	1.284E-01	NOT IDENT.
SN-113	-6.637E-02	9.474E-02	1.675E-01	NOT IDENT.
CD-115	0.000E+00	5.182E+05	0.000E+00	SHORT HLIF
SN-117M	3.127E-01	3.966E-01	7.601E-01	NOT IDENT.
TE-123M	-3.973E-03	4.764E-02	8.709E-02	NOT IDENT.
SB-124	2.982E-03	1.344E-01	2.824E-01	NOT IDENT.
SB-125	-9.747E-02	1.982E-01	3.021E-01	FAIL ABUN
TE-125M	1.670E+00	1.972E+01	3.709E+01	NOT IDENT.
I-126	2.632E-01	1.783E+00	2.949E+00	NOT IDENT.
SB-126	4.373E-01	1.269E+00	2.165E+00	NOT IDENT.
SB-127	0.000E+00	6.814E+02	0.000E+00	SHORT HLIF
I-131	1.432E+00	3.274E+00	6.270E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.429E+03	0.000E+00	SHORT HLIF
BA-133	6.753E-02	7.999E-02	1.390E-01	NOT IDENT.
I-133	0.000E+00	2.681E+15	0.000E+00	SHORT HLIF
CS-134	6.519E-02	5.408E-02	1.165E-01	FAIL ABUN
CS-135	1.079E-01	2.487E-01	4.555E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-4.240E-01	6.505E-01	1.131E+00	NOT IDENT.
CE-139	1.244E-02	4.870E-02	9.047E-02	NOT IDENT.
BA-140	-8.015E-01	2.537E+00	4.547E+00	FAIL ABUN
LA-140	-3.178E-01	4.809E-01	8.457E-01	FAIL ABUN
CE-141	6.119E-03	1.669E-01	3.088E-01	NOT IDENT.
CE-143	0.000E+00	3.958E+09	0.000E+00	SHORT HLIF
CE-144	2.287E-01	3.270E-01	5.607E-01	NOT IDENT.
PM-144	-1.887E-02	4.915E-02	8.648E-02	NOT IDENT.
PR-144	-1.437E+00	3.742E+00	6.585E+00	NOT IDENT.
PM-146	-2.072E-02	8.175E-02	1.474E-01	NOT IDENT.
ND-147	-5.105E+00	6.980E+00	1.204E+01	FAIL ABUN
PM-149	0.000E+00	4.297E+06	0.000E+00	SHORT HLIF
EU-150	9.645E-03	5.827E-02	7.704E-02	FAIL ABUN
EU-152	3.239E-02	2.381E-01	3.105E-01	FAIL ABUN
GD-153	3.630E-02	1.341E-01	2.276E-01	NOT IDENT.
EU-154	1.250E-02	1.409E-01	2.723E-01	FAIL ABUN
EU-155	1.383E-01	1.428E-01	2.814E-01	FAIL ABUN
TB-160	-1.681E-02	2.149E-01	4.121E-01	FAIL ABUN
HO-166M	3.296E-02	7.110E-02	1.407E-01	FAIL ABUN
TM-171	-3.975E+00	2.485E+01	4.438E+01	NOT IDENT.
HF-172	-1.946E-01	3.052E-01	4.752E-01	FAIL ABUN
LU-172	3.189E-02	7.201E-02	1.479E-01	FAIL ABUN

LU-176	1.466E-02	4.183E-02	7.630E-02	FAIL ABUN
HF-181	-1.020E-01	1.300E-01	2.249E-01	FAIL ABUN
TA-182	1.245E-01	2.058E-01	4.070E-01	FAIL ABUN
RE-183	2.667E-01	3.291E-01	6.058E-01	FAIL ABUN
RE-184	3.600E-03	3.620E-01	5.970E-01	NOT IDENT.
W-188	-2.966E+00	1.756E+01	2.689E+01	FAIL ABUN
IR-192	1.764E-02	7.519E-02	1.359E-01	FAIL ABUN
HG-203	8.593E-02	1.024E-01	1.926E-01	NOT IDENT.
PB-210	-4.688E-01	5.094E+00	9.164E+00	NOT IDENT.
BI-211	0.000E+00	7.587E-01	9.992E-01	FAIL ABUN
PB-211	2.906E-01	1.305E+00	2.437E+00	NOT IDENT.
BI-212	9.880E-01	8.176E-01	1.521E+00	NOT IDENT.
RN-219	3.176E-01	7.392E-01	1.398E+00	NOT IDENT.
RA-223	6.047E-01	1.084E+00	1.863E+00	FAIL ABUN
AC-227	3.553E-01	4.565E-01	6.980E-01	FAIL ABUN
TH-227	3.553E-01	4.565E-01	6.980E-01	FAIL ABUN
TH-229	2.308E-01	7.990E-01	1.469E+00	FAIL ABUN
PA-231	3.366E-01	7.242E-01	1.293E+00	NOT IDENT.
TH-231	6.047E-01	1.084E+00	1.863E+00	FAIL ABUN
PA-233	-6.149E-02	1.077E-01	1.834E-01	NOT IDENT.
PA-234	9.245E-03	3.540E-01	6.856E-01	FAIL ABUN
PA-234M	3.084E+00	3.601E+00	9.269E+00	FAIL ABUN
NP-237	-6.149E-02	1.077E-01	1.834E-01	NOT IDENT.
NP-238	0.000E+00	1.124E+06	0.000E+00	SHORT HLIF
NP-239	-3.671E-01	4.169E-01	6.395E-01	NOT IDENT.
PU-239	3.175E+02	6.039E+02	8.981E+02	FAIL ABUN
CM-243	2.452E-02	1.431E-01	2.713E-01	NOT IDENT.
BK-247	2.711E-02	1.277E-01	2.314E-01	FAIL ABUN
CM-247	5.113E-02	6.696E-02	1.292E-01	NOT IDENT.
CF-249	1.305E-02	6.862E-02	1.287E-01	NOT IDENT.
CF-251	6.487E-02	1.754E-01	3.274E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	168	10.66*	1.161E+00	7.602E+00	7.602E+00	15.38
AS-74	595.83	18	59.00*	2.350E+00	7.288E-02	4.765E-01	230.14
	634.78	-----	15.40	2.236E+00	-----	Line Not Found	-----
CD-109	88.03	80	3.70*	5.485E+00	2.217E+00	2.383E+00	76.73
SN-126	64.28	51	9.60	3.310E+00	9.080E-01	9.080E-01	121.86
	86.94	80	8.90	5.485E+00	9.217E-01	9.217E-01	76.73
	87.57	80	37.00*	5.485E+00	2.217E-01	2.217E-01	76.73
BA-137M	661.66	1684	89.90*	2.164E+00	4.854E+00	4.869E+00	5.23
CS-137	661.66	1684	85.10*	2.164E+00	5.128E+00	5.144E+00	5.23
PM-147	121.22	41	0.00*	6.505E+00	1.227E+03	1.271E+03	100.29
BI-207	72.81	-----	21.40	4.355E+00	-----	Line Not Found	-----
	74.97	147	35.70	4.534E+00	5.097E-01	5.111E-01	41.99
	569.70	46	97.76	2.438E+00	1.076E-01	1.079E-01	90.06
	1063.66	25	74.60*	1.497E+00	1.262E-01	1.265E-01	110.78
	1770.23	-----	6.87	9.833E-01	-----	Line Not Found	-----
TL-208	277.37	-----	6.60	4.415E+00	-----	Line Not Found	-----
	583.19	106	85.00*	2.393E+00	2.935E-01	2.935E-01	32.17
	860.56	27	12.50	1.763E+00	6.814E-01	6.814E-01	83.10
BI-211	72.87	-----	1.23	4.361E+00	-----	Line Not Found	-----
	351.06	189	12.92*	3.632E+00	2.256E+00	2.256E+00	34.32
PB-212	74.82	147	10.28	4.534E+00	1.770E+00	1.770E+00	41.99
	77.11	251	17.10	4.746E+00	1.736E+00	1.736E+00	24.38
	238.63	421	43.60*	4.961E+00	1.093E+00	1.093E+00	13.47
	300.09	-----	3.30	4.142E+00	-----	Line Not Found	-----
BI-214	609.32	111	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14
	1120.29	44	14.92	1.437E+00	1.162E+00	1.162E+00	38.25
	1764.49	22	15.30	9.864E-01	8.217E-01	8.218E-01	58.48
PB-214	74.82	147	5.80	4.534E+00	3.137E+00	3.137E+00	41.99
	77.11	251	9.70	4.746E+00	3.061E+00	3.061E+00	24.38
	87.09	80	3.41	5.485E+00	2.406E+00	2.406E+00	76.73
	242.00	101	7.25	4.915E+00	1.593E+00	1.593E+00	65.29
	295.22	141	18.42	4.201E+00	1.025E+00	1.025E+00	32.41
	351.93	189	35.60*	3.632E+00	8.188E-01	8.188E-01	34.32
RN-222	609.32	111	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14
	1120.29	44	14.92	1.437E+00	1.162E+00	1.162E+00	38.25
	1764.49	22	15.30	9.864E-01	8.217E-01	8.218E-01	58.48
RA-224	240.99	101	4.10*	4.915E+00	2.818E+00	2.818E+00	65.29
RA-226	609.32	111	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14
	1120.29	44	14.92	1.437E+00	1.162E+00	1.162E+00	38.25
	1764.49	22	15.30	9.864E-01	8.217E-01	8.218E-01	58.48
AC-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.751E+00	1.168E+00	1.168E+00	49.89
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	29	25.80*	1.686E+00	3.751E-01	3.751E-01	106.15
	968.97	49	15.80	1.609E+00	1.083E+00	1.083E+00	37.77
RA-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	88	11.27	3.751E+00	1.168E+00	1.168E+00	49.89
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	29	25.80*	1.686E+00	3.751E-01	3.751E-01	106.15
	968.97	49	15.80	1.609E+00	1.083E+00	1.083E+00	37.77
TH-228	74.82	147	10.28	4.534E+00	1.770E+00	1.770E+00	41.99
	77.11	251	17.10	4.746E+00	1.736E+00	1.736E+00	24.38
	238.63	421	43.60*	4.961E+00	1.093E+00	1.093E+00	13.47
	300.09	-----	3.30	4.142E+00	-----	Line Not Found	-----
TH-230	609.32	111	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14
	1120.29	44	14.92	1.437E+00	1.162E+00	1.162E+00	38.25
	1764.49	22	15.30	9.864E-01	8.217E-01	8.217E-01	58.48
TH-232	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	88	11.27	3.751E+00	1.168E+00	1.168E+00	49.89
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	29	25.80*	1.686E+00	3.751E-01	3.751E-01	106.15
	968.97	49	15.80	1.609E+00	1.083E+00	1.083E+00	37.77
TH-234	63.29	51	3.70*	3.310E+00	2.356E+00	2.356E+00	121.86
	92.59	89	4.23	5.791E+00	2.039E+00	2.039E+00	88.59
U-234	609.32	111	45.49*	2.312E+00	5.901E-01	5.901E-01	37.14
	1120.29	44	14.92	1.437E+00	1.162E+00	1.162E+00	38.25
	1764.49	22	15.30	9.864E-01	8.217E-01	8.217E-01	58.48
U-235	89.96	58	3.47	5.648E+00	1.665E+00	1.665E+00	81.90
	93.35	89	5.60	5.791E+00	1.540E+00	1.540E+00	88.59
	143.76	-----	10.96*	6.462E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.216E+00	-----	Line Not Found	-----
	185.72	53	57.20	5.846E+00	8.915E-02	8.915E-02	103.39
	205.31	-----	5.01	5.506E+00	-----	Line Not Found	-----
U-238	63.29	51	3.70*	3.310E+00	2.356E+00	2.356E+00	121.86
	92.59	89	4.23	5.791E+00	2.039E+00	2.039E+00	88.59
AM-241	59.54	45	35.90*	2.880E+00	2.453E-01	2.454E-01	115.35
AM-243	43.53	-----	5.90	5.190E-01	-----	Line Not Found	-----
	74.66	147	67.20*	4.534E+00	2.708E-01	2.708E-01	41.99
ANH-511	511.00	18	100.00*	2.661E+00	3.823E-02	3.823E-02	297.19

Flag: "*" = Keyline

Total number of lines in spectrum 51
Number of unidentified lines 10
Number of lines tentatively identified by NID 41 80.39%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	7.602E+00	7.602E+00	1.169E+00	15.38	
AS-74	17.77D	6.54	7.288E-02	4.765E-01	10.97E-01	230.14	
CD-109	461.40D	1.07	2.217E+00	2.383E+00	1.829E+00	76.73	
SN-126	2.30E+05Y	1.00	2.217E-01	2.217E-01	1.701E-01	76.73	
BA-137M	30.08Y	1.00	4.854E+00	4.869E+00	0.254E+00	5.23	
CS-137	30.08Y	1.00	5.128E+00	5.144E+00	0.269E+00	5.23	
PM-147	2.62Y	1.04	1.227E+03	1.271E+03	1.274E+03	100.29	
BI-207	32.90Y	1.00	1.262E-01	1.265E-01	1.402E-01	110.78	
TL-208	1.41E+10Y	1.00	2.935E-01	2.935E-01	0.944E-01	32.17	
BI-211	7.04E+08Y	1.00	2.256E+00	2.256E+00	0.774E+00	34.32	
PB-212	1.41E+10Y	1.00	1.093E+00	1.093E+00	0.147E+00	13.47	
BI-214	1600.00Y	1.00	5.901E-01	5.901E-01	2.192E-01	37.14	
PB-214	1600.00Y	1.00	8.188E-01	8.188E-01	2.810E-01	34.32	
RN-222	1600.00Y	1.00	5.901E-01	5.901E-01	2.192E-01	37.14	
RA-224	1.41E+10Y	1.00	2.818E+00	2.818E+00	1.839E+00	65.29	
RA-226	1600.00Y	1.00	5.901E-01	5.901E-01	2.192E-01	37.14	
AC-228	1.41E+10Y	1.00	3.751E-01	3.751E-01	3.981E-01	106.15	
RA-228	1.41E+10Y	1.00	3.751E-01	3.751E-01	3.981E-01	106.15	
TH-228	1.41E+10Y	1.00	1.093E+00	1.093E+00	0.147E+00	13.47	
TH-230	7.54E+04Y	1.00	5.901E-01	5.901E-01	2.192E-01	37.14	
TH-232	1.41E+10Y	1.00	3.751E-01	3.751E-01	3.981E-01	106.15	
TH-234	4.47E+09Y	1.00	2.356E+00	2.356E+00	2.871E+00	121.86	
U-234	2.45E+05Y	1.00	5.901E-01	5.901E-01	2.192E-01	37.14	
U-235	7.04E+08Y	1.00	8.915E-02	8.915E-02	9.218E-02	103.39	K
U-238	4.47E+09Y	1.00	2.356E+00	2.356E+00	2.871E+00	121.86	
AM-241	432.60Y	1.00	2.453E-01	2.454E-01	2.831E-01	115.35	
AM-243	7370.00Y	1.00	2.708E-01	2.708E-01	1.137E-01	41.99	
ANH-511	1.00E+09Y	1.00	3.823E-02	3.823E-02	11.36E-02	297.19	
Total Activity :			1.265E+03	1.309E+03			

Grand Total Activity : 1.265E+03 1.309E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	57.60	26	87	1.11	115.97	114	11	5.98E-03	****	2.55E+00	T
0	129.32	23	155	0.58	259.49	256	7	5.69E-03	****	6.54E+00	T
0	202.24	27	147	1.07	405.39	401	8	6.78E-03	****	5.56E+00	T
0	208.57	32	187	1.21	418.04	413	9	8.15E-03	****	5.45E+00	
0	256.09	28	97	1.10	513.12	510	8	7.23E-03	****	4.70E+00	T
0	327.46	42	118	1.83	655.94	652	10	1.09E-02	****	3.85E+00	T
0	425.07	23	67	1.30	851.23	848	8	6.11E-03	****	3.10E+00	T
0	463.97	12	65	0.64	929.06	924	7	3.30E-03	****	2.88E+00	T
0	648.90	6	23	1.36	1299.07	1294	7	1.57E-03	****	2.20E+00	
0	729.08	23	36	2.93	1459.51	1448	13	6.42E-03	****	2.01E+00	
0	768.25	17	13	1.40	1537.89	1532	9	4.71E-03	91.6	1.93E+00	T
0	781.91	10	20	5.16	1565.22	1556	13	2.85E-03	****	1.90E+00	
0	927.74	8	10	1.45	1857.00	1850	10	2.22E-03	****	1.66E+00	T
0	963.61	23	14	3.21	1928.78	1920	14	6.39E-03	80.6	1.62E+00	T
0	978.98	7	6	3.36	1959.54	1951	11	2.03E-03	****	1.60E+00	
0	1000.16	7	2	1.78	2001.90	1999	6	2.05E-03	****	1.57E+00	T
0	1005.46	15	3	1.28	2012.51	2008	10	4.26E-03	64.2	1.56E+00	T
0	1072.41	3	8	0.61	2146.46	2142	6	8.96E-04	****	1.49E+00	
0	1111.65	16	6	3.53	2224.99	2218	14	4.49E-03	84.3	1.45E+00	T
0	1151.91	7	7	0.59	2305.54	2300	9	1.93E-03	****	1.41E+00	
0	1173.45	20	7	1.35	2348.65	2342	14	5.76E-03	72.8	1.39E+00	T
0	1180.88	10	3	1.42	2363.50	2360	8	2.78E-03	91.7	1.38E+00	
0	1228.90	7	5	0.55	2459.59	2452	12	1.90E-03	****	1.34E+00	
0	1507.48	15	0	3.50	3017.00	3012	11	4.44E-03	50.0	1.13E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677005.CNF;1  *
* Acquisition date   : 28-JUN-2016 13:07:49 Sensitivity      : 3.000          *
* Detector ID        : GAM19 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.80 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 10:19:00 Nuclide Library : SOLID          *
* Sample ID          : G398677005 Analyst initials: MXR1          *
* Batch Number       : 1572231 Sample Quantity : 1.3383E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 15-JUN-2016 10:35:16 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.701E-01
AS-74	4.183E-01
CD-109	9.474E-01
SN-126	8.855E-02
BA-137M	3.719E-02
CS-137	3.929E-02
PM-147	8.860E+02
BI-207	4.629E-02
TL-208	3.820E-02
PB-212	6.686E-02
BI-214	9.003E-02
PB-214	1.146E-01
RN-222	9.003E-02
RA-224	7.167E-01
RA-226	9.003E-02
AC-228	1.398E-01
RA-228	1.398E-01
TH-228	6.686E-02
TH-230	9.003E-02
TH-232	1.398E-01
TH-234	1.326E+00
U-234	9.003E-02
U-235	2.227E-01
U-238	1.326E+00
AM-241	1.619E-01
AM-243	5.838E-02
ANH-511	4.490E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.073E-01	NOT IDENT.
NA-22	4.261E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.079E-02	NOT IDENT.

SC-46	4.607E-02	FAIL ABUN
V-48	2.563E-01	NOT IDENT.
CR-51	1.114E+00	NOT IDENT.
MN-54	4.007E-02	NOT IDENT.
CO-56	6.058E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.434E-02	NOT IDENT.
CO-58	5.788E-02	NOT IDENT.
FE-59	1.220E-01	NOT IDENT.
CO-60	3.984E-02	FAIL ABUN
ZN-65	8.774E-02	NOT IDENT.
GE-68	1.116E+00	NOT IDENT.
AS-73	1.272E+00	NOT IDENT.
SE-75	7.474E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	8.993E-01	NOT IDENT.
RB-83	1.290E-01	NOT IDENT.
KR-85	1.153E+01	NOT IDENT.
SR-85	8.637E-02	NOT IDENT.
RB-86	2.142E+00	NOT IDENT.
Y-88	4.976E-02	NOT IDENT.
Y-91	2.709E+01	NOT IDENT.
NB-94	3.866E-02	NOT IDENT.
NB-95	6.528E-02	NOT IDENT.
NB-95M	2.325E-01	NOT IDENT.
ZR-95	9.629E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.915E-02	NOT IDENT.
RH-102	6.417E-02	FAIL ABUN
RU-103	9.867E-02	NOT IDENT.
RH-106	3.788E-01	NOT IDENT.
RU-106	3.788E-01	NOT IDENT.
AG-108M	4.833E-02	NOT IDENT.
AG-110M	5.723E-02	NOT IDENT.
SN-113	7.898E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.633E-01	NOT IDENT.
TE-123M	4.158E-02	NOT IDENT.
SB-124	1.141E-01	NOT IDENT.
SB-125	1.424E-01	FAIL ABUN
TE-125M	1.772E+01	NOT IDENT.
I-126	1.331E+00	NOT IDENT.
SB-126	9.776E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.963E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	6.600E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.326E-02	FAIL ABUN
CS-135	2.170E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.861E-01	NOT IDENT.
CE-139	4.322E-02	NOT IDENT.
BA-140	2.104E+00	FAIL ABUN
LA-140	3.217E-01	FAIL ABUN
CE-141	1.474E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.682E-01	NOT IDENT.
PM-144	3.917E-02	NOT IDENT.
PR-144	2.982E+00	NOT IDENT.
PM-146	6.957E-02	NOT IDENT.
ND-147	5.542E+00	FAIL ABUN
PM-149	0.000E+00	SHORT HLIF
EU-150	3.639E-02	FAIL ABUN
EU-152	1.474E-01	FAIL ABUN
GD-153	1.086E-01	NOT IDENT.
EU-154	1.192E-01	FAIL ABUN
EU-155	1.346E-01	FAIL ABUN
TB-160	1.828E-01	FAIL ABUN
HO-166M	6.341E-02	FAIL ABUN
TM-171	2.120E+01	NOT IDENT.
HF-172	2.264E-01	FAIL ABUN
LU-172	6.527E-02	FAIL ABUN
LU-176	3.611E-02	FAIL ABUN

HF-181	1.049E-01	FAIL ABUN
TA-182	1.754E-01	FAIL ABUN
RE-183	2.885E-01	FAIL ABUN
RE-184	2.682E-01	NOT IDENT.
W-188	1.271E+01	FAIL ABUN
IR-192	6.425E-02	FAIL ABUN
HG-203	9.187E-02	NOT IDENT.
PB-210	4.375E+00	NOT IDENT.
BI-211	4.832E-01	FAIL ABUN
PB-211	1.156E+00	NOT IDENT.
BI-212	7.031E-01	NOT IDENT.
RN-219	6.633E-01	NOT IDENT.
RA-223	8.817E-01	FAIL ABUN
AC-227	3.316E-01	FAIL ABUN
TH-227	3.316E-01	FAIL ABUN
TH-229	7.035E-01	FAIL ABUN
PA-231	6.113E-01	NOT IDENT.
TH-231	8.817E-01	FAIL ABUN
PA-233	8.667E-02	NOT IDENT.
PA-234	3.039E-01	FAIL ABUN
PA-234M	4.055E+00	FAIL ABUN
NP-237	8.667E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	3.045E-01	NOT IDENT.
PU-239	4.300E+02	FAIL ABUN
CM-243	1.296E-01	NOT IDENT.
BK-247	1.100E-01	FAIL ABUN
CM-247	6.132E-02	NOT IDENT.
CF-249	6.084E-02	NOT IDENT.
CF-251	1.562E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677005.CNF;1
Acquisition date : 28-JUN-2016 13:07:49 Sensitivity : 3.000
Detector ID : GAM19 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.80 Half life ratio : *****
Sample date : 11-MAY-2016 10:19:00 Nuclide Library : SOLID
Sample ID : G398677005 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.3383E+02 GRAM
Quantity Err(%) : 1.4944E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 10:35:16 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	7.602E+00	1.213E+00	1.213E+00
AS-74	4.765E-01	1.075E+00	1.075E+00
CD-109	1.368E+00	1.829E+00	1.829E+00
SN-126	1.272E-01	1.700E-01	1.700E-01
BA-137M	4.869E+00	3.265E-01	3.265E-01
CS-137	5.144E+00	3.446E-01	3.446E-01
PM-147	1.271E+03	1.250E+03	1.250E+03
BI-207	1.265E-01	1.375E-01	1.375E-01
TL-208	2.935E-01	9.339E-02	9.339E-02
PB-212	1.093E+00	1.555E-01	1.555E-01
BI-214	5.901E-01	2.163E-01	2.163E-01
PB-214	8.188E-01	2.775E-01	2.775E-01
RN-222	5.901E-01	2.163E-01	2.163E-01
RA-224	1.005E+00	1.897E+00	1.897E+00
RA-226	5.901E-01	2.163E-01	2.163E-01
AC-228	3.751E-01	3.907E-01	3.907E-01
RA-228	3.751E-01	3.907E-01	3.907E-01
TH-228	1.093E+00	1.555E-01	1.555E-01
TH-230	5.901E-01	2.163E-01	2.163E-01
TH-232	3.751E-01	3.907E-01	3.907E-01
TH-234	2.356E+00	2.862E+00	2.862E+00
U-234	5.901E-01	2.163E-01	2.163E-01
U-235	-1.737E-01	2.653E-01	2.653E-01
U-238	2.356E+00	2.862E+00	2.862E+00
AM-241	2.454E-01	2.780E-01	2.780E-01
AM-243	1.823E-01	1.160E-01	1.160E-01
ANH-511	3.823E-02	1.113E-01	1.113E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.820E-01	9.225E-01	9.261E-01	NOT IDENT.
NA-22	-5.531E-03	5.210E-02	5.216E-02	NOT IDENT.
NA-24	-1.493E+21	6.153E+21	0.000E+00	SHORT HLIF

AL-26	2.973E-02	4.132E-02	4.344E-02	NOT IDENT.
SC-46	-3.169E-02	5.861E-02	6.032E-02	FAIL ABUN
V-48	-1.055E-01	3.763E-01	3.793E-01	NOT IDENT.
CR-51	-8.908E-02	1.335E+00	1.335E+00	NOT IDENT.
MN-54	-2.924E-02	5.014E-02	5.184E-02	NOT IDENT.
CO-56	9.788E-03	6.896E-02	6.910E-02	NOT IDENT.
MN-56	1.000E+41	7.046E+41	0.000E+00	SHORT HLIF
CO-57	4.361E-02	4.050E-02	4.502E-02	NOT IDENT.
CO-58	1.466E-02	6.489E-02	6.522E-02	NOT IDENT.
FE-59	-1.303E-01	1.679E-01	1.779E-01	NOT IDENT.
CO-60	9.841E-04	4.782E-02	4.782E-02	FAIL ABUN
ZN-65	1.592E-01	7.367E-02	1.028E-01	NOT IDENT.
GE-68	5.084E-01	1.336E+00	1.356E+00	NOT IDENT.
AS-73	-5.892E-01	1.601E+00	1.623E+00	NOT IDENT.
SE-75	5.218E-02	8.453E-02	8.774E-02	FAIL ABUN
BR-77	2.581E+06	3.604E+06	3.787E+06	SHORT HLIF
SR-82	4.051E-01	1.173E+00	1.187E+00	NOT IDENT.
RB-83	1.680E-02	1.490E-01	1.492E-01	NOT IDENT.
KR-85	1.849E+01	1.353E+01	1.589E+01	NOT IDENT.
SR-85	1.382E-01	1.014E-01	1.190E-01	NOT IDENT.
RB-86	8.245E-01	2.602E+00	2.628E+00	NOT IDENT.
Y-88	7.786E-03	5.736E-02	5.746E-02	NOT IDENT.
Y-91	8.037E+00	3.085E+01	3.106E+01	NOT IDENT.
NB-94	2.248E-02	4.336E-02	4.453E-02	NOT IDENT.
NB-95	3.095E-02	8.516E-02	8.629E-02	NOT IDENT.
NB-95M	-6.438E-02	3.157E-01	3.170E-01	NOT IDENT.
ZR-95	-2.483E-02	1.183E-01	1.188E-01	NOT IDENT.
NB-97	1.000E+41	2.153E+40	0.000E+00	SHORT HLIF
ZR-97	5.305E+20	4.735E+20	0.000E+00	SHORT HLIF
MO-99	3.499E+04	6.535E+04	6.723E+04	SHORT HLIF
TC-99M	1.000E+41	5.156E+41	0.000E+00	SHORT HLIF
RH-101	-1.096E-02	5.101E-02	5.125E-02	NOT IDENT.
RH-102	3.381E-03	7.556E-02	7.557E-02	FAIL ABUN
RU-103	1.387E-03	1.146E-01	1.146E-01	NOT IDENT.
RH-106	-1.898E-01	4.705E-01	4.782E-01	NOT IDENT.
RU-106	-1.898E-01	4.705E-01	4.782E-01	NOT IDENT.
AG-108M	-4.358E-03	5.591E-02	5.595E-02	NOT IDENT.
AG-110M	1.423E-02	6.453E-02	6.485E-02	NOT IDENT.
SN-113	-6.637E-02	9.478E-02	9.939E-02	NOT IDENT.
CD-115	-2.144E+05	5.184E+05	5.273E+05	SHORT HLIF
SN-117M	3.127E-01	3.969E-01	4.212E-01	NOT IDENT.
TE-123M	-3.973E-03	4.764E-02	4.768E-02	NOT IDENT.
SB-124	2.982E-03	1.344E-01	1.344E-01	NOT IDENT.
SB-125	-9.747E-02	1.982E-01	2.030E-01	FAIL ABUN
TE-125M	1.670E+00	1.972E+01	1.973E+01	NOT IDENT.
I-126	2.632E-01	1.783E+00	1.787E+00	NOT IDENT.
SB-126	4.373E-01	1.270E+00	1.285E+00	NOT IDENT.
SB-127	-3.650E+02	6.863E+02	7.058E+02	SHORT HLIF
I-131	1.432E+00	3.275E+00	3.338E+00	NOT IDENT.
I-132	1.000E+41	5.498E+41	0.000E+00	SHORT HLIF
TE-132	-1.047E+03	1.433E+03	1.509E+03	SHORT HLIF
BA-133	6.753E-02	8.004E-02	8.564E-02	NOT IDENT.
I-133	-3.050E+15	2.831E+15	3.147E+15	SHORT HLIF
CS-134	6.519E-02	5.415E-02	6.161E-02	FAIL ABUN
CS-135	1.079E-01	2.488E-01	2.536E-01	NOT IDENT.
I-135	-1.000E+41	2.249E+41	0.000E+00	SHORT HLIF
CS-136	-4.240E-01	6.514E-01	6.789E-01	NOT IDENT.
CE-139	1.244E-02	4.877E-02	4.909E-02	NOT IDENT.
BA-140	-8.015E-01	2.537E+00	2.563E+00	FAIL ABUN
LA-140	-3.178E-01	4.812E-01	5.021E-01	FAIL ABUN
CE-141	6.119E-03	1.669E-01	1.669E-01	NOT IDENT.
CE-143	7.244E+09	3.975E+09	5.144E+09	SHORT HLIF
CE-144	2.287E-01	3.273E-01	3.431E-01	NOT IDENT.
PM-144	-1.887E-02	4.916E-02	4.989E-02	NOT IDENT.
PR-144	-1.437E+00	3.743E+00	3.798E+00	NOT IDENT.
PM-146	-2.072E-02	8.176E-02	8.230E-02	NOT IDENT.
ND-147	-5.105E+00	6.984E+00	7.353E+00	FAIL ABUN
PM-149	3.757E+05	4.297E+06	4.301E+06	SHORT HLIF
EU-150	9.645E-03	5.827E-02	5.844E-02	FAIL ABUN
EU-152	3.239E-02	2.381E-01	2.385E-01	FAIL ABUN
GD-153	3.630E-02	1.342E-01	1.352E-01	NOT IDENT.
EU-154	1.250E-02	1.409E-01	1.410E-01	FAIL ABUN
EU-155	1.383E-01	1.432E-01	1.562E-01	FAIL ABUN
TB-160	-1.681E-02	2.149E-01	2.150E-01	FAIL ABUN
HO-166M	3.296E-02	7.112E-02	7.266E-02	FAIL ABUN
TM-171	-3.975E+00	2.485E+01	2.492E+01	NOT IDENT.
HF-172	-1.946E-01	3.068E-01	3.191E-01	FAIL ABUN
LU-172	3.189E-02	7.208E-02	7.350E-02	FAIL ABUN

LU-176	1.466E-02	4.184E-02	4.236E-02	FAIL ABUN
HF-181	-1.020E-01	1.301E-01	1.380E-01	FAIL ABUN
TA-182	1.245E-01	2.058E-01	2.133E-01	FAIL ABUN
RE-183	2.667E-01	3.304E-01	3.515E-01	FAIL ABUN
RE-184	3.600E-03	3.620E-01	3.620E-01	NOT IDENT.
W-188	-2.966E+00	1.757E+01	1.762E+01	FAIL ABUN
IR-192	1.764E-02	7.520E-02	7.562E-02	FAIL ABUN
HG-203	8.593E-02	1.024E-01	1.095E-01	NOT IDENT.
PB-210	-4.688E-01	5.094E+00	5.099E+00	NOT IDENT.
BI-211	2.256E+00	7.654E-01	1.273E+00	FAIL ABUN
PB-211	2.906E-01	1.305E+00	1.312E+00	NOT IDENT.
BI-212	9.880E-01	8.191E-01	9.324E-01	NOT IDENT.
RN-219	3.176E-01	7.403E-01	7.540E-01	NOT IDENT.
RA-223	6.047E-01	1.085E+00	1.119E+00	FAIL ABUN
AC-227	3.553E-01	4.589E-01	4.860E-01	FAIL ABUN
TH-227	3.553E-01	4.589E-01	4.860E-01	FAIL ABUN
TH-229	2.308E-01	7.991E-01	8.059E-01	FAIL ABUN
PA-231	3.366E-01	7.278E-01	7.434E-01	NOT IDENT.
TH-231	6.047E-01	1.085E+00	1.119E+00	FAIL ABUN
PA-233	-6.149E-02	1.077E-01	1.112E-01	NOT IDENT.
PA-234	9.245E-03	3.541E-01	3.542E-01	FAIL ABUN
PA-234M	3.084E+00	3.604E+00	3.863E+00	FAIL ABUN
NP-237	-6.149E-02	1.077E-01	1.112E-01	NOT IDENT.
NP-238	-7.424E+03	1.124E+06	1.124E+06	SHORT HLIF
NP-239	-3.671E-01	4.179E-01	4.495E-01	NOT IDENT.
PU-239	3.175E+02	6.041E+02	6.208E+02	FAIL ABUN
CM-243	2.452E-02	1.431E-01	1.435E-01	NOT IDENT.
BK-247	2.711E-02	1.278E-01	1.284E-01	FAIL ABUN
CM-247	5.113E-02	6.751E-02	7.133E-02	NOT IDENT.
CF-249	1.305E-02	6.862E-02	6.888E-02	NOT IDENT.
CF-251	6.487E-02	1.755E-01	1.780E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	165.4563	87.09	172.3727	136.47	170.0717
45.60	134.7778	87.57	172.4955	140.51	0.0000
46.54	145.1857	88.03	172.6130	143.76	151.9534
49.72	0.0000	88.34	172.6912	144.24	153.0065
51.35	153.4948	88.47	172.7246	145.44	144.4206
51.87	143.4147	89.96	173.1015	152.43	157.2827
52.39	156.1005	1093.63	173.2725	153.25	160.3673
52.97	154.0026	91.11	173.3899	323.87	163.4810
53.44	161.6846	92.59	173.7589	156.02	164.7716
54.07	133.7638	93.35	173.9473	158.56	129.5858
57.36	0.0000	94.56	132.0601	159.00	151.4148
57.53	122.5869	94.65	132.0765	162.33	166.8144
57.98	143.4288	94.67	132.0804	162.66	166.8695
59.27	140.3160	94.87	132.1177	163.33	151.0769
59.32	140.3293	97.43	134.0634	165.86	143.4825
59.54	140.3874	98.43	134.0024	176.31	138.8907
60.96	76.4622	98.44	134.0041	176.60	143.9623
61.17	76.4919	99.53	136.6673	177.52	129.9803
62.93	76.7391	100.11	139.5476	181.07	0.0000
63.29	137.8715	102.03	167.7066	181.52	153.7256
63.58	139.6899	103.18	151.2611	184.41	136.2867
64.28	139.8663	103.37	143.8739	143.76	156.3487
66.73	171.3801	105.21	130.2679	193.51	160.5108
67.24	171.5327	105.31	130.2850	197.03	167.3662
125.81	175.8858	106.12	146.2610	198.01	172.4361
67.75	175.9064	106.47	146.3281	201.83	162.4142
69.67	134.1324	109.28	151.5394	203.43	156.7442
70.83	166.9343	111.00	158.4356	205.31	144.6014
72.81	178.8440	111.76	0.0000	210.85	136.1458
72.87	178.8617	114.06	143.0497	215.65	144.8147
74.66	166.3985	116.30	0.0000	222.11	140.3405
74.82	166.4420	116.74	164.6776	227.09	161.9308
74.97	166.4834	119.76	151.6388	227.38	156.7096
77.11	167.0598	121.12	135.1807	228.16	0.0000
78.74	156.2085	121.22	135.1970	228.18	158.9134
79.69	169.3600	121.78	133.7676	116.74	158.9134
80.12	201.0706	122.06	115.5656	235.69	169.3774
80.19	201.0928	122.92	117.2065	235.96	162.6363
80.57	210.1951	123.07	133.9739	238.63	114.5885
81.00	210.3361	265.00	131.4049	238.98	0.0000
81.07	218.1495	125.81	160.3743	240.99	114.7961
81.75	237.5782	127.23	162.1702	242.00	95.3114
83.79	194.9911	127.91	140.8635	244.70	119.3828
84.00	195.0529	129.30	153.3582	252.40	0.0000
85.43	183.8911	131.20	150.6200	252.80	120.1057
86.55	172.2339	133.02	147.8520	254.15	0.0000
86.79	172.2955	133.52	134.0662	256.23	96.7569
86.94	172.3346	136.00	174.8121	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	109.2466	355.39	0.0000	584.27	35.8511
264.80	109.2574	356.01	91.7615	595.83	44.5944
265.00	119.0100	364.49	87.6013	427.87	23.1987
268.22	122.5368	366.42	0.0000	602.52	0.0000
269.46	118.3023	372.51	98.1898	604.72	34.4246
270.03	108.5770	375.05	96.4742	607.14	29.2893
271.23	107.5833	377.52	100.3232	609.32	50.6963
273.65	149.1288	356.01	96.9465	610.33	65.5522
276.40	131.9653	388.16	95.3075	614.28	46.6490
277.37	113.5009	388.63	89.7246	618.01	50.8698
277.60	106.9692	391.69	109.5332	620.36	37.4080
278.00	102.6318	264.66	124.1754	621.93	41.5898
279.20	102.7164	401.81	100.7187	630.19	0.0000
279.54	110.3917	402.40	93.2173	631.29	34.4357
279.70	106.0316	404.85	104.6533	633.25	49.0815
280.46	109.3674	410.95	96.4779	634.78	38.6612
283.69	123.8593	413.71	107.0369	635.95	33.4516
284.31	114.0420	414.70	91.9286	636.99	34.5106
285.41	103.1539	423.72	90.4541	645.85	43.7205
285.90	0.0000	427.09	87.4302	657.76	47.4291
287.50	106.5970	427.87	104.9579	657.90	0.0000
290.67	105.7222	433.94	101.4531	661.66	29.5545
293.27	0.0000	439.40	86.3767	664.57	0.0000
351.93	106.0430	453.88	102.4624	666.33	26.4337
295.96	106.0957	463.37	96.1371	666.50	21.1479
879.38	74.3952	468.07	82.7287	667.71	0.0000
299.98	92.1934	473.00	0.0000	677.62	35.0367
300.09	93.9728	475.06	84.9567	685.70	0.0000
300.13	93.9754	476.78	85.0257	695.00	41.6670
301.36	87.4593	477.60	85.0586	696.49	37.4139
302.85	99.9152	482.18	83.2817	696.51	37.4139
256.23	101.1336	487.02	65.7945	697.00	38.4899
304.85	105.6037	492.35	0.0000	697.30	36.3549
306.78	94.6043	497.08	61.1667	697.49	33.1494
308.46	86.9073	505.52	64.3732	702.65	27.8541
311.90	116.1320	507.63	0.0000	706.68	26.8207
316.51	92.9545	511.00	80.4166	711.68	21.4941
319.41	104.3440	514.00	59.6484	720.70	23.3588
320.08	95.4071	514.00	59.6484	721.93	0.0000
321.04	96.2677	520.40	57.8244	722.78	32.3665
323.87	87.0083	520.69	0.0000	722.91	32.3679
325.23	108.1011	522.65	0.0000	723.31	26.9769
328.76	121.8790	527.90	0.0000	724.19	23.3874
333.37	108.6416	528.26	59.0245	727.33	27.0148
333.97	90.5676	529.59	54.0541	733.00	23.4583
334.37	97.3851	529.87	0.0000	735.93	33.5975
338.28	98.9768	531.02	60.0967	333.97	34.6992
338.32	98.9795	537.26	58.2521	739.50	0.0000
311.90	119.7183	546.56	0.0000	747.24	22.8472
340.48	119.7183	552.55	37.4047	748.06	26.1182
340.55	119.7231	563.25	45.6965	752.31	21.7964
344.28	109.3579	569.33	50.9021	753.82	23.9884
345.93	101.8631	946.00	50.9058	756.73	21.8291
351.06	121.6905	569.70	50.9106	756.80	25.1040
351.93	121.7538	583.19	34.1284	884.68	21.8813

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	25.5442	1274.44	15.0817	1620.50	8.6648
766.42	21.8994	1001.03	16.7791	1621.92	7.7042
766.84	22.9975	1002.74	0.0000	1678.03	0.0000
772.60	0.0000	1004.73	6.7183	1690.97	5.8512
776.52	21.9727	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	8.8914
778.90	29.3197	1028.54	0.0000	1063.66	29.6673
783.70	0.0000	1037.84	22.7342	1771.35	17.8035
785.37	20.4621	1038.76	0.0000	1791.20	0.0000
792.07	24.8450	631.29	19.8145	1808.65	3.9817
794.95	16.5787	1048.07	19.8218	1810.72	0.0000
795.86	20.2687	1049.04	15.8613	1836.06	6.0002
810.06	23.1379	1050.41	12.8921		
810.29	21.2883	1063.66	15.3532		
344.28	22.2148	1077.00	8.9868		
810.76	22.2173	1077.34	8.9875		
815.77	28.7427	1085.87	10.0081		
1048.07	18.5600	1093.63	14.0387		
832.01	22.3662	1099.45	22.0931		
834.85	32.6466	1112.07	0.0000		
835.71	27.0571	1112.84	0.0000		
836.80	0.0000	1115.54	0.0000		
846.75	0.0000	1120.29	8.6527		
846.77	26.2135	1120.55	8.6534		
856.80	32.1973	1221.41	8.6548		
860.56	24.4443	1129.67	22.7664		
871.09	25.4652	1131.51	0.0000		
873.19	24.5374	1147.95	0.0000		
875.33	0.0000	1173.23	13.4981		
879.38	21.7469	1177.95	12.2852		
880.51	23.6455	1189.05	9.2380		
883.24	16.0921	1204.77	12.3633		
884.68	19.8870	1221.41	7.0921		
889.28	22.7593	1231.02	15.9930		
894.76	20.8962	1235.36	15.5640		
898.04	23.7686	1238.28	13.4978		
900.72	28.5449	1260.41	0.0000		
903.28	26.1177	1271.87	15.6934		
911.20	21.2701	1274.44	15.7025		
912.08	21.2755	1274.54	17.7969		
923.98	0.0000	1291.59	8.4069		
926.50	19.1732	1298.22	0.0000		
929.11	18.0910	1312.11	13.7231		
937.49	24.0417	1332.49	13.7845		
944.13	19.2696	1362.66	0.0000		
946.00	20.2438	1365.19	5.3389		
949.00	15.4368	1368.63	0.0000		
667.71	0.0000	1384.29	9.6489		
962.31	16.6016	1408.01	8.6195		
964.08	11.6267	1457.56	0.0000		
966.17	11.6335	1460.82	6.5347		
911.20	11.6426	1489.16	6.5718		
968.97	11.6426	1505.03	8.2407		
983.53	18.3691	1584.12	11.4747		
984.45	0.0000	1596.21	7.6674		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 14:09:35.48

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677006.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;251
Background date    : 26-JUN-2016 12:05:29
Sample date       : 11-MAY-2016 10:24:00 Acquisition date : 28-JUN-2016 13:08:10
Sample ID        : G398677006 Sample quantity : 1.50450E+02 GRAM
Detector name    : GAM28 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.38 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	74.90	99	159	1.43	149.88	145	16	2.76E-02	25.7	1.79E+00
2	3	77.32	164	126	1.41	154.73	145	16	4.57E-02	14.9	
3	6	90.15*	12	148	1.21	180.40	169	22	3.29E-03	169.6	2.07E+00
4	6	93.03*	46	165	1.50	186.17	169	22	1.27E-02	57.4	
5	0	151.39	34	64	1.40	302.98	300	7	9.42E-03	42.6	
6	0	186.24*	29	139	1.34	372.73	368	10	8.13E-03	81.6	
7	0	195.20	28	75	1.31	390.68	387	7	7.67E-03	55.5	
8	1	232.43	28	45	1.47	465.17	463	26	7.85E-03	37.5	1.87E+00
9	1	235.45	31	79	1.47	471.22	463	26	8.74E-03	53.7	
10	1	238.80*	291	60	1.23	477.94	463	26	8.09E-02	7.5	
11	1	241.70	50	65	1.27	483.73	463	26	1.39E-02	34.6	
12	0	295.35	95	75	0.95	591.13	586	11	2.65E-02	20.3	
13	0	300.69	27	68	1.58	601.81	597	9	7.36E-03	59.2	
14	0	338.52*	63	66	0.77	677.52	673	9	1.75E-02	26.8	
15	0	352.15*	120	96	1.23	704.80	700	12	3.32E-02	18.8	
16	0	454.75	52	91	5.24	910.16	902	20	1.44E-02	46.9	
17	0	463.08	25	57	0.60	926.83	922	9	7.05E-03	56.9	
18	0	511.31*	53	50	1.79	1023.36	1017	15	1.46E-02	38.4	
19	0	542.27	30	24	3.30	1085.32	1079	14	8.32E-03	39.5	
20	0	583.40*	99	24	1.47	1167.64	1162	13	2.74E-02	14.6	
21	0	609.41	96	23	1.16	1219.70	1216	9	2.66E-02	13.8	
22	0	620.04	29	12	4.56	1240.98	1234	12	8.11E-03	30.1	
23	0	652.36	27	8	2.37	1305.67	1300	11	7.47E-03	28.2	
24	0	661.60*	1011	21	1.58	1324.17	1315	16	2.81E-01	3.3	
25	0	720.77	12	6	1.52	1442.58	1435	12	3.33E-03	50.0	
26	0	726.94	49	8	2.59	1454.94	1447	15	1.35E-02	18.9	
27	0	778.12	7	9	1.42	1557.37	1550	9	1.93E-03	86.8	
28	0	795.05	8	10	0.70	1591.26	1586	8	2.27E-03	75.5	
29	0	818.75	7	26	6.24	1638.69	1624	17	1.81E-03	182.3	
30	0	841.19	10	15	0.86	1683.61	1676	12	2.73E-03	85.0	
31	0	861.03	16	17	1.93	1723.32	1717	11	4.31E-03	56.8	
32	0	911.20*	46	12	1.23	1823.74	1817	12	1.29E-02	22.3	
33	0	964.47	23	0	1.46	1930.35	1924	11	6.39E-03	20.9	
34	0	968.67*	42	12	2.02	1938.76	1935	10	1.17E-02	21.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1120.66	18	11	2.20	2242.96	2233	16	4.97E-03	49.1	
36	0	1172.44	13	5	1.72	2346.60	2343	9	3.47E-03	41.7	
37	0	1237.68	21	0	2.29	2477.19	2473	9	5.83E-03	21.8	
38	0	1268.32	6	9	3.23	2538.50	2530	12	1.73E-03	104.0	
39	0	1281.51	10	4	0.81	2564.91	2560	9	2.70E-03	50.6	
40	0	1295.25	6	4	0.50	2592.42	2588	8	1.67E-03	70.7	
41	0	1332.66	15	4	0.93	2667.29	2663	9	4.23E-03	35.5	
42	0	1342.61	9	3	3.44	2687.19	2681	11	2.57E-03	47.8	
43	0	1460.45*	175	0	2.23	2923.06	2915	16	4.85E-02	7.7	
44	0	1472.57	10	3	1.34	2947.31	2941	11	2.88E-03	43.7	
45	0	1763.58	17	0	1.88	3529.76	3524	12	4.72E-03	24.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 14:09:37

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677006.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:24:00 Acquisition date : 28-JUN-2016 13:08:10
Sample ID        : G398677006 Sample quantity  : 150.45 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA28 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.38 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.248E+00	6.318E+00	6.318E+00	15.49	OK
CO-60	1173.23	99.85	1.504E+00	4.104E-02	4.176E-02	83.33	OK
	1332.49	99.98*	1.349E+00	5.485E-02	5.581E-02	70.96	OK
NB-95M	235.69	24.80*	5.084E+00	1.441E-01	2.427E-01	107.35	OK
BA-137M	661.66	89.90*	2.390E+00	2.461E+00	2.469E+00	6.64	OK
CS-137	661.66	85.10*	2.390E+00	2.600E+00	2.608E+00	6.64	OK
TL-208	277.37	6.60	4.546E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.631E+00	2.338E-01	2.338E-01	29.23	OK
	860.56	12.50	1.942E+00	3.252E-01	3.252E-01	113.50	OK
PB-212	74.82	10.28	4.424E+00	1.013E+00	1.013E+00	72.37	OK
	77.11	17.10	4.671E+00	1.310E+00	1.310E+00	29.88	OK
	238.63	43.60*	5.037E+00	7.654E-01	7.654E-01	15.03	OK
	300.09	3.30	4.292E+00	1.057E+00	1.057E+00	118.34	OK
BI-214	609.32	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64	OK
	1120.29	14.92	1.562E+00	3.800E-01	3.800E-01	98.16	OK
	1764.49	15.30	1.067E+00	4.910E-01	4.910E-01	48.51	OK
PB-214	74.82	5.80	4.416E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.671E+00	2.309E+00	2.310E+00	29.88	OK
	87.09	3.41	5.488E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.993E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.347E+00	6.730E-01	6.730E-01	40.61	OK
	351.93	35.60*	3.828E+00	4.884E-01	4.884E-01	37.68	OK
RN-222	609.32	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64	OK
	1120.29	14.92	1.562E+00	3.800E-01	3.800E-01	98.16	OK
	1764.49	15.30	1.067E+00	4.910E-01	4.910E-01	48.51	OK
RA-224	240.99	4.10*	4.997E+00	2.195E-01	2.195E-01	495.68	OK
RA-226	609.32	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64	OK
	1120.29	14.92	1.562E+00	3.800E-01	3.800E-01	98.16	OK
	1764.49	15.30	1.067E+00	4.910E-01	4.910E-01	48.51	OK
AC-228	105.21	1.10	6.331E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.940E+00	7.926E-01	7.926E-01	53.69	OK
	794.95	4.25	2.070E+00	4.766E-01	4.766E-01	150.97	OK
	835.71	1.61	1.989E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.855E+00	4.899E-01	4.899E-01	44.63	OK
	968.97	15.80	1.764E+00	7.575E-01	7.575E-01	43.46	OK
RA-228	105.21	1.10	6.331E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.940E+00	7.926E-01	7.926E-01	53.69	OK
	794.95	4.25	2.070E+00	4.766E-01	4.766E-01	150.97	OK
	835.71	1.61	1.989E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.855E+00	4.899E-01	4.899E-01	44.63	OK
	968.97	15.80	1.764E+00	7.575E-01	7.575E-01	43.46	OK
TH-228	74.82	10.28	4.424E+00	1.013E+00	1.013E+00	72.37	OK
	77.11	17.10	4.671E+00	1.310E+00	1.310E+00	29.88	OK
	238.63	43.60*	5.037E+00	7.654E-01	7.654E-01	15.03	OK
	300.09	3.30	4.292E+00	1.057E+00	1.057E+00	118.34	OK
TH-230	609.32	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64	OK
	1120.29	14.92	1.562E+00	3.800E-01	3.800E-01	98.16	OK
	1764.49	15.30	1.067E+00	4.910E-01	4.910E-01	48.51	OK
PA-231	283.69	1.70	4.474E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	301.36	5.35*	4.292E+00	6.518E-01	6.518E-01	118.34	OK
	105.21	1.10	6.331E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.940E+00	7.926E-01	7.926E-01	53.69	OK
	835.71	1.61	1.989E+00	----- Line	Not Found	-----	Absent
U-234	911.20	25.80*	1.855E+00	4.899E-01	4.899E-01	44.63	OK
	968.97	15.80	1.764E+00	7.575E-01	7.575E-01	43.46	OK
	609.32	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64	OK
	1120.29	14.92	1.562E+00	3.800E-01	3.800E-01	98.16	OK
U-235	1764.49	15.30	1.067E+00	4.910E-01	4.910E-01	48.51	OK
	89.96	3.47	5.686E+00	3.769E-01	3.769E-01	339.18	OK
	93.35	5.60	5.851E+00	8.715E-01	8.715E-01	114.80	OK
	143.76	10.96*	6.480E+00	----- Line	Not Found	-----	Absent
AM-243	163.33	5.08	6.221E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.853E+00	5.157E-02	5.157E-02	163.13	OK
	205.31	5.01	5.541E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	6.298E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	4.424E+00	1.549E-01	1.549E-01	72.37	OK
	511.00	100.00*	2.905E+00	9.736E-02	9.736E-02	76.86	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677006.CNF;1      *
* Acquisition date   : 28-JUN-2016 13:08:10 Sensitivity      : 3.000                *
* Detector ID        : GAM28 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.38 Half life ratio : *****      *
* Sample date        : 11-MAY-2016 10:24:00 Analyst initials: MXR1      *
* Sample ID          : G398677006 Sample Quantity : 1.5045E+02 GRAM  *
* Batch Number       : 1572231 Wet Weight : 0.00000          *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000           *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 27-JUL-2015 07:57:17 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.318E+00	9.589E-01	5.818E-01
CO-60	5.581E-02	3.881E-02	6.420E-02
NB-95M	2.427E-01	2.553E-01	3.266E-01
BA-137M	2.469E+00	1.606E-01	5.945E-02
CS-137	2.608E+00	1.696E-01	6.281E-02
TL-208	2.338E-01	6.698E-02	6.142E-02
PB-212	7.654E-01	1.128E-01	1.113E-01
BI-214	4.358E-01	1.180E-01	1.357E-01
PB-214	4.884E-01	1.804E-01	1.531E-01
RN-222	4.358E-01	1.180E-01	1.357E-01
RA-224	2.195E-01	1.066E+00	1.192E+00
RA-226	4.358E-01	1.180E-01	1.357E-01
AC-228	4.899E-01	2.143E-01	1.813E-01
RA-228	4.899E-01	2.143E-01	1.813E-01
TH-228	7.654E-01	1.128E-01	1.113E-01
TH-230	4.358E-01	1.180E-01	1.357E-01
PA-231	6.518E-01	7.560E-01	1.018E+00
TH-232	4.899E-01	2.143E-01	1.813E-01
U-234	4.358E-01	1.180E-01	1.357E-01
U-235	2.564E-01	2.150E-01	4.381E-01
AM-243	1.549E-01	1.099E-01	1.014E-01
ANH-511	9.736E-02	7.334E-02	6.186E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.087E-01	6.600E-01	1.303E+00	NOT IDENT.
NA-22	-2.926E-03	4.155E-02	6.215E-02	NOT IDENT.
NA-24	0.000E+00	4.755E+21	0.000E+00	SHORT HLIF
AL-26	1.612E-02	2.835E-02	6.886E-02	NOT IDENT.
SC-46	-9.477E-03	4.043E-02	7.857E-02	FAIL ABUN
V-48	-2.741E-02	2.331E-01	4.585E-01	NOT IDENT.
CR-51	1.346E-02	9.797E-01	1.807E+00	NOT IDENT.
MN-54	-7.286E-03	3.368E-02	5.332E-02	NOT IDENT.

CO-56	-2.063E-02	5.728E-02	8.614E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-3.398E-03	2.830E-02	5.470E-02	NOT IDENT.
CO-58	5.371E-02	5.389E-02	1.068E-01	NOT IDENT.
FE-59	-9.460E-03	1.224E-01	2.390E-01	NOT IDENT.
ZN-65	-1.970E-02	9.193E-02	1.473E-01	NOT IDENT.
GE-68	-1.796E-01	1.066E+00	2.068E+00	NOT IDENT.
AS-73	-6.349E-01	1.154E+00	2.114E+00	NOT IDENT.
AS-74	-1.509E-01	3.636E-01	6.543E-01	NOT IDENT.
SE-75	3.026E-02	5.735E-02	1.114E-01	NOT IDENT.
BR-77	0.000E+00	2.660E+05	0.000E+00	SHORT HLIF
SR-82	-1.127E-01	7.227E-01	1.352E+00	NOT IDENT.
RB-83	-9.083E-03	9.199E-02	1.753E-01	NOT IDENT.
KR-85	1.792E+01	9.423E+00	1.867E+01	NOT IDENT.
SR-85	1.338E-01	7.060E-02	1.399E-01	NOT IDENT.
RB-86	-1.834E+00	2.134E+00	3.605E+00	NOT IDENT.
Y-88	-5.971E-03	3.870E-02	8.003E-02	NOT IDENT.
Y-91	1.115E+01	2.518E+01	5.228E+01	NOT IDENT.
NB-94	-9.455E-03	3.236E-02	5.910E-02	NOT IDENT.
NB-95	1.907E-02	5.849E-02	1.143E-01	NOT IDENT.
ZR-95	-1.460E-03	8.768E-02	1.681E-01	NOT IDENT.
NB-97	0.000E+00	4.591E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.085E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.368E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	9.236E+40	0.000E+00	SHORT HLIF
RH-101	-1.179E-02	3.251E-02	6.177E-02	NOT IDENT.
RH-102	-5.922E-02	4.820E-02	7.654E-02	NOT IDENT.
RU-103	-9.579E-02	8.063E-02	1.364E-01	FAIL ABUN
RH-106	2.196E-01	3.772E-01	6.829E-01	NOT IDENT.
RU-106	2.196E-01	3.772E-01	6.829E-01	NOT IDENT.
AG-108M	6.946E-03	3.587E-02	6.954E-02	NOT IDENT.
CD-109	8.951E-01	8.998E-01	1.747E+00	NOT IDENT.
AG-110M	-7.884E-03	4.791E-02	9.302E-02	FAIL ABUN
SN-113	8.351E-03	7.133E-02	1.304E-01	NOT IDENT.
CD-115	0.000E+00	3.364E+05	0.000E+00	SHORT HLIF
SN-117M	-1.416E-02	2.915E-01	5.579E-01	NOT IDENT.
TE-123M	-2.360E-04	3.459E-02	6.630E-02	NOT IDENT.
SB-124	3.043E-03	8.961E-02	1.993E-01	NOT IDENT.
SB-125	1.139E-01	1.120E-01	2.302E-01	FAIL ABUN
TE-125M	-3.503E+00	1.438E+01	2.779E+01	NOT IDENT.
I-126	-1.259E-01	1.260E+00	2.062E+00	NOT IDENT.
SB-126	7.710E-01	7.555E-01	1.366E+00	FAIL ABUN
SN-126	7.031E-02	8.338E-02	1.607E-01	NOT IDENT.
SB-127	0.000E+00	4.497E+02	0.000E+00	SHORT HLIF
I-131	1.684E+00	2.293E+00	4.475E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.179E+03	0.000E+00	SHORT HLIF
BA-133	1.734E-02	5.101E-02	8.567E-02	NOT IDENT.
I-133	0.000E+00	1.816E+15	0.000E+00	SHORT HLIF
CS-134	2.477E-02	3.665E-02	7.463E-02	FAIL ABUN
CS-135	1.301E-02	1.659E-01	3.108E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	2.572E-01	4.947E-01	1.057E+00	FAIL ABUN
CE-139	2.522E-02	3.621E-02	7.206E-02	NOT IDENT.
BA-140	-3.647E-01	2.208E+00	3.550E+00	NOT IDENT.
LA-140	-1.472E-01	4.224E-01	8.220E-01	NOT IDENT.
CE-141	9.387E-02	1.358E-01	2.699E-01	NOT IDENT.
CE-143	0.000E+00	2.661E+09	0.000E+00	SHORT HLIF
CE-144	6.693E-02	2.078E-01	4.113E-01	NOT IDENT.
PM-144	8.078E-03	3.760E-02	7.260E-02	NOT IDENT.
PR-144	6.078E-01	2.862E+00	5.525E+00	NOT IDENT.
PM-146	0.000E+00	1.279E-01	1.081E-01	FAIL ABUN
ND-147	-8.604E-01	5.058E+00	9.481E+00	FAIL ABUN
PM-147	-1.385E+02	7.686E+02	1.482E+03	NOT IDENT.
PM-149	0.000E+00	2.983E+06	0.000E+00	SHORT HLIF
EU-150	7.161E-04	3.790E-02	6.069E-02	FAIL ABUN
EU-152	2.465E-02	1.240E-01	2.226E-01	FAIL ABUN
GD-153	1.169E-02	1.075E-01	1.772E-01	NOT IDENT.
EU-154	-8.148E-03	1.158E-01	1.732E-01	NOT IDENT.
EU-155	9.811E-02	1.029E-01	2.134E-01	NOT IDENT.
TB-160	5.926E-02	1.782E-01	3.514E-01	NOT IDENT.
HO-166M	-9.424E-03	5.510E-02	1.001E-01	NOT IDENT.
TM-171	-8.262E+00	1.876E+01	3.471E+01	NOT IDENT.
HF-172	-6.122E-02	2.019E-01	3.852E-01	NOT IDENT.
LU-172	-9.123E-03	6.514E-02	1.235E-01	FAIL ABUN
LU-176	1.312E-02	3.224E-02	6.112E-02	NOT IDENT.
HF-181	-2.106E-02	9.165E-02	1.709E-01	NOT IDENT.
TA-182	-8.922E-02	2.144E-01	3.859E-01	FAIL ABUN

RE-183	2.545E-01	2.981E-01	5.950E-01	NOT IDENT.
RE-184	7.476E-02	1.895E-01	3.826E-01	NOT IDENT.
W-188	4.961E+00	1.189E+01	2.027E+01	NOT IDENT.
IR-192	3.156E-02	5.099E-02	9.938E-02	FAIL ABUN
HG-203	1.900E-02	7.040E-02	1.331E-01	NOT IDENT.
BI-207	6.374E-02	4.733E-02	1.087E-01	FAIL ABUN
PB-210	2.446E-01	3.639E+00	6.980E+00	NOT IDENT.
BI-211	0.000E+00	4.969E-01	7.107E-01	FAIL ABUN
PB-211	-1.150E-01	8.853E-01	1.676E+00	NOT IDENT.
BI-212	0.000E+00	6.287E-01	1.229E+00	FAIL ABUN
RN-219	-1.340E-01	4.916E-01	9.225E-01	NOT IDENT.
RA-223	3.408E-01	7.252E-01	1.387E+00	FAIL ABUN
AC-227	6.703E-02	2.974E-01	5.613E-01	FAIL ABUN
TH-227	6.703E-02	2.974E-01	5.613E-01	FAIL ABUN
TH-229	1.478E-01	6.055E-01	1.031E+00	NOT IDENT.
TH-231	3.408E-01	7.252E-01	1.387E+00	FAIL ABUN
PA-233	-5.154E-02	7.352E-02	1.279E-01	FAIL ABUN
PA-234	-5.670E-02	2.411E-01	4.651E-01	NOT IDENT.
PA-234M	1.541E+00	3.688E+00	7.830E+00	NOT IDENT.
TH-234	-4.890E-01	1.392E+00	2.616E+00	FAIL ABUN
NP-237	-5.154E-02	7.352E-02	1.279E-01	FAIL ABUN
NP-238	0.000E+00	7.571E+05	0.000E+00	SHORT HLIF
U-238	-4.890E-01	1.392E+00	2.616E+00	FAIL ABUN
NP-239	-3.498E-03	2.708E-01	5.281E-01	NOT IDENT.
PU-239	1.655E+02	3.316E+02	6.630E+02	NOT IDENT.
AM-241	7.392E-02	1.616E-01	3.145E-01	NOT IDENT.
CM-243	-1.031E-01	1.134E-01	1.936E-01	NOT IDENT.
BK-247	4.500E-02	8.532E-02	1.657E-01	NOT IDENT.
CM-247	5.880E-03	4.492E-02	8.681E-02	NOT IDENT.
CF-249	-4.307E-03	5.247E-02	9.439E-02	NOT IDENT.
CF-251	-7.230E-02	1.426E-01	2.629E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	168	10.66*	1.248E+00	6.318E+00	6.318E+00	15.49
CO-60	1173.23	12	99.85	1.504E+00	4.104E-02	4.176E-02	83.33
	1332.49	15	99.98*	1.349E+00	5.485E-02	5.581E-02	70.96
NB-95M	235.69	36	24.80*	5.084E+00	1.441E-01	2.427E-01	107.35
BA-137M	661.66	1060	89.90*	2.390E+00	2.461E+00	2.469E+00	6.64
CS-137	661.66	1060	85.10*	2.390E+00	2.600E+00	2.608E+00	6.64
TL-208	277.37	-----	6.60	4.546E+00	-----	Line Not Found	-----
	583.19	105	85.00*	2.631E+00	2.338E-01	2.338E-01	29.23
	860.56	16	12.50	1.942E+00	3.252E-01	3.252E-01	113.50
BI-211	72.87	-----	1.23	4.205E+00	-----	Line Not Found	-----
	351.06	133	12.92*	3.828E+00	1.346E+00	1.346E+00	37.68
PB-212	74.82	127	10.28	4.424E+00	1.393E+00	1.393E+00	51.46
	77.11	210	17.10	4.671E+00	1.310E+00	1.310E+00	29.88
	238.63	337	43.60*	5.037E+00	7.654E-01	7.654E-01	15.03
	300.09	30	3.30	4.292E+00	1.057E+00	1.057E+00	118.34
BI-214	609.32	101	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64
	1120.29	18	14.92	1.562E+00	3.800E-01	3.800E-01	98.16
	1764.49	16	15.30	1.067E+00	4.910E-01	4.910E-01	48.51
PB-214	74.82	127	5.80	4.424E+00	2.468E+00	2.468E+00	51.46
	77.11	210	9.70	4.671E+00	2.309E+00	2.310E+00	29.88
	87.09	-----	3.41	5.488E+00	-----	Line Not Found	-----
	242.00	58	7.25	4.997E+00	7.971E-01	7.971E-01	69.14
	295.22	108	18.42	4.347E+00	6.730E-01	6.730E-01	40.61
	351.93	133	35.60*	3.828E+00	4.884E-01	4.884E-01	37.68
RN-222	609.32	101	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64
	1120.29	18	14.92	1.562E+00	3.800E-01	3.800E-01	98.16
	1764.49	16	15.30	1.067E+00	4.910E-01	4.910E-01	48.51
RA-224	240.99	58	4.10*	4.997E+00	1.409E+00	1.409E+00	69.14
RA-226	609.32	101	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64
	1120.29	18	14.92	1.562E+00	3.800E-01	3.800E-01	98.16
	1764.49	16	15.30	1.067E+00	4.910E-01	4.910E-01	48.51
AC-228	105.21	-----	1.10	6.331E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.940E+00	7.926E-01	7.926E-01	53.69
	794.95	8	4.25	2.070E+00	4.766E-01	4.766E-01	150.97
	835.71	-----	1.61	1.989E+00	-----	Line Not Found	-----
	911.20	47	25.80*	1.855E+00	4.899E-01	4.899E-01	44.63
	968.97	42	15.80	1.764E+00	7.575E-01	7.575E-01	43.46
RA-228	105.21	-----	1.10	6.331E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.940E+00	7.926E-01	7.926E-01	53.69
	794.95	8	4.25	2.070E+00	4.766E-01	4.766E-01	150.97
	835.71	-----	1.61	1.989E+00	-----	Line Not Found	-----
	911.20	47	25.80*	1.855E+00	4.899E-01	4.899E-01	44.63
	968.97	42	15.80	1.764E+00	7.575E-01	7.575E-01	43.46
TH-228	74.82	127	10.28	4.424E+00	1.393E+00	1.393E+00	51.46
	77.11	210	17.10	4.671E+00	1.310E+00	1.310E+00	29.88
	238.63	337	43.60*	5.037E+00	7.654E-01	7.654E-01	15.03
	300.09	30	3.30	4.292E+00	1.057E+00	1.057E+00	118.34

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	609.32	101	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64
	1120.29	18	14.92	1.562E+00	3.800E-01	3.800E-01	98.16
	1764.49	16	15.30	1.067E+00	4.910E-01	4.910E-01	48.51
PA-231	283.69	-----	1.70	4.474E+00	-----	Line Not Found	-----
	301.36	30	5.35*	4.292E+00	6.518E-01	6.518E-01	118.34
TH-232	105.21	-----	1.10	6.331E+00	-----	Line Not Found	-----
	338.32	71	11.27	3.940E+00	7.926E-01	7.926E-01	53.69
	835.71	-----	1.61	1.989E+00	-----	Line Not Found	-----
U-234	911.20	47	25.80*	1.855E+00	4.899E-01	4.899E-01	44.63
	968.97	42	15.80	1.764E+00	7.575E-01	7.575E-01	43.46
	609.32	101	45.49*	2.545E+00	4.358E-01	4.358E-01	27.64
	1120.29	18	14.92	1.562E+00	3.800E-01	3.800E-01	98.16
	1764.49	16	15.30	1.067E+00	4.910E-01	4.910E-01	48.51
U-235	89.96	15	3.47	5.686E+00	3.769E-01	3.769E-01	339.18
	93.35	57	5.60	5.851E+00	8.715E-01	8.715E-01	114.80
	143.76	-----	10.96*	6.480E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.221E+00	-----	Line Not Found	-----
	185.72	35	57.20	5.853E+00	5.157E-02	5.157E-02	163.13
AM-243	205.31	-----	5.01	5.541E+00	-----	Line Not Found	-----
	43.53	-----	5.90	6.298E-01	-----	Line Not Found	-----
ANH-511	74.66	127	67.20*	4.424E+00	2.130E-01	2.130E-01	51.46
	511.00	57	100.00*	2.905E+00	9.736E-02	9.736E-02	76.86

Flag: "*" = Keyline

Total number of lines in spectrum 45
Number of unidentified lines 10
Number of lines tentatively identified by NID 35 77.78%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.318E+00	6.318E+00	0.978E+00	15.49	
CO-60	5.27Y	1.02	5.485E-02	5.581E-02	3.960E-02	70.96	
NB-95M	64.03D	1.68	1.441E-01	2.427E-01	2.605E-01	107.35	
BA-137M	30.08Y	1.00	2.461E+00	2.469E+00	0.164E+00	6.64	
CS-137	30.08Y	1.00	2.600E+00	2.608E+00	0.173E+00	6.64	
TL-208	1.41E+10Y	1.00	2.338E-01	2.338E-01	0.683E-01	29.23	
BI-211	7.04E+08Y	1.00	1.346E+00	1.346E+00	0.507E+00	37.68	
PB-212	1.41E+10Y	1.00	7.654E-01	7.654E-01	1.151E-01	15.03	
BI-214	1600.00Y	1.00	4.358E-01	4.358E-01	1.205E-01	27.64	
PB-214	1600.00Y	1.00	4.884E-01	4.884E-01	1.840E-01	37.68	
RN-222	1600.00Y	1.00	4.358E-01	4.358E-01	1.205E-01	27.64	
RA-224	1.41E+10Y	1.00	1.409E+00	1.409E+00	0.975E+00	69.14	
RA-226	1600.00Y	1.00	4.358E-01	4.358E-01	1.205E-01	27.64	
AC-228	1.41E+10Y	1.00	4.899E-01	4.899E-01	2.186E-01	44.63	
RA-228	1.41E+10Y	1.00	4.899E-01	4.899E-01	2.186E-01	44.63	
TH-228	1.41E+10Y	1.00	7.654E-01	7.654E-01	1.151E-01	15.03	
TH-230	7.54E+04Y	1.00	4.358E-01	4.358E-01	1.205E-01	27.64	
PA-231	7.04E+08Y	1.00	6.518E-01	6.518E-01	7.714E-01	118.34	
TH-232	1.41E+10Y	1.00	4.899E-01	4.899E-01	2.186E-01	44.63	
U-234	2.45E+05Y	1.00	4.358E-01	4.358E-01	1.205E-01	27.64	
U-235	7.04E+08Y	1.00	5.157E-02	5.157E-02	8.413E-02	163.13	K
AM-243	7370.00Y	1.00	2.130E-01	2.130E-01	1.096E-01	51.46	
ANH-511	1.00E+09Y	1.00	9.736E-02	9.736E-02	7.484E-02	76.86	
Total Activity :			2.125E+01	2.136E+01			

Grand Total Activity : 2.125E+01 2.136E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	151.39	41	77	1.40	302.98	300	7	9.42E-03	85.1	6.39E+00	T
0	195.20	33	89	1.31	390.68	387	7	7.67E-03	****	5.70E+00	
1	232.43	33	52	1.47	465.17	463	26	7.85E-03	74.9	5.13E+00	
0	454.75	57	99	5.24	910.16	902	20	1.44E-02	93.7	3.17E+00	T
0	463.08	28	61	0.60	926.83	922	9	7.05E-03	****	3.13E+00	T
0	542.27	32	26	3.30	1085.32	1079	14	8.32E-03	79.0	2.78E+00	
0	620.04	31	12	4.56	1240.98	1234	12	8.11E-03	60.1	2.51E+00	T
0	652.36	28	9	2.37	1305.67	1300	11	7.47E-03	56.5	2.42E+00	
0	720.77	12	6	1.52	1442.58	1435	12	3.33E-03	****	2.24E+00	T
0	726.94	50	8	2.59	1454.94	1447	15	1.35E-02	37.8	2.22E+00	T
0	778.12	7	9	1.42	1557.37	1550	9	1.93E-03	****	2.11E+00	T
0	818.75	7	26	6.24	1638.69	1624	17	1.81E-03	****	2.02E+00	T
0	841.19	10	16	0.86	1683.61	1676	12	2.73E-03	****	1.98E+00	
0	964.47	23	0	1.46	1930.35	1924	11	6.39E-03	41.7	1.77E+00	T
0	1237.68	21	0	2.29	2477.19	2473	9	5.83E-03	43.6	1.44E+00	T
0	1268.32	6	9	3.23	2538.50	2530	12	1.73E-03	****	1.41E+00	
0	1281.51	10	4	0.81	2564.91	2560	9	2.70E-03	****	1.39E+00	
0	1295.25	6	4	0.50	2592.42	2588	8	1.67E-03	****	1.38E+00	
0	1342.61	9	3	3.44	2687.19	2681	11	2.57E-03	95.6	1.34E+00	
0	1472.57	10	3	1.34	2947.31	2941	11	2.88E-03	87.3	1.24E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677006.CNF;1  *
* Acquisition date   : 28-JUN-2016 13:08:10 Sensitivity      : 3.000          *
* Detector ID        : GAM28 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.38 Half life ratio  : *****      *
* Sample date        : 11-MAY-2016 10:24:00 Nuclide Library : SOLID       *
* Sample ID          : G398677006 Analyst initials: MXR1         *
* Batch Number       : 1572231 Sample Quantity : 1.5045E+02 GRAM    *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000         *
*                                     Dry Weight    : 0.00000         *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 27-JUL-2015 07:57:17 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.398E-01
CO-60	2.697E-02
NB-95M	1.539E-01
BA-137M	2.650E-02
CS-137	2.799E-02
TL-208	2.761E-02
PB-212	5.245E-02
BI-214	6.186E-02
PB-214	7.142E-02
RN-222	6.186E-02
RA-224	5.618E-01
RA-226	6.186E-02
AC-228	7.628E-02
RA-228	7.628E-02
TH-228	5.245E-02
TH-230	6.186E-02
PA-231	4.782E-01
TH-232	7.628E-02
U-234	6.186E-02
U-235	2.090E-01
AM-243	4.827E-02
ANH-511	2.854E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.109E-01	NOT IDENT.
NA-22	2.604E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.796E-02	NOT IDENT.
SC-46	3.388E-02	FAIL ABUN
V-48	1.975E-01	NOT IDENT.
CR-51	8.460E-01	NOT IDENT.
MN-54	2.281E-02	NOT IDENT.
CO-56	3.768E-02	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	2.591E-02	NOT IDENT.
CO-58	4.796E-02	NOT IDENT.
FE-59	1.034E-01	NOT IDENT.
ZN-65	6.380E-02	NOT IDENT.
GE-68	8.852E-01	NOT IDENT.
AS-73	9.944E-01	NOT IDENT.
AS-74	2.975E-01	NOT IDENT.
SE-75	5.233E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.953E-01	NOT IDENT.
RB-83	7.973E-02	NOT IDENT.
KR-85	8.781E+00	NOT IDENT.
SR-85	6.577E-02	NOT IDENT.
RB-86	1.509E+00	NOT IDENT.
Y-88	3.100E-02	NOT IDENT.
Y-91	2.299E+01	NOT IDENT.
NB-94	2.652E-02	NOT IDENT.
NB-95	5.171E-02	NOT IDENT.
ZR-95	7.414E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.924E-02	NOT IDENT.
RH-102	3.315E-02	NOT IDENT.
RU-103	6.218E-02	FAIL ABUN
RH-106	3.111E-01	NOT IDENT.
RU-106	3.111E-01	NOT IDENT.
AG-108M	3.242E-02	NOT IDENT.
CD-109	8.358E-01	NOT IDENT.
AG-110M	4.083E-02	FAIL ABUN
SN-113	6.113E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.637E-01	NOT IDENT.
TE-123M	3.136E-02	NOT IDENT.
SB-124	7.720E-02	NOT IDENT.
SB-125	1.078E-01	FAIL ABUN
TE-125M	1.316E+01	NOT IDENT.
I-126	9.143E-01	NOT IDENT.
SB-126	5.974E-01	FAIL ABUN
SN-126	7.684E-02	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.091E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.984E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.325E-02	FAIL ABUN
CS-135	1.460E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.634E-01	FAIL ABUN
CE-139	3.420E-02	NOT IDENT.
BA-140	1.636E+00	NOT IDENT.
LA-140	3.270E-01	NOT IDENT.
CE-141	1.286E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.946E-01	NOT IDENT.
PM-144	3.299E-02	NOT IDENT.
PR-144	2.510E+00	NOT IDENT.
PM-146	5.061E-02	FAIL ABUN
ND-147	4.349E+00	FAIL ABUN
PM-147	7.014E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.851E-02	FAIL ABUN
EU-152	1.045E-01	FAIL ABUN
GD-153	8.392E-02	NOT IDENT.
EU-154	7.254E-02	NOT IDENT.
EU-155	1.012E-01	NOT IDENT.
TB-160	1.568E-01	NOT IDENT.
HO-166M	4.441E-02	NOT IDENT.
TM-171	1.633E+01	NOT IDENT.
HF-172	1.825E-01	NOT IDENT.
LU-172	5.463E-02	FAIL ABUN
LU-176	2.879E-02	NOT IDENT.
HF-181	7.920E-02	NOT IDENT.
TA-182	1.697E-01	FAIL ABUN
RE-183	2.828E-01	NOT IDENT.

RE-184	1.665E-01	NOT IDENT.
W-188	9.494E+00	NOT IDENT.
IR-192	4.647E-02	FAIL ABUN
HG-203	6.267E-02	NOT IDENT.
BI-207	4.870E-02	FAIL ABUN
PB-210	3.300E+00	NOT IDENT.
BI-211	3.413E-01	FAIL ABUN
PB-211	7.845E-01	NOT IDENT.
BI-212	5.681E-01	FAIL ABUN
RN-219	4.308E-01	NOT IDENT.
RA-223	6.501E-01	FAIL ABUN
AC-227	2.652E-01	FAIL ABUN
TH-227	2.652E-01	FAIL ABUN
TH-229	4.875E-01	NOT IDENT.
TH-231	6.501E-01	FAIL ABUN
PA-233	5.957E-02	FAIL ABUN
PA-234	2.008E-01	NOT IDENT.
PA-234M	3.440E+00	NOT IDENT.
TH-234	1.243E+00	FAIL ABUN
NP-237	5.957E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.243E+00	FAIL ABUN
NP-239	2.502E-01	NOT IDENT.
PU-239	3.143E+02	NOT IDENT.
AM-241	1.492E-01	NOT IDENT.
CM-243	9.132E-02	NOT IDENT.
BK-247	7.785E-02	NOT IDENT.
CM-247	4.061E-02	NOT IDENT.
CF-249	4.423E-02	NOT IDENT.
CF-251	1.246E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677006.CNF;1
Acquisition date : 28-JUN-2016 13:08:10 Sensitivity : 3.000
Detector ID : GAM28 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.38 Half life ratio : *****
Sample date : 11-MAY-2016 10:24:00 Nuclide Library : SOLID
Sample ID : G398677006 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5045E+02 GRAM
Quantity Err(%) : 1.3293E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 27-JUL-2015 07:57:17 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.318E+00	1.119E+00	1.119E+00
CO-60	5.581E-02	3.911E-02	3.911E-02
NB-95M	2.427E-01	2.564E-01	2.564E-01
BA-137M	2.469E+00	2.559E-01	2.559E-01
CS-137	2.608E+00	2.702E-01	2.702E-01
TL-208	2.338E-01	6.972E-02	6.972E-02
PB-212	7.654E-01	1.276E-01	1.276E-01
BI-214	4.358E-01	1.234E-01	1.234E-01
PB-214	4.884E-01	1.844E-01	1.844E-01
RN-222	4.358E-01	1.234E-01	1.234E-01
RA-224	2.195E-01	1.074E+00	1.074E+00
RA-226	4.358E-01	1.234E-01	1.234E-01
AC-228	4.899E-01	2.244E-01	2.244E-01
RA-228	4.899E-01	2.244E-01	2.244E-01
TH-228	7.654E-01	1.276E-01	1.276E-01
TH-230	4.358E-01	1.234E-01	1.234E-01
PA-231	6.518E-01	7.697E-01	7.697E-01
TH-232	4.899E-01	2.244E-01	2.244E-01
U-234	4.358E-01	1.234E-01	1.234E-01
U-235	2.564E-01	2.158E-01	2.158E-01
AM-243	1.549E-01	1.108E-01	1.108E-01
ANH-511	9.736E-02	7.378E-02	7.378E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.087E-01	6.608E-01	6.860E-01	NOT IDENT.
NA-22	-2.926E-03	4.155E-02	4.157E-02	NOT IDENT.
NA-24	1.564E+21	4.758E+21	0.000E+00	SHORT HLIF
AL-26	1.612E-02	2.838E-02	2.929E-02	NOT IDENT.
SC-46	-9.477E-03	4.045E-02	4.067E-02	FAIL ABUN
V-48	-2.741E-02	2.331E-01	2.335E-01	NOT IDENT.
CR-51	1.346E-02	9.797E-01	9.797E-01	NOT IDENT.
MN-54	-7.286E-03	3.369E-02	3.385E-02	NOT IDENT.

CO-56	-2.063E-02	5.733E-02	5.808E-02	FAIL ABUN
MN-56	-1.000E+41	2.758E+41	0.000E+00	SHORT HLIF
CO-57	-3.398E-03	2.830E-02	2.834E-02	NOT IDENT.
CO-58	5.371E-02	5.422E-02	5.938E-02	NOT IDENT.
FE-59	-9.460E-03	1.224E-01	1.225E-01	NOT IDENT.
ZN-65	-1.970E-02	9.200E-02	9.243E-02	NOT IDENT.
GE-68	-1.796E-01	1.067E+00	1.070E+00	NOT IDENT.
AS-73	-6.349E-01	1.161E+00	1.196E+00	NOT IDENT.
AS-74	-1.509E-01	3.639E-01	3.702E-01	NOT IDENT.
SE-75	3.026E-02	5.739E-02	5.899E-02	NOT IDENT.
BR-77	1.805E+06	2.526E+06	2.654E+06	SHORT HLIF
SR-82	-1.127E-01	7.228E-01	7.246E-01	NOT IDENT.
RB-83	-9.083E-03	9.201E-02	9.210E-02	NOT IDENT.
KR-85	1.792E+01	9.538E+00	1.250E+01	NOT IDENT.
SR-85	1.338E-01	7.146E-02	9.352E-02	NOT IDENT.
RB-86	-1.834E+00	2.159E+00	2.312E+00	NOT IDENT.
Y-88	-5.971E-03	3.870E-02	3.879E-02	NOT IDENT.
Y-91	1.115E+01	2.521E+01	2.570E+01	NOT IDENT.
NB-94	-9.455E-03	3.237E-02	3.265E-02	NOT IDENT.
NB-95	1.907E-02	5.852E-02	5.915E-02	NOT IDENT.
ZR-95	-1.460E-03	8.768E-02	8.769E-02	NOT IDENT.
NB-97	1.000E+41	4.662E+40	0.000E+00	SHORT HLIF
ZR-97	2.298E+20	3.091E+20	0.000E+00	SHORT HLIF
MO-99	4.433E+03	4.368E+04	4.373E+04	SHORT HLIF
TC-99M	-1.000E+41	9.304E+40	0.000E+00	SHORT HLIF
RH-101	-1.179E-02	3.258E-02	3.301E-02	NOT IDENT.
RH-102	-5.922E-02	4.862E-02	5.546E-02	NOT IDENT.
RU-103	-9.579E-02	8.105E-02	9.184E-02	FAIL ABUN
RH-106	2.196E-01	3.777E-01	3.905E-01	NOT IDENT.
RU-106	2.196E-01	3.777E-01	3.905E-01	NOT IDENT.
AG-108M	6.946E-03	3.587E-02	3.601E-02	NOT IDENT.
CD-109	8.951E-01	9.040E-01	9.900E-01	NOT IDENT.
AG-110M	-7.884E-03	4.792E-02	4.805E-02	FAIL ABUN
SN-113	8.351E-03	7.133E-02	7.143E-02	NOT IDENT.
CD-115	-2.957E+04	3.364E+05	3.366E+05	SHORT HLIF
SN-117M	-1.416E-02	2.915E-01	2.916E-01	NOT IDENT.
TE-123M	-2.360E-04	3.459E-02	3.459E-02	NOT IDENT.
SB-124	3.043E-03	8.961E-02	8.962E-02	NOT IDENT.
SB-125	1.139E-01	1.124E-01	1.236E-01	FAIL ABUN
TE-125M	-3.503E+00	1.438E+01	1.447E+01	NOT IDENT.
I-126	-1.259E-01	1.260E+00	1.261E+00	NOT IDENT.
SB-126	7.710E-01	7.621E-01	8.376E-01	FAIL ABUN
SN-126	7.031E-02	8.358E-02	8.938E-02	NOT IDENT.
SB-127	-2.092E+02	4.524E+02	4.622E+02	SHORT HLIF
I-131	1.684E+00	2.297E+00	2.419E+00	NOT IDENT.
I-132	1.000E+41	6.120E+41	0.000E+00	SHORT HLIF
TE-132	1.566E+02	1.180E+03	1.182E+03	SHORT HLIF
BA-133	1.734E-02	5.103E-02	5.162E-02	NOT IDENT.
I-133	-1.588E+14	1.816E+15	1.818E+15	SHORT HLIF
CS-134	2.477E-02	3.675E-02	3.841E-02	FAIL ABUN
CS-135	1.301E-02	1.659E-01	1.660E-01	NOT IDENT.
I-135	1.000E+41	5.983E+41	0.000E+00	SHORT HLIF
CS-136	2.572E-01	4.970E-01	5.104E-01	FAIL ABUN
CE-139	2.522E-02	3.659E-02	3.832E-02	NOT IDENT.
BA-140	-3.647E-01	2.208E+00	2.214E+00	NOT IDENT.
LA-140	-1.472E-01	4.226E-01	4.277E-01	NOT IDENT.
CE-141	9.387E-02	1.360E-01	1.424E-01	NOT IDENT.
CE-143	2.008E+09	2.666E+09	2.816E+09	SHORT HLIF
CE-144	6.693E-02	2.079E-01	2.101E-01	NOT IDENT.
PM-144	8.078E-03	3.761E-02	3.779E-02	NOT IDENT.
PR-144	6.078E-01	2.863E+00	2.876E+00	NOT IDENT.
PM-146	1.392E-01	1.286E-01	1.431E-01	FAIL ABUN
ND-147	-8.604E-01	5.059E+00	5.074E+00	FAIL ABUN
PM-147	-1.385E+02	7.687E+02	7.712E+02	NOT IDENT.
PM-149	-7.972E+05	2.985E+06	3.007E+06	SHORT HLIF
EU-150	7.161E-04	3.790E-02	3.790E-02	FAIL ABUN
EU-152	2.465E-02	1.240E-01	1.245E-01	FAIL ABUN
GD-153	1.169E-02	1.075E-01	1.076E-01	NOT IDENT.
EU-154	-8.148E-03	1.158E-01	1.158E-01	NOT IDENT.
EU-155	9.811E-02	1.032E-01	1.123E-01	NOT IDENT.
TB-160	5.926E-02	1.783E-01	1.803E-01	NOT IDENT.
HO-166M	-9.424E-03	5.511E-02	5.528E-02	NOT IDENT.
TM-171	-8.262E+00	1.878E+01	1.914E+01	NOT IDENT.
HF-172	-6.122E-02	2.022E-01	2.041E-01	NOT IDENT.
LU-172	-9.123E-03	6.516E-02	6.529E-02	FAIL ABUN
LU-176	1.312E-02	3.225E-02	3.279E-02	NOT IDENT.
HF-181	-2.106E-02	9.167E-02	9.216E-02	NOT IDENT.
TA-182	-8.922E-02	2.146E-01	2.183E-01	FAIL ABUN

RE-183	2.545E-01	2.994E-01	3.206E-01	NOT IDENT.
RE-184	7.476E-02	1.898E-01	1.928E-01	NOT IDENT.
W-188	4.961E+00	1.191E+01	1.212E+01	NOT IDENT.
IR-192	3.156E-02	5.105E-02	5.299E-02	FAIL ABUN
HG-203	1.900E-02	7.042E-02	7.094E-02	NOT IDENT.
BI-207	6.374E-02	4.863E-02	5.649E-02	FAIL ABUN
PB-210	2.446E-01	3.639E+00	3.641E+00	NOT IDENT.
BI-211	1.346E+00	5.085E-01	7.916E-01	FAIL ABUN
PB-211	-1.150E-01	8.854E-01	8.869E-01	NOT IDENT.
BI-212	1.696E+00	6.497E-01	1.003E+00	FAIL ABUN
RN-219	-1.340E-01	4.919E-01	4.956E-01	NOT IDENT.
RA-223	3.408E-01	7.259E-01	7.419E-01	FAIL ABUN
AC-227	6.703E-02	2.976E-01	2.991E-01	FAIL ABUN
TH-227	6.703E-02	2.976E-01	2.991E-01	FAIL ABUN
TH-229	1.478E-01	6.056E-01	6.093E-01	NOT IDENT.
TH-231	3.408E-01	7.259E-01	7.419E-01	FAIL ABUN
PA-233	-5.154E-02	7.363E-02	7.721E-02	FAIL ABUN
PA-234	-5.670E-02	2.498E-01	2.511E-01	NOT IDENT.
PA-234M	1.541E+00	3.696E+00	3.761E+00	NOT IDENT.
TH-234	-4.890E-01	1.396E+00	1.413E+00	FAIL ABUN
NP-237	-5.154E-02	7.363E-02	7.721E-02	FAIL ABUN
NP-238	4.857E+05	7.607E+05	7.916E+05	SHORT HLIF
U-238	-4.890E-01	1.396E+00	1.413E+00	FAIL ABUN
NP-239	-3.498E-03	2.708E-01	2.708E-01	NOT IDENT.
PU-239	1.655E+02	3.318E+02	3.401E+02	NOT IDENT.
AM-241	7.392E-02	1.617E-01	1.651E-01	NOT IDENT.
CM-243	-1.031E-01	1.139E-01	1.230E-01	NOT IDENT.
BK-247	4.500E-02	8.584E-02	8.820E-02	NOT IDENT.
CM-247	5.880E-03	4.493E-02	4.501E-02	NOT IDENT.
CF-249	-4.307E-03	5.247E-02	5.251E-02	NOT IDENT.
CF-251	-7.230E-02	1.429E-01	1.466E-01	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	93.7825	87.09	128.3463	136.47	104.9141
45.60	97.4031	87.57	128.4458	140.51	0.0000
46.54	89.2263	88.03	128.5412	143.76	102.1444
49.72	0.0000	88.34	128.6050	144.24	95.7560
51.35	88.1056	88.47	128.6314	145.44	108.7975
51.87	80.7693	89.96	128.9372	152.43	95.1688
52.39	95.7591	1093.63	129.0760	153.25	90.7911
52.97	90.5557	91.11	129.1717	323.87	83.4381
53.44	99.1812	92.59	129.4706	156.02	100.7746
54.07	90.7749	93.35	129.6234	158.56	101.0564
57.36	0.0000	94.56	91.3655	159.00	102.9765
57.53	109.7405	94.65	91.3780	162.33	107.1064
57.98	96.9207	94.67	91.3808	162.66	106.2048
59.27	89.6222	94.87	91.4087	163.33	117.5671
59.32	89.6315	97.43	102.1530	165.86	96.1939
59.54	101.5565	98.43	101.7285	176.31	110.5891
60.96	137.6076	98.44	101.7303	176.60	119.2036
61.17	136.5820	99.53	91.4743	177.52	119.3151
62.93	110.9573	100.11	83.4408	181.07	0.0000
63.29	112.1252	102.03	98.7849	181.52	115.0031
63.58	107.8326	103.18	118.7401	184.41	119.9460
64.28	91.6204	103.37	118.7728	143.76	113.5572
66.73	131.5094	105.21	87.5648	193.51	93.0835
67.24	123.9587	105.31	87.5774	197.03	107.4040
125.81	121.8664	106.12	106.9678	198.01	119.9666
67.75	121.8828	106.47	106.1441	201.83	102.6096
69.67	104.1409	109.28	111.8493	203.43	94.9316
70.83	99.3951	111.00	105.0542	205.31	105.8799
72.81	126.3568	111.76	0.0000	210.85	100.5012
72.87	121.3824	114.06	101.9498	215.65	97.9645
74.66	129.0026	116.30	0.0000	222.11	107.4768
74.82	129.0392	116.74	109.4366	227.09	95.9451
74.97	129.0734	119.76	109.8758	227.38	101.6809
77.11	129.5619	121.12	109.1770	228.16	0.0000
78.74	97.4467	121.22	109.1915	228.18	100.8362
79.69	89.1917	121.78	108.3754	116.74	100.8362
80.12	102.7299	122.06	111.1026	235.69	88.5895
80.19	102.7425	122.92	104.0506	235.96	88.6089
80.57	123.0338	123.07	102.2766	238.63	88.8057
81.00	123.1235	265.00	108.6422	238.98	0.0000
81.07	132.6966	125.81	117.0419	240.99	88.9779
81.75	135.1007	127.23	115.4485	242.00	89.0514
83.79	130.4786	127.91	99.2994	244.70	84.3794
84.00	132.2189	129.30	96.7592	252.40	0.0000
85.43	137.6281	131.20	108.7729	252.80	89.8289
86.55	128.2337	133.02	113.5588	254.15	0.0000
86.79	128.2837	133.52	94.5388	256.23	92.1190
86.94	128.3153	136.00	101.2077	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	67.9970	355.39	0.0000	584.27	26.6447
264.80	68.0051	356.01	50.9072	595.83	38.6772
265.00	68.0152	364.49	51.8351	427.87	46.7062
268.22	77.4799	366.42	0.0000	602.52	0.0000
269.46	79.6213	372.51	63.1700	604.72	44.7957
270.03	83.7933	375.05	64.3765	607.14	39.8594
271.23	78.6927	377.52	63.3596	609.32	35.9060
273.65	105.8054	356.01	71.4082	610.33	28.2711
276.40	87.3133	388.16	76.0632	614.28	29.9832
277.37	80.0948	388.63	78.3217	618.01	20.0200
277.60	75.9474	391.69	72.8567	620.36	18.3696
278.00	74.9290	264.66	81.1198	621.93	25.0653
279.20	79.1613	401.81	73.0562	630.19	0.0000
279.54	81.2659	402.40	67.6675	631.29	30.1941
279.70	79.1914	404.85	74.9888	633.25	23.1673
280.46	80.2780	410.95	60.7416	634.78	20.1577
283.69	67.9279	413.71	83.5356	635.95	19.1591
284.31	65.8676	414.70	79.9466	636.99	24.2109
285.41	64.8741	423.72	73.9550	645.85	26.9974
285.90	0.0000	427.09	62.1994	657.76	10.1719
287.50	60.7807	427.87	51.2449	657.90	0.0000
290.67	62.1801	433.94	59.6767	661.66	22.6389
293.27	0.0000	439.40	81.0294	664.57	0.0000
351.93	60.6964	453.88	49.4844	666.33	22.1131
295.96	63.2593	463.37	65.2678	666.50	22.1147
879.38	63.3765	468.07	73.2128	667.71	0.0000
299.98	69.3597	473.00	0.0000	677.62	23.5772
300.09	69.3647	475.06	74.0982	685.70	0.0000
300.13	69.3667	476.78	63.8355	695.00	26.8303
301.36	81.2801	477.60	61.0446	696.49	29.9424
302.85	91.5350	482.18	58.3604	696.51	29.9431
256.23	89.9434	487.02	52.8391	697.00	27.8833
304.85	78.0832	492.35	0.0000	697.30	29.9516
306.78	77.5502	497.08	57.8420	697.49	32.0195
308.46	70.1955	505.52	50.7786	702.65	30.0125
311.90	78.8892	507.63	0.0000	706.68	27.9848
316.51	55.6094	511.00	47.7301	711.68	23.0756
319.41	82.5069	514.00	38.2385	720.70	26.0468
320.08	71.8234	514.00	38.2385	721.93	0.0000
321.04	58.9973	520.40	35.4779	722.78	5.2133
323.87	64.4824	520.69	0.0000	722.91	5.2135
325.23	72.0708	522.65	0.0000	723.31	5.2144
328.76	74.3948	527.90	0.0000	724.19	5.2159
333.37	62.2916	528.26	39.4585	727.33	13.9255
333.97	79.6257	529.59	36.5936	733.00	15.6984
334.37	81.3779	529.87	0.0000	735.93	20.9531
338.28	71.6034	531.02	44.3267	333.97	18.8684
338.32	71.6044	537.26	49.9310	739.50	0.0000
311.90	78.2227	546.56	0.0000	747.24	18.9352
340.48	78.2227	552.55	38.9258	748.06	17.8882
340.55	78.2260	563.25	34.2233	752.31	12.6463
344.28	73.4341	569.33	34.3156	753.82	15.8163
345.93	62.5054	946.00	32.3571	756.73	18.9989
351.06	87.5000	569.70	32.3595	756.80	18.9993
351.93	64.5664	583.19	26.6322	884.68	27.5133

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	25.4133	1274.44	17.0841	1620.50	1.8825
766.42	23.3003	1001.03	10.4546	1621.92	3.7662
766.84	24.3634	1002.74	12.3613	1678.03	0.0000
772.60	0.0000	1004.73	22.8340	1690.97	3.8160
776.52	20.1945	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.3845
778.90	21.2749	1028.54	0.0000	1063.66	16.4563
783.70	0.0000	1037.84	15.3646	1771.35	9.4883
785.37	14.9256	1038.76	0.0000	1791.20	0.0000
792.07	16.0287	631.29	16.3643	1808.65	2.9240
794.95	17.1141	1048.07	11.5562	1810.72	0.0000
795.86	12.4827	1049.04	8.6693	1836.06	4.8969
810.06	10.7510	1050.41	15.4180		
810.29	10.7520	1063.66	9.6712		
344.28	12.5445	1077.00	17.4712		
810.76	12.5459	1077.34	13.5898		
815.77	28.0065	1085.87	16.5400		
1048.07	28.7507	1093.63	21.4486		
832.01	19.2530	1099.45	14.6466		
834.85	14.4535	1112.07	6.7179		
835.71	9.0358	1112.84	8.3991		
836.80	0.0000	1115.54	16.8101		
846.75	0.0000	1120.29	14.7272		
846.77	21.7646	1120.55	15.1492		
856.80	16.3766	1221.41	11.7852		
860.56	17.4895	1129.67	13.7790		
871.09	15.3549	1131.51	0.0000		
873.19	15.3651	1147.95	0.0000		
875.33	0.0000	1173.23	16.9191		
879.38	18.6942	1177.95	17.0815		
880.51	14.6673	1189.05	14.9878		
883.24	18.3500	1204.77	13.0397		
884.68	19.2761	1221.41	23.1647		
889.28	15.6269	1231.02	21.2000		
894.76	12.8912	1235.36	8.6621		
898.04	15.6698	1238.28	16.1803		
900.72	16.6051	1260.41	0.0000		
903.28	11.0789	1271.87	8.7378		
911.20	9.5194	1274.44	9.7922		
912.08	4.7610	1274.54	9.7926		
923.98	0.0000	1291.59	14.0452		
926.50	13.0176	1298.22	0.0000		
929.11	13.9584	1312.11	6.1741		
937.49	15.8593	1332.49	9.3043		
944.13	18.6955	1362.66	0.0000		
946.00	15.8998	1365.19	8.3317		
949.00	13.1056	1368.63	0.0000		
667.71	0.0000	1384.29	9.4127		
962.31	12.8890	1408.01	5.2566		
964.08	16.1196	1457.56	0.0000		
966.17	0.0000	1460.82	7.4429		
911.20	24.2139	1489.16	5.3479		
968.97	24.2139	1505.03	6.4387		
983.53	14.1846	1584.12	10.2807		
984.45	0.0000	1596.21	7.4947		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 14:10:22.69

```
*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677007.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM31.CNF;292
Background date    : 26-JUN-2016 12:05:46
Sample date       : 11-MAY-2016 10:30:00 Acquisition date : 28-JUN-2016 13:08:29
Sample ID        : G398677007 Sample quantity : 1.47580E+02 GRAM
Detector name     : GAM31 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:06.39 0.2%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.02*	14	216	0.52	93.68	90	7	3.96E-03	180.8	
2	0	63.46*	45	209	1.46	126.53	123	7	1.26E-02	58.9	
3	4	74.94	129	123	1.06	149.49	145	13	3.59E-02	16.0	1.43E+00
4	4	77.13*	187	123	1.00	153.85	145	13	5.18E-02	12.2	
5	3	84.02*	27	119	1.27	167.63	164	14	7.59E-03	75.9	1.36E+00
6	3	87.20	65	102	0.99	173.98	164	14	1.80E-02	27.1	
7	0	92.95*	61	166	1.36	185.47	181	10	1.70E-02	44.7	
8	0	186.08*	38	82	1.65	371.60	367	9	1.05E-02	49.6	
9	0	229.61	23	22	0.93	458.59	457	5	6.30E-03	37.3	
10	5	238.70*	179	59	1.20	476.76	471	17	4.97E-02	10.7	7.39E-01
11	5	241.47	49	56	1.29	482.30	471	17	1.35E-02	34.3	
12	0	270.26	21	56	1.51	539.84	535	8	5.75E-03	66.4	
13	0	295.47*	57	74	1.44	590.23	585	10	1.59E-02	31.6	
14	0	301.09	20	57	2.79	601.46	595	10	5.52E-03	74.7	
15	0	338.61*	38	70	1.36	676.45	671	11	1.06E-02	45.6	
16	0	352.01*	95	66	1.33	703.23	699	12	2.64E-02	20.5	
17	0	369.13	45	35	0.70	737.45	730	14	1.24E-02	32.8	
18	0	374.96	47	34	2.20	749.09	744	14	1.30E-02	29.4	
19	0	463.17	19	27	0.75	925.40	922	7	5.24E-03	53.4	
20	0	510.55*	6	47	1.99	1020.08	1012	14	1.76E-03	280.2	
21	0	583.34*	54	28	1.16	1165.57	1159	14	1.49E-02	25.6	
22	0	609.26*	80	32	1.53	1217.37	1212	11	2.23E-02	18.3	
23	0	631.35	20	10	3.50	1261.53	1254	13	5.62E-03	38.8	
24	0	661.43	530	19	1.51	1321.66	1313	15	1.47E-01	4.7	
25	0	727.99	17	16	0.85	1454.69	1448	12	4.67E-03	55.5	
26	0	817.38	5	6	0.45	1633.36	1629	8	1.29E-03	103.4	
27	0	860.45	12	6	0.77	1719.44	1715	8	3.38E-03	45.0	
28	0	911.23*	29	27	1.05	1820.95	1815	12	7.94E-03	42.0	
29	0	968.74*	28	12	2.13	1935.90	1929	14	7.86E-03	34.5	
30	0	980.05	10	0	0.73	1958.50	1954	8	2.78E-03	31.6	
31	0	1000.47	11	6	1.48	1999.32	1992	12	3.06E-03	53.8	
32	0	1025.20	10	6	3.87	2048.75	2042	12	2.78E-03	58.3	
33	0	1110.41	6	8	2.24	2219.07	2210	11	1.62E-03	104.0	
34	0	1120.27	25	14	3.04	2238.79	2231	18	6.94E-03	39.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1153.02	8	0	0.73	2304.25	2301	6	2.22E-03	35.4	
36	0	1173.41	8	1	0.58	2345.01	2342	6	2.13E-03	43.7	
37	0	1460.35*	61	6	1.55	2918.57	2912	14	1.70E-02	16.1	
38	0	1591.63	9	0	1.07	3181.00	3177	9	2.50E-03	33.3	
39	0	1629.65	9	0	0.58	3257.00	3251	11	2.50E-03	33.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 14:10:24

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677007.CNF;1
 Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
 Sample title : MXR1
 Sample date : 11-MAY-2016 10:30:00 Acquisition date : 28-JUN-2016 13:08:29
 Sample ID : G398677007 Sample quantity : 147.58 GRAM
 Sample type : SOLID Sample geometry :
 Detector name : GAMMA31 Detector geometry: CAN
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.39 0.2%
 Energy tolerance : 1.50 keV Half life ratio : 10.00
 Errors propagated: No Systematic Error : 0.00 %
 Efficiency type : Linear Efficiencies at : Peak Energy
 Abundance limit : 75.00

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.949E-01	4.053E+00	4.053E+00	32.29	OK
CD-109	88.03	3.70*	5.391E+00	1.439E+00	1.546E+00	81.93	OK
SN-126	64.28	9.60	5.585E+00	5.481E-01	5.481E-01	117.86	OK
	86.94	8.90	5.391E+00	5.981E-01	5.981E-01	81.93	OK
	87.57	37.00*	5.391E+00	1.439E-01	1.439E-01	81.93	OK
BA-137M	661.66	89.90*	1.341E+00	2.331E+00	2.338E+00	9.40	OK
CS-137	661.66	85.10*	1.341E+00	2.462E+00	2.470E+00	9.40	OK
TL-208	277.37	6.60	2.816E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.486E+00	2.276E-01	2.276E-01	51.28	OK
	860.56	12.50	1.084E+00	4.641E-01	4.641E-01	90.04	OK
PB-210	46.54	4.25*	5.527E+00	4.040E-01	4.056E-01	361.57	OK
PB-212	74.82	10.28	5.475E+00	1.095E+00	1.095E+00	48.30	OK
	77.11	17.10	5.460E+00	1.280E+00	1.280E+00	24.33	OK
	238.63	43.60*	3.202E+00	7.470E-01	7.470E-01	21.33	OK
	300.09	3.30	2.621E+00	1.312E+00	1.312E+00	149.40	OK
BI-214	609.32	45.49*	1.434E+00	6.579E-01	6.580E-01	36.62	OK
	1120.29	14.92	8.740E-01	9.653E-01	9.653E-01	79.90	OK
	1764.49	15.30	5.813E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	5.476E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.460E+00	2.257E+00	2.257E+00	24.33	OK
	87.09	3.41	5.392E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.165E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	2.665E+00	6.688E-01	6.688E-01	63.27	OK
	351.93	35.60*	2.286E+00	6.579E-01	6.580E-01	40.94	OK
RN-222	609.32	45.49*	1.434E+00	6.579E-01	6.580E-01	36.62	OK
	1120.29	14.92	8.740E-01	9.653E-01	9.653E-01	79.90	OK
	1764.49	15.30	5.813E-01	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	3.171E+00	9.907E-01	9.907E-01	168.29	OK
RA-226	609.32	45.49*	1.434E+00	6.579E-01	6.580E-01	36.62	OK
	1120.29	14.92	8.740E-01	9.653E-01	9.653E-01	79.90	OK
	1764.49	15.30	5.813E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.365E+00	8.117E-01	8.117E-01	91.29	OK
	794.95	4.25	1.156E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	5.502E-01	5.502E-01	83.91	OK
	968.97	15.80	9.850E-01	9.291E-01	9.291E-01	68.97	OK
RA-228	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.365E+00	8.117E-01	8.117E-01	91.29	OK
	794.95	4.25	1.156E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	5.502E-01	5.502E-01	83.91	OK
	968.97	15.80	9.850E-01	9.291E-01	9.291E-01	68.97	OK
TH-228	74.82	10.28	5.475E+00	1.095E+00	1.095E+00	48.30	OK
	77.11	17.10	5.460E+00	1.280E+00	1.280E+00	24.33	OK
	238.63	43.60*	3.202E+00	7.470E-01	7.470E-01	21.33	OK
	300.09	3.30	2.621E+00	1.312E+00	1.312E+00	149.40	OK
TH-229	85.43	14.70	5.414E+00	2.184E-01	2.184E-01	151.79	OK
	88.47	24.00	5.391E+00	2.218E-01	2.218E-01	81.93	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	193.51	4.41*	3.791E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	3.546E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	1.434E+00	6.579E-01	6.579E-01	36.62	OK
	1120.29	14.92	8.740E-01	9.653E-01	9.653E-01	79.90	OK
	1764.49	15.30	5.813E-01	----- Line	Not Found	-----	Absent
PA-231	283.69	1.70	2.761E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	2.621E+00	8.095E-01	8.095E-01	149.40	OK
TH-232	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.365E+00	8.117E-01	8.117E-01	91.29	OK
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	5.502E-01	5.502E-01	83.91	OK
	968.97	15.80	9.850E-01	9.291E-01	9.291E-01	68.97	OK
TH-234	63.29	3.70*	5.585E+00	1.422E+00	1.422E+00	117.86	OK
	92.59	4.23	5.344E+00	1.703E+00	1.703E+00	89.46	OK
U-234	609.32	45.49*	1.434E+00	6.579E-01	6.579E-01	36.62	OK
	1120.29	14.92	8.740E-01	9.653E-01	9.653E-01	79.90	OK
	1764.49	15.30	5.813E-01	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	5.585E+00	1.422E+00	1.422E+00	117.86	OK
	92.59	4.23	5.344E+00	1.703E+00	1.703E+00	89.46	OK
AM-243	43.53	5.90	5.049E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.475E+00	1.676E-01	1.676E-01	48.30	OK
ANH-511	511.00	100.00*	1.661E+00	2.072E-02	2.072E-02	560.42	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677007.CNF;1
Acquisition date : 28-JUN-2016 13:08:29 Sensitivity : 3.000
Detector ID : GAM31 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:06.39 Half life ratio : *****
Sample date : 11-MAY-2016 10:30:00 Analyst initials: MXR1
Sample ID : G398677007 Sample Quantity : 1.4758E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.053E+00	1.283E+00	1.049E+00
CD-109	1.546E+00	1.242E+00	1.604E+00
SN-126	1.439E-01	1.155E-01	1.507E-01
BA-137M	2.338E+00	2.153E-01	8.319E-02
CS-137	2.470E+00	2.274E-01	8.788E-02
TL-208	2.276E-01	1.144E-01	8.760E-02
PB-210	4.056E-01	1.437E+00	1.543E+00
PB-212	7.470E-01	1.561E-01	1.388E-01
BI-214	6.580E-01	2.361E-01	2.322E-01
PB-214	6.580E-01	2.640E-01	2.203E-01
RN-222	6.580E-01	2.361E-01	2.322E-01
RA-224	9.907E-01	1.634E+00	1.490E+00
RA-226	6.580E-01	2.361E-01	2.322E-01
AC-228	5.502E-01	4.525E-01	3.885E-01
RA-228	5.502E-01	4.525E-01	3.885E-01
TH-228	7.470E-01	1.561E-01	1.388E-01
TH-229	-6.444E-03	7.495E-01	1.369E+00
TH-230	6.579E-01	2.361E-01	2.322E-01
PA-231	8.095E-01	1.185E+00	1.277E+00
TH-232	5.502E-01	4.525E-01	3.885E-01
TH-234	1.422E+00	1.642E+00	1.844E+00
U-234	6.579E-01	2.361E-01	2.322E-01
U-238	1.422E+00	1.642E+00	1.844E+00
AM-243	1.676E-01	7.931E-02	8.610E-02
ANH-511	2.072E-02	1.138E-01	1.003E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.985E-01	9.544E-01	1.803E+00	NOT IDENT.
NA-22	-3.597E-02	5.377E-02	9.345E-02	NOT IDENT.
NA-24	0.000E+00	8.160E+21	0.000E+00	SHORT HLIF
AL-26	1.106E-02	4.655E-02	1.096E-01	NOT IDENT.
SC-46	1.435E-02	6.865E-02	1.404E-01	FAIL ABUN

V-48	-1.104E-01	3.498E-01	6.263E-01	NOT IDENT.
CR-51	6.858E-01	1.363E+00	2.709E+00	NOT IDENT.
MN-54	-1.587E-02	4.932E-02	9.195E-02	NOT IDENT.
CO-56	2.711E-02	7.008E-02	1.474E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.293E-02	3.340E-02	6.776E-02	NOT IDENT.
CO-58	5.696E-02	8.948E-02	1.804E-01	NOT IDENT.
FE-59	7.052E-02	1.489E-01	3.455E-01	NOT IDENT.
CO-60	2.412E-02	5.347E-02	1.185E-01	FAIL ABUN
ZN-65	1.842E-02	1.514E-01	2.316E-01	NOT IDENT.
GE-68	8.854E-01	1.432E+00	3.371E+00	NOT IDENT.
AS-73	-1.562E-01	5.104E-01	9.566E-01	NOT IDENT.
AS-74	-1.057E-02	5.157E-01	1.010E+00	NOT IDENT.
SE-75	3.101E-02	8.083E-02	1.513E-01	NOT IDENT.
BR-77	0.000E+00	3.679E+05	0.000E+00	SHORT HLIF
SR-82	8.815E-01	1.121E+00	2.471E+00	NOT IDENT.
RB-83	-5.734E-02	1.394E-01	2.473E-01	NOT IDENT.
KR-85	6.854E+00	1.429E+01	2.464E+01	NOT IDENT.
SR-85	5.126E-02	1.071E-01	1.847E-01	NOT IDENT.
RB-86	1.794E+00	2.837E+00	6.687E+00	NOT IDENT.
Y-88	1.340E-02	6.446E-02	1.508E-01	NOT IDENT.
Y-91	-1.263E+01	3.714E+01	7.007E+01	NOT IDENT.
NB-94	6.088E-02	5.098E-02	1.134E-01	NOT IDENT.
NB-95	4.696E-02	7.580E-02	1.637E-01	NOT IDENT.
NB-95M	-1.413E-01	2.769E-01	4.481E-01	NOT IDENT.
ZR-95	5.689E-02	1.465E-01	3.035E-01	NOT IDENT.
NB-97	0.000E+00	8.116E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.972E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.629E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.461E-02	3.935E-02	7.070E-02	NOT IDENT.
RH-102	1.417E-01	1.078E-01	1.839E-01	FAIL ABUN
RU-103	9.542E-03	1.269E-01	2.380E-01	FAIL ABUN
RH-106	6.627E-02	5.473E-01	1.082E+00	NOT IDENT.
RU-106	6.627E-02	5.473E-01	1.082E+00	NOT IDENT.
AG-108M	1.297E-02	5.597E-02	1.065E-01	NOT IDENT.
AG-110M	1.299E-02	6.826E-02	1.406E-01	NOT IDENT.
SN-113	5.241E-02	8.293E-02	1.681E-01	NOT IDENT.
CD-115	0.000E+00	5.529E+05	0.000E+00	SHORT HLIF
SN-117M	6.791E-02	3.648E-01	6.909E-01	NOT IDENT.
TE-123M	1.740E-02	4.357E-02	8.377E-02	NOT IDENT.
SB-124	-2.795E-02	2.087E-01	4.261E-01	NOT IDENT.
SB-125	-1.144E-01	1.793E-01	3.123E-01	FAIL ABUN
TE-125M	-1.819E+00	1.595E+01	3.022E+01	NOT IDENT.
I-126	-9.386E-01	2.087E+00	3.232E+00	NOT IDENT.
SB-126	-2.483E-02	1.522E+00	2.683E+00	NOT IDENT.
SB-127	0.000E+00	7.130E+02	0.000E+00	SHORT HLIF
I-131	-2.866E+00	3.830E+00	5.682E+00	NOT IDENT.
I-132	0.000E+00	1.696E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.123E+03	0.000E+00	SHORT HLIF
BA-133	-1.740E-02	7.284E-02	1.176E-01	NOT IDENT.
I-133	0.000E+00	2.921E+15	0.000E+00	SHORT HLIF
CS-134	5.544E-02	6.067E-02	1.336E-01	NOT IDENT.
CS-135	3.574E-02	2.701E-01	4.636E-01	NOT IDENT.
I-135	0.000E+00	1.177E+41	0.000E+00	SHORT HLIF
CS-136	2.847E-01	8.503E-01	1.798E+00	FAIL ABUN
CE-139	-1.406E-02	4.826E-02	8.715E-02	NOT IDENT.
BA-140	-3.334E+00	2.446E+00	4.006E+00	NOT IDENT.
LA-140	6.027E-01	8.910E-01	1.907E+00	NOT IDENT.
CE-141	-1.293E-01	1.684E-01	2.955E-01	NOT IDENT.
CE-143	0.000E+00	3.720E+09	0.000E+00	SHORT HLIF
CE-144	2.554E-02	2.602E-01	4.942E-01	NOT IDENT.
PM-144	1.144E-03	5.464E-02	1.068E-01	NOT IDENT.
PR-144	1.137E-01	4.165E+00	8.147E+00	NOT IDENT.
PM-146	3.778E-02	8.008E-02	1.557E-01	NOT IDENT.
ND-147	-6.119E+00	8.071E+00	1.349E+01	NOT IDENT.
PM-147	5.284E+02	9.101E+02	1.799E+03	NOT IDENT.
PM-149	0.000E+00	4.393E+06	0.000E+00	SHORT HLIF
EU-150	-9.547E-03	5.317E-02	8.636E-02	FAIL ABUN
EU-152	-5.798E-02	1.546E-01	2.609E-01	NOT IDENT.
GD-153	-7.594E-02	1.113E-01	1.782E-01	NOT IDENT.
EU-154	-1.040E-01	1.489E-01	2.566E-01	NOT IDENT.
EU-155	-1.263E-03	1.118E-01	2.144E-01	FAIL ABUN
TB-160	-5.454E-02	2.517E-01	4.747E-01	FAIL ABUN
HO-166M	8.773E-02	9.788E-02	2.099E-01	NOT IDENT.
TM-171	2.313E+00	7.649E+00	1.474E+01	NOT IDENT.
HF-172	-9.154E-02	2.386E-01	4.376E-01	FAIL ABUN
LU-172	-7.177E-02	7.968E-02	1.332E-01	FAIL ABUN

LU-176	-2.250E-02	3.899E-02	7.087E-02	FAIL ABUN
HF-181	-9.437E-03	1.464E-01	2.686E-01	NOT IDENT.
TA-182	1.527E-01	2.623E-01	5.862E-01	FAIL ABUN
RE-183	-2.391E-01	1.573E-01	2.853E-01	NOT IDENT.
RE-184	-2.966E-01	3.357E-01	5.181E-01	NOT IDENT.
W-188	-1.104E+01	1.712E+01	2.661E+01	FAIL ABUN
IR-192	4.646E-03	7.194E-02	1.386E-01	FAIL ABUN
HG-203	1.126E-02	8.871E-02	1.731E-01	NOT IDENT.
BI-207	2.804E-02	7.427E-02	1.575E-01	FAIL ABUN
BI-211	0.000E+00	7.273E-01	1.089E+00	FAIL ABUN
PB-211	3.693E-01	1.280E+00	2.460E+00	NOT IDENT.
BI-212	1.068E+00	1.161E+00	1.789E+00	FAIL ABUN
RN-219	-2.027E-01	7.337E-01	1.336E+00	FAIL ABUN
RA-223	-7.694E-01	1.029E+00	1.826E+00	FAIL ABUN
AC-227	-2.768E-01	3.776E-01	6.868E-01	FAIL ABUN
TH-227	-2.768E-01	3.776E-01	6.868E-01	FAIL ABUN
TH-231	-7.694E-01	1.029E+00	1.826E+00	FAIL ABUN
PA-233	-5.946E-02	9.406E-02	1.698E-01	FAIL ABUN
PA-234	-3.276E-01	4.221E-01	6.972E-01	NOT IDENT.
PA-234M	6.951E+00	7.327E+00	1.368E+01	FAIL ABUN
U-235	5.786E-02	2.534E-01	4.820E-01	FAIL ABUN
NP-237	-5.946E-02	9.406E-02	1.698E-01	FAIL ABUN
NP-238	0.000E+00	1.001E+06	0.000E+00	SHORT HLIF
NP-239	9.454E-02	3.129E-01	6.079E-01	FAIL ABUN
PU-239	1.088E+02	4.285E+02	8.209E+02	FAIL ABUN
AM-241	7.105E-02	1.036E-01	1.886E-01	NOT IDENT.
CM-243	-1.349E-03	1.132E-01	2.170E-01	FAIL ABUN
BK-247	6.947E-02	1.253E-01	2.281E-01	FAIL ABUN
CM-247	-4.009E-02	6.955E-02	1.227E-01	NOT IDENT.
CF-249	-5.583E-02	6.451E-02	1.106E-01	NOT IDENT.
CF-251	-2.745E-03	1.709E-01	3.153E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	59	10.66*	6.949E-01	4.053E+00	4.053E+00	32.29
CD-109	88.03	81	3.70*	5.391E+00	2.055E+00	2.209E+00	54.12
SN-126	64.28	58	9.60	5.585E+00	5.481E-01	5.481E-01	117.86
	86.94	81	8.90	5.391E+00	8.543E-01	8.543E-01	54.12
	87.57	81	37.00*	5.391E+00	2.055E-01	2.055E-01	54.12
BA-137M	661.66	552	89.90*	1.341E+00	2.331E+00	2.338E+00	9.40
CS-137	661.66	552	85.10*	1.341E+00	2.462E+00	2.470E+00	9.40
TL-208	277.37	-----	6.60	2.816E+00	-----	Line Not Found	-----
	583.19	57	85.00*	1.486E+00	2.276E-01	2.276E-01	51.28
	860.56	12	12.50	1.084E+00	4.641E-01	4.641E-01	90.04
PB-210	46.54	19	4.25*	5.527E+00	4.040E-01	4.056E-01	361.57
BI-211	72.87	-----	1.23	5.491E+00	-----	Line Not Found	-----
	351.06	105	12.92*	2.286E+00	1.813E+00	1.813E+00	40.94
PB-212	74.82	163	10.28	5.475E+00	1.473E+00	1.473E+00	32.06
	77.11	235	17.10	5.460E+00	1.280E+00	1.280E+00	24.33
	238.63	205	43.60*	3.202E+00	7.470E-01	7.470E-01	21.33
	300.09	22	3.30	2.621E+00	1.312E+00	1.312E+00	149.40
BI-214	609.32	84	45.49*	1.434E+00	6.579E-01	6.580E-01	36.62
	1120.29	25	14.92	8.740E-01	9.653E-01	9.653E-01	79.90
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
PB-214	74.82	163	5.80	5.475E+00	2.610E+00	2.610E+00	32.06
	77.11	235	9.70	5.460E+00	2.257E+00	2.257E+00	24.33
	87.09	81	3.41	5.391E+00	2.230E+00	2.230E+00	54.12
	242.00	56	7.25	3.171E+00	1.229E+00	1.229E+00	68.56
	295.22	65	18.42	2.665E+00	6.688E-01	6.688E-01	63.27
	351.93	105	35.60*	2.286E+00	6.579E-01	6.580E-01	40.94
RN-222	609.32	84	45.49*	1.434E+00	6.579E-01	6.580E-01	36.62
	1120.29	25	14.92	8.740E-01	9.653E-01	9.653E-01	79.90
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
RA-224	240.99	56	4.10*	3.171E+00	2.173E+00	2.173E+00	68.56
RA-226	609.32	84	45.49*	1.434E+00	6.579E-01	6.580E-01	36.62
	1120.29	25	14.92	8.740E-01	9.653E-01	9.653E-01	79.90
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	43	11.27	2.365E+00	8.117E-01	8.117E-01	91.29
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	29	25.80*	1.035E+00	5.502E-01	5.502E-01	83.91
	968.97	28	15.80	9.850E-01	9.291E-01	9.291E-01	68.97
RA-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	43	11.27	2.365E+00	8.117E-01	8.117E-01	91.29
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	29	25.80*	1.035E+00	5.502E-01	5.502E-01	83.91
	968.97	28	15.80	9.850E-01	9.291E-01	9.291E-01	68.97
TH-228	74.82	163	10.28	5.475E+00	1.473E+00	1.473E+00	32.06
	77.11	235	17.10	5.460E+00	1.280E+00	1.280E+00	24.33

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-229	238.63	205	43.60*	3.202E+00	7.470E-01	7.470E-01	21.33
	300.09	22	3.30	2.621E+00	1.312E+00	1.312E+00	149.40
	85.43	34	14.70	5.414E+00	2.184E-01	2.184E-01	151.79
	88.47	81	24.00	5.391E+00	3.168E-01	3.168E-01	54.12
TH-230	193.51	-----	4.41*	3.791E+00	-----	Line Not Found	-----
	210.85	-----	2.80	3.546E+00	-----	Line Not Found	-----
	609.32	84	45.49*	1.434E+00	6.579E-01	6.579E-01	36.62
	1120.29	25	14.92	8.740E-01	9.653E-01	9.653E-01	79.90
PA-231	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
	283.69	-----	1.70	2.761E+00	-----	Line Not Found	-----
TH-232	301.36	22	5.35*	2.621E+00	8.095E-01	8.095E-01	149.40
	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	43	11.27	2.365E+00	8.117E-01	8.117E-01	91.29
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
TH-234	911.20	29	25.80*	1.035E+00	5.502E-01	5.502E-01	83.91
	968.97	28	15.80	9.850E-01	9.291E-01	9.291E-01	68.97
	63.29	58	3.70*	5.585E+00	1.422E+00	1.422E+00	117.86
	92.59	76	4.23	5.344E+00	1.703E+00	1.703E+00	89.46
U-234	609.32	84	45.49*	1.434E+00	6.579E-01	6.579E-01	36.62
	1120.29	25	14.92	8.740E-01	9.653E-01	9.653E-01	79.90
	1764.49	-----	15.30	5.813E-01	-----	Line Not Found	-----
U-238	63.29	58	3.70*	5.585E+00	1.422E+00	1.422E+00	117.86
	92.59	76	4.23	5.344E+00	1.703E+00	1.703E+00	89.46
AM-243	43.53	-----	5.90	5.049E+00	-----	Line Not Found	-----
	74.66	163	67.20*	5.475E+00	2.253E-01	2.253E-01	32.06
ANH-511	511.00	7	100.00*	1.661E+00	2.072E-02	2.072E-02	560.42

Flag: "*" = Keyline

Total number of lines in spectrum 39
Number of unidentified lines 6
Number of lines tentatively identified by NID 33 84.62%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.053E+00	4.053E+00	1.309E+00	32.29	
CD-109	461.40D	1.07	2.055E+00	2.209E+00	1.196E+00	54.12	
SN-126	2.30E+05Y	1.00	2.055E-01	2.055E-01	1.112E-01	54.12	
BA-137M	30.08Y	1.00	2.331E+00	2.338E+00	0.220E+00	9.40	
CS-137	30.08Y	1.00	2.462E+00	2.470E+00	0.232E+00	9.40	
TL-208	1.41E+10Y	1.00	2.276E-01	2.276E-01	1.167E-01	51.28	
PB-210	22.20Y	1.00	4.040E-01	4.056E-01	14.67E-01	361.57	
BI-211	7.04E+08Y	1.00	1.813E+00	1.813E+00	0.742E+00	40.94	
PB-212	1.41E+10Y	1.00	7.470E-01	7.470E-01	1.593E-01	21.33	
BI-214	1600.00Y	1.00	6.579E-01	6.580E-01	2.409E-01	36.62	
PB-214	1600.00Y	1.00	6.579E-01	6.580E-01	2.693E-01	40.94	
RN-222	1600.00Y	1.00	6.579E-01	6.580E-01	2.409E-01	36.62	
RA-224	1.41E+10Y	1.00	2.173E+00	2.173E+00	1.490E+00	68.56	
RA-226	1600.00Y	1.00	6.579E-01	6.580E-01	2.409E-01	36.62	
AC-228	1.41E+10Y	1.00	5.502E-01	5.502E-01	4.617E-01	83.91	
RA-228	1.41E+10Y	1.00	5.502E-01	5.502E-01	4.617E-01	83.91	
TH-228	1.41E+10Y	1.00	7.470E-01	7.470E-01	1.593E-01	21.33	
TH-229	7340.00Y	1.00	3.168E-01	3.168E-01	1.715E-01	54.12	K
TH-230	7.54E+04Y	1.00	6.579E-01	6.579E-01	2.409E-01	36.62	
PA-231	7.04E+08Y	1.00	8.095E-01	8.095E-01	12.09E-01	149.40	
TH-232	1.41E+10Y	1.00	5.502E-01	5.502E-01	4.617E-01	83.91	
TH-234	4.47E+09Y	1.00	1.422E+00	1.422E+00	1.676E+00	117.86	
U-234	2.45E+05Y	1.00	6.579E-01	6.579E-01	2.409E-01	36.62	
U-238	4.47E+09Y	1.00	1.422E+00	1.422E+00	1.676E+00	117.86	
AM-243	7370.00Y	1.00	2.253E-01	2.253E-01	0.722E-01	32.06	
ANH-511	1.00E+09Y	1.00	2.072E-02	2.072E-02	11.61E-02	560.42	
Total Activity :			2.703E+01	2.720E+01			

Grand Total Activity : 2.703E+01 2.720E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	186.08	44	95	1.65	371.60	367	9	1.05E-02	99.2	3.90E+00	T
0	229.61	26	26	0.93	458.59	457	5	6.30E-03	74.6	3.31E+00	T
0	270.26	23	64	1.51	539.84	535	8	5.75E-03	****	2.88E+00	T
0	369.13	49	39	0.70	737.45	730	14	1.24E-02	65.5	2.19E+00	
0	374.96	52	37	2.20	749.09	744	14	1.30E-02	58.9	2.16E+00	T
0	463.17	20	29	0.75	925.40	922	7	5.24E-03	****	1.80E+00	T
0	631.35	21	10	3.50	1261.53	1254	13	5.62E-03	77.6	1.39E+00	T
0	727.99	17	17	0.85	1454.69	1448	12	4.67E-03	****	1.24E+00	T
0	817.38	5	7	0.45	1633.36	1629	8	1.29E-03	****	1.13E+00	T
0	980.05	10	0	0.73	1958.50	1954	8	2.78E-03	63.2	9.76E-01	
0	1000.47	11	6	1.48	1999.32	1992	12	3.06E-03	****	9.59E-01	T
0	1025.20	10	6	3.87	2048.75	2042	12	2.78E-03	****	9.40E-01	T
0	1110.41	6	8	2.24	2219.07	2210	11	1.62E-03	****	8.80E-01	
0	1153.02	8	0	0.73	2304.25	2301	6	2.22E-03	70.7	8.53E-01	
0	1173.41	8	1	0.58	2345.01	2342	6	2.13E-03	87.5	8.41E-01	T
0	1591.63	9	0	1.07	3181.00	3177	9	2.50E-03	66.7	6.42E-01	
0	1629.65	9	0	0.58	3257.00	3251	11	2.50E-03	66.7	6.28E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677007.CNF;1      *
* Acquisition date   : 28-JUN-2016 13:08:29 Sensitivity      : 3.000                *
* Detector ID        : GAM31 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:06.39 Half life ratio  : ***** *
* Sample date        : 11-MAY-2016 10:30:00 Nuclide Library : SOLID      *
* Sample ID          : G398677007 Analyst initials: MXR1         *
* Batch Number       : 1572231 Sample Quantity : 1.4758E+02 GRAM *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 15-JUN-2016 06:54:07 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7      *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	4.312E-01
CD-109	7.627E-01
SN-126	7.169E-02
BA-137M	3.573E-02
CS-137	3.775E-02
TL-208	3.821E-02
PB-210	7.395E-01
PB-212	6.427E-02
BI-214	1.053E-01
PB-214	1.014E-01
RN-222	1.053E-01
RA-224	6.898E-01
RA-226	1.053E-01
AC-228	1.681E-01
RA-228	1.681E-01
TH-228	6.427E-02
TH-229	6.416E-01
TH-230	1.053E-01
PA-231	5.875E-01
TH-232	1.681E-01
TH-234	8.862E-01
U-234	1.053E-01
U-238	8.862E-01
AM-243	4.106E-02
ANH-511	4.589E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.291E-01	NOT IDENT.
NA-22	3.754E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.262E-02	NOT IDENT.
SC-46	6.034E-02	FAIL ABUN
V-48	2.552E-01	NOT IDENT.

CR-51	1.258E+00	NOT IDENT.
MN-54	3.895E-02	NOT IDENT.
CO-56	6.385E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.195E-02	NOT IDENT.
CO-58	8.027E-02	NOT IDENT.
FE-59	1.434E-01	NOT IDENT.
CO-60	4.992E-02	FAIL ABUN
ZN-65	9.784E-02	NOT IDENT.
GE-68	1.415E+00	NOT IDENT.
AS-73	4.593E-01	NOT IDENT.
AS-74	4.516E-01	NOT IDENT.
SE-75	7.018E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.088E+00	NOT IDENT.
RB-83	1.095E-01	NOT IDENT.
KR-85	1.132E+01	NOT IDENT.
SR-85	8.487E-02	NOT IDENT.
RB-86	2.809E+00	NOT IDENT.
Y-88	5.842E-02	NOT IDENT.
Y-91	2.929E+01	NOT IDENT.
NB-94	5.121E-02	NOT IDENT.
NB-95	7.190E-02	NOT IDENT.
NB-95M	2.090E-01	NOT IDENT.
ZR-95	1.337E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.310E-02	NOT IDENT.
RH-102	8.268E-02	FAIL ABUN
RU-103	1.083E-01	FAIL ABUN
RH-106	4.862E-01	NOT IDENT.
RU-106	4.862E-01	NOT IDENT.
AG-108M	4.914E-02	NOT IDENT.
AG-110M	5.993E-02	NOT IDENT.
SN-113	7.702E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.230E-01	NOT IDENT.
TE-123M	3.926E-02	NOT IDENT.
SB-124	1.714E-01	NOT IDENT.
SB-125	1.434E-01	FAIL ABUN
TE-125M	1.417E+01	NOT IDENT.
I-126	1.404E+00	NOT IDENT.
SB-126	1.186E+00	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.590E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	5.370E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.938E-02	NOT IDENT.
CS-135	2.163E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.801E-01	FAIL ABUN
CE-139	4.085E-02	NOT IDENT.
BA-140	1.754E+00	NOT IDENT.
LA-140	7.988E-01	NOT IDENT.
CE-141	1.386E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.317E-01	NOT IDENT.
PM-144	4.738E-02	NOT IDENT.
PR-144	3.615E+00	NOT IDENT.
PM-146	7.183E-02	NOT IDENT.
ND-147	6.044E+00	NOT IDENT.
PM-147	8.465E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	4.007E-02	FAIL ABUN
EU-152	1.189E-01	NOT IDENT.
GD-153	8.363E-02	NOT IDENT.
EU-154	1.027E-01	NOT IDENT.
EU-155	1.004E-01	FAIL ABUN
TB-160	2.027E-01	FAIL ABUN
HO-166M	9.468E-02	NOT IDENT.
TM-171	7.083E+00	NOT IDENT.
HF-172	2.051E-01	FAIL ABUN
LU-172	5.358E-02	FAIL ABUN
LU-176	3.247E-02	FAIL ABUN

HF-181	1.232E-01	NOT IDENT.
TA-182	2.507E-01	FAIL ABUN
RE-183	1.365E-01	NOT IDENT.
RE-184	2.138E-01	NOT IDENT.
W-188	1.224E+01	FAIL ABUN
IR-192	6.392E-02	FAIL ABUN
HG-203	8.011E-02	NOT IDENT.
BI-207	6.847E-02	FAIL ABUN
BI-211	5.207E-01	FAIL ABUN
PB-211	1.137E+00	NOT IDENT.
BI-212	8.098E-01	FAIL ABUN
RN-219	6.153E-01	FAIL ABUN
RA-223	8.402E-01	FAIL ABUN
AC-227	3.183E-01	FAIL ABUN
TH-227	3.183E-01	FAIL ABUN
TH-231	8.402E-01	FAIL ABUN
PA-233	7.758E-02	FAIL ABUN
PA-234	2.906E-01	NOT IDENT.
PA-234M	5.972E+00	FAIL ABUN
U-235	2.266E-01	FAIL ABUN
NP-237	7.758E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.858E-01	FAIL ABUN
PU-239	3.867E+02	FAIL ABUN
AM-241	9.069E-02	NOT IDENT.
CM-243	1.018E-01	FAIL ABUN
BK-247	1.059E-01	FAIL ABUN
CM-247	5.650E-02	NOT IDENT.
CF-249	5.017E-02	NOT IDENT.
CF-251	1.473E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677007.CNF;1
Acquisition date : 28-JUN-2016 13:08:29 Sensitivity : 3.000
Detector ID : GAM31 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:06.39 Half life ratio : *****
Sample date : 11-MAY-2016 10:30:00 Nuclide Library : SOLID
Sample ID : G398677007 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.4758E+02 GRAM
Quantity Err(%) : 1.3552E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.053E+00	1.300E+00	1.300E+00
CD-109	1.546E+00	1.251E+00	1.251E+00
SN-126	1.439E-01	1.161E-01	1.161E-01
BA-137M	2.338E+00	2.377E-01	2.377E-01
CS-137	2.470E+00	2.510E-01	2.510E-01
TL-208	2.276E-01	1.148E-01	1.148E-01
PB-210	4.056E-01	1.438E+00	1.438E+00
PB-212	7.470E-01	1.611E-01	1.611E-01
BI-214	6.580E-01	2.378E-01	2.378E-01
PB-214	6.580E-01	2.654E-01	2.654E-01
RN-222	6.580E-01	2.378E-01	2.378E-01
RA-224	9.907E-01	1.637E+00	1.637E+00
RA-226	6.580E-01	2.378E-01	2.378E-01
AC-228	5.502E-01	4.534E-01	4.534E-01
RA-228	5.502E-01	4.534E-01	4.534E-01
TH-228	7.470E-01	1.611E-01	1.611E-01
TH-229	-6.444E-03	7.495E-01	7.495E-01
TH-230	6.579E-01	2.378E-01	2.378E-01
PA-231	8.095E-01	1.198E+00	1.198E+00
TH-232	5.502E-01	4.534E-01	4.534E-01
TH-234	1.422E+00	1.672E+00	1.672E+00
U-234	6.579E-01	2.378E-01	2.378E-01
U-238	1.422E+00	1.672E+00	1.672E+00
AM-243	1.676E-01	8.031E-02	8.031E-02
ANH-511	2.072E-02	1.138E-01	1.138E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.985E-01	9.545E-01	9.586E-01	NOT IDENT.
NA-22	-3.597E-02	5.379E-02	5.618E-02	NOT IDENT.
NA-24	-9.468E+20	8.160E+21	0.000E+00	SHORT HLIF
AL-26	1.106E-02	4.656E-02	4.682E-02	NOT IDENT.
SC-46	1.435E-02	6.866E-02	6.896E-02	FAIL ABUN

V-48	-1.104E-01	3.498E-01	3.533E-01	NOT IDENT.
CR-51	6.858E-01	1.363E+00	1.398E+00	NOT IDENT.
MN-54	-1.587E-02	4.932E-02	4.984E-02	NOT IDENT.
CO-56	2.711E-02	7.009E-02	7.115E-02	NOT IDENT.
MN-56	1.000E+41	2.536E+41	0.000E+00	SHORT HLIF
CO-57	3.293E-02	3.343E-02	3.658E-02	NOT IDENT.
CO-58	5.696E-02	8.951E-02	9.312E-02	NOT IDENT.
FE-59	7.052E-02	1.490E-01	1.524E-01	NOT IDENT.
CO-60	2.412E-02	5.348E-02	5.458E-02	FAIL ABUN
ZN-65	1.842E-02	1.514E-01	1.516E-01	NOT IDENT.
GE-68	8.854E-01	1.432E+00	1.487E+00	NOT IDENT.
AS-73	-1.562E-01	5.114E-01	5.162E-01	NOT IDENT.
AS-74	-1.057E-02	5.157E-01	5.158E-01	NOT IDENT.
SE-75	3.101E-02	8.085E-02	8.205E-02	NOT IDENT.
BR-77	1.760E+06	2.474E+06	2.598E+06	SHORT HLIF
SR-82	8.815E-01	1.121E+00	1.190E+00	NOT IDENT.
RB-83	-5.734E-02	1.397E-01	1.420E-01	NOT IDENT.
KR-85	6.854E+00	1.429E+01	1.462E+01	NOT IDENT.
SR-85	5.126E-02	1.071E-01	1.096E-01	NOT IDENT.
RB-86	1.794E+00	2.838E+00	2.951E+00	NOT IDENT.
Y-88	1.340E-02	6.446E-02	6.474E-02	NOT IDENT.
Y-91	-1.263E+01	3.714E+01	3.758E+01	NOT IDENT.
NB-94	6.088E-02	5.105E-02	5.796E-02	NOT IDENT.
NB-95	4.696E-02	7.582E-02	7.872E-02	NOT IDENT.
NB-95M	-1.413E-01	2.771E-01	2.843E-01	NOT IDENT.
ZR-95	5.689E-02	1.465E-01	1.487E-01	NOT IDENT.
NB-97	1.000E+41	8.128E+40	0.000E+00	SHORT HLIF
ZR-97	4.032E+20	3.975E+20	0.000E+00	SHORT HLIF
MO-99	5.391E+03	7.629E+04	7.633E+04	SHORT HLIF
TC-99M	-1.000E+41	3.418E+41	0.000E+00	SHORT HLIF
RH-101	-2.461E-02	3.959E-02	4.112E-02	NOT IDENT.
RH-102	1.417E-01	1.084E-01	1.258E-01	FAIL ABUN
RU-103	9.542E-03	1.269E-01	1.270E-01	FAIL ABUN
RH-106	6.627E-02	5.474E-01	5.482E-01	NOT IDENT.
RU-106	6.627E-02	5.474E-01	5.482E-01	NOT IDENT.
AG-108M	1.297E-02	5.597E-02	5.627E-02	NOT IDENT.
AG-110M	1.299E-02	6.826E-02	6.851E-02	NOT IDENT.
SN-113	5.241E-02	8.296E-02	8.626E-02	NOT IDENT.
CD-115	4.304E+05	5.536E+05	5.866E+05	SHORT HLIF
SN-117M	6.791E-02	3.648E-01	3.661E-01	NOT IDENT.
TE-123M	1.740E-02	4.358E-02	4.428E-02	NOT IDENT.
SB-124	-2.795E-02	2.087E-01	2.091E-01	NOT IDENT.
SB-125	-1.144E-01	1.794E-01	1.866E-01	FAIL ABUN
TE-125M	-1.819E+00	1.595E+01	1.597E+01	NOT IDENT.
I-126	-9.386E-01	2.088E+00	2.131E+00	NOT IDENT.
SB-126	-2.483E-02	1.522E+00	1.522E+00	NOT IDENT.
SB-127	1.399E+02	7.137E+02	7.165E+02	SHORT HLIF
I-131	-2.866E+00	3.832E+00	4.044E+00	NOT IDENT.
I-132	-1.000E+41	3.417E+41	0.000E+00	SHORT HLIF
TE-132	1.535E+03	1.134E+03	1.328E+03	SHORT HLIF
BA-133	-1.740E-02	7.285E-02	7.327E-02	NOT IDENT.
I-133	-9.584E+14	2.935E+15	2.967E+15	SHORT HLIF
CS-134	5.544E-02	6.071E-02	6.566E-02	NOT IDENT.
CS-135	3.574E-02	2.701E-01	2.706E-01	NOT IDENT.
I-135	1.000E+41	1.604E+41	0.000E+00	SHORT HLIF
CS-136	2.847E-01	8.506E-01	8.602E-01	FAIL ABUN
CE-139	-1.406E-02	4.834E-02	4.876E-02	NOT IDENT.
BA-140	-3.334E+00	2.450E+00	2.874E+00	NOT IDENT.
LA-140	6.027E-01	8.914E-01	9.319E-01	NOT IDENT.
CE-141	-1.293E-01	1.685E-01	1.783E-01	NOT IDENT.
CE-143	5.587E+09	3.730E+09	4.501E+09	SHORT HLIF
CE-144	2.554E-02	2.602E-01	2.605E-01	NOT IDENT.
PM-144	1.144E-03	5.464E-02	5.465E-02	NOT IDENT.
PR-144	1.137E-01	4.165E+00	4.165E+00	NOT IDENT.
PM-146	3.778E-02	8.013E-02	8.192E-02	NOT IDENT.
ND-147	-6.119E+00	8.076E+00	8.534E+00	NOT IDENT.
PM-147	5.284E+02	9.104E+02	9.411E+02	NOT IDENT.
PM-149	2.174E+06	4.403E+06	4.511E+06	SHORT HLIF
EU-150	-9.547E-03	5.317E-02	5.335E-02	FAIL ABUN
EU-152	-5.798E-02	1.546E-01	1.568E-01	NOT IDENT.
GD-153	-7.594E-02	1.113E-01	1.165E-01	NOT IDENT.
EU-154	-1.040E-01	1.490E-01	1.562E-01	NOT IDENT.
EU-155	-1.263E-03	1.118E-01	1.118E-01	FAIL ABUN
TB-160	-5.454E-02	2.517E-01	2.529E-01	FAIL ABUN
HO-166M	8.773E-02	9.800E-02	1.057E-01	NOT IDENT.
TM-171	2.313E+00	7.652E+00	7.723E+00	NOT IDENT.
HF-172	-9.154E-02	2.390E-01	2.426E-01	FAIL ABUN
LU-172	-7.177E-02	8.001E-02	8.630E-02	FAIL ABUN

LU-176	-2.250E-02	3.900E-02	4.030E-02	FAIL ABUN
HF-181	-9.437E-03	1.464E-01	1.465E-01	NOT IDENT.
TA-182	1.527E-01	2.623E-01	2.712E-01	FAIL ABUN
RE-183	-2.391E-01	1.593E-01	1.923E-01	NOT IDENT.
RE-184	-2.966E-01	3.366E-01	3.622E-01	NOT IDENT.
W-188	-1.104E+01	1.717E+01	1.787E+01	FAIL ABUN
IR-192	4.646E-03	7.194E-02	7.197E-02	FAIL ABUN
HG-203	1.126E-02	8.871E-02	8.886E-02	NOT IDENT.
BI-207	2.804E-02	7.428E-02	7.535E-02	FAIL ABUN
BI-211	1.813E+00	7.317E-01	1.097E+00	FAIL ABUN
PB-211	3.693E-01	1.280E+00	1.291E+00	NOT IDENT.
BI-212	1.068E+00	1.162E+00	1.258E+00	FAIL ABUN
RN-219	-2.027E-01	7.342E-01	7.398E-01	FAIL ABUN
RA-223	-7.694E-01	1.030E+00	1.087E+00	FAIL ABUN
AC-227	-2.768E-01	3.794E-01	3.994E-01	FAIL ABUN
TH-227	-2.768E-01	3.794E-01	3.994E-01	FAIL ABUN
TH-231	-7.694E-01	1.030E+00	1.087E+00	FAIL ABUN
PA-233	-5.946E-02	9.411E-02	9.785E-02	FAIL ABUN
PA-234	-3.276E-01	5.645E-01	5.835E-01	NOT IDENT.
PA-234M	6.951E+00	7.333E+00	7.975E+00	FAIL ABUN
U-235	5.786E-02	2.535E-01	2.548E-01	FAIL ABUN
NP-237	-5.946E-02	9.411E-02	9.785E-02	FAIL ABUN
NP-238	3.722E+05	1.001E+06	1.015E+06	SHORT HLIF
NP-239	9.454E-02	3.130E-01	3.159E-01	FAIL ABUN
PU-239	1.088E+02	4.285E+02	4.313E+02	FAIL ABUN
AM-241	7.105E-02	1.037E-01	1.085E-01	NOT IDENT.
CM-243	-1.349E-03	1.132E-01	1.132E-01	FAIL ABUN
BK-247	6.947E-02	1.260E-01	1.299E-01	FAIL ABUN
CM-247	-4.009E-02	6.988E-02	7.218E-02	NOT IDENT.
CF-249	-5.583E-02	6.467E-02	6.939E-02	NOT IDENT.
CF-251	-2.745E-03	1.709E-01	1.709E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	174.4939	87.09	107.1955	136.47	71.3929
45.60	170.6209	87.57	126.4711	140.51	0.0000
46.54	177.6011	88.03	123.7221	143.76	70.0955
49.72	0.0000	88.34	123.8061	144.24	72.2735
51.35	176.9260	88.47	123.8415	145.44	89.4444
51.87	179.8351	89.96	124.2431	152.43	69.9479
52.39	174.0071	1093.63	115.7446	153.25	60.3363
52.97	185.7086	91.11	124.5508	323.87	66.8955
53.44	191.2417	92.59	100.7304	156.02	65.9915
54.07	194.2489	93.35	100.8923	158.56	65.1501
57.36	0.0000	94.56	80.2378	159.00	65.1910
57.53	206.9284	94.65	80.2530	162.33	81.8779
57.98	221.4281	94.67	80.2563	162.66	74.2705
59.27	186.1062	94.87	80.2899	163.33	83.0871
59.32	176.7592	97.43	93.9229	165.86	82.2861
59.54	176.8710	98.43	81.1740	176.31	73.4531
60.96	184.3127	98.44	79.4110	176.60	71.2546
61.17	184.4220	99.53	70.7432	177.52	67.9983
62.93	204.7180	100.11	79.6788	181.07	0.0000
63.29	204.9212	102.03	94.7964	181.52	73.9606
63.58	205.0846	103.18	77.1966	184.41	74.2393
64.28	173.7952	103.37	77.2256	143.76	72.1113
66.73	157.1757	105.21	73.5284	193.51	73.9641
67.24	153.2822	105.31	73.5427	197.03	73.1445
125.81	162.2287	106.12	86.5978	198.01	60.6456
67.75	162.2580	106.47	83.6680	201.83	63.2273
69.67	144.3407	109.28	79.1097	203.43	72.5643
70.83	142.2827	111.00	84.3884	205.31	84.2718
72.81	141.6072	111.76	0.0000	210.85	76.6912
72.87	141.6282	114.06	88.9082	215.65	77.1195
74.66	140.3982	116.30	0.0000	222.11	67.0949
74.82	140.4535	116.74	75.1284	227.09	56.8159
74.97	140.5049	119.76	89.8244	227.38	56.8340
77.11	141.2368	121.12	70.5993	228.16	0.0000
78.74	102.8194	121.22	70.6116	228.18	59.7285
79.69	107.2849	121.78	74.7781	116.74	59.7285
80.12	121.5241	122.06	66.6160	235.69	77.4246
80.19	121.5438	122.92	80.0586	235.96	71.7102
80.57	70.7279	123.07	75.9730	238.63	52.1390
81.00	107.6143	265.00	80.1642	238.98	0.0000
81.07	107.6317	125.81	83.5523	240.99	52.2700
81.75	104.0185	127.23	87.8899	242.00	52.3258
83.79	106.4059	127.91	81.7802	244.70	68.0358
84.00	106.4566	129.30	81.9710	252.40	0.0000
85.43	106.8001	131.20	87.4359	252.80	58.3896
86.55	107.0673	133.02	73.0819	254.15	0.0000
86.79	107.1237	133.52	73.1417	256.23	69.5795
86.94	107.1596	136.00	63.9953	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	46.7779	355.39	0.0000	584.27	15.7395
264.80	47.2773	356.01	41.6108	595.83	24.2188
265.00	44.3313	364.49	51.5516	427.87	25.2130
268.22	62.2597	366.42	0.0000	602.52	0.0000
269.46	63.0766	372.51	8.1045	604.72	32.7527
270.03	57.9144	375.05	34.1040	607.14	29.6705
271.23	60.9555	377.52	50.4378	609.32	31.8924
273.65	55.1369	356.01	46.9981	610.33	26.5909
276.40	49.4926	388.16	47.1476	614.28	18.8076
277.37	50.4734	388.63	41.0120	618.01	21.6698
277.60	51.4190	391.69	29.8000	620.36	29.2419
278.00	57.0497	264.66	38.2675	621.93	24.5445
279.20	49.6244	401.81	50.7204	630.19	0.0000
279.54	54.3237	402.40	56.9554	631.29	17.0723
279.70	54.3316	404.85	44.6062	633.25	12.6585
280.46	59.0577	410.95	45.8403	634.78	15.8350
283.69	45.1333	413.71	42.7974	635.95	15.8443
284.31	52.6863	414.70	40.7377	636.99	15.8525
285.41	54.6237	423.72	38.8902	645.85	21.0160
285.90	0.0000	427.09	41.0864	657.76	17.6150
287.50	58.5044	427.87	54.8112	657.90	0.0000
290.67	59.0542	433.94	43.3942	661.66	12.5141
293.27	0.0000	439.40	35.0544	664.57	0.0000
351.93	48.6563	453.88	38.6065	666.33	20.9031
295.96	49.4490	463.37	42.0796	666.50	22.5130
879.38	49.5665	468.07	34.6304	667.71	0.0000
299.98	54.9729	473.00	0.0000	677.62	15.5188
300.09	54.9791	475.06	39.1306	685.70	0.0000
300.13	54.9809	476.78	43.5254	695.00	20.5334
301.36	44.3390	477.60	40.2813	696.49	20.5473
302.85	35.2120	482.18	42.5795	696.51	20.5478
256.23	38.3301	487.02	40.5162	697.00	22.5098
304.85	44.4763	492.35	0.0000	697.30	22.5126
306.78	50.8893	497.08	33.0524	697.49	24.4727
308.46	37.5022	505.52	35.4346	702.65	13.7368
311.90	49.1891	507.63	0.0000	706.68	25.5582
316.51	45.5119	511.00	38.8826	711.68	16.7489
319.41	48.5374	514.00	33.8319	720.70	19.7842
320.08	46.6223	514.00	33.8319	721.93	0.0000
321.04	47.6325	520.40	25.6925	722.78	21.4530
323.87	59.4400	520.69	0.0000	722.91	19.8037
325.23	51.7044	522.65	0.0000	723.31	19.8076
328.76	48.9220	527.90	0.0000	724.19	19.8152
333.37	53.4313	528.26	25.8097	727.33	13.8899
333.97	59.7470	529.59	31.4445	733.00	4.9731
334.37	50.3297	529.87	0.0000	735.93	17.9262
338.28	42.4049	531.02	37.0898	333.97	21.9248
338.32	42.4062	537.26	35.1914	739.50	0.0000
311.90	42.6786	546.56	0.0000	747.24	17.0141
340.48	42.6786	552.55	27.3032	748.06	14.0164
340.55	42.6812	563.25	23.8018	752.31	15.0454
344.28	42.2813	569.33	25.7175	753.82	9.0330
345.93	45.3613	946.00	29.3945	756.73	14.0690
351.06	43.0425	569.70	28.4790	756.80	14.0694
351.93	44.8668	583.19	15.7308	884.68	17.1365

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	11.0969	1274.44	7.8643	1620.50	4.3564
766.42	14.1271	1001.03	14.1786	1621.92	5.8105
766.84	15.1392	1002.74	11.0342	1678.03	0.0000
772.60	0.0000	1004.73	14.1965	1690.97	6.6372
776.52	10.1340	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.8527
778.90	13.1873	1028.54	0.0000	1063.66	8.6789
783.70	0.0000	1037.84	12.0949	1771.35	6.7517
785.37	11.1885	1038.76	0.0000	1791.20	0.0000
792.07	13.2596	631.29	18.6613	1808.65	2.9160
794.95	13.2755	1048.07	11.2021	1810.72	0.0000
795.86	11.2371	1049.04	10.2718	1836.06	2.9323
810.06	14.8419	1050.41	10.2762		
810.29	14.8429	1063.66	11.2588		
344.28	14.1303	1077.00	4.7113		
810.76	14.1320	1077.34	4.7119		
815.77	18.8812	1085.87	6.6143		
1048.07	12.0284	1093.63	13.2617		
832.01	14.5120	1099.45	4.7449		
834.85	13.4907	1112.07	11.4326		
835.71	11.4189	1112.84	5.7178		
836.80	0.0000	1115.54	8.5836		
846.75	0.0000	1120.29	6.6861		
846.77	10.4260	1120.55	6.6867		
856.80	6.9779	1221.41	6.6881		
860.56	11.5301	1129.67	11.4951		
871.09	17.8915	1131.51	0.0000		
873.19	14.7461	1147.95	0.0000		
875.33	0.0000	1173.23	11.6470		
879.38	13.7249	1177.95	6.6649		
880.51	12.6747	1189.05	11.7017		
883.24	13.7449	1204.77	11.7554		
884.68	9.5210	1221.41	6.8903		
889.28	10.5972	1231.02	9.8706		
894.76	15.9283	1235.36	13.8359		
898.04	10.6318	1238.28	11.8691		
900.72	8.5139	1260.41	0.0000		
903.28	16.5707	1271.87	10.9830		
911.20	13.8887	1274.44	10.9906		
912.08	17.8117	1274.54	10.9910		
923.98	0.0000	1291.59	5.0193		
926.50	13.9664	1298.22	0.0000		
929.11	9.6783	1312.11	7.0664		
937.49	14.0220	1332.49	6.0901		
944.13	8.6494	1362.66	0.0000		
946.00	16.2283	1365.19	4.0952		
949.00	12.9967	1368.63	0.0000		
667.71	0.0000	1384.29	14.4045		
962.31	12.6952	1408.01	4.1406		
964.08	21.7764	1457.56	0.0000		
966.17	14.5283	1460.82	7.1928		
911.20	11.9977	1489.16	9.5061		
968.97	11.9977	1505.03	10.6026		
983.53	5.4811	1584.12	7.7771		
984.45	0.0000	1596.21	3.7136		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 14:11:10.42

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677008.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM16.CNF;426
Background date    : 26-JUN-2016 12:04:40
Sample date       : 11-MAY-2016 10:35:00 Acquisition date : 28-JUN-2016 13:08:49
Sample ID        : G398677008 Sample quantity : 1.50780E+02 GRAM
Detector name     : GAM16 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.30 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	61.19	19	44	1.00	122.18	120	14	5.38E-03	50.9	1.78E+00
2	1	63.58*	22	64	0.96	126.96	120	14	6.18E-03	65.7	
3	2	74.90	75	110	1.14	149.60	143	17	2.08E-02	25.9	9.18E-01
4	2	77.29*	93	87	1.02	154.37	143	17	2.58E-02	19.5	
5	2	87.58	46	57	1.18	174.95	172	11	1.26E-02	27.7	5.04E+00
6	2	89.81	38	52	0.98	179.41	172	11	1.07E-02	36.7	
7	0	93.02*	46	87	1.70	185.82	182	8	1.29E-02	41.5	
8	0	186.41*	63	98	1.20	372.52	367	13	1.75E-02	36.9	
9	0	199.58*	6	55	1.62	398.84	397	7	1.74E-03	214.6	
10	0	211.72	140	145	6.86	423.11	411	26	3.90E-02	25.2	
11	1	238.78*	268	52	1.17	477.22	472	20	7.44E-02	7.7	7.73E-01
12	1	241.80	55	52	1.33	483.24	472	20	1.52E-02	28.8	
13	0	268.74	33	63	2.34	537.11	532	11	9.06E-03	50.4	
14	4	295.38	100	31	1.53	590.36	585	24	2.77E-02	14.2	1.08E+00
15	4	300.90	23	30	1.87	601.40	585	24	6.47E-03	56.0	
16	0	338.12*	74	47	1.37	675.82	670	11	2.06E-02	21.6	
17	0	351.97*	110	52	1.12	703.50	698	10	3.07E-02	15.7	
18	0	510.92*	50	20	3.25	1021.29	1014	18	1.40E-02	32.7	
19	0	523.47	21	14	0.73	1046.38	1039	14	5.83E-03	43.6	
20	0	583.87*	55	35	1.57	1167.15	1160	12	1.53E-02	26.0	
21	0	597.28	36	9	7.28	1193.97	1185	18	1.00E-02	25.7	
22	0	609.28*	106	8	1.66	1217.95	1213	11	2.93E-02	11.3	
23	0	625.93	21	10	4.27	1251.25	1244	13	5.92E-03	37.1	
24	0	661.72	165	36	1.26	1322.81	1316	14	4.59E-02	10.9	
25	0	727.66	15	22	2.90	1454.67	1448	11	4.17E-03	65.8	
26	0	757.21	11	15	1.43	1513.75	1508	12	3.16E-03	74.1	
27	0	786.39*	11	12	0.76	1572.10	1567	10	3.19E-03	66.7	
28	0	795.60	13	11	1.62	1590.51	1584	9	3.63E-03	53.8	
29	0	853.49	7	13	0.49	1706.27	1697	11	2.07E-03	102.1	
30	0	911.17*	55	10	1.24	1821.61	1816	13	1.53E-02	18.6	
31	0	933.72	16	2	1.63	1866.71	1861	10	4.39E-03	31.2	
32	0	968.66	29	11	1.31	1936.58	1929	12	8.01E-03	30.2	
33	0	1012.75	21	0	4.92	2024.76	2019	12	5.83E-03	21.8	
34	0	1037.09	6	4	1.32	2073.42	2070	7	1.72E-03	64.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1119.98	20	8	1.26	2239.19	2233	11	5.51E-03	35.9	
36	0	1149.51	16	0	3.38	2298.25	2294	10	4.44E-03	25.0	
37	0	1153.79	9	2	0.96	2306.80	2303	8	2.59E-03	41.6	
38	0	1181.67	5	4	1.16	2362.57	2356	8	1.36E-03	84.3	
39	0	1185.43	10	2	2.06	2370.09	2366	8	2.82E-03	39.3	
40	0	1236.74	24	0	4.17	2472.71	2464	18	6.67E-03	20.4	
41	0	1460.73*	112	13	2.25	2920.70	2914	13	3.12E-02	11.8	
42	0	1764.86*	8	2	1.83	3529.04	3524	9	2.09E-03	58.4	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677008.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:35:00 Acquisition date : 28-JUN-2016 13:08:49
Sample ID        : G398677008 Sample quantity  : 150.78 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA16 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.30 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.236E+00	4.101E+00	4.101E+00	23.57	OK
AS-74	595.83	59.00*	2.662E+00	1.210E-01	7.908E-01	51.37	OK
	634.78	15.40	2.538E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	5.854E+00	6.943E-01	7.464E-01	108.82	OK
SN-126	64.28	9.60	3.013E+00	4.975E-01	4.975E-01	131.48	OK
	86.94	8.90	5.854E+00	2.887E-01	2.887E-01	108.82	OK
	87.57	37.00*	5.854E+00	6.943E-02	6.943E-02	108.82	OK
CS-135	268.22	16.00*	4.788E+00	2.427E-01	2.427E-01	100.77	OK
BA-137M	661.66	89.90*	2.456E+00	3.911E-01	3.923E-01	21.76	OK
CS-137	661.66	85.10*	2.456E+00	4.131E-01	4.144E-01	21.76	OK
TL-208	277.37	6.60	4.682E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.709E+00	1.264E-01	1.264E-01	52.05	OK
	860.56	12.50	1.976E+00	----- Line	Not Found	-----	Absent
BI-212	727.33	6.67*	2.275E+00	5.115E-01	5.115E-01	131.66	OK
	785.37	1.10	2.133E+00	2.511E+00	2.511E+00	133.45	OK
	1620.50	1.47	1.134E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	4.579E+00	6.311E-01	6.311E-01	85.24	OK
	77.11	17.10	4.863E+00	7.115E-01	7.115E-01	39.03	OK
	238.63	43.60*	5.201E+00	6.811E-01	6.811E-01	15.40	OK
	300.09	3.30	4.416E+00	9.021E-01	9.021E-01	112.00	OK
BI-214	609.32	45.49*	2.621E+00	4.661E-01	4.662E-01	22.62	OK
	1120.29	14.92	1.566E+00	4.200E-01	4.201E-01	71.77	OK
	1764.49	15.30	1.062E+00	2.174E-01	2.174E-01	116.77	OK
PB-214	74.82	5.80	4.569E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.863E+00	1.254E+00	1.254E+00	39.03	OK
	87.09	3.41	5.815E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.153E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.475E+00	6.823E-01	6.824E-01	28.47	OK
	351.93	35.60*	3.943E+00	4.373E-01	4.373E-01	31.43	OK
RN-222	609.32	45.49*	2.621E+00	4.661E-01	4.662E-01	22.62	OK
	1120.29	14.92	1.566E+00	4.200E-01	4.201E-01	71.77	OK
	1764.49	15.30	1.062E+00	2.174E-01	2.174E-01	116.77	OK
RA-224	240.99	4.10*	5.156E+00	2.832E-01	2.832E-01	326.81	OK
RA-226	609.32	45.49*	2.621E+00	4.661E-01	4.662E-01	22.62	OK
	1120.29	14.92	1.566E+00	4.200E-01	4.201E-01	71.77	OK
	1764.49	15.30	1.062E+00	2.174E-01	2.174E-01	116.77	OK
AC-228	105.21	1.10	6.766E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.059E+00	9.047E-01	9.047E-01	43.18	OK
	794.95	4.25	2.112E+00	7.459E-01	7.459E-01	107.52	OK
	835.71	1.61	2.026E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.881E+00	5.733E-01	5.733E-01	37.20	OK
	968.97	15.80	1.782E+00	5.140E-01	5.140E-01	60.49	OK
RA-228	105.21	1.10	6.766E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.059E+00	9.047E-01	9.047E-01	43.18	OK
	794.95	4.25	2.112E+00	7.459E-01	7.459E-01	107.52	OK
	835.71	1.61	2.026E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.881E+00	5.733E-01	5.733E-01	37.20	OK
	968.97	15.80	1.782E+00	5.140E-01	5.140E-01	60.49	OK
TH-228	74.82	10.28	4.579E+00	6.311E-01	6.311E-01	85.24	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	4.863E+00	7.115E-01	7.115E-01	39.03	OK
	238.63	43.60*	5.201E+00	6.811E-01	6.811E-01	15.40	OK
	300.09	3.30	4.416E+00	9.021E-01	9.021E-01	112.00	OK
TH-230	609.32	45.49*	2.621E+00	4.661E-01	4.661E-01	22.62	OK
	1120.29	14.92	1.566E+00	4.200E-01	4.200E-01	71.77	OK
	1764.49	15.30	1.062E+00	2.174E-01	2.174E-01	116.77	OK
PA-231	283.69	1.70	4.607E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.416E+00	5.564E-01	5.564E-01	112.00	OK
TH-232	105.21	1.10	6.766E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.059E+00	9.047E-01	9.047E-01	43.18	OK
	835.71	1.61	2.026E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.881E+00	5.733E-01	5.733E-01	37.20	OK
	968.97	15.80	1.782E+00	5.140E-01	5.140E-01	60.49	OK
TH-234	63.29	3.70*	3.013E+00	1.291E+00	1.291E+00	131.48	OK
	92.59	4.23	6.231E+00	1.101E+00	1.101E+00	82.99	OK
U-234	609.32	45.49*	2.621E+00	4.661E-01	4.661E-01	22.62	OK
	1120.29	14.92	1.566E+00	4.200E-01	4.200E-01	71.77	OK
	1764.49	15.30	1.062E+00	2.174E-01	2.174E-01	116.77	OK
U-235	89.96	3.47	6.020E+00	1.157E+00	1.157E+00	73.32	OK
	93.35	5.60	6.231E+00	8.316E-01	8.316E-01	82.99	OK
	143.76	10.96*	6.848E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.528E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.095E+00	1.067E-01	1.067E-01	73.74	OK
	205.31	5.01	5.749E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.013E+00	1.291E+00	1.291E+00	131.48	OK
	92.59	4.23	6.231E+00	1.101E+00	1.101E+00	82.99	OK
AM-243	43.53	5.90	4.621E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.579E+00	9.654E-02	9.654E-02	85.24	OK
ANH-511	511.00	100.00*	2.998E+00	9.002E-02	9.002E-02	65.41	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677008.CNF;1
Acquisition date : 28-JUN-2016 13:08:49 Sensitivity : 3.000
Detector ID : GAM16 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.30 Half life ratio : *****
Sample date : 11-MAY-2016 10:35:00 Analyst initials: MXR1
Sample ID : G398677008 Sample Quantity : 1.5078E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 28-SEP-2015 08:03:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.101E+00	9.473E-01	6.302E-01
AS-74	7.908E-01	3.981E-01	5.052E-01
CD-109	7.464E-01	7.960E-01	1.215E+00
SN-126	6.943E-02	7.405E-02	1.137E-01
CS-135	2.427E-01	2.396E-01	2.431E-01
BA-137M	3.923E-01	8.366E-02	5.915E-02
CS-137	4.144E-01	8.838E-02	6.249E-02
TL-208	1.264E-01	6.449E-02	5.862E-02
BI-212	5.115E-01	6.599E-01	9.413E-01
PB-212	6.811E-01	1.028E-01	9.295E-02
BI-214	4.662E-01	1.034E-01	1.002E-01
PB-214	4.373E-01	1.347E-01	1.352E-01
RN-222	4.662E-01	1.034E-01	1.002E-01
RA-224	2.832E-01	9.070E-01	9.961E-01
RA-226	4.662E-01	1.034E-01	1.002E-01
AC-228	5.733E-01	2.090E-01	1.607E-01
RA-228	5.733E-01	2.090E-01	1.607E-01
TH-228	6.811E-01	1.028E-01	9.295E-02
TH-230	4.661E-01	1.033E-01	1.002E-01
PA-231	5.564E-01	6.107E-01	6.959E-01
TH-232	5.733E-01	2.090E-01	1.607E-01
TH-234	1.291E+00	1.663E+00	2.132E+00
U-234	4.661E-01	1.033E-01	1.002E-01
U-235	-5.347E-02	1.717E-01	3.141E-01
U-238	1.291E+00	1.663E+00	2.132E+00
AM-243	9.654E-02	8.064E-02	7.911E-02
ANH-511	9.002E-02	5.771E-02	4.668E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.414E-01	4.191E-01	8.261E-01	NOT IDENT.
NA-22	-4.195E-02	3.248E-02	4.688E-02	NOT IDENT.
NA-24	0.000E+00	4.979E+21	0.000E+00	SHORT HLIF

AL-26	-4.368E-03	1.577E-02	3.524E-02	NOT IDENT.
SC-46	3.196E-03	4.209E-02	8.282E-02	FAIL ABUN
V-48	-9.511E-02	1.804E-01	3.193E-01	NOT IDENT.
CR-51	4.144E-01	7.257E-01	1.468E+00	NOT IDENT.
MN-54	-4.565E-03	3.477E-02	6.553E-02	NOT IDENT.
CO-56	4.666E-03	5.454E-02	9.228E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.242E-03	2.166E-02	4.146E-02	NOT IDENT.
CO-58	-2.107E-02	3.314E-02	5.837E-02	NOT IDENT.
FE-59	2.414E-03	1.032E-01	2.115E-01	NOT IDENT.
CO-60	1.886E-02	3.401E-02	7.439E-02	NOT IDENT.
ZN-65	5.162E-02	5.567E-02	1.290E-01	NOT IDENT.
GE-68	-5.087E-01	8.213E-01	1.495E+00	NOT IDENT.
AS-73	-7.632E-02	1.022E+00	2.043E+00	NOT IDENT.
SE-75	-5.928E-03	5.003E-02	8.454E-02	NOT IDENT.
BR-77	0.000E+00	2.419E+05	0.000E+00	SHORT HLIF
SR-82	1.681E-01	7.530E-01	1.491E+00	NOT IDENT.
RB-83	-3.151E-02	8.610E-02	1.315E-01	NOT IDENT.
KR-85	6.277E+00	6.803E+00	1.277E+01	NOT IDENT.
SR-85	4.690E-02	5.099E-02	9.567E-02	NOT IDENT.
RB-86	-5.751E-01	1.724E+00	3.344E+00	NOT IDENT.
Y-88	-1.124E-03	3.052E-02	6.899E-02	NOT IDENT.
Y-91	1.044E+00	2.358E+01	4.703E+01	NOT IDENT.
NB-94	-3.399E-02	3.050E-02	5.041E-02	NOT IDENT.
NB-95	-1.370E-02	4.683E-02	8.731E-02	NOT IDENT.
NB-95M	1.321E-01	1.548E-01	2.896E-01	NOT IDENT.
ZR-95	8.237E-02	1.197E-01	1.767E-01	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.330E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.006E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.861E-02	2.652E-02	5.280E-02	NOT IDENT.
RH-102	-1.071E-02	4.930E-02	8.136E-02	NOT IDENT.
RU-103	-2.600E-02	6.616E-02	1.179E-01	FAIL ABUN
RH-106	7.121E-03	2.901E-01	5.042E-01	NOT IDENT.
RU-106	7.121E-03	2.901E-01	5.042E-01	NOT IDENT.
AG-108M	6.207E-03	2.847E-02	5.473E-02	NOT IDENT.
AG-110M	1.715E-03	4.389E-02	8.599E-02	NOT IDENT.
SN-113	1.219E-02	4.835E-02	9.422E-02	NOT IDENT.
CD-115	0.000E+00	3.107E+05	0.000E+00	SHORT HLIF
SN-117M	1.265E-01	2.432E-01	4.722E-01	NOT IDENT.
TE-123M	8.061E-03	2.841E-02	5.419E-02	NOT IDENT.
SB-124	-5.520E-02	8.924E-02	1.622E-01	NOT IDENT.
SB-125	-3.612E-02	8.406E-02	1.502E-01	NOT IDENT.
TE-125M	-8.567E-01	1.034E+01	1.981E+01	NOT IDENT.
I-126	5.607E-01	1.161E+00	2.159E+00	NOT IDENT.
SB-126	2.274E-01	8.074E-01	1.454E+00	NOT IDENT.
SB-127	0.000E+00	3.790E+02	0.000E+00	SHORT HLIF
I-131	-1.375E+00	1.704E+00	2.886E+00	NOT IDENT.
I-132	0.000E+00	1.128E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.685E+02	0.000E+00	SHORT HLIF
BA-133	3.635E-02	3.812E-02	7.307E-02	NOT IDENT.
I-133	0.000E+00	1.510E+15	0.000E+00	SHORT HLIF
CS-134	3.877E-02	4.085E-02	7.241E-02	FAIL ABUN
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	1.420E-01	4.889E-01	1.021E+00	FAIL ABUN
CE-139	5.353E-03	2.992E-02	5.633E-02	NOT IDENT.
BA-140	-1.116E+00	1.440E+00	2.404E+00	NOT IDENT.
LA-140	-2.610E-01	3.669E-01	6.019E-01	NOT IDENT.
CE-141	3.309E-03	9.817E-02	1.851E-01	NOT IDENT.
CE-143	0.000E+00	2.005E+09	0.000E+00	SHORT HLIF
CE-144	-9.861E-02	1.590E-01	2.855E-01	NOT IDENT.
PM-144	-1.501E-03	3.496E-02	6.679E-02	NOT IDENT.
PR-144	-2.973E-01	2.682E+00	5.081E+00	NOT IDENT.
PM-146	-4.126E-03	3.551E-02	6.647E-02	NOT IDENT.
ND-147	-1.792E+00	3.875E+00	6.817E+00	FAIL ABUN
PM-147	1.611E+02	6.057E+02	1.178E+03	NOT IDENT.
PM-149	0.000E+00	2.460E+06	0.000E+00	SHORT HLIF
EU-150	-1.883E-02	2.802E-02	4.273E-02	FAIL ABUN
EU-152	-4.026E-03	9.993E-02	1.822E-01	NOT IDENT.
GD-153	-3.033E-02	7.418E-02	1.319E-01	NOT IDENT.
EU-154	-1.210E-01	8.959E-02	1.259E-01	FAIL ABUN
EU-155	-1.505E-03	8.267E-02	1.589E-01	FAIL ABUN
TB-160	-7.504E-02	1.366E-01	2.418E-01	FAIL ABUN
HO-166M	-5.467E-03	4.998E-02	9.612E-02	NOT IDENT.
TM-171	-1.462E+01	1.629E+01	3.045E+01	NOT IDENT.
HF-172	1.787E-01	1.589E-01	3.266E-01	FAIL ABUN
LU-172	2.332E-02	4.838E-02	1.054E-01	FAIL ABUN

LU-176	3.519E-03	2.197E-02	3.855E-02	FAIL ABUN
HF-181	6.123E-03	6.363E-02	1.219E-01	NOT IDENT.
TA-182	2.195E-01	1.515E-01	3.752E-01	FAIL ABUN
RE-183	-5.357E-02	2.675E-01	4.722E-01	NOT IDENT.
RE-184	1.954E-02	1.872E-01	3.628E-01	NOT IDENT.
W-188	-8.810E-01	9.481E+00	1.594E+01	FAIL ABUN
IR-192	-2.607E-02	3.983E-02	7.182E-02	FAIL ABUN
HG-203	3.688E-02	5.650E-02	1.142E-01	NOT IDENT.
BI-207	8.229E-03	4.161E-02	8.589E-02	FAIL ABUN
PB-210	3.712E+00	3.744E+00	8.070E+00	NOT IDENT.
BI-211	0.000E+00	3.711E-01	6.187E-01	FAIL ABUN
PB-211	-6.810E-03	6.483E-01	1.225E+00	NOT IDENT.
RN-219	-1.164E-02	3.727E-01	7.023E-01	NOT IDENT.
RA-223	-2.219E-01	5.381E-01	9.784E-01	FAIL ABUN
AC-227	-1.629E-01	1.990E-01	3.602E-01	FAIL ABUN
TH-227	-1.629E-01	1.990E-01	3.602E-01	FAIL ABUN
TH-229	7.183E-02	4.599E-01	8.545E-01	FAIL ABUN
TH-231	-2.219E-01	5.381E-01	9.784E-01	FAIL ABUN
PA-233	1.532E-02	4.915E-02	9.864E-02	FAIL ABUN
PA-234	-1.148E-01	2.554E-01	4.548E-01	NOT IDENT.
PA-234M	7.805E-01	3.793E+00	7.514E+00	NOT IDENT.
NP-237	1.532E-02	4.915E-02	9.864E-02	FAIL ABUN
NP-238	0.000E+00	6.085E+05	0.000E+00	SHORT HLIF
NP-239	2.256E-02	2.084E-01	4.017E-01	NOT IDENT.
PU-239	-2.685E+02	2.890E+02	5.038E+02	NOT IDENT.
AM-241	-6.410E-02	1.441E-01	2.474E-01	NOT IDENT.
CM-243	3.228E-02	8.248E-02	1.637E-01	NOT IDENT.
BK-247	-2.456E-02	7.304E-02	1.201E-01	NOT IDENT.
CM-247	-1.543E-02	3.441E-02	6.196E-02	NOT IDENT.
CF-249	-2.505E-02	3.894E-02	6.877E-02	NOT IDENT.
CF-251	-7.270E-03	1.215E-01	2.221E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	109	10.66*	1.236E+00	4.101E+00	4.101E+00	23.57
AS-74	595.83	38	59.00*	2.662E+00	1.210E-01	7.908E-01	51.37
	634.78	-----	15.40	2.538E+00	-----	Line Not Found	-----
CD-109	88.03	58	3.70*	5.854E+00	1.323E+00	1.422E+00	55.48
SN-126	64.28	29	9.60	3.013E+00	4.975E-01	4.975E-01	131.48
	86.94	58	8.90	5.854E+00	5.501E-01	5.501E-01	55.48
	87.57	58	37.00*	5.854E+00	1.323E-01	1.323E-01	55.48
CS-135	268.22	37	16.00*	4.788E+00	2.427E-01	2.427E-01	100.77
BA-137M	661.66	173	89.90*	2.456E+00	3.911E-01	3.923E-01	21.76
CS-137	661.66	173	85.10*	2.456E+00	4.131E-01	4.144E-01	21.76
TL-208	277.37	-----	6.60	4.682E+00	-----	Line Not Found	-----
	583.19	58	85.00*	2.709E+00	1.264E-01	1.264E-01	52.05
	860.56	-----	12.50	1.976E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	4.323E+00	-----	Line Not Found	-----
	351.06	123	12.92*	3.943E+00	1.205E+00	1.205E+00	31.43
BI-212	727.33	16	6.67*	2.275E+00	5.115E-01	5.115E-01	131.66
	785.37	12	1.10	2.133E+00	2.511E+00	2.511E+00	133.45
	1620.50	-----	1.47	1.134E+00	-----	Line Not Found	-----
PB-212	74.82	96	10.28	4.579E+00	1.016E+00	1.016E+00	51.83
	77.11	119	17.10	4.863E+00	7.115E-01	7.115E-01	39.03
	238.63	310	43.60*	5.201E+00	6.811E-01	6.811E-01	15.40
	300.09	26	3.30	4.416E+00	9.021E-01	9.021E-01	112.00
BI-214	609.32	112	45.49*	2.621E+00	4.661E-01	4.662E-01	22.62
	1120.29	20	14.92	1.566E+00	4.200E-01	4.201E-01	71.77
	1764.49	7	15.30	1.062E+00	2.174E-01	2.174E-01	116.77
PB-214	74.82	96	5.80	4.579E+00	1.801E+00	1.801E+00	51.83
	77.11	119	9.70	4.863E+00	1.254E+00	1.254E+00	39.03
	87.09	58	3.41	5.854E+00	1.436E+00	1.436E+00	55.48
	242.00	63	7.25	5.156E+00	8.425E-01	8.425E-01	57.68
	295.22	113	18.42	4.475E+00	6.823E-01	6.824E-01	28.47
	351.93	123	35.60*	3.943E+00	4.373E-01	4.373E-01	31.43
RN-222	609.32	112	45.49*	2.621E+00	4.661E-01	4.662E-01	22.62
	1120.29	20	14.92	1.566E+00	4.200E-01	4.201E-01	71.77
	1764.49	7	15.30	1.062E+00	2.174E-01	2.174E-01	116.77
RA-224	240.99	63	4.10*	5.156E+00	1.490E+00	1.490E+00	57.68
RA-226	609.32	112	45.49*	2.621E+00	4.661E-01	4.662E-01	22.62
	1120.29	20	14.92	1.566E+00	4.200E-01	4.201E-01	71.77
	1764.49	7	15.30	1.062E+00	2.174E-01	2.174E-01	116.77
AC-228	105.21	-----	1.10	6.766E+00	-----	Line Not Found	-----
	338.32	83	11.27	4.059E+00	9.047E-01	9.047E-01	43.18
	794.95	13	4.25	2.112E+00	7.459E-01	7.459E-01	107.52
	835.71	-----	1.61	2.026E+00	-----	Line Not Found	-----
	911.20	56	25.80*	1.881E+00	5.733E-01	5.733E-01	37.20
	968.97	29	15.80	1.782E+00	5.140E-01	5.140E-01	60.49
RA-228	105.21	-----	1.10	6.766E+00	-----	Line Not Found	-----
	338.32	83	11.27	4.059E+00	9.047E-01	9.047E-01	43.18
	794.95	13	4.25	2.112E+00	7.459E-01	7.459E-01	107.52

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	2.026E+00	-----	Line Not Found	-----
	911.20	56	25.80*	1.881E+00	5.733E-01	5.733E-01	37.20
	968.97	29	15.80	1.782E+00	5.140E-01	5.140E-01	60.49
TH-228	74.82	96	10.28	4.579E+00	1.016E+00	1.016E+00	51.83
	77.11	119	17.10	4.863E+00	7.115E-01	7.115E-01	39.03
	238.63	310	43.60*	5.201E+00	6.811E-01	6.811E-01	15.40
	300.09	26	3.30	4.416E+00	9.021E-01	9.021E-01	112.00
TH-230	609.32	112	45.49*	2.621E+00	4.661E-01	4.661E-01	22.62
	1120.29	20	14.92	1.566E+00	4.200E-01	4.200E-01	71.77
	1764.49	7	15.30	1.062E+00	2.174E-01	2.174E-01	116.77
PA-231	283.69	-----	1.70	4.607E+00	-----	Line Not Found	-----
	301.36	26	5.35*	4.416E+00	5.564E-01	5.564E-01	112.00
TH-232	105.21	-----	1.10	6.766E+00	-----	Line Not Found	-----
	338.32	83	11.27	4.059E+00	9.047E-01	9.047E-01	43.18
	835.71	-----	1.61	2.026E+00	-----	Line Not Found	-----
	911.20	56	25.80*	1.881E+00	5.733E-01	5.733E-01	37.20
	968.97	29	15.80	1.782E+00	5.140E-01	5.140E-01	60.49
TH-234	63.29	29	3.70*	3.013E+00	1.291E+00	1.291E+00	131.48
	92.59	58	4.23	6.231E+00	1.101E+00	1.101E+00	82.99
U-234	609.32	112	45.49*	2.621E+00	4.661E-01	4.661E-01	22.62
	1120.29	20	14.92	1.566E+00	4.200E-01	4.200E-01	71.77
	1764.49	7	15.30	1.062E+00	2.174E-01	2.174E-01	116.77
U-235	89.96	49	3.47	6.020E+00	1.157E+00	1.157E+00	73.32
	93.35	58	5.60	6.231E+00	8.316E-01	8.316E-01	82.99
	143.76	-----	10.96*	6.848E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.528E+00	-----	Line Not Found	-----
	185.72	75	57.20	6.095E+00	1.067E-01	1.067E-01	73.74
	205.31	-----	5.01	5.749E+00	-----	Line Not Found	-----
U-238	63.29	29	3.70*	3.013E+00	1.291E+00	1.291E+00	131.48
	92.59	58	4.23	6.231E+00	1.101E+00	1.101E+00	82.99
AM-243	43.53	-----	5.90	4.621E-01	-----	Line Not Found	-----
	74.66	96	67.20*	4.579E+00	1.554E-01	1.554E-01	51.83
ANH-511	511.00	54	100.00*	2.998E+00	9.002E-02	9.002E-02	65.41

Flag: "*" = Keyline

Total number of lines in spectrum 42
Number of unidentified lines 9
Number of lines tentatively identified by NID 33 78.57%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.101E+00	4.101E+00	0.967E+00	23.57	
AS-74	17.77D	6.54	1.210E-01	7.908E-01	4.062E-01	51.37	
CD-109	461.40D	1.07	1.323E+00	1.422E+00	0.789E+00	55.48	
SN-126	2.30E+05Y	1.00	1.323E-01	1.323E-01	0.734E-01	55.48	
CS-135	2.30E+06Y	1.00	2.427E-01	2.427E-01	2.445E-01	100.77	
BA-137M	30.08Y	1.00	3.911E-01	3.923E-01	0.854E-01	21.76	
CS-137	30.08Y	1.00	4.131E-01	4.144E-01	0.902E-01	21.76	
TL-208	1.41E+10Y	1.00	1.264E-01	1.264E-01	0.658E-01	52.05	
BI-211	7.04E+08Y	1.00	1.205E+00	1.205E+00	0.379E+00	31.43	
BI-212	1.41E+10Y	1.00	5.115E-01	5.115E-01	6.734E-01	131.66	
PB-212	1.41E+10Y	1.00	6.811E-01	6.811E-01	1.049E-01	15.40	
BI-214	1600.00Y	1.00	4.661E-01	4.662E-01	1.055E-01	22.62	
PB-214	1600.00Y	1.00	4.373E-01	4.373E-01	1.374E-01	31.43	
RN-222	1600.00Y	1.00	4.661E-01	4.662E-01	1.055E-01	22.62	
RA-224	1.41E+10Y	1.00	1.490E+00	1.490E+00	0.859E+00	57.68	
RA-226	1600.00Y	1.00	4.661E-01	4.662E-01	1.055E-01	22.62	
AC-228	1.41E+10Y	1.00	5.733E-01	5.733E-01	2.133E-01	37.20	
RA-228	1.41E+10Y	1.00	5.733E-01	5.733E-01	2.133E-01	37.20	
TH-228	1.41E+10Y	1.00	6.811E-01	6.811E-01	1.049E-01	15.40	
TH-230	7.54E+04Y	1.00	4.661E-01	4.661E-01	1.055E-01	22.62	
PA-231	7.04E+08Y	1.00	5.564E-01	5.564E-01	6.232E-01	112.00	
TH-232	1.41E+10Y	1.00	5.733E-01	5.733E-01	2.133E-01	37.20	
TH-234	4.47E+09Y	1.00	1.291E+00	1.291E+00	1.697E+00	131.48	
U-234	2.45E+05Y	1.00	4.661E-01	4.661E-01	1.055E-01	22.62	
U-235	7.04E+08Y	1.00	1.067E-01	1.067E-01	0.787E-01	73.74	K
U-238	4.47E+09Y	1.00	1.291E+00	1.291E+00	1.697E+00	131.48	
AM-243	7370.00Y	1.00	1.554E-01	1.554E-01	0.806E-01	51.83	
ANH-511	1.00E+09Y	1.00	9.002E-02	9.002E-02	5.888E-02	65.41	
Total Activity :			1.940E+01	2.017E+01			

Grand Total Activity : 1.940E+01 2.017E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	61.19	25	57	1.00	122.18	120	14	5.38E-03	****	2.66E+00	T
0	199.58	7	64	1.62	398.84	397	7	1.74E-03	****	5.85E+00	
0	211.72	164	169	6.86	423.11	411	26	3.90E-02	50.5	5.64E+00	T
0	523.47	23	15	0.73	1046.38	1039	14	5.83E-03	87.3	2.94E+00	T
0	625.93	22	10	4.27	1251.25	1244	13	5.92E-03	74.3	2.57E+00	
0	757.21	12	15	1.43	1513.75	1508	12	3.16E-03	****	2.20E+00	T
0	853.49	8	13	0.49	1706.27	1697	11	2.07E-03	****	1.99E+00	
0	933.72	16	2	1.63	1866.71	1861	10	4.39E-03	62.3	1.84E+00	
0	1012.75	21	0	4.92	2024.76	2019	12	5.83E-03	43.6	1.71E+00	
0	1037.09	6	4	1.32	2073.42	2070	7	1.72E-03	****	1.68E+00	T
0	1149.51	16	0	3.38	2298.25	2294	10	4.44E-03	50.0	1.53E+00	
0	1153.79	9	2	0.96	2306.80	2303	8	2.59E-03	83.1	1.52E+00	
0	1181.67	5	4	1.16	2362.57	2356	8	1.36E-03	****	1.49E+00	
0	1185.43	10	2	2.06	2370.09	2366	8	2.82E-03	78.7	1.49E+00	
0	1236.74	24	0	4.17	2472.71	2464	18	6.67E-03	40.8	1.43E+00	T

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677008.CNF;1  *
* Acquisition date   : 28-JUN-2016 13:08:49 Sensitivity      : 3.000          *
* Detector ID        : GAM16 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.30 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 10:35:00 Nuclide Library : SOLID         *
* Sample ID          : G398677008 Analyst initials: MXR1          *
* Batch Number       : 1572231 Sample Quantity : 1.5078E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000          *
*                                     Dry Weight    : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 28-SEP-2015 08:03:00 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;13          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.637E-01
AS-74	2.238E-01
CD-109	5.720E-01
SN-126	5.351E-02
CS-135	1.124E-01
BA-137M	2.644E-02
CS-137	2.793E-02
TL-208	2.631E-02
BI-212	4.253E-01
PB-212	4.337E-02
BI-214	4.429E-02
PB-214	6.262E-02
RN-222	4.429E-02
RA-224	4.648E-01
RA-226	4.429E-02
AC-228	6.623E-02
RA-228	6.623E-02
TH-228	4.337E-02
TH-230	4.428E-02
PA-231	3.182E-01
TH-232	6.623E-02
TH-234	9.999E-01
U-234	4.428E-02
U-235	1.476E-01
U-238	9.999E-01
AM-243	3.719E-02
ANH-511	2.102E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.735E-01	NOT IDENT.
NA-22	1.838E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.114E-02	NOT IDENT.

SC-46	3.610E-02	FAIL ABUN
V-48	1.282E-01	NOT IDENT.
CR-51	6.782E-01	NOT IDENT.
MN-54	2.900E-02	NOT IDENT.
CO-56	4.086E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	1.938E-02	NOT IDENT.
CO-58	2.386E-02	NOT IDENT.
FE-59	8.972E-02	NOT IDENT.
CO-60	3.204E-02	NOT IDENT.
ZN-65	5.469E-02	NOT IDENT.
GE-68	5.994E-01	NOT IDENT.
AS-73	9.513E-01	NOT IDENT.
SE-75	3.901E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.669E-01	NOT IDENT.
RB-83	5.808E-02	NOT IDENT.
KR-85	5.844E+00	NOT IDENT.
SR-85	4.379E-02	NOT IDENT.
RB-86	1.380E+00	NOT IDENT.
Y-88	2.550E-02	NOT IDENT.
Y-91	2.036E+01	NOT IDENT.
NB-94	2.225E-02	NOT IDENT.
NB-95	3.834E-02	NOT IDENT.
NB-95M	1.357E-01	NOT IDENT.
ZR-95	7.867E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.486E-02	NOT IDENT.
RH-102	3.572E-02	NOT IDENT.
RU-103	5.311E-02	FAIL ABUN
RH-106	2.226E-01	NOT IDENT.
RU-106	2.226E-01	NOT IDENT.
AG-108M	2.509E-02	NOT IDENT.
AG-110M	3.741E-02	NOT IDENT.
SN-113	4.317E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.217E-01	NOT IDENT.
TE-123M	2.540E-02	NOT IDENT.
SB-124	5.855E-02	NOT IDENT.
SB-125	6.805E-02	NOT IDENT.
TE-125M	9.212E+00	NOT IDENT.
I-126	9.662E-01	NOT IDENT.
SB-126	6.440E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.301E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.363E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.223E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	4.457E-01	FAIL ABUN
CE-139	2.642E-02	NOT IDENT.
BA-140	1.067E+00	NOT IDENT.
LA-140	2.163E-01	NOT IDENT.
CE-141	8.652E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.323E-01	NOT IDENT.
PM-144	3.017E-02	NOT IDENT.
PR-144	2.295E+00	NOT IDENT.
PM-146	2.991E-02	NOT IDENT.
ND-147	3.029E+00	FAIL ABUN
PM-147	5.518E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.958E-02	FAIL ABUN
EU-152	8.449E-02	NOT IDENT.
GD-153	6.153E-02	NOT IDENT.
EU-154	4.885E-02	FAIL ABUN
EU-155	7.431E-02	FAIL ABUN
TB-160	1.023E-01	FAIL ABUN
HO-166M	4.256E-02	NOT IDENT.
TM-171	1.405E+01	NOT IDENT.
HF-172	1.538E-01	FAIL ABUN
LU-172	4.560E-02	FAIL ABUN
LU-176	1.755E-02	FAIL ABUN

HF-181	5.488E-02	NOT IDENT.
TA-182	1.643E-01	FAIL ABUN
RE-183	2.204E-01	NOT IDENT.
RE-184	1.571E-01	NOT IDENT.
W-188	7.345E+00	FAIL ABUN
IR-192	3.278E-02	FAIL ABUN
HG-203	5.332E-02	NOT IDENT.
BI-207	3.735E-02	FAIL ABUN
PB-210	3.795E+00	NOT IDENT.
BI-211	2.957E-01	FAIL ABUN
PB-211	5.604E-01	NOT IDENT.
RN-219	3.216E-01	NOT IDENT.
RA-223	4.472E-01	FAIL ABUN
AC-227	1.651E-01	FAIL ABUN
TH-227	1.651E-01	FAIL ABUN
TH-229	4.003E-01	FAIL ABUN
TH-231	4.472E-01	FAIL ABUN
PA-233	4.508E-02	FAIL ABUN
PA-234	1.961E-01	NOT IDENT.
PA-234M	3.287E+00	NOT IDENT.
NP-237	4.508E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.879E-01	NOT IDENT.
PU-239	2.357E+02	NOT IDENT.
AM-241	1.153E-01	NOT IDENT.
CM-243	7.673E-02	NOT IDENT.
BK-247	5.518E-02	NOT IDENT.
CM-247	2.827E-02	NOT IDENT.
CF-249	3.150E-02	NOT IDENT.
CF-251	1.045E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677008.CNF;1
Acquisition date : 28-JUN-2016 13:08:49 Sensitivity : 3.000
Detector ID : GAM16 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.30 Half life ratio : *****
Sample date : 11-MAY-2016 10:35:00 Nuclide Library : SOLID
Sample ID : G398677008 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5078E+02 GRAM
Quantity Err(%) : 1.3264E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 28-SEP-2015 08:03:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.101E+00	1.014E+00	1.014E+00
AS-74	7.908E-01	4.071E-01	4.071E-01
CD-109	7.464E-01	8.061E-01	8.061E-01
SN-126	6.943E-02	7.490E-02	7.490E-02
CS-135	2.427E-01	2.408E-01	2.408E-01
BA-137M	3.923E-01	8.970E-02	8.970E-02
CS-137	4.144E-01	9.475E-02	9.475E-02
TL-208	1.264E-01	6.538E-02	6.538E-02
BI-212	5.115E-01	6.620E-01	6.620E-01
PB-212	6.811E-01	1.173E-01	1.173E-01
BI-214	4.662E-01	1.106E-01	1.106E-01
PB-214	4.373E-01	1.396E-01	1.396E-01
RN-222	4.662E-01	1.106E-01	1.106E-01
RA-224	2.832E-01	9.182E-01	9.182E-01
RA-226	4.662E-01	1.106E-01	1.106E-01
AC-228	5.733E-01	2.258E-01	2.258E-01
RA-228	5.733E-01	2.258E-01	2.258E-01
TH-228	6.811E-01	1.173E-01	1.173E-01
TH-230	4.661E-01	1.106E-01	1.106E-01
PA-231	5.564E-01	6.235E-01	6.235E-01
TH-232	5.733E-01	2.258E-01	2.258E-01
TH-234	1.291E+00	1.689E+00	1.689E+00
U-234	4.661E-01	1.106E-01	1.106E-01
U-235	-5.347E-02	1.717E-01	1.717E-01
U-238	1.291E+00	1.689E+00	1.689E+00
AM-243	9.654E-02	8.152E-02	8.152E-02
ANH-511	9.002E-02	5.821E-02	5.821E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.414E-01	4.193E-01	4.241E-01	NOT IDENT.
NA-22	-4.195E-02	3.268E-02	3.776E-02	NOT IDENT.
NA-24	1.799E+21	4.983E+21	0.000E+00	SHORT HLIF

AL-26	-4.368E-03	1.577E-02	1.589E-02	NOT IDENT.
SC-46	3.196E-03	4.210E-02	4.212E-02	FAIL ABUN
V-48	-9.511E-02	1.811E-01	1.861E-01	NOT IDENT.
CR-51	4.144E-01	7.265E-01	7.502E-01	NOT IDENT.
MN-54	-4.565E-03	3.478E-02	3.484E-02	NOT IDENT.
CO-56	4.666E-03	5.454E-02	5.458E-02	FAIL ABUN
MN-56	1.000E+41	1.132E+42	0.000E+00	SHORT HLIF
CO-57	1.242E-03	2.166E-02	2.166E-02	NOT IDENT.
CO-58	-2.107E-02	3.323E-02	3.456E-02	NOT IDENT.
FE-59	2.414E-03	1.032E-01	1.032E-01	NOT IDENT.
CO-60	1.886E-02	3.404E-02	3.509E-02	NOT IDENT.
ZN-65	5.162E-02	5.669E-02	6.128E-02	NOT IDENT.
GE-68	-5.087E-01	8.273E-01	8.585E-01	NOT IDENT.
AS-73	-7.632E-02	1.022E+00	1.023E+00	NOT IDENT.
SE-75	-5.928E-03	5.003E-02	5.010E-02	NOT IDENT.
BR-77	1.603E+06	2.244E+06	2.357E+06	SHORT HLIF
SR-82	1.681E-01	7.533E-01	7.571E-01	NOT IDENT.
RB-83	-3.151E-02	8.624E-02	8.740E-02	NOT IDENT.
KR-85	6.277E+00	6.824E+00	7.387E+00	NOT IDENT.
SR-85	4.690E-02	5.114E-02	5.534E-02	NOT IDENT.
RB-86	-5.751E-01	1.728E+00	1.747E+00	NOT IDENT.
Y-88	-1.124E-03	3.052E-02	3.052E-02	NOT IDENT.
Y-91	1.044E+00	2.358E+01	2.358E+01	NOT IDENT.
NB-94	-3.399E-02	3.066E-02	3.427E-02	NOT IDENT.
NB-95	-1.370E-02	4.686E-02	4.726E-02	NOT IDENT.
NB-95M	1.321E-01	1.554E-01	1.664E-01	NOT IDENT.
ZR-95	8.237E-02	1.200E-01	1.256E-01	FAIL ABUN
NB-97	1.000E+41	8.610E+41	0.000E+00	SHORT HLIF
ZR-97	2.917E+20	2.343E+20	0.000E+00	SHORT HLIF
MO-99	-6.545E+03	4.006E+04	4.017E+04	SHORT HLIF
TC-99M	1.000E+41	8.154E+41	0.000E+00	SHORT HLIF
RH-101	1.861E-02	2.675E-02	2.804E-02	NOT IDENT.
RH-102	-1.071E-02	4.931E-02	4.955E-02	NOT IDENT.
RU-103	-2.600E-02	6.620E-02	6.723E-02	FAIL ABUN
RH-106	7.121E-03	2.901E-01	2.902E-01	NOT IDENT.
RU-106	7.121E-03	2.901E-01	2.902E-01	NOT IDENT.
AG-108M	6.207E-03	2.848E-02	2.861E-02	NOT IDENT.
AG-110M	1.715E-03	4.389E-02	4.390E-02	NOT IDENT.
SN-113	1.219E-02	4.836E-02	4.867E-02	NOT IDENT.
CD-115	-2.048E+05	3.114E+05	3.248E+05	SHORT HLIF
SN-117M	1.265E-01	2.433E-01	2.499E-01	NOT IDENT.
TE-123M	8.061E-03	2.842E-02	2.865E-02	NOT IDENT.
SB-124	-5.520E-02	8.935E-02	9.275E-02	NOT IDENT.
SB-125	-3.612E-02	8.411E-02	8.568E-02	NOT IDENT.
TE-125M	-8.567E-01	1.034E+01	1.034E+01	NOT IDENT.
I-126	5.607E-01	1.162E+00	1.190E+00	NOT IDENT.
SB-126	2.274E-01	8.080E-01	8.145E-01	NOT IDENT.
SB-127	7.648E+01	3.795E+02	3.810E+02	SHORT HLIF
I-131	-1.375E+00	1.708E+00	1.817E+00	NOT IDENT.
I-132	1.000E+41	3.175E+41	0.000E+00	SHORT HLIF
TE-132	-5.424E+01	7.685E+02	7.689E+02	SHORT HLIF
BA-133	3.635E-02	3.824E-02	4.161E-02	NOT IDENT.
I-133	-2.653E+14	1.512E+15	1.517E+15	SHORT HLIF
CS-134	3.877E-02	4.109E-02	4.465E-02	FAIL ABUN
I-135	1.000E+41	1.775E+42	0.000E+00	SHORT HLIF
CS-136	1.420E-01	4.897E-01	4.939E-01	FAIL ABUN
CE-139	5.353E-03	2.994E-02	3.004E-02	NOT IDENT.
BA-140	-1.116E+00	1.443E+00	1.528E+00	NOT IDENT.
LA-140	-2.610E-01	3.675E-01	3.859E-01	NOT IDENT.
CE-141	3.309E-03	9.818E-02	9.819E-02	NOT IDENT.
CE-143	2.180E+09	2.014E+09	2.241E+09	SHORT HLIF
CE-144	-9.861E-02	1.592E-01	1.653E-01	NOT IDENT.
PM-144	-1.501E-03	3.496E-02	3.497E-02	NOT IDENT.
PR-144	-2.973E-01	2.682E+00	2.686E+00	NOT IDENT.
PM-146	-4.126E-03	3.552E-02	3.556E-02	NOT IDENT.
ND-147	-1.792E+00	3.878E+00	3.962E+00	FAIL ABUN
PM-147	1.611E+02	6.058E+02	6.102E+02	NOT IDENT.
PM-149	-1.071E+06	2.466E+06	2.513E+06	SHORT HLIF
EU-150	-1.883E-02	2.806E-02	2.932E-02	FAIL ABUN
EU-152	-4.026E-03	9.994E-02	9.995E-02	NOT IDENT.
GD-153	-3.033E-02	7.422E-02	7.547E-02	NOT IDENT.
EU-154	-1.210E-01	9.021E-02	1.054E-01	FAIL ABUN
EU-155	-1.505E-03	8.267E-02	8.267E-02	FAIL ABUN
TB-160	-7.504E-02	1.371E-01	1.412E-01	FAIL ABUN
HO-166M	-5.467E-03	4.999E-02	5.005E-02	NOT IDENT.
TM-171	-1.462E+01	1.636E+01	1.764E+01	NOT IDENT.
HF-172	1.787E-01	1.618E-01	1.808E-01	FAIL ABUN
LU-172	2.332E-02	4.865E-02	4.978E-02	FAIL ABUN

LU-176	3.519E-03	2.197E-02	2.203E-02	FAIL ABUN
HF-181	6.123E-03	6.363E-02	6.369E-02	NOT IDENT.
TA-182	2.195E-01	1.527E-01	1.820E-01	FAIL ABUN
RE-183	-5.357E-02	2.676E-01	2.687E-01	NOT IDENT.
RE-184	1.954E-02	1.872E-01	1.874E-01	NOT IDENT.
W-188	-8.810E-01	9.482E+00	9.490E+00	FAIL ABUN
IR-192	-2.607E-02	3.989E-02	4.159E-02	FAIL ABUN
HG-203	3.688E-02	5.658E-02	5.898E-02	NOT IDENT.
BI-207	8.229E-03	4.164E-02	4.181E-02	FAIL ABUN
PB-210	3.712E+00	3.760E+00	4.116E+00	NOT IDENT.
BI-211	1.205E+00	3.852E-01	6.659E-01	FAIL ABUN
PB-211	-6.810E-03	6.483E-01	6.483E-01	NOT IDENT.
RN-219	-1.164E-02	3.727E-01	3.727E-01	NOT IDENT.
RA-223	-2.219E-01	5.385E-01	5.477E-01	FAIL ABUN
AC-227	-1.629E-01	2.005E-01	2.135E-01	FAIL ABUN
TH-227	-1.629E-01	2.005E-01	2.135E-01	FAIL ABUN
TH-229	7.183E-02	4.599E-01	4.611E-01	FAIL ABUN
TH-231	-2.219E-01	5.385E-01	5.477E-01	FAIL ABUN
PA-233	1.532E-02	4.917E-02	4.965E-02	FAIL ABUN
PA-234	-1.148E-01	2.877E-01	2.923E-01	NOT IDENT.
PA-234M	7.805E-01	3.795E+00	3.812E+00	NOT IDENT.
NP-237	1.532E-02	4.917E-02	4.965E-02	FAIL ABUN
NP-238	-3.069E+05	6.107E+05	6.261E+05	SHORT HLIF
NP-239	2.256E-02	2.084E-01	2.087E-01	NOT IDENT.
PU-239	-2.685E+02	2.896E+02	3.139E+02	NOT IDENT.
AM-241	-6.410E-02	1.442E-01	1.471E-01	NOT IDENT.
CM-243	3.228E-02	8.255E-02	8.382E-02	NOT IDENT.
BK-247	-2.456E-02	7.322E-02	7.405E-02	NOT IDENT.
CM-247	-1.543E-02	3.453E-02	3.522E-02	NOT IDENT.
CF-249	-2.505E-02	3.904E-02	4.064E-02	NOT IDENT.
CF-251	-7.270E-03	1.215E-01	1.215E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	77.1426	87.09	103.3820	136.47	59.3627
45.60	66.3224	87.57	85.9955	140.51	0.0000
46.54	50.7671	88.03	86.0778	143.76	80.3818
49.72	0.0000	88.34	86.1336	144.24	78.2940
51.35	62.1858	88.47	86.1566	145.44	67.6880
51.87	62.2822	89.96	11.7183	152.43	60.7772
52.39	62.3779	1093.63	11.7346	153.25	60.8478
52.97	65.1621	91.11	11.7458	323.87	70.7221
53.44	58.9946	92.59	60.3780	156.02	77.4468
54.07	58.2068	93.35	67.8443	158.56	65.6793
57.36	0.0000	94.56	66.5298	159.00	67.9096
57.53	74.6047	94.65	66.5414	162.33	86.9238
57.98	70.6228	94.67	66.5442	162.66	75.9552
59.27	73.5984	94.87	66.5706	163.33	60.5988
59.32	73.6085	97.43	74.9340	165.86	71.8601
59.54	73.6524	98.43	59.5868	176.31	77.3302
60.96	58.8735	98.44	59.5880	176.60	87.4493
61.17	58.9063	99.53	64.6889	177.52	86.4292
62.93	76.1545	100.11	69.7422	181.07	0.0000
63.29	76.2260	102.03	80.9959	181.52	64.3036
63.58	76.2835	103.18	77.1621	184.41	79.8195
64.28	76.4216	103.37	65.1600	143.76	61.2372
66.73	84.7746	105.21	70.4119	193.51	69.8319
67.24	80.7080	105.31	70.4251	197.03	48.2818
125.81	84.9761	106.12	67.5071	198.01	53.5166
67.75	84.9905	106.47	67.5504	201.83	62.4254
69.67	97.0599	109.28	60.8014	203.43	52.1173
70.83	84.2303	111.00	59.9720	205.31	80.0859
72.81	81.8090	111.76	0.0000	210.85	51.6826
72.87	81.8209	114.06	63.3614	215.65	51.9590
74.66	82.1656	116.30	0.0000	222.11	59.8015
74.82	82.1962	116.74	67.7621	227.09	51.7142
74.97	82.2249	119.76	67.0785	227.38	63.3248
77.11	82.6307	121.12	67.2316	228.16	0.0000
78.74	77.2163	121.22	67.2428	228.18	65.1638
79.69	78.8137	121.78	61.0928	116.74	65.1638
80.12	76.0201	122.06	67.3371	235.69	53.2611
80.19	76.0322	122.92	79.8821	235.96	54.7159
80.57	83.2750	123.07	84.0524	238.63	64.9731
81.00	100.5999	265.00	91.4084	238.98	0.0000
81.07	100.6154	125.81	60.4565	240.99	65.1297
81.75	107.9636	127.23	68.9533	242.00	65.1962
83.79	79.5249	127.91	69.0295	244.70	59.5631
84.00	76.6675	129.30	91.1952	252.40	0.0000
85.43	85.6083	131.20	57.8265	252.80	37.5269
86.55	109.0822	133.02	64.3186	254.15	0.0000
86.79	109.1372	133.52	67.5345	256.23	56.0196
86.94	103.3495	136.00	48.7271	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	50.3642	355.39	0.0000	584.27	18.4185
264.80	50.3708	356.01	27.1979	595.83	20.3795
265.00	50.3799	364.49	40.2521	427.87	21.6665
268.22	50.1611	366.42	0.0000	602.52	0.0000
269.46	50.2196	372.51	35.4288	604.72	9.3047
270.03	59.5508	375.05	37.5228	607.14	21.7371
271.23	62.5991	377.52	48.7654	609.32	19.5850
273.65	70.2080	356.01	46.9462	610.33	13.9962
276.40	64.5822	388.16	52.2085	614.28	17.1396
277.37	65.5769	388.63	46.0815	618.01	15.2201
277.60	63.7168	391.69	35.9186	620.36	14.0654
278.00	55.3035	264.66	37.1761	621.93	18.7681
279.20	52.5487	401.81	40.3062	630.19	0.0000
279.54	54.4423	402.40	44.4579	631.29	20.4246
279.70	55.3890	404.85	39.3545	633.25	19.9195
280.46	62.0039	410.95	39.5180	634.78	21.7180
283.69	58.4154	413.71	45.8430	635.95	23.6194
284.31	56.5631	414.70	45.8738	636.99	22.6857
285.41	55.6753	423.72	26.2215	645.85	18.9849
285.90	0.0000	427.09	43.0989	657.76	20.6823
287.50	48.2156	427.87	36.8105	657.90	0.0000
290.67	48.5406	433.94	36.9563	661.66	23.9075
293.27	0.0000	439.40	32.8486	664.57	0.0000
351.93	38.0743	453.88	28.8737	666.33	17.5697
295.96	38.0988	463.37	30.1200	666.50	17.5711
879.38	38.1854	468.07	38.8372	667.71	0.0000
299.98	38.2312	473.00	0.0000	677.62	16.3766
300.09	38.2349	475.06	26.0017	685.70	0.0000
300.13	38.2364	476.78	33.6205	695.00	32.0396
301.36	38.2770	477.60	24.9566	696.49	30.1175
302.85	32.1937	482.18	26.1130	696.51	31.0898
256.23	35.3092	487.02	24.0058	697.00	28.1808
304.85	38.3911	492.35	0.0000	697.30	26.2406
306.78	29.2250	497.08	34.0269	697.49	26.2433
308.46	35.6207	505.52	30.0019	702.65	35.0710
311.90	32.8270	507.63	0.0000	706.68	20.4945
316.51	48.4604	511.00	27.6619	711.68	21.5177
319.41	35.9465	514.00	23.0541	720.70	16.3652
320.08	38.8824	514.00	23.0541	721.93	0.0000
321.04	46.6956	520.40	24.9177	722.78	21.2937
323.87	43.8780	520.69	0.0000	722.91	21.2948
325.23	45.8791	522.65	0.0000	723.31	26.2135
328.76	47.9675	527.90	0.0000	724.19	18.0290
333.37	45.5900	528.26	26.8147	727.33	29.5415
333.97	55.0490	529.59	21.4676	733.00	24.6777
334.37	55.0660	529.87	0.0000	735.93	18.7787
338.28	43.3998	531.02	27.9747	333.97	19.7798
338.32	43.4011	537.26	32.5622	739.50	0.0000
311.90	55.3318	546.56	0.0000	747.24	13.9033
340.48	55.3318	552.55	19.9262	748.06	15.8949
340.55	47.4294	563.25	20.9510	752.31	13.2692
344.28	55.4958	569.33	13.7073	753.82	9.9583
345.93	56.8898	946.00	13.7084	756.73	19.9404
351.06	52.7978	569.70	13.7098	756.80	19.9414
351.93	52.8326	583.19	25.7715	884.68	15.7143

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.0164	1274.44	19.6115	1620.50	5.3658
766.42	25.0256	1001.03	14.1861	1621.92	2.1470
766.84	28.0335	1002.74	12.0103	1678.03	0.0000
772.60	0.0000	1004.73	13.3537	1690.97	5.6037
776.52	21.1087	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	4.7417
778.90	22.3589	1028.54	0.0000	1063.66	14.2419
783.70	0.0000	1037.84	10.1236	1771.35	14.2451
785.37	18.4945	1038.76	0.0000	1791.20	0.0000
792.07	20.2305	631.29	16.6121	1808.65	1.9137
794.95	13.1647	1048.07	12.9268	1810.72	0.0000
795.86	6.7536	1049.04	9.2362	1836.06	2.8863
810.06	13.2441	1050.41	13.8605		
810.29	12.2262	1063.66	12.9906		
344.28	12.2271	1077.00	10.2494		
810.76	12.2285	1077.34	10.2507		
815.77	5.1052	1085.87	11.2119		
1048.07	9.1993	1093.63	9.3656		
832.01	18.4948	1099.45	10.3206		
834.85	21.6009	1112.07	12.5581		
835.71	23.6660	1112.84	8.0748		
836.80	0.0000	1115.54	3.2326		
846.75	0.0000	1120.29	16.1858		
846.77	18.9438	1120.55	16.1872		
856.80	19.0159	1221.41	16.1907		
860.56	8.3096	1129.67	11.3623		
871.09	16.6844	1131.51	0.0000		
873.19	13.5665	1147.95	0.0000		
875.33	0.0000	1173.23	10.3575		
879.38	15.6896	1177.95	11.5244		
880.51	15.6962	1189.05	1.6516		
883.24	13.6170	1204.77	13.5483		
884.68	14.6720	1221.41	3.8892		
889.28	14.6966	1231.02	5.0137		
894.76	12.6223	1235.36	9.7607		
898.04	20.0089	1238.28	6.6984		
900.72	16.8660	1260.41	0.0000		
903.28	12.8957	1271.87	6.9009		
911.20	7.4067	1274.44	15.7845		
912.08	12.3483	1274.54	15.7852		
923.98	0.0000	1291.59	12.8842		
926.50	7.5991	1298.22	0.0000		
929.11	7.0990	1312.11	10.9615		
937.49	17.7995	1332.49	8.0146		
944.13	11.7748	1362.66	0.0000		
946.00	18.2090	1365.19	3.0309		
949.00	8.5779	1368.63	0.0000		
667.71	0.0000	1384.29	9.1366		
962.31	12.5667	1408.01	6.1272		
964.08	8.9817	1457.56	0.0000		
966.17	10.7856	1460.82	8.8668		
911.20	17.9932	1489.16	1.0415		
968.97	17.9932	1505.03	3.1361		
983.53	9.7642	1584.12	9.5804		
984.45	0.0000	1596.21	6.4043		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:38:47.26

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677009.CNF:1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM14.CNF:512
Background date    : 26-JUN-2016 12:04:30
Sample date       : 11-MAY-2016 10:40:00 Acquisition date : 28-JUN-2016 14:35:10
Sample ID        : G398677009 Sample quantity : 1.51840E+02 GRAM
Detector name     : GAM14 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.39 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	64.53*	21	102	0.72	129.52	125	8	5.77E-03	90.2	
2	6	75.66	81	83	0.89	151.76	148	18	2.24E-02	18.6	2.66E+00
3	6	77.81	130	62	0.89	156.07	148	18	3.62E-02	12.7	
4	6	80.72	26	53	1.78	161.89	148	18	7.21E-03	60.1	
5	2	88.18*	54	89	1.23	176.81	173	22	1.50E-02	31.6	2.27E+00
6	2	90.68	37	77	1.13	181.80	173	22	1.03E-02	43.2	
7	2	93.36*	50	66	1.24	187.15	173	22	1.40E-02	35.5	
8	0	159.96	28	31	0.84	320.33	318	6	7.72E-03	37.1	
9	0	186.84*	26	80	1.29	374.06	370	8	7.25E-03	66.6	
10	0	212.71	32	73	3.80	425.78	419	12	8.90E-03	57.5	
11	3	239.39*	252	56	1.10	479.13	474	16	7.01E-02	8.2	1.41E+00
12	3	242.23	63	69	1.63	484.81	474	16	1.75E-02	32.5	
13	0	253.15	19	16	0.67	506.65	504	5	5.27E-03	39.2	
14	0	295.80	77	31	1.31	591.91	585	11	2.14E-02	18.0	
15	0	300.49	33	26	2.76	601.29	597	8	9.22E-03	31.7	
16	0	331.46	21	53	1.99	663.20	654	15	5.89E-03	79.6	
17	0	338.82*	62	27	1.09	677.92	672	11	1.73E-02	21.0	
18	0	352.90*	97	58	1.37	706.06	701	10	2.70E-02	18.1	
19	0	463.90	14	41	0.63	927.98	922	11	3.90E-03	92.5	
20	0	511.41*	28	33	1.86	1022.98	1017	13	7.92E-03	55.9	
21	0	583.99*	92	12	1.22	1168.09	1163	12	2.56E-02	13.2	
22	0	610.11*	71	32	1.02	1220.32	1215	11	1.98E-02	20.0	
23	0	662.34	100	27	1.48	1324.73	1319	13	2.78E-02	14.5	
24	0	679.70	7	9	0.81	1359.45	1352	11	2.01E-03	93.8	
25	0	727.62*	21	5	2.68	1455.25	1449	11	5.78E-03	32.5	
26	0	772.34	4	23	3.69	1544.67	1533	13	1.11E-03	251.2	
27	0	887.47	10	1	0.91	1774.84	1772	6	2.69E-02	37.6	
28	0	911.89*	52	15	1.47	1823.65	1818	12	1.46E-02	20.9	
29	0	969.62*	30	8	1.39	1939.07	1935	10	8.27E-03	25.5	
30	0	1001.73*	13	3	1.37	2003.26	1999	10	3.52E-03	38.7	
31	0	1053.16	10	9	1.59	2106.09	2097	12	2.73E-03	68.9	
32	0	1122.23	16	28	1.09	2244.18	2235	11	4.55E-03	66.8	
33	0	1141.46	11	2	0.59	2282.62	2277	10	2.93E-03	41.6	
34	0	1238.79*	10	4	0.62	2477.23	2473	8	2.64E-03	49.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1243.43*	8	8	3.64	2486.50	2480	11	2.24E-03	78.8	
36	0	1461.56*	145	3	1.73	2922.59	2916	14	4.03E-02	8.9	
37	0	1496.59	8	0	0.83	2992.63	2988	9	2.22E-03	35.4	
38	0	1588.69	8	0	1.62	3176.75	3173	8	2.22E-03	35.4	
39	0	1764.99*	12	0	2.94	3529.21	3524	10	3.26E-03	32.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:38:49

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677009.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:40:00 Acquisition date : 28-JUN-2016 14:35:10
Sample ID        : G398677009 Sample quantity  : 151.84 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA14 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.39 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.191E+00	5.449E+00	5.449E+00	17.90	OK
CD-109	88.03	3.70*	6.014E+00	1.120E+00	1.204E+00	86.56	OK
SN-117M	156.02	2.11	6.613E+00	----- Line	Not Found	-----	Absent
	158.56	86.40*	6.543E+00	2.931E-02	3.416E-01	74.14	OK
TE-123M	159.00	84.00*	6.543E+00	3.014E-02	3.989E-02	74.14	OK
SN-126	64.28	9.60	3.333E+00	4.181E-01	4.181E-01	180.40	OK
	86.94	8.90	6.014E+00	4.656E-01	4.656E-01	86.56	OK
	87.57	37.00*	6.014E+00	1.120E-01	1.120E-01	86.56	OK
BA-137M	661.66	89.90*	2.407E+00	2.406E-01	2.413E-01	29.04	OK
CS-137	661.66	85.10*	2.407E+00	2.541E-01	2.549E-01	29.04	OK
TL-208	277.37	6.60	4.639E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.664E+00	2.146E-01	2.146E-01	26.38	OK
	860.56	12.50	1.924E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	4.833E+00	7.850E-01	7.850E-01	49.61	OK
	77.11	17.10	5.076E+00	9.511E-01	9.511E-01	25.36	OK
	238.63	43.60*	5.145E+00	6.460E-01	6.460E-01	16.34	OK
	300.09	3.30	4.380E+00	1.291E+00	1.291E+00	63.48	OK
BI-214	609.32	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	3.492E-01	3.493E-01	65.44	OK
PB-214	74.82	5.80	4.734E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.076E+00	1.677E+00	1.677E+00	25.36	OK
	87.09	3.41	5.933E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.107E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.430E+00	5.302E-01	5.302E-01	35.98	OK
	351.93	35.60*	3.897E+00	3.875E-01	3.876E-01	36.30	OK
RN-222	609.32	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	3.492E-01	3.493E-01	65.44	OK
RA-224	240.99	4.10*	5.103E+00	9.560E-01	9.560E-01	119.62	OK
RA-226	609.32	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	3.492E-01	3.493E-01	65.44	OK
AC-228	105.21	1.10	6.812E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.015E+00	7.668E-01	7.668E-01	41.92	OK
	794.95	4.25	2.062E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.826E+00	5.588E-01	5.588E-01	41.72	OK
	968.97	15.80	1.728E+00	5.447E-01	5.447E-01	51.09	OK
RA-228	105.21	1.10	6.812E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.015E+00	7.668E-01	7.668E-01	41.92	OK
	794.95	4.25	2.062E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.826E+00	5.588E-01	5.588E-01	41.72	OK
	968.97	15.80	1.728E+00	5.447E-01	5.447E-01	51.09	OK
TH-228	74.82	10.28	4.833E+00	7.850E-01	7.850E-01	49.61	OK
	77.11	17.10	5.076E+00	9.511E-01	9.511E-01	25.36	OK
	238.63	43.60*	5.145E+00	6.460E-01	6.460E-01	16.34	OK
	300.09	3.30	4.380E+00	1.291E+00	1.291E+00	63.48	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	609.32	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	3.492E-01	3.492E-01	65.44	OK
PA-231	283.69	1.70	4.565E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.380E+00	7.961E-01	7.961E-01	63.48	OK
TH-232	105.21	1.10	6.812E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.015E+00	7.668E-01	7.668E-01	41.92	OK
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.826E+00	5.588E-01	5.588E-01	41.72	OK
	968.97	15.80	1.728E+00	5.447E-01	5.447E-01	51.09	OK
TH-234	63.29	3.70*	3.333E+00	1.085E+00	1.085E+00	180.40	OK
	92.59	4.23	6.343E+00	1.169E+00	1.169E+00	70.95	OK
U-234	609.32	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99	OK
	1120.29	14.92	1.513E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	1.028E+00	3.492E-01	3.492E-01	65.44	OK
U-235	89.96	3.47	6.183E+00	1.087E+00	1.087E+00	86.39	OK
	93.35	5.60	6.343E+00	8.831E-01	8.831E-01	70.95	OK
	143.76	10.96*	6.814E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.481E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.035E+00	4.443E-02	4.443E-02	133.23	OK
	205.31	5.01	5.698E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.333E+00	1.085E+00	1.085E+00	180.40	OK
	92.59	4.23	6.343E+00	1.169E+00	1.169E+00	70.95	OK
AM-243	43.53	5.90	5.274E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.833E+00	1.201E-01	1.201E-01	49.61	OK
ANH-511	511.00	100.00*	2.955E+00	5.146E-02	5.146E-02	111.81	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677009.CNF;1
Acquisition date : 28-JUN-2016 14:35:10 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.39 Half life ratio : *****
Sample date : 11-MAY-2016 10:40:00 Analyst initials: MXR1
Sample ID : G398677009 Sample Quantity : 1.5184E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.449E+00	9.557E-01	5.828E-01
CD-109	1.204E+00	1.021E+00	1.135E+00
SN-117M	3.416E-01	2.482E-01	3.935E-01
TE-123M	3.989E-02	2.898E-02	4.737E-02
SN-126	1.120E-01	9.500E-02	1.061E-01
BA-137M	2.413E-01	6.868E-02	4.890E-02
CS-137	2.549E-01	7.256E-02	5.166E-02
TL-208	2.146E-01	5.548E-02	6.227E-02
PB-212	6.460E-01	1.034E-01	8.830E-02
BI-214	3.189E-01	1.250E-01	1.293E-01
PB-214	3.876E-01	1.379E-01	1.279E-01
RN-222	3.189E-01	1.250E-01	1.293E-01
RA-224	9.560E-01	1.121E+00	9.461E-01
RA-226	3.189E-01	1.250E-01	1.293E-01
AC-228	5.588E-01	2.285E-01	2.016E-01
RA-228	5.588E-01	2.285E-01	2.016E-01
TH-228	6.460E-01	1.034E-01	8.830E-02
TH-230	3.189E-01	1.250E-01	1.293E-01
PA-231	7.961E-01	4.953E-01	7.010E-01
TH-232	5.588E-01	2.285E-01	2.016E-01
TH-234	1.085E+00	1.918E+00	2.167E+00
U-234	3.189E-01	1.250E-01	1.293E-01
U-235	-7.211E-02	1.672E-01	2.997E-01
U-238	1.085E+00	1.918E+00	2.167E+00
AM-243	1.201E-01	5.838E-02	7.837E-02
ANH-511	5.146E-02	5.639E-02	4.515E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.830E-01	4.000E-01	8.073E-01	NOT IDENT.
NA-22	-5.627E-03	3.093E-02	6.131E-02	NOT IDENT.
NA-24	0.000E+00	4.269E+21	0.000E+00	SHORT HLIF
AL-26	-3.227E-03	3.698E-02	7.294E-02	NOT IDENT.

SC-46	-7.935E-04	3.701E-02	6.496E-02	NOT IDENT.
V-48	9.152E-03	2.054E-01	4.143E-01	NOT IDENT.
CR-51	3.591E-01	6.665E-01	1.360E+00	NOT IDENT.
MN-54	-8.641E-03	3.050E-02	5.727E-02	NOT IDENT.
CO-56	-7.598E-03	3.787E-02	7.292E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	6.061E-03	2.096E-02	4.069E-02	NOT IDENT.
CO-58	-1.160E-02	4.142E-02	7.831E-02	NOT IDENT.
FE-59	1.001E-02	1.203E-01	2.368E-01	NOT IDENT.
CO-60	-1.429E-02	2.992E-02	5.548E-02	NOT IDENT.
ZN-65	2.441E-02	1.021E-01	1.750E-01	NOT IDENT.
GE-68	5.792E-01	1.098E+00	2.330E+00	NOT IDENT.
AS-73	4.465E-01	9.101E-01	1.890E+00	NOT IDENT.
AS-74	6.210E-02	2.754E-01	5.598E-01	NOT IDENT.
SE-75	3.205E-02	4.173E-02	8.697E-02	NOT IDENT.
BR-77	0.000E+00	2.475E+05	0.000E+00	SHORT HLIF
SR-82	2.671E-01	6.419E-01	1.265E+00	NOT IDENT.
RB-83	-6.725E-02	7.914E-02	1.314E-01	NOT IDENT.
KR-85	0.000E+00	7.469E+00	1.580E+01	NOT IDENT.
SR-85	0.000E+00	5.600E-02	1.184E-01	NOT IDENT.
RB-86	1.456E+00	2.134E+00	4.650E+00	NOT IDENT.
Y-88	6.431E-03	4.189E-02	9.105E-02	NOT IDENT.
Y-91	8.566E+00	2.173E+01	4.685E+01	NOT IDENT.
NB-94	-7.956E-03	2.661E-02	5.023E-02	NOT IDENT.
NB-95	2.856E-03	4.557E-02	8.026E-02	NOT IDENT.
NB-95M	1.313E-02	1.512E-01	2.622E-01	NOT IDENT.
ZR-95	7.091E-02	7.798E-02	1.742E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.213E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.719E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	4.201E-03	2.807E-02	5.250E-02	NOT IDENT.
RH-102	-1.034E-02	4.287E-02	8.269E-02	NOT IDENT.
RU-103	-1.857E-03	5.953E-02	1.126E-01	FAIL ABUN
RH-106	1.147E-01	2.756E-01	5.727E-01	NOT IDENT.
RU-106	1.147E-01	2.756E-01	5.727E-01	NOT IDENT.
AG-108M	1.319E-02	2.610E-02	5.231E-02	NOT IDENT.
AG-110M	-8.765E-03	5.097E-02	8.298E-02	NOT IDENT.
SN-113	1.189E-03	4.594E-02	8.800E-02	NOT IDENT.
CD-115	0.000E+00	2.881E+05	0.000E+00	SHORT HLIF
SB-124	-2.165E-02	1.138E-01	2.247E-01	NOT IDENT.
SB-125	-1.230E-02	7.699E-02	1.441E-01	FAIL ABUN
TE-125M	-7.588E-01	1.149E+01	2.170E+01	NOT IDENT.
I-126	-3.086E-01	9.870E-01	1.608E+00	NOT IDENT.
SB-126	-5.006E-01	7.041E-01	1.082E+00	NOT IDENT.
SB-127	0.000E+00	4.122E+02	0.000E+00	SHORT HLIF
I-131	-4.890E-02	1.704E+00	3.255E+00	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	6.907E+02	0.000E+00	SHORT HLIF
BA-133	-9.390E-04	4.153E-02	6.941E-02	FAIL ABUN
I-133	0.000E+00	1.449E+15	0.000E+00	SHORT HLIF
CS-134	1.869E-02	3.318E-02	7.150E-02	NOT IDENT.
CS-135	-6.681E-02	1.258E-01	2.325E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-2.502E-01	6.023E-01	8.957E-01	NOT IDENT.
CE-139	4.624E-03	2.910E-02	5.453E-02	NOT IDENT.
BA-140	2.718E-01	1.353E+00	2.628E+00	NOT IDENT.
LA-140	-5.541E-02	4.172E-01	8.279E-01	NOT IDENT.
CE-141	4.014E-02	1.034E-01	1.986E-01	NOT IDENT.
CE-143	0.000E+00	1.620E+09	0.000E+00	SHORT HLIF
CE-144	-1.478E-01	1.902E-01	3.334E-01	FAIL ABUN
PM-144	-2.705E-02	2.957E-02	5.065E-02	NOT IDENT.
PR-144	-2.053E+00	2.252E+00	3.861E+00	NOT IDENT.
PM-146	9.821E-04	3.488E-02	6.675E-02	NOT IDENT.
ND-147	1.364E+00	3.210E+00	6.601E+00	FAIL ABUN
PM-147	3.449E+02	5.716E+02	1.139E+03	NOT IDENT.
PM-149	0.000E+00	2.131E+06	0.000E+00	SHORT HLIF
EU-150	1.202E-02	2.338E-02	3.473E-02	FAIL ABUN
EU-152	3.104E-02	8.306E-02	1.555E-01	NOT IDENT.
GD-153	-4.943E-02	7.906E-02	1.260E-01	NOT IDENT.
EU-154	-1.142E-02	8.718E-02	1.743E-01	NOT IDENT.
EU-155	1.765E-02	7.755E-02	1.514E-01	NOT IDENT.
TB-160	9.491E-02	1.473E-01	3.173E-01	FAIL ABUN
HO-166M	3.248E-03	4.261E-02	8.630E-02	FAIL ABUN
TM-171	-1.654E+00	1.524E+01	3.021E+01	NOT IDENT.
HF-172	-2.737E-02	1.614E-01	2.952E-01	FAIL ABUN
LU-172	-5.527E-03	5.120E-02	9.790E-02	FAIL ABUN
LU-176	6.636E-03	1.900E-02	3.854E-02	FAIL ABUN

HF-181	-1.616E-02	6.344E-02	1.164E-01	NOT IDENT.
TA-182	-3.040E-02	1.398E-01	2.769E-01	FAIL ABUN
RE-183	-8.815E-02	2.236E-01	4.292E-01	NOT IDENT.
RE-184	-9.429E-02	1.739E-01	3.105E-01	NOT IDENT.
W-188	-5.031E+00	8.381E+00	1.309E+01	FAIL ABUN
IR-192	-2.224E-03	3.613E-02	6.975E-02	FAIL ABUN
HG-203	-1.503E-02	4.860E-02	9.171E-02	NOT IDENT.
BI-207	4.481E-03	3.790E-02	7.654E-02	FAIL ABUN
PB-210	-2.402E+00	3.134E+00	6.048E+00	NOT IDENT.
BI-211	0.000E+00	2.615E-01	5.637E-01	NOT IDENT.
PB-211	-1.151E-01	6.118E-01	1.140E+00	NOT IDENT.
BI-212	7.221E-01	4.606E-01	9.384E-01	FAIL ABUN
RN-219	1.724E-01	3.393E-01	6.834E-01	NOT IDENT.
RA-223	-5.561E-01	5.927E-01	8.612E-01	FAIL ABUN
AC-227	6.905E-02	2.032E-01	3.680E-01	FAIL ABUN
TH-227	6.905E-02	2.032E-01	3.680E-01	FAIL ABUN
TH-229	-4.020E-01	4.194E-01	7.659E-01	FAIL ABUN
TH-231	-5.561E-01	5.927E-01	8.612E-01	FAIL ABUN
PA-233	2.180E-03	4.655E-02	9.142E-02	FAIL ABUN
PA-234	-1.165E-01	2.179E-01	3.879E-01	FAIL ABUN
PA-234M	4.471E+00	3.395E+00	7.933E+00	FAIL ABUN
NP-237	2.180E-03	4.655E-02	9.142E-02	FAIL ABUN
NP-238	0.000E+00	7.026E+05	0.000E+00	SHORT HLIF
NP-239	1.457E-03	1.925E-01	3.671E-01	NOT IDENT.
PU-239	1.994E+02	2.960E+02	5.803E+02	NOT IDENT.
AM-241	5.479E-02	1.324E-01	2.575E-01	NOT IDENT.
CM-243	5.971E-02	7.851E-02	1.597E-01	NOT IDENT.
BK-247	2.563E-02	6.239E-02	1.262E-01	NOT IDENT.
CM-247	1.976E-02	3.112E-02	6.349E-02	NOT IDENT.
CF-249	1.737E-02	3.447E-02	6.919E-02	FAIL ABUN
CF-251	-3.365E-02	9.940E-02	1.781E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	140	10.66*	1.191E+00	5.449E+00	5.449E+00	17.90
CD-109	88.03	69	3.70*	6.014E+00	1.523E+00	1.638E+00	63.26
SN-117M	156.02	-----	2.11	6.613E+00	-----	Line Not Found	-----
	158.56	34	86.40*	6.543E+00	2.931E-02	3.416E-01	74.14
TE-123M	159.00	34	84.00*	6.543E+00	3.014E-02	3.989E-02	74.14
SN-126	64.28	27	9.60	3.333E+00	4.181E-01	4.181E-01	180.40
	86.94	69	8.90	6.014E+00	6.333E-01	6.333E-01	63.26
	87.57	69	37.00*	6.014E+00	1.523E-01	1.523E-01	63.26
BA-137M	661.66	105	89.90*	2.407E+00	2.406E-01	2.413E-01	29.04
CS-137	661.66	105	85.10*	2.407E+00	2.541E-01	2.549E-01	29.04
TL-208	277.37	-----	6.60	4.639E+00	-----	Line Not Found	-----
	583.19	98	85.00*	2.664E+00	2.146E-01	2.146E-01	26.38
	860.56	-----	12.50	1.924E+00	-----	Line Not Found	-----
PB-212	74.82	104	10.28	4.833E+00	1.032E+00	1.032E+00	37.23
	77.11	167	17.10	5.076E+00	9.511E-01	9.511E-01	25.36
	238.63	293	43.60*	5.145E+00	6.460E-01	6.460E-01	16.34
	300.09	38	3.30	4.380E+00	1.291E+00	1.291E+00	63.48
BI-214	609.32	75	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	11	15.30	1.028E+00	3.492E-01	3.493E-01	65.44
PB-214	74.82	104	5.80	4.833E+00	1.829E+00	1.829E+00	37.23
	77.11	167	9.70	5.076E+00	1.677E+00	1.677E+00	25.36
	87.09	69	3.41	6.014E+00	1.653E+00	1.653E+00	63.26
	242.00	73	7.25	5.103E+00	9.784E-01	9.785E-01	65.08
	295.22	88	18.42	4.430E+00	5.302E-01	5.302E-01	35.98
	351.93	109	35.60*	3.897E+00	3.875E-01	3.876E-01	36.30
RN-222	609.32	75	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	11	15.30	1.028E+00	3.492E-01	3.493E-01	65.44
RA-224	240.99	73	4.10*	5.103E+00	1.730E+00	1.730E+00	65.08
RA-226	609.32	75	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	11	15.30	1.028E+00	3.492E-01	3.493E-01	65.44
AC-228	105.21	-----	1.10	6.812E+00	-----	Line Not Found	-----
	338.32	70	11.27	4.015E+00	7.668E-01	7.668E-01	41.92
	794.95	-----	4.25	2.062E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	53	25.80*	1.826E+00	5.588E-01	5.588E-01	41.72
	968.97	30	15.80	1.728E+00	5.447E-01	5.447E-01	51.09
RA-228	105.21	-----	1.10	6.812E+00	-----	Line Not Found	-----
	338.32	70	11.27	4.015E+00	7.668E-01	7.668E-01	41.92
	794.95	-----	4.25	2.062E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	53	25.80*	1.826E+00	5.588E-01	5.588E-01	41.72
	968.97	30	15.80	1.728E+00	5.447E-01	5.447E-01	51.09
TH-228	74.82	104	10.28	4.833E+00	1.032E+00	1.032E+00	37.23
	77.11	167	17.10	5.076E+00	9.511E-01	9.511E-01	25.36

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	238.63	293	43.60*	5.145E+00	6.460E-01	6.460E-01	16.34
	300.09	38	3.30	4.380E+00	1.291E+00	1.291E+00	63.48
TH-230	609.32	75	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	11	15.30	1.028E+00	3.492E-01	3.492E-01	65.44
PA-231	283.69	-----	1.70	4.565E+00	-----	Line Not Found	-----
	301.36	38	5.35*	4.380E+00	7.961E-01	7.961E-01	63.48
TH-232	105.21	-----	1.10	6.812E+00	-----	Line Not Found	-----
	338.32	70	11.27	4.015E+00	7.668E-01	7.668E-01	41.92
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	53	25.80*	1.826E+00	5.588E-01	5.588E-01	41.72
	968.97	30	15.80	1.728E+00	5.447E-01	5.447E-01	51.09
TH-234	63.29	27	3.70*	3.333E+00	1.085E+00	1.085E+00	180.40
	92.59	63	4.23	6.343E+00	1.169E+00	1.169E+00	70.95
U-234	609.32	75	45.49*	2.573E+00	3.189E-01	3.189E-01	39.99
	1120.29	-----	14.92	1.513E+00	-----	Line Not Found	-----
	1764.49	11	15.30	1.028E+00	3.492E-01	3.492E-01	65.44
U-235	89.96	47	3.47	6.183E+00	1.087E+00	1.087E+00	86.39
	93.35	63	5.60	6.343E+00	8.831E-01	8.831E-01	70.95
	143.76	-----	10.96*	6.814E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.481E+00	-----	Line Not Found	-----
	185.72	31	57.20	6.035E+00	4.443E-02	4.443E-02	133.23
	205.31	-----	5.01	5.698E+00	-----	Line Not Found	-----
U-238	63.29	27	3.70*	3.333E+00	1.085E+00	1.085E+00	180.40
	92.59	63	4.23	6.343E+00	1.169E+00	1.169E+00	70.95
AM-243	43.53	-----	5.90	5.274E-01	-----	Line Not Found	-----
	74.66	104	67.20*	4.833E+00	1.579E-01	1.579E-01	37.23
ANH-511	511.00	31	100.00*	2.955E+00	5.146E-02	5.146E-02	111.81

Flag: "*" = Keyline

Total number of lines in spectrum 39
Number of unidentified lines 9
Number of lines tentatively identified by NID 30 76.92%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.449E+00	5.449E+00	0.975E+00	17.90	
CD-109	461.40D	1.08	1.523E+00	1.638E+00	1.036E+00	63.26	
SN-117M	13.60D	11.7	2.931E-02	3.416E-01	2.533E-01	74.14	
TE-123M	119.20D	1.32	3.014E-02	3.989E-02	2.958E-02	74.14	
SN-126	2.30E+05Y	1.00	1.523E-01	1.523E-01	0.964E-01	63.26	
BA-137M	30.08Y	1.00	2.406E-01	2.413E-01	0.701E-01	29.04	
CS-137	30.08Y	1.00	2.541E-01	2.549E-01	0.740E-01	29.04	
TL-208	1.41E+10Y	1.00	2.146E-01	2.146E-01	0.566E-01	26.38	
PB-212	1.41E+10Y	1.00	6.460E-01	6.460E-01	1.055E-01	16.34	
BI-214	1600.00Y	1.00	3.189E-01	3.189E-01	1.276E-01	39.99	
PB-214	1600.00Y	1.00	3.875E-01	3.876E-01	1.407E-01	36.30	
RN-222	1600.00Y	1.00	3.189E-01	3.189E-01	1.276E-01	39.99	
RA-224	1.41E+10Y	1.00	1.730E+00	1.730E+00	1.126E+00	65.08	
RA-226	1600.00Y	1.00	3.189E-01	3.189E-01	1.276E-01	39.99	
AC-228	1.41E+10Y	1.00	5.588E-01	5.588E-01	2.331E-01	41.72	
RA-228	1.41E+10Y	1.00	5.588E-01	5.588E-01	2.331E-01	41.72	
TH-228	1.41E+10Y	1.00	6.460E-01	6.460E-01	1.055E-01	16.34	
TH-230	7.54E+04Y	1.00	3.189E-01	3.189E-01	1.275E-01	39.99	
PA-231	7.04E+08Y	1.00	7.961E-01	7.961E-01	5.054E-01	63.48	
TH-232	1.41E+10Y	1.00	5.588E-01	5.588E-01	2.331E-01	41.72	
TH-234	4.47E+09Y	1.00	1.085E+00	1.085E+00	1.957E+00	180.40	
U-234	2.45E+05Y	1.00	3.189E-01	3.189E-01	1.275E-01	39.99	
U-235	7.04E+08Y	1.00	4.443E-02	4.443E-02	5.920E-02	133.23	K
U-238	4.47E+09Y	1.00	1.085E+00	1.085E+00	1.957E+00	180.40	
AM-243	7370.00Y	1.00	1.579E-01	1.579E-01	0.588E-01	37.23	
ANH-511	1.00E+09Y	1.00	5.146E-02	5.146E-02	5.754E-02	111.81	
Total Activity :			1.779E+01	1.823E+01			

Grand Total Activity : 1.779E+01 1.823E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	80.72	33	68	1.78	161.89	148	18	7.21E-03	****	5.38E+00	T
0	212.71	38	86	3.80	425.78	419	12	8.90E-03	****	5.57E+00	
0	253.15	22	19	0.67	506.65	504	5	5.27E-03	78.5	4.95E+00	T
0	331.46	24	59	1.99	663.20	654	15	5.89E-03	****	4.08E+00	
0	463.90	15	45	0.63	927.98	922	11	3.90E-03	****	3.18E+00	T
0	679.70	8	9	0.81	1359.45	1352	11	2.01E-03	****	2.36E+00	
0	727.62	22	5	2.68	1455.25	1449	11	5.78E-03	65.1	2.23E+00	T
0	772.34	4	24	3.69	1544.67	1533	13	1.11E-03	****	2.11E+00	T
0	887.47	10	1	0.91	1774.84	1772	6	2.69E-03	75.2	1.87E+00	
0	1001.73	13	3	1.37	2003.26	1999	10	3.52E-03	77.5	1.68E+00	T
0	1053.16	10	9	1.59	2106.09	2097	12	2.73E-03	****	1.60E+00	
0	1122.23	16	27	1.09	2244.18	2235	11	4.55E-03	****	1.51E+00	T
0	1141.46	10	2	0.59	2282.62	2277	10	2.93E-03	83.3	1.49E+00	
0	1238.79	9	4	0.62	2477.23	2473	8	2.64E-03	99.0	1.38E+00	T
0	1243.43	8	8	3.64	2486.50	2480	11	2.24E-03	****	1.37E+00	
0	1496.59	8	0	0.83	2992.63	2988	9	2.22E-03	70.7	1.17E+00	
0	1588.69	8	0	1.62	3176.75	3173	8	2.22E-03	70.7	1.11E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677009.CNF;1
Acquisition date : 28-JUN-2016 14:35:10 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.39 Half life ratio : *****
Sample date : 11-MAY-2016 10:40:00 Nuclide Library : SOLID
Sample ID : G398677009 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5184E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.384E-01
CD-109	5.326E-01
SN-117M	1.822E-01
TE-123M	2.198E-02
SN-126	4.981E-02
BA-137M	2.127E-02
CS-137	2.247E-02
TL-208	2.810E-02
PB-212	4.103E-02
BI-214	5.880E-02
PB-214	5.893E-02
RN-222	5.880E-02
RA-224	4.397E-01
RA-226	5.880E-02
AC-228	8.634E-02
RA-228	8.634E-02
TH-228	4.103E-02
TH-230	5.880E-02
PA-231	3.207E-01
TH-232	8.634E-02
TH-234	1.022E+00
U-234	5.880E-02
U-235	1.404E-01
U-238	1.022E+00
AM-243	3.692E-02
ANH-511	2.024E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.638E-01	NOT IDENT.
NA-22	2.545E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.984E-02	NOT IDENT.
SC-46	2.704E-02	NOT IDENT.

V-48	1.749E-01	NOT IDENT.
CR-51	6.237E-01	NOT IDENT.
MN-54	2.479E-02	NOT IDENT.
CO-56	3.107E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	1.900E-02	NOT IDENT.
CO-58	3.373E-02	NOT IDENT.
FE-59	1.019E-01	NOT IDENT.
CO-60	2.242E-02	NOT IDENT.
ZN-65	7.741E-02	NOT IDENT.
GE-68	1.013E+00	NOT IDENT.
AS-73	8.811E-01	NOT IDENT.
AS-74	2.508E-01	NOT IDENT.
SE-75	4.021E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.519E-01	NOT IDENT.
RB-83	5.793E-02	NOT IDENT.
KR-85	7.354E+00	NOT IDENT.
SR-85	5.512E-02	NOT IDENT.
RB-86	2.025E+00	NOT IDENT.
Y-88	3.631E-02	NOT IDENT.
Y-91	2.017E+01	NOT IDENT.
NB-94	2.212E-02	NOT IDENT.
NB-95	3.471E-02	NOT IDENT.
NB-95M	1.219E-01	NOT IDENT.
ZR-95	7.726E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.471E-02	NOT IDENT.
RH-102	3.632E-02	NOT IDENT.
RU-103	5.040E-02	FAIL ABUN
RH-106	2.565E-01	NOT IDENT.
RU-106	2.565E-01	NOT IDENT.
AG-108M	2.387E-02	NOT IDENT.
AG-110M	3.578E-02	NOT IDENT.
SN-113	4.004E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SB-124	8.917E-02	NOT IDENT.
SB-125	6.495E-02	FAIL ABUN
TE-125M	1.017E+01	NOT IDENT.
I-126	6.888E-01	NOT IDENT.
SB-126	4.561E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.484E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.178E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.170E-02	NOT IDENT.
CS-135	1.070E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.812E-01	NOT IDENT.
CE-139	2.551E-02	NOT IDENT.
BA-140	1.178E+00	NOT IDENT.
LA-140	3.266E-01	NOT IDENT.
CE-141	9.324E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.563E-01	FAIL ABUN
PM-144	2.205E-02	NOT IDENT.
PR-144	1.681E+00	NOT IDENT.
PM-146	3.003E-02	NOT IDENT.
ND-147	2.917E+00	FAIL ABUN
PM-147	5.327E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.557E-02	FAIL ABUN
EU-152	7.112E-02	NOT IDENT.
GD-153	5.867E-02	NOT IDENT.
EU-154	7.264E-02	NOT IDENT.
EU-155	7.061E-02	NOT IDENT.
TB-160	1.396E-01	FAIL ABUN
HO-166M	3.757E-02	FAIL ABUN
TM-171	1.404E+01	NOT IDENT.
HF-172	1.382E-01	FAIL ABUN
LU-172	4.165E-02	FAIL ABUN
LU-176	1.754E-02	FAIL ABUN
HF-181	5.210E-02	NOT IDENT.

TA-182	1.144E-01	FAIL ABUN
RE-183	2.000E-01	NOT IDENT.
RE-184	1.303E-01	NOT IDENT.
W-188	5.919E+00	FAIL ABUN
IR-192	3.173E-02	FAIL ABUN
HG-203	4.205E-02	NOT IDENT.
BI-207	3.253E-02	FAIL ABUN
PB-210	2.812E+00	NOT IDENT.
BI-211	2.681E-01	NOT IDENT.
PB-211	5.178E-01	NOT IDENT.
BI-212	4.231E-01	FAIL ABUN
RN-219	3.121E-01	NOT IDENT.
RA-223	3.884E-01	FAIL ABUN
AC-227	1.690E-01	FAIL ABUN
TH-227	1.690E-01	FAIL ABUN
TH-229	3.559E-01	FAIL ABUN
TH-231	3.884E-01	FAIL ABUN
PA-233	4.146E-02	FAIL ABUN
PA-234	1.619E-01	FAIL ABUN
PA-234M	3.485E+00	FAIL ABUN
NP-237	4.146E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.707E-01	NOT IDENT.
PU-239	2.740E+02	NOT IDENT.
AM-241	1.209E-01	NOT IDENT.
CM-243	7.477E-02	NOT IDENT.
BK-247	5.821E-02	NOT IDENT.
CM-247	2.902E-02	NOT IDENT.
CF-249	3.170E-02	FAIL ABUN
CF-251	8.246E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677009.CNF;1
Acquisition date : 28-JUN-2016 14:35:10 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.39 Half life ratio : *****
Sample date : 11-MAY-2016 10:40:00 Nuclide Library : SOLID
Sample ID : G398677009 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5184E+02 GRAM
Quantity Err(%) : 1.3172E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.449E+00	1.068E+00	1.068E+00
CD-109	1.204E+00	1.031E+00	1.031E+00
SN-117M	3.416E-01	2.495E-01	2.495E-01
TE-123M	3.989E-02	2.913E-02	2.913E-02
SN-126	1.120E-01	9.576E-02	9.576E-02
BA-137M	2.413E-01	7.148E-02	7.148E-02
CS-137	2.549E-01	7.551E-02	7.551E-02
TL-208	2.146E-01	5.831E-02	5.831E-02
PB-212	6.460E-01	1.184E-01	1.184E-01
BI-214	3.189E-01	1.278E-01	1.278E-01
PB-214	3.876E-01	1.418E-01	1.418E-01
RN-222	3.189E-01	1.278E-01	1.278E-01
RA-224	9.566E-01	1.127E+00	1.127E+00
RA-226	3.189E-01	1.278E-01	1.278E-01
AC-228	5.588E-01	2.438E-01	2.438E-01
RA-228	5.588E-01	2.438E-01	2.438E-01
TH-228	6.460E-01	1.184E-01	1.184E-01
TH-230	3.189E-01	1.278E-01	1.278E-01
PA-231	7.961E-01	5.275E-01	5.275E-01
TH-232	5.588E-01	2.438E-01	2.438E-01
TH-234	1.085E+00	1.935E+00	1.935E+00
U-234	3.189E-01	1.278E-01	1.278E-01
U-235	-7.211E-02	1.673E-01	1.673E-01
U-238	1.085E+00	1.935E+00	1.935E+00
AM-243	1.201E-01	5.970E-02	5.970E-02
ANH-511	5.146E-02	5.655E-02	5.655E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.830E-01	4.003E-01	4.087E-01	NOT IDENT.
NA-22	-5.627E-03	3.094E-02	3.104E-02	NOT IDENT.
NA-24	1.898E+20	4.269E+21	0.000E+00	SHORT HLIF
AL-26	-3.227E-03	3.698E-02	3.701E-02	NOT IDENT.

SC-46	-7.935E-04	3.701E-02	3.701E-02	NOT IDENT.
V-48	9.152E-03	2.054E-01	2.055E-01	NOT IDENT.
CR-51	3.591E-01	6.673E-01	6.867E-01	NOT IDENT.
MN-54	-8.641E-03	3.052E-02	3.077E-02	NOT IDENT.
CO-56	-7.598E-03	3.788E-02	3.804E-02	FAIL ABUN
MN-56	-1.000E+41	1.062E+42	0.000E+00	SHORT HLIF
CO-57	6.061E-03	2.096E-02	2.114E-02	NOT IDENT.
CO-58	-1.160E-02	4.144E-02	4.177E-02	NOT IDENT.
FE-59	1.001E-02	1.203E-01	1.204E-01	NOT IDENT.
CO-60	-1.429E-02	2.994E-02	3.062E-02	NOT IDENT.
ZN-65	2.441E-02	1.022E-01	1.028E-01	NOT IDENT.
GE-68	5.792E-01	1.104E+00	1.134E+00	NOT IDENT.
AS-73	4.465E-01	9.156E-01	9.374E-01	NOT IDENT.
AS-74	6.210E-02	2.754E-01	2.769E-01	NOT IDENT.
SE-75	3.205E-02	4.183E-02	4.426E-02	NOT IDENT.
BR-77	1.546E+06	2.168E+06	2.277E+06	SHORT HLIF
SR-82	2.671E-01	6.426E-01	6.538E-01	NOT IDENT.
RB-83	-6.725E-02	7.982E-02	8.538E-02	NOT IDENT.
KR-85	1.633E+01	7.591E+00	1.058E+01	NOT IDENT.
SR-85	1.222E-01	5.691E-02	7.920E-02	NOT IDENT.
RB-86	1.456E+00	2.152E+00	2.250E+00	NOT IDENT.
Y-88	6.431E-03	4.190E-02	4.200E-02	NOT IDENT.
Y-91	8.566E+00	2.174E+01	2.208E+01	NOT IDENT.
NB-94	-7.956E-03	2.662E-02	2.686E-02	NOT IDENT.
NB-95	2.856E-03	4.557E-02	4.559E-02	NOT IDENT.
NB-95M	1.313E-02	1.512E-01	1.513E-01	NOT IDENT.
ZR-95	7.091E-02	7.834E-02	8.461E-02	NOT IDENT.
NB-97	1.000E+41	3.756E+41	0.000E+00	SHORT HLIF
ZR-97	-6.052E+19	2.213E+20	0.000E+00	SHORT HLIF
MO-99	-1.316E+04	3.722E+04	3.769E+04	SHORT HLIF
TC-99M	1.000E+41	2.267E+41	0.000E+00	SHORT HLIF
RH-101	4.201E-03	2.808E-02	2.814E-02	NOT IDENT.
RH-102	-1.034E-02	4.288E-02	4.314E-02	NOT IDENT.
RU-103	-1.857E-03	5.953E-02	5.954E-02	FAIL ABUN
RH-106	1.147E-01	2.759E-01	2.807E-01	NOT IDENT.
RU-106	1.147E-01	2.759E-01	2.807E-01	NOT IDENT.
AG-108M	1.319E-02	2.612E-02	2.679E-02	NOT IDENT.
AG-110M	-8.765E-03	5.098E-02	5.113E-02	NOT IDENT.
SN-113	1.189E-03	4.594E-02	4.595E-02	NOT IDENT.
CD-115	-2.209E+05	2.889E+05	3.056E+05	SHORT HLIF
SB-124	-2.165E-02	1.138E-01	1.142E-01	NOT IDENT.
SB-125	-1.230E-02	7.700E-02	7.720E-02	FAIL ABUN
TE-125M	-7.588E-01	1.149E+01	1.149E+01	NOT IDENT.
I-126	-3.086E-01	9.874E-01	9.972E-01	NOT IDENT.
SB-126	-5.006E-01	7.072E-01	7.423E-01	NOT IDENT.
SB-127	2.910E+02	4.179E+02	4.380E+02	SHORT HLIF
I-131	-4.890E-02	1.704E+00	1.704E+00	FAIL ABUN
I-132	-1.000E+41	3.656E+41	0.000E+00	SHORT HLIF
TE-132	-4.912E+02	6.934E+02	7.279E+02	SHORT HLIF
BA-133	-9.390E-04	4.153E-02	4.153E-02	FAIL ABUN
I-133	-5.217E+14	1.458E+15	1.477E+15	SHORT HLIF
CS-134	1.869E-02	3.325E-02	3.430E-02	NOT IDENT.
CS-135	-6.681E-02	1.260E-01	1.296E-01	NOT IDENT.
I-135	-1.000E+41	9.317E+41	0.000E+00	SHORT HLIF
CS-136	-2.502E-01	6.043E-01	6.148E-01	NOT IDENT.
CE-139	4.624E-03	2.912E-02	2.919E-02	NOT IDENT.
BA-140	2.718E-01	1.354E+00	1.359E+00	NOT IDENT.
LA-140	-5.541E-02	4.173E-01	4.180E-01	NOT IDENT.
CE-141	4.014E-02	1.035E-01	1.050E-01	NOT IDENT.
CE-143	7.287E+08	1.621E+09	1.654E+09	SHORT HLIF
CE-144	-1.478E-01	1.906E-01	2.019E-01	FAIL ABUN
PM-144	-2.705E-02	2.967E-02	3.208E-02	NOT IDENT.
PR-144	-2.053E+00	2.260E+00	2.442E+00	NOT IDENT.
PM-146	9.821E-04	3.488E-02	3.488E-02	NOT IDENT.
ND-147	1.364E+00	3.212E+00	3.271E+00	FAIL ABUN
PM-147	3.449E+02	5.723E+02	5.930E+02	NOT IDENT.
PM-149	3.023E+05	2.132E+06	2.136E+06	SHORT HLIF
EU-150	1.202E-02	2.340E-02	2.402E-02	FAIL ABUN
EU-152	3.104E-02	8.312E-02	8.429E-02	NOT IDENT.
GD-153	-4.943E-02	7.917E-02	8.225E-02	NOT IDENT.
EU-154	-1.142E-02	8.719E-02	8.734E-02	NOT IDENT.
EU-155	1.765E-02	7.757E-02	7.798E-02	NOT IDENT.
TB-160	9.491E-02	1.479E-01	1.540E-01	FAIL ABUN
HO-166M	3.248E-03	4.261E-02	4.264E-02	FAIL ABUN
TM-171	-1.654E+00	1.524E+01	1.526E+01	NOT IDENT.
HF-172	-2.737E-02	1.615E-01	1.619E-01	FAIL ABUN
LU-172	-5.527E-03	5.121E-02	5.127E-02	FAIL ABUN
LU-176	6.636E-03	1.901E-02	1.924E-02	FAIL ABUN

HF-181	-1.616E-02	6.345E-02	6.387E-02	NOT IDENT.
TA-182	-3.040E-02	1.398E-01	1.405E-01	FAIL ABUN
RE-183	-8.815E-02	2.239E-01	2.274E-01	NOT IDENT.
RE-184	-9.429E-02	1.746E-01	1.797E-01	NOT IDENT.
W-188	-5.031E+00	8.410E+00	8.711E+00	FAIL ABUN
IR-192	-2.224E-03	3.613E-02	3.615E-02	FAIL ABUN
HG-203	-1.503E-02	4.862E-02	4.909E-02	NOT IDENT.
BI-207	4.481E-03	3.791E-02	3.796E-02	FAIL ABUN
PB-210	-2.402E+00	3.143E+00	3.325E+00	NOT IDENT.
BI-211	8.836E-01	2.727E-01	4.827E-01	NOT IDENT.
PB-211	-1.151E-01	6.119E-01	6.141E-01	NOT IDENT.
BI-212	7.221E-01	4.664E-01	5.687E-01	FAIL ABUN
RN-219	1.724E-01	3.402E-01	3.489E-01	NOT IDENT.
RA-223	-5.561E-01	5.953E-01	6.460E-01	FAIL ABUN
AC-227	6.905E-02	2.035E-01	2.059E-01	FAIL ABUN
TH-227	6.905E-02	2.035E-01	2.059E-01	FAIL ABUN
TH-229	-4.020E-01	4.206E-01	4.580E-01	FAIL ABUN
TH-231	-5.561E-01	5.953E-01	6.460E-01	FAIL ABUN
PA-233	2.180E-03	4.655E-02	4.656E-02	FAIL ABUN
PA-234	-1.165E-01	2.561E-01	2.614E-01	FAIL ABUN
PA-234M	4.471E+00	3.481E+00	4.023E+00	FAIL ABUN
NP-237	2.180E-03	4.655E-02	4.656E-02	FAIL ABUN
NP-238	4.064E+04	7.026E+05	7.029E+05	SHORT HLIF
NP-239	1.457E-03	1.925E-01	1.925E-01	NOT IDENT.
PU-239	1.994E+02	2.965E+02	3.098E+02	NOT IDENT.
AM-241	5.479E-02	1.325E-01	1.348E-01	NOT IDENT.
CM-243	5.971E-02	7.880E-02	8.327E-02	NOT IDENT.
BK-247	2.563E-02	6.263E-02	6.369E-02	NOT IDENT.
CM-247	1.976E-02	3.133E-02	3.257E-02	NOT IDENT.
CF-249	1.737E-02	3.452E-02	3.540E-02	FAIL ABUN
CF-251	-3.365E-02	9.949E-02	1.006E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	61.9370	87.09	103.7027	136.47	74.5258
45.60	52.9909	87.57	78.3519	140.51	0.0000
46.54	61.5119	88.03	78.4158	143.76	78.5518
49.72	0.0000	88.34	78.4585	144.24	67.5292
51.35	59.4469	88.47	78.4765	145.44	69.8490
51.87	64.2479	89.96	78.6813	152.43	61.5108
52.39	60.5464	1093.63	78.7745	153.25	66.0503
52.97	60.6327	91.11	78.8384	323.87	80.6982
53.44	53.1145	92.59	79.0389	156.02	47.1769
54.07	53.1957	93.35	79.1415	158.56	52.3905
57.36	0.0000	94.56	79.3036	159.00	55.7998
57.53	78.5347	94.65	79.3154	162.33	57.7164
57.98	71.9051	94.67	79.3181	162.66	59.4369
59.27	65.7720	94.87	79.3448	163.33	66.2814
59.32	65.7794	97.43	77.6142	165.86	67.0442
59.54	69.2761	98.43	68.4130	176.31	55.1914
60.96	66.6026	98.44	68.4143	176.60	54.0588
61.17	69.5310	99.53	70.0938	177.52	59.8706
62.93	84.3445	100.11	59.2463	181.07	0.0000
63.29	90.2326	102.03	71.9413	181.52	73.5466
63.58	78.6394	103.18	55.3606	184.41	74.8202
64.28	78.7591	103.37	55.3776	143.76	76.6670
66.73	83.5713	105.21	59.7301	193.51	79.0535
67.24	76.3222	105.31	59.7397	197.03	65.2355
125.81	80.8001	106.12	71.3587	198.01	63.5361
67.75	80.8119	106.47	72.4476	201.83	62.8964
69.67	81.6263	109.28	74.8716	203.43	67.4335
70.83	95.8177	111.00	63.4375	205.31	68.0679
72.81	89.0749	111.76	0.0000	210.85	60.0638
72.87	89.0858	114.06	67.9782	215.65	61.7800
74.66	87.9121	116.30	0.0000	222.11	56.9198
74.82	87.9396	116.74	58.6504	227.09	51.7389
74.97	87.9657	119.76	58.9080	227.38	51.7524
77.11	84.8387	121.12	52.5841	228.16	0.0000
78.74	85.1033	121.22	55.8115	228.18	57.2423
79.69	85.2564	121.78	59.0784	116.74	57.2423
80.12	85.3255	122.06	60.1768	235.69	57.0865
80.19	85.3368	122.92	73.1607	235.96	54.1721
80.57	85.3973	123.07	71.0240	238.63	57.7878
81.00	85.4661	265.00	74.3162	238.98	0.0000
81.07	85.9801	125.81	73.4581	240.99	57.9089
81.75	93.6405	127.23	80.0968	242.00	57.9608
83.79	66.7039	127.91	89.9232	244.70	63.4476
84.00	66.7295	129.30	78.1538	252.40	0.0000
85.43	77.0395	131.20	82.7098	252.80	43.6491
86.55	95.9847	133.02	100.3686	254.15	0.0000
86.79	103.6467	133.52	96.0683	256.23	35.7668
86.94	103.6747	136.00	72.2896	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	36.5833	355.39	0.0000	584.27	23.6710
264.80	37.5256	356.01	40.1526	595.83	21.9656
265.00	40.3466	364.49	36.3411	427.87	28.4336
268.22	55.5070	366.42	0.0000	602.52	0.0000
269.46	50.8541	372.51	28.4131	604.72	27.5669
270.03	52.7623	375.05	26.4269	607.14	30.6632
271.23	44.3264	377.52	25.4509	609.32	33.7627
273.65	59.5326	356.01	33.7306	610.33	28.5577
276.40	44.5122	388.16	31.7724	614.28	16.9185
277.37	39.8076	388.63	32.8071	618.01	24.9572
277.60	38.8673	391.69	33.8968	620.36	22.2070
278.00	41.7240	264.66	34.0851	621.93	19.4445
279.20	46.5102	401.81	28.9408	630.19	0.0000
279.54	44.6240	402.40	27.9175	631.29	20.4537
279.70	48.4281	404.85	36.2433	633.25	19.5409
280.46	47.5075	410.95	33.2588	634.78	18.6226
283.69	35.2453	413.71	34.3550	635.95	14.9055
284.31	36.2153	414.70	29.1668	636.99	17.7081
285.41	35.2933	423.72	24.0865	645.85	18.7109
285.90	0.0000	427.09	31.4795	657.76	15.6714
287.50	34.3954	427.87	30.4439	657.90	0.0000
290.67	41.3767	433.94	28.4444	661.66	15.0691
293.27	0.0000	439.40	27.4766	664.57	0.0000
351.93	30.7568	453.88	26.6365	666.33	15.7275
295.96	26.9276	463.37	37.4876	666.50	12.5830
879.38	23.1270	468.07	24.0536	667.71	0.0000
299.98	32.4121	473.00	0.0000	677.62	17.3809
300.09	35.5018	475.06	26.9474	685.70	0.0000
300.13	35.5029	476.78	23.7359	695.00	22.9143
301.36	38.6261	477.60	21.5875	696.49	26.7497
302.85	32.4823	482.18	28.1324	696.51	26.7497
256.23	29.4250	487.02	20.6112	697.00	21.9775
304.85	38.7274	492.35	0.0000	697.30	20.0689
306.78	29.0872	497.08	25.0826	697.49	17.2033
308.46	35.9194	505.52	21.0299	702.65	22.0269
311.90	31.1445	507.63	0.0000	706.68	17.2661
316.51	35.1557	511.00	25.2629	711.68	14.4170
319.41	31.3154	514.00	19.3610	720.70	17.9131
320.08	32.3096	514.00	19.3612	721.93	0.0000
321.04	31.3525	520.40	30.9010	722.78	14.4800
323.87	47.1248	520.69	0.0000	722.91	14.4807
325.23	37.7361	522.65	0.0000	723.31	9.6553
328.76	30.4000	527.90	0.0000	724.19	12.8783
333.37	27.6749	528.26	27.6993	727.33	19.3408
333.97	15.8208	529.59	23.2828	733.00	11.3069
334.37	15.8252	529.87	0.0000	735.93	12.6134
338.28	31.7368	531.02	14.4231	333.97	12.6207
338.32	31.7378	537.26	22.2577	739.50	0.0000
311.90	34.9637	546.56	0.0000	747.24	9.7446
340.48	34.9637	552.55	15.6966	748.06	8.7730
340.55	34.9653	563.25	18.9323	752.31	15.6215
344.28	31.8687	569.33	25.3155	753.82	14.6536
345.93	39.8804	946.00	23.5092	756.73	10.7578
351.06	36.8180	569.70	23.5111	756.80	10.7580
351.93	46.4503	583.19	28.8154	884.68	14.7092

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	13.0840	1274.44	8.8338	1620.50	4.1200
766.42	13.0869	1001.03	8.8464	1621.92	4.1213
766.84	14.7250	1002.74	15.9320	1678.03	0.0000
772.60	0.0000	1004.73	7.0851	1690.97	6.2676
776.52	11.2595	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.1786
778.90	14.7909	1028.54	0.0000	1063.66	5.4549
783.70	0.0000	1037.84	8.5859	1771.35	8.4873
785.37	11.8608	1038.76	0.0000	1791.20	0.0000
792.07	19.8164	631.29	8.9665	1808.65	7.4785
794.95	17.8537	1048.07	16.1470	1810.72	0.0000
795.86	11.9063	1049.04	14.3568	1836.06	4.2951
810.06	16.9535	1050.41	14.3626		
810.29	15.9574	1063.66	9.7317		
344.28	15.9582	1077.00	8.6836		
810.76	15.9602	1077.34	9.7699		
815.77	11.9915	1085.87	9.7937		
1048.07	21.0051	1093.63	11.9958		
832.01	17.0851	1099.45	12.0157		
834.85	17.1021	1112.07	16.4429		
835.71	16.1008	1112.84	17.8163		
836.80	0.0000	1115.54	16.4583		
846.75	0.0000	1120.29	18.6776		
846.77	13.1320	1120.55	18.6784		
856.80	23.3139	1221.41	21.9795		
860.56	12.1793	1129.67	14.6868		
871.09	12.2227	1131.51	0.0000		
873.19	11.2122	1147.95	0.0000		
875.33	0.0000	1173.23	13.0025		
879.38	11.2355	1177.95	8.3690		
880.51	16.3484	1189.05	5.5957		
883.24	11.9318	1204.77	9.3644		
884.68	15.3483	1221.41	9.4047		
889.28	8.5398	1231.02	10.2850		
894.76	7.1865	1235.36	12.9442		
898.04	11.3051	1238.28	16.1921		
900.72	10.2864	1260.41	0.0000		
903.28	14.4132	1271.87	10.4781		
911.20	12.0421	1274.44	9.5313		
912.08	16.5195	1274.54	9.5317		
923.98	0.0000	1291.59	5.7432		
926.50	11.4101	1298.22	0.0000		
929.11	11.4195	1312.11	8.6580		
937.49	15.6138	1332.49	9.6672		
944.13	14.6036	1362.66	0.0000		
946.00	13.5684	1365.19	5.8452		
949.00	6.2682	1368.63	0.0000		
667.71	0.0000	1384.29	5.8713		
962.31	12.8220	1408.01	5.9036		
964.08	12.2460	1457.56	0.0000		
966.17	10.5032	1460.82	6.8276		
911.20	22.7770	1489.16	8.0153		
968.97	22.7770	1505.03	2.0107		
983.53	9.5036	1584.12	5.2577		
984.45	0.0000	1596.21	5.5904		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:39:36.20

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677010.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM16.CNF;426
Background date  : 26-JUN-2016 12:04:40
Sample date     : 11-MAY-2016 10:50:00 Acquisition date : 28-JUN-2016 14:35:32
Sample ID      : G398677010 Sample quantity : 1.57340E+02 GRAM
Detector name   : GAM16 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.33 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572231 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	73.56	29	97	1.04	146.93	143	20	8.17E-03	56.7	2.41E+00
2	1	75.20	76	95	1.04	150.19	143	20	2.11E-02	23.4	
3	1	77.20*	82	91	1.05	154.19	143	20	2.29E-02	22.6	
4	5	87.20	63	71	1.56	174.18	171	24	1.75E-02	22.6	3.86E+00
5	5	89.93	55	119	1.57	179.65	171	24	1.52E-02	39.6	
6	0	185.81*	28	95	1.51	371.31	366	10	7.65E-03	72.8	
7	0	209.33	30	62	1.20	418.34	414	8	8.38E-03	48.3	
8	0	214.29	13	55	1.18	428.24	424	7	3.66E-03	98.8	
9	3	238.78*	256	66	1.10	477.22	473	14	7.12E-02	8.3	7.93E-01
10	3	241.58	49	70	1.61	482.81	473	14	1.37E-02	34.1	
11	0	270.70	37	66	1.24	541.03	536	11	1.03E-02	45.6	
12	0	295.18	85	74	1.49	589.96	583	13	2.36E-02	23.6	
13	0	301.76	9	64	1.26	603.11	597	8	2.50E-03	157.5	
14	0	328.31	21	35	1.03	656.20	652	9	5.96E-03	53.6	
15	0	338.87*	52	47	1.34	677.30	669	15	1.45E-02	32.6	
16	0	352.05*	129	30	1.03	703.67	698	10	3.57E-02	12.1	
17	0	361.27	17	28	0.80	722.09	719	9	4.67E-03	61.1	
18	0	464.95	16	48	4.87	929.38	920	16	4.44E-03	100.0	
19	0	511.25*	30	50	2.04	1021.95	1014	17	8.26E-03	67.0	
20	0	583.54*	93	15	1.53	1166.48	1160	15	2.59E-02	14.0	
21	0	600.89	9	18	1.18	1201.19	1196	8	2.46E-03	89.7	
22	0	609.64*	73	47	1.42	1218.68	1213	14	2.03E-02	23.2	
23	0	661.67	143	27	1.45	1322.71	1317	12	3.97E-02	11.1	
24	0	726.75	23	18	0.95	1452.85	1448	12	6.39E-03	42.4	
25	0	780.52	21	8	3.53	1560.37	1553	15	5.69E-03	36.5	
26	0	878.13	8	10	0.82	1755.55	1751	9	2.28E-03	75.2	
27	0	911.76*	60	16	1.97	1822.79	1815	18	1.66E-02	21.5	
28	0	950.38	9	3	0.66	1900.02	1896	8	2.41E-03	51.6	
29	0	969.08	46	18	1.20	1937.41	1930	11	1.27E-02	22.9	
30	0	1120.53	31	7	3.57	2240.30	2234	13	8.47E-03	25.0	
31	0	1201.22	14	3	2.39	2401.66	2396	10	4.01E-03	33.4	
32	0	1460.33*	169	0	2.23	2919.91	2912	15	4.70E-02	7.9	
33	0	1764.54*	20	4	2.83	3528.40	3519	14	5.65E-03	31.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:39:38

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677010.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:50:00 Acquisition date : 28-JUN-2016 14:35:32
Sample ID        : G398677010 Sample quantity  : 157.34 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA16 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.33 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.236E+00	5.933E+00	5.933E+00	15.75	OK
CD-109	88.03	3.70*	5.824E+00	1.290E+00	1.387E+00	66.41	OK
SN-126	64.28	9.60	3.118E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	5.824E+00	5.362E-01	5.362E-01	66.41	OK
	87.57	37.00*	5.824E+00	1.290E-01	1.290E-01	66.41	OK
BA-137M	661.66	89.90*	2.456E+00	3.279E-01	3.289E-01	22.19	OK
CS-137	661.66	85.10*	2.456E+00	3.464E-01	3.474E-01	22.19	OK
TL-208	277.37	6.60	4.682E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.710E+00	2.082E-01	2.082E-01	28.06	OK
	860.56	12.50	1.976E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	4.615E+00	6.881E-01	6.881E-01	71.95	OK
	77.11	17.10	4.852E+00	6.238E-01	6.238E-01	45.18	OK
	238.63	43.60*	5.201E+00	6.383E-01	6.383E-01	16.51	OK
	300.09	3.30	4.425E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33	OK
	1120.29	14.92	1.565E+00	6.235E-01	6.235E-01	49.99	OK
	1764.49	15.30	1.062E+00	5.651E-01	5.651E-01	63.30	OK
PB-214	74.82	5.80	4.569E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.852E+00	1.100E+00	1.100E+00	45.18	OK
	87.09	3.41	5.815E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.153E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.478E+00	5.683E-01	5.683E-01	47.26	OK
	351.93	35.60*	3.942E+00	4.971E-01	4.971E-01	24.14	OK
RN-222	609.32	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33	OK
	1120.29	14.92	1.565E+00	6.235E-01	6.235E-01	49.99	OK
	1764.49	15.30	1.062E+00	5.651E-01	5.651E-01	63.30	OK
RA-224	240.99	4.10*	5.160E+00	3.088E-01	3.088E-01	328.55	OK
RA-226	609.32	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33	OK
	1120.29	14.92	1.565E+00	6.235E-01	6.235E-01	49.99	OK
	1764.49	15.30	1.062E+00	5.651E-01	5.651E-01	63.30	OK
AC-228	105.21	1.10	6.766E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.053E+00	6.214E-01	6.214E-01	65.22	OK
	794.95	4.25	2.114E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.026E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.880E+00	6.023E-01	6.023E-01	43.01	OK
	968.97	15.80	1.782E+00	7.884E-01	7.884E-01	45.75	OK
RA-228	105.21	1.10	6.766E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.053E+00	6.214E-01	6.214E-01	65.22	OK
	794.95	4.25	2.114E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.026E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.880E+00	6.023E-01	6.023E-01	43.01	OK
	968.97	15.80	1.782E+00	7.884E-01	7.884E-01	45.75	OK
TH-228	74.82	10.28	4.615E+00	6.881E-01	6.881E-01	71.95	OK
	77.11	17.10	4.852E+00	6.238E-01	6.238E-01	45.18	OK
	238.63	43.60*	5.201E+00	6.383E-01	6.383E-01	16.51	OK
	300.09	3.30	4.425E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33	OK
	1120.29	14.92	1.565E+00	6.235E-01	6.235E-01	49.99	OK
	1764.49	15.30	1.062E+00	5.651E-01	5.651E-01	63.30	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
PA-231	283.69	1.70	4.607E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.407E+00	2.104E-01	2.104E-01	315.05	OK
TH-232	105.21	1.10	6.766E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.053E+00	6.214E-01	6.214E-01	65.22	OK
	835.71	1.61	2.026E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.880E+00	6.023E-01	6.023E-01	43.01	OK
	968.97	15.80	1.782E+00	7.884E-01	7.884E-01	45.75	OK
U-234	609.32	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33	OK
	1120.29	14.92	1.565E+00	6.235E-01	6.235E-01	49.99	OK
	1764.49	15.30	1.062E+00	5.651E-01	5.651E-01	63.30	OK
AM-243	43.53	5.90	4.621E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.615E+00	1.053E-01	1.053E-01	71.95	OK
ANH-511	511.00	100.00*	2.997E+00	5.173E-02	5.173E-02	133.99	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
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*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677010.CNF;1  *
* Acquisition date   : 28-JUN-2016 14:35:32 Sensitivity      : 3.000          *
* Detector ID        : GAM16 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 01:00:00.33 Half life ratio : *****          *
* Sample date        : 11-MAY-2016 10:50:00 Analyst initials: MXR1          *
* Sample ID          : G398677010 Sample Quantity : 1.5734E+02 GRAM          *
* Batch Number       : 1572231 Wet Weight : 0.00000          *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 28-SEP-2015 08:03:00 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;13          *
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.933E+00	9.159E-01	9.905E-02
CD-109	1.387E+00	9.023E-01	1.262E+00
SN-126	1.290E-01	8.393E-02	1.181E-01
BA-137M	3.289E-01	7.151E-02	5.794E-02
CS-137	3.474E-01	7.555E-02	6.120E-02
TL-208	2.082E-01	5.726E-02	5.552E-02
PB-212	6.383E-01	1.033E-01	9.693E-02
BI-214	3.134E-01	1.423E-01	1.196E-01
PB-214	4.971E-01	1.176E-01	1.158E-01
RN-222	3.134E-01	1.423E-01	1.196E-01
RA-224	3.088E-01	9.943E-01	1.039E+00
RA-226	3.134E-01	1.423E-01	1.196E-01
AC-228	6.023E-01	2.539E-01	1.794E-01
RA-228	6.023E-01	2.539E-01	1.794E-01
TH-228	6.383E-01	1.033E-01	9.693E-02
TH-230	3.134E-01	1.423E-01	1.196E-01
PA-231	2.104E-01	6.496E-01	7.835E-01
TH-232	6.023E-01	2.539E-01	1.794E-01
U-234	3.134E-01	1.423E-01	1.196E-01
AM-243	1.053E-01	7.422E-02	8.016E-02
ANH-511	5.173E-02	6.793E-02	4.495E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.814E-01	4.314E-01	7.729E-01	NOT IDENT.
NA-22	1.283E-02	3.623E-02	7.547E-02	NOT IDENT.
NA-24	0.000E+00	4.025E+21	0.000E+00	SHORT HLIF
AL-26	-1.256E-02	2.617E-02	4.946E-02	NOT IDENT.
SC-46	-7.351E-03	4.132E-02	7.806E-02	FAIL ABUN
V-48	-1.961E-02	2.299E-01	4.397E-01	NOT IDENT.
CR-51	3.311E-01	6.893E-01	1.394E+00	NOT IDENT.
MN-54	2.604E-02	3.036E-02	6.623E-02	NOT IDENT.
CO-56	-1.002E-02	4.133E-02	7.761E-02	NOT IDENT.

MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.839E-03	2.098E-02	4.087E-02	NOT IDENT.
CO-58	-5.393E-02	4.146E-02	6.277E-02	NOT IDENT.
FE-59	-3.777E-02	1.194E-01	2.265E-01	NOT IDENT.
CO-60	-8.329E-03	2.995E-02	5.734E-02	NOT IDENT.
ZN-65	-4.702E-02	8.497E-02	1.267E-01	NOT IDENT.
GE-68	-4.149E-01	8.499E-01	1.596E+00	NOT IDENT.
AS-73	8.931E-02	1.099E+00	2.229E+00	NOT IDENT.
AS-74	-2.307E-01	3.185E-01	4.753E-01	NOT IDENT.
SE-75	-6.672E-03	4.931E-02	8.795E-02	NOT IDENT.
BR-77	0.000E+00	2.466E+05	0.000E+00	SHORT HLIF
SR-82	-5.389E-02	7.111E-01	1.192E+00	NOT IDENT.
RB-83	1.684E-02	8.149E-02	1.570E-01	NOT IDENT.
KR-85	1.037E+01	7.164E+00	1.409E+01	NOT IDENT.
SR-85	7.749E-02	5.371E-02	1.056E-01	NOT IDENT.
RB-86	-4.904E-01	1.670E+00	3.273E+00	NOT IDENT.
Y-88	1.346E-02	3.480E-02	8.366E-02	NOT IDENT.
Y-91	4.339E-01	2.242E+01	3.940E+01	NOT IDENT.
NB-94	-1.325E-02	2.699E-02	4.927E-02	NOT IDENT.
NB-95	1.069E-02	4.743E-02	9.477E-02	NOT IDENT.
NB-95M	4.451E-02	1.683E-01	2.963E-01	NOT IDENT.
ZR-95	2.465E-02	7.151E-02	1.496E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.197E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.755E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.897E-03	2.610E-02	4.945E-02	NOT IDENT.
RH-102	2.033E-02	4.380E-02	9.155E-02	NOT IDENT.
RU-103	1.029E-02	6.325E-02	1.214E-01	FAIL ABUN
RH-106	-5.209E-02	2.830E-01	5.437E-01	NOT IDENT.
RU-106	-5.209E-02	2.830E-01	5.437E-01	NOT IDENT.
AG-108M	5.347E-04	2.471E-02	4.723E-02	NOT IDENT.
AG-110M	-2.012E-02	5.184E-02	8.731E-02	NOT IDENT.
SN-113	-2.677E-02	4.705E-02	8.430E-02	NOT IDENT.
CD-115	0.000E+00	3.155E+05	0.000E+00	SHORT HLIF
SN-117M	-1.661E-01	2.356E-01	4.162E-01	NOT IDENT.
TE-123M	-2.290E-02	2.791E-02	4.878E-02	NOT IDENT.
SB-124	-9.614E-03	9.986E-02	2.098E-01	NOT IDENT.
SB-125	7.379E-04	7.859E-02	1.490E-01	FAIL ABUN
TE-125M	4.175E+00	1.134E+01	2.248E+01	NOT IDENT.
I-126	-6.694E-01	1.329E+00	2.045E+00	NOT IDENT.
SB-126	-4.391E-01	8.561E-01	1.300E+00	NOT IDENT.
SB-127	0.000E+00	3.734E+02	0.000E+00	SHORT HLIF
I-131	8.924E-01	1.740E+00	3.140E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.600E+02	0.000E+00	SHORT HLIF
BA-133	2.182E-02	3.869E-02	6.294E-02	FAIL ABUN
I-133	0.000E+00	1.664E+15	0.000E+00	SHORT HLIF
CS-134	4.004E-02	3.468E-02	7.708E-02	NOT IDENT.
CS-135	3.204E-02	1.414E-01	2.491E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-1.572E-02	4.074E-01	8.300E-01	NOT IDENT.
CE-139	-7.942E-03	2.998E-02	5.475E-02	NOT IDENT.
BA-140	-2.011E-01	1.410E+00	2.596E+00	NOT IDENT.
LA-140	2.238E-01	2.859E-01	7.770E-01	FAIL ABUN
CE-141	-4.151E-02	1.048E-01	1.913E-01	NOT IDENT.
CE-143	0.000E+00	1.963E+09	0.000E+00	SHORT HLIF
CE-144	-1.282E-02	1.656E-01	3.135E-01	NOT IDENT.
PM-144	7.280E-03	2.819E-02	5.716E-02	NOT IDENT.
PR-144	7.197E-01	2.122E+00	4.353E+00	NOT IDENT.
PM-146	5.405E-03	3.522E-02	6.824E-02	NOT IDENT.
ND-147	4.239E+00	3.938E+00	8.358E+00	FAIL ABUN
PM-147	1.794E+01	5.864E+02	1.128E+03	NOT IDENT.
PM-149	0.000E+00	2.078E+06	0.000E+00	SHORT HLIF
EU-150	-8.438E-03	2.563E-02	3.833E-02	FAIL ABUN
EU-152	2.135E-02	9.985E-02	1.721E-01	NOT IDENT.
GD-153	-5.925E-02	8.056E-02	1.298E-01	NOT IDENT.
EU-154	3.180E-02	1.002E-01	2.079E-01	NOT IDENT.
EU-155	-1.326E-02	8.486E-02	1.622E-01	FAIL ABUN
TB-160	1.096E-01	1.616E-01	3.518E-01	FAIL ABUN
HO-166M	8.860E-03	5.107E-02	1.015E-01	FAIL ABUN
TM-171	-6.670E+00	1.836E+01	3.615E+01	NOT IDENT.
HF-172	-5.723E-02	1.555E-01	2.885E-01	NOT IDENT.
LU-172	-1.950E-02	5.056E-02	9.522E-02	FAIL ABUN
LU-176	9.348E-03	2.228E-02	4.432E-02	FAIL ABUN
HF-181	9.345E-03	6.735E-02	1.289E-01	NOT IDENT.
TA-182	-9.875E-03	1.757E-01	3.430E-01	FAIL ABUN
RE-183	-2.538E-02	2.408E-01	4.824E-01	NOT IDENT.

RE-184	5.710E-02	2.024E-01	3.885E-01	NOT IDENT.
W-188	-8.173E-01	8.496E+00	1.443E+01	NOT IDENT.
IR-192	2.306E-02	3.940E-02	8.024E-02	FAIL ABUN
HG-203	3.249E-02	4.803E-02	9.931E-02	FAIL ABUN
BI-207	2.374E-03	4.016E-02	8.139E-02	FAIL ABUN
PB-210	6.897E-01	3.562E+00	7.380E+00	NOT IDENT.
BI-211	0.000E+00	3.240E-01	5.894E-01	FAIL ABUN
PB-211	-5.100E-01	5.260E-01	8.876E-01	NOT IDENT.
BI-212	7.597E-01	6.310E-01	9.847E-01	FAIL ABUN
RN-219	1.470E-01	3.219E-01	6.486E-01	FAIL ABUN
RA-223	-6.118E-01	6.132E-01	8.870E-01	FAIL ABUN
AC-227	7.986E-02	2.018E-01	4.077E-01	NOT IDENT.
TH-227	7.986E-02	2.018E-01	4.077E-01	NOT IDENT.
TH-229	1.380E-01	4.462E-01	8.446E-01	FAIL ABUN
TH-231	-6.118E-01	6.132E-01	8.870E-01	FAIL ABUN
PA-233	-1.864E-02	5.250E-02	9.838E-02	NOT IDENT.
PA-234	-3.900E-02	2.461E-01	4.002E-01	FAIL ABUN
PA-234M	4.479E-01	3.958E+00	7.660E+00	NOT IDENT.
TH-234	-5.224E-01	1.149E+00	2.283E+00	NOT IDENT.
U-235	-2.965E-02	1.712E-01	3.186E-01	FAIL ABUN
NP-237	-1.864E-02	5.250E-02	9.838E-02	NOT IDENT.
NP-238	0.000E+00	7.045E+05	0.000E+00	SHORT HLIF
U-238	-5.224E-01	1.149E+00	2.283E+00	NOT IDENT.
NP-239	2.491E-02	2.251E-01	4.341E-01	NOT IDENT.
PU-239	1.932E+02	2.862E+02	5.669E+02	NOT IDENT.
AM-241	5.557E-02	1.265E-01	2.631E-01	NOT IDENT.
CM-243	4.760E-02	8.423E-02	1.697E-01	NOT IDENT.
BK-247	5.606E-03	7.233E-02	1.319E-01	NOT IDENT.
CM-247	5.249E-03	2.853E-02	5.608E-02	NOT IDENT.
CF-249	2.199E-02	3.575E-02	7.206E-02	NOT IDENT.
CF-251	-1.980E-02	1.083E-01	1.984E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	164	10.66*	1.236E+00	5.933E+00	5.933E+00	15.75
CD-109	88.03	82	3.70*	5.824E+00	1.813E+00	1.950E+00	45.21
SN-126	64.28	-----	9.60	3.118E+00	-----	Line Not Found	-----
	86.94	82	8.90	5.824E+00	7.539E-01	7.539E-01	45.21
	87.57	82	37.00*	5.824E+00	1.813E-01	1.813E-01	45.21
BA-137M	661.66	152	89.90*	2.456E+00	3.279E-01	3.289E-01	22.19
CS-137	661.66	152	85.10*	2.456E+00	3.464E-01	3.474E-01	22.19
TL-208	277.37	-----	6.60	4.682E+00	-----	Line Not Found	-----
	583.19	101	85.00*	2.710E+00	2.082E-01	2.082E-01	28.06
	860.56	-----	12.50	1.976E+00	-----	Line Not Found	-----
BI-211	72.87	39	1.23	4.412E+00	3.419E+00	3.419E+00	113.46
	351.06	146	12.92*	3.942E+00	1.370E+00	1.370E+00	24.14
PB-212	74.82	100	10.28	4.615E+00	1.009E+00	1.009E+00	46.72
	77.11	108	17.10	4.852E+00	6.238E-01	6.238E-01	45.18
	238.63	303	43.60*	5.201E+00	6.383E-01	6.383E-01	16.51
	300.09	-----	3.30	4.425E+00	-----	Line Not Found	-----
BI-214	609.32	78	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33
	1120.29	31	14.92	1.565E+00	6.235E-01	6.235E-01	49.99
	1764.49	19	15.30	1.062E+00	5.651E-01	5.651E-01	63.30
PB-214	74.82	100	5.80	4.615E+00	1.788E+00	1.788E+00	46.72
	77.11	108	9.70	4.852E+00	1.100E+00	1.100E+00	45.18
	87.09	82	3.41	5.824E+00	1.968E+00	1.968E+00	45.21
	242.00	58	7.25	5.160E+00	7.429E-01	7.429E-01	68.25
	295.22	98	18.42	4.478E+00	5.683E-01	5.683E-01	47.26
	351.93	146	35.60*	3.942E+00	4.971E-01	4.971E-01	24.14
RN-222	609.32	78	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33
	1120.29	31	14.92	1.565E+00	6.235E-01	6.235E-01	49.99
	1764.49	19	15.30	1.062E+00	5.651E-01	5.651E-01	63.30
RA-224	240.99	58	4.10*	5.160E+00	1.314E+00	1.314E+00	68.25
RA-226	609.32	78	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33
	1120.29	31	14.92	1.565E+00	6.235E-01	6.235E-01	49.99
	1764.49	19	15.30	1.062E+00	5.651E-01	5.651E-01	63.30
AC-228	105.21	-----	1.10	6.766E+00	-----	Line Not Found	-----
	338.32	59	11.27	4.053E+00	6.214E-01	6.214E-01	65.22
	794.95	-----	4.25	2.114E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.026E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.880E+00	6.023E-01	6.023E-01	43.01
	968.97	47	15.80	1.782E+00	7.884E-01	7.884E-01	45.75
RA-228	105.21	-----	1.10	6.766E+00	-----	Line Not Found	-----
	338.32	59	11.27	4.053E+00	6.214E-01	6.214E-01	65.22
	794.95	-----	4.25	2.114E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.026E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.880E+00	6.023E-01	6.023E-01	43.01
	968.97	47	15.80	1.782E+00	7.884E-01	7.884E-01	45.75
TH-228	74.82	100	10.28	4.615E+00	1.009E+00	1.009E+00	46.72
	77.11	108	17.10	4.852E+00	6.238E-01	6.238E-01	45.18
	238.63	303	43.60*	5.201E+00	6.383E-01	6.383E-01	16.51

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	300.09	-----	3.30	4.425E+00	-----	Line Not Found	-----
TH-230	609.32	78	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33
	1120.29	31	14.92	1.565E+00	6.235E-01	6.235E-01	49.99
	1764.49	19	15.30	1.062E+00	5.651E-01	5.651E-01	63.30
PA-231	283.69	-----	1.70	4.607E+00	-----	Line Not Found	-----
	301.36	10	5.35*	4.407E+00	2.104E-01	2.104E-01	315.05
TH-232	105.21	-----	1.10	6.766E+00	-----	Line Not Found	-----
	338.32	59	11.27	4.053E+00	6.214E-01	6.214E-01	65.22
	835.71	-----	1.61	2.026E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.880E+00	6.023E-01	6.023E-01	43.01
	968.97	47	15.80	1.782E+00	7.884E-01	7.884E-01	45.75
U-234	609.32	78	45.49*	2.620E+00	3.134E-01	3.134E-01	46.33
	1120.29	31	14.92	1.565E+00	6.235E-01	6.235E-01	49.99
	1764.49	19	15.30	1.062E+00	5.651E-01	5.651E-01	63.30
AM-243	43.53	-----	5.90	4.621E-01	-----	Line Not Found	-----
	74.66	100	67.20*	4.615E+00	1.543E-01	1.543E-01	46.72
ANH-511	511.00	32	100.00*	2.997E+00	5.173E-02	5.173E-02	133.99

Flag: "*" = Keyline

Total number of lines in spectrum 33
Number of unidentified lines 5
Number of lines tentatively identified by NID 28 84.85%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.933E+00	5.933E+00	0.935E+00	15.75	
CD-109	461.40D	1.08	1.813E+00	1.950E+00	0.881E+00	45.21	
SN-126	2.30E+05Y	1.00	1.813E-01	1.813E-01	0.820E-01	45.21	
BA-137M	30.08Y	1.00	3.279E-01	3.289E-01	0.730E-01	22.19	
CS-137	30.08Y	1.00	3.464E-01	3.474E-01	0.771E-01	22.19	
TL-208	1.41E+10Y	1.00	2.082E-01	2.082E-01	0.584E-01	28.06	
BI-211	7.04E+08Y	1.00	1.370E+00	1.370E+00	0.331E+00	24.14	
PB-212	1.41E+10Y	1.00	6.383E-01	6.383E-01	1.054E-01	16.51	
BI-214	1600.00Y	1.00	3.134E-01	3.134E-01	1.452E-01	46.33	
PB-214	1600.00Y	1.00	4.971E-01	4.971E-01	1.200E-01	24.14	
RN-222	1600.00Y	1.00	3.134E-01	3.134E-01	1.452E-01	46.33	
RA-224	1.41E+10Y	1.00	1.314E+00	1.314E+00	0.897E+00	68.25	
RA-226	1600.00Y	1.00	3.134E-01	3.134E-01	1.452E-01	46.33	
AC-228	1.41E+10Y	1.00	6.023E-01	6.023E-01	2.591E-01	43.01	
RA-228	1.41E+10Y	1.00	6.023E-01	6.023E-01	2.591E-01	43.01	
TH-228	1.41E+10Y	1.00	6.383E-01	6.383E-01	1.054E-01	16.51	
TH-230	7.54E+04Y	1.00	3.134E-01	3.134E-01	1.452E-01	46.33	
PA-231	7.04E+08Y	1.00	2.104E-01	2.104E-01	6.629E-01	315.05	
TH-232	1.41E+10Y	1.00	6.023E-01	6.023E-01	2.591E-01	43.01	
U-234	2.45E+05Y	1.00	3.134E-01	3.134E-01	1.452E-01	46.33	
AM-243	7370.00Y	1.00	1.543E-01	1.543E-01	0.721E-01	46.72	
ANH-511	1.00E+09Y	1.00	5.173E-02	5.173E-02	6.932E-02	133.99	

Total Activity : 1.706E+01 1.720E+01

Grand Total Activity : 1.706E+01 1.720E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	89.93	71	154	1.57	179.65	171	24	1.52E-02	79.1	6.03E+00	T
0	185.81	33	115	1.51	371.31	366	10	7.65E-03	****	6.11E+00	T
0	209.33	36	74	1.20	418.34	414	8	8.38E-03	96.5	5.68E+00	
0	214.29	16	66	1.18	428.24	424	7	3.66E-03	****	5.59E+00	T
0	270.70	43	77	1.24	541.03	536	11	1.03E-02	91.2	4.76E+00	T
0	328.31	25	40	1.03	656.20	652	9	5.96E-03	****	4.15E+00	T
0	361.27	19	32	0.80	722.09	719	9	4.67E-03	****	3.87E+00	
0	464.95	18	53	4.87	929.38	920	16	4.44E-03	****	3.22E+00	
0	600.89	10	19	1.18	1201.19	1196	8	2.46E-03	****	2.65E+00	T
0	726.75	24	19	0.95	1452.85	1448	12	6.39E-03	84.8	2.28E+00	T
0	780.52	21	8	3.53	1560.37	1553	15	5.69E-03	73.1	2.15E+00	
0	878.13	8	10	0.82	1755.55	1751	9	2.28E-03	****	1.94E+00	T
0	950.38	9	3	0.66	1900.02	1896	8	2.41E-03	****	1.81E+00	T
0	1201.22	14	3	2.39	2401.66	2396	10	4.01E-03	66.8	1.47E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                      *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677010.CNF;1      *
* Acquisition date   : 28-JUN-2016 14:35:32 Sensitivity      : 3.000              *
* Detector ID        : GAM16 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000  *
* Elapsed real time  : 0 01:00:00.33 Half life ratio  : ***** *
* Sample date        : 11-MAY-2016 10:50:00 Nuclide Library : SOLID          *
* Sample ID          : G398677010 Analyst initials: MXR1       *
* Batch Number       : 1572231 Sample Quantity : 1.5734E+02 GRAM *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000      *
*                                     Dry Weight    : 0.00000      *
*****
*
*                                     CALIBRATION INFORMATION                      *
*
* Eff. Cal. date     : 28-SEP-2015 08:03:00 Eff. Geometry   : CAN              *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;13             *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	0.000E+00
CD-109	5.968E-01
SN-126	5.583E-02
BA-137M	2.595E-02
CS-137	2.742E-02
TL-208	2.487E-02
PB-212	4.547E-02
BI-214	5.424E-02
PB-214	5.309E-02
RN-222	5.424E-02
RA-224	4.873E-01
RA-226	5.424E-02
AC-228	7.612E-02
RA-228	7.612E-02
TH-228	4.547E-02
TH-230	5.424E-02
PA-231	3.631E-01
TH-232	7.612E-02
U-234	5.424E-02
AM-243	3.779E-02
ANH-511	2.025E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.483E-01	NOT IDENT.
NA-22	3.288E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.851E-02	NOT IDENT.
SC-46	3.391E-02	FAIL ABUN
V-48	1.896E-01	NOT IDENT.
CR-51	6.430E-01	NOT IDENT.
MN-54	2.949E-02	NOT IDENT.
CO-56	3.373E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF

CO-57	1.913E-02	NOT IDENT.
CO-58	2.626E-02	NOT IDENT.
FE-59	9.781E-02	NOT IDENT.
CO-60	2.371E-02	NOT IDENT.
ZN-65	5.387E-02	NOT IDENT.
GE-68	6.557E-01	NOT IDENT.
AS-73	1.047E+00	NOT IDENT.
AS-74	2.099E-01	NOT IDENT.
SE-75	4.083E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.202E-01	NOT IDENT.
RB-83	7.109E-02	NOT IDENT.
KR-85	6.524E+00	NOT IDENT.
SR-85	4.889E-02	NOT IDENT.
RB-86	1.355E+00	NOT IDENT.
Y-88	3.320E-02	NOT IDENT.
Y-91	1.666E+01	NOT IDENT.
NB-94	2.180E-02	NOT IDENT.
NB-95	4.227E-02	NOT IDENT.
NB-95M	1.394E-01	NOT IDENT.
ZR-95	6.548E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.323E-02	NOT IDENT.
RH-102	4.100E-02	NOT IDENT.
RU-103	5.509E-02	FAIL ABUN
RH-106	2.434E-01	NOT IDENT.
RU-106	2.434E-01	NOT IDENT.
AG-108M	2.142E-02	NOT IDENT.
AG-110M	3.829E-02	NOT IDENT.
SN-113	3.835E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	1.941E-01	NOT IDENT.
TE-123M	2.275E-02	NOT IDENT.
SB-124	8.325E-02	NOT IDENT.
SB-125	6.769E-02	FAIL ABUN
TE-125M	1.057E+01	NOT IDENT.
I-126	9.130E-01	NOT IDENT.
SB-126	5.699E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.433E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.866E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.472E-02	NOT IDENT.
CS-135	1.157E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.525E-01	NOT IDENT.
CE-139	2.569E-02	NOT IDENT.
BA-140	1.168E+00	NOT IDENT.
LA-140	3.071E-01	FAIL ABUN
CE-141	8.982E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.467E-01	NOT IDENT.
PM-144	2.548E-02	NOT IDENT.
PR-144	1.940E+00	NOT IDENT.
PM-146	3.092E-02	NOT IDENT.
ND-147	3.813E+00	FAIL ABUN
PM-147	5.282E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.744E-02	FAIL ABUN
EU-152	7.969E-02	NOT IDENT.
GD-153	6.062E-02	NOT IDENT.
EU-154	9.042E-02	NOT IDENT.
EU-155	7.613E-02	FAIL ABUN
TB-160	1.580E-01	FAIL ABUN
HO-166M	4.546E-02	FAIL ABUN
TM-171	1.695E+01	NOT IDENT.
HF-172	1.351E-01	NOT IDENT.
LU-172	4.078E-02	FAIL ABUN
LU-176	2.050E-02	FAIL ABUN
HF-181	5.862E-02	NOT IDENT.
TA-182	1.491E-01	FAIL ABUN
RE-183	2.260E-01	NOT IDENT.
RE-184	1.708E-01	NOT IDENT.

W-188	6.615E+00	NOT IDENT.
IR-192	3.710E-02	FAIL ABUN
HG-203	4.600E-02	FAIL ABUN
BI-207	3.532E-02	FAIL ABUN
PB-210	3.458E+00	NOT IDENT.
BI-211	2.815E-01	FAIL ABUN
PB-211	3.938E-01	NOT IDENT.
BI-212	4.488E-01	FAIL ABUN
RN-219	2.958E-01	FAIL ABUN
RA-223	4.030E-01	FAIL ABUN
AC-227	1.894E-01	NOT IDENT.
TH-227	1.894E-01	NOT IDENT.
TH-229	3.963E-01	FAIL ABUN
TH-231	4.030E-01	FAIL ABUN
PA-233	4.511E-02	NOT IDENT.
PA-234	1.700E-01	FAIL ABUN
PA-234M	3.379E+00	NOT IDENT.
TH-234	1.078E+00	NOT IDENT.
U-235	1.501E-01	FAIL ABUN
NP-237	4.511E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.078E+00	NOT IDENT.
NP-239	2.045E-01	NOT IDENT.
PU-239	2.678E+02	NOT IDENT.
AM-241	1.234E-01	NOT IDENT.
CM-243	7.990E-02	NOT IDENT.
BK-247	6.127E-02	NOT IDENT.
CM-247	2.543E-02	NOT IDENT.
CF-249	3.326E-02	NOT IDENT.
CF-251	9.286E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677010.CNF;1
Acquisition date : 28-JUN-2016 14:35:32 Sensitivity : 3.000
Detector ID : GAM16 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.33 Half life ratio : *****
Sample date : 11-MAY-2016 10:50:00 Nuclide Library : SOLID
Sample ID : G398677010 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5734E+02 GRAM
Quantity Err(%) : 1.2711E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 28-SEP-2015 08:03:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM16_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.933E+00	1.056E+00	1.056E+00
CD-109	1.387E+00	9.166E-01	9.166E-01
SN-126	1.290E-01	8.499E-02	8.499E-02
BA-137M	3.289E-01	7.648E-02	7.648E-02
CS-137	3.474E-01	8.079E-02	8.079E-02
TL-208	2.082E-01	5.993E-02	5.993E-02
PB-212	6.383E-01	1.160E-01	1.160E-01
BI-214	3.134E-01	1.447E-01	1.447E-01
PB-214	4.971E-01	1.248E-01	1.248E-01
RN-222	3.134E-01	1.447E-01	1.447E-01
RA-224	3.088E-01	1.002E+00	1.002E+00
RA-226	3.134E-01	1.447E-01	1.447E-01
AC-228	6.023E-01	2.694E-01	2.694E-01
RA-228	6.023E-01	2.694E-01	2.694E-01
TH-228	6.383E-01	1.160E-01	1.160E-01
TH-230	3.134E-01	1.447E-01	1.447E-01
PA-231	2.104E-01	6.513E-01	6.513E-01
TH-232	6.023E-01	2.694E-01	2.694E-01
U-234	3.134E-01	1.447E-01	1.447E-01
AM-243	1.053E-01	7.508E-02	7.508E-02
ANH-511	5.173E-02	6.807E-02	6.807E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.814E-01	4.317E-01	4.393E-01	NOT IDENT.
NA-22	1.283E-02	3.625E-02	3.671E-02	NOT IDENT.
NA-24	-1.101E+21	4.026E+21	0.000E+00	SHORT HLIF
AL-26	-1.256E-02	2.619E-02	2.679E-02	NOT IDENT.
SC-46	-7.351E-03	4.133E-02	4.146E-02	FAIL ABUN
V-48	-1.961E-02	2.299E-01	2.301E-01	NOT IDENT.
CR-51	3.311E-01	6.899E-01	7.058E-01	NOT IDENT.
MN-54	2.604E-02	3.053E-02	3.271E-02	NOT IDENT.
CO-56	-1.002E-02	4.135E-02	4.160E-02	NOT IDENT.

MN-56	-1.000E+41	4.064E+41	0.000E+00	SHORT HLIF
CO-57	3.839E-03	2.098E-02	2.105E-02	NOT IDENT.
CO-58	-5.393E-02	4.195E-02	4.848E-02	NOT IDENT.
FE-59	-3.777E-02	1.196E-01	1.208E-01	NOT IDENT.
CO-60	-8.329E-03	2.995E-02	3.019E-02	NOT IDENT.
ZN-65	-4.702E-02	8.553E-02	8.812E-02	NOT IDENT.
GE-68	-4.149E-01	8.538E-01	8.740E-01	NOT IDENT.
AS-73	8.931E-02	1.099E+00	1.100E+00	NOT IDENT.
AS-74	-2.307E-01	3.194E-01	3.359E-01	NOT IDENT.
SE-75	-6.672E-03	4.931E-02	4.940E-02	NOT IDENT.
BR-77	1.524E+06	2.137E+06	2.245E+06	SHORT HLIF
SR-82	-5.389E-02	7.111E-01	7.115E-01	NOT IDENT.
RB-83	1.684E-02	8.153E-02	8.188E-02	NOT IDENT.
KR-85	1.037E+01	7.218E+00	8.599E+00	NOT IDENT.
SR-85	7.749E-02	5.411E-02	6.441E-02	NOT IDENT.
RB-86	-4.904E-01	1.673E+00	1.687E+00	NOT IDENT.
Y-88	1.346E-02	3.482E-02	3.534E-02	NOT IDENT.
Y-91	4.339E-01	2.242E+01	2.242E+01	NOT IDENT.
NB-94	-1.325E-02	2.702E-02	2.767E-02	NOT IDENT.
NB-95	1.069E-02	4.744E-02	4.769E-02	NOT IDENT.
NB-95M	4.451E-02	1.684E-01	1.696E-01	NOT IDENT.
ZR-95	2.465E-02	7.156E-02	7.242E-02	NOT IDENT.
NB-97	1.000E+41	1.026E+42	0.000E+00	SHORT HLIF
ZR-97	1.447E+20	2.200E+20	0.000E+00	SHORT HLIF
MO-99	3.818E+04	3.777E+04	4.151E+04	SHORT HLIF
TC-99M	-1.000E+41	2.268E+41	0.000E+00	SHORT HLIF
RH-101	-1.897E-03	2.610E-02	2.612E-02	NOT IDENT.
RH-102	2.033E-02	4.385E-02	4.480E-02	NOT IDENT.
RU-103	1.029E-02	6.326E-02	6.343E-02	FAIL ABUN
RH-106	-5.209E-02	2.831E-01	2.840E-01	NOT IDENT.
RU-106	-5.209E-02	2.831E-01	2.840E-01	NOT IDENT.
AG-108M	5.347E-04	2.471E-02	2.472E-02	NOT IDENT.
AG-110M	-2.012E-02	5.191E-02	5.270E-02	NOT IDENT.
SN-113	-2.677E-02	4.710E-02	4.862E-02	NOT IDENT.
CD-115	-1.724E+04	3.155E+05	3.156E+05	SHORT HLIF
SN-117M	-1.661E-01	2.359E-01	2.475E-01	NOT IDENT.
TE-123M	-2.290E-02	2.796E-02	2.980E-02	NOT IDENT.
SB-124	-9.614E-03	9.987E-02	9.996E-02	NOT IDENT.
SB-125	7.379E-04	7.859E-02	7.859E-02	FAIL ABUN
TE-125M	4.175E+00	1.135E+01	1.150E+01	NOT IDENT.
I-126	-6.694E-01	1.330E+00	1.364E+00	NOT IDENT.
SB-126	-4.391E-01	8.581E-01	8.806E-01	NOT IDENT.
SB-127	5.533E+01	3.736E+02	3.745E+02	SHORT HLIF
I-131	8.924E-01	1.742E+00	1.787E+00	NOT IDENT.
I-132	1.000E+41	3.388E+42	0.000E+00	SHORT HLIF
TE-132	-5.729E+02	7.632E+02	8.057E+02	SHORT HLIF
BA-133	2.182E-02	3.873E-02	3.996E-02	FAIL ABUN
I-133	6.860E+13	1.664E+15	1.664E+15	SHORT HLIF
CS-134	4.004E-02	3.498E-02	3.936E-02	NOT IDENT.
CS-135	3.204E-02	1.414E-01	1.421E-01	NOT IDENT.
I-135	1.000E+41	9.119E+41	0.000E+00	SHORT HLIF
CS-136	-1.572E-02	4.074E-01	4.075E-01	NOT IDENT.
CE-139	-7.942E-03	3.003E-02	3.024E-02	NOT IDENT.
BA-140	-2.011E-01	1.410E+00	1.413E+00	NOT IDENT.
LA-140	2.238E-01	2.865E-01	3.037E-01	FAIL ABUN
CE-141	-4.151E-02	1.048E-01	1.065E-01	NOT IDENT.
CE-143	3.357E+09	1.985E+09	2.496E+09	SHORT HLIF
CE-144	-1.282E-02	1.656E-01	1.657E-01	NOT IDENT.
PM-144	7.280E-03	2.820E-02	2.839E-02	NOT IDENT.
PR-144	7.197E-01	2.123E+00	2.148E+00	NOT IDENT.
PM-146	5.405E-03	3.522E-02	3.531E-02	NOT IDENT.
ND-147	4.239E+00	3.955E+00	4.392E+00	FAIL ABUN
PM-147	1.794E+01	5.864E+02	5.864E+02	NOT IDENT.
PM-149	-9.720E+05	2.083E+06	2.129E+06	SHORT HLIF
EU-150	-8.438E-03	2.564E-02	2.592E-02	FAIL ABUN
EU-152	2.135E-02	9.987E-02	1.003E-01	NOT IDENT.
GD-153	-5.925E-02	8.069E-02	8.500E-02	NOT IDENT.
EU-154	3.180E-02	1.002E-01	1.013E-01	NOT IDENT.
EU-155	-1.326E-02	8.487E-02	8.508E-02	FAIL ABUN
TB-160	1.096E-01	1.624E-01	1.697E-01	FAIL ABUN
HO-166M	8.860E-03	5.108E-02	5.124E-02	FAIL ABUN
TM-171	-6.670E+00	1.838E+01	1.862E+01	NOT IDENT.
HF-172	-5.723E-02	1.558E-01	1.579E-01	NOT IDENT.
LU-172	-1.950E-02	5.074E-02	5.150E-02	FAIL ABUN
LU-176	9.348E-03	2.229E-02	2.269E-02	FAIL ABUN
HF-181	9.345E-03	6.735E-02	6.748E-02	NOT IDENT.
TA-182	-9.875E-03	1.757E-01	1.757E-01	FAIL ABUN
RE-183	-2.538E-02	2.409E-01	2.411E-01	NOT IDENT.

RE-184	5.710E-02	2.026E-01	2.042E-01	NOT IDENT.
W-188	-8.173E-01	8.496E+00	8.504E+00	NOT IDENT.
IR-192	2.306E-02	3.945E-02	4.079E-02	FAIL ABUN
HG-203	3.249E-02	4.811E-02	5.029E-02	FAIL ABUN
BI-207	2.374E-03	4.016E-02	4.017E-02	FAIL ABUN
PB-210	6.897E-01	3.563E+00	3.577E+00	NOT IDENT.
BI-211	1.370E+00	3.446E-01	7.071E-01	FAIL ABUN
PB-211	-5.100E-01	5.279E-01	5.758E-01	NOT IDENT.
BI-212	7.597E-01	6.357E-01	7.221E-01	FAIL ABUN
RN-219	1.470E-01	3.226E-01	3.293E-01	FAIL ABUN
RA-223	-6.118E-01	6.160E-01	6.749E-01	FAIL ABUN
AC-227	7.986E-02	2.021E-01	2.053E-01	NOT IDENT.
TH-227	7.986E-02	2.021E-01	2.053E-01	NOT IDENT.
TH-229	1.380E-01	4.463E-01	4.506E-01	FAIL ABUN
TH-231	-6.118E-01	6.160E-01	6.749E-01	FAIL ABUN
PA-233	-1.864E-02	5.253E-02	5.320E-02	NOT IDENT.
PA-234	-3.900E-02	2.501E-01	2.508E-01	FAIL ABUN
PA-234M	4.479E-01	3.959E+00	3.964E+00	NOT IDENT.
TH-234	-5.224E-01	1.155E+00	1.179E+00	NOT IDENT.
U-235	-2.965E-02	1.712E-01	1.718E-01	FAIL ABUN
NP-237	-1.864E-02	5.253E-02	5.320E-02	NOT IDENT.
NP-238	3.754E+05	7.073E+05	7.273E+05	SHORT HLIF
U-238	-5.224E-01	1.155E+00	1.179E+00	NOT IDENT.
NP-239	2.491E-02	2.251E-01	2.254E-01	NOT IDENT.
PU-239	1.932E+02	2.865E+02	2.995E+02	NOT IDENT.
AM-241	5.557E-02	1.266E-01	1.291E-01	NOT IDENT.
CM-243	4.760E-02	8.438E-02	8.706E-02	NOT IDENT.
BK-247	5.606E-03	7.234E-02	7.238E-02	NOT IDENT.
CM-247	5.249E-03	2.855E-02	2.865E-02	NOT IDENT.
CF-249	2.199E-02	3.583E-02	3.717E-02	NOT IDENT.
CF-251	-1.980E-02	1.084E-01	1.087E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	64.1410	87.09	99.9845	136.47	58.3027
45.60	60.2137	87.57	100.0851	140.51	0.0000
46.54	59.5201	88.03	100.1810	143.76	85.7406
49.72	0.0000	88.34	100.2459	144.24	72.9314
51.35	67.5161	88.47	100.2727	145.44	89.1762
51.87	66.7309	89.96	100.5817	152.43	70.5449
52.39	79.3091	1093.63	100.7216	153.25	66.2807
52.97	72.3032	91.11	100.8180	323.87	70.7221
53.44	73.2963	92.59	101.1208	156.02	69.8112
54.07	62.6843	93.35	101.2748	158.56	81.0045
57.36	0.0000	94.56	101.5195	159.00	84.3394
57.53	73.2483	94.65	101.5373	162.33	66.0181
57.98	76.0554	94.67	101.5415	162.66	63.8464
59.27	63.6036	94.87	101.5818	163.33	80.4311
59.32	63.6123	97.43	87.7204	165.86	84.0210
59.54	66.3781	98.43	71.5042	176.31	78.4509
60.96	83.0618	98.44	71.5056	176.60	78.4801
61.17	99.5472	99.53	83.5980	177.52	76.3271
62.93	79.8246	100.11	84.8863	181.07	0.0000
63.29	85.4099	102.03	89.9954	181.52	57.5348
63.58	85.4743	103.18	71.1495	184.41	67.9315
64.28	81.9460	103.37	72.1772	143.76	79.3816
66.73	95.4293	105.21	82.4826	193.51	69.8319
67.24	84.4187	105.31	82.4980	197.03	74.7218
125.81	85.4405	106.12	79.5979	198.01	60.9974
67.75	91.0281	106.47	82.6736	201.83	89.0140
69.67	97.9932	109.28	73.9750	203.43	66.0153
70.83	81.4227	111.00	75.2191	205.31	62.6759
72.81	90.2720	111.76	0.0000	210.85	98.1094
72.87	90.2852	114.06	80.7346	215.65	46.4989
74.66	90.6655	116.30	0.0000	222.11	63.8558
74.82	90.6992	116.74	86.2426	227.09	75.7881
74.97	90.7310	119.76	68.1105	227.38	64.2167
77.11	91.1787	121.12	71.3689	228.16	0.0000
78.74	91.5156	121.22	71.3809	228.18	75.8756
79.69	91.7104	121.78	69.3766	116.74	75.8756
80.12	76.0201	122.06	67.3371	235.69	76.2930
80.19	76.0322	122.92	82.9944	235.96	71.9946
80.57	76.0961	123.07	80.9394	238.63	76.7044
81.00	96.2885	265.00	77.9049	238.98	0.0000
81.07	96.3033	125.81	81.3036	240.99	76.8892
81.75	119.4797	127.23	82.5350	242.00	68.0938
83.79	98.3217	127.91	82.6262	244.70	66.8269
84.00	98.3658	129.30	76.5201	252.40	0.0000
85.43	69.6475	131.20	83.0599	252.80	58.5786
86.55	113.4455	133.02	81.1890	254.15	0.0000
86.79	113.5026	133.52	72.8106	256.23	49.5911
86.94	99.9531	136.00	61.4386	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	59.2520	355.39	0.0000	584.27	24.8649
264.80	55.5560	356.01	23.9982	595.83	30.8781
265.00	55.5661	364.49	25.7613	427.87	21.3570
268.22	52.0189	366.42	0.0000	602.52	0.0000
269.46	56.5436	372.51	30.3676	604.72	23.2617
270.03	58.6203	375.05	30.4239	607.14	32.6057
271.23	58.6866	377.52	40.6378	609.32	31.7090
273.65	56.7639	356.01	48.9873	610.33	31.7248
276.40	53.6625	388.16	36.8531	614.28	38.9537
277.37	53.3984	388.63	28.6729	618.01	28.0986
277.60	52.4727	391.69	44.1285	620.36	30.9439
278.00	50.6168	264.66	27.8821	621.93	27.2137
279.20	40.3499	401.81	28.9378	630.19	0.0000
279.54	42.2397	402.40	28.9493	631.29	18.8535
279.70	45.0623	404.85	35.2119	633.25	18.8711
280.46	50.7305	410.95	34.3183	634.78	20.7738
283.69	44.2827	413.71	39.5916	635.95	21.7298
284.31	49.0214	414.70	45.8738	636.99	21.7405
285.41	40.5769	423.72	36.7101	645.85	23.7311
285.90	0.0000	427.09	33.6382	657.76	25.4551
287.50	44.4340	427.87	31.5518	657.90	0.0000
290.67	42.4730	433.94	31.6768	661.66	24.8638
293.27	0.0000	439.40	27.5504	664.57	0.0000
351.93	53.3041	453.88	28.8737	666.33	31.9450
295.96	53.3383	463.37	25.8171	666.50	31.9474
879.38	84.0079	468.07	20.7132	667.71	0.0000
299.98	68.8162	473.00	0.0000	677.62	19.2666
300.09	47.4112	475.06	23.8349	685.70	0.0000
300.13	47.4131	476.78	22.7752	695.00	21.3598
301.36	53.5878	477.60	34.7222	696.49	19.4307
302.85	53.6561	482.18	31.5533	696.51	18.4596
256.23	52.1961	487.02	30.5528	697.00	19.4351
304.85	52.2119	492.35	0.0000	697.30	18.4656
306.78	40.3767	497.08	29.6363	697.49	18.4675
308.46	49.0989	505.52	30.0019	702.65	26.3032
311.90	47.3095	507.63	0.0000	706.68	17.5667
316.51	39.7375	511.00	27.6619	711.68	22.4958
319.41	49.5479	514.00	24.8274	720.70	24.5477
320.08	38.8824	514.00	24.8274	721.93	0.0000
321.04	34.0488	520.40	27.8099	722.78	24.5697
323.87	53.0437	520.69	0.0000	722.91	24.5709
325.23	40.6079	522.65	0.0000	723.31	19.6602
328.76	40.7234	527.90	0.0000	724.19	18.0290
333.37	43.2319	528.26	33.5184	727.33	13.7860
333.97	41.2867	529.59	33.5431	733.00	18.0970
334.37	41.2995	529.87	0.0000	735.93	16.8020
338.28	48.3316	531.02	20.1418	333.97	22.7468
338.32	48.3331	537.26	29.1937	739.50	0.0000
311.90	50.5891	546.56	0.0000	747.24	5.9585
340.48	50.5891	552.55	28.9836	748.06	9.9343
340.55	47.4294	563.25	21.8619	752.31	12.9375
344.28	47.5679	569.33	25.5869	753.82	8.9624
345.93	53.9792	946.00	25.5890	756.73	12.9613
351.06	40.8436	569.70	25.5917	756.80	12.9619
351.93	40.8705	583.19	24.8511	884.68	22.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	20.0156	1274.44	14.1638	1620.50	3.2195
766.42	18.0185	1001.03	17.4598	1621.92	4.2939
766.84	25.0299	1002.74	16.3777	1678.03	0.0000
772.60	0.0000	1004.73	22.9441	1690.97	5.6037
776.52	16.7529	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.6384
778.90	13.4154	1028.54	0.0000	1063.66	25.6355
783.70	0.0000	1037.84	9.2033	1771.35	19.9431
785.37	6.7253	1038.76	0.0000	1791.20	0.0000
792.07	16.1844	631.29	8.3060	1808.65	5.7411
794.95	13.1647	1048.07	11.0801	1810.72	0.0000
795.86	13.1695	1049.04	16.6252	1836.06	2.8863
810.06	16.3004	1050.41	13.8605		
810.29	20.3770	1063.66	13.9185		
344.28	20.3784	1077.00	10.2494		
810.76	23.4380	1077.34	11.1826		
815.77	16.3367	1085.87	11.2119		
1048.07	17.3764	1093.63	15.9216		
832.01	22.6048	1099.45	16.8882		
834.85	12.3434	1112.07	18.0836		
835.71	17.4922	1112.84	14.1309		
836.80	0.0000	1115.54	17.7791		
846.75	0.0000	1120.29	12.2743		
846.77	17.5661	1120.55	12.2753		
856.80	23.8563	1221.41	12.9526		
860.56	18.6965	1129.67	15.1497		
871.09	11.7312	1131.51	0.0000		
873.19	13.9144	1147.95	0.0000		
875.33	0.0000	1173.23	14.3854		
879.38	22.6627	1177.95	12.4848		
880.51	13.9521	1189.05	9.6342		
883.24	20.9492	1204.77	9.9538		
884.68	22.2700	1221.41	15.5566		
889.28	16.7961	1231.02	16.5732		
894.76	16.8297	1235.36	16.5933		
898.04	18.9558	1238.28	12.6990		
900.72	15.8119	1260.41	0.0000		
903.28	14.5077	1271.87	14.7876		
911.20	10.5811	1274.44	11.8384		
912.08	10.5842	1274.54	11.8389		
923.98	0.0000	1291.59	6.9376		
926.50	10.6387	1298.22	0.0000		
929.11	12.7781	1312.11	10.9615		
937.49	17.0875	1332.49	10.0183		
944.13	12.2335	1362.66	0.0000		
946.00	12.4964	1365.19	8.0824		
949.00	11.7947	1368.63	0.0000		
667.71	0.0000	1384.29	9.1366		
962.31	19.7477	1408.01	8.1696		
964.08	16.1671	1457.56	0.0000		
966.17	14.3809	1460.82	0.0000		
911.20	17.9932	1489.16	7.2902		
968.97	17.9932	1505.03	7.3176		
983.53	14.1039	1584.12	12.7739		
984.45	0.0000	1596.21	1.0674		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:40:25.62

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677011.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM17.CNF;468
Background date    : 26-JUN-2016 12:04:46
Sample date       : 11-MAY-2016 10:55:00 Acquisition date : 28-JUN-2016 14:35:52
Sample ID        : G398677011 Sample quantity : 1.60200E+02 GRAM
Detector name     : GAM17 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.35 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	40.45	42	96	2.79	81.03	75	11	1.17E-02	47.8	
2	0	46.68*	33	99	1.94	93.51	88	9	9.17E-03	60.7	
3	0	63.66*	6	126	0.84	127.49	123	8	1.80E-03	319.7	
4	1	75.04	121	111	1.46	150.27	144	18	3.37E-02	19.4	1.27E+00
5	1	77.28	167	97	1.46	154.73	144	18	4.63E-02	14.7	
6	0	83.76*	19	85	0.83	167.71	165	7	5.18E-03	87.2	
7	0	86.84*	39	117	0.89	173.87	172	7	1.08E-02	49.0	
8	0	93.15*	48	108	1.34	186.50	183	11	1.33E-02	47.8	
9	0	186.44*	28	72	1.72	373.21	365	11	7.78E-03	64.8	
10	0	194.29	34	55	0.62	388.91	384	11	9.44E-03	45.6	
11	0	209.36	35	41	1.71	419.08	415	10	9.82E-03	37.5	
12	0	239.20*	220	101	1.40	478.79	473	14	6.12E-02	12.1	
13	0	295.23*	72	45	1.49	590.93	585	12	1.99E-02	22.8	
14	0	338.24*	46	26	1.69	676.99	672	10	1.28E-02	26.4	
15	0	351.89*	130	17	1.14	704.31	697	14	3.62E-02	11.4	
16	0	535.44	40	16	8.07	1071.61	1060	23	1.10E-02	31.5	
17	0	583.68*	45	20	1.26	1168.15	1162	13	1.25E-02	26.0	
18	0	609.80*	60	39	1.93	1220.42	1209	22	1.66E-02	30.0	
19	0	661.63	18	25	1.59	1324.14	1319	11	4.96E-03	59.0	
20	0	685.60	11	14	4.26	1372.10	1361	14	3.06E-03	78.2	
21	0	727.00	16	13	1.58	1454.93	1450	12	4.31E-03	51.6	
22	0	736.14	20	15	5.45	1473.23	1463	17	5.42E-03	53.1	
23	0	807.53	5	9	3.06	1616.07	1607	12	1.48E-03	120.3	
24	0	911.35*	27	15	1.52	1823.80	1816	11	7.42E-03	34.8	
25	0	924.11	5	6	0.51	1849.33	1840	11	1.25E-03	111.4	
26	0	968.78	12	10	3.52	1938.71	1931	13	3.43E-03	59.4	
27	0	1121.25*	6	12	0.73	2243.78	2236	12	1.64E-03	130.2	
28	0	1257.03	6	2	1.27	2515.41	2511	8	1.72E-03	56.0	
29	0	1377.28	9	0	0.98	2756.00	2752	9	2.50E-03	33.3	
30	0	1460.66*	108	3	2.40	2922.79	2914	15	3.00E-02	10.6	
31	0	1764.41*	7	2	1.06	3530.44	3524	11	1.84E-03	68.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:40:27

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677011.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 10:55:00 Acquisition date : 28-JUN-2016 14:35:52
Sample ID        : G398677011 Sample quantity  : 160.20 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA17 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.35 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	7.898E-01	5.836E+00	5.836E+00	21.21	OK
CD-109	88.03	3.70*	6.705E+00	3.742E-01	4.023E-01	264.26	OK
SN-126	64.28	9.60	6.714E+00	6.393E-02	6.393E-02	639.37	OK
	86.94	8.90	6.705E+00	1.556E-01	1.556E-01	264.26	OK
	87.57	37.00*	6.705E+00	3.742E-02	3.742E-02	264.26	OK
BA-137M	661.66	89.90*	1.587E+00	6.263E-02	6.282E-02	118.09	OK
CS-137	661.66	85.10*	1.587E+00	6.616E-02	6.637E-02	118.09	OK
TL-208	277.37	6.60	3.487E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.769E+00	1.516E-01	1.516E-01	51.96	OK
	860.56	12.50	1.267E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	6.822E+00	7.440E-01	7.471E-01	121.44	OK
BI-211	72.87	1.23	6.698E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	2.796E+00	1.535E-01	1.535E-01	603.76	OK
PB-212	74.82	10.28	6.701E+00	7.384E-01	7.384E-01	62.29	OK
	77.11	17.10	6.704E+00	9.088E-01	9.088E-01	29.46	OK
	238.63	43.60*	3.988E+00	7.093E-01	7.093E-01	24.10	OK
	300.09	3.30	3.242E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94	OK
	1120.29	14.92	1.007E+00	1.845E-01	1.845E-01	260.41	OK
	1764.49	15.30	6.536E-01	2.934E-01	2.934E-01	137.51	OK
PB-214	74.82	5.80	6.701E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.704E+00	1.602E+00	1.602E+00	29.46	OK
	87.09	3.41	6.705E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.947E+00	----- Line	Not Found	-----	Absent
	295.22	18.42	3.291E+00	6.477E-01	6.477E-01	45.60	OK
	351.93	35.60*	2.795E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94	OK
	1120.29	14.92	1.007E+00	1.845E-01	1.845E-01	260.41	OK
	1764.49	15.30	6.536E-01	2.934E-01	2.934E-01	137.51	OK
RA-226	609.32	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94	OK
	1120.29	14.92	1.007E+00	1.845E-01	1.845E-01	260.41	OK
	1764.49	15.30	6.536E-01	2.934E-01	2.934E-01	137.51	OK
AC-228	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.900E+00	7.620E-01	7.620E-01	52.81	OK
	794.95	4.25	1.356E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	4.141E-01	4.141E-01	69.54	OK
	968.97	15.80	1.144E+00	3.267E-01	3.267E-01	118.75	OK
RA-228	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.900E+00	7.620E-01	7.620E-01	52.81	OK
	794.95	4.25	1.356E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	4.141E-01	4.141E-01	69.54	OK
	968.97	15.80	1.144E+00	3.267E-01	3.267E-01	118.75	OK
TH-228	74.82	10.28	6.701E+00	7.384E-01	7.384E-01	62.29	OK
	77.11	17.10	6.704E+00	9.088E-01	9.088E-01	29.46	OK
	238.63	43.60*	3.988E+00	7.093E-01	7.093E-01	24.10	OK
	300.09	3.30	3.242E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.007E+00	1.845E-01	1.845E-01	260.41	OK
	1764.49	15.30	6.536E-01	2.934E-01	2.934E-01	137.51	OK
TH-232	105.21	1.10	6.576E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.900E+00	7.620E-01	7.620E-01	52.81	OK
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	4.141E-01	4.141E-01	69.54	OK
	968.97	15.80	1.144E+00	3.267E-01	3.267E-01	118.75	OK
TH-234	63.29	3.70*	6.714E+00	1.659E-01	1.659E-01	639.37	OK
	92.59	4.23	6.683E+00	1.041E+00	1.041E+00	95.57	OK
U-234	609.32	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94	OK
	1120.29	14.92	1.007E+00	1.845E-01	1.845E-01	260.41	OK
	1764.49	15.30	6.536E-01	2.934E-01	2.934E-01	137.51	OK
U-238	63.29	3.70*	6.714E+00	1.659E-01	1.659E-01	639.37	OK
	92.59	4.23	6.683E+00	1.041E+00	1.041E+00	95.57	OK
AM-243	43.53	5.90	6.544E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.701E+00	1.130E-01	1.130E-01	62.29	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677011.CNF;1
Acquisition date : 28-JUN-2016 14:35:52 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.35 Half life ratio : *****
Sample date : 11-MAY-2016 10:55:00 Analyst initials: MXR1
Sample ID : G398677011 Sample Quantity : 1.6020E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.836E+00	1.213E+00	6.331E-01
CD-109	4.023E-01	1.042E+00	1.185E+00
SN-126	3.742E-02	9.692E-02	1.165E-01
BA-137M	6.282E-02	7.270E-02	8.567E-02
CS-137	6.637E-02	7.680E-02	9.050E-02
TL-208	1.516E-01	7.722E-02	7.337E-02
PB-210	7.471E-01	8.891E-01	8.575E-01
BI-211	1.535E-01	9.081E-01	4.399E-01
PB-212	7.093E-01	1.675E-01	1.068E-01
BI-214	3.892E-01	2.286E-01	1.500E-01
PB-214	7.034E-01	1.576E-01	2.876E-01
RN-222	3.892E-01	2.286E-01	1.500E-01
RA-226	3.892E-01	2.286E-01	1.500E-01
AC-228	4.141E-01	2.822E-01	3.237E-01
RA-228	4.141E-01	2.822E-01	3.237E-01
TH-228	7.093E-01	1.675E-01	1.068E-01
TH-230	3.892E-01	2.286E-01	1.500E-01
TH-232	4.141E-01	2.822E-01	3.237E-01
TH-234	1.659E-01	1.039E+00	1.204E+00
U-234	3.892E-01	2.286E-01	1.500E-01
U-238	1.659E-01	1.039E+00	1.204E+00
AM-243	1.130E-01	6.895E-02	5.770E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.255E-01		5.443E-01	1.134E+00	NOT IDENT.
NA-22	3.663E-02		5.085E-02	1.143E-01	NOT IDENT.
NA-24	0.000E+00		5.625E+21	0.000E+00	SHORT HLIF
AL-26	6.663E-03		4.385E-02	9.704E-02	NOT IDENT.
SC-46	-3.456E-02		5.631E-02	1.005E-01	FAIL ABUN
V-48	1.047E-01		2.590E-01	5.782E-01	NOT IDENT.
CR-51	5.341E-01		9.228E-01	1.891E+00	NOT IDENT.
MN-54	2.440E-03		4.428E-02	8.854E-02	NOT IDENT.

CO-56	1.176E-02	6.549E-02	1.322E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	2.218E-02	2.486E-02	5.058E-02	NOT IDENT.
CO-58	-3.024E-02	6.547E-02	1.000E-01	NOT IDENT.
FE-59	-1.169E-02	1.609E-01	3.148E-01	NOT IDENT.
CO-60	-2.056E-02	5.084E-02	9.553E-02	NOT IDENT.
ZN-65	-1.007E-01	1.395E-01	1.880E-01	NOT IDENT.
GE-68	4.148E-01	1.703E+00	3.445E+00	NOT IDENT.
AS-73	3.545E-02	2.768E-01	5.536E-01	NOT IDENT.
AS-74	1.618E-01	4.287E-01	8.526E-01	NOT IDENT.
SE-75	-1.716E-02	5.224E-02	9.960E-02	NOT IDENT.
BR-77	0.000E+00	3.997E+05	0.000E+00	SHORT HLIF
SR-82	2.723E-01	1.030E+00	2.098E+00	NOT IDENT.
RB-83	-2.694E-02	1.147E-01	2.128E-01	NOT IDENT.
KR-85	-3.721E+00	1.233E+01	2.220E+01	NOT IDENT.
SR-85	-2.813E-02	9.249E-02	1.664E-01	NOT IDENT.
RB-86	1.748E+00	3.169E+00	6.778E+00	NOT IDENT.
Y-88	4.003E-02	5.736E-02	1.452E-01	NOT IDENT.
Y-91	1.827E+01	3.479E+01	7.337E+01	NOT IDENT.
NB-94	4.604E-02	4.255E-02	9.376E-02	NOT IDENT.
NB-95	3.942E-03	5.964E-02	1.210E-01	NOT IDENT.
NB-95M	2.351E-01	2.037E-01	3.858E-01	NOT IDENT.
ZR-95	1.049E-01	1.184E-01	2.628E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.659E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.524E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.955E+41	0.000E+00	SHORT HLIF
RH-101	-1.164E-02	2.919E-02	5.393E-02	NOT IDENT.
RH-102	-9.128E-03	6.632E-02	1.298E-01	NOT IDENT.
RU-103	-7.871E-03	7.690E-02	1.473E-01	FAIL ABUN
RH-106	1.816E-01	4.040E-01	8.454E-01	NOT IDENT.
RU-106	1.816E-01	4.040E-01	8.454E-01	NOT IDENT.
AG-108M	-1.780E-03	3.274E-02	6.307E-02	NOT IDENT.
AG-110M	-1.111E-02	5.940E-02	1.151E-01	NOT IDENT.
SN-113	-1.924E-02	5.458E-02	1.021E-01	NOT IDENT.
CD-115	0.000E+00	3.600E+05	0.000E+00	SHORT HLIF
SN-117M	4.679E-02	2.983E-01	5.671E-01	NOT IDENT.
TE-123M	5.290E-03	3.492E-02	6.634E-02	NOT IDENT.
SB-124	4.996E-02	1.208E-01	3.033E-01	NOT IDENT.
SB-125	-6.450E-03	1.030E-01	1.982E-01	NOT IDENT.
TE-125M	-2.843E+00	1.295E+01	2.442E+01	NOT IDENT.
I-126	3.812E-01	1.834E+00	3.239E+00	NOT IDENT.
SB-126	3.372E-01	1.124E+00	2.065E+00	NOT IDENT.
SB-127	0.000E+00	8.674E+02	0.000E+00	SHORT HLIF
I-131	9.548E-01	2.472E+00	4.932E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.122E+02	0.000E+00	SHORT HLIF
BA-133	1.296E-02	5.297E-02	9.236E-02	NOT IDENT.
I-133	0.000E+00	2.198E+15	0.000E+00	SHORT HLIF
CS-134	2.745E-02	4.918E-02	1.046E-01	NOT IDENT.
CS-135	5.232E-03	1.562E-01	3.064E-01	NOT IDENT.
I-135	0.000E+00	1.319E+41	0.000E+00	SHORT HLIF
CS-136	-8.446E-02	5.375E-01	1.066E+00	NOT IDENT.
CE-139	-1.140E-02	3.243E-02	5.936E-02	NOT IDENT.
BA-140	1.066E+00	1.915E+00	3.937E+00	NOT IDENT.
LA-140	-8.261E-01	7.007E-01	1.009E+00	NOT IDENT.
CE-141	3.744E-02	1.248E-01	2.404E-01	NOT IDENT.
CE-143	0.000E+00	2.616E+09	0.000E+00	SHORT HLIF
CE-144	-1.260E-01	1.948E-01	3.518E-01	NOT IDENT.
PM-144	-3.406E-02	4.814E-02	8.611E-02	NOT IDENT.
PR-144	-2.594E+00	3.666E+00	6.557E+00	NOT IDENT.
PM-146	3.805E-02	4.560E-02	9.771E-02	FAIL ABUN
ND-147	-5.028E-01	6.054E+00	9.899E+00	NOT IDENT.
PM-147	3.224E+02	6.907E+02	1.364E+03	NOT IDENT.
PM-149	0.000E+00	2.557E+06	0.000E+00	SHORT HLIF
EU-150	7.158E-03	3.641E-02	6.251E-02	FAIL ABUN
EU-152	-9.366E-03	1.221E-01	1.788E-01	NOT IDENT.
GD-153	4.257E-02	8.429E-02	1.513E-01	NOT IDENT.
EU-154	1.020E-01	1.417E-01	3.183E-01	NOT IDENT.
EU-155	5.463E-02	8.939E-02	1.794E-01	FAIL ABUN
TB-160	2.593E-02	2.097E-01	4.247E-01	FAIL ABUN
HO-166M	6.536E-03	7.018E-02	1.411E-01	NOT IDENT.
TM-171	2.317E+00	4.126E+00	8.491E+00	NOT IDENT.
HF-172	-7.779E-02	1.779E-01	3.280E-01	FAIL ABUN
LU-172	3.709E-03	7.293E-02	1.455E-01	FAIL ABUN
LU-176	-1.273E-02	2.677E-02	4.988E-02	NOT IDENT.
HF-181	3.053E-02	8.278E-02	1.682E-01	NOT IDENT.
TA-182	-1.094E-01	2.734E-01	4.898E-01	FAIL ABUN

RE-183	2.793E-02	1.029E-01	1.916E-01	NOT IDENT.
RE-184	-3.318E-02	3.244E-01	5.379E-01	NOT IDENT.
W-188	-2.209E+00	1.076E+01	1.784E+01	FAIL ABUN
IR-192	-1.843E-02	5.040E-02	9.468E-02	FAIL ABUN
HG-203	2.484E-02	6.453E-02	1.302E-01	NOT IDENT.
BI-207	4.425E-02	6.488E-02	1.394E-01	FAIL ABUN
PB-211	-4.750E-02	8.295E-01	1.589E+00	NOT IDENT.
BI-212	7.863E-01	7.954E-01	1.344E+00	FAIL ABUN
RN-219	5.225E-02	4.458E-01	8.754E-01	NOT IDENT.
RA-223	-6.009E-01	6.994E-01	1.242E+00	FAIL ABUN
RA-224	0.000E+00	9.722E-01	2.157E+00	NOT IDENT.
AC-227	1.294E-01	2.413E-01	4.975E-01	NOT IDENT.
TH-227	1.294E-01	2.413E-01	4.975E-01	NOT IDENT.
TH-229	9.258E-01	8.272E-01	1.044E+00	FAIL ABUN
PA-231	2.956E-02	6.096E-01	1.031E+00	NOT IDENT.
TH-231	-6.009E-01	6.994E-01	1.242E+00	FAIL ABUN
PA-233	1.827E-02	6.433E-02	1.297E-01	NOT IDENT.
PA-234	1.641E-01	3.156E-01	6.881E-01	NOT IDENT.
PA-234M	1.553E+00	5.389E+00	1.104E+01	NOT IDENT.
U-235	7.199E-02	1.985E-01	3.844E-01	FAIL ABUN
NP-237	1.827E-02	6.433E-02	1.297E-01	NOT IDENT.
NP-238	0.000E+00	9.475E+05	0.000E+00	SHORT HLIF
NP-239	-7.256E-02	2.352E-01	4.401E-01	NOT IDENT.
PU-239	2.585E+02	2.893E+02	5.906E+02	NOT IDENT.
AM-241	8.743E-02	6.252E-02	1.207E-01	NOT IDENT.
CM-243	-8.060E-02	8.895E-02	1.598E-01	NOT IDENT.
BK-247	-2.616E-02	7.848E-02	1.495E-01	FAIL ABUN
CM-247	-6.374E-03	4.218E-02	8.013E-02	NOT IDENT.
CF-249	-5.145E-03	3.873E-02	7.480E-02	NOT IDENT.
CF-251	-1.896E-02	1.182E-01	2.196E-01	NOT IDENT.
ANH-511	9.071E-03	5.555E-02	1.183E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	105	10.66*	7.898E-01	5.836E+00	5.836E+00	21.21
CD-109	88.03	51	3.70*	6.705E+00	9.712E-01	1.044E+00	97.90
SN-126	64.28	9	9.60	6.714E+00	6.393E-02	6.393E-02	639.37
	86.94	51	8.90	6.705E+00	4.037E-01	4.037E-01	97.90
	87.57	51	37.00*	6.705E+00	9.712E-02	9.712E-02	97.90
BA-137M	661.66	19	89.90*	1.587E+00	6.263E-02	6.282E-02	118.09
CS-137	661.66	19	85.10*	1.587E+00	6.616E-02	6.637E-02	118.09
TL-208	277.37	-----	6.60	3.487E+00	-----	Line Not Found	-----
	583.19	49	85.00*	1.769E+00	1.516E-01	1.516E-01	51.96
	860.56	-----	12.50	1.267E+00	-----	Line Not Found	-----
PB-210	46.54	46	4.25*	6.822E+00	7.440E-01	7.471E-01	121.44
BI-211	72.87	-----	1.23	6.698E+00	-----	Line Not Found	-----
	351.06	149	12.92*	2.796E+00	1.938E+00	1.938E+00	22.87
PB-212	74.82	162	10.28	6.701E+00	1.104E+00	1.104E+00	38.84
	77.11	222	17.10	6.704E+00	9.088E-01	9.088E-01	29.46
	238.63	263	43.60*	3.988E+00	7.093E-01	7.093E-01	24.10
	300.09	-----	3.30	3.242E+00	-----	Line Not Found	-----
BI-214	609.32	64	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94
	1120.29	6	14.92	1.007E+00	1.845E-01	1.845E-01	260.41
	1764.49	6	15.30	6.536E-01	2.934E-01	2.934E-01	137.51
PB-214	74.82	162	5.80	6.701E+00	1.956E+00	1.957E+00	38.84
	77.11	222	9.70	6.704E+00	1.602E+00	1.602E+00	29.46
	87.09	51	3.41	6.705E+00	1.054E+00	1.054E+00	97.90
	242.00	-----	7.25	3.947E+00	-----	Line Not Found	-----
	295.22	84	18.42	3.291E+00	6.477E-01	6.477E-01	45.60
	351.93	149	35.60*	2.796E+00	7.034E-01	7.034E-01	22.87
RN-222	609.32	64	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94
	1120.29	6	14.92	1.007E+00	1.845E-01	1.845E-01	260.41
	1764.49	6	15.30	6.536E-01	2.934E-01	2.934E-01	137.51
RA-226	609.32	64	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94
	1120.29	6	14.92	1.007E+00	1.845E-01	1.845E-01	260.41
	1764.49	6	15.30	6.536E-01	2.934E-01	2.934E-01	137.51
AC-228	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	53	11.27	2.900E+00	7.620E-01	7.620E-01	52.81
	794.95	-----	4.25	1.356E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	27	25.80*	1.206E+00	4.141E-01	4.141E-01	69.54
	968.97	13	15.80	1.144E+00	3.267E-01	3.267E-01	118.75
RA-228	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	53	11.27	2.900E+00	7.620E-01	7.620E-01	52.81
	794.95	-----	4.25	1.356E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	27	25.80*	1.206E+00	4.141E-01	4.141E-01	69.54
	968.97	13	15.80	1.144E+00	3.267E-01	3.267E-01	118.75
TH-228	74.82	162	10.28	6.701E+00	1.104E+00	1.104E+00	38.84
	77.11	222	17.10	6.704E+00	9.088E-01	9.088E-01	29.46
	238.63	263	43.60*	3.988E+00	7.093E-01	7.093E-01	24.10

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	300.09	-----	3.30	3.242E+00	-----	Line Not Found	-----
TH-230	609.32	64	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94
	1120.29	6	14.92	1.007E+00	1.845E-01	1.845E-01	260.41
	1764.49	6	15.30	6.536E-01	2.934E-01	2.934E-01	137.51
TH-232	105.21	-----	1.10	6.576E+00	-----	Line Not Found	-----
	338.32	53	11.27	2.900E+00	7.620E-01	7.620E-01	52.81
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	27	25.80*	1.206E+00	4.141E-01	4.141E-01	69.54
	968.97	13	15.80	1.144E+00	3.267E-01	3.267E-01	118.75
TH-234	63.29	9	3.70*	6.714E+00	1.659E-01	1.659E-01	639.37
	92.59	63	4.23	6.683E+00	1.041E+00	1.041E+00	95.57
U-234	609.32	64	45.49*	1.703E+00	3.892E-01	3.892E-01	59.94
	1120.29	6	14.92	1.007E+00	1.845E-01	1.845E-01	260.41
	1764.49	6	15.30	6.536E-01	2.934E-01	2.934E-01	137.51
U-238	63.29	9	3.70*	6.714E+00	1.659E-01	1.659E-01	639.37
	92.59	63	4.23	6.683E+00	1.041E+00	1.041E+00	95.57
AM-243	43.53	-----	5.90	6.544E+00	-----	Line Not Found	-----
	74.66	162	67.20*	6.701E+00	1.689E-01	1.689E-01	38.84

Flag: "*" = Keyline

Total number of lines in spectrum 31
Number of unidentified lines 5
Number of lines tentatively identified by NID 26 83.87%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.836E+00	5.836E+00	1.238E+00	21.21	
CD-109	461.40D	1.08	9.712E-01	1.044E+00	1.022E+00	97.90	
SN-126	2.30E+05Y	1.00	9.712E-02	9.712E-02	9.508E-02	97.90	
BA-137M	30.08Y	1.00	6.263E-02	6.282E-02	7.419E-02	118.09	
CS-137	30.08Y	1.00	6.616E-02	6.637E-02	7.837E-02	118.09	
TL-208	1.41E+10Y	1.00	1.516E-01	1.516E-01	0.788E-01	51.96	
PB-210	22.20Y	1.00	7.440E-01	7.471E-01	9.072E-01	121.44	
BI-211	7.04E+08Y	1.00	1.938E+00	1.938E+00	0.443E+00	22.87	
PB-212	1.41E+10Y	1.00	7.093E-01	7.093E-01	1.710E-01	24.10	
BI-214	1600.00Y	1.00	3.892E-01	3.892E-01	2.333E-01	59.94	
PB-214	1600.00Y	1.00	7.034E-01	7.034E-01	1.609E-01	22.87	
RN-222	1600.00Y	1.00	3.892E-01	3.892E-01	2.333E-01	59.94	
RA-226	1600.00Y	1.00	3.892E-01	3.892E-01	2.333E-01	59.94	
AC-228	1.41E+10Y	1.00	4.141E-01	4.141E-01	2.880E-01	69.54	
RA-228	1.41E+10Y	1.00	4.141E-01	4.141E-01	2.880E-01	69.54	
TH-228	1.41E+10Y	1.00	7.093E-01	7.093E-01	1.710E-01	24.10	
TH-230	7.54E+04Y	1.00	3.892E-01	3.892E-01	2.333E-01	59.94	
TH-232	1.41E+10Y	1.00	4.141E-01	4.141E-01	2.880E-01	69.54	
TH-234	4.47E+09Y	1.00	1.659E-01	1.659E-01	10.60E-01	639.37	
U-234	2.45E+05Y	1.00	3.892E-01	3.892E-01	2.333E-01	59.94	
U-238	4.47E+09Y	1.00	1.659E-01	1.659E-01	10.60E-01	639.37	
AM-243	7370.00Y	1.00	1.689E-01	1.689E-01	0.656E-01	38.84	

Total Activity : 1.568E+01 1.575E+01

Grand Total Activity : 1.568E+01 1.575E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	40.45	59	136	2.79	81.03	75	11	1.17E-02	95.7	5.82E+00	
0	83.76	25	113	0.83	167.71	165	7	5.18E-03	****	6.71E+00	T
0	186.44	34	88	1.72	373.21	365	11	7.78E-03	****	4.92E+00	T
0	194.29	41	67	0.62	388.91	384	11	9.44E-03	91.2	4.76E+00	T
0	209.36	43	49	1.71	419.08	415	10	9.82E-03	75.0	4.48E+00	T
0	535.44	43	18	8.07	1071.61	1060	23	1.10E-02	63.0	1.91E+00	
0	685.60	12	15	4.26	1372.10	1361	14	3.06E-03	****	1.54E+00	T
0	727.00	16	13	1.58	1454.93	1450	12	4.31E-03	****	1.46E+00	T
0	736.14	21	16	5.45	1473.23	1463	17	5.42E-03	****	1.45E+00	T
0	807.53	6	9	3.06	1616.07	1607	12	1.48E-03	****	1.34E+00	
0	924.11	5	6	0.51	1849.33	1840	11	1.25E-03	****	1.19E+00	T
0	1257.03	6	2	1.27	2515.41	2511	8	1.72E-03	****	9.09E-01	
0	1377.28	9	0	0.98	2756.00	2752	9	2.50E-03	66.7	8.35E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677011.CNF;1  *
* Acquisition date   : 28-JUN-2016 14:35:52 Sensitivity      : 3.000          *
* Detector ID        : GAM17 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.35 Half life ratio  : *****      *
* Sample date        : 11-MAY-2016 10:55:00 Nuclide Library : SOLID        *
* Sample ID          : G398677011 Analyst initials: MXR1         *
* Batch Number       : 1572231 Sample Quantity : 1.6020E+02 GRAM    *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 1-JUN-2016 09:40:09 Eff. Geometry    : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.405E-01
CD-109	5.628E-01
SN-126	5.551E-02
BA-137M	3.824E-02
CS-137	4.040E-02
TL-208	3.232E-02
PB-210	4.046E-01
BI-211	2.016E-01
PB-212	4.957E-02
BI-214	6.657E-02
PB-214	1.372E-01
RN-222	6.657E-02
RA-226	6.657E-02
AC-228	1.411E-01
RA-228	1.411E-01
TH-228	4.957E-02
TH-230	6.656E-02
TH-232	1.411E-01
TH-234	5.740E-01
U-234	6.656E-02
U-238	5.740E-01
AM-243	2.732E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	5.113E-01	NOT IDENT.
NA-22	4.972E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.851E-02	NOT IDENT.
SC-46	4.239E-02	FAIL ABUN
V-48	2.427E-01	NOT IDENT.
CR-51	8.722E-01	NOT IDENT.
MN-54	3.871E-02	NOT IDENT.
CO-56	5.828E-02	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	2.386E-02	NOT IDENT.
CO-58	4.216E-02	NOT IDENT.
FE-59	1.338E-01	NOT IDENT.
CO-60	4.019E-02	NOT IDENT.
ZN-65	7.958E-02	NOT IDENT.
GE-68	1.505E+00	NOT IDENT.
AS-73	2.618E-01	NOT IDENT.
AS-74	3.845E-01	NOT IDENT.
SE-75	4.567E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	9.328E-01	NOT IDENT.
RB-83	9.538E-02	NOT IDENT.
KR-85	1.033E+01	NOT IDENT.
SR-85	7.744E-02	NOT IDENT.
RB-86	2.960E+00	NOT IDENT.
Y-88	5.863E-02	NOT IDENT.
Y-91	3.206E+01	NOT IDENT.
NB-94	4.255E-02	NOT IDENT.
NB-95	5.264E-02	NOT IDENT.
NB-95M	1.817E-01	NOT IDENT.
ZR-95	1.172E-01	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.531E-02	NOT IDENT.
RH-102	5.766E-02	NOT IDENT.
RU-103	6.535E-02	FAIL ABUN
RH-106	3.797E-01	NOT IDENT.
RU-106	3.797E-01	NOT IDENT.
AG-108M	2.837E-02	NOT IDENT.
AG-110M	4.932E-02	NOT IDENT.
SN-113	4.568E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.670E-01	NOT IDENT.
TE-123M	3.123E-02	NOT IDENT.
SB-124	1.175E-01	NOT IDENT.
SB-125	8.925E-02	NOT IDENT.
TE-125M	1.152E+01	NOT IDENT.
I-126	1.453E+00	NOT IDENT.
SB-126	9.097E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.273E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.228E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	4.644E-02	NOT IDENT.
CS-135	1.416E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.374E-01	NOT IDENT.
CE-139	2.766E-02	NOT IDENT.
BA-140	1.774E+00	NOT IDENT.
LA-140	3.778E-01	NOT IDENT.
CE-141	1.135E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.645E-01	NOT IDENT.
PM-144	3.832E-02	NOT IDENT.
PR-144	2.918E+00	NOT IDENT.
PM-146	4.419E-02	FAIL ABUN
ND-147	4.403E+00	NOT IDENT.
PM-147	6.429E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.889E-02	FAIL ABUN
EU-152	8.057E-02	NOT IDENT.
GD-153	7.155E-02	NOT IDENT.
EU-154	1.385E-01	NOT IDENT.
EU-155	8.465E-02	FAIL ABUN
TB-160	1.848E-01	FAIL ABUN
HO-166M	6.247E-02	NOT IDENT.
TM-171	4.019E+00	NOT IDENT.
HF-172	1.538E-01	FAIL ABUN
LU-172	6.230E-02	FAIL ABUN
LU-176	2.269E-02	NOT IDENT.
HF-181	7.549E-02	NOT IDENT.
TA-182	2.107E-01	FAIL ABUN
RE-183	9.098E-02	NOT IDENT.

RE-184	2.330E-01	NOT IDENT.
W-188	8.117E+00	FAIL ABUN
IR-192	4.324E-02	FAIL ABUN
HG-203	6.026E-02	NOT IDENT.
BI-207	6.149E-02	FAIL ABUN
PB-211	7.230E-01	NOT IDENT.
BI-212	6.052E-01	FAIL ABUN
RN-219	3.971E-01	NOT IDENT.
RA-223	5.655E-01	FAIL ABUN
RA-224	1.037E+00	NOT IDENT.
AC-227	2.299E-01	NOT IDENT.
TH-227	2.299E-01	NOT IDENT.
TH-229	4.899E-01	FAIL ABUN
PA-231	4.771E-01	NOT IDENT.
TH-231	5.655E-01	FAIL ABUN
PA-233	5.934E-02	NOT IDENT.
PA-234	2.978E-01	NOT IDENT.
PA-234M	4.829E+00	NOT IDENT.
U-235	1.816E-01	FAIL ABUN
NP-237	5.934E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.066E-01	NOT IDENT.
PU-239	2.778E+02	NOT IDENT.
AM-241	5.748E-02	NOT IDENT.
CM-243	7.489E-02	NOT IDENT.
BK-247	6.860E-02	FAIL ABUN
CM-247	3.634E-02	NOT IDENT.
CF-249	3.346E-02	NOT IDENT.
CF-251	1.022E-01	NOT IDENT.
ANH-511	5.586E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677011.CNF;1
Acquisition date : 28-JUN-2016 14:35:52 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.35 Half life ratio : *****
Sample date : 11-MAY-2016 10:55:00 Nuclide Library : SOLID
Sample ID : G398677011 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.6020E+02 GRAM
Quantity Err(%) : 1.2484E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.836E+00	1.251E+00	1.251E+00
CD-109	4.023E-01	1.045E+00	1.045E+00
SN-126	3.742E-02	9.723E-02	9.723E-02
BA-137M	6.282E-02	7.275E-02	7.275E-02
CS-137	6.637E-02	7.686E-02	7.686E-02
TL-208	1.516E-01	7.749E-02	7.749E-02
PB-210	7.471E-01	8.912E-01	8.912E-01
BI-211	1.535E-01	9.146E-01	9.146E-01
PB-212	7.093E-01	1.717E-01	1.717E-01
BI-214	3.892E-01	2.292E-01	2.292E-01
PB-214	7.034E-01	1.603E-01	1.603E-01
RN-222	3.892E-01	2.292E-01	2.292E-01
RA-226	3.892E-01	2.292E-01	2.292E-01
AC-228	4.141E-01	2.830E-01	2.830E-01
RA-228	4.141E-01	2.830E-01	2.830E-01
TH-228	7.093E-01	1.717E-01	1.717E-01
TH-230	3.892E-01	2.292E-01	2.292E-01
TH-232	4.141E-01	2.830E-01	2.830E-01
TH-234	1.659E-01	1.040E+00	1.040E+00
U-234	3.892E-01	2.292E-01	2.292E-01
U-238	1.659E-01	1.040E+00	1.040E+00
AM-243	1.130E-01	6.966E-02	6.966E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.255E-01	5.445E-01	5.639E-01	NOT IDENT.
NA-22	3.663E-02	5.087E-02	5.349E-02	NOT IDENT.
NA-24	-1.614E+21	5.626E+21	0.000E+00	SHORT HLIF
AL-26	6.663E-03	4.385E-02	4.396E-02	NOT IDENT.
SC-46	-3.456E-02	5.633E-02	5.844E-02	FAIL ABUN
V-48	1.047E-01	2.590E-01	2.633E-01	NOT IDENT.
CR-51	5.341E-01	9.231E-01	9.540E-01	NOT IDENT.
MN-54	2.440E-03	4.428E-02	4.429E-02	NOT IDENT.

CO-56	1.176E-02	6.550E-02	6.571E-02	NOT IDENT.
MN-56	1.000E+41	5.469E+41	0.000E+00	SHORT HLIF
CO-57	2.218E-02	2.488E-02	2.682E-02	NOT IDENT.
CO-58	-3.024E-02	6.549E-02	6.689E-02	NOT IDENT.
FE-59	-1.169E-02	1.609E-01	1.610E-01	NOT IDENT.
CO-60	-2.056E-02	5.084E-02	5.168E-02	NOT IDENT.
ZN-65	-1.007E-01	1.396E-01	1.468E-01	NOT IDENT.
GE-68	4.148E-01	1.703E+00	1.713E+00	NOT IDENT.
AS-73	3.545E-02	2.769E-01	2.774E-01	NOT IDENT.
AS-74	1.618E-01	4.289E-01	4.351E-01	NOT IDENT.
SE-75	-1.716E-02	5.224E-02	5.281E-02	NOT IDENT.
BR-77	1.692E+06	2.388E+06	2.507E+06	SHORT HLIF
SR-82	2.723E-01	1.030E+00	1.037E+00	NOT IDENT.
RB-83	-2.694E-02	1.147E-01	1.154E-01	NOT IDENT.
KR-85	-3.721E+00	1.233E+01	1.245E+01	NOT IDENT.
SR-85	-2.813E-02	9.250E-02	9.337E-02	NOT IDENT.
RB-86	1.748E+00	3.170E+00	3.267E+00	NOT IDENT.
Y-88	4.003E-02	5.742E-02	6.019E-02	NOT IDENT.
Y-91	1.827E+01	3.480E+01	3.576E+01	NOT IDENT.
NB-94	4.604E-02	4.259E-02	4.738E-02	NOT IDENT.
NB-95	3.942E-03	5.964E-02	5.967E-02	NOT IDENT.
NB-95M	2.351E-01	2.046E-01	2.304E-01	NOT IDENT.
ZR-95	1.049E-01	1.185E-01	1.276E-01	NOT IDENT.
NB-97	-1.000E+41	3.788E+41	0.000E+00	SHORT HLIF
ZR-97	-3.717E+20	3.662E+20	0.000E+00	SHORT HLIF
MO-99	-1.218E+03	6.524E+04	6.524E+04	SHORT HLIF
TC-99M	-1.000E+41	1.957E+41	0.000E+00	SHORT HLIF
RH-101	-1.164E-02	2.926E-02	2.973E-02	NOT IDENT.
RH-102	-9.128E-03	6.632E-02	6.645E-02	NOT IDENT.
RU-103	-7.871E-03	7.690E-02	7.698E-02	FAIL ABUN
RH-106	1.816E-01	4.041E-01	4.123E-01	NOT IDENT.
RU-106	1.816E-01	4.041E-01	4.123E-01	NOT IDENT.
AG-108M	-1.780E-03	3.274E-02	3.275E-02	NOT IDENT.
AG-110M	-1.111E-02	5.940E-02	5.961E-02	NOT IDENT.
SN-113	-1.924E-02	5.459E-02	5.527E-02	NOT IDENT.
CD-115	1.964E+05	3.603E+05	3.710E+05	SHORT HLIF
SN-117M	4.679E-02	2.984E-01	2.991E-01	NOT IDENT.
TE-123M	5.290E-03	3.492E-02	3.500E-02	NOT IDENT.
SB-124	4.996E-02	1.208E-01	1.229E-01	NOT IDENT.
SB-125	-6.450E-03	1.030E-01	1.030E-01	NOT IDENT.
TE-125M	-2.843E+00	1.295E+01	1.302E+01	NOT IDENT.
I-126	3.812E-01	1.834E+00	1.842E+00	NOT IDENT.
SB-126	3.372E-01	1.125E+00	1.135E+00	NOT IDENT.
SB-127	5.659E+02	8.767E+02	9.131E+02	SHORT HLIF
I-131	9.548E-01	2.473E+00	2.510E+00	NOT IDENT.
I-132	-1.000E+41	5.854E+41	0.000E+00	SHORT HLIF
TE-132	2.170E+02	9.125E+02	9.177E+02	SHORT HLIF
BA-133	1.296E-02	5.297E-02	5.329E-02	NOT IDENT.
I-133	-1.382E+15	2.236E+15	2.321E+15	SHORT HLIF
CS-134	2.745E-02	4.919E-02	5.073E-02	NOT IDENT.
CS-135	5.232E-03	1.562E-01	1.562E-01	NOT IDENT.
I-135	1.000E+41	1.711E+41	0.000E+00	SHORT HLIF
CS-136	-8.446E-02	5.375E-01	5.389E-01	NOT IDENT.
CE-139	-1.140E-02	3.251E-02	3.292E-02	NOT IDENT.
BA-140	1.066E+00	1.916E+00	1.975E+00	NOT IDENT.
LA-140	-8.261E-01	7.018E-01	7.945E-01	NOT IDENT.
CE-141	3.744E-02	1.248E-01	1.260E-01	NOT IDENT.
CE-143	5.955E+09	2.633E+09	3.761E+09	SHORT HLIF
CE-144	-1.260E-01	1.949E-01	2.031E-01	NOT IDENT.
PM-144	-3.406E-02	4.816E-02	5.055E-02	NOT IDENT.
PR-144	-2.594E+00	3.667E+00	3.849E+00	NOT IDENT.
PM-146	3.805E-02	4.569E-02	4.880E-02	FAIL ABUN
ND-147	-5.028E-01	6.054E+00	6.058E+00	NOT IDENT.
PM-147	3.224E+02	6.909E+02	7.060E+02	NOT IDENT.
PM-149	4.394E+05	2.558E+06	2.565E+06	SHORT HLIF
EU-150	7.158E-03	3.641E-02	3.656E-02	FAIL ABUN
EU-152	-9.366E-03	1.221E-01	1.221E-01	NOT IDENT.
GD-153	4.257E-02	8.433E-02	8.648E-02	NOT IDENT.
EU-154	1.020E-01	1.417E-01	1.490E-01	NOT IDENT.
EU-155	5.463E-02	8.948E-02	9.280E-02	FAIL ABUN
TB-160	2.593E-02	2.097E-01	2.101E-01	FAIL ABUN
HO-166M	6.536E-03	7.018E-02	7.024E-02	NOT IDENT.
TM-171	2.317E+00	4.131E+00	4.261E+00	NOT IDENT.
HF-172	-7.779E-02	1.783E-01	1.818E-01	FAIL ABUN
LU-172	3.709E-03	7.293E-02	7.295E-02	FAIL ABUN
LU-176	-1.273E-02	2.678E-02	2.738E-02	NOT IDENT.
HF-181	3.053E-02	8.279E-02	8.392E-02	NOT IDENT.
TA-182	-1.094E-01	2.734E-01	2.778E-01	FAIL ABUN

RE-183	2.793E-02	1.030E-01	1.037E-01	NOT IDENT.
RE-184	-3.318E-02	3.244E-01	3.248E-01	NOT IDENT.
W-188	-2.209E+00	1.076E+01	1.081E+01	FAIL ABUN
IR-192	-1.843E-02	5.040E-02	5.108E-02	FAIL ABUN
HG-203	2.484E-02	6.454E-02	6.551E-02	NOT IDENT.
BI-207	4.425E-02	6.490E-02	6.790E-02	FAIL ABUN
PB-211	-4.750E-02	8.295E-01	8.298E-01	NOT IDENT.
BI-212	7.863E-01	7.964E-01	8.718E-01	FAIL ABUN
RN-219	5.225E-02	4.458E-01	4.464E-01	NOT IDENT.
RA-223	-6.009E-01	7.004E-01	7.510E-01	FAIL ABUN
RA-224	4.412E+00	1.000E+00	2.226E+00	NOT IDENT.
AC-227	1.294E-01	2.419E-01	2.489E-01	NOT IDENT.
TH-227	1.294E-01	2.419E-01	2.489E-01	NOT IDENT.
TH-229	9.258E-01	8.284E-01	9.276E-01	FAIL ABUN
PA-231	2.956E-02	6.097E-01	6.098E-01	NOT IDENT.
TH-231	-6.009E-01	7.004E-01	7.510E-01	FAIL ABUN
PA-233	1.827E-02	6.433E-02	6.486E-02	NOT IDENT.
PA-234	1.641E-01	3.672E-01	3.746E-01	NOT IDENT.
PA-234M	1.553E+00	5.389E+00	5.435E+00	NOT IDENT.
U-235	7.199E-02	1.985E-01	2.011E-01	FAIL ABUN
NP-237	1.827E-02	6.433E-02	6.486E-02	NOT IDENT.
NP-238	-7.101E+04	9.475E+05	9.480E+05	SHORT HLIF
NP-239	-7.256E-02	2.353E-01	2.376E-01	NOT IDENT.
PU-239	2.585E+02	2.895E+02	3.121E+02	NOT IDENT.
AM-241	8.743E-02	6.285E-02	7.418E-02	NOT IDENT.
CM-243	-8.060E-02	8.927E-02	9.638E-02	NOT IDENT.
BK-247	-2.616E-02	7.866E-02	7.953E-02	FAIL ABUN
CM-247	-6.374E-03	4.219E-02	4.229E-02	NOT IDENT.
CF-249	-5.145E-03	3.873E-02	3.880E-02	NOT IDENT.
CF-251	-1.896E-02	1.182E-01	1.185E-01	NOT IDENT.
ANH-511	9.071E-03	5.556E-02	5.571E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	83.2738	87.09	168.1780	136.47	73.5557
45.60	91.1948	87.57	133.4905	140.51	0.0000
46.54	92.8736	88.03	118.7258	143.76	82.6420
49.72	0.0000	88.34	137.6669	144.24	76.2359
51.35	90.8490	88.47	137.6892	145.44	85.9937
51.87	85.6240	89.96	137.9419	152.43	82.2065
52.39	89.4076	1093.63	138.0565	153.25	79.0184
52.97	85.6460	91.11	138.1354	323.87	82.3347
53.44	98.2333	92.59	154.6632	156.02	80.2950
54.07	105.0852	93.35	133.4167	158.56	82.6466
57.36	0.0000	94.56	133.6091	159.00	82.6774
57.53	121.8852	94.65	109.3469	162.33	77.4580
57.98	109.9601	94.67	109.3494	162.66	72.0233
59.27	88.6664	94.87	109.3753	163.33	67.6966
59.32	88.6734	97.43	80.2318	165.86	71.1230
59.54	88.7040	98.43	80.3251	176.31	75.0453
60.96	118.5341	98.44	80.3260	176.60	70.6475
61.17	134.1742	99.53	82.0686	177.52	62.9669
62.93	141.7714	100.11	83.4921	181.07	0.0000
63.29	140.8704	102.03	97.7350	181.52	63.8319
63.58	140.9322	103.18	101.9823	184.41	71.0854
64.28	125.4049	103.37	98.9132	143.76	81.8319
66.73	130.5811	105.21	78.4675	193.51	69.7949
67.24	124.3806	105.31	78.4765	197.03	64.5967
125.81	124.4602	106.12	88.8820	198.01	70.0310
67.75	129.9874	106.47	90.9840	201.83	59.4250
69.67	134.2983	109.28	97.4872	203.43	59.2375
70.83	123.4413	111.00	89.3561	205.31	67.7005
72.81	125.3715	111.76	0.0000	210.85	58.9090
72.87	125.3821	114.06	83.3939	215.65	44.1702
74.66	105.6905	116.30	0.0000	222.11	52.9831
74.82	105.7136	116.74	86.7649	227.09	56.8312
74.97	105.7355	119.76	88.0849	227.38	58.6762
77.11	106.0424	121.12	77.7067	228.16	0.0000
78.74	79.9908	121.22	77.7146	228.18	56.8736
79.69	84.0961	121.78	70.4031	116.74	56.8736
80.12	84.1436	122.06	70.4233	235.69	56.8542
80.19	64.1152	122.92	76.7966	235.96	49.1800
80.57	64.1472	123.07	78.9125	238.63	55.4253
81.00	64.1833	265.00	83.1723	238.98	0.0000
81.07	64.1892	125.81	87.5698	240.99	50.8857
81.75	64.2458	127.23	87.6928	242.00	50.9193
83.79	91.2543	127.91	74.0077	244.70	57.1918
84.00	91.2788	129.30	62.4629	252.40	0.0000
85.43	108.9270	131.20	84.8529	252.80	55.9365
86.55	109.0802	133.02	86.0644	254.15	0.0000
86.79	151.9496	133.52	86.1058	256.23	40.1748
86.94	168.1469	136.00	67.1293	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	46.9611	355.39	0.0000	584.27	14.5081
264.80	47.9040	356.01	34.5869	595.83	22.9447
265.00	47.9102	364.49	39.6963	427.87	41.9533
268.22	48.9461	366.42	0.0000	602.52	0.0000
269.46	32.0273	372.51	44.8352	604.72	29.2272
270.03	33.9231	375.05	40.9009	607.14	20.8416
271.23	50.9223	377.52	33.9585	609.32	20.8578
273.65	65.1626	356.01	34.0623	610.33	20.8647
276.40	42.5676	388.16	26.1012	614.28	25.6587
277.37	35.0204	388.63	27.1114	618.01	18.8756
277.60	35.0249	391.69	29.1618	620.36	22.0391
278.00	35.9803	264.66	27.2653	621.93	20.2137
279.20	44.5335	401.81	30.3109	630.19	0.0000
279.54	46.4381	402.40	34.3619	631.29	23.0433
279.70	48.3379	404.85	35.4127	633.25	23.0586
280.46	46.4633	410.95	34.4976	634.78	23.9931
283.69	44.6523	413.71	37.5890	635.95	23.0794
284.31	41.8172	414.70	43.7044	636.99	16.6230
285.41	34.2360	423.72	27.5544	645.85	20.3775
285.90	0.0000	427.09	25.5518	657.76	23.9120
287.50	34.9130	427.87	28.6279	657.90	0.0000
290.67	38.1572	433.94	27.6799	661.66	23.2778
293.27	0.0000	439.40	35.9673	664.57	0.0000
351.93	52.6038	453.88	18.6137	666.33	22.3809
295.96	63.7891	463.37	17.6506	666.50	22.3818
879.38	43.1219	468.07	27.0483	667.71	0.0000
299.98	46.3533	473.00	0.0000	677.62	28.8809
300.09	46.3562	475.06	19.8236	685.70	0.0000
300.13	44.7583	476.78	19.8377	695.00	19.7644
301.36	47.9889	477.60	19.8445	696.49	32.0140
302.85	44.8272	482.18	20.9282	696.51	32.0147
256.23	39.4205	487.02	22.0182	697.00	31.0778
304.85	42.3135	492.35	0.0000	697.30	30.1387
306.78	42.3591	497.08	22.1079	697.49	32.0244
308.46	43.3625	505.52	59.1534	702.65	16.0381
311.90	33.7909	507.63	0.0000	706.68	31.1725
316.51	43.5553	511.00	33.8750	711.68	18.9217
319.41	35.8690	514.00	66.7702	720.70	14.6376
320.08	36.8515	514.00	66.7702	721.93	0.0000
321.04	36.8709	520.40	28.6875	722.78	27.6665
323.87	50.5324	520.69	0.0000	722.91	27.6677
325.23	49.5968	522.65	0.0000	723.31	21.1604
328.76	46.7672	527.90	0.0000	724.19	14.6533
333.37	43.9519	528.26	12.4334	727.33	13.0377
333.97	45.5940	529.59	23.1028	733.00	22.8555
334.37	45.6037	529.87	0.0000	735.93	11.4380
338.28	41.1279	531.02	23.1155	333.97	14.7129
338.32	41.1284	537.26	20.3188	739.50	0.0000
311.90	19.6072	546.56	0.0000	747.24	15.3027
340.48	19.6072	552.55	27.9652	748.06	16.2633
340.55	21.2419	563.25	30.2354	752.31	26.8208
344.28	29.4686	569.33	20.5628	753.82	18.2079
345.93	22.9397	946.00	20.5642	756.73	12.4689
351.06	40.4144	569.70	23.8127	756.80	12.4692
351.93	40.4324	583.19	18.4908	884.68	19.2240

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	14.4260	1274.44	8.1825	1620.50	9.9365
766.42	15.3903	1001.03	13.3118	1621.92	5.9634
766.84	14.4302	1002.74	12.2930	1678.03	0.0000
772.60	0.0000	1004.73	13.3237	1690.97	2.0106
776.52	18.3305	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.0860
778.90	23.1704	1028.54	0.0000	1063.66	13.2358
783.70	0.0000	1037.84	5.1652	1771.35	13.2380
785.37	15.4759	1038.76	0.0000	1791.20	0.0000
792.07	20.3514	631.29	10.3516	1808.65	4.0970
794.95	15.5186	1048.07	8.2842	1810.72	0.0000
795.86	14.5526	1049.04	5.1788	1836.06	2.0571
810.06	16.6989	1050.41	9.3248		
810.29	16.6999	1063.66	11.4324		
344.28	15.0306	1077.00	10.4248		
810.76	15.0321	1077.34	13.5533		
815.77	14.6350	1085.87	10.4460		
1048.07	11.7170	1093.63	11.5111		
832.01	13.7217	1099.45	11.5264		
834.85	15.6943	1112.07	9.8077		
835.71	16.6790	1112.84	7.8824		
836.80	0.0000	1115.54	19.8308		
846.75	0.0000	1120.29	10.5273		
846.77	16.7299	1120.55	10.5282		
856.80	21.7100	1221.41	10.8306		
860.56	13.8294	1129.67	7.3845		
871.09	10.8968	1131.51	0.0000		
873.19	18.8326	1147.95	0.0000		
875.33	0.0000	1173.23	11.7153		
879.38	13.8997	1177.95	15.9912		
880.51	11.9175	1189.05	10.6864		
883.24	12.9201	1204.77	10.7218		
884.68	13.9191	1221.41	17.2148		
889.28	15.9271	1231.02	18.3274		
894.76	11.9626	1235.36	17.2650		
898.04	15.9639	1238.28	9.7174		
900.72	12.9799	1260.41	0.0000		
903.28	15.4148	1271.87	13.0459		
911.20	15.4468	1274.44	8.3910		
912.08	15.4502	1274.54	8.3914		
923.98	0.0000	1291.59	7.4844		
926.50	8.6155	1298.22	0.0000		
929.11	16.5960	1312.11	6.5757		
937.49	9.0716	1332.49	13.2041		
944.13	10.0966	1362.66	0.0000		
946.00	9.0912	1365.19	8.5423		
949.00	13.1418	1368.63	0.0000		
667.71	0.0000	1384.29	5.9273		
962.31	12.1714	1408.01	7.6551		
964.08	12.1768	1457.56	0.0000		
966.17	15.6640	1460.82	3.3820		
911.20	10.4500	1489.16	2.9137		
968.97	10.4500	1505.03	8.7658		
983.53	6.1178	1584.12	5.9253		
984.45	0.0000	1596.21	11.8749		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:41:12.68

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677012.CNF:1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM19.CNF:546
Background date    : 26-JUN-2016 12:04:57
Sample date       : 11-MAY-2016 11:00:00 Acquisition date : 28-JUN-2016 14:36:15
Sample ID        : G398677012 Sample quantity : 1.51630E+02 GRAM
Detector name    : GAM19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.35*	48	83	1.13	93.46	88	10	1.33E-02	39.1	
2	0	63.20*	14	117	1.72	127.20	122	10	3.95E-03	150.3	
3	0	77.12	103	73	1.19	155.04	153	5	2.86E-02	15.8	
4	6	90.07	30	41	1.06	180.94	179	14	8.27E-03	35.4	2.40E+00
5	6	92.84*	26	106	1.59	186.49	179	14	7.34E-03	80.8	
6	0	160.21	18	65	0.71	321.28	317	7	5.13E-03	75.9	
7	0	186.10*	35	105	1.30	373.09	367	10	9.84E-03	59.3	
8	0	194.79	18	54	0.56	390.48	386	8	4.88E-03	77.3	
9	0	208.41	30	97	1.04	417.73	414	10	8.45E-03	62.8	
10	4	238.53*	254	39	1.41	478.00	473	17	7.06E-02	7.8	8.85E-01
11	4	241.65	59	64	2.08	484.24	473	17	1.65E-02	37.4	
12	0	268.84	58	117	4.18	538.65	527	24	1.60E-02	50.9	
13	0	287.18	23	40	0.55	575.33	569	9	6.32E-03	54.5	
14	0	294.90*	79	66	1.25	590.78	584	12	2.20E-02	23.8	
15	0	338.15	48	28	1.02	677.31	674	8	1.35E-02	23.4	
16	0	351.72*	100	32	1.11	704.47	700	11	2.78E-02	15.3	
17	0	356.93	30	28	3.46	714.89	710	10	8.29E-03	37.7	
18	0	395.07	14	39	2.38	791.21	782	12	3.95E-03	91.6	
19	0	411.99	15	14	1.55	825.06	822	6	4.08E-03	50.0	
20	0	569.55*	7	15	1.24	1140.32	1135	10	1.91E-03	203.7	
21	0	583.14*	76	27	0.98	1167.51	1165	9	2.11E-02	17.5	
22	0	609.65*	47	64	1.45	1220.56	1213	16	1.30E-02	41.6	
23	0	661.37	127	24	1.61	1324.04	1318	12	3.52E-02	11.8	
24	0	723.29*	4	15	1.31	1447.93	1440	10	1.08E-03	213.2	
25	0	784.61	36	0	1.83	1570.61	1562	16	1.00E-02	16.7	
26	0	860.20	15	21	1.98	1721.86	1714	12	4.20E-03	65.8	
27	0	910.96*	50	8	1.71	1823.44	1818	11	1.40E-02	18.5	
28	0	968.88*	20	19	1.99	1939.32	1934	10	5.68E-03	47.3	
29	0	989.61	7	1	1.13	1980.80	1978	6	1.87E-03	47.4	
30	0	1063.35*	18	34	1.78	2128.34	2118	17	5.04E-03	99.7	
31	0	1120.22	10	11	0.75	2242.13	2237	8	2.84E-03	65.5	
32	0	1196.16	13	0	0.56	2394.08	2388	12	3.61E-03	27.7	
33	0	1209.73	6	11	4.85	2421.23	2409	15	1.58E-03	134.8	
34	0	1215.82	6	6	1.33	2433.41	2428	8	1.57E-03	93.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1238.16	18	7	0.54	2478.11	2470	14	5.00E-03	39.1	
36	0	1254.33	9	2	0.58	2510.46	2506	9	2.51E-03	44.3	
37	0	1460.59*	99	32	2.15	2923.17	2915	14	2.75E-02	15.9	
38	0	1763.69*	17	4	1.09	3529.64	3525	9	4.60E-03	35.3	
39	0	1769.56*	6	2	1.54	3541.41	3537	10	1.74E-03	81.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:41:14

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677012.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:00:00 Acquisition date : 28-JUN-2016 14:36:15
Sample ID        : G398677012 Sample quantity  : 151.63 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA19 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.53 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.161E+00	3.824E+00	3.824E+00	31.81	OK
TE-123M	159.00	84.00*	6.262E+00	2.092E-02	2.769E-02	151.77	OK
CS-135	268.22	16.00*	4.526E+00	4.513E-01	4.513E-01	101.88	OK
BA-137M	661.66	89.90*	2.164E+00	3.392E-01	3.402E-01	23.55	OK
CS-137	661.66	85.10*	2.164E+00	3.584E-01	3.594E-01	23.55	OK
BI-207	72.81	21.40	4.355E+00	----- Line	Not Found	-----	Absent
	74.97	35.70	4.558E+00	----- Line	Not Found	-----	Absent
	569.70	97.76	2.438E+00	1.524E-02	1.528E-02	407.45	OK
	1063.66	74.60*	1.497E+00	8.049E-02	8.072E-02	199.32	OK
	1770.23	6.87	9.836E-01	4.336E-01	4.348E-01	163.40	OK
TL-208	277.37	6.60	4.415E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.392E+00	1.968E-01	1.968E-01	34.95	OK
	860.56	12.50	1.764E+00	3.474E-01	3.474E-01	131.57	OK
PB-210	46.54	4.25*	8.857E-01	8.444E+00	8.479E+00	78.19	OK
PB-212	74.82	10.28	4.544E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	4.748E+00	8.060E-01	8.060E-01	31.69	OK
	238.63	43.60*	4.961E+00	6.754E-01	6.754E-01	15.54	OK
	300.09	3.30	4.142E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.309E+00	2.334E-01	2.335E-01	83.20	OK
	1120.29	14.92	1.437E+00	2.350E-01	2.350E-01	131.04	OK
	1764.49	15.30	9.865E-01	5.139E-01	5.139E-01	70.63	OK
PB-214	74.82	5.80	4.544E+00	----- Line	Not Found	-----	Absent
	77.11	9.70	4.748E+00	1.421E+00	1.421E+00	31.69	OK
	87.09	3.41	5.478E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.908E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.201E+00	5.757E-01	5.757E-01	47.68	OK
	351.93	35.60*	3.631E+00	4.292E-01	4.292E-01	30.64	OK
RN-222	609.32	45.49*	2.309E+00	2.334E-01	2.335E-01	83.20	OK
	1120.29	14.92	1.437E+00	2.350E-01	2.350E-01	131.04	OK
	1764.49	15.30	9.865E-01	5.139E-01	5.139E-01	70.63	OK
RA-224	240.99	4.10*	4.913E+00	6.741E-01	6.741E-01	201.08	OK
RA-226	609.32	45.49*	2.309E+00	2.334E-01	2.335E-01	83.20	OK
	1120.29	14.92	1.437E+00	2.350E-01	2.350E-01	131.04	OK
	1764.49	15.30	9.865E-01	5.139E-01	5.139E-01	70.63	OK
AC-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.752E+00	6.369E-01	6.369E-01	46.73	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	5.817E-01	5.817E-01	37.09	OK
	968.97	15.80	1.609E+00	4.023E-01	4.023E-01	94.56	OK
RA-228	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.752E+00	6.369E-01	6.369E-01	46.73	OK
	794.95	4.25	1.875E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	5.817E-01	5.817E-01	37.09	OK
	968.97	15.80	1.609E+00	4.023E-01	4.023E-01	94.56	OK
TH-228	74.82	10.28	4.544E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	4.748E+00	8.060E-01	8.060E-01	31.69	OK
	238.63	43.60*	4.961E+00	6.754E-01	6.754E-01	15.54	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	300.09	3.30	4.142E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.309E+00	2.334E-01	2.334E-01	83.20	OK
	1120.29	14.92	1.437E+00	2.350E-01	2.350E-01	131.04	OK
TH-232	1764.49	15.30	9.865E-01	5.139E-01	5.139E-01	70.63	OK
	105.21	1.10	6.259E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.752E+00	6.369E-01	6.369E-01	46.73	OK
TH-234	835.71	1.61	1.803E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.687E+00	5.817E-01	5.817E-01	37.09	OK
	968.97	15.80	1.609E+00	4.023E-01	4.023E-01	94.56	OK
U-234	63.29	3.70*	3.295E+00	7.526E-01	7.526E-01	300.67	OK
	92.59	4.23	5.795E+00	6.742E-01	6.742E-01	161.53	OK
	609.32	45.49*	2.309E+00	2.334E-01	2.334E-01	83.20	OK
U-235	1120.29	14.92	1.437E+00	2.350E-01	2.350E-01	131.04	OK
	1764.49	15.30	9.865E-01	5.139E-01	5.139E-01	70.63	OK
	89.96	3.47	5.651E+00	9.513E-01	9.513E-01	70.80	OK
U-238	93.35	5.60	5.795E+00	5.092E-01	5.092E-01	161.53	OK
	143.76	10.96*	6.462E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.216E+00	----- Line	Not Found	-----	Absent
U-238	185.72	57.20	5.840E+00	6.233E-02	6.233E-02	118.50	OK
	205.31	5.01	5.506E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.295E+00	7.526E-01	7.526E-01	300.67	OK
	92.59	4.23	5.795E+00	6.742E-01	6.742E-01	161.53	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677012.CNF;1
Acquisition date : 28-JUN-2016 14:36:15 Sensitivity : 3.000
Detector ID : GAM19 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.53 Half life ratio : *****
Sample date : 11-MAY-2016 11:00:00 Analyst initials: MXR1
Sample ID : G398677012 Sample Quantity : 1.5163E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 10:35:16 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	3.824E+00	1.192E+00	7.869E-01
TE-123M	2.769E-02	4.118E-02	6.292E-02
CS-135	4.513E-01	4.507E-01	2.652E-01
BA-137M	3.402E-01	7.851E-02	6.321E-02
CS-137	3.594E-01	8.294E-02	6.678E-02
BI-207	8.072E-02	1.577E-01	1.073E-01
TL-208	1.968E-01	6.741E-02	6.225E-02
PB-210	8.479E+00	6.497E+00	6.049E+00
PB-212	6.754E-01	1.029E-01	9.836E-02
BI-214	2.335E-01	1.903E-01	1.529E-01
PB-214	4.292E-01	1.289E-01	1.368E-01
RN-222	2.335E-01	1.903E-01	1.529E-01
RA-224	6.741E-01	1.328E+00	1.054E+00
RA-226	2.335E-01	1.903E-01	1.529E-01
AC-228	5.817E-01	2.115E-01	2.612E-01
RA-228	5.817E-01	2.115E-01	2.612E-01
TH-228	6.754E-01	1.029E-01	9.836E-02
TH-230	2.334E-01	1.903E-01	1.529E-01
TH-232	5.817E-01	2.115E-01	2.612E-01
TH-234	7.526E-01	2.218E+00	2.020E+00
U-234	2.334E-01	1.903E-01	1.529E-01
U-235	-1.122E-01	1.897E-01	3.427E-01
U-238	7.526E-01	2.218E+00	2.020E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.173E-01	5.104E-01	1.044E+00	NOT IDENT.
NA-22	2.072E-02	3.667E-02	7.944E-02	NOT IDENT.
NA-24	0.000E+00	4.123E+21	0.000E+00	SHORT HLIF
AL-26	-5.005E-03	3.337E-02	6.757E-02	NOT IDENT.
SC-46	-2.902E-04	5.108E-02	1.004E-01	FAIL ABUN
V-48	2.288E-02	2.306E-01	4.466E-01	NOT IDENT.
CR-51	7.189E-02	9.057E-01	1.677E+00	NOT IDENT.

MN-54	2.848E-03	3.897E-02	7.714E-02	NOT IDENT.
CO-56	-1.150E-02	5.472E-02	1.043E-01	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	5.043E-03	2.564E-02	5.024E-02	NOT IDENT.
CO-58	-9.908E-03	4.890E-02	9.474E-02	NOT IDENT.
FE-59	-9.078E-02	1.435E-01	2.511E-01	NOT IDENT.
CO-60	4.129E-03	3.187E-02	6.596E-02	NOT IDENT.
ZN-65	1.301E-02	1.066E-01	1.812E-01	NOT IDENT.
GE-68	2.502E-01	8.642E-01	1.903E+00	NOT IDENT.
AS-73	-1.237E-02	9.587E-01	1.807E+00	NOT IDENT.
AS-74	-1.675E-01	3.411E-01	6.108E-01	NOT IDENT.
SE-75	1.643E-02	5.883E-02	9.911E-02	NOT IDENT.
BR-77	0.000E+00	2.452E+05	0.000E+00	SHORT HLIF
SR-82	-1.046E+00	1.066E+00	1.356E+00	NOT IDENT.
RB-83	1.538E-02	9.856E-02	1.917E-01	NOT IDENT.
KR-85	-1.350E+01	1.012E+01	1.678E+01	NOT IDENT.
SR-85	-1.015E-01	7.591E-02	1.258E-01	NOT IDENT.
RB-86	6.516E-01	1.748E+00	3.887E+00	NOT IDENT.
Y-88	-6.872E-03	3.733E-02	7.775E-02	NOT IDENT.
Y-91	1.768E+01	2.339E+01	4.893E+01	NOT IDENT.
NB-94	2.242E-02	3.381E-02	6.921E-02	NOT IDENT.
NB-95	5.830E-02	5.729E-02	1.227E-01	NOT IDENT.
NB-95M	1.051E-02	1.915E-01	3.131E-01	NOT IDENT.
ZR-95	3.320E-02	1.122E-01	2.203E-01	FAIL ABUN
NB-97	0.000E+00	6.416E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.263E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.962E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.630E+41	0.000E+00	SHORT HLIF
RH-101	2.194E-02	3.058E-02	6.154E-02	NOT IDENT.
RH-102	-7.263E-02	5.723E-02	8.957E-02	NOT IDENT.
RU-103	8.443E-03	7.585E-02	1.471E-01	FAIL ABUN
RH-106	8.744E-03	3.077E-01	5.959E-01	NOT IDENT.
RU-106	8.744E-03	3.077E-01	5.959E-01	NOT IDENT.
AG-108M	-1.127E-02	3.184E-02	5.908E-02	FAIL ABUN
CD-109	7.734E-01	8.296E-01	1.539E+00	NOT IDENT.
AG-110M	1.305E-02	5.828E-02	1.168E-01	NOT IDENT.
SN-113	-9.710E-03	6.391E-02	1.052E-01	NOT IDENT.
CD-115	0.000E+00	3.770E+05	0.000E+00	SHORT HLIF
SN-117M	-1.050E-01	3.302E-01	5.335E-01	NOT IDENT.
SB-124	3.904E-02	7.051E-02	1.954E-01	FAIL ABUN
SB-125	-9.218E-03	1.024E-01	1.947E-01	NOT IDENT.
TE-125M	4.030E+00	1.336E+01	2.649E+01	NOT IDENT.
I-126	4.201E-01	1.261E+00	2.256E+00	NOT IDENT.
SB-126	4.293E-01	1.087E+00	1.900E+00	NOT IDENT.
SN-126	5.311E-02	7.844E-02	1.428E-01	FAIL ABUN
SB-127	0.000E+00	5.233E+02	0.000E+00	SHORT HLIF
I-131	-5.470E-01	2.078E+00	3.932E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	9.229E+02	0.000E+00	SHORT HLIF
BA-133	7.481E-02	5.534E-02	8.380E-02	FAIL ABUN
I-133	0.000E+00	1.947E+15	0.000E+00	SHORT HLIF
CS-134	-2.526E-04	4.377E-02	8.559E-02	FAIL ABUN
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	1.187E-01	4.538E-01	9.605E-01	NOT IDENT.
CE-139	-8.084E-03	3.346E-02	6.239E-02	NOT IDENT.
BA-140	1.543E+00	1.918E+00	3.909E+00	NOT IDENT.
LA-140	2.039E-01	3.389E-01	8.710E-01	NOT IDENT.
CE-141	-2.461E-02	1.135E-01	2.140E-01	NOT IDENT.
CE-143	0.000E+00	2.661E+09	0.000E+00	SHORT HLIF
CE-144	-3.310E-03	1.862E-01	3.591E-01	NOT IDENT.
PM-144	-1.683E-03	3.881E-02	7.264E-02	NOT IDENT.
PR-144	-1.442E-01	2.953E+00	5.524E+00	NOT IDENT.
PM-146	-2.380E-03	4.369E-02	8.369E-02	NOT IDENT.
ND-147	-3.687E+00	5.033E+00	8.803E+00	FAIL ABUN
PM-147	5.622E+02	6.907E+02	1.411E+03	NOT IDENT.
PM-149	0.000E+00	3.720E+06	0.000E+00	SHORT HLIF
EU-150	-2.113E-02	3.161E-02	4.905E-02	FAIL ABUN
EU-152	-5.846E-02	1.032E-01	1.784E-01	NOT IDENT.
GD-153	5.818E-02	9.063E-02	1.662E-01	NOT IDENT.
EU-154	6.199E-02	1.031E-01	2.240E-01	FAIL ABUN
EU-155	4.826E-02	1.024E-01	2.049E-01	NOT IDENT.
TB-160	4.314E-02	1.815E-01	3.678E-01	FAIL ABUN
HO-166M	-7.999E-03	5.744E-02	1.074E-01	FAIL ABUN
TM-171	1.843E+00	1.595E+01	3.038E+01	NOT IDENT.
HF-172	5.942E-03	1.889E-01	3.646E-01	FAIL ABUN
LU-172	2.023E-02	5.598E-02	1.172E-01	FAIL ABUN
LU-176	-3.488E-02	2.835E-02	4.594E-02	NOT IDENT.
HF-181	-8.009E-02	8.307E-02	1.425E-01	NOT IDENT.

TA-182	8.769E-02	1.628E-01	3.357E-01	FAIL ABUN
RE-183	9.666E-02	2.528E-01	4.397E-01	NOT IDENT.
RE-184	-6.567E-02	2.432E-01	4.237E-01	NOT IDENT.
W-188	6.735E+00	1.386E+01	1.811E+01	FAIL ABUN
IR-192	1.139E-03	4.820E-02	8.921E-02	FAIL ABUN
HG-203	2.796E-02	6.852E-02	1.315E-01	NOT IDENT.
BI-211	0.000E+00	3.550E-01	6.158E-01	FAIL ABUN
PB-211	-5.311E-01	7.525E-01	1.353E+00	NOT IDENT.
BI-212	5.541E-01	6.081E-01	1.143E+00	FAIL ABUN
RN-219	4.263E-01	4.288E-01	8.960E-01	NOT IDENT.
RA-223	3.800E-01	6.385E-01	1.299E+00	FAIL ABUN
AC-227	-2.036E-02	2.539E-01	4.688E-01	NOT IDENT.
TH-227	-2.036E-02	2.539E-01	4.688E-01	NOT IDENT.
TH-229	4.098E-01	6.206E-01	9.101E-01	FAIL ABUN
PA-231	3.129E-01	5.313E-01	9.932E-01	NOT IDENT.
TH-231	3.800E-01	6.385E-01	1.299E+00	FAIL ABUN
PA-233	4.518E-02	6.548E-02	1.288E-01	NOT IDENT.
PA-234	-4.098E-01	2.750E-01	4.032E-01	FAIL ABUN
PA-234M	1.109E+00	4.105E+00	8.534E+00	NOT IDENT.
NP-237	4.518E-02	6.548E-02	1.288E-01	NOT IDENT.
NP-238	0.000E+00	8.891E+05	0.000E+00	SHORT HLIF
NP-239	-1.263E-01	2.342E-01	4.380E-01	NOT IDENT.
PU-239	1.434E+02	3.081E+02	6.122E+02	NOT IDENT.
AM-241	5.596E-02	1.437E-01	2.489E-01	NOT IDENT.
AM-243	8.640E-02	6.138E-02	1.160E-01	NOT IDENT.
CM-243	8.394E-02	1.010E-01	2.070E-01	NOT IDENT.
BK-247	4.848E-02	7.935E-02	1.552E-01	NOT IDENT.
CM-247	3.858E-02	3.931E-02	8.206E-02	FAIL ABUN
CF-249	-1.447E-02	4.677E-02	7.537E-02	NOT IDENT.
CF-251	8.835E-03	1.228E-01	2.334E-01	NOT IDENT.
ANH-511	-9.781E-03	4.949E-02	1.037E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	96	10.66*	1.161E+00	3.824E+00	3.824E+00	31.81
TE-123M	159.00	22	84.00*	6.262E+00	2.092E-02	2.769E-02	151.77
CS-135	268.22	66	16.00*	4.526E+00	4.513E-01	4.513E-01	101.88
BA-137M	661.66	133	89.90*	2.164E+00	3.392E-01	3.402E-01	23.55
CS-137	661.66	133	85.10*	2.164E+00	3.584E-01	3.594E-01	23.55
BI-207	72.81	-----	21.40	4.355E+00	-----	Line Not Found	-----
	74.97	-----	35.70	4.558E+00	-----	Line Not Found	-----
	569.70	7	97.76	2.438E+00	1.524E-02	1.528E-02	407.45
	1063.66	18	74.60*	1.497E+00	8.049E-02	8.072E-02	199.32
	1770.23	6	6.87	9.836E-01	4.336E-01	4.348E-01	163.40
TL-208	277.37	-----	6.60	4.415E+00	-----	Line Not Found	-----
	583.19	81	85.00*	2.392E+00	1.968E-01	1.968E-01	34.95
	860.56	15	12.50	1.764E+00	3.474E-01	3.474E-01	131.57
PB-210	46.54	64	4.25*	8.857E-01	8.444E+00	8.479E+00	78.19
BI-211	72.87	-----	1.23	4.361E+00	-----	Line Not Found	-----
	351.06	112	12.92*	3.631E+00	1.183E+00	1.183E+00	30.64
PB-212	74.82	-----	10.28	4.544E+00	-----	Line Not Found	-----
	77.11	132	17.10	4.748E+00	8.060E-01	8.060E-01	31.69
	238.63	295	43.60*	4.961E+00	6.754E-01	6.754E-01	15.54
	300.09	-----	3.30	4.142E+00	-----	Line Not Found	-----
BI-214	609.32	50	45.49*	2.309E+00	2.334E-01	2.335E-01	83.20
	1120.29	10	14.92	1.437E+00	2.350E-01	2.350E-01	131.04
	1764.49	16	15.30	9.865E-01	5.139E-01	5.139E-01	70.63
PB-214	74.82	-----	5.80	4.544E+00	-----	Line Not Found	-----
	77.11	132	9.70	4.748E+00	1.421E+00	1.421E+00	31.69
	87.09	-----	3.41	5.478E+00	-----	Line Not Found	-----
	242.00	69	7.25	4.913E+00	9.569E-01	9.569E-01	74.79
	295.22	90	18.42	4.201E+00	5.757E-01	5.757E-01	47.68
	351.93	112	35.60*	3.631E+00	4.292E-01	4.292E-01	30.64
RN-222	609.32	50	45.49*	2.309E+00	2.334E-01	2.335E-01	83.20
	1120.29	10	14.92	1.437E+00	2.350E-01	2.350E-01	131.04
	1764.49	16	15.30	9.865E-01	5.139E-01	5.139E-01	70.63
RA-224	240.99	69	4.10*	4.913E+00	1.692E+00	1.692E+00	74.79
RA-226	609.32	50	45.49*	2.309E+00	2.334E-01	2.335E-01	83.20
	1120.29	10	14.92	1.437E+00	2.350E-01	2.350E-01	131.04
	1764.49	16	15.30	9.865E-01	5.139E-01	5.139E-01	70.63
AC-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	54	11.27	3.752E+00	6.369E-01	6.369E-01	46.73
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.687E+00	5.817E-01	5.817E-01	37.09
	968.97	21	15.80	1.609E+00	4.023E-01	4.023E-01	94.56
RA-228	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	54	11.27	3.752E+00	6.369E-01	6.369E-01	46.73
	794.95	-----	4.25	1.875E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.687E+00	5.817E-01	5.817E-01	37.09

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	21	15.80	1.609E+00	4.023E-01	4.023E-01	94.56
	74.82	-----	10.28	4.544E+00	-----	Line Not Found	-----
	77.11	132	17.10	4.748E+00	8.060E-01	8.060E-01	31.69
	238.63	295	43.60*	4.961E+00	6.754E-01	6.754E-01	15.54
TH-230	300.09	-----	3.30	4.142E+00	-----	Line Not Found	-----
	609.32	50	45.49*	2.309E+00	2.334E-01	2.334E-01	83.20
	1120.29	10	14.92	1.437E+00	2.350E-01	2.350E-01	131.04
	1764.49	16	15.30	9.865E-01	5.139E-01	5.139E-01	70.63
TH-232	105.21	-----	1.10	6.259E+00	-----	Line Not Found	-----
	338.32	54	11.27	3.752E+00	6.369E-01	6.369E-01	46.73
	835.71	-----	1.61	1.803E+00	-----	Line Not Found	-----
	911.20	51	25.80*	1.687E+00	5.817E-01	5.817E-01	37.09
TH-234	968.97	21	15.80	1.609E+00	4.023E-01	4.023E-01	94.56
	63.29	19	3.70*	3.295E+00	7.526E-01	7.526E-01	300.67
	92.59	33	4.23	5.795E+00	6.742E-01	6.742E-01	161.53
U-234	609.32	50	45.49*	2.309E+00	2.334E-01	2.334E-01	83.20
	1120.29	10	14.92	1.437E+00	2.350E-01	2.350E-01	131.04
	1764.49	16	15.30	9.865E-01	5.139E-01	5.139E-01	70.63
U-235	89.96	38	3.47	5.651E+00	9.513E-01	9.513E-01	70.80
	93.35	33	5.60	5.795E+00	5.092E-01	5.092E-01	161.53
	143.76	-----	10.96*	6.462E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.216E+00	-----	Line Not Found	-----
U-238	185.72	42	57.20	5.840E+00	6.233E-02	6.233E-02	118.50
	205.31	-----	5.01	5.506E+00	-----	Line Not Found	-----
	63.29	19	3.70*	3.295E+00	7.526E-01	7.526E-01	300.67
	92.59	33	4.23	5.795E+00	6.742E-01	6.742E-01	161.53

Flag: "*" = Keyline

Total number of lines in spectrum 39
Number of unidentified lines 7
Number of lines tentatively identified by NID 32 82.05%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	3.824E+00	3.824E+00	1.216E+00	31.81	
TE-123M	119.20D	1.32	2.092E-02	2.769E-02	4.202E-02	151.77	
CS-135	2.30E+06Y	1.00	4.513E-01	4.513E-01	4.598E-01	101.88	
BA-137M	30.08Y	1.00	3.392E-01	3.402E-01	0.801E-01	23.55	
CS-137	30.08Y	1.00	3.584E-01	3.594E-01	0.846E-01	23.55	
BI-207	32.90Y	1.00	8.049E-02	8.072E-02	16.09E-02	199.32	
TL-208	1.41E+10Y	1.00	1.968E-01	1.968E-01	0.688E-01	34.95	
PB-210	22.20Y	1.00	8.444E+00	8.479E+00	6.630E+00	78.19	
BI-211	7.04E+08Y	1.00	1.183E+00	1.183E+00	0.362E+00	30.64	
PB-212	1.41E+10Y	1.00	6.754E-01	6.754E-01	1.050E-01	15.54	
BI-214	1600.00Y	1.00	2.334E-01	2.335E-01	1.942E-01	83.20	
PB-214	1600.00Y	1.00	4.292E-01	4.292E-01	1.315E-01	30.64	
RN-222	1600.00Y	1.00	2.334E-01	2.335E-01	1.942E-01	83.20	
RA-224	1.41E+10Y	1.00	1.692E+00	1.692E+00	1.266E+00	74.79	
RA-226	1600.00Y	1.00	2.334E-01	2.335E-01	1.942E-01	83.20	
AC-228	1.41E+10Y	1.00	5.817E-01	5.817E-01	2.158E-01	37.09	
RA-228	1.41E+10Y	1.00	5.817E-01	5.817E-01	2.158E-01	37.09	
TH-228	1.41E+10Y	1.00	6.754E-01	6.754E-01	1.050E-01	15.54	
TH-230	7.54E+04Y	1.00	2.334E-01	2.334E-01	1.942E-01	83.20	
TH-232	1.41E+10Y	1.00	5.817E-01	5.817E-01	2.158E-01	37.09	
TH-234	4.47E+09Y	1.00	7.526E-01	7.526E-01	22.63E-01	300.67	
U-234	2.45E+05Y	1.00	2.334E-01	2.334E-01	1.942E-01	83.20	
U-235	7.04E+08Y	1.00	6.233E-02	6.233E-02	7.387E-02	118.50	K
U-238	4.47E+09Y	1.00	7.526E-01	7.526E-01	22.63E-01	300.67	
Total Activity :			2.285E+01	2.289E+01			

Grand Total Activity : 2.285E+01 2.289E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	194.79	21	64	0.56	390.48	386	8	4.88E-03	****	5.69E+00	T
0	208.41	36	114	1.04	417.73	414	10	8.45E-03	****	5.45E+00	
0	287.18	26	46	0.55	575.33	569	9	6.32E-03	****	4.29E+00	T
0	356.93	33	31	3.46	714.89	710	10	8.29E-03	75.5	3.59E+00	T
0	395.07	16	43	2.38	791.21	782	12	3.95E-03	****	3.29E+00	
0	411.99	16	16	1.55	825.06	822	6	4.08E-03	99.9	3.18E+00	T
0	723.29	4	16	1.31	1447.93	1440	10	1.08E-03	****	2.02E+00	T
0	784.61	37	0	1.83	1570.61	1562	16	1.00E-02	33.3	1.89E+00	T
0	989.61	7	1	1.13	1980.80	1978	6	1.87E-03	94.9	1.58E+00	
0	1196.16	13	0	0.56	2394.08	2388	12	3.61E-03	55.5	1.36E+00	
0	1209.73	6	11	4.85	2421.23	2409	15	1.58E-03	****	1.35E+00	
0	1215.82	6	6	1.33	2433.41	2428	8	1.57E-03	****	1.35E+00	
0	1238.16	18	7	0.54	2478.11	2470	14	5.00E-03	78.2	1.33E+00	T
0	1254.33	9	2	0.58	2510.46	2506	9	2.51E-03	88.6	1.31E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677012.CNF;1
Acquisition date : 28-JUN-2016 14:36:15 Sensitivity : 3.000
Detector ID : GAM19 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.53 Half life ratio : *****
Sample date : 11-MAY-2016 11:00:00 Nuclide Library : SOLID
Sample ID : G398677012 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5163E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 10:35:16 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.390E-01
TE-123M	2.968E-02
CS-135	1.230E-01
BA-137M	2.807E-02
CS-137	2.965E-02
BI-207	4.755E-02
TL-208	2.774E-02
PB-210	2.836E+00
PB-212	4.593E-02
BI-214	6.990E-02
PB-214	6.302E-02
RN-222	6.990E-02
RA-224	4.924E-01
RA-226	6.990E-02
AC-228	1.149E-01
RA-228	1.149E-01
TH-228	4.593E-02
TH-230	6.990E-02
TH-232	1.149E-01
TH-234	9.510E-01
U-234	6.990E-02
U-235	1.613E-01
U-238	9.510E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.779E-01	NOT IDENT.
NA-22	3.432E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.682E-02	NOT IDENT.
SC-46	4.429E-02	FAIL ABUN
V-48	1.887E-01	NOT IDENT.
CR-51	7.789E-01	NOT IDENT.
MN-54	3.436E-02	NOT IDENT.

CO-56	4.627E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.368E-02	NOT IDENT.
CO-58	4.140E-02	NOT IDENT.
FE-59	1.081E-01	NOT IDENT.
CO-60	2.749E-02	NOT IDENT.
ZN-65	7.997E-02	NOT IDENT.
GE-68	7.904E-01	NOT IDENT.
AS-73	8.484E-01	NOT IDENT.
AS-74	2.729E-01	NOT IDENT.
SE-75	4.612E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.892E-01	NOT IDENT.
RB-83	8.724E-02	NOT IDENT.
KR-85	7.786E+00	NOT IDENT.
SR-85	5.835E-02	NOT IDENT.
RB-86	1.625E+00	NOT IDENT.
Y-88	2.916E-02	NOT IDENT.
Y-91	2.107E+01	NOT IDENT.
NB-94	3.128E-02	NOT IDENT.
NB-95	5.538E-02	NOT IDENT.
NB-95M	1.470E-01	NOT IDENT.
ZR-95	9.925E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.913E-02	NOT IDENT.
RH-102	3.918E-02	NOT IDENT.
RU-103	6.702E-02	FAIL ABUN
RH-106	2.646E-01	NOT IDENT.
RU-106	2.646E-01	NOT IDENT.
AG-108M	2.703E-02	FAIL ABUN
CD-109	7.321E-01	NOT IDENT.
AG-110M	5.217E-02	NOT IDENT.
SN-113	4.830E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.516E-01	NOT IDENT.
SB-124	7.368E-02	FAIL ABUN
SB-125	8.956E-02	NOT IDENT.
TE-125M	1.250E+01	NOT IDENT.
I-126	9.996E-01	NOT IDENT.
SB-126	8.562E-01	NOT IDENT.
SN-126	6.786E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	1.811E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.876E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.833E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	4.093E-01	NOT IDENT.
CE-139	2.937E-02	NOT IDENT.
BA-140	1.803E+00	NOT IDENT.
LA-140	3.457E-01	NOT IDENT.
CE-141	1.006E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.685E-01	NOT IDENT.
PM-144	3.269E-02	NOT IDENT.
PR-144	2.485E+00	NOT IDENT.
PM-146	3.815E-02	NOT IDENT.
ND-147	3.974E+00	FAIL ABUN
PM-147	6.657E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.261E-02	FAIL ABUN
EU-152	8.205E-02	NOT IDENT.
GD-153	7.838E-02	NOT IDENT.
EU-154	9.697E-02	FAIL ABUN
EU-155	9.696E-02	NOT IDENT.
TB-160	1.632E-01	FAIL ABUN
HO-166M	4.749E-02	FAIL ABUN
TM-171	1.428E+01	NOT IDENT.
HF-172	1.722E-01	FAIL ABUN
LU-172	5.089E-02	FAIL ABUN
LU-176	2.114E-02	NOT IDENT.
HF-181	6.450E-02	NOT IDENT.
TA-182	1.428E-01	FAIL ABUN

RE-183	2.068E-01	NOT IDENT.
RE-184	1.848E-01	NOT IDENT.
W-188	8.393E+00	FAIL ABUN
IR-192	4.126E-02	FAIL ABUN
HG-203	6.176E-02	NOT IDENT.
BI-211	2.931E-01	FAIL ABUN
PB-211	6.195E-01	NOT IDENT.
BI-212	5.203E-01	FAIL ABUN
RN-219	4.156E-01	NOT IDENT.
RA-223	6.045E-01	FAIL ABUN
AC-227	2.187E-01	NOT IDENT.
TH-227	2.187E-01	NOT IDENT.
TH-229	4.270E-01	FAIL ABUN
PA-231	4.650E-01	NOT IDENT.
TH-231	6.045E-01	FAIL ABUN
PA-233	5.989E-02	NOT IDENT.
PA-234	1.669E-01	FAIL ABUN
PA-234M	3.751E+00	NOT IDENT.
NP-237	5.989E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.051E-01	NOT IDENT.
PU-239	2.889E+02	NOT IDENT.
AM-241	1.173E-01	NOT IDENT.
AM-243	5.566E-02	NOT IDENT.
CM-243	9.799E-02	NOT IDENT.
BK-247	7.253E-02	NOT IDENT.
CM-247	3.806E-02	FAIL ABUN
CF-249	3.454E-02	NOT IDENT.
CF-251	1.099E-01	NOT IDENT.
ANH-511	4.926E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677012.CNF;1
Acquisition date : 28-JUN-2016 14:36:15 Sensitivity : 3.000
Detector ID : GAM19 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.53 Half life ratio : *****
Sample date : 11-MAY-2016 11:00:00 Nuclide Library : SOLID
Sample ID : G398677012 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5163E+02 GRAM
Quantity Err(%) : 1.3190E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 10:35:16 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM19_CAN.CNF;17

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	3.824E+00	1.209E+00	1.209E+00
TE-123M	2.769E-02	4.120E-02	4.120E-02
CS-135	4.513E-01	4.517E-01	4.517E-01
BA-137M	3.402E-01	7.988E-02	7.988E-02
CS-137	3.594E-01	8.438E-02	8.438E-02
BI-207	8.072E-02	1.577E-01	1.577E-01
TL-208	1.968E-01	6.793E-02	6.793E-02
PB-210	8.479E+00	6.548E+00	6.548E+00
PB-212	6.754E-01	1.089E-01	1.089E-01
BI-214	2.335E-01	1.906E-01	1.906E-01
PB-214	4.292E-01	1.301E-01	1.301E-01
RN-222	2.335E-01	1.906E-01	1.906E-01
RA-224	6.741E-01	1.331E+00	1.331E+00
RA-226	2.335E-01	1.906E-01	1.906E-01
AC-228	5.817E-01	2.136E-01	2.136E-01
RA-228	5.817E-01	2.136E-01	2.136E-01
TH-228	6.754E-01	1.089E-01	1.089E-01
TH-230	2.334E-01	1.906E-01	1.906E-01
TH-232	5.817E-01	2.136E-01	2.136E-01
TH-234	7.526E-01	2.224E+00	2.224E+00
U-234	2.334E-01	1.906E-01	1.906E-01
U-235	-1.122E-01	1.898E-01	1.898E-01
U-238	7.526E-01	2.224E+00	2.224E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.173E-01	5.106E-01	5.303E-01	NOT IDENT.
NA-22	2.072E-02	3.668E-02	3.785E-02	NOT IDENT.
NA-24	-2.204E+20	4.123E+21	0.000E+00	SHORT HLIF
AL-26	-5.005E-03	3.337E-02	3.345E-02	NOT IDENT.
SC-46	-2.902E-04	5.108E-02	5.108E-02	FAIL ABUN
V-48	2.288E-02	2.306E-01	2.309E-01	NOT IDENT.
CR-51	7.189E-02	9.057E-01	9.063E-01	NOT IDENT.

MN-54	2.848E-03	3.897E-02	3.899E-02	NOT IDENT.
CO-56	-1.150E-02	5.472E-02	5.497E-02	FAIL ABUN
MN-56	-1.000E+41	4.910E+41	0.000E+00	SHORT HLIF
CO-57	5.043E-03	2.564E-02	2.574E-02	NOT IDENT.
CO-58	-9.908E-03	4.890E-02	4.911E-02	NOT IDENT.
FE-59	-9.078E-02	1.437E-01	1.494E-01	NOT IDENT.
CO-60	4.129E-03	3.187E-02	3.193E-02	NOT IDENT.
ZN-65	1.301E-02	1.066E-01	1.067E-01	NOT IDENT.
GE-68	2.502E-01	8.642E-01	8.716E-01	NOT IDENT.
AS-73	-1.237E-02	9.587E-01	9.587E-01	NOT IDENT.
AS-74	-1.675E-01	3.414E-01	3.496E-01	NOT IDENT.
SE-75	1.643E-02	5.883E-02	5.930E-02	NOT IDENT.
BR-77	1.610E+06	2.253E+06	2.367E+06	SHORT HLIF
SR-82	-1.046E+00	1.067E+00	1.167E+00	NOT IDENT.
RB-83	1.538E-02	9.858E-02	9.882E-02	NOT IDENT.
KR-85	-1.350E+01	1.014E+01	1.183E+01	NOT IDENT.
SR-85	-1.015E-01	7.603E-02	8.874E-02	NOT IDENT.
RB-86	6.516E-01	1.748E+00	1.772E+00	NOT IDENT.
Y-88	-6.872E-03	3.733E-02	3.746E-02	NOT IDENT.
Y-91	1.768E+01	2.340E+01	2.472E+01	NOT IDENT.
NB-94	2.242E-02	3.382E-02	3.530E-02	NOT IDENT.
NB-95	5.830E-02	5.735E-02	6.308E-02	NOT IDENT.
NB-95M	1.051E-02	1.915E-01	1.916E-01	NOT IDENT.
ZR-95	3.320E-02	1.122E-01	1.132E-01	FAIL ABUN
NB-97	1.000E+41	6.431E+40	0.000E+00	SHORT HLIF
ZR-97	-4.025E+20	3.267E+20	0.000E+00	SHORT HLIF
MO-99	3.177E+04	4.965E+04	5.168E+04	SHORT HLIF
TC-99M	1.000E+41	1.633E+41	0.000E+00	SHORT HLIF
RH-101	2.194E-02	3.083E-02	3.238E-02	NOT IDENT.
RH-102	-7.263E-02	5.754E-02	6.620E-02	NOT IDENT.
RU-103	8.443E-03	7.585E-02	7.595E-02	FAIL ABUN
RH-106	8.744E-03	3.077E-01	3.078E-01	NOT IDENT.
RU-106	8.744E-03	3.077E-01	3.078E-01	NOT IDENT.
AG-108M	-1.127E-02	3.184E-02	3.225E-02	FAIL ABUN
CD-109	7.734E-01	8.320E-01	9.021E-01	NOT IDENT.
AG-110M	1.305E-02	5.828E-02	5.858E-02	NOT IDENT.
SN-113	-9.710E-03	6.391E-02	6.406E-02	NOT IDENT.
CD-115	2.408E+05	3.773E+05	3.926E+05	SHORT HLIF
SN-117M	-1.050E-01	3.303E-01	3.336E-01	NOT IDENT.
SB-124	3.904E-02	7.054E-02	7.271E-02	FAIL ABUN
SB-125	-9.218E-03	1.024E-01	1.025E-01	NOT IDENT.
TE-125M	4.030E+00	1.336E+01	1.349E+01	NOT IDENT.
I-126	4.201E-01	1.261E+00	1.275E+00	NOT IDENT.
SB-126	4.293E-01	1.088E+00	1.105E+00	NOT IDENT.
SN-126	5.311E-02	7.851E-02	8.208E-02	FAIL ABUN
SB-127	1.831E+02	5.249E+02	5.313E+02	SHORT HLIF
I-131	-5.470E-01	2.079E+00	2.093E+00	NOT IDENT.
I-132	1.000E+41	5.125E+41	0.000E+00	SHORT HLIF
TE-132	-9.972E+02	9.287E+02	1.032E+03	SHORT HLIF
BA-133	7.481E-02	5.543E-02	6.488E-02	FAIL ABUN
I-133	-4.936E+14	1.953E+15	1.965E+15	SHORT HLIF
CS-134	-2.526E-04	4.377E-02	4.377E-02	FAIL ABUN
I-135	1.000E+41	2.569E+41	0.000E+00	SHORT HLIF
CS-136	1.187E-01	4.539E-01	4.570E-01	NOT IDENT.
CE-139	-8.084E-03	3.350E-02	3.369E-02	NOT IDENT.
BA-140	1.543E+00	1.919E+00	2.041E+00	NOT IDENT.
LA-140	2.039E-01	3.390E-01	3.512E-01	NOT IDENT.
CE-141	-2.461E-02	1.135E-01	1.140E-01	NOT IDENT.
CE-143	4.816E+09	2.672E+09	3.443E+09	SHORT HLIF
CE-144	-3.310E-03	1.862E-01	1.862E-01	NOT IDENT.
PM-144	-1.683E-03	3.881E-02	3.881E-02	NOT IDENT.
PR-144	-1.442E-01	2.953E+00	2.953E+00	NOT IDENT.
PM-146	-2.380E-03	4.369E-02	4.370E-02	NOT IDENT.
ND-147	-3.687E+00	5.036E+00	5.303E+00	FAIL ABUN
PM-147	5.622E+02	6.912E+02	7.362E+02	NOT IDENT.
PM-149	3.481E+06	3.751E+06	4.066E+06	SHORT HLIF
EU-150	-2.113E-02	3.162E-02	3.302E-02	FAIL ABUN
EU-152	-5.846E-02	1.033E-01	1.066E-01	NOT IDENT.
GD-153	5.818E-02	9.069E-02	9.441E-02	NOT IDENT.
EU-154	6.199E-02	1.031E-01	1.068E-01	FAIL ABUN
EU-155	4.826E-02	1.024E-01	1.047E-01	NOT IDENT.
TB-160	4.314E-02	1.815E-01	1.825E-01	FAIL ABUN
HO-166M	-7.999E-03	5.745E-02	5.756E-02	FAIL ABUN
TM-171	1.843E+00	1.595E+01	1.597E+01	NOT IDENT.
HF-172	5.942E-03	1.889E-01	1.890E-01	FAIL ABUN
LU-172	2.023E-02	5.602E-02	5.675E-02	FAIL ABUN
LU-176	-3.488E-02	2.839E-02	3.245E-02	NOT IDENT.
HF-181	-8.009E-02	8.314E-02	9.064E-02	NOT IDENT.

TA-182	8.769E-02	1.628E-01	1.676E-01	FAIL ABUN
RE-183	9.666E-02	2.530E-01	2.568E-01	NOT IDENT.
RE-184	-6.567E-02	2.433E-01	2.451E-01	NOT IDENT.
W-188	6.735E+00	1.388E+01	1.421E+01	FAIL ABUN
IR-192	1.139E-03	4.820E-02	4.820E-02	FAIL ABUN
HG-203	2.796E-02	6.853E-02	6.968E-02	NOT IDENT.
BI-211	1.183E+00	3.590E-01	6.427E-01	FAIL ABUN
PB-211	-5.311E-01	7.530E-01	7.902E-01	NOT IDENT.
BI-212	5.541E-01	6.087E-01	6.580E-01	FAIL ABUN
RN-219	4.263E-01	4.322E-01	4.730E-01	NOT IDENT.
RA-223	3.800E-01	6.390E-01	6.615E-01	FAIL ABUN
AC-227	-2.036E-02	2.540E-01	2.541E-01	NOT IDENT.
TH-227	-2.036E-02	2.540E-01	2.541E-01	NOT IDENT.
TH-229	4.098E-01	6.210E-01	6.479E-01	FAIL ABUN
PA-231	3.129E-01	5.355E-01	5.537E-01	NOT IDENT.
TH-231	3.800E-01	6.390E-01	6.615E-01	FAIL ABUN
PA-233	4.518E-02	6.551E-02	6.861E-02	NOT IDENT.
PA-234	-4.098E-01	5.435E-01	5.740E-01	FAIL ABUN
PA-234M	1.109E+00	4.105E+00	4.136E+00	NOT IDENT.
NP-237	4.518E-02	6.551E-02	6.861E-02	NOT IDENT.
NP-238	-2.677E+05	8.892E+05	8.973E+05	SHORT HLIF
NP-239	-1.263E-01	2.345E-01	2.413E-01	NOT IDENT.
PU-239	1.434E+02	3.081E+02	3.149E+02	NOT IDENT.
AM-241	5.596E-02	1.438E-01	1.460E-01	NOT IDENT.
AM-243	8.640E-02	6.161E-02	7.289E-02	NOT IDENT.
CM-243	8.394E-02	1.013E-01	1.082E-01	NOT IDENT.
BK-247	4.848E-02	7.995E-02	8.288E-02	NOT IDENT.
CM-247	3.858E-02	3.984E-02	4.347E-02	FAIL ABUN
CF-249	-1.447E-02	4.679E-02	4.724E-02	NOT IDENT.
CF-251	8.835E-03	1.228E-01	1.229E-01	NOT IDENT.
ANH-511	-9.781E-03	4.949E-02	4.969E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	72.1076	87.09	100.1576	136.47	80.2042
45.60	75.2510	87.57	101.6816	140.51	0.0000
46.54	75.4065	88.03	95.9365	143.76	98.3801
49.72	0.0000	88.34	106.1597	144.24	93.5581
51.35	84.5927	88.47	106.1802	145.44	88.7991
51.87	87.6423	89.96	145.7697	152.43	97.3187
52.39	79.7594	1093.63	125.4858	153.25	88.5464
52.97	79.8532	91.11	93.9956	323.87	72.0329
53.44	79.9288	92.59	94.1956	156.02	89.9830
54.07	82.3162	93.35	94.2977	158.56	101.2945
57.36	0.0000	94.56	95.3767	159.00	93.0261
57.53	82.8756	94.65	95.3886	162.33	74.6693
57.98	72.5784	94.67	95.3914	162.66	74.6940
59.27	77.9533	94.87	95.4184	163.33	81.1044
59.32	77.9607	97.43	73.6612	165.86	92.6658
59.54	77.9930	98.43	79.6638	176.31	68.4389
60.96	97.3156	98.44	79.6648	176.60	72.4845
61.17	99.0918	99.53	90.7597	177.52	84.6383
62.93	86.0408	100.11	90.5673	181.07	0.0000
63.29	86.0970	102.03	105.6273	181.52	79.2900
63.58	86.1421	103.18	82.5904	184.41	90.8578
64.28	92.6614	103.37	82.6115	143.76	97.4641
66.73	116.5946	105.21	90.2570	193.51	85.0605
67.24	116.6985	105.31	90.2689	197.03	75.4789
125.81	121.0094	106.12	96.8863	198.01	68.9744
67.75	121.0236	106.47	100.6588	201.83	92.6820
69.67	116.4834	109.28	86.0594	203.43	74.2473
70.83	137.0488	111.00	88.1239	205.31	66.1035
72.81	160.8650	111.76	0.0000	210.85	69.7332
72.87	160.8809	114.06	87.5238	215.65	84.3884
74.66	130.9832	116.30	0.0000	222.11	86.9274
74.82	131.0175	116.74	85.9269	227.09	88.3259
74.97	131.0500	119.76	78.6626	227.38	87.2946
77.11	159.0195	121.12	73.0963	228.16	0.0000
78.74	116.0816	121.22	73.1051	228.18	90.5069
79.69	106.2088	121.78	81.7047	116.74	90.5069
80.12	107.7164	122.06	84.5833	235.69	77.9136
80.19	107.7283	122.92	87.5243	235.96	76.2358
80.57	104.9179	123.07	89.4428	238.63	66.8433
81.00	104.9883	265.00	96.1732	238.98	0.0000
81.07	106.4378	125.81	95.4609	240.99	66.9644
81.75	116.2179	127.23	85.1011	242.00	67.0158
83.79	137.2160	127.91	85.1688	244.70	52.8695
84.00	137.2595	129.30	81.4715	252.40	0.0000
85.43	104.4601	131.20	98.9404	252.80	67.5595
86.55	100.0770	133.02	82.7817	254.15	0.0000
86.79	97.2109	133.52	78.0127	256.23	66.6548
86.94	97.2330	136.00	76.2992	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	53.6498	355.39	0.0000	584.27	19.4620
264.80	53.6551	356.01	9.1761	595.83	30.8730
265.00	54.0955	364.49	50.7166	427.87	22.9123
268.22	54.2198	366.42	0.0000	602.52	0.0000
269.46	54.2671	372.51	53.7265	604.72	34.4246
270.03	54.2885	375.05	42.6713	607.14	39.6267
271.23	54.3350	377.52	50.1616	609.32	38.2809
273.65	74.8910	356.01	41.9480	610.33	38.2963
276.40	82.0148	388.16	46.7194	614.28	20.7329
277.37	54.1312	388.63	48.2893	618.01	24.6563
277.60	64.6181	391.69	45.2488	620.36	28.0560
278.00	65.5096	264.66	44.9456	621.93	20.7949
279.20	56.8218	401.81	36.7106	630.19	0.0000
279.54	52.4634	402.40	36.7220	631.29	34.4357
279.70	52.4692	404.85	52.7980	633.25	15.6643
280.46	58.3293	410.95	24.5924	634.78	18.8082
283.69	66.6429	413.71	33.1530	635.95	18.8165
284.31	57.8982	414.70	36.3292	636.99	16.7324
285.41	61.4534	423.72	37.1338	645.85	25.1830
285.90	0.0000	427.09	46.7354	657.76	12.2964
287.50	54.9469	427.87	45.7998	657.90	0.0000
290.67	39.6458	433.94	44.9839	661.66	21.1104
293.27	0.0000	439.40	37.4299	664.57	0.0000
351.93	83.0670	453.88	36.7318	666.33	15.8602
295.96	77.8035	463.37	39.8143	666.50	19.3856
879.38	56.6820	468.07	45.7441	667.71	0.0000
299.98	62.0532	473.00	0.0000	677.62	18.0492
300.09	58.5114	475.06	36.1310	685.70	0.0000
300.13	58.5130	476.78	30.2965	695.00	20.2993
301.36	58.3062	477.60	29.3306	696.49	27.7932
302.85	65.4999	482.18	47.0297	696.51	27.7932
256.23	60.0134	487.02	32.4062	697.00	28.8675
304.85	55.5809	492.35	0.0000	697.30	27.8008
306.78	71.2314	497.08	33.5430	697.49	33.1494
308.46	50.1389	505.52	72.2960	702.65	20.3550
311.90	44.6661	507.63	0.0000	706.68	35.4033
316.51	50.3970	511.00	39.7119	711.68	21.4941
319.41	61.7088	514.00	86.4902	720.70	21.5620
320.08	54.9994	514.00	86.4902	721.93	0.0000
321.04	52.7868	520.40	31.9031	722.78	34.1646
323.87	48.6046	520.69	0.0000	722.91	37.7626
325.23	62.1581	522.65	0.0000	723.31	37.7677
328.76	49.6544	527.90	0.0000	724.19	32.3826
333.37	55.8297	528.26	26.0108	727.33	19.8108
333.97	61.8879	529.59	37.0370	733.00	30.3153
334.37	60.3939	529.87	0.0000	735.93	28.1785
338.28	53.5746	531.02	41.0661	333.97	21.6870
338.32	53.5761	537.26	33.1434	739.50	0.0000
311.90	51.5243	546.56	0.0000	747.24	25.0232
340.48	51.5243	552.55	32.3500	748.06	23.9417
340.55	51.5264	563.25	25.3870	752.31	22.8862
344.28	55.8181	569.33	37.6676	753.82	21.8076
345.93	48.2167	946.00	37.6703	756.73	21.8291
351.06	44.2234	569.70	35.6375	756.80	21.8296
351.93	45.7721	583.19	22.5248	884.68	24.0695

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	15.3265	1274.44	15.2493	1620.50	2.8883
766.42	24.0894	1001.03	11.7454	1621.92	2.8891
766.84	27.3779	1002.74	9.7923	1678.03	0.0000
772.60	0.0000	1004.73	13.7166	1690.97	0.9752
776.52	31.1279	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.9155
778.90	12.8274	1028.54	0.0000	1063.66	20.7671
783.70	0.0000	1037.84	13.8382	1771.35	1.7309
785.37	17.3141	1038.76	0.0000	1791.20	0.0000
792.07	13.8028	631.29	13.8701	1808.65	5.9726
794.95	17.4998	1048.07	8.9198	1810.72	0.0000
795.86	24.8752	1049.04	9.9133	1836.06	4.0001
810.06	18.5103	1050.41	9.9170		
810.29	19.4371	1063.66	20.4710		
344.28	18.5124	1077.00	5.9912		
810.76	18.5144	1077.34	5.9917		
815.77	16.6893	1085.87	8.0065		
1048.07	12.9920	1093.63	11.0304		
832.01	19.5704	1099.45	20.0846		
834.85	21.4535	1112.07	15.7155		
835.71	20.5261	1112.84	17.4652		
836.80	0.0000	1115.54	17.2852		
846.75	0.0000	1120.29	18.1707		
846.77	23.4049	1120.55	18.1721		
856.80	24.1479	1221.41	17.3096		
860.56	19.3405	1129.67	16.1895		
871.09	17.9200	1131.51	0.0000		
873.19	16.0437	1147.95	0.0000		
875.33	0.0000	1173.23	23.5194		
879.38	17.9648	1177.95	19.4515		
880.51	14.1873	1189.05	12.3174		
883.24	20.8251	1204.77	4.1211		
884.68	20.8340	1221.41	6.2056		
889.28	18.9661	1231.02	5.3310		
894.76	10.4481	1235.36	14.2299		
898.04	16.1627	1238.28	16.0193		
900.72	22.8359	1260.41	0.0000		
903.28	19.0442	1271.87	10.4622		
911.20	18.1341	1274.44	8.3747		
912.08	14.7292	1274.54	8.3750		
923.98	0.0000	1291.59	7.3560		
926.50	15.3385	1298.22	0.0000		
929.11	16.3093	1312.11	5.2781		
937.49	21.1567	1332.49	7.4224		
944.13	13.4887	1362.66	0.0000		
946.00	24.0997	1365.19	9.6101		
949.00	13.5072	1368.63	0.0000		
667.71	0.0000	1384.29	11.7931		
962.31	13.2813	1408.01	6.4646		
964.08	14.9486	1457.56	0.0000		
966.17	19.9432	1460.82	13.0693		
911.20	17.4639	1489.16	6.5718		
968.97	17.4639	1505.03	9.4179		
983.53	9.0918	1584.12	1.9125		
984.45	0.0000	1596.21	1.9169		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:42:00.78

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677013.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;342
Background date    : 26-JUN-2016 12:05:18
Sample date       : 11-MAY-2016 11:03:00 Acquisition date : 28-JUN-2016 14:36:36
Sample ID        : G398677013 Sample quantity : 1.58930E+02 GRAM
Detector name    : GAM25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.43 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.54*	58	116	0.91	92.67	88	9	1.62E-02	38.0	
2	0	63.59*	7	182	1.07	126.75	122	9	1.83E-03	391.2	
3	3	74.79*	150	164	1.20	149.15	145	14	4.16E-02	15.9	3.92E+00
4	3	77.20*	198	101	0.80	153.96	145	14	5.50E-02	10.7	
5	6	90.20	71	98	1.23	179.95	163	28	1.97E-02	25.9	3.85E+00
6	6	93.01*	105	126	1.86	185.57	163	28	2.90E-02	26.9	
7	0	186.23*	49	97	1.69	371.95	368	10	1.36E-02	43.0	
8	0	209.62	38	78	1.07	418.71	414	9	1.05E-02	45.2	
9	0	222.34	14	79	3.36	444.14	437	10	3.98E-03	118.3	
10	3	238.74*	260	53	1.08	476.94	471	17	7.22E-02	7.8	6.09E-01
11	3	241.54	60	77	1.47	482.53	471	17	1.67E-02	32.6	
12	0	269.87	48	91	2.12	539.19	532	14	1.33E-02	44.6	
13	0	295.68	61	86	0.75	590.80	588	10	1.69E-02	31.7	
14	0	306.02	20	22	0.56	611.46	609	6	5.68E-03	42.5	
15	0	309.31	24	31	1.11	618.06	615	8	6.63E-03	45.0	
16	0	323.97	36	80	3.58	647.37	635	18	9.89E-03	61.6	
17	0	338.20	63	28	1.16	675.81	670	10	1.76E-02	20.0	
18	0	352.09*	132	63	1.25	703.59	698	11	3.68E-02	14.8	
19	0	404.63	8	37	0.89	808.66	802	10	2.19E-03	149.1	
20	0	410.42	31	49	2.07	820.24	812	14	8.61E-03	51.2	
21	0	463.64	30	32	3.05	926.67	920	12	8.34E-03	42.3	
22	0	479.00	23	32	0.97	957.38	949	13	6.29E-03	57.8	
23	0	511.00*	14	36	2.14	1021.38	1015	12	3.93E-03	112.7	
24	0	571.10	12	27	0.93	1141.59	1133	12	3.35E-03	90.7	
25	0	583.82*	73	26	1.91	1167.03	1160	13	2.03E-02	19.7	
26	0	600.01	12	17	3.43	1199.39	1194	11	3.19E-03	74.5	
27	0	610.24*	64	54	1.31	1219.87	1212	16	1.78E-02	28.4	
28	0	644.23	6	12	0.43	1287.84	1282	7	1.57E-03	111.4	
29	0	661.96	182	65	1.70	1323.31	1315	14	5.04E-02	12.1	
30	0	728.55	17	22	1.40	1456.49	1450	12	4.76E-03	61.4	
31	0	772.07	9	11	0.55	1543.55	1539	9	2.53E-03	73.8	
32	0	795.79	15	7	1.34	1590.99	1586	9	4.27E-03	39.7	
33	0	836.08	9	6	1.16	1671.60	1667	8	2.55E-03	56.7	
34	0	911.31*	59	15	1.96	1822.10	1816	12	1.65E-02	18.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	926.35	11	0	1.29	1852.18	1849	8	3.06E-03	30.2	
36	0	933.59	12	5	2.26	1866.67	1860	11	3.42E-03	46.1	
37	0	948.72	17	0	1.44	1896.94	1891	12	4.72E-03	24.3	
38	0	969.17*	17	32	4.88	1937.84	1926	16	4.68E-03	79.5	
39	0	1121.57	23	30	2.19	2242.76	2231	20	6.39E-03	61.9	
40	0	1143.54	11	13	4.24	2286.72	2275	17	3.17E-03	77.5	
41	0	1226.68	6	5	3.21	2453.08	2446	10	1.67E-03	80.8	
42	0	1238.72	30	13	4.11	2477.18	2467	18	8.21E-03	34.4	
43	0	1377.28*	11	6	1.07	2754.46	2749	10	2.92E-03	58.7	
44	0	1460.53*	142	11	1.84	2921.08	2913	15	3.95E-02	10.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:42:02

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677013.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:03:00 Acquisition date : 28-JUN-2016 14:36:36
Sample ID         : G398677013 Sample quantity  : 158.93 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA25 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.43 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
BE-7	477.60	10.44*	3.101E+00	3.652E-01	6.840E-01	115.51	OK
K-40	1460.82	10.66*	1.148E+00	5.323E+00	5.323E+00	20.03	OK
MN-54	834.85	99.98*	1.903E+00	2.361E-02	2.628E-02	113.37	OK
BA-137M	661.66	89.90*	2.339E+00	4.348E-01	4.361E-01	24.12	OK
CS-137	661.66	85.10*	2.339E+00	4.593E-01	4.607E-01	24.12	OK
TL-208	277.37	6.60	4.895E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.611E+00	1.681E-01	1.681E-01	39.45	OK
	860.56	12.50	1.855E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	9.004E+00	9.971E-01	1.001E+00	75.91	OK
BI-211	72.87	1.23	9.809E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	4.029E+00	2.959E-01	2.959E-01	268.05	OK
PB-212	74.82	10.28	9.789E+00	7.139E-01	7.139E-01	46.07	OK
	77.11	17.10	9.756E+00	7.428E-01	7.428E-01	21.38	OK
	238.63	43.60*	5.502E+00	6.085E-01	6.085E-01	15.53	OK
	300.09	3.30	4.595E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86	OK
	1120.29	14.92	1.463E+00	4.987E-01	4.987E-01	123.89	OK
	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	9.788E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	9.756E+00	1.309E+00	1.310E+00	21.38	OK
	87.09	3.41	9.550E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	5.446E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.650E+00	3.904E-01	3.904E-01	63.38	OK
	351.93	35.60*	4.030E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86	OK
	1120.29	14.92	1.463E+00	4.987E-01	4.987E-01	123.89	OK
	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	5.454E+00	8.179E-01	8.179E-01	131.46	OK
RA-226	609.32	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86	OK
	1120.29	14.92	1.463E+00	4.987E-01	4.987E-01	123.89	OK
	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	9.011E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.166E+00	7.310E-01	7.310E-01	39.91	OK
	794.95	4.25	1.988E+00	8.962E-01	8.962E-01	79.38	OK
	835.71	1.61	1.903E+00	1.466E+00	1.466E+00	113.37	OK
	911.20	25.80*	1.762E+00	6.341E-01	6.341E-01	37.51	OK
RA-228	968.97	15.80	1.668E+00	3.081E-01	3.081E-01	159.00	OK
	105.21	1.10	9.011E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.166E+00	7.310E-01	7.310E-01	39.91	OK
	794.95	4.25	1.988E+00	8.962E-01	8.962E-01	79.38	OK
	835.71	1.61	1.903E+00	1.466E+00	1.466E+00	113.37	OK
	911.20	25.80*	1.762E+00	6.341E-01	6.341E-01	37.51	OK
	968.97	15.80	1.668E+00	3.081E-01	3.081E-01	159.00	OK
TH-228	74.82	10.28	9.789E+00	7.139E-01	7.139E-01	46.07	OK
	77.11	17.10	9.756E+00	7.428E-01	7.428E-01	21.38	OK
	238.63	43.60*	5.502E+00	6.085E-01	6.085E-01	15.53	OK
	300.09	3.30	4.595E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86	OK
	1120.29	14.92	1.463E+00	4.987E-01	4.987E-01	123.89	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
	105.21	1.10	9.011E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.166E+00	7.310E-01	7.310E-01	39.91	OK
	835.71	1.61	1.903E+00	1.466E+00	1.466E+00	113.37	OK
	911.20	25.80*	1.762E+00	6.341E-01	6.341E-01	37.51	OK
TH-234	968.97	15.80	1.668E+00	3.081E-01	3.081E-01	159.00	OK
	63.29	3.70*	9.800E+00	1.158E-01	1.158E-01	782.38	OK
	92.59	4.23	9.389E+00	1.621E+00	1.621E+00	53.75	OK
U-234	609.32	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86	OK
	1120.29	14.92	1.463E+00	4.987E-01	4.987E-01	123.89	OK
	1764.49	15.30	9.604E-01	----- Line	Not Found	-----	Absent
U-235	89.96	3.47	9.468E+00	1.334E+00	1.334E+00	51.83	OK
	93.35	5.60	9.389E+00	1.224E+00	1.224E+00	53.75	OK
	143.76	10.96*	7.756E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	7.183E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.588E+00	7.477E-02	7.477E-02	86.05	OK
U-238	205.31	5.01	6.153E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	9.800E+00	1.158E-01	1.158E-01	782.38	OK
	92.59	4.23	9.389E+00	1.621E+00	1.621E+00	53.75	OK
AM-243	43.53	5.90	8.693E+00	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	9.789E+00	1.092E-01	1.092E-01	46.07	OK
	511.00	100.00*	2.932E+00	2.500E-02	2.500E-02	225.33	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677013.CNF;1
Acquisition date : 28-JUN-2016 14:36:36 Sensitivity : 3.000
Detector ID : GAM25 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.43 Half life ratio : *****
Sample date : 11-MAY-2016 11:03:00 Analyst initials: MXR1
Sample ID : G398677013 Sample Quantity : 1.5893E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUL-2015 12:07:25 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
BE-7	6.840E-01	7.742E-01	7.470E-01
K-40	5.323E+00	1.045E+00	6.981E-01
MN-54	2.628E-02	2.920E-02	6.301E-02
BA-137M	4.361E-01	1.031E-01	6.285E-02
CS-137	4.607E-01	1.089E-01	6.640E-02
TL-208	1.681E-01	6.500E-02	5.525E-02
PB-210	1.001E+00	7.449E-01	5.984E-01
BI-211	2.959E-01	7.772E-01	3.697E-01
PB-212	6.085E-01	9.263E-02	8.612E-02
BI-214	2.847E-01	1.587E-01	1.239E-01
PB-214	4.978E-01	1.441E-01	2.315E-01
RN-222	2.847E-01	1.587E-01	1.239E-01
RA-224	8.179E-01	1.054E+00	9.236E-01
RA-226	2.847E-01	1.587E-01	1.239E-01
AC-228	6.341E-01	2.331E-01	2.454E-01
RA-228	6.341E-01	2.331E-01	2.454E-01
TH-228	6.085E-01	9.263E-02	8.612E-02
TH-230	2.847E-01	1.586E-01	1.239E-01
TH-232	6.341E-01	2.331E-01	2.454E-01
TH-234	1.158E-01	8.877E-01	7.942E-01
U-234	2.847E-01	1.586E-01	1.239E-01
U-235	3.986E-02	1.496E-01	2.966E-01
U-238	1.158E-01	8.877E-01	7.942E-01
AM-243	1.092E-01	4.931E-02	4.385E-02
ANH-511	2.500E-02	5.520E-02	5.589E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
NA-22	-2.009E-02	3.840E-02	6.951E-02	NOT IDENT.
NA-24	0.000E+00	5.528E+21	0.000E+00	SHORT HLIF
AL-26	5.603E-03	2.578E-02	6.083E-02	NOT IDENT.
SC-46	-1.947E-02	4.664E-02	8.539E-02	FAIL ABUN
V-48	3.020E-01	2.487E-01	5.731E-01	NOT IDENT.

CR-51	1.853E-01	7.639E-01	1.454E+00	NOT IDENT.
CO-56	1.203E-02	4.574E-02	9.304E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	9.670E-03	1.979E-02	3.806E-02	NOT IDENT.
CO-58	9.632E-03	3.989E-02	8.305E-02	NOT IDENT.
FE-59	8.986E-04	1.156E-01	2.270E-01	NOT IDENT.
CO-60	-1.155E-03	3.137E-02	6.355E-02	NOT IDENT.
ZN-65	-2.003E-03	1.035E-01	1.673E-01	NOT IDENT.
GE-68	1.019E-01	1.167E+00	2.297E+00	NOT IDENT.
AS-73	-1.842E-02	2.080E-01	4.019E-01	NOT IDENT.
AS-74	1.525E-01	2.867E-01	5.328E-01	NOT IDENT.
SE-75	2.232E-02	4.534E-02	8.058E-02	NOT IDENT.
BR-77	0.000E+00	2.207E+05	0.000E+00	SHORT HLIF
SR-82	-3.401E-01	7.661E-01	1.182E+00	NOT IDENT.
RB-83	-2.574E-02	9.449E-02	1.744E-01	NOT IDENT.
KR-85	1.015E+01	9.138E+00	1.674E+01	NOT IDENT.
SR-85	7.587E-02	6.852E-02	1.255E-01	NOT IDENT.
RB-86	5.011E-01	2.274E+00	4.578E+00	NOT IDENT.
Y-88	1.098E-03	4.300E-02	9.262E-02	NOT IDENT.
Y-91	2.015E+01	2.703E+01	5.828E+01	NOT IDENT.
NB-94	8.687E-03	2.919E-02	5.937E-02	NOT IDENT.
NB-95	3.063E-02	4.919E-02	9.755E-02	NOT IDENT.
NB-95M	1.547E-02	1.649E-01	2.759E-01	NOT IDENT.
ZR-95	1.934E-02	9.064E-02	1.791E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.522E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.566E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.389E+41	0.000E+00	SHORT HLIF
RH-101	1.183E-02	2.296E-02	4.682E-02	FAIL ABUN
RH-102	5.941E-02	4.345E-02	9.941E-02	NOT IDENT.
RU-103	8.850E-02	6.908E-02	1.484E-01	FAIL ABUN
RH-106	2.900E-01	3.001E-01	6.338E-01	NOT IDENT.
RU-106	2.900E-01	3.001E-01	6.338E-01	NOT IDENT.
AG-108M	1.782E-02	2.732E-02	5.597E-02	NOT IDENT.
CD-109	0.000E+00	4.773E-01	1.010E+00	NOT IDENT.
AG-110M	1.776E-02	4.978E-02	1.017E-01	NOT IDENT.
SN-113	2.309E-02	4.548E-02	9.306E-02	NOT IDENT.
CD-115	0.000E+00	2.819E+05	0.000E+00	SHORT HLIF
SN-117M	-1.054E-01	2.186E-01	4.130E-01	NOT IDENT.
TE-123M	-8.249E-04	2.523E-02	4.920E-02	NOT IDENT.
SB-124	2.040E-02	8.737E-02	2.087E-01	NOT IDENT.
SB-125	-4.337E-02	8.254E-02	1.515E-01	FAIL ABUN
TE-125M	1.757E+00	9.646E+00	1.826E+01	NOT IDENT.
I-126	-1.427E-01	1.611E+00	2.541E+00	NOT IDENT.
SB-126	1.625E-01	8.161E-01	1.546E+00	NOT IDENT.
SN-126	0.000E+00	4.440E-02	9.408E-02	FAIL ABUN
SB-127	0.000E+00	4.774E+02	0.000E+00	SHORT HLIF
I-131	6.109E-02	1.760E+00	3.450E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.837E+02	0.000E+00	SHORT HLIF
BA-133	3.172E-03	3.991E-02	6.895E-02	NOT IDENT.
I-133	0.000E+00	1.355E+15	0.000E+00	SHORT HLIF
CS-134	4.658E-02	3.624E-02	8.235E-02	FAIL ABUN
CS-135	1.918E-01	1.416E-01	2.921E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	1.488E-02	4.635E-01	9.194E-01	NOT IDENT.
CE-139	-1.679E-02	2.575E-02	4.788E-02	NOT IDENT.
BA-140	-1.212E+00	1.482E+00	2.557E+00	FAIL ABUN
LA-140	-3.581E-01	5.371E-01	9.126E-01	NOT IDENT.
CE-141	1.284E-03	9.433E-02	1.841E-01	NOT IDENT.
CE-143	0.000E+00	2.163E+09	0.000E+00	SHORT HLIF
CE-144	2.740E-02	1.506E-01	3.012E-01	NOT IDENT.
PM-144	-1.187E-02	3.153E-02	5.972E-02	NOT IDENT.
PR-144	-8.969E-01	2.402E+00	4.551E+00	NOT IDENT.
PM-146	3.190E-02	4.019E-02	8.304E-02	NOT IDENT.
ND-147	-1.117E+00	3.814E+00	7.098E+00	FAIL ABUN
PM-147	-2.102E+02	5.692E+02	1.023E+03	NOT IDENT.
PM-149	0.000E+00	2.471E+06	0.000E+00	SHORT HLIF
EU-150	3.829E-03	2.543E-02	4.231E-02	FAIL ABUN
EU-152	-3.525E-02	9.167E-02	1.568E-01	NOT IDENT.
GD-153	1.829E-02	6.229E-02	1.084E-01	NOT IDENT.
EU-154	-4.791E-02	1.047E-01	1.922E-01	NOT IDENT.
EU-155	2.664E-02	6.598E-02	1.278E-01	NOT IDENT.
TB-160	-1.168E-01	1.638E-01	2.856E-01	FAIL ABUN
HO-166M	2.621E-03	5.163E-02	1.026E-01	FAIL ABUN
TM-171	2.490E+00	3.098E+00	6.345E+00	NOT IDENT.
HF-172	-1.651E-02	1.404E-01	2.755E-01	FAIL ABUN
LU-172	2.441E-02	5.348E-02	1.122E-01	FAIL ABUN

LU-176	2.647E-02	2.206E-02	4.591E-02	FAIL ABUN
HF-181	1.142E-04	6.423E-02	1.094E-01	NOT IDENT.
TA-182	-5.829E-02	2.296E-01	3.642E-01	FAIL ABUN
RE-183	-1.678E-02	6.960E-02	1.269E-01	NOT IDENT.
RE-184	1.286E-01	1.898E-01	3.972E-01	NOT IDENT.
W-188	-5.128E+00	8.870E+00	1.435E+01	FAIL ABUN
IR-192	3.461E-02	4.178E-02	7.686E-02	FAIL ABUN
HG-203	4.779E-02	5.740E-02	1.143E-01	NOT IDENT.
BI-207	-7.880E-04	4.639E-02	8.928E-02	FAIL ABUN
PB-211	3.100E-01	9.060E-01	1.200E+00	FAIL ABUN
BI-212	5.958E-01	7.172E-01	1.107E+00	FAIL ABUN
RN-219	5.278E-02	4.177E-01	7.162E-01	FAIL ABUN
RA-223	0.000E+00	1.358E+00	1.107E+00	FAIL ABUN
AC-227	1.634E-02	2.193E-01	4.163E-01	NOT IDENT.
TH-227	1.634E-02	2.193E-01	4.163E-01	NOT IDENT.
TH-229	-1.075E-01	3.932E-01	7.433E-01	FAIL ABUN
PA-231	2.440E-01	5.546E-01	8.170E-01	NOT IDENT.
TH-231	0.000E+00	1.358E+00	1.107E+00	FAIL ABUN
PA-233	-3.671E-02	6.188E-02	9.255E-02	NOT IDENT.
PA-234	3.513E-02	2.688E-01	4.717E-01	FAIL ABUN
PA-234M	2.820E+00	3.552E+00	7.852E+00	NOT IDENT.
NP-237	-3.671E-02	6.188E-02	9.255E-02	NOT IDENT.
NP-238	0.000E+00	8.603E+05	0.000E+00	SHORT HLIF
NP-239	5.836E-02	1.850E-01	3.524E-01	NOT IDENT.
PU-239	5.241E+01	2.434E+02	4.873E+02	NOT IDENT.
AM-241	-1.527E-02	4.478E-02	7.547E-02	NOT IDENT.
CM-243	-6.275E-02	6.452E-02	1.117E-01	NOT IDENT.
BK-247	2.522E-02	6.674E-02	1.171E-01	NOT IDENT.
CM-247	-4.376E-03	3.885E-02	6.448E-02	NOT IDENT.
CF-249	-5.649E-03	3.098E-02	5.982E-02	NOT IDENT.
CF-251	1.995E-02	1.008E-01	1.977E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
BE-7	477.60	25	10.44*	3.101E+00	3.652E-01	6.840E-01	115.51
K-40	1460.82	138	10.66*	1.148E+00	5.323E+00	5.323E+00	20.03
MN-54	834.85	10	99.98*	1.903E+00	2.361E-02	2.628E-02	113.37
BA-137M	661.66	194	89.90*	2.339E+00	4.348E-01	4.361E-01	24.12
CS-137	661.66	194	85.10*	2.339E+00	4.593E-01	4.607E-01	24.12
TL-208	277.37	-----	6.60	4.895E+00	-----	Line Not Found	-----
	583.19	79	85.00*	2.611E+00	1.681E-01	1.681E-01	39.45
	860.56	-----	12.50	1.855E+00	-----	Line Not Found	-----
PB-210	46.54	81	4.25*	9.004E+00	9.971E-01	1.001E+00	75.91
BI-211	72.87	-----	1.23	9.809E+00	-----	Line Not Found	-----
	351.06	151	12.92*	4.029E+00	1.372E+00	1.372E+00	29.55
PB-212	74.82	199	10.28	9.789E+00	9.341E-01	9.341E-01	31.88
	77.11	262	17.10	9.756E+00	7.428E-01	7.428E-01	21.38
	238.63	309	43.60*	5.502E+00	6.085E-01	6.085E-01	15.53
	300.09	-----	3.30	4.595E+00	-----	Line Not Found	-----
BI-214	609.32	69	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86
	1120.29	23	14.92	1.463E+00	4.987E-01	4.987E-01	123.89
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
PB-214	74.82	199	5.80	9.789E+00	1.656E+00	1.656E+00	31.88
	77.11	262	9.70	9.756E+00	1.309E+00	1.310E+00	21.38
	87.09	-----	3.41	9.550E+00	-----	Line Not Found	-----
	242.00	71	7.25	5.454E+00	8.529E-01	8.530E-01	65.13
	295.22	71	18.42	4.650E+00	3.904E-01	3.904E-01	63.38
	351.93	151	35.60*	4.029E+00	4.978E-01	4.978E-01	29.55
RN-222	609.32	69	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86
	1120.29	23	14.92	1.463E+00	4.987E-01	4.987E-01	123.89
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
RA-224	240.99	71	4.10*	5.454E+00	1.508E+00	1.508E+00	65.13
RA-226	609.32	69	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86
	1120.29	23	14.92	1.463E+00	4.987E-01	4.987E-01	123.89
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	9.011E+00	-----	Line Not Found	-----
	338.32	73	11.27	4.166E+00	7.310E-01	7.310E-01	39.91
	794.95	16	4.25	1.988E+00	8.962E-01	8.962E-01	79.38
	835.71	10	1.61	1.903E+00	1.466E+00	1.466E+00	113.37
	911.20	61	25.80*	1.762E+00	6.341E-01	6.341E-01	37.51
	968.97	17	15.80	1.668E+00	3.081E-01	3.081E-01	159.00
RA-228	105.21	-----	1.10	9.011E+00	-----	Line Not Found	-----
	338.32	73	11.27	4.166E+00	7.310E-01	7.310E-01	39.91
	794.95	16	4.25	1.988E+00	8.962E-01	8.962E-01	79.38
	835.71	10	1.61	1.903E+00	1.466E+00	1.466E+00	113.37
	911.20	61	25.80*	1.762E+00	6.341E-01	6.341E-01	37.51
	968.97	17	15.80	1.668E+00	3.081E-01	3.081E-01	159.00
TH-228	74.82	199	10.28	9.789E+00	9.341E-01	9.341E-01	31.88
	77.11	262	17.10	9.756E+00	7.428E-01	7.428E-01	21.38
	238.63	309	43.60*	5.502E+00	6.085E-01	6.085E-01	15.53
	300.09	-----	3.30	4.595E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	609.32	69	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86
	1120.29	23	14.92	1.463E+00	4.987E-01	4.987E-01	123.89
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
TH-232	105.21	-----	1.10	9.011E+00	-----	Line Not Found	-----
	338.32	73	11.27	4.166E+00	7.310E-01	7.310E-01	39.91
	835.71	10	1.61	1.903E+00	1.466E+00	1.466E+00	113.37
	911.20	61	25.80*	1.762E+00	6.341E-01	6.341E-01	37.51
	968.97	17	15.80	1.668E+00	3.081E-01	3.081E-01	159.00
TH-234	63.29	9	3.70*	9.800E+00	1.158E-01	1.158E-01	782.38
	92.59	136	4.23	9.389E+00	1.621E+00	1.621E+00	53.75
U-234	609.32	69	45.49*	2.512E+00	2.847E-01	2.847E-01	56.86
	1120.29	23	14.92	1.463E+00	4.987E-01	4.987E-01	123.89
	1764.49	-----	15.30	9.604E-01	-----	Line Not Found	-----
U-235	89.96	93	3.47	9.468E+00	1.334E+00	1.334E+00	51.83
	93.35	136	5.60	9.389E+00	1.224E+00	1.224E+00	53.75
	143.76	-----	10.96*	7.756E+00	-----	Line Not Found	-----
	163.33	-----	5.08	7.183E+00	-----	Line Not Found	-----
	185.72	60	57.20	6.588E+00	7.477E-02	7.477E-02	86.05
U-238	205.31	-----	5.01	6.153E+00	-----	Line Not Found	-----
	63.29	9	3.70*	9.800E+00	1.158E-01	1.158E-01	782.38
	92.59	136	4.23	9.389E+00	1.621E+00	1.621E+00	53.75
AM-243	43.53	-----	5.90	8.693E+00	-----	Line Not Found	-----
	74.66	199	67.20*	9.789E+00	1.429E-01	1.429E-01	31.88
ANH-511	511.00	16	100.00*	2.932E+00	2.500E-02	2.500E-02	225.33

Flag: "*" = Keyline

Total number of lines in spectrum 44
Number of unidentified lines 5
Number of lines tentatively identified by NID 39 88.64%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BE-7	53.22D	1.87	3.652E-01	6.840E-01	7.900E-01	115.51	
K-40	1.25E+09Y	1.00	5.323E+00	5.323E+00	1.066E+00	20.03	
MN-54	312.05D	1.11	2.361E-02	2.628E-02	2.979E-02	113.37	
BA-137M	30.08Y	1.00	4.348E-01	4.361E-01	1.052E-01	24.12	
CS-137	30.08Y	1.00	4.593E-01	4.607E-01	1.111E-01	24.12	
TL-208	1.41E+10Y	1.00	1.681E-01	1.681E-01	0.663E-01	39.45	
PB-210	22.20Y	1.00	9.971E-01	1.001E+00	0.760E+00	75.91	
BI-211	7.04E+08Y	1.00	1.372E+00	1.372E+00	0.405E+00	29.55	
PB-212	1.41E+10Y	1.00	6.085E-01	6.085E-01	0.945E-01	15.53	
BI-214	1600.00Y	1.00	2.847E-01	2.847E-01	1.619E-01	56.86	
PB-214	1600.00Y	1.00	4.978E-01	4.978E-01	1.471E-01	29.55	
RN-222	1600.00Y	1.00	2.847E-01	2.847E-01	1.619E-01	56.86	
RA-224	1.41E+10Y	1.00	1.508E+00	1.508E+00	0.982E+00	65.13	
RA-226	1600.00Y	1.00	2.847E-01	2.847E-01	1.619E-01	56.86	
AC-228	1.41E+10Y	1.00	6.341E-01	6.341E-01	2.378E-01	37.51	
RA-228	1.41E+10Y	1.00	6.341E-01	6.341E-01	2.378E-01	37.51	
TH-228	1.41E+10Y	1.00	6.085E-01	6.085E-01	0.945E-01	15.53	
TH-230	7.54E+04Y	1.00	2.847E-01	2.847E-01	1.619E-01	56.86	
TH-232	1.41E+10Y	1.00	6.341E-01	6.341E-01	2.378E-01	37.51	
TH-234	4.47E+09Y	1.00	1.158E-01	1.158E-01	9.058E-01	782.38	
U-234	2.45E+05Y	1.00	2.847E-01	2.847E-01	1.619E-01	56.86	
U-235	7.04E+08Y	1.00	7.477E-02	7.477E-02	6.434E-02	86.05	K
U-238	4.47E+09Y	1.00	1.158E-01	1.158E-01	9.058E-01	782.38	
AM-243	7370.00Y	1.00	1.429E-01	1.429E-01	0.456E-01	31.88	
ANH-511	1.00E+09Y	1.00	2.500E-02	2.500E-02	5.633E-02	225.33	
Total Activity :			1.617E+01	1.649E+01			

Grand Total Activity : 1.617E+01 1.649E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	209.62	46	94	1.07	418.71	414	9	1.05E-02	90.4	6.06E+00	T
0	222.34	17	94	3.36	444.14	437	10	3.98E-03	****	5.80E+00	T
0	269.87	56	107	2.12	539.19	532	14	1.33E-02	89.1	5.00E+00	T
0	306.02	24	25	0.56	611.46	609	6	5.68E-03	85.1	4.52E+00	T
0	309.31	28	36	1.11	618.06	615	8	6.63E-03	89.9	4.48E+00	T
0	323.97	41	93	3.58	647.37	635	18	9.89E-03	****	4.32E+00	T
0	404.63	9	42	0.89	808.66	802	10	2.19E-03	****	3.58E+00	T
0	410.42	35	55	2.07	820.24	812	14	8.61E-03	****	3.54E+00	T
0	463.64	33	35	3.05	926.67	920	12	8.34E-03	84.5	3.19E+00	T
0	571.10	13	29	0.93	1141.59	1133	12	3.35E-03	****	2.66E+00	T
0	600.01	12	18	3.43	1199.39	1194	11	3.19E-03	****	2.55E+00	T
0	644.23	6	13	0.43	1287.84	1282	7	1.57E-03	****	2.40E+00	
0	728.55	18	23	1.40	1456.49	1450	12	4.76E-03	****	2.15E+00	T
0	772.07	10	11	0.55	1543.55	1539	9	2.53E-03	****	2.04E+00	T
0	926.35	11	0	1.29	1852.18	1849	8	3.06E-03	60.3	1.74E+00	T
0	933.59	13	5	2.26	1866.67	1860	11	3.42E-03	92.2	1.72E+00	
0	948.72	17	0	1.44	1896.94	1891	12	4.72E-03	48.5	1.70E+00	T
0	1143.54	11	13	4.24	2286.72	2275	17	3.17E-03	****	1.44E+00	
0	1226.68	6	5	3.21	2453.08	2446	10	1.67E-03	****	1.35E+00	
0	1238.72	29	13	4.11	2477.18	2467	18	8.21E-03	68.9	1.34E+00	T
0	1377.28	10	6	1.07	2754.46	2749	10	2.92E-03	****	1.21E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677013.CNF;1
Acquisition date : 28-JUN-2016 14:36:36 Sensitivity : 3.000
Detector ID : GAM25 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.43 Half life ratio : *****
Sample date : 11-MAY-2016 11:03:00 Nuclide Library : SOLID
Sample ID : G398677013 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5893E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUL-2015 12:07:25 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	3.352E-01
K-40	2.965E-01
MN-54	2.768E-02
BA-137M	2.829E-02
CS-137	2.988E-02
TL-208	2.465E-02
PB-210	2.807E-01
BI-211	1.720E-01
PB-212	4.025E-02
BI-214	5.621E-02
PB-214	1.111E-01
RN-222	5.621E-02
RA-224	4.317E-01
RA-226	5.621E-02
AC-228	1.083E-01
RA-228	1.083E-01
TH-228	4.025E-02
TH-230	5.620E-02
TH-232	1.083E-01
TH-234	3.779E-01
U-234	5.620E-02
U-235	1.403E-01
U-238	3.779E-01
AM-243	2.087E-02
ANH-511	2.569E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
NA-22	2.961E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.357E-02	NOT IDENT.
SC-46	3.729E-02	FAIL ABUN
V-48	2.546E-01	NOT IDENT.
CR-51	6.753E-01	NOT IDENT.

CO-56	4.116E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	1.796E-02	NOT IDENT.
CO-58	3.613E-02	NOT IDENT.
FE-59	9.715E-02	NOT IDENT.
CO-60	2.651E-02	NOT IDENT.
ZN-65	7.366E-02	NOT IDENT.
GE-68	9.979E-01	NOT IDENT.
AS-73	1.901E-01	NOT IDENT.
AS-74	2.379E-01	NOT IDENT.
SE-75	3.731E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.113E-01	NOT IDENT.
RB-83	7.970E-02	NOT IDENT.
KR-85	7.844E+00	NOT IDENT.
SR-85	5.879E-02	NOT IDENT.
RB-86	1.992E+00	NOT IDENT.
Y-88	3.676E-02	NOT IDENT.
Y-91	2.593E+01	NOT IDENT.
NB-94	2.672E-02	NOT IDENT.
NB-95	4.340E-02	NOT IDENT.
NB-95M	1.297E-01	NOT IDENT.
ZR-95	7.977E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.216E-02	FAIL ABUN
RH-102	4.476E-02	NOT IDENT.
RU-103	6.854E-02	FAIL ABUN
RH-106	2.875E-01	NOT IDENT.
RU-106	2.875E-01	NOT IDENT.
AG-108M	2.581E-02	NOT IDENT.
CD-109	4.838E-01	NOT IDENT.
AG-110M	4.517E-02	NOT IDENT.
SN-113	4.281E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	1.939E-01	NOT IDENT.
TE-123M	2.313E-02	NOT IDENT.
SB-124	8.084E-02	NOT IDENT.
SB-125	6.902E-02	FAIL ABUN
TE-125M	8.617E+00	NOT IDENT.
I-126	1.157E+00	NOT IDENT.
SB-126	6.892E-01	NOT IDENT.
SN-126	4.509E-02	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	1.591E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.176E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.715E-02	FAIL ABUN
CS-135	1.377E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.936E-01	NOT IDENT.
CE-139	2.241E-02	NOT IDENT.
BA-140	1.146E+00	FAIL ABUN
LA-140	3.688E-01	NOT IDENT.
CE-141	8.694E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.420E-01	NOT IDENT.
PM-144	2.662E-02	NOT IDENT.
PR-144	2.029E+00	NOT IDENT.
PM-146	3.833E-02	NOT IDENT.
ND-147	3.176E+00	FAIL ABUN
PM-147	4.823E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.949E-02	FAIL ABUN
EU-152	7.224E-02	NOT IDENT.
GD-153	5.127E-02	NOT IDENT.
EU-154	8.175E-02	NOT IDENT.
EU-155	6.020E-02	NOT IDENT.
TB-160	1.239E-01	FAIL ABUN
HO-166M	4.578E-02	FAIL ABUN
TM-171	3.007E+00	NOT IDENT.
HF-172	1.301E-01	FAIL ABUN
LU-172	4.887E-02	FAIL ABUN
LU-176	2.137E-02	FAIL ABUN

HF-181	4.882E-02	NOT IDENT.
TA-182	1.584E-01	FAIL ABUN
RE-183	6.007E-02	NOT IDENT.
RE-184	1.738E-01	NOT IDENT.
W-188	6.601E+00	FAIL ABUN
IR-192	3.553E-02	FAIL ABUN
HG-203	5.370E-02	NOT IDENT.
BI-207	3.895E-02	FAIL ABUN
PB-211	5.506E-01	FAIL ABUN
BI-212	5.077E-01	FAIL ABUN
RN-219	3.301E-01	FAIL ABUN
RA-223	5.145E-01	FAIL ABUN
AC-227	1.945E-01	NOT IDENT.
TH-227	1.945E-01	NOT IDENT.
TH-229	3.477E-01	FAIL ABUN
PA-231	3.811E-01	NOT IDENT.
TH-231	5.145E-01	FAIL ABUN
PA-233	4.236E-02	NOT IDENT.
PA-234	2.040E-01	FAIL ABUN
PA-234M	3.448E+00	NOT IDENT.
NP-237	4.236E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.662E-01	NOT IDENT.
PU-239	2.304E+02	NOT IDENT.
AM-241	3.573E-02	NOT IDENT.
CM-243	5.222E-02	NOT IDENT.
BK-247	5.413E-02	NOT IDENT.
CM-247	2.967E-02	NOT IDENT.
CF-249	2.718E-02	NOT IDENT.
CF-251	9.309E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677013.CNF;1
Acquisition date : 28-JUN-2016 14:36:36 Sensitivity : 3.000
Detector ID : GAM25 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.43 Half life ratio : *****
Sample date : 11-MAY-2016 11:03:00 Nuclide Library : SOLID
Sample ID : G398677013 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5893E+02 GRAM
Quantity Err(%) : 1.2584E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUL-2015 12:07:25 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
BE-7	6.840E-01	7.763E-01	7.763E-01
K-40	5.323E+00	1.166E+00	1.166E+00
MN-54	2.628E-02	2.935E-02	2.935E-02
BA-137M	4.361E-01	1.094E-01	1.094E-01
CS-137	4.607E-01	1.156E-01	1.156E-01
TL-208	1.681E-01	6.656E-02	6.656E-02
PB-210	1.001E+00	7.498E-01	7.498E-01
BI-211	2.959E-01	7.894E-01	7.894E-01
PB-212	6.085E-01	1.188E-01	1.188E-01
BI-214	2.847E-01	1.605E-01	1.605E-01
PB-214	4.978E-01	1.503E-01	1.503E-01
RN-222	2.847E-01	1.605E-01	1.605E-01
RA-224	8.179E-01	1.063E+00	1.063E+00
RA-226	2.847E-01	1.605E-01	1.605E-01
AC-228	6.341E-01	2.475E-01	2.475E-01
RA-228	6.341E-01	2.475E-01	2.475E-01
TH-228	6.085E-01	1.188E-01	1.188E-01
TH-230	2.847E-01	1.605E-01	1.605E-01
TH-232	6.341E-01	2.475E-01	2.475E-01
TH-234	1.158E-01	8.881E-01	8.881E-01
U-234	2.847E-01	1.605E-01	1.605E-01
U-235	3.986E-02	1.497E-01	1.497E-01
U-238	1.158E-01	8.881E-01	8.881E-01
AM-243	1.092E-01	5.038E-02	5.038E-02
ANH-511	2.500E-02	5.524E-02	5.524E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
NA-22	-2.009E-02	3.845E-02	3.950E-02	NOT IDENT.
NA-24	-2.938E+21	5.539E+21	0.000E+00	SHORT HLIF
AL-26	5.603E-03	2.578E-02	2.591E-02	NOT IDENT.
SC-46	-1.947E-02	4.670E-02	4.751E-02	FAIL ABUN
V-48	3.020E-01	2.526E-01	2.870E-01	NOT IDENT.

CR-51	1.853E-01	7.641E-01	7.686E-01	NOT IDENT.
CO-56	1.203E-02	4.576E-02	4.608E-02	FAIL ABUN
MN-56	1.000E+41	3.713E+41	0.000E+00	SHORT HLIF
CO-57	9.670E-03	1.982E-02	2.029E-02	NOT IDENT.
CO-58	9.632E-03	3.991E-02	4.014E-02	NOT IDENT.
FE-59	8.986E-04	1.156E-01	1.156E-01	NOT IDENT.
CO-60	-1.155E-03	3.137E-02	3.137E-02	NOT IDENT.
ZN-65	-2.003E-03	1.035E-01	1.035E-01	NOT IDENT.
GE-68	1.019E-01	1.168E+00	1.168E+00	NOT IDENT.
AS-73	-1.842E-02	2.081E-01	2.082E-01	NOT IDENT.
AS-74	1.525E-01	2.871E-01	2.952E-01	NOT IDENT.
SE-75	2.232E-02	4.540E-02	4.650E-02	NOT IDENT.
BR-77	1.450E+06	2.035E+06	2.137E+06	SHORT HLIF
SR-82	-3.401E-01	7.669E-01	7.821E-01	NOT IDENT.
RB-83	-2.574E-02	9.457E-02	9.528E-02	NOT IDENT.
KR-85	1.015E+01	9.178E+00	1.026E+01	NOT IDENT.
SR-85	7.587E-02	6.882E-02	7.685E-02	NOT IDENT.
RB-86	5.011E-01	2.275E+00	2.286E+00	NOT IDENT.
Y-88	1.098E-03	4.300E-02	4.300E-02	NOT IDENT.
Y-91	2.015E+01	2.710E+01	2.858E+01	NOT IDENT.
NB-94	8.687E-03	2.920E-02	2.946E-02	NOT IDENT.
NB-95	3.063E-02	4.929E-02	5.118E-02	NOT IDENT.
NB-95M	1.547E-02	1.649E-01	1.651E-01	NOT IDENT.
ZR-95	1.934E-02	9.066E-02	9.107E-02	NOT IDENT.
NB-97	-1.000E+41	3.999E+41	0.000E+00	SHORT HLIF
ZR-97	1.271E+20	2.524E+20	0.000E+00	SHORT HLIF
MO-99	-3.280E+03	4.566E+04	4.569E+04	SHORT HLIF
TC-99M	-1.000E+41	1.398E+41	0.000E+00	SHORT HLIF
RH-101	1.183E-02	2.308E-02	2.369E-02	FAIL ABUN
RH-102	5.941E-02	4.393E-02	5.145E-02	NOT IDENT.
RU-103	8.850E-02	6.951E-02	8.014E-02	FAIL ABUN
RH-106	2.900E-01	3.014E-01	3.285E-01	NOT IDENT.
RU-106	2.900E-01	3.014E-01	3.285E-01	NOT IDENT.
AG-108M	1.782E-02	2.736E-02	2.851E-02	NOT IDENT.
CD-109	1.061E+00	4.896E-01	6.844E-01	NOT IDENT.
AG-110M	1.776E-02	4.983E-02	5.047E-02	NOT IDENT.
SN-113	2.309E-02	4.551E-02	4.669E-02	NOT IDENT.
CD-115	-1.803E+05	2.824E+05	2.939E+05	SHORT HLIF
SN-117M	-1.054E-01	2.191E-01	2.242E-01	NOT IDENT.
TE-123M	-8.249E-04	2.523E-02	2.523E-02	NOT IDENT.
SB-124	2.040E-02	8.738E-02	8.787E-02	NOT IDENT.
SB-125	-4.337E-02	8.261E-02	8.489E-02	FAIL ABUN
TE-125M	1.757E+00	9.647E+00	9.680E+00	NOT IDENT.
I-126	-1.427E-01	1.611E+00	1.612E+00	NOT IDENT.
SB-126	1.625E-01	8.164E-01	8.196E-01	NOT IDENT.
SN-126	1.001E-01	4.527E-02	6.391E-02	FAIL ABUN
SB-127	4.269E+01	4.775E+02	4.779E+02	SHORT HLIF
I-131	6.109E-02	1.760E+00	1.760E+00	NOT IDENT.
I-132	-1.000E+41	7.789E+41	0.000E+00	SHORT HLIF
TE-132	-1.647E+02	7.841E+02	7.876E+02	SHORT HLIF
BA-133	3.172E-03	3.991E-02	3.993E-02	NOT IDENT.
I-133	4.072E+14	1.361E+15	1.373E+15	SHORT HLIF
CS-134	4.658E-02	3.658E-02	4.218E-02	FAIL ABUN
CS-135	1.918E-01	1.433E-01	1.673E-01	NOT IDENT.
I-135	1.000E+41	4.145E+41	0.000E+00	SHORT HLIF
CS-136	1.488E-02	4.635E-01	4.635E-01	NOT IDENT.
CE-139	-1.679E-02	2.607E-02	2.715E-02	NOT IDENT.
BA-140	-1.212E+00	1.486E+00	1.583E+00	FAIL ABUN
LA-140	-3.581E-01	5.380E-01	5.617E-01	NOT IDENT.
CE-141	1.284E-03	9.433E-02	9.433E-02	NOT IDENT.
CE-143	3.814E+09	2.193E+09	2.787E+09	SHORT HLIF
CE-144	2.740E-02	1.506E-01	1.511E-01	NOT IDENT.
PM-144	-1.187E-02	3.155E-02	3.200E-02	NOT IDENT.
PR-144	-8.969E-01	2.403E+00	2.437E+00	NOT IDENT.
PM-146	3.190E-02	4.032E-02	4.281E-02	NOT IDENT.
ND-147	-1.117E+00	3.815E+00	3.848E+00	FAIL ABUN
PM-147	-2.102E+02	5.697E+02	5.775E+02	NOT IDENT.
PM-149	1.176E+05	2.471E+06	2.472E+06	SHORT HLIF
EU-150	3.829E-03	2.543E-02	2.549E-02	FAIL ABUN
EU-152	-3.525E-02	9.173E-02	9.310E-02	NOT IDENT.
GD-153	1.829E-02	6.232E-02	6.286E-02	NOT IDENT.
EU-154	-4.791E-02	1.048E-01	1.070E-01	NOT IDENT.
EU-155	2.664E-02	6.604E-02	6.712E-02	NOT IDENT.
TB-160	-1.168E-01	1.645E-01	1.727E-01	FAIL ABUN
HO-166M	2.621E-03	5.163E-02	5.164E-02	FAIL ABUN
TM-171	2.490E+00	3.106E+00	3.302E+00	NOT IDENT.
HF-172	-1.651E-02	1.405E-01	1.407E-01	FAIL ABUN
LU-172	2.441E-02	5.371E-02	5.482E-02	FAIL ABUN

LU-176	2.647E-02	2.219E-02	2.520E-02	FAIL ABUN
HF-181	1.142E-04	6.423E-02	6.423E-02	NOT IDENT.
TA-182	-5.829E-02	2.296E-01	2.311E-01	FAIL ABUN
RE-183	-1.678E-02	6.962E-02	7.003E-02	NOT IDENT.
RE-184	1.286E-01	1.907E-01	1.993E-01	NOT IDENT.
W-188	-5.128E+00	8.898E+00	9.194E+00	FAIL ABUN
IR-192	3.461E-02	4.190E-02	4.471E-02	FAIL ABUN
HG-203	4.779E-02	5.758E-02	6.148E-02	NOT IDENT.
BI-207	-7.880E-04	4.640E-02	4.640E-02	FAIL ABUN
PB-211	3.100E-01	9.064E-01	9.171E-01	FAIL ABUN
BI-212	5.958E-01	7.196E-01	7.681E-01	FAIL ABUN
RN-219	5.278E-02	4.178E-01	4.185E-01	FAIL ABUN
RA-223	1.124E+00	1.362E+00	1.454E+00	FAIL ABUN
AC-227	1.634E-02	2.193E-01	2.194E-01	NOT IDENT.
TH-227	1.634E-02	2.193E-01	2.194E-01	NOT IDENT.
TH-229	-1.075E-01	3.935E-01	3.964E-01	FAIL ABUN
PA-231	2.440E-01	5.574E-01	5.681E-01	NOT IDENT.
TH-231	1.124E+00	1.362E+00	1.454E+00	FAIL ABUN
PA-233	-3.671E-02	6.198E-02	6.415E-02	NOT IDENT.
PA-234	3.513E-02	2.718E-01	2.723E-01	FAIL ABUN
PA-234M	2.820E+00	3.577E+00	3.796E+00	NOT IDENT.
NP-237	-3.671E-02	6.198E-02	6.415E-02	NOT IDENT.
NP-238	7.814E+05	8.678E+05	9.366E+05	SHORT HLIF
NP-239	5.836E-02	1.851E-01	1.870E-01	NOT IDENT.
PU-239	5.241E+01	2.435E+02	2.446E+02	NOT IDENT.
AM-241	-1.527E-02	4.480E-02	4.533E-02	NOT IDENT.
CM-243	-6.275E-02	6.498E-02	7.087E-02	NOT IDENT.
BK-247	2.522E-02	6.698E-02	6.794E-02	NOT IDENT.
CM-247	-4.376E-03	3.885E-02	3.890E-02	NOT IDENT.
CF-249	-5.649E-03	3.098E-02	3.109E-02	NOT IDENT.
CF-251	1.995E-02	1.009E-01	1.013E-01	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
74.66	55.0776	105.31	101.0887	131.20	93.1567
879.38	76.8820	86.79	101.1417	133.02	101.4434
46.54	77.1259	86.94	101.1752	133.52	86.3862
228.16	0.0000	87.09	101.2088	136.00	80.4735
52.39	97.5754	87.57	101.3153	136.47	84.1139
1093.63	78.4656	88.03	101.4174	739.50	0.0000
52.39	83.5666	306.78	101.4855	140.51	0.0000
125.81	100.6589	88.47	101.5144	143.76	87.7975
53.44	100.8043	143.76	101.8417	144.24	87.8626
54.07	100.9977	90.64	101.9903	145.44	88.9321
293.27	0.0000	531.02	102.0924	152.43	90.7883
482.18	106.0833	92.59	102.4127	1048.07	83.5525
57.98	111.6842	93.35	102.5763	154.21	86.4289
59.27	102.0468	94.56	92.8833	158.56	86.6577
59.32	102.0614	311.90	92.9008	159.00	83.3272
59.54	117.3678	946.00	92.9047	162.33	75.3504
60.96	117.8393	94.87	86.3043	537.26	75.3856
61.17	110.2519	97.43	83.4217	163.33	81.9777
62.93	128.2295	98.43	72.2224	165.86	87.8776
63.29	128.3558	98.44	72.2240	427.87	82.4964
290.67	128.4574	103.37	73.7226	176.60	83.4769
87.57	138.9977	116.74	73.7226	177.52	81.6787
66.73	135.2459	100.11	81.6364	181.07	0.0000
67.24	126.0873	102.03	93.1728	181.52	80.9628
67.68	137.1415	103.18	95.6332	184.41	73.5990
1221.41	137.1663	103.37	93.4176	185.72	96.7618
97.43	127.8237	911.20	65.5128	193.51	76.5825
279.20	127.2583	105.31	77.9528	197.03	85.6783
1063.66	143.6809	106.12	80.3372	198.01	69.2097
72.87	143.7024	106.47	89.4492	201.83	95.9715
351.06	143.7024	109.28	88.7874	203.43	82.9796
74.66	130.0619	111.00	97.0664	205.31	88.1111
238.63	130.1126	111.76	0.0000	210.85	63.3477
351.93	130.1126	114.06	83.8326	215.65	58.9222
238.63	130.1126	116.30	0.0000	222.11	77.0004
74.97	130.1601	116.74	83.0848	227.09	69.1317
77.11	130.8333	119.76	75.4098	227.38	69.1537
78.74	138.8146	264.66	100.0110	228.16	0.0000
256.23	144.4750	121.22	100.0282	228.18	73.6845
133.52	141.4061	344.28	80.3333	235.69	79.7823
364.49	141.4290	122.06	80.3726	235.96	79.8050
711.68	141.5538	122.92	89.8243	238.63	68.3950
356.01	141.6948	1274.44	86.6390	238.98	0.0000
323.87	141.7177	123.68	98.1186	240.99	68.5662
81.75	141.9399	125.81	95.8382	242.00	59.0089
83.79	100.4681	127.23	90.7798	244.70	73.9698
265.00	100.5159	127.91	89.1192	685.70	0.0000
193.51	100.8380	129.30	95.5168	388.16	58.0132

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
507.63	0.0000	345.93	45.0513	569.50	26.0486
256.23	66.5308	351.06	60.3133	569.70	26.0516
527.90	0.0000	351.93	57.9406	583.19	23.0909
264.66	41.9312	355.39	0.0000	584.27	26.2549
264.80	41.9373	356.01	43.8971	595.83	15.8481
265.00	41.9452	364.49	46.6240	600.60	38.8357
268.22	57.8568	366.42	0.0000	602.52	0.0000
269.46	57.9256	372.51	45.0696	604.72	21.2280
270.03	57.9583	375.05	43.3132	607.14	31.8816
401.81	54.0164	377.52	40.6232	609.32	31.9175
273.65	81.2121	383.85	39.8868	610.33	31.9336
276.40	74.9227	388.16	36.2907	614.28	24.8874
583.19	65.7946	666.33	37.2344	618.01	33.5847
277.60	66.8702	391.69	35.4510	884.68	24.6071
402.40	59.4624	400.66	37.5581	621.93	17.1313
279.20	60.5929	401.81	43.8537	630.19	0.0000
279.54	54.2326	402.40	47.0062	631.29	10.7571
279.70	65.9393	404.85	32.9612	633.25	24.7654
280.46	70.2438	410.95	45.7137	634.78	43.1025
301.36	67.2538	413.71	41.0635	635.95	32.3459
284.31	63.0197	720.70	45.8329	636.99	20.0337
285.41	58.8076	423.72	39.1207	1690.97	21.6685
285.90	0.0000	427.09	37.2976	657.76	39.9547
287.50	47.1367	427.87	44.0150	657.90	0.0000
290.67	57.3014	433.94	35.5484	661.66	27.2925
293.27	0.0000	439.40	43.3922	664.57	0.0000
295.22	46.6066	453.88	34.0703	666.33	36.4714
316.51	46.6376	463.37	38.1954	666.50	36.4738
298.58	46.7477	468.07	27.8311	667.71	0.0000
299.98	52.0063	473.00	0.0000	677.62	32.9985
300.09	52.0115	631.29	34.5305	685.70	0.0000
300.13	52.0137	696.49	29.6294	695.00	24.0248
311.90	52.0137	477.60	25.6918	696.49	24.9659
301.36	52.0708	482.18	23.1220	696.51	24.9659
302.85	58.6571	487.02	31.8043	697.00	25.8968
304.50	71.3606	492.35	0.0000	697.30	26.8252
304.85	59.1954	497.08	26.9990	697.49	28.6778
306.78	45.3438	505.52	28.4751	702.65	23.1817
308.46	26.1984	507.63	0.0000	706.68	25.0818
311.90	52.5542	511.00	43.3548	711.68	22.3452
316.51	33.4165	514.00	47.1346	720.70	19.9427
319.41	49.3671	514.00	47.1349	721.93	0.0000
320.08	51.8208	520.40	42.5793	722.78	20.8521
321.04	51.8631	520.69	0.0000	722.91	24.0616
323.87	51.9872	667.71	0.0000	723.31	24.0658
325.23	63.7840	527.90	0.0000	756.73	19.2602
1596.21	51.5334	528.26	24.4412	727.33	33.7522
333.37	46.3785	529.59	17.3258	733.00	24.1689
333.97	42.8320	529.87	0.0000	735.93	19.1985
334.37	48.2019	531.02	28.5599	737.46	22.6016
338.28	41.1922	537.26	37.8735	739.50	0.0000
338.32	39.4023	1260.41	0.0000	747.24	23.6435
340.48	39.4716	552.55	32.0036	748.06	20.8134
340.55	39.4738	795.86	19.0378	752.31	13.2691
344.28	53.9897	569.33	26.0468	753.82	22.7617

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
756.73	18.0421	968.97	19.4292	1505.03	8.2377
756.80	18.0429	983.53	8.2842	1584.12	12.5876
763.94	19.7430	984.45	0.0000	1596.21	11.5705
765.81	11.4392	996.26	14.5605	1620.50	8.4612
1001.03	17.9805	1001.03	9.3755	1621.92	10.5800
766.84	16.3487	1002.74	13.5504	1678.03	0.0000
772.60	0.0000	1004.73	19.8176	1690.97	2.8198
776.52	19.6984	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	4.7737
778.90	25.5604	1028.54	0.0000	1770.23	10.5146
783.70	0.0000	1037.84	15.8191	1771.35	8.6048
785.37	20.1831	1038.76	0.0000	1791.20	0.0000
903.28	16.5217	1046.59	13.7490	1808.65	2.8904
794.95	25.0875	1048.07	11.6392	1810.72	0.0000
795.86	20.2703	1049.04	14.8186	1836.06	4.8442
801.95	18.0628	1050.41	16.9427		
810.06	18.4461	1063.66	15.9521		
810.29	15.5352	1077.00	12.8164		
810.45	15.5361	1077.34	13.8855		
810.76	12.6247	1085.87	17.1367		
815.77	13.6232	1093.63	10.7365		
818.51	15.5863	1099.45	11.8316		
832.01	16.7896	1112.07	9.2557		
834.85	17.6488	1112.84	18.5163		
835.71	23.5396	1115.54	18.5317		
836.80	0.0000	1120.29	19.4868		
846.75	0.0000	1120.55	19.4883		
846.77	16.7461	1121.30	19.4927		
856.80	20.7672	1808.65	13.0283		
860.56	13.8647	1131.51	0.0000		
871.09	16.9035	1147.95	0.0000		
873.19	17.9121	1332.49	17.9146		
875.33	0.0000	1177.95	15.1071		
879.38	22.9415	1189.05	14.2090		
880.51	19.9577	1204.77	13.3228		
883.24	13.9846	1221.41	18.4067		
884.68	16.9907	1231.02	20.1350		
889.28	21.0244	1235.36	16.7999		
894.76	9.0289	1238.28	15.3728		
1836.06	22.0976	1260.41	0.0000		
900.72	21.1141	1271.87	14.5480		
903.28	9.3930	1274.44	15.5285		
911.20	19.1770	1274.54	16.4996		
912.08	20.7698	1291.59	13.6519		
984.45	0.0000	1298.22	0.0000		
926.50	12.1794	1312.11	6.8638		
929.11	0.0000	1332.49	8.8732		
937.49	20.9615	1362.66	0.0000		
983.53	12.2566	1365.19	10.9386		
946.00	12.2646	1368.63	0.0000		
949.00	19.4395	1384.29	7.7726		
954.55	0.0000	1408.01	7.0378		
962.31	19.3839	1457.56	0.0000		
964.08	21.1595	1460.82	10.6970		
966.17	19.5574	1489.16	7.1807		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:42:48.50

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677014.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM27.CNF;316
Background date    : 26-JUN-2016 12:05:24
Sample date       : 11-MAY-2016 11:10:00 Acquisition date : 28-JUN-2016 14:36:54
Sample ID        : G398677014 Sample quantity : 1.53480E+02 GRAM
Detector name    : GAM27 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.76 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	58.79	19	70	0.71	116.89	115	5	5.28E-03	69.9	
2	0	63.38*	41	198	1.12	126.07	121	11	1.14E-02	70.6	
3	1	74.84*	89	147	1.12	149.00	144	15	2.47E-02	25.3	1.35E+00
4	1	77.23	155	140	1.13	153.79	144	15	4.31E-02	15.4	
5	0	83.73*	2	206	3.35	166.80	160	11	4.78E-04	*****	
6	0	87.23	69	85	1.01	173.79	171	6	1.93E-02	24.4	
7	0	93.14*	85	136	1.30	185.63	182	10	2.37E-02	30.0	
8	0	125.81	40	64	1.52	250.99	248	7	1.12E-02	36.9	
9	0	129.35	50	99	1.42	258.07	255	11	1.38E-02	41.1	
10	0	173.41	33	57	1.19	346.22	343	7	9.06E-03	42.7	
11	0	186.16*	54	101	1.32	371.72	366	12	1.50E-02	41.9	
12	0	209.74	11	60	0.87	418.91	415	6	3.06E-03	115.4	
13	2	220.48	43	68	1.51	440.39	436	18	1.19E-02	37.4	1.69E+00
14	2	224.02	25	68	1.52	447.47	436	18	6.89E-03	64.9	
15	0	238.71*	244	137	1.05	476.87	471	10	6.77E-02	11.3	
16	0	242.06	43	62	1.94	483.57	481	7	1.19E-02	35.4	
17	0	269.95	34	55	1.36	539.36	535	9	9.46E-03	42.6	
18	8	295.39	64	49	1.36	590.28	584	22	1.79E-02	23.2	1.75E+00
19	8	300.27	36	83	2.88	600.03	584	22	9.99E-03	55.9	
20	0	338.29*	92	69	1.16	676.10	670	13	2.55E-02	21.5	
21	0	352.11*	129	56	1.17	703.75	699	9	3.58E-02	13.8	
22	0	356.66*	20	34	2.93	712.87	709	9	5.55E-03	61.2	
23	0	410.30	27	56	0.71	820.19	816	12	7.38E-03	60.0	
24	0	483.78	27	34	6.16	967.22	959	17	7.50E-03	53.1	
25	0	583.26*	98	26	1.68	1166.28	1162	10	2.72E-02	14.3	
26	0	609.75*	82	36	1.10	1219.29	1214	11	2.29E-02	18.8	
27	0	651.87	5	15	2.56	1303.57	1298	7	1.32E-03	145.2	
28	0	661.67	423	12	1.31	1323.17	1315	16	1.18E-01	5.2	
29	0	682.38	8	24	0.96	1364.61	1357	12	2.11E-03	134.3	
30	0	727.58*	34	16	2.53	1455.06	1449	17	9.42E-03	30.9	
31	0	836.07	14	11	0.96	1672.18	1667	9	3.79E-03	51.9	
32	0	888.77	6	3	1.50	1777.62	1772	8	1.64E-03	70.0	
33	0	894.48	4	11	1.23	1789.05	1783	8	1.07E-03	161.5	
34	0	911.09*	68	7	1.47	1822.29	1815	14	1.89E-02	15.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	949.73	8	10	0.67	1899.63	1893	10	2.22E-03	82.0	
36	0	969.91*	39	21	2.07	1940.00	1931	17	1.10E-02	33.4	
37	0	1001.13*	0	6	0.62	2002.48	1998	8	6.59E-05	****	
38	0	1069.55	8	2	0.90	2139.41	2136	6	2.08E-03	44.7	
39	0	1120.05*	28	10	1.36	2240.47	2233	13	7.88E-03	31.2	
40	0	1200.76	12	0	1.74	2402.00	2398	9	3.33E-03	28.9	
41	0	1378.09	21	0	3.32	2756.90	2750	13	5.83E-03	21.8	
42	0	1460.80*	169	3	2.24	2922.46	2916	14	4.69E-02	8.3	
43	0	1764.41*	13	0	1.66	3530.16	3524	12	3.66E-03	34.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677014.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:10:00 Acquisition date : 28-JUN-2016 14:36:54
Sample ID        : G398677014 Sample quantity  : 153.48 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA27 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.76 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.419E+00	5.280E+00	5.280E+00	16.56	OK
SC-46	889.28	99.98*	2.166E+00	1.360E-02	2.025E-02	140.03	OK
	1120.55	99.99	1.781E+00	7.766E-02	1.157E-01	62.37	OK
MN-54	834.85	99.98*	2.277E+00	3.019E-02	3.359E-02	103.85	OK
CD-109	88.03	3.70*	7.788E+00	1.146E+00	1.232E+00	65.89	OK
SN-126	64.28	9.60	5.714E+00	4.818E-01	4.818E-01	141.13	OK
	86.94	8.90	7.788E+00	4.763E-01	4.763E-01	65.89	OK
	87.57	37.00*	7.788E+00	1.146E-01	1.146E-01	65.89	OK
BA-137M	661.66	89.90*	2.746E+00	8.840E-01	8.867E-01	10.39	OK
CS-137	661.66	85.10*	2.746E+00	9.339E-01	9.367E-01	10.39	OK
TL-208	277.37	6.60	5.181E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	3.027E+00	1.991E-01	1.991E-01	28.62	OK
	860.56	12.50	2.224E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	6.838E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	4.383E+00	1.674E-01	1.674E-01	364.83	OK
PB-212	74.82	10.28	7.016E+00	5.599E-01	5.599E-01	73.09	OK
	77.11	17.10	7.212E+00	7.968E-01	7.968E-01	30.85	OK
	238.63	43.60*	5.736E+00	5.570E-01	5.570E-01	22.56	OK
	300.09	3.30	4.904E+00	1.242E+00	1.242E+00	111.76	OK
BI-214	609.32	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56	OK
	1120.29	14.92	1.781E+00	5.204E-01	5.205E-01	62.37	OK
	1764.49	15.30	1.217E+00	3.277E-01	3.277E-01	68.48	OK
PB-214	74.82	5.80	7.015E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	7.212E+00	1.405E+00	1.405E+00	30.85	OK
	87.09	3.41	7.783E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.684E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.960E+00	3.939E-01	3.940E-01	46.44	OK
	351.93	35.60*	4.385E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56	OK
	1120.29	14.92	1.781E+00	5.204E-01	5.205E-01	62.37	OK
	1764.49	15.30	1.217E+00	3.277E-01	3.277E-01	68.48	OK
RA-224	240.99	4.10*	5.683E+00	3.545E-01	3.545E-01	228.78	OK
RA-226	609.32	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56	OK
	1120.29	14.92	1.781E+00	5.204E-01	5.205E-01	62.37	OK
	1764.49	15.30	1.217E+00	3.277E-01	3.277E-01	68.48	OK
AC-228	105.21	1.10	8.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.509E+00	9.995E-01	9.995E-01	43.04	OK
	794.95	4.25	2.373E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.277E+00	1.875E+00	1.875E+00	103.85	OK
	911.20	25.80*	2.121E+00	6.186E-01	6.186E-01	30.82	OK
	968.97	15.80	2.013E+00	6.139E-01	6.139E-01	66.84	OK
RA-228	105.21	1.10	8.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.509E+00	9.995E-01	9.995E-01	43.04	OK
	794.95	4.25	2.373E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.277E+00	1.875E+00	1.875E+00	103.85	OK
	911.20	25.80*	2.121E+00	6.186E-01	6.186E-01	30.82	OK
	968.97	15.80	2.013E+00	6.139E-01	6.139E-01	66.84	OK
TH-228	74.82	10.28	7.016E+00	5.599E-01	5.599E-01	73.09	OK
	77.11	17.10	7.212E+00	7.968E-01	7.968E-01	30.85	OK

Nuclide Type:

Nuclide Type:				Uncorrected	Decay Corr	2-Sigma	
Nuclide	Energy	%Abn	%Eff	pCi/GRAM	pCi/GRAM	%Error	Status
TH-230	238.63	43.60*	5.736E+00	5.570E-01	5.570E-01	22.56	OK
	300.09	3.30	4.904E+00	1.242E+00	1.242E+00	111.76	OK
	609.32	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56	OK
	1120.29	14.92	1.781E+00	5.204E-01	5.204E-01	62.37	OK
PA-231	1764.49	15.30	1.217E+00	3.277E-01	3.277E-01	68.48	OK
	283.69	1.70	5.101E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	4.904E+00	7.662E-01	7.662E-01	111.76	OK
	105.21	1.10	8.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.509E+00	9.995E-01	9.995E-01	43.04	OK
TH-234	835.71	1.61	2.277E+00	1.875E+00	1.875E+00	103.85	OK
	911.20	25.80*	2.121E+00	6.186E-01	6.186E-01	30.82	OK
	968.97	15.80	2.013E+00	6.139E-01	6.139E-01	66.84	OK
	63.29	3.70*	5.714E+00	1.250E+00	1.250E+00	141.13	OK
	92.59	4.23	7.982E+00	1.576E+00	1.576E+00	59.93	OK
	609.32	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56	OK
U-234	1120.29	14.92	1.781E+00	5.204E-01	5.204E-01	62.37	OK
	1764.49	15.30	1.217E+00	3.277E-01	3.277E-01	68.48	OK
U-238	63.29	3.70*	5.714E+00	1.250E+00	1.250E+00	141.13	OK
	92.59	4.23	7.982E+00	1.576E+00	1.576E+00	59.93	OK
AM-241	59.54	35.90*	5.011E+00	6.839E-02	6.841E-02	139.85	OK
AM-243	43.53	5.90	2.173E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	7.016E+00	8.566E-02	8.566E-02	73.09	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677014.CNF;1  *
* Acquisition date   : 28-JUN-2016 14:36:54 Sensitivity      : 3.000          *
* Detector ID        : GAM27 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 01:00:00.76 Half life ratio : *****          *
* Sample date        : 11-MAY-2016 11:10:00 Analyst initials: MXR1          *
* Sample ID          : G398677014 Sample Quantity : 1.5348E+02 GRAM          *
* Batch Number       : 1572231 Wet Weight : 0.00000          *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 8-SEP-2015 09:22:55 Eff. Geometry   : CAN            *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;12          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.280E+00	8.568E-01	5.012E-01
SC-46	2.025E-02	2.779E-02	8.382E-02
MN-54	3.359E-02	3.419E-02	6.523E-02
CD-109	1.232E+00	7.953E-01	1.071E+00
SN-126	1.146E-01	7.397E-02	1.108E-01
BA-137M	8.867E-01	9.028E-02	4.796E-02
CS-137	9.367E-01	9.537E-02	5.066E-02
TL-208	1.991E-01	5.584E-02	5.178E-02
BI-211	1.674E-01	5.984E-01	3.364E-01
PB-212	5.570E-01	1.231E-01	1.199E-01
BI-214	3.225E-01	1.187E-01	1.215E-01
PB-214	4.547E-01	1.226E-01	2.189E-01
RN-222	3.225E-01	1.187E-01	1.215E-01
RA-224	3.545E-01	7.948E-01	1.144E+00
RA-226	3.225E-01	1.187E-01	1.215E-01
AC-228	6.186E-01	1.869E-01	2.280E-01
RA-228	6.186E-01	1.869E-01	2.280E-01
TH-228	5.570E-01	1.231E-01	1.199E-01
TH-230	3.225E-01	1.187E-01	1.214E-01
PA-231	7.662E-01	8.392E-01	7.869E-01
TH-232	6.186E-01	1.869E-01	2.280E-01
TH-234	1.250E+00	1.729E+00	1.370E+00
U-234	3.225E-01	1.187E-01	1.214E-01
U-238	1.250E+00	1.729E+00	1.370E+00
AM-241	6.841E-02	9.375E-02	1.412E-01
AM-243	8.566E-02	6.135E-02	6.441E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.829E-01	5.052E-01	8.134E-01	NOT IDENT.
NA-22	-2.635E-02	2.945E-02	4.806E-02	NOT IDENT.
NA-24	0.000E+00	4.679E+21	0.000E+00	SHORT HLIF
AL-26	-1.988E-02	2.518E-02	4.758E-02	NOT IDENT.

V-48	1.514E-01	2.235E-01	4.834E-01	NOT IDENT.
CR-51	-5.101E-02	6.368E-01	1.204E+00	NOT IDENT.
CO-56	-8.021E-03	4.128E-02	7.663E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	8.914E-03	2.499E-02	4.276E-02	NOT IDENT.
CO-58	-1.705E-02	4.207E-02	7.580E-02	NOT IDENT.
FE-59	-2.937E-02	1.005E-01	1.908E-01	NOT IDENT.
CO-60	-1.090E-02	3.003E-02	5.547E-02	NOT IDENT.
ZN-65	1.037E-02	7.838E-02	1.365E-01	NOT IDENT.
GE-68	3.419E-01	8.302E-01	1.804E+00	NOT IDENT.
AS-73	-1.152E-01	4.735E-01	9.139E-01	NOT IDENT.
AS-74	9.732E-03	2.793E-01	5.411E-01	NOT IDENT.
SE-75	2.671E-02	4.714E-02	8.472E-02	NOT IDENT.
BR-77	0.000E+00	2.930E+05	0.000E+00	SHORT HLIF
SR-82	3.732E-01	6.787E-01	1.385E+00	NOT IDENT.
RB-83	2.589E-02	6.735E-02	1.386E-01	NOT IDENT.
KR-85	-1.007E+00	7.494E+00	1.409E+01	NOT IDENT.
SR-85	-7.721E-03	5.620E-02	1.057E-01	NOT IDENT.
RB-86	5.238E-01	1.753E+00	3.696E+00	NOT IDENT.
Y-88	-2.798E-02	2.919E-02	4.212E-02	NOT IDENT.
Y-91	-2.434E+01	2.695E+01	3.502E+01	NOT IDENT.
NB-94	-1.657E-02	2.596E-02	4.567E-02	NOT IDENT.
NB-95	-5.997E-03	4.627E-02	8.677E-02	NOT IDENT.
NB-95M	1.381E-02	1.734E-01	2.922E-01	NOT IDENT.
ZR-95	-1.058E-02	8.748E-02	1.638E-01	NOT IDENT.
NB-97	0.000E+00	1.454E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.365E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.445E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.338E+41	0.000E+00	SHORT HLIF
RH-101	0.000E+00	3.368E-02	4.647E-02	FAIL ABUN
RH-102	-1.189E-02	4.625E-02	8.648E-02	NOT IDENT.
RU-103	-5.531E-02	5.624E-02	9.825E-02	FAIL ABUN
RH-106	-1.759E-01	2.840E-01	5.072E-01	NOT IDENT.
RU-106	-1.759E-01	2.840E-01	5.072E-01	NOT IDENT.
AG-108M	1.445E-02	2.854E-02	5.518E-02	NOT IDENT.
AG-110M	-2.141E-02	3.421E-02	4.656E-02	NOT IDENT.
SN-113	3.079E-03	4.903E-02	9.181E-02	NOT IDENT.
CD-115	0.000E+00	2.586E+05	0.000E+00	SHORT HLIF
SN-117M	5.746E-02	2.254E-01	4.500E-01	NOT IDENT.
TE-123M	-3.408E-04	2.638E-02	5.179E-02	NOT IDENT.
SB-124	-3.886E-02	8.118E-02	1.537E-01	NOT IDENT.
SB-125	8.016E-02	8.376E-02	1.699E-01	NOT IDENT.
TE-125M	-3.441E+00	1.178E+01	2.156E+01	NOT IDENT.
I-126	-7.573E-02	1.016E+00	1.697E+00	NOT IDENT.
SB-126	-4.805E-01	7.945E-01	1.235E+00	NOT IDENT.
SB-127	0.000E+00	4.598E+02	0.000E+00	SHORT HLIF
I-131	9.892E-01	1.702E+00	3.375E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.211E+02	0.000E+00	SHORT HLIF
BA-133	4.113E-02	4.935E-02	7.349E-02	FAIL ABUN
I-133	0.000E+00	1.432E+15	0.000E+00	SHORT HLIF
CS-134	4.260E-02	3.231E-02	7.227E-02	NOT IDENT.
CS-135	4.794E-02	1.507E-01	2.599E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	3.257E-01	4.552E-01	9.870E-01	NOT IDENT.
CE-139	-1.488E-02	2.770E-02	5.234E-02	NOT IDENT.
BA-140	1.724E-01	1.317E+00	2.599E+00	NOT IDENT.
LA-140	-1.795E-01	4.018E-01	7.561E-01	NOT IDENT.
CE-141	-5.678E-03	1.048E-01	1.917E-01	NOT IDENT.
CE-143	0.000E+00	1.924E+09	0.000E+00	SHORT HLIF
CE-144	3.809E-02	1.898E-01	3.188E-01	NOT IDENT.
PM-144	1.949E-02	2.834E-02	5.894E-02	NOT IDENT.
PR-144	1.522E+00	2.163E+00	4.505E+00	NOT IDENT.
PM-146	2.493E-02	3.690E-02	7.340E-02	NOT IDENT.
ND-147	-1.830E+00	3.840E+00	7.086E+00	NOT IDENT.
PM-147	1.087E+02	6.546E+02	1.173E+03	NOT IDENT.
PM-149	0.000E+00	2.327E+06	0.000E+00	SHORT HLIF
EU-150	-3.476E-04	2.606E-02	4.287E-02	FAIL ABUN
EU-152	-6.753E-02	9.148E-02	1.351E-01	NOT IDENT.
GD-153	1.996E-02	7.436E-02	1.283E-01	NOT IDENT.
EU-154	-5.162E-02	7.902E-02	1.373E-01	NOT IDENT.
EU-155	3.072E-02	7.949E-02	1.535E-01	FAIL ABUN
TB-160	6.296E-02	1.269E-01	2.655E-01	FAIL ABUN
HO-166M	2.139E-03	4.818E-02	9.297E-02	FAIL ABUN
TM-171	-2.410E+00	7.369E+00	1.417E+01	NOT IDENT.
HF-172	2.859E-01	2.070E-01	3.035E-01	FAIL ABUN
LU-172	2.195E-02	4.119E-02	9.041E-02	FAIL ABUN
LU-176	-2.734E-02	2.367E-02	3.820E-02	FAIL ABUN

HF-181	3.203E-03	6.289E-02	1.235E-01	FAIL ABUN
TA-182	1.474E-02	1.548E-01	3.078E-01	FAIL ABUN
RE-183	1.153E-01	1.581E-01	2.587E-01	FAIL ABUN
RE-184	-6.940E-02	2.080E-01	3.335E-01	FAIL ABUN
W-188	-5.875E+00	9.440E+00	1.451E+01	FAIL ABUN
IR-192	-2.225E-02	3.567E-02	6.370E-02	FAIL ABUN
HG-203	2.025E-02	5.533E-02	1.076E-01	NOT IDENT.
BI-207	7.846E-03	4.219E-02	7.769E-02	FAIL ABUN
PB-210	-4.448E-02	1.219E+00	2.449E+00	NOT IDENT.
PB-211	-2.712E-01	6.868E-01	1.053E+00	NOT IDENT.
BI-212	0.000E+00	6.178E-01	1.004E+00	FAIL ABUN
RN-219	2.113E-01	3.376E-01	6.714E-01	FAIL ABUN
RA-223	8.697E-02	5.195E-01	9.979E-01	FAIL ABUN
AC-227	-2.003E-01	2.008E-01	3.521E-01	FAIL ABUN
TH-227	-2.003E-01	2.008E-01	3.521E-01	FAIL ABUN
TH-229	3.871E-01	4.252E-01	8.713E-01	FAIL ABUN
TH-231	8.697E-02	5.195E-01	9.979E-01	FAIL ABUN
PA-233	2.730E-02	5.387E-02	1.065E-01	FAIL ABUN
PA-234	1.368E-01	2.189E-01	4.417E-01	FAIL ABUN
PA-234M	7.108E-02	2.995E+00	6.343E+00	FAIL ABUN
U-235	7.852E-02	1.573E-01	3.010E-01	FAIL ABUN
NP-237	2.730E-02	5.387E-02	1.065E-01	FAIL ABUN
NP-238	0.000E+00	7.925E+05	0.000E+00	SHORT HLIF
NP-239	1.866E-01	2.149E-01	4.244E-01	NOT IDENT.
PU-239	0.000E+00	4.828E+02	5.235E+02	FAIL ABUN
CM-243	-9.122E-02	7.983E-02	1.375E-01	NOT IDENT.
BK-247	6.859E-02	6.945E-02	1.305E-01	FAIL ABUN
CM-247	2.296E-02	3.096E-02	6.222E-02	NOT IDENT.
CF-249	-8.703E-03	3.783E-02	6.869E-02	NOT IDENT.
CF-251	-6.340E-02	1.141E-01	1.860E-01	NOT IDENT.
ANH-511	-2.668E-02	3.742E-02	7.973E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	163	10.66*	1.419E+00	5.280E+00	5.280E+00	16.56
SC-46	889.28	6	99.98*	2.166E+00	1.360E-02	2.025E-02	140.03
	1120.55	28	99.99	1.781E+00	7.766E-02	1.157E-01	62.37
MN-54	834.85	14	99.98*	2.277E+00	3.019E-02	3.359E-02	103.85
CD-109	88.03	89	3.70*	7.788E+00	1.509E+00	1.622E+00	48.77
SN-126	64.28	54	9.60	5.714E+00	4.818E-01	4.818E-01	141.13
	86.94	89	8.90	7.788E+00	6.272E-01	6.272E-01	48.77
	87.57	89	37.00*	7.788E+00	1.509E-01	1.509E-01	48.77
BA-137M	661.66	446	89.90*	2.746E+00	8.840E-01	8.867E-01	10.39
CS-137	661.66	446	85.10*	2.746E+00	9.339E-01	9.367E-01	10.39
TL-208	277.37	-----	6.60	5.181E+00	-----	Line Not Found	-----
	583.19	105	85.00*	3.027E+00	1.991E-01	1.991E-01	28.62
	860.56	-----	12.50	2.224E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	6.838E+00	-----	Line Not Found	-----
	351.06	145	12.92*	4.383E+00	1.253E+00	1.253E+00	27.50
PB-212	74.82	115	10.28	7.016E+00	7.822E-01	7.822E-01	50.63
	77.11	201	17.10	7.212E+00	7.968E-01	7.968E-01	30.85
	238.63	285	43.60*	5.736E+00	5.570E-01	5.570E-01	22.56
	300.09	41	3.30	4.904E+00	1.242E+00	1.242E+00	111.76
BI-214	609.32	88	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56
	1120.29	28	14.92	1.781E+00	5.204E-01	5.205E-01	62.37
	1764.49	12	15.30	1.217E+00	3.277E-01	3.277E-01	68.48
PB-214	74.82	115	5.80	7.016E+00	1.386E+00	1.386E+00	50.63
	77.11	201	9.70	7.212E+00	1.405E+00	1.405E+00	30.85
	87.09	89	3.41	7.788E+00	1.637E+00	1.637E+00	48.77
	242.00	50	7.25	5.683E+00	5.944E-01	5.944E-01	70.75
	295.22	74	18.42	4.960E+00	3.939E-01	3.940E-01	46.44
	351.93	145	35.60*	4.383E+00	4.547E-01	4.547E-01	27.50
RN-222	609.32	88	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56
	1120.29	28	14.92	1.781E+00	5.204E-01	5.205E-01	62.37
	1764.49	12	15.30	1.217E+00	3.277E-01	3.277E-01	68.48
RA-224	240.99	50	4.10*	5.683E+00	1.051E+00	1.051E+00	70.75
RA-226	609.32	88	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56
	1120.29	28	14.92	1.781E+00	5.204E-01	5.205E-01	62.37
	1764.49	12	15.30	1.217E+00	3.277E-01	3.277E-01	68.48
AC-228	105.21	-----	1.10	8.138E+00	-----	Line Not Found	-----
	338.32	104	11.27	4.509E+00	9.995E-01	9.995E-01	43.04
	794.95	-----	4.25	2.373E+00	-----	Line Not Found	-----
	835.71	14	1.61	2.277E+00	1.875E+00	1.875E+00	103.85
	911.20	69	25.80*	2.121E+00	6.186E-01	6.186E-01	30.82
	968.97	40	15.80	2.013E+00	6.139E-01	6.139E-01	66.84
RA-228	105.21	-----	1.10	8.138E+00	-----	Line Not Found	-----
	338.32	104	11.27	4.509E+00	9.995E-01	9.995E-01	43.04
	794.95	-----	4.25	2.373E+00	-----	Line Not Found	-----
	835.71	14	1.61	2.277E+00	1.875E+00	1.875E+00	103.85
	911.20	69	25.80*	2.121E+00	6.186E-01	6.186E-01	30.82
	968.97	40	15.80	2.013E+00	6.139E-01	6.139E-01	66.84

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	74.82	115	10.28	7.016E+00	7.822E-01	7.822E-01	50.63
	77.11	201	17.10	7.212E+00	7.968E-01	7.968E-01	30.85
	238.63	285	43.60*	5.736E+00	5.570E-01	5.570E-01	22.56
	300.09	41	3.30	4.904E+00	1.242E+00	1.242E+00	111.76
TH-230	609.32	88	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56
	1120.29	28	14.92	1.781E+00	5.204E-01	5.204E-01	62.37
	1764.49	12	15.30	1.217E+00	3.277E-01	3.277E-01	68.48
	283.69	-----	1.70	5.101E+00	-----	Line Not Found	-----
PA-231	301.36	41	5.35*	4.904E+00	7.662E-01	7.662E-01	111.76
	105.21	-----	1.10	8.138E+00	-----	Line Not Found	-----
	338.32	104	11.27	4.509E+00	9.995E-01	9.995E-01	43.04
	835.71	14	1.61	2.277E+00	1.875E+00	1.875E+00	103.85
TH-232	911.20	69	25.80*	2.121E+00	6.186E-01	6.186E-01	30.82
	968.97	40	15.80	2.013E+00	6.139E-01	6.139E-01	66.84
	63.29	54	3.70*	5.714E+00	1.250E+00	1.250E+00	141.13
	92.59	109	4.23	7.982E+00	1.576E+00	1.576E+00	59.93
U-234	609.32	88	45.49*	2.926E+00	3.225E-01	3.225E-01	37.56
	1120.29	28	14.92	1.781E+00	5.204E-01	5.204E-01	62.37
	1764.49	12	15.30	1.217E+00	3.277E-01	3.277E-01	68.48
	63.29	54	3.70*	5.714E+00	1.250E+00	1.250E+00	141.13
U-238	92.59	109	4.23	7.982E+00	1.576E+00	1.576E+00	59.93
	59.54	25	35.90*	5.011E+00	6.839E-02	6.841E-02	139.85
AM-241	43.53	-----	5.90	2.173E+00	-----	Line Not Found	-----
	74.66	115	67.20*	7.016E+00	1.197E-01	1.197E-01	50.63

Flag: "*" = Keyline

Total number of lines in spectrum 43
Number of unidentified lines 9
Number of lines tentatively identified by NID 34 79.07%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.280E+00	5.280E+00	0.874E+00	16.56	
SC-46	83.79D	1.49	1.360E-02	2.025E-02	2.836E-02	140.03	
MN-54	312.05D	1.11	3.019E-02	3.359E-02	3.489E-02	103.85	
CD-109	461.40D	1.08	1.509E+00	1.622E+00	0.791E+00	48.77	
SN-126	2.30E+05Y	1.00	1.509E-01	1.509E-01	0.736E-01	48.77	
BA-137M	30.08Y	1.00	8.840E-01	8.867E-01	0.921E-01	10.39	
CS-137	30.08Y	1.00	9.339E-01	9.367E-01	0.973E-01	10.39	
TL-208	1.41E+10Y	1.00	1.991E-01	1.991E-01	0.570E-01	28.62	
BI-211	7.04E+08Y	1.00	1.253E+00	1.253E+00	0.345E+00	27.50	
PB-212	1.41E+10Y	1.00	5.570E-01	5.570E-01	1.257E-01	22.56	
BI-214	1600.00Y	1.00	3.225E-01	3.225E-01	1.211E-01	37.56	
PB-214	1600.00Y	1.00	4.547E-01	4.547E-01	1.251E-01	27.50	
RN-222	1600.00Y	1.00	3.225E-01	3.225E-01	1.211E-01	37.56	
RA-224	1.41E+10Y	1.00	1.051E+00	1.051E+00	0.744E+00	70.75	
RA-226	1600.00Y	1.00	3.225E-01	3.225E-01	1.211E-01	37.56	
AC-228	1.41E+10Y	1.00	6.186E-01	6.186E-01	1.907E-01	30.82	
RA-228	1.41E+10Y	1.00	6.186E-01	6.186E-01	1.907E-01	30.82	
TH-228	1.41E+10Y	1.00	5.570E-01	5.570E-01	1.257E-01	22.56	
TH-230	7.54E+04Y	1.00	3.225E-01	3.225E-01	1.211E-01	37.56	
PA-231	7.04E+08Y	1.00	7.662E-01	7.662E-01	8.563E-01	111.76	
TH-232	1.41E+10Y	1.00	6.186E-01	6.186E-01	1.907E-01	30.82	
TH-234	4.47E+09Y	1.00	1.250E+00	1.250E+00	1.764E+00	141.13	
U-234	2.45E+05Y	1.00	3.225E-01	3.225E-01	1.211E-01	37.56	
U-238	4.47E+09Y	1.00	1.250E+00	1.250E+00	1.764E+00	141.13	
AM-241	432.60Y	1.00	6.839E-02	6.841E-02	9.566E-02	139.85	
AM-243	7370.00Y	1.00	1.197E-01	1.197E-01	0.606E-01	50.63	
Total Activity :			1.980E+01	1.992E+01			

Grand Total Activity : 1.980E+01 1.992E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	83.73	2	265	3.35	166.80	160	11	4.78E-04	****	7.63E+00	T
0	125.81	50	79	1.52	250.99	248	7	1.12E-02	73.9	7.97E+00	T
0	129.35	61	123	1.42	258.07	255	11	1.38E-02	82.1	7.91E+00	T
0	173.41	39	69	1.19	346.22	343	7	9.06E-03	85.5	6.98E+00	
0	186.16	65	121	1.32	371.72	366	12	1.50E-02	83.8	6.70E+00	T
0	209.74	13	71	0.87	418.91	415	6	3.06E-03	****	6.24E+00	T
2	220.48	50	79	1.51	440.39	436	18	1.19E-02	74.9	6.04E+00	
2	224.02	29	79	1.52	447.47	436	18	6.89E-03	****	5.98E+00	
0	269.95	39	63	1.36	539.36	535	9	9.46E-03	85.2	5.28E+00	T
0	356.66	22	39	2.93	712.87	709	9	5.55E-03	****	4.34E+00	T
0	410.30	29	62	0.71	820.19	816	12	7.38E-03	****	3.93E+00	T
0	483.78	29	37	6.16	967.22	959	17	7.50E-03	****	3.48E+00	
0	651.87	5	16	2.56	1303.57	1298	7	1.32E-03	****	2.78E+00	
0	682.38	8	26	0.96	1364.61	1357	12	2.11E-03	****	2.68E+00	
0	727.58	35	16	2.53	1455.06	1449	17	9.42E-03	61.8	2.55E+00	T
0	894.48	4	11	1.23	1789.05	1783	8	1.07E-03	****	2.15E+00	T
0	949.73	8	10	0.67	1899.63	1893	10	2.22E-03	****	2.05E+00	T
0	1069.55	8	2	0.90	2139.41	2136	6	2.08E-03	89.4	1.85E+00	
0	1200.76	12	0	1.74	2402.00	2398	9	3.33E-03	57.7	1.68E+00	
0	1378.09	20	0	3.32	2756.90	2750	13	5.83E-03	43.6	1.49E+00	

Flags: "T" = Tentatively associated


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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677014.CNF;1  *
* Acquisition date   : 28-JUN-2016 14:36:54 Sensitivity      : 3.000          *
* Detector ID        : GAM27 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 01:00:00.76 Half life ratio  : *****          *
* Sample date        : 11-MAY-2016 11:10:00 Nuclide Library : SOLID         *
* Sample ID          : G398677014 Analyst initials: MXR1          *
* Batch Number       : 1572231 Sample Quantity : 1.5348E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000           *
*                                     Dry Weight : 0.00000           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 8-SEP-2015 09:22:55 Eff. Geometry    : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;12          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.065E-01
SC-46	3.727E-02
MN-54	2.932E-02
CD-109	5.091E-01
SN-126	5.297E-02
BA-137M	2.122E-02
CS-137	2.242E-02
TL-208	2.324E-02
BI-211	1.560E-01
PB-212	5.717E-02
BI-214	5.562E-02
PB-214	1.051E-01
RN-222	5.562E-02
RA-224	5.422E-01
RA-226	5.562E-02
AC-228	1.017E-01
RA-228	1.017E-01
TH-228	5.717E-02
TH-230	5.562E-02
PA-231	3.671E-01
TH-232	1.017E-01
TH-234	6.513E-01
U-234	5.562E-02
U-238	6.513E-01
AM-241	6.670E-02
AM-243	3.069E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.718E-01	NOT IDENT.
NA-22	1.968E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.823E-02	NOT IDENT.
V-48	2.144E-01	NOT IDENT.

CR-51	5.526E-01	NOT IDENT.
CO-56	3.370E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.022E-02	NOT IDENT.
CO-58	3.324E-02	NOT IDENT.
FE-59	8.152E-02	NOT IDENT.
CO-60	2.331E-02	NOT IDENT.
ZN-65	5.977E-02	NOT IDENT.
GE-68	7.739E-01	NOT IDENT.
AS-73	4.310E-01	NOT IDENT.
AS-74	2.452E-01	NOT IDENT.
SE-75	3.945E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.231E-01	NOT IDENT.
RB-83	6.252E-02	NOT IDENT.
KR-85	6.571E+00	NOT IDENT.
SR-85	4.926E-02	NOT IDENT.
RB-86	1.595E+00	NOT IDENT.
Y-88	1.331E-02	NOT IDENT.
Y-91	1.479E+01	NOT IDENT.
NB-94	2.024E-02	NOT IDENT.
NB-95	3.872E-02	NOT IDENT.
NB-95M	1.380E-01	NOT IDENT.
ZR-95	7.344E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.189E-02	FAIL ABUN
RH-102	3.887E-02	NOT IDENT.
RU-103	4.397E-02	FAIL ABUN
RH-106	2.276E-01	NOT IDENT.
RU-106	2.276E-01	NOT IDENT.
AG-108M	2.558E-02	NOT IDENT.
AG-110M	1.839E-02	NOT IDENT.
SN-113	4.242E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.121E-01	NOT IDENT.
TE-123M	2.438E-02	NOT IDENT.
SB-124	5.755E-02	NOT IDENT.
SB-125	7.872E-02	NOT IDENT.
TE-125M	1.020E+01	NOT IDENT.
I-126	7.486E-01	NOT IDENT.
SB-126	5.443E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.561E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.418E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.265E-02	NOT IDENT.
CS-135	1.218E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.373E-01	NOT IDENT.
CE-139	2.461E-02	NOT IDENT.
BA-140	1.180E+00	NOT IDENT.
LA-140	3.056E-01	NOT IDENT.
CE-141	9.051E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.503E-01	NOT IDENT.
PM-144	2.664E-02	NOT IDENT.
PR-144	2.037E+00	NOT IDENT.
PM-146	3.376E-02	NOT IDENT.
ND-147	3.207E+00	NOT IDENT.
PM-147	5.547E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.985E-02	FAIL ABUN
EU-152	6.169E-02	NOT IDENT.
GD-153	6.068E-02	NOT IDENT.
EU-154	5.654E-02	NOT IDENT.
EU-155	7.255E-02	FAIL ABUN
TB-160	1.165E-01	FAIL ABUN
HO-166M	4.165E-02	FAIL ABUN
TM-171	6.671E+00	NOT IDENT.
HF-172	1.435E-01	FAIL ABUN
LU-172	3.906E-02	FAIL ABUN
LU-176	1.757E-02	FAIL ABUN
HF-181	5.638E-02	FAIL ABUN

TA-182	1.339E-01	FAIL ABUN
RE-183	1.224E-01	FAIL ABUN
RE-184	1.455E-01	FAIL ABUN
W-188	6.702E+00	FAIL ABUN
IR-192	2.907E-02	FAIL ABUN
HG-203	5.045E-02	NOT IDENT.
BI-207	3.400E-02	FAIL ABUN
PB-210	1.163E+00	NOT IDENT.
PB-211	4.806E-01	NOT IDENT.
BI-212	4.620E-01	FAIL ABUN
RN-219	3.096E-01	FAIL ABUN
RA-223	4.618E-01	FAIL ABUN
AC-227	1.627E-01	FAIL ABUN
TH-227	1.627E-01	FAIL ABUN
TH-229	4.115E-01	FAIL ABUN
TH-231	4.618E-01	FAIL ABUN
PA-233	4.951E-02	FAIL ABUN
PA-234	1.936E-01	FAIL ABUN
PA-234M	2.763E+00	FAIL ABUN
U-235	1.421E-01	FAIL ABUN
NP-237	4.951E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.012E-01	NOT IDENT.
PU-239	2.477E+02	FAIL ABUN
CM-243	6.456E-02	NOT IDENT.
BK-247	6.091E-02	FAIL ABUN
CM-247	2.872E-02	NOT IDENT.
CF-249	3.180E-02	NOT IDENT.
CF-251	8.714E-02	NOT IDENT.
ANH-511	3.783E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677014.CNF;1
Acquisition date : 28-JUN-2016 14:36:54 Sensitivity : 3.000
Detector ID : GAM27 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.76 Half life ratio : *****
Sample date : 11-MAY-2016 11:10:00 Nuclide Library : SOLID
Sample ID : G398677014 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5348E+02 GRAM
Quantity Err(%) : 1.3031E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-SEP-2015 09:22:55 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;12

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.280E+00	9.728E-01	9.728E-01
SC-46	2.025E-02	2.792E-02	2.792E-02
MN-54	3.359E-02	3.442E-02	3.442E-02
CD-109	1.232E+00	8.065E-01	8.065E-01
SN-126	1.146E-01	7.477E-02	7.477E-02
BA-137M	8.867E-01	1.145E-01	1.145E-01
CS-137	9.367E-01	1.209E-01	1.209E-01
TL-208	1.991E-01	5.820E-02	5.820E-02
BI-211	1.674E-01	6.127E-01	6.127E-01
PB-212	5.570E-01	1.336E-01	1.336E-01
BI-214	3.225E-01	1.216E-01	1.216E-01
PB-214	4.547E-01	1.284E-01	1.284E-01
RN-222	3.225E-01	1.216E-01	1.216E-01
RA-224	3.545E-01	8.002E-01	8.002E-01
RA-226	3.225E-01	1.216E-01	1.216E-01
AC-228	6.186E-01	2.065E-01	2.065E-01
RA-228	6.186E-01	2.065E-01	2.065E-01
TH-228	5.570E-01	1.336E-01	1.336E-01
TH-230	3.225E-01	1.216E-01	1.216E-01
PA-231	7.662E-01	8.569E-01	8.569E-01
TH-232	6.186E-01	2.065E-01	2.065E-01
TH-234	1.250E+00	1.751E+00	1.751E+00
U-234	3.225E-01	1.216E-01	1.216E-01
U-238	1.250E+00	1.751E+00	1.751E+00
AM-241	6.841E-02	9.389E-02	9.389E-02
AM-243	8.566E-02	6.189E-02	6.189E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.829E-01	5.054E-01	5.121E-01	NOT IDENT.
NA-22	-2.635E-02	2.955E-02	3.185E-02	NOT IDENT.
NA-24	-1.384E+21	4.681E+21	0.000E+00	SHORT HLIF
AL-26	-1.988E-02	2.522E-02	2.677E-02	NOT IDENT.

V-48	1.514E-01	2.248E-01	2.349E-01	NOT IDENT.
CR-51	-5.101E-02	6.369E-01	6.373E-01	NOT IDENT.
CO-56	-8.021E-03	4.130E-02	4.145E-02	NOT IDENT.
MN-56	-1.000E+41	5.331E+41	0.000E+00	SHORT HLIF
CO-57	8.914E-03	2.499E-02	2.532E-02	NOT IDENT.
CO-58	-1.705E-02	4.211E-02	4.281E-02	NOT IDENT.
FE-59	-2.937E-02	1.007E-01	1.015E-01	NOT IDENT.
CO-60	-1.090E-02	3.005E-02	3.045E-02	NOT IDENT.
ZN-65	1.037E-02	7.841E-02	7.854E-02	NOT IDENT.
GE-68	3.419E-01	8.327E-01	8.469E-01	NOT IDENT.
AS-73	-1.152E-01	4.740E-01	4.769E-01	NOT IDENT.
AS-74	9.732E-03	2.793E-01	2.793E-01	NOT IDENT.
SE-75	2.671E-02	4.720E-02	4.871E-02	NOT IDENT.
BR-77	1.325E+06	1.869E+06	1.962E+06	SHORT HLIF
SR-82	3.732E-01	6.798E-01	7.003E-01	NOT IDENT.
RB-83	2.589E-02	6.747E-02	6.847E-02	NOT IDENT.
KR-85	-1.007E+00	7.495E+00	7.509E+00	NOT IDENT.
SR-85	-7.721E-03	5.620E-02	5.631E-02	NOT IDENT.
RB-86	5.238E-01	1.755E+00	1.771E+00	NOT IDENT.
Y-88	-2.798E-02	2.926E-02	3.187E-02	NOT IDENT.
Y-91	-2.434E+01	2.706E+01	2.920E+01	NOT IDENT.
NB-94	-1.657E-02	2.600E-02	2.705E-02	NOT IDENT.
NB-95	-5.997E-03	4.628E-02	4.636E-02	NOT IDENT.
NB-95M	1.381E-02	1.734E-01	1.735E-01	NOT IDENT.
ZR-95	-1.058E-02	8.749E-02	8.762E-02	NOT IDENT.
NB-97	1.000E+41	1.456E+41	0.000E+00	SHORT HLIF
ZR-97	-5.149E+20	2.403E+20	0.000E+00	SHORT HLIF
MO-99	-1.988E+04	4.450E+04	4.539E+04	SHORT HLIF
TC-99M	-1.000E+41	1.343E+41	0.000E+00	SHORT HLIF
RH-101	4.651E-02	3.480E-02	4.063E-02	FAIL ABUN
RH-102	-1.189E-02	4.627E-02	4.658E-02	NOT IDENT.
RU-103	-5.531E-02	5.645E-02	6.171E-02	FAIL ABUN
RH-106	-1.759E-01	2.845E-01	2.953E-01	NOT IDENT.
RU-106	-1.759E-01	2.845E-01	2.953E-01	NOT IDENT.
AG-108M	1.445E-02	2.857E-02	2.930E-02	NOT IDENT.
AG-110M	-2.141E-02	3.434E-02	3.567E-02	NOT IDENT.
SN-113	3.079E-03	4.903E-02	4.905E-02	NOT IDENT.
CD-115	6.916E+04	2.586E+05	2.605E+05	SHORT HLIF
SN-117M	5.746E-02	2.254E-01	2.269E-01	NOT IDENT.
TE-123M	-3.408E-04	2.638E-02	2.638E-02	NOT IDENT.
SB-124	-3.886E-02	8.124E-02	8.311E-02	NOT IDENT.
SB-125	8.016E-02	8.401E-02	9.145E-02	NOT IDENT.
TE-125M	-3.441E+00	1.178E+01	1.188E+01	NOT IDENT.
I-126	-7.573E-02	1.016E+00	1.017E+00	NOT IDENT.
SB-126	-4.805E-01	7.970E-01	8.259E-01	NOT IDENT.
SB-127	-3.126E+02	4.657E+02	4.866E+02	SHORT HLIF
I-131	9.892E-01	1.704E+00	1.761E+00	NOT IDENT.
I-132	-1.000E+41	6.531E+41	0.000E+00	SHORT HLIF
TE-132	-9.412E+01	8.212E+02	8.223E+02	SHORT HLIF
BA-133	4.113E-02	4.947E-02	5.283E-02	FAIL ABUN
I-133	7.076E+13	1.432E+15	1.432E+15	SHORT HLIF
CS-134	4.260E-02	3.264E-02	3.787E-02	NOT IDENT.
CS-135	4.794E-02	1.508E-01	1.523E-01	NOT IDENT.
I-135	-1.000E+41	2.318E+43	0.000E+00	SHORT HLIF
CS-136	3.257E-01	4.597E-01	4.826E-01	NOT IDENT.
CE-139	-1.488E-02	2.788E-02	2.868E-02	NOT IDENT.
BA-140	1.724E-01	1.317E+00	1.319E+00	NOT IDENT.
LA-140	-1.795E-01	4.020E-01	4.101E-01	NOT IDENT.
CE-141	-5.678E-03	1.048E-01	1.048E-01	NOT IDENT.
CE-143	3.223E+09	1.945E+09	2.428E+09	SHORT HLIF
CE-144	3.809E-02	1.898E-01	1.906E-01	NOT IDENT.
PM-144	1.949E-02	2.839E-02	2.971E-02	NOT IDENT.
PR-144	1.522E+00	2.167E+00	2.273E+00	NOT IDENT.
PM-146	2.493E-02	3.699E-02	3.866E-02	NOT IDENT.
ND-147	-1.830E+00	3.843E+00	3.931E+00	NOT IDENT.
PM-147	1.087E+02	6.547E+02	6.565E+02	NOT IDENT.
PM-149	-1.616E+06	2.341E+06	2.451E+06	SHORT HLIF
EU-150	-3.476E-04	2.606E-02	2.606E-02	FAIL ABUN
EU-152	-6.753E-02	9.169E-02	9.662E-02	NOT IDENT.
GD-153	1.996E-02	7.437E-02	7.492E-02	NOT IDENT.
EU-154	-5.162E-02	7.916E-02	8.251E-02	NOT IDENT.
EU-155	3.072E-02	7.954E-02	8.073E-02	FAIL ABUN
TB-160	6.296E-02	1.272E-01	1.303E-01	FAIL ABUN
HO-166M	2.139E-03	4.818E-02	4.819E-02	FAIL ABUN
TM-171	-2.410E+00	7.371E+00	7.451E+00	NOT IDENT.
HF-172	2.859E-01	2.128E-01	2.488E-01	FAIL ABUN
LU-172	2.195E-02	4.146E-02	4.263E-02	FAIL ABUN
LU-176	-2.734E-02	2.379E-02	2.679E-02	FAIL ABUN

HF-181	3.203E-03	6.289E-02	6.291E-02	FAIL	ABUN
TA-182	1.474E-02	1.548E-01	1.549E-01	FAIL	ABUN
RE-183	1.153E-01	1.585E-01	1.668E-01	FAIL	ABUN
RE-184	-6.940E-02	2.083E-01	2.106E-01	FAIL	ABUN
W-188	-5.875E+00	9.473E+00	9.836E+00	FAIL	ABUN
IR-192	-2.225E-02	3.572E-02	3.710E-02	FAIL	ABUN
HG-203	2.025E-02	5.536E-02	5.611E-02	NOT	IDENT.
BI-207	7.846E-03	4.221E-02	4.236E-02	FAIL	ABUN
PB-210	-4.448E-02	1.219E+00	1.220E+00	NOT	IDENT.
PB-211	-2.712E-01	6.872E-01	6.980E-01	NOT	IDENT.
BI-212	1.019E+00	6.257E-01	7.763E-01	FAIL	ABUN
RN-219	2.113E-01	3.390E-01	3.521E-01	FAIL	ABUN
RA-223	8.697E-02	5.195E-01	5.210E-01	FAIL	ABUN
AC-227	-2.003E-01	2.031E-01	2.223E-01	FAIL	ABUN
TH-227	-2.003E-01	2.031E-01	2.223E-01	FAIL	ABUN
TH-229	3.871E-01	4.266E-01	4.609E-01	FAIL	ABUN
TH-231	8.697E-02	5.195E-01	5.210E-01	FAIL	ABUN
PA-233	2.730E-02	5.392E-02	5.531E-02	FAIL	ABUN
PA-234	1.368E-01	2.698E-01	2.768E-01	FAIL	ABUN
PA-234M	7.108E-02	2.995E+00	2.995E+00	FAIL	ABUN
U-235	7.852E-02	1.575E-01	1.614E-01	FAIL	ABUN
NP-237	2.730E-02	5.392E-02	5.531E-02	FAIL	ABUN
NP-238	1.121E+05	7.927E+05	7.943E+05	SHORT	HLIF
NP-239	1.866E-01	2.157E-01	2.315E-01	NOT	IDENT.
PU-239	6.000E+02	4.848E+02	5.552E+02	FAIL	ABUN
CM-243	-9.122E-02	8.042E-02	9.032E-02	NOT	IDENT.
BK-247	6.859E-02	7.100E-02	7.744E-02	FAIL	ABUN
CM-247	2.296E-02	3.124E-02	3.291E-02	NOT	IDENT.
CF-249	-8.703E-03	3.784E-02	3.804E-02	NOT	IDENT.
CF-251	-6.340E-02	1.144E-01	1.179E-01	NOT	IDENT.
ANH-511	-2.668E-02	3.749E-02	3.937E-02	NOT	IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	99.1905	87.09	160.0979	136.47	95.2391
45.60	95.9944	87.57	153.9602	140.51	0.0000
46.54	91.4895	88.03	123.6945	143.76	73.2962
49.72	0.0000	88.34	123.7671	144.24	88.2425
51.35	84.0253	88.47	123.7977	145.44	88.3850
51.87	93.8138	89.96	94.6857	152.43	77.6201
52.39	94.9123	1093.63	94.8056	153.25	68.4246
52.97	93.1182	91.11	94.8880	323.87	83.6052
53.44	98.0891	92.59	158.5777	156.02	77.9806
54.07	90.4681	93.35	135.5072	158.56	83.1953
57.36	0.0000	94.56	97.0791	159.00	86.7466
57.53	103.0467	94.65	97.0950	162.33	82.7097
57.98	95.7931	94.67	97.0982	162.66	82.7441
59.27	97.5770	94.87	97.1331	163.33	86.3362
59.32	97.5891	97.43	92.7787	165.86	96.3272
59.54	97.6417	98.43	100.9542	176.31	77.3178
60.96	118.7619	98.44	100.9561	176.60	77.3442
61.17	118.8217	99.53	85.6287	177.52	88.8979
62.93	122.3035	100.11	86.7864	181.07	0.0000
63.29	122.4071	102.03	88.1489	181.52	74.9062
63.58	117.5110	103.18	117.4036	184.41	80.9354
64.28	117.7032	103.37	110.9772	143.76	71.4666
66.73	112.8508	105.21	88.6256	193.51	73.9148
67.24	122.0194	105.31	88.6404	197.03	94.3528
125.81	111.5849	106.12	102.8326	198.01	92.6185
67.75	111.6024	106.47	100.7263	201.83	80.1082
69.67	122.6841	109.28	113.1634	203.43	86.7014
70.83	107.8114	111.00	97.1129	205.31	76.8923
72.81	118.9489	111.76	0.0000	210.85	83.2874
72.87	118.9644	114.06	100.8800	215.65	74.7305
74.66	136.2589	116.30	0.0000	222.11	65.8157
74.82	136.3050	116.74	86.9921	227.09	74.0766
74.97	136.3478	119.76	101.7822	227.38	63.5127
77.11	136.9569	121.12	95.7858	228.16	0.0000
78.74	148.2239	121.22	95.8008	228.18	69.6160
79.69	148.5095	121.78	91.5541	116.74	69.6160
80.12	148.6384	122.06	89.9278	235.69	92.9878
80.19	148.6589	122.92	106.7197	235.96	89.9620
80.57	148.7725	123.07	106.7441	238.63	141.4001
81.00	148.9006	265.00	98.4948	238.98	0.0000
81.07	148.9219	125.81	102.1584	240.99	111.0740
81.75	139.8031	127.23	46.9908	242.00	76.6754
83.79	140.3661	127.91	47.0380	244.70	55.3452
84.00	140.4238	129.30	84.1669	252.40	0.0000
85.43	115.7803	131.20	84.3994	252.80	59.0491
86.55	131.7095	133.02	103.2372	254.15	0.0000
86.79	131.7691	133.52	84.6809	256.23	70.8844
86.94	131.8076	136.00	91.0977	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	48.5238	355.39	0.0000	584.27	19.1807
264.80	48.5298	356.01	50.4404	595.83	30.8594
265.00	43.8409	364.49	40.1686	427.87	39.6277
268.22	65.9470	366.42	0.0000	602.52	0.0000
269.46	69.1614	372.51	45.7046	604.72	46.8064
270.03	66.8358	375.05	61.7542	607.14	40.3961
271.23	64.5440	377.52	40.5275	609.32	39.7898
273.65	82.0308	356.01	44.9832	610.33	25.8919
276.40	61.2725	388.16	56.9271	614.28	30.8031
277.37	62.3117	388.63	58.0193	618.01	21.4366
277.60	68.2598	391.69	48.4463	620.36	34.1408
278.00	67.2934	264.66	34.6519	621.93	35.1413
279.20	66.3702	401.81	35.7614	630.19	0.0000
279.54	63.4170	402.40	34.6909	631.29	30.3900
279.70	63.4258	404.85	45.1687	633.25	31.3984
280.46	74.3740	410.95	41.4199	634.78	19.6377
283.69	55.6830	413.71	29.6998	635.95	19.6479
284.31	69.6400	414.70	40.2068	636.99	21.6229
285.41	63.7285	423.72	52.7388	645.85	11.5123
285.90	0.0000	427.09	40.7369	657.76	18.1861
287.50	60.8464	427.87	35.2490	657.90	0.0000
290.67	64.0059	433.94	44.2242	661.66	19.8730
293.27	0.0000	439.40	52.1349	664.57	0.0000
351.93	65.2470	453.88	32.4453	666.33	19.9136
295.96	65.2856	463.37	40.4995	666.50	19.9150
879.38	65.4235	468.07	43.3160	667.71	0.0000
299.98	65.4969	473.00	0.0000	677.62	6.6702
300.09	65.5029	475.06	30.2006	685.70	0.0000
300.13	65.5048	476.78	48.3678	695.00	27.2142
301.36	64.5605	477.60	45.3656	696.49	20.1714
302.85	48.4775	482.18	36.3857	696.51	20.1719
256.23	50.1593	487.02	39.5242	697.00	24.2109
304.85	50.1729	492.35	0.0000	697.30	28.2495
306.78	69.4692	497.08	39.4380	697.49	30.2703
308.46	56.8075	505.52	51.5963	702.65	29.3243
311.90	47.8061	507.63	0.0000	706.68	26.3345
316.51	47.9768	511.00	36.9631	711.68	24.3592
319.41	40.9216	514.00	66.6404	720.70	27.6511
320.08	42.9895	514.00	66.6404	721.93	0.0000
321.04	49.1675	520.40	23.2172	722.78	20.3916
323.87	48.2464	520.69	0.0000	722.91	15.2948
325.23	53.4338	522.65	0.0000	723.31	15.2970
328.76	62.8476	527.90	0.0000	724.19	11.9019
333.37	49.6238	528.26	27.9756	727.33	23.4941
333.97	52.9555	529.59	33.5944	733.00	35.8340
334.37	44.6944	529.87	0.0000	735.93	23.9172
338.28	40.4651	531.02	38.2884	333.97	19.3736
338.32	40.4663	537.26	30.9174	739.50	0.0000
311.90	38.2437	546.56	0.0000	747.24	21.6229
340.48	38.2437	552.55	31.1583	748.06	31.9294
340.55	38.2454	563.25	23.7311	752.31	23.7294
344.28	53.3555	569.33	30.4672	753.82	21.6793
345.93	36.1689	946.00	33.3260	756.73	26.8715
351.06	55.2903	569.70	33.3295	756.80	26.8722
351.93	53.6480	583.19	25.8807	884.68	19.6921

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	24.8924	1274.44	16.0575	1620.50	7.5315
766.42	20.7485	1001.03	17.8237	1621.92	2.8252
766.84	22.8271	1002.74	17.6993	1678.03	0.0000
772.60	0.0000	1004.73	12.8800	1690.97	5.7315
776.52	19.7886	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	3.8774
778.90	29.1888	1028.54	0.0000	1063.66	5.0947
783.70	0.0000	1037.84	12.3346	1771.35	13.5889
785.37	22.9904	1038.76	0.0000	1791.20	0.0000
792.07	19.9059	631.29	21.8807	1808.65	3.9107
794.95	14.6836	1048.07	12.3726	1810.72	0.0000
795.86	12.5903	1049.04	14.2804	1836.06	5.8968
810.06	26.3696	1050.41	15.2389		
810.29	23.2074	1063.66	14.3433		
344.28	22.1536	1077.00	10.5600		
810.76	22.1561	1077.34	8.6411		
815.77	11.6273	1085.87	7.7002		
1048.07	17.9874	1093.63	8.6825		
832.01	17.7222	1099.45	14.4952		
834.85	26.6107	1112.07	17.4573		
835.71	25.5545	1112.84	14.9671		
836.80	0.0000	1115.54	14.9784		
846.75	0.0000	1120.29	24.9986		
846.77	20.3114	1120.55	24.9997		
856.80	16.0928	1221.41	16.6706		
860.56	18.2630	1129.67	24.3693		
871.09	20.4872	1131.51	0.0000		
873.19	15.1071	1147.95	0.0000		
875.33	0.0000	1173.23	13.8137		
879.38	11.8954	1177.95	9.8796		
880.51	6.0102	1189.05	7.9277		
883.24	18.0477	1204.77	22.1787		
884.68	10.8340	1221.41	13.9949		
889.28	21.7026	1231.02	23.0505		
894.76	18.1195	1235.36	18.0601		
898.04	14.5120	1238.28	15.0616		
900.72	20.6982	1260.41	0.0000		
903.28	20.2490	1271.87	8.1035		
911.20	22.9590	1274.44	13.1767		
912.08	18.2267	1274.54	15.2045		
923.98	0.0000	1291.59	6.1084		
926.50	9.8901	1298.22	0.0000		
929.11	20.8972	1312.11	16.3737		
937.49	22.0586	1332.49	10.2856		
944.13	7.8953	1362.66	0.0000		
946.00	7.9002	1365.19	9.3314		
949.00	18.4517	1368.63	0.0000		
667.71	0.0000	1384.29	19.6421		
962.31	17.4729	1408.01	11.5228		
964.08	12.7148	1457.56	0.0000		
966.17	27.0374	1460.82	7.4235		
911.20	19.5004	1489.16	6.4043		
968.97	19.5004	1505.03	14.9963		
983.53	13.0609	1584.12	6.5393		
984.45	0.0000	1596.21	9.3663		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:43:35.78

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677015.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;251
Background date    : 26-JUN-2016 12:05:29
Sample date       : 11-MAY-2016 11:15:00 Acquisition date : 28-JUN-2016 14:37:15
Sample ID        : G398677015 Sample quantity : 1.48820E+02 GRAM
Detector name    : GAM28 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.31 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.61*	12	119	1.15	95.26	90	11	3.21E-03	192.2	
2	0	60.74	24	84	1.17	121.54	116	8	6.67E-03	69.2	
3	0	63.59*	26	104	0.72	127.25	124	8	7.27E-03	73.0	
4	4	74.97	65	154	1.63	150.03	144	16	1.81E-02	38.5	3.15E+00
5	4	77.38	166	103	1.34	154.85	144	16	4.62E-02	13.5	
6	3	84.32*	27	72	1.50	168.74	165	28	7.64E-03	56.2	1.00E+00
7	3	87.41	69	90	1.45	174.93	165	28	1.91E-02	27.8	
8	3	90.15*	46	68	1.17	180.41	165	28	1.27E-02	34.3	
9	3	92.91*	62	84	1.52	185.94	165	28	1.73E-02	33.6	
10	0	186.84*	54	98	1.46	373.93	369	13	1.49E-02	42.4	
11	0	210.07	5	117	1.09	420.43	415	10	1.32E-03	429.3	
12	2	238.77*	254	48	1.22	477.88	473	19	7.05E-02	7.9	7.98E-01
13	2	242.05	78	73	1.63	484.43	473	19	2.18E-02	23.4	
14	0	251.54	26	90	4.24	503.43	492	16	7.34E-03	83.3	
15	0	295.22	88	68	1.21	590.85	584	11	2.44E-02	21.2	
16	0	299.98	25	39	1.86	600.39	597	9	6.87E-03	49.6	
17	0	338.65*	44	56	1.39	677.79	673	9	1.23E-02	34.4	
18	0	352.21*	170	41	1.67	704.91	697	17	4.72E-02	11.8	
19	0	463.64	27	38	1.46	927.94	921	14	7.62E-03	53.1	
20	0	554.35	21	21	3.68	1109.50	1104	11	5.75E-03	48.9	
21	0	583.06*	79	21	1.56	1166.97	1161	12	2.19E-02	16.7	
22	0	609.57	96	29	1.42	1220.03	1215	11	2.65E-02	15.4	
23	0	661.80*	196	17	1.87	1324.55	1319	12	5.44E-02	8.6	
24	0	708.68	29	13	4.04	1418.39	1411	17	8.15E-03	36.4	
25	0	796.64	12	18	0.86	1594.44	1587	11	3.22E-03	78.5	
26	0	836.08	14	6	1.74	1673.38	1669	9	3.77E-03	43.7	
27	0	859.31	24	3	4.45	1719.87	1714	12	6.65E-03	25.1	
28	0	871.99	10	9	4.19	1745.25	1738	11	2.65E-03	73.7	
29	0	902.23	10	21	5.05	1805.78	1795	17	2.78E-03	110.1	
30	0	910.90*	49	9	1.69	1823.14	1817	12	1.35E-02	20.3	
31	0	968.75*	38	16	1.79	1938.93	1933	11	1.05E-02	27.0	
32	0	1000.30*	18	3	3.63	2002.07	1995	14	4.94E-03	34.8	
33	0	1074.04	12	0	1.40	2149.67	2146	7	3.33E-03	28.9	
34	0	1104.66	8	6	1.40	2210.94	2207	8	2.32E-03	61.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1120.84	16	23	4.59	2243.32	2233	15	4.31E-03	71.4	
36	0	1129.24	15	0	1.58	2260.13	2255	10	4.17E-03	25.8	
37	0	1235.39	12	3	1.45	2472.60	2467	10	3.19E-03	39.1	
38	0	1239.75	19	0	4.32	2481.32	2476	12	5.28E-03	22.9	
39	0	1341.56	5	8	0.60	2685.09	2677	11	1.28E-03	129.4	
40	0	1460.43	146	4	2.01	2923.01	2914	16	4.04E-02	8.9	
41	0	1763.79	17	7	1.07	3530.19	3524	9	4.72E-03	36.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:43:37

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677015.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:15:00 Acquisition date : 28-JUN-2016 14:37:15
Sample ID         : G398677015 Sample quantity  : 148.82 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA28 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.31 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated : No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.248E+00	5.322E+00	5.322E+00	17.70	OK
MN-54	834.85	99.98*	1.989E+00	3.517E-02	3.914E-02	87.39	OK
CD-109	88.03	3.70*	5.509E+00	1.562E+00	1.680E+00	77.58	OK
SN-126	64.28	9.60	3.068E+00	5.767E-01	5.767E-01	145.97	OK
	86.94	8.90	5.509E+00	6.495E-01	6.495E-01	77.58	OK
	87.57	37.00*	5.509E+00	1.562E-01	1.562E-01	77.58	OK
BA-137M	661.66	89.90*	2.389E+00	4.808E-01	4.823E-01	17.12	OK
CS-137	661.66	85.10*	2.389E+00	5.080E-01	5.095E-01	17.12	OK
TL-208	277.37	6.60	4.546E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.632E+00	1.882E-01	1.882E-01	33.46	OK
	860.56	12.50	1.945E+00	5.054E-01	5.054E-01	50.15	OK
PB-210	46.54	4.25*	1.024E+00	1.760E+00	1.767E+00	384.45	OK
BI-211	72.87	1.23	4.205E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.827E+00	2.052E-01	2.052E-01	418.15	OK
PB-212	74.82	10.28	4.432E+00	5.627E-01	5.627E-01	127.94	OK
	77.11	17.10	4.677E+00	1.327E+00	1.327E+00	27.05	OK
	238.63	43.60*	5.037E+00	6.700E-01	6.700E-01	15.89	OK
	300.09	3.30	4.299E+00	9.901E-01	9.901E-01	99.11	OK
BI-214	609.32	45.49*	2.545E+00	4.388E-01	4.389E-01	30.74	OK
	1120.29	14.92	1.562E+00	3.325E-01	3.325E-01	142.74	OK
	1764.49	15.30	1.067E+00	4.962E-01	4.962E-01	73.65	OK
PB-214	74.82	5.80	4.416E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.677E+00	2.339E+00	2.339E+00	27.05	OK
	87.09	3.41	5.488E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.993E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.349E+00	6.239E-01	6.239E-01	42.31	OK
	351.93	35.60*	3.829E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.545E+00	4.388E-01	4.389E-01	30.74	OK
	1120.29	14.92	1.562E+00	3.325E-01	3.325E-01	142.74	OK
	1764.49	15.30	1.067E+00	4.962E-01	4.962E-01	73.65	OK
RA-224	240.99	4.10*	4.992E+00	1.118E+00	1.118E+00	101.82	OK
RA-226	609.32	45.49*	2.545E+00	4.388E-01	4.389E-01	30.74	OK
	1120.29	14.92	1.562E+00	3.325E-01	3.325E-01	142.74	OK
	1764.49	15.30	1.067E+00	4.962E-01	4.962E-01	73.65	OK
AC-228	105.21	1.10	6.331E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.938E+00	5.599E-01	5.599E-01	68.86	OK
	794.95	4.25	2.070E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.989E+00	2.184E+00	2.184E+00	87.39	OK
	911.20	25.80*	1.856E+00	5.182E-01	5.182E-01	40.51	OK
	968.97	15.80	1.764E+00	6.859E-01	6.859E-01	54.02	OK
RA-228	105.21	1.10	6.331E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.938E+00	5.599E-01	5.599E-01	68.86	OK
	794.95	4.25	2.070E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.989E+00	2.184E+00	2.184E+00	87.39	OK
	911.20	25.80*	1.856E+00	5.182E-01	5.182E-01	40.51	OK
	968.97	15.80	1.764E+00	6.859E-01	6.859E-01	54.02	OK
TH-228	74.82	10.28	4.432E+00	5.627E-01	5.627E-01	127.94	OK
	77.11	17.10	4.677E+00	1.327E+00	1.327E+00	27.05	OK
	238.63	43.60*	5.037E+00	6.700E-01	6.700E-01	15.89	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	300.09	3.30	4.299E+00	9.901E-01	9.901E-01	99.11	OK
	85.43	14.70	5.285E+00	2.244E-01	2.245E-01	112.30	OK
	88.47	24.00	5.509E+00	2.409E-01	2.409E-01	77.58	OK
	193.51	4.41*	5.733E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	5.466E+00	1.821E-01	1.821E-01	858.52	OK
	609.32	45.49*	2.545E+00	4.388E-01	4.388E-01	30.74	OK
	1120.29	14.92	1.562E+00	3.325E-01	3.325E-01	142.74	OK
	1764.49	15.30	1.067E+00	4.962E-01	4.962E-01	73.65	OK
PA-231	283.69	1.70	4.474E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	4.299E+00	6.107E-01	6.107E-01	99.11	OK
	105.21	1.10	6.331E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.938E+00	5.599E-01	5.599E-01	68.86	OK
	835.71	1.61	1.989E+00	2.184E+00	2.184E+00	87.39	OK
TH-234	911.20	25.80*	1.856E+00	5.182E-01	5.182E-01	40.51	OK
	968.97	15.80	1.764E+00	6.859E-01	6.859E-01	54.02	OK
	63.29	3.70*	3.068E+00	1.496E+00	1.496E+00	145.97	OK
	92.59	4.23	5.844E+00	1.583E+00	1.583E+00	67.23	OK
U-234	609.32	45.49*	2.545E+00	4.388E-01	4.388E-01	30.74	OK
	1120.29	14.92	1.562E+00	3.325E-01	3.325E-01	142.74	OK
	1764.49	15.30	1.067E+00	4.962E-01	4.962E-01	73.65	OK
U-235	89.96	3.47	5.686E+00	1.457E+00	1.457E+00	68.66	OK
	93.35	5.60	5.844E+00	1.195E+00	1.195E+00	67.23	OK
	143.76	10.96*	6.480E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.221E+00	----- Line	Not Found	-----	Absent
U-238	185.72	57.20	5.843E+00	9.541E-02	9.541E-02	84.82	OK
	205.31	5.01	5.541E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.068E+00	1.496E+00	1.496E+00	145.97	OK
	92.59	4.23	5.844E+00	1.583E+00	1.583E+00	67.23	OK
AM-241	59.54	35.90*	2.689E+00	1.619E-01	1.619E-01	138.44	OK
AM-243	43.53	5.90	6.298E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.432E+00	8.609E-02	8.609E-02	127.94	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677015.CNF;1
Acquisition date : 28-JUN-2016 14:37:15 Sensitivity : 3.000
Detector ID : GAM28 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.31 Half life ratio : *****
Sample date : 11-MAY-2016 11:15:00 Analyst initials: MXR1
Sample ID : G398677015 Sample Quantity : 1.4882E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 27-JUL-2015 07:57:17 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.322E+00	9.232E-01	4.425E-01
MN-54	3.914E-02	3.352E-02	6.469E-02
CD-109	1.680E+00	1.277E+00	1.186E+00
SN-126	1.562E-01	1.188E-01	1.109E-01
BA-137M	4.823E-01	8.091E-02	6.329E-02
CS-137	5.095E-01	8.547E-02	6.685E-02
TL-208	1.882E-01	6.170E-02	5.544E-02
PB-210	1.767E+00	6.659E+00	6.226E+00
BI-211	2.052E-01	8.409E-01	3.467E-01
PB-212	6.700E-01	1.043E-01	9.789E-02
BI-214	4.389E-01	1.322E-01	1.280E-01
PB-214	6.984E-01	1.620E-01	2.494E-01
RN-222	4.389E-01	1.322E-01	1.280E-01
RA-224	1.118E+00	1.115E+00	1.049E+00
RA-226	4.389E-01	1.322E-01	1.280E-01
AC-228	5.182E-01	2.057E-01	2.883E-01
RA-228	5.182E-01	2.057E-01	2.883E-01
TH-228	6.700E-01	1.043E-01	9.789E-02
TH-229	5.722E-02	5.145E-01	8.750E-01
TH-230	4.388E-01	1.322E-01	1.280E-01
PA-231	6.107E-01	5.932E-01	7.725E-01
TH-232	5.182E-01	2.057E-01	2.883E-01
TH-234	1.496E+00	2.140E+00	2.010E+00
U-234	4.388E-01	1.322E-01	1.280E-01
U-235	-9.102E-03	1.874E-01	3.598E-01
U-238	1.496E+00	2.140E+00	2.010E+00
AM-241	1.619E-01	2.197E-01	2.585E-01
AM-243	8.609E-02	1.079E-01	8.974E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.925E-01	5.160E-01	1.044E+00	NOT IDENT.
NA-22	-9.991E-03	4.160E-02	7.733E-02	NOT IDENT.

NA-24	0.000E+00	4.169E+21	0.000E+00	SHORT HLIF
AL-26	5.203E-03	2.481E-02	5.814E-02	FAIL ABUN
SC-46	1.617E-02	3.772E-02	8.184E-02	FAIL ABUN
V-48	-1.419E-01	2.305E-01	4.149E-01	NOT IDENT.
CR-51	-5.018E-01	8.339E-01	1.462E+00	NOT IDENT.
CO-56	8.308E-03	4.942E-02	9.600E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.166E-02	2.574E-02	5.173E-02	NOT IDENT.
CO-58	-2.902E-02	4.326E-02	7.383E-02	NOT IDENT.
FE-59	-7.371E-02	1.363E-01	1.999E-01	NOT IDENT.
CO-60	-6.276E-03	3.443E-02	6.091E-02	NOT IDENT.
ZN-65	-9.362E-03	9.926E-02	1.625E-01	NOT IDENT.
GE-68	2.397E-01	1.239E+00	2.226E+00	NOT IDENT.
AS-73	-4.313E-01	9.928E-01	1.839E+00	NOT IDENT.
AS-74	-6.962E-02	2.864E-01	5.316E-01	NOT IDENT.
SE-75	-2.132E-02	4.621E-02	8.363E-02	NOT IDENT.
BR-77	0.000E+00	2.480E+05	0.000E+00	SHORT HLIF
SR-82	2.232E-02	6.466E-01	1.263E+00	NOT IDENT.
RB-83	5.387E-02	8.611E-02	1.780E-01	NOT IDENT.
KR-85	-1.251E+01	9.803E+00	1.656E+01	NOT IDENT.
SR-85	-9.409E-02	7.350E-02	1.241E-01	NOT IDENT.
RB-86	8.745E-01	2.515E+00	4.642E+00	NOT IDENT.
Y-88	1.387E-04	1.847E-02	4.957E-02	NOT IDENT.
Y-91	7.403E+00	2.391E+01	4.924E+01	NOT IDENT.
NB-94	2.161E-03	3.421E-02	5.723E-02	FAIL ABUN
NB-95	7.256E-03	5.014E-02	9.781E-02	NOT IDENT.
NB-95M	-1.422E-01	1.858E-01	2.803E-01	NOT IDENT.
ZR-95	2.413E-02	8.774E-02	1.754E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.966E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.047E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.025E+41	0.000E+00	SHORT HLIF
RH-101	-1.816E-02	3.032E-02	5.675E-02	NOT IDENT.
RH-102	-1.884E-02	4.698E-02	8.611E-02	NOT IDENT.
RU-103	3.023E-02	6.353E-02	1.303E-01	FAIL ABUN
RH-106	-4.418E-02	3.141E-01	5.927E-01	NOT IDENT.
RU-106	-4.418E-02	3.141E-01	5.927E-01	NOT IDENT.
AG-108M	-8.655E-03	2.901E-02	5.469E-02	NOT IDENT.
AG-110M	1.557E-02	4.221E-02	8.982E-02	NOT IDENT.
SN-113	-1.060E-02	5.279E-02	9.549E-02	NOT IDENT.
CD-115	0.000E+00	2.816E+05	0.000E+00	SHORT HLIF
SN-117M	9.654E-02	2.687E-01	5.300E-01	NOT IDENT.
TE-123M	-1.408E-03	3.154E-02	6.053E-02	NOT IDENT.
SB-124	2.308E-03	7.848E-02	1.805E-01	NOT IDENT.
SB-125	7.664E-02	8.903E-02	1.868E-01	FAIL ABUN
TE-125M	-1.690E+01	1.340E+01	2.418E+01	NOT IDENT.
I-126	-1.819E-01	1.366E+00	2.205E+00	NOT IDENT.
SB-126	3.016E-01	8.812E-01	1.743E+00	NOT IDENT.
SB-127	0.000E+00	4.229E+02	0.000E+00	SHORT HLIF
I-131	1.571E+00	1.855E+00	3.768E+00	NOT IDENT.
I-132	0.000E+00	1.944E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.167E+02	0.000E+00	SHORT HLIF
BA-133	4.683E-02	3.780E-02	7.451E-02	NOT IDENT.
I-133	0.000E+00	1.557E+15	0.000E+00	SHORT HLIF
CS-134	3.553E-02	5.467E-02	8.644E-02	FAIL ABUN
CS-135	-2.387E-03	1.464E-01	2.743E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	1.206E-01	5.562E-01	1.121E+00	FAIL ABUN
CE-139	-1.213E-02	3.288E-02	6.150E-02	NOT IDENT.
BA-140	-5.772E-01	1.341E+00	2.478E+00	NOT IDENT.
LA-140	3.164E-02	4.757E-01	9.976E-01	NOT IDENT.
CE-141	3.906E-02	1.236E-01	2.420E-01	NOT IDENT.
CE-143	0.000E+00	2.491E+09	0.000E+00	SHORT HLIF
CE-144	7.962E-02	1.971E-01	3.931E-01	NOT IDENT.
PM-144	1.028E-02	3.437E-02	6.777E-02	NOT IDENT.
PR-144	7.528E-01	2.613E+00	5.147E+00	NOT IDENT.
PM-146	-3.194E-02	4.505E-02	8.095E-02	NOT IDENT.
ND-147	-3.838E-01	3.942E+00	7.595E+00	FAIL ABUN
PM-147	-1.534E+02	7.078E+02	1.364E+03	NOT IDENT.
PM-149	0.000E+00	2.764E+06	0.000E+00	SHORT HLIF
EU-150	-7.837E-03	2.972E-02	4.649E-02	FAIL ABUN
EU-152	5.556E-02	1.045E-01	1.901E-01	NOT IDENT.
GD-153	-4.488E-02	9.440E-02	1.468E-01	NOT IDENT.
EU-154	-2.575E-02	1.163E-01	2.167E-01	FAIL ABUN
EU-155	5.733E-02	1.023E-01	2.077E-01	FAIL ABUN
TB-160	-4.599E-02	1.349E-01	2.461E-01	FAIL ABUN
HO-166M	1.009E-02	4.823E-02	8.652E-02	NOT IDENT.
TM-171	5.531E+00	1.720E+01	3.074E+01	NOT IDENT.

HF-172	-1.623E-01	1.842E-01	3.383E-01	FAIL ABUN
LU-172	1.695E-02	4.898E-02	1.040E-01	FAIL ABUN
LU-176	7.158E-03	2.467E-02	4.751E-02	FAIL ABUN
HF-181	-2.190E-04	7.882E-02	1.515E-01	NOT IDENT.
TA-182	8.102E-02	1.685E-01	3.584E-01	FAIL ABUN
RE-183	-1.140E-01	2.803E-01	4.555E-01	FAIL ABUN
RE-184	1.842E-01	3.977E-01	4.350E-01	FAIL ABUN
W-188	-1.823E+00	1.151E+01	1.841E+01	FAIL ABUN
IR-192	-2.405E-02	4.498E-02	7.954E-02	FAIL ABUN
HG-203	3.879E-02	6.067E-02	1.195E-01	NOT IDENT.
BI-207	1.176E-02	4.419E-02	9.071E-02	FAIL ABUN
PB-211	-4.785E-01	6.185E-01	1.117E+00	NOT IDENT.
BI-212	2.149E-01	4.969E-01	9.878E-01	NOT IDENT.
RN-219	5.652E-02	3.638E-01	7.227E-01	NOT IDENT.
RA-223	-1.033E-01	6.653E-01	1.215E+00	FAIL ABUN
AC-227	-2.077E-01	2.906E-01	4.373E-01	FAIL ABUN
TH-227	-2.077E-01	2.906E-01	4.373E-01	FAIL ABUN
TH-231	-1.033E-01	6.653E-01	1.215E+00	FAIL ABUN
PA-233	-5.943E-03	6.193E-02	1.146E-01	FAIL ABUN
PA-234	1.927E-02	2.574E-01	5.165E-01	NOT IDENT.
PA-234M	6.231E+00	4.247E+00	8.785E+00	FAIL ABUN
NP-237	-5.943E-03	6.193E-02	1.146E-01	FAIL ABUN
NP-238	0.000E+00	7.615E+05	0.000E+00	SHORT HLIF
NP-239	-1.147E-01	2.531E-01	4.810E-01	NOT IDENT.
PU-239	2.644E+02	3.183E+02	6.500E+02	NOT IDENT.
CM-243	-2.035E-02	1.138E-01	2.052E-01	NOT IDENT.
BK-247	-2.441E-02	6.946E-02	1.271E-01	FAIL ABUN
CM-247	-8.313E-03	3.344E-02	6.386E-02	NOT IDENT.
CF-249	5.350E-02	3.692E-02	7.906E-02	FAIL ABUN
CF-251	2.356E-02	1.159E-01	2.261E-01	NOT IDENT.
ANH-511	-2.437E-02	4.616E-02	9.812E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	140	10.66*	1.248E+00	5.322E+00	5.322E+00	17.70
MN-54	834.85	14	99.98*	1.989E+00	3.517E-02	3.914E-02	87.39
CD-109	88.03	86	3.70*	5.509E+00	2.137E+00	2.298E+00	55.55
SN-126	64.28	34	9.60	3.068E+00	5.767E-01	5.767E-01	145.97
	86.94	86	8.90	5.509E+00	8.886E-01	8.886E-01	55.55
	87.57	86	37.00*	5.509E+00	2.137E-01	2.137E-01	55.55
BA-137M	661.66	205	89.90*	2.389E+00	4.808E-01	4.823E-01	17.12
CS-137	661.66	205	85.10*	2.389E+00	5.080E-01	5.095E-01	17.12
TL-208	277.37	-----	6.60	4.546E+00	-----	Line Not Found	-----
	583.19	83	85.00*	2.632E+00	1.882E-01	1.882E-01	33.46
	860.56	24	12.50	1.945E+00	5.054E-01	5.054E-01	50.15
PB-210	46.54	15	4.25*	1.024E+00	1.760E+00	1.767E+00	384.45
BI-211	72.87	-----	1.23	4.205E+00	-----	Line Not Found	-----
	351.06	189	12.92*	3.827E+00	1.924E+00	1.924E+00	23.66
PB-212	74.82	83	10.28	4.432E+00	9.147E-01	9.147E-01	77.00
	77.11	210	17.10	4.677E+00	1.327E+00	1.327E+00	27.05
	238.63	292	43.60*	5.037E+00	6.700E-01	6.700E-01	15.89
	300.09	28	3.30	4.299E+00	9.901E-01	9.901E-01	99.11
BI-214	609.32	101	45.49*	2.545E+00	4.388E-01	4.389E-01	30.74
	1120.29	15	14.92	1.562E+00	3.325E-01	3.325E-01	142.74
	1764.49	16	15.30	1.067E+00	4.962E-01	4.962E-01	73.65
PB-214	74.82	83	5.80	4.432E+00	1.621E+00	1.621E+00	77.00
	77.11	210	9.70	4.677E+00	2.339E+00	2.339E+00	27.05
	87.09	86	3.41	5.509E+00	2.319E+00	2.319E+00	55.55
	242.00	90	7.25	4.992E+00	1.256E+00	1.256E+00	46.73
	295.22	99	18.42	4.349E+00	6.239E-01	6.239E-01	42.31
	351.93	189	35.60*	3.827E+00	6.984E-01	6.984E-01	23.66
RN-222	609.32	101	45.49*	2.545E+00	4.388E-01	4.389E-01	30.74
	1120.29	15	14.92	1.562E+00	3.325E-01	3.325E-01	142.74
	1764.49	16	15.30	1.067E+00	4.962E-01	4.962E-01	73.65
RA-224	240.99	90	4.10*	4.992E+00	2.221E+00	2.221E+00	46.73
RA-226	609.32	101	45.49*	2.545E+00	4.388E-01	4.389E-01	30.74
	1120.29	15	14.92	1.562E+00	3.325E-01	3.325E-01	142.74
	1764.49	16	15.30	1.067E+00	4.962E-01	4.962E-01	73.65
AC-228	105.21	-----	1.10	6.331E+00	-----	Line Not Found	-----
	338.32	49	11.27	3.938E+00	5.599E-01	5.599E-01	68.86
	794.95	-----	4.25	2.070E+00	-----	Line Not Found	-----
	835.71	14	1.61	1.989E+00	2.184E+00	2.184E+00	87.39
	911.20	49	25.80*	1.856E+00	5.182E-01	5.182E-01	40.51
	968.97	38	15.80	1.764E+00	6.859E-01	6.859E-01	54.02
RA-228	105.21	-----	1.10	6.331E+00	-----	Line Not Found	-----
	338.32	49	11.27	3.938E+00	5.599E-01	5.599E-01	68.86
	794.95	-----	4.25	2.070E+00	-----	Line Not Found	-----
	835.71	14	1.61	1.989E+00	2.184E+00	2.184E+00	87.39
	911.20	49	25.80*	1.856E+00	5.182E-01	5.182E-01	40.51
	968.97	38	15.80	1.764E+00	6.859E-01	6.859E-01	54.02
TH-228	74.82	83	10.28	4.432E+00	9.147E-01	9.147E-01	77.00

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	210	17.10	4.677E+00	1.327E+00	1.327E+00	27.05
	238.63	292	43.60*	5.037E+00	6.700E-01	6.700E-01	15.89
	300.09	28	3.30	4.299E+00	9.901E-01	9.901E-01	99.11
TH-229	85.43	35	14.70	5.285E+00	2.244E-01	2.245E-01	112.30
	88.47	86	24.00	5.509E+00	3.295E-01	3.295E-01	55.55
	193.51	-----	4.41*	5.733E+00	-----	Line Not Found	-----
	210.85	6	2.80	5.466E+00	1.821E-01	1.821E-01	858.52
TH-230	609.32	101	45.49*	2.545E+00	4.388E-01	4.388E-01	30.74
	1120.29	15	14.92	1.562E+00	3.325E-01	3.325E-01	142.74
	1764.49	16	15.30	1.067E+00	4.962E-01	4.962E-01	73.65
PA-231	283.69	-----	1.70	4.474E+00	-----	Line Not Found	-----
	301.36	28	5.35*	4.299E+00	6.107E-01	6.107E-01	99.11
TH-232	105.21	-----	1.10	6.331E+00	-----	Line Not Found	-----
	338.32	49	11.27	3.938E+00	5.599E-01	5.599E-01	68.86
	835.71	14	1.61	1.989E+00	2.184E+00	2.184E+00	87.39
	911.20	49	25.80*	1.856E+00	5.182E-01	5.182E-01	40.51
	968.97	38	15.80	1.764E+00	6.859E-01	6.859E-01	54.02
TH-234	63.29	34	3.70*	3.068E+00	1.496E+00	1.496E+00	145.97
	92.59	78	4.23	5.844E+00	1.583E+00	1.583E+00	67.23
U-234	609.32	101	45.49*	2.545E+00	4.388E-01	4.388E-01	30.74
	1120.29	15	14.92	1.562E+00	3.325E-01	3.325E-01	142.74
	1764.49	16	15.30	1.067E+00	4.962E-01	4.962E-01	73.65
U-235	89.96	57	3.47	5.686E+00	1.457E+00	1.457E+00	68.66
	93.35	78	5.60	5.844E+00	1.195E+00	1.195E+00	67.23
	143.76	-----	10.96*	6.480E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.221E+00	-----	Line Not Found	-----
	185.72	63	57.20	5.843E+00	9.541E-02	9.541E-02	84.82
	205.31	-----	5.01	5.541E+00	-----	Line Not Found	-----
U-238	63.29	34	3.70*	3.068E+00	1.496E+00	1.496E+00	145.97
	92.59	78	4.23	5.844E+00	1.583E+00	1.583E+00	67.23
AM-241	59.54	31	35.90*	2.689E+00	1.619E-01	1.619E-01	138.44
AM-243	43.53	-----	5.90	6.298E-01	-----	Line Not Found	-----
	74.66	83	67.20*	4.432E+00	1.399E-01	1.399E-01	77.00

Flag: "*" = Keyline

Total number of lines in spectrum 41
Number of unidentified lines 5
Number of lines tentatively identified by NID 36 87.80%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.322E+00	5.322E+00	0.942E+00	17.70	
MN-54	312.05D	1.11	3.517E-02	3.914E-02	3.421E-02	87.39	
CD-109	461.40D	1.08	2.137E+00	2.298E+00	1.277E+00	55.55	
SN-126	2.30E+05Y	1.00	2.137E-01	2.137E-01	1.187E-01	55.55	
BA-137M	30.08Y	1.00	4.808E-01	4.823E-01	0.826E-01	17.12	
CS-137	30.08Y	1.00	5.080E-01	5.095E-01	0.872E-01	17.12	
TL-208	1.41E+10Y	1.00	1.882E-01	1.882E-01	0.630E-01	33.46	
PB-210	22.20Y	1.00	1.760E+00	1.767E+00	6.795E+00	384.45	
BI-211	7.04E+08Y	1.00	1.924E+00	1.924E+00	0.455E+00	23.66	
PB-212	1.41E+10Y	1.00	6.700E-01	6.700E-01	1.065E-01	15.89	
BI-214	1600.00Y	1.00	4.388E-01	4.389E-01	1.349E-01	30.74	
PB-214	1600.00Y	1.00	6.984E-01	6.984E-01	1.653E-01	23.66	
RN-222	1600.00Y	1.00	4.388E-01	4.389E-01	1.349E-01	30.74	
RA-224	1.41E+10Y	1.00	2.221E+00	2.221E+00	1.038E+00	46.73	
RA-226	1600.00Y	1.00	4.388E-01	4.389E-01	1.349E-01	30.74	
AC-228	1.41E+10Y	1.00	5.182E-01	5.182E-01	2.099E-01	40.51	
RA-228	1.41E+10Y	1.00	5.182E-01	5.182E-01	2.099E-01	40.51	
TH-228	1.41E+10Y	1.00	6.700E-01	6.700E-01	1.065E-01	15.89	
TH-229	7340.00Y	1.00	3.295E-01	3.295E-01	1.831E-01	55.55	K
TH-230	7.54E+04Y	1.00	4.388E-01	4.388E-01	1.349E-01	30.74	
PA-231	7.04E+08Y	1.00	6.107E-01	6.107E-01	6.053E-01	99.11	
TH-232	1.41E+10Y	1.00	5.182E-01	5.182E-01	2.099E-01	40.51	
TH-234	4.47E+09Y	1.00	1.496E+00	1.496E+00	2.184E+00	145.97	
U-234	2.45E+05Y	1.00	4.388E-01	4.388E-01	1.349E-01	30.74	
U-235	7.04E+08Y	1.00	9.541E-02	9.541E-02	8.093E-02	84.82	K
U-238	4.47E+09Y	1.00	1.496E+00	1.496E+00	2.184E+00	145.97	
AM-241	432.60Y	1.00	1.619E-01	1.619E-01	2.241E-01	138.44	
AM-243	7370.00Y	1.00	1.399E-01	1.399E-01	1.078E-01	77.00	
Total Activity :			2.491E+01	2.508E+01			

Grand Total Activity : 2.491E+01 2.508E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	251.54	30	103	4.24	503.43	492	16	7.34E-03	****	4.86E+00	T
0	463.64	30	41	1.46	927.94	921	14	7.62E-03	****	3.12E+00	T
0	554.35	22	23	3.68	1109.50	1104	11	5.75E-03	97.8	2.73E+00	
0	708.68	30	13	4.04	1418.39	1411	17	8.15E-03	72.9	2.27E+00	
0	796.64	12	19	0.86	1594.44	1587	11	3.22E-03	****	2.07E+00	T
0	871.99	10	10	4.19	1745.25	1738	11	2.65E-03	****	1.92E+00	T
0	902.23	10	21	5.05	1805.78	1795	17	2.78E-03	****	1.87E+00	T
0	1000.30	18	3	3.63	2002.07	1995	14	4.94E-03	69.6	1.72E+00	T
0	1074.04	12	0	1.40	2149.67	2146	7	3.33E-03	57.7	1.62E+00	
0	1104.66	8	6	1.40	2210.94	2207	8	2.32E-03	****	1.58E+00	
0	1129.24	15	0	1.58	2260.13	2255	10	4.17E-03	51.6	1.55E+00	T
0	1235.39	11	2	1.45	2472.60	2467	10	3.19E-03	78.3	1.44E+00	T
0	1239.75	19	0	4.32	2481.32	2476	12	5.28E-03	45.9	1.43E+00	T
0	1341.56	4	8	0.60	2685.09	2677	11	1.28E-03	****	1.34E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677015.CNF;1
Acquisition date : 28-JUN-2016 14:37:15 Sensitivity : 3.000
Detector ID : GAM28 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.31 Half life ratio : *****
Sample date : 11-MAY-2016 11:15:00 Nuclide Library : SOLID
Sample ID : G398677015 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.4882E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 27-JUL-2015 07:57:17 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.696E-01
MN-54	2.846E-02
CD-109	5.549E-01
SN-126	5.189E-02
BA-137M	2.838E-02
CS-137	2.998E-02
TL-208	2.459E-02
PB-210	2.921E+00
BI-211	1.591E-01
PB-212	4.570E-02
BI-214	5.797E-02
PB-214	1.195E-01
RN-222	5.797E-02
RA-224	4.896E-01
RA-226	5.797E-02
AC-228	1.297E-01
RA-228	1.297E-01
TH-228	4.570E-02
TH-229	4.092E-01
TH-230	5.797E-02
PA-231	3.553E-01
TH-232	1.297E-01
TH-234	9.396E-01
U-234	5.797E-02
U-235	1.698E-01
U-238	9.396E-01
AM-241	1.211E-01
AM-243	4.240E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.809E-01	NOT IDENT.
NA-22	3.358E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF

AL-26	2.252E-02	FAIL ABUN
SC-46	3.546E-02	FAIL ABUN
V-48	1.753E-01	NOT IDENT.
CR-51	6.726E-01	NOT IDENT.
CO-56	4.256E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	2.441E-02	NOT IDENT.
CO-58	3.141E-02	NOT IDENT.
FE-59	8.365E-02	NOT IDENT.
CO-60	2.527E-02	NOT IDENT.
ZN-65	7.127E-02	NOT IDENT.
GE-68	9.628E-01	NOT IDENT.
AS-73	8.563E-01	NOT IDENT.
AS-74	2.358E-01	NOT IDENT.
SE-75	3.841E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.499E-01	NOT IDENT.
RB-83	8.100E-02	NOT IDENT.
KR-85	7.716E+00	NOT IDENT.
SR-85	5.782E-02	NOT IDENT.
RB-86	2.025E+00	NOT IDENT.
Y-88	1.567E-02	NOT IDENT.
Y-91	2.143E+01	NOT IDENT.
NB-94	2.555E-02	FAIL ABUN
NB-95	4.340E-02	NOT IDENT.
NB-95M	1.306E-01	NOT IDENT.
ZR-95	7.767E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.672E-02	NOT IDENT.
RH-102	3.789E-02	NOT IDENT.
RU-103	5.908E-02	FAIL ABUN
RH-106	2.656E-01	NOT IDENT.
RU-106	2.656E-01	NOT IDENT.
AG-108M	2.497E-02	NOT IDENT.
AG-110M	3.917E-02	NOT IDENT.
SN-113	4.364E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.496E-01	NOT IDENT.
TE-123M	2.847E-02	NOT IDENT.
SB-124	6.758E-02	NOT IDENT.
SB-125	8.602E-02	FAIL ABUN
TE-125M	1.134E+01	NOT IDENT.
I-126	9.847E-01	NOT IDENT.
SB-126	7.854E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.735E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.423E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.911E-02	FAIL ABUN
CS-135	1.276E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.946E-01	FAIL ABUN
CE-139	2.890E-02	NOT IDENT.
BA-140	1.098E+00	NOT IDENT.
LA-140	4.138E-01	NOT IDENT.
CE-141	1.146E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.854E-01	NOT IDENT.
PM-144	3.054E-02	NOT IDENT.
PR-144	2.319E+00	NOT IDENT.
PM-146	3.701E-02	NOT IDENT.
ND-147	3.401E+00	FAIL ABUN
PM-147	6.421E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.139E-02	FAIL ABUN
EU-152	8.818E-02	NOT IDENT.
GD-153	6.863E-02	NOT IDENT.
EU-154	9.419E-02	FAIL ABUN
EU-155	9.833E-02	FAIL ABUN
TB-160	1.039E-01	FAIL ABUN
HO-166M	3.755E-02	NOT IDENT.
TM-171	1.433E+01	NOT IDENT.
HF-172	1.589E-01	FAIL ABUN

LU-172	4.477E-02	FAIL ABUN
LU-176	2.196E-02	FAIL ABUN
HF-181	6.944E-02	NOT IDENT.
TA-182	1.557E-01	FAIL ABUN
RE-183	2.128E-01	FAIL ABUN
RE-184	1.925E-01	FAIL ABUN
W-188	8.556E+00	FAIL ABUN
IR-192	3.651E-02	FAIL ABUN
HG-203	5.583E-02	NOT IDENT.
BI-207	3.967E-02	FAIL ABUN
PB-211	5.042E-01	NOT IDENT.
BI-212	4.469E-01	NOT IDENT.
RN-219	3.306E-01	NOT IDENT.
RA-223	5.639E-01	FAIL ABUN
AC-227	2.031E-01	FAIL ABUN
TH-227	2.031E-01	FAIL ABUN
TH-231	5.639E-01	FAIL ABUN
PA-233	5.291E-02	FAIL ABUN
PA-234	2.262E-01	NOT IDENT.
PA-234M	3.913E+00	FAIL ABUN
NP-237	5.291E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.265E-01	NOT IDENT.
PU-239	3.076E+02	NOT IDENT.
CM-243	9.706E-02	NOT IDENT.
BK-247	5.848E-02	FAIL ABUN
CM-247	2.911E-02	NOT IDENT.
CF-249	3.653E-02	FAIL ABUN
CF-251	1.061E-01	NOT IDENT.
ANH-511	4.666E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677015.CNF;1
Acquisition date : 28-JUN-2016 14:37:15 Sensitivity : 3.000
Detector ID : GAM28 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.31 Half life ratio : *****
Sample date : 11-MAY-2016 11:15:00 Nuclide Library : SOLID
Sample ID : G398677015 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.4882E+02 GRAM
Quantity Err(%) : 1.3439E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 27-JUL-2015 07:57:17 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.322E+00	1.043E+00	1.043E+00
MN-54	3.914E-02	3.383E-02	3.383E-02
CD-109	1.680E+00	1.291E+00	1.291E+00
SN-126	1.562E-01	1.198E-01	1.198E-01
BA-137M	4.823E-01	8.979E-02	8.979E-02
CS-137	5.095E-01	9.484E-02	9.484E-02
TL-208	1.882E-01	6.364E-02	6.364E-02
PB-210	1.767E+00	6.661E+00	6.661E+00
BI-211	2.052E-01	8.620E-01	8.620E-01
PB-212	6.700E-01	1.167E-01	1.167E-01
BI-214	4.389E-01	1.371E-01	1.371E-01
PB-214	6.984E-01	1.710E-01	1.710E-01
RN-222	4.389E-01	1.371E-01	1.371E-01
RA-224	1.118E+00	1.125E+00	1.125E+00
RA-226	4.389E-01	1.371E-01	1.371E-01
AC-228	5.182E-01	2.175E-01	2.175E-01
RA-228	5.182E-01	2.175E-01	2.175E-01
TH-228	6.700E-01	1.167E-01	1.167E-01
TH-229	5.722E-02	5.145E-01	5.145E-01
TH-230	4.388E-01	1.371E-01	1.371E-01
PA-231	6.107E-01	6.086E-01	6.086E-01
TH-232	5.182E-01	2.175E-01	2.175E-01
TH-234	1.496E+00	2.167E+00	2.167E+00
U-234	4.388E-01	1.371E-01	1.371E-01
U-235	-9.102E-03	1.874E-01	1.874E-01
U-238	1.496E+00	2.167E+00	2.167E+00
AM-241	1.619E-01	2.200E-01	2.200E-01
AM-243	8.609E-02	1.084E-01	1.084E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.925E-01	5.165E-01	5.331E-01	NOT IDENT.
NA-22	-9.991E-03	4.161E-02	4.186E-02	NOT IDENT.

NA-24	1.113E+21	4.171E+21	0.000E+00	SHORT HLIF
AL-26	5.203E-03	2.481E-02	2.492E-02	FAIL ABUN
SC-46	1.617E-02	3.777E-02	3.847E-02	FAIL ABUN
V-48	-1.419E-01	2.315E-01	2.402E-01	NOT IDENT.
CR-51	-5.018E-01	8.348E-01	8.649E-01	NOT IDENT.
CO-56	8.308E-03	4.943E-02	4.957E-02	FAIL ABUN
MN-56	1.000E+41	6.062E+41	0.000E+00	SHORT HLIF
CO-57	1.166E-02	2.575E-02	2.629E-02	NOT IDENT.
CO-58	-2.902E-02	4.338E-02	4.531E-02	NOT IDENT.
FE-59	-7.371E-02	1.370E-01	1.410E-01	NOT IDENT.
CO-60	-6.276E-03	3.443E-02	3.455E-02	NOT IDENT.
ZN-65	-9.362E-03	9.928E-02	9.937E-02	NOT IDENT.
GE-68	2.397E-01	1.240E+00	1.245E+00	NOT IDENT.
AS-73	-4.313E-01	9.968E-01	1.016E+00	NOT IDENT.
AS-74	-6.962E-02	2.865E-01	2.882E-01	NOT IDENT.
SE-75	-2.132E-02	4.624E-02	4.722E-02	NOT IDENT.
BR-77	1.592E+06	2.231E+06	2.343E+06	SHORT HLIF
SR-82	2.232E-02	6.466E-01	6.467E-01	NOT IDENT.
RB-83	5.387E-02	8.651E-02	8.986E-02	NOT IDENT.
KR-85	-1.251E+01	9.857E+00	1.136E+01	NOT IDENT.
SR-85	-9.409E-02	7.391E-02	8.522E-02	NOT IDENT.
RB-86	8.745E-01	2.520E+00	2.550E+00	NOT IDENT.
Y-88	1.387E-04	1.847E-02	1.847E-02	NOT IDENT.
Y-91	7.403E+00	2.392E+01	2.415E+01	NOT IDENT.
NB-94	2.161E-03	3.421E-02	3.423E-02	FAIL ABUN
NB-95	7.256E-03	5.014E-02	5.025E-02	NOT IDENT.
NB-95M	-1.422E-01	1.863E-01	1.970E-01	NOT IDENT.
ZR-95	2.413E-02	8.777E-02	8.844E-02	NOT IDENT.
NB-97	1.000E+41	3.800E+41	0.000E+00	SHORT HLIF
ZR-97	-4.954E+20	2.994E+20	0.000E+00	SHORT HLIF
MO-99	3.047E+04	5.056E+04	5.239E+04	SHORT HLIF
TC-99M	-1.000E+41	1.031E+41	0.000E+00	SHORT HLIF
RH-101	-1.816E-02	3.051E-02	3.159E-02	NOT IDENT.
RH-102	-1.884E-02	4.703E-02	4.779E-02	NOT IDENT.
RU-103	3.023E-02	6.358E-02	6.503E-02	FAIL ABUN
RH-106	-4.418E-02	3.141E-01	3.148E-01	NOT IDENT.
RU-106	-4.418E-02	3.141E-01	3.148E-01	NOT IDENT.
AG-108M	-8.655E-03	2.902E-02	2.928E-02	NOT IDENT.
AG-110M	1.557E-02	4.225E-02	4.283E-02	NOT IDENT.
SN-113	-1.060E-02	5.280E-02	5.302E-02	NOT IDENT.
CD-115	8.313E+04	2.817E+05	2.842E+05	SHORT HLIF
SN-117M	9.654E-02	2.688E-01	2.723E-01	NOT IDENT.
TE-123M	-1.408E-03	3.154E-02	3.155E-02	NOT IDENT.
SB-124	2.308E-03	7.848E-02	7.848E-02	NOT IDENT.
SB-125	7.664E-02	8.924E-02	9.569E-02	FAIL ABUN
TE-125M	-1.690E+01	1.346E+01	1.547E+01	NOT IDENT.
I-126	-1.819E-01	1.366E+00	1.369E+00	NOT IDENT.
SB-126	3.016E-01	8.820E-01	8.924E-01	NOT IDENT.
SB-127	-8.466E+00	4.229E+02	4.229E+02	SHORT HLIF
I-131	1.571E+00	1.859E+00	1.990E+00	NOT IDENT.
I-132	1.000E+41	3.549E+41	0.000E+00	SHORT HLIF
TE-132	-1.819E+01	8.167E+02	8.167E+02	SHORT HLIF
BA-133	4.683E-02	3.798E-02	4.345E-02	NOT IDENT.
I-133	-5.788E+13	1.557E+15	1.557E+15	SHORT HLIF
CS-134	3.553E-02	5.480E-02	5.709E-02	FAIL ABUN
CS-135	-2.387E-03	1.464E-01	1.464E-01	NOT IDENT.
I-135	1.000E+41	4.778E+41	0.000E+00	SHORT HLIF
CS-136	1.206E-01	5.566E-01	5.593E-01	FAIL ABUN
CE-139	-1.213E-02	3.298E-02	3.343E-02	NOT IDENT.
BA-140	-5.772E-01	1.342E+00	1.367E+00	NOT IDENT.
LA-140	3.164E-02	4.757E-01	4.760E-01	NOT IDENT.
CE-141	3.906E-02	1.236E-01	1.249E-01	NOT IDENT.
CE-143	4.777E+09	2.520E+09	3.315E+09	SHORT HLIF
CE-144	7.962E-02	1.972E-01	2.004E-01	NOT IDENT.
PM-144	1.028E-02	3.439E-02	3.470E-02	NOT IDENT.
PR-144	7.528E-01	2.614E+00	2.636E+00	NOT IDENT.
PM-146	-3.194E-02	4.517E-02	4.741E-02	NOT IDENT.
ND-147	-3.838E-01	3.942E+00	3.946E+00	FAIL ABUN
PM-147	-1.534E+02	7.078E+02	7.112E+02	NOT IDENT.
PM-149	-5.123E+04	2.764E+06	2.764E+06	SHORT HLIF
EU-150	-7.837E-03	2.973E-02	2.994E-02	FAIL ABUN
EU-152	5.556E-02	1.046E-01	1.076E-01	NOT IDENT.
GD-153	-4.488E-02	9.446E-02	9.661E-02	NOT IDENT.
EU-154	-2.575E-02	1.163E-01	1.169E-01	FAIL ABUN
EU-155	5.733E-02	1.025E-01	1.057E-01	FAIL ABUN
TB-160	-4.599E-02	1.350E-01	1.366E-01	FAIL ABUN
HO-166M	1.009E-02	4.824E-02	4.846E-02	NOT IDENT.
TM-171	5.531E+00	1.720E+01	1.738E+01	NOT IDENT.

HF-172	-1.623E-01	1.862E-01	2.001E-01	FAIL ABUN
LU-172	1.695E-02	4.911E-02	4.970E-02	FAIL ABUN
LU-176	7.158E-03	2.468E-02	2.489E-02	FAIL ABUN
HF-181	-2.190E-04	7.882E-02	7.882E-02	NOT IDENT.
TA-182	8.102E-02	1.687E-01	1.726E-01	FAIL ABUN
RE-183	-1.140E-01	2.806E-01	2.853E-01	FAIL ABUN
RE-184	1.842E-01	3.986E-01	4.072E-01	FAIL ABUN
W-188	-1.823E+00	1.151E+01	1.154E+01	FAIL ABUN
IR-192	-2.405E-02	4.502E-02	4.631E-02	FAIL ABUN
HG-203	3.879E-02	6.074E-02	6.320E-02	NOT IDENT.
BI-207	1.176E-02	4.424E-02	4.456E-02	FAIL ABUN
PB-211	-4.785E-01	6.198E-01	6.563E-01	NOT IDENT.
BI-212	2.149E-01	4.974E-01	5.067E-01	NOT IDENT.
RN-219	5.652E-02	3.639E-01	3.648E-01	NOT IDENT.
RA-223	-1.033E-01	6.654E-01	6.670E-01	FAIL ABUN
AC-227	-2.077E-01	2.922E-01	3.068E-01	FAIL ABUN
TH-227	-2.077E-01	2.922E-01	3.068E-01	FAIL ABUN
TH-231	-1.033E-01	6.654E-01	6.670E-01	FAIL ABUN
PA-233	-5.943E-03	6.193E-02	6.199E-02	FAIL ABUN
PA-234	1.927E-02	2.584E-01	2.585E-01	NOT IDENT.
PA-234M	6.231E+00	4.360E+00	5.186E+00	FAIL ABUN
NP-237	-5.943E-03	6.193E-02	6.199E-02	FAIL ABUN
NP-238	-2.879E+05	7.627E+05	7.737E+05	SHORT HLIF
NP-239	-1.147E-01	2.534E-01	2.586E-01	NOT IDENT.
PU-239	2.644E+02	3.188E+02	3.403E+02	NOT IDENT.
CM-243	-2.035E-02	1.138E-01	1.142E-01	NOT IDENT.
BK-247	-2.441E-02	6.965E-02	7.052E-02	FAIL ABUN
CM-247	-8.313E-03	3.347E-02	3.368E-02	NOT IDENT.
CF-249	5.350E-02	3.735E-02	4.446E-02	FAIL ABUN
CF-251	2.356E-02	1.160E-01	1.164E-01	NOT IDENT.
ANH-511	-2.437E-02	4.621E-02	4.749E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	81.2782	87.09	70.4201	136.47	80.2821
45.60	83.2640	87.57	70.4747	140.51	0.0000
46.54	77.6793	88.03	70.5270	143.76	89.2613
49.72	0.0000	88.34	70.5620	144.24	92.0731
51.35	66.8753	88.47	70.5765	145.44	91.2792
51.87	62.1711	89.96	70.7443	152.43	95.7264
52.39	55.8595	1093.63	70.8204	153.25	90.2330
52.97	63.9217	91.11	70.8730	323.87	83.8106
53.44	71.4531	92.59	71.0369	156.02	84.9119
54.07	68.3481	93.35	71.1208	158.56	78.5994
57.36	0.0000	94.56	62.0596	159.00	84.2535
57.53	67.7809	94.65	62.0681	162.33	84.5576
57.98	79.1519	94.67	62.0700	162.66	81.7683
59.27	79.3643	94.87	62.0890	163.33	74.3024
59.32	79.3725	97.43	83.1075	165.86	90.5354
59.54	74.5468	98.43	88.4344	176.31	76.2683
60.96	68.2620	98.44	88.4360	176.60	78.1975
61.17	68.2910	99.53	88.0006	177.52	67.7710
62.93	68.5325	100.11	85.7586	181.07	0.0000
63.29	68.5814	102.03	92.9740	181.52	84.3356
63.58	81.6914	103.18	107.0989	184.41	76.8884
64.28	99.8008	103.37	107.1284	143.76	72.3686
66.73	101.9198	105.21	90.1918	193.51	66.7098
67.24	100.3736	105.31	90.2048	197.03	70.0461
125.81	102.1043	106.12	94.6928	198.01	72.0579
67.75	102.1180	106.47	93.8630	201.83	97.7234
69.67	102.4879	109.28	109.2072	203.43	74.9386
70.83	127.5571	111.00	88.2809	205.31	75.2924
72.81	114.7187	111.76	0.0000	210.85	80.4009
72.87	109.7430	114.06	84.2194	215.65	62.1997
74.66	97.8640	116.30	0.0000	222.11	45.7771
74.82	97.8918	116.74	99.6496	227.09	75.9565
74.97	97.9177	119.76	99.1562	227.38	66.9780
77.11	98.2883	121.12	91.2792	228.16	0.0000
78.74	75.6052	121.22	91.2912	228.18	62.0222
79.69	63.9487	121.78	84.1924	116.74	62.0222
80.12	74.1003	122.06	82.4309	235.69	83.7573
80.19	74.1093	122.92	80.7289	235.96	83.7757
80.57	64.0450	123.07	77.1561	238.63	66.2006
81.00	64.0917	265.00	75.4210	238.98	0.0000
81.07	64.0992	125.81	103.5370	240.99	66.3290
81.75	70.9279	127.23	101.9194	242.00	66.3838
83.79	89.8099	127.91	88.4667	244.70	60.8505
84.00	70.0647	129.30	82.2905	252.40	0.0000
85.43	70.2300	131.20	91.5505	252.80	57.1638
86.55	70.3583	133.02	88.1216	254.15	0.0000
86.79	70.3857	133.52	81.8124	256.23	75.3329
86.94	70.4031	136.00	78.4132	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	51.5129	355.39	0.0000	584.27	24.6710
264.80	51.5190	356.01	21.0650	595.83	21.8179
265.00	51.5266	364.49	30.8805	427.87	22.8562
268.22	59.9178	366.42	0.0000	602.52	0.0000
269.46	55.8383	372.51	33.2474	604.72	26.5456
270.03	61.0346	375.05	38.8479	607.14	34.8770
271.23	65.2321	377.52	46.6860	609.32	30.9190
273.65	74.6862	356.01	49.0931	610.33	18.2931
276.40	63.4061	388.16	24.6087	614.28	23.3202
277.37	66.5723	388.63	26.8531	618.01	26.0260
277.60	67.6244	391.69	41.4723	620.36	23.0455
278.00	65.5628	264.66	30.6452	621.93	27.0705
279.20	53.1214	401.81	36.0771	630.19	0.0000
279.54	55.2191	402.40	39.6983	631.29	23.1488
279.70	62.5195	404.85	41.5600	633.25	20.1455
280.46	61.5117	410.95	36.2637	634.78	23.1814
283.69	62.7026	413.71	46.3078	635.95	26.2177
284.31	63.7765	414.70	41.7903	636.99	23.2021
285.41	60.6887	423.72	36.5210	645.85	22.2729
285.90	0.0000	427.09	40.2467	657.76	23.7344
287.50	45.5107	427.87	31.1130	657.90	0.0000
290.67	62.1801	433.94	42.2327	661.66	25.4688
293.27	0.0000	439.40	41.4355	664.57	0.0000
351.93	59.0104	453.88	51.0308	666.33	25.5151
295.96	59.0420	463.37	40.0931	666.50	25.5170
879.38	59.1514	468.07	37.3853	667.71	0.0000
299.98	57.5178	473.00	0.0000	677.62	17.4267
300.09	57.5219	475.06	42.2078	685.70	0.0000
300.13	57.5236	476.78	39.4278	695.00	25.7983
301.36	44.0267	477.60	35.6876	696.49	23.7474
302.85	44.0724	482.18	40.4757	696.51	23.7479
256.23	57.6996	487.02	34.9115	697.00	22.7197
304.85	54.3188	492.35	0.0000	697.30	23.7547
306.78	44.6180	497.08	24.6540	697.49	21.6906
308.46	53.1784	505.52	62.8386	702.65	22.4231
311.90	50.1053	507.63	0.0000	706.68	29.3668
316.51	52.4012	511.00	44.8663	711.68	12.1147
319.41	56.7905	514.00	93.6844	720.70	22.9211
320.08	56.8155	514.00	93.6844	721.93	0.0000
321.04	42.9071	520.40	24.9304	722.78	28.1516
323.87	59.1089	520.69	0.0000	722.91	27.1102
325.23	51.6328	522.65	0.0000	723.31	23.9860
328.76	45.2838	527.90	0.0000	724.19	23.9933
333.37	46.7187	528.26	20.2104	727.33	24.0214
333.97	50.1988	529.59	25.0377	733.00	23.0243
334.37	45.0176	529.87	0.0000	735.93	23.0484
338.28	49.9054	531.02	26.0178	333.97	20.9648
338.32	49.9061	537.26	26.0930	739.50	0.0000
311.90	50.4102	546.56	0.0000	747.24	18.9352
340.48	50.4102	552.55	17.8410	748.06	22.0972
340.55	50.4123	563.25	21.5118	752.31	20.0233
344.28	43.5626	569.33	15.6871	753.82	20.0340
345.93	61.0518	946.00	18.6298	756.73	16.8879
351.06	41.5625	569.70	18.6312	756.80	16.8883
351.93	41.5851	583.19	20.7139	884.68	21.1641

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	19.0600	1274.44	6.5082	1620.50	3.7651
766.42	20.1230	1001.03	9.7757	1621.92	3.7662
766.84	23.3041	1002.74	11.4104	1678.03	0.0000
772.60	0.0000	1004.73	11.4170	1690.97	2.8620
776.52	14.8801	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.7690
778.90	17.0199	1028.54	0.0000	1063.66	25.1685
783.70	0.0000	1037.84	10.5632	1771.35	8.7137
785.37	15.9917	1038.76	0.0000	1791.20	0.0000
792.07	23.1525	631.29	20.2147	1808.65	2.9240
794.95	19.6099	1048.07	16.3712	1810.72	0.0000
795.86	17.8324	1049.04	15.4121	1836.06	0.9794
810.06	20.4269	1050.41	15.4180		
810.29	20.4287	1063.66	13.5397		
344.28	18.2792	1077.00	11.6475		
810.76	18.2812	1077.34	11.6484		
815.77	16.1576	1085.87	11.6753		
1048.07	17.2504	1093.63	9.7493		
832.01	18.0497	1099.45	15.0651		
834.85	18.0668	1112.07	15.6751		
835.71	23.8546	1112.84	21.8378		
836.80	0.0000	1115.54	18.4911		
846.75	0.0000	1120.29	8.4155		
846.77	18.5000	1120.55	7.8551		
856.80	18.1962	1221.41	7.0711		
860.56	18.2182	1129.67	8.8579		
871.09	14.2581	1131.51	0.0000		
873.19	12.8043	1147.95	0.0000		
875.33	0.0000	1173.23	8.9572		
879.38	13.1959	1177.95	19.9284		
880.51	17.4174	1189.05	14.9878		
883.24	11.9275	1204.77	12.0366		
884.68	11.9328	1221.41	10.0716		
889.28	10.1115	1231.02	6.9224		
894.76	17.3636	1235.36	29.4512		
898.04	9.4809	1238.28	0.0000		
900.72	10.0637	1260.41	0.0000		
903.28	11.0789	1271.87	9.1747		
911.20	26.9716	1274.44	17.3403		
912.08	23.8048	1274.54	17.3410		
923.98	0.0000	1291.59	7.1689		
926.50	13.0176	1298.22	0.0000		
929.11	12.0973	1312.11	7.2031		
937.49	12.1277	1332.49	9.6489		
944.13	16.8259	1362.66	0.0000		
946.00	15.8998	1365.19	7.2902		
949.00	18.7223	1368.63	0.0000		
667.71	0.0000	1384.29	9.4127		
962.31	20.9445	1408.01	3.1539		
964.08	24.1793	1457.56	0.0000		
966.17	20.9681	1460.82	3.6455		
911.20	9.6855	1489.16	9.6262		
968.97	9.6855	1505.03	5.3656		
983.53	16.0758	1584.12	9.3461		
984.45	0.0000	1596.21	7.4947		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:53:45.84

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677016.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM27.CNF;316
Background date    : 26-JUN-2016 12:05:24
Sample date       : 11-MAY-2016 11:25:00 Acquisition date : 28-JUN-2016 12:50:21
Sample ID        : G398677016 Sample quantity : 1.52710E+02 GRAM
Detector name     : GAM27 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.86 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.08*	15	177	0.85	93.47	89	8	4.09E-03	165.9	
2	1	74.94*	105	185	1.12	149.20	145	13	2.91E-02	23.5	2.34E+00
3	1	77.23	186	160	1.13	153.79	145	13	5.18E-02	14.0	
4	0	93.36*	27	301	1.41	186.06	180	12	7.40E-03	138.8	
5	0	98.55	46	108	1.25	196.45	194	8	1.27E-02	41.9	
6	0	129.18	60	95	2.47	257.73	254	8	1.66E-02	31.3	
7	0	144.10*	18	71	0.65	287.57	285	6	4.94E-03	81.8	
8	0	154.64	51	80	1.95	308.66	305	8	1.43E-02	33.7	
9	0	185.81*	26	126	1.30	371.03	366	9	7.35E-03	83.5	
10	0	209.20	30	108	1.01	417.82	414	8	8.46E-03	61.7	
11	1	238.68*	311	88	1.29	476.80	471	19	8.64E-02	7.9	1.08E+00
12	1	241.75	71	68	1.40	482.96	471	19	1.97E-02	25.4	
13	0	269.73	50	94	0.67	538.93	533	11	1.38E-02	40.8	
14	0	295.43	106	81	0.88	590.35	586	9	2.94E-02	18.3	
15	0	302.12	27	99	3.66	603.74	598	12	7.55E-03	74.9	
16	0	306.17	27	49	1.56	611.85	609	7	7.50E-03	47.1	
17	0	337.87*	45	101	1.10	675.27	672	10	1.25E-02	44.9	
18	0	351.95*	148	90	1.36	703.45	699	12	4.12E-02	15.4	
19	0	396.85*	16	34	1.48	793.28	791	6	4.43E-03	65.1	
20	0	452.01	14	46	1.24	903.65	897	8	3.94E-03	86.9	
21	0	457.33	22	62	1.40	914.29	911	8	6.22E-03	65.0	
22	0	487.25	21	49	0.59	974.16	966	12	5.85E-03	70.9	
23	0	511.14*	38	81	2.25	1021.96	1015	16	1.05E-02	63.1	
24	0	583.24*	94	39	1.44	1166.23	1160	14	2.60E-02	17.8	
25	0	609.42*	71	35	1.16	1218.61	1213	10	1.98E-02	20.3	
26	0	624.90	18	24	0.94	1249.61	1244	12	4.96E-03	59.8	
27	0	634.21	19	28	6.21	1268.23	1259	17	5.39E-03	67.9	
28	0	661.63	1360	22	1.55	1323.10	1318	11	3.78E-01	2.8	
29	0	727.24*	42	3	1.98	1454.39	1449	11	1.16E-02	18.3	
30	0	736.91	23	8	2.98	1473.73	1467	12	6.35E-03	33.3	
31	0	756.52	8	27	4.61	1512.97	1501	14	2.18E-03	146.8	
32	0	852.64	5	5	1.34	1705.33	1702	8	1.50E-03	78.6	
33	0	860.16	22	9	2.68	1720.37	1714	12	6.15E-03	34.4	
34	0	911.15*	66	21	0.84	1822.41	1815	12	1.82E-02	19.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	918.94	8	11	0.62	1838.00	1832	11	2.22E-03	87.7	
36	0	968.54*	42	10	1.28	1937.27	1930	14	1.17E-02	23.0	
37	0	1038.47	8	10	1.46	2077.22	2071	9	2.11E-03	86.8	
38	0	1080.81	7	10	0.78	2161.95	2154	10	2.08E-03	86.8	
39	0	1121.04*	10	17	0.76	2242.45	2236	11	2.70E-03	91.9	
40	0	1173.60*	15	18	1.13	2347.65	2342	11	4.04E-03	65.3	
41	0	1330.85	22	0	3.97	2662.36	2657	12	6.11E-03	21.3	
42	0	1460.82*	155	16	2.18	2922.50	2914	14	4.31E-02	9.8	
43	0	1764.79*	9	7	2.75	3530.93	3522	14	2.55E-03	75.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:53:47

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677016.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:25:00 Acquisition date : 28-JUN-2016 12:50:21
Sample ID         : G398677016 Sample quantity  : 152.71 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA27 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.86 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated : No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.419E+00	4.868E+00	4.868E+00	19.62	OK
BA-137M	661.66	89.90*	2.746E+00	2.852E+00	2.860E+00	5.59	OK
CS-137	661.66	85.10*	2.746E+00	3.013E+00	3.022E+00	5.59	OK
CE-141	145.44	48.29*	7.623E+00	1.950E-02	5.435E-02	255.68	OK
TL-208	277.37	6.60	5.181E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	3.027E+00	1.912E-01	1.912E-01	35.55	OK
	860.56	12.50	2.225E+00	4.010E-01	4.010E-01	68.78	OK
PB-210	46.54	4.25*	2.854E+00	8.015E-01	8.048E-01	331.85	OK
PB-212	74.82	10.28	7.025E+00	5.552E-01	5.552E-01	81.77	OK
	77.11	17.10	7.212E+00	9.578E-01	9.578E-01	28.08	OK
	238.63	43.60*	5.736E+00	7.121E-01	7.121E-01	15.71	OK
	300.09	3.30	4.906E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67	OK
	1120.29	14.92	1.780E+00	1.794E-01	1.794E-01	183.78	OK
	1764.49	15.30	1.217E+00	2.294E-01	2.294E-01	150.61	OK
PB-214	74.82	5.80	7.015E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	7.212E+00	1.689E+00	1.689E+00	28.08	OK
	87.09	3.41	7.783E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	5.684E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.960E+00	6.494E-01	6.494E-01	36.61	OK
	351.93	35.60*	4.384E+00	5.238E-01	5.238E-01	30.81	OK
RN-222	609.32	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67	OK
	1120.29	14.92	1.780E+00	1.794E-01	1.794E-01	183.78	OK
	1764.49	15.30	1.217E+00	2.294E-01	2.294E-01	150.61	OK
RA-224	240.99	4.10*	5.688E+00	5.910E-01	5.910E-01	165.49	OK
RA-226	609.32	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67	OK
	1120.29	14.92	1.780E+00	1.794E-01	1.794E-01	183.78	OK
	1764.49	15.30	1.217E+00	2.294E-01	2.294E-01	150.61	OK
AC-228	105.21	1.10	8.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.513E+00	4.885E-01	4.885E-01	89.72	OK
	794.95	4.25	2.373E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.278E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.121E+00	5.997E-01	5.997E-01	38.58	OK
	968.97	15.80	2.015E+00	6.598E-01	6.598E-01	45.90	OK
RA-228	105.21	1.10	8.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.513E+00	4.885E-01	4.885E-01	89.72	OK
	794.95	4.25	2.373E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	2.278E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.121E+00	5.997E-01	5.997E-01	38.58	OK
	968.97	15.80	2.015E+00	6.598E-01	6.598E-01	45.90	OK
TH-228	74.82	10.28	7.025E+00	5.552E-01	5.552E-01	81.77	OK
	77.11	17.10	7.212E+00	9.578E-01	9.578E-01	28.08	OK
	238.63	43.60*	5.736E+00	7.121E-01	7.121E-01	15.71	OK
	300.09	3.30	4.906E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67	OK
	1120.29	14.92	1.780E+00	1.794E-01	1.794E-01	183.78	OK
	1764.49	15.30	1.217E+00	2.294E-01	2.294E-01	150.61	OK
PA-231	283.69	1.70	5.101E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.883E+00	5.825E-01	5.825E-01	149.75	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	105.21	1.10	8.138E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.513E+00	4.885E-01	4.885E-01	89.72	OK
	835.71	1.61	2.278E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.121E+00	5.997E-01	5.997E-01	38.58	OK
U-234	968.97	15.80	2.015E+00	6.598E-01	6.598E-01	45.90	OK
	609.32	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67	OK
	1120.29	14.92	1.780E+00	1.794E-01	1.794E-01	183.78	OK
	1764.49	15.30	1.217E+00	2.294E-01	2.294E-01	150.61	OK
U-235	89.96	3.47	7.889E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	7.987E+00	3.711E-01	3.711E-01	277.62	OK
	143.76	10.96*	7.630E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	7.200E+00	----- Line	Not Found	-----	Absent
AM-243	185.72	57.20	6.712E+00	4.042E-02	4.042E-02	166.98	OK
	205.31	5.01	6.321E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	2.173E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	7.025E+00	8.493E-02	8.493E-02	81.77	OK
ANH-511	511.00	100.00*	3.343E+00	6.030E-02	6.030E-02	126.18	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677016.CNF;1
Acquisition date : 28-JUN-2016 12:50:21 Sensitivity : 3.000
Detector ID : GAM27 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.86 Half life ratio : *****
Sample date : 11-MAY-2016 11:25:00 Analyst initials: MXR1
Sample ID : G398677016 Sample Quantity : 1.5271E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 8-SEP-2015 09:22:55 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;12

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.868E+00	9.360E-01	5.478E-01
BA-137M	2.860E+00	1.566E-01	6.112E-02
CS-137	3.022E+00	1.654E-01	6.457E-02
CE-141	5.435E-02	1.362E-01	1.996E-01
TL-208	1.912E-01	6.660E-02	5.923E-02
PB-210	8.048E-01	2.617E+00	2.364E+00
PB-212	7.121E-01	1.096E-01	9.561E-02
BI-214	2.792E-01	1.113E-01	1.110E-01
PB-214	5.238E-01	1.582E-01	1.509E-01
RN-222	2.792E-01	1.113E-01	1.110E-01
RA-224	5.910E-01	9.585E-01	1.024E+00
RA-226	2.792E-01	1.113E-01	1.110E-01
AC-228	5.997E-01	2.267E-01	2.113E-01
RA-228	5.997E-01	2.267E-01	2.113E-01
TH-228	7.121E-01	1.096E-01	9.561E-02
TH-230	2.792E-01	1.113E-01	1.110E-01
PA-231	5.825E-01	8.549E-01	8.976E-01
TH-232	5.997E-01	2.267E-01	2.113E-01
U-234	2.792E-01	1.113E-01	1.110E-01
U-235	1.277E-01	2.049E-01	3.225E-01
AM-243	8.493E-02	6.806E-02	7.007E-02
ANH-511	6.030E-02	7.456E-02	5.642E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.152E-02	5.634E-01	1.069E+00	NOT IDENT.
NA-22	2.139E-04	3.231E-02	6.346E-02	NOT IDENT.
NA-24	0.000E+00	4.167E+21	0.000E+00	SHORT HLIF
AL-26	-3.562E-03	2.782E-02	6.070E-02	NOT IDENT.
SC-46	-1.475E-02	4.354E-02	7.827E-02	FAIL ABUN
V-48	-6.212E-02	2.474E-01	4.691E-01	NOT IDENT.
CR-51	1.987E-01	9.202E-01	1.735E+00	NOT IDENT.
MN-54	2.601E-02	3.034E-02	6.455E-02	NOT IDENT.

CO-56	2.104E-03	5.038E-02	8.681E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.801E-02	2.359E-02	4.133E-02	NOT IDENT.
CO-58	-2.120E-02	4.045E-02	7.152E-02	NOT IDENT.
FE-59	8.510E-02	9.675E-02	2.206E-01	NOT IDENT.
CO-60	2.138E-02	4.309E-02	7.963E-02	FAIL ABUN
ZN-65	-7.537E-02	7.831E-02	9.968E-02	NOT IDENT.
GE-68	5.750E-01	1.176E+00	2.204E+00	NOT IDENT.
AS-73	6.188E-01	5.144E-01	1.075E+00	NOT IDENT.
AS-74	-1.173E-01	2.979E-01	5.477E-01	FAIL ABUN
SE-75	-3.686E-02	6.085E-02	9.476E-02	NOT IDENT.
BR-77	0.000E+00	2.545E+05	0.000E+00	SHORT HLIF
SR-82	-2.719E-01	6.487E-01	1.169E+00	NOT IDENT.
RB-83	2.371E-02	9.546E-02	1.863E-01	NOT IDENT.
KR-85	7.028E+00	8.236E+00	1.493E+01	NOT IDENT.
SR-85	5.234E-02	6.169E-02	1.118E-01	NOT IDENT.
RB-86	6.593E-01	2.243E+00	4.077E+00	NOT IDENT.
Y-88	-1.089E-02	3.521E-02	6.902E-02	NOT IDENT.
Y-91	7.988E+00	2.065E+01	4.305E+01	NOT IDENT.
NB-94	-8.288E-03	2.722E-02	5.008E-02	NOT IDENT.
NB-95	-6.562E-03	4.738E-02	8.855E-02	NOT IDENT.
NB-95M	-3.315E-02	1.875E-01	3.075E-01	NOT IDENT.
ZR-95	5.025E-02	1.446E-01	1.636E-01	FAIL ABUN
NB-97	0.000E+00	6.357E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.538E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.321E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	8.917E-03	3.277E-02	5.491E-02	NOT IDENT.
RH-102	6.767E-03	8.205E-02	9.381E-02	NOT IDENT.
RU-103	3.208E-02	7.126E-02	1.421E-01	FAIL ABUN
RH-106	-7.374E-02	3.054E-01	4.913E-01	NOT IDENT.
RU-106	-7.374E-02	3.054E-01	4.913E-01	NOT IDENT.
AG-108M	-2.045E-02	3.498E-02	6.043E-02	NOT IDENT.
CD-109	3.520E-01	7.879E-01	1.353E+00	NOT IDENT.
AG-110M	-1.095E-03	4.424E-02	8.380E-02	NOT IDENT.
SN-113	1.251E-02	6.510E-02	1.168E-01	NOT IDENT.
CD-115	0.000E+00	3.358E+05	0.000E+00	SHORT HLIF
SN-117M	2.318E-01	2.767E-01	5.100E-01	FAIL ABUN
TE-123M	3.476E-02	3.321E-02	6.196E-02	NOT IDENT.
SB-124	4.414E-02	7.315E-02	1.879E-01	NOT IDENT.
SB-125	1.215E-02	1.134E-01	2.074E-01	NOT IDENT.
TE-125M	-2.719E+00	1.228E+01	2.253E+01	NOT IDENT.
I-126	-3.332E-01	1.256E+00	1.988E+00	NOT IDENT.
SB-126	2.654E-01	7.173E-01	1.344E+00	NOT IDENT.
SN-126	2.263E-02	7.418E-02	1.262E-01	NOT IDENT.
SB-127	0.000E+00	3.864E+02	0.000E+00	SHORT HLIF
I-131	9.461E-01	2.115E+00	4.047E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.551E+02	0.000E+00	SHORT HLIF
BA-133	1.405E-02	5.068E-02	8.551E-02	FAIL ABUN
I-133	0.000E+00	1.642E+15	0.000E+00	SHORT HLIF
CS-134	-1.381E-03	3.398E-02	6.436E-02	NOT IDENT.
CS-135	1.271E-01	1.729E-01	3.053E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	5.290E-02	4.738E-01	9.454E-01	FAIL ABUN
CE-139	1.679E-02	3.234E-02	6.448E-02	NOT IDENT.
BA-140	-2.725E-01	1.517E+00	2.866E+00	FAIL ABUN
LA-140	5.192E-02	3.314E-01	7.385E-01	FAIL ABUN
CE-143	0.000E+00	2.341E+09	0.000E+00	SHORT HLIF
CE-144	1.425E-01	2.095E-01	3.638E-01	NOT IDENT.
PM-144	2.106E-03	3.004E-02	5.788E-02	NOT IDENT.
PR-144	1.604E-01	2.287E+00	4.407E+00	NOT IDENT.
PM-146	-3.635E-02	8.980E-02	9.247E-02	FAIL ABUN
ND-147	-3.620E+00	4.549E+00	8.076E+00	NOT IDENT.
PM-147	-4.511E+02	6.604E+02	1.165E+03	NOT IDENT.
PM-149	0.000E+00	2.830E+06	0.000E+00	SHORT HLIF
EU-150	8.554E-04	3.149E-02	5.137E-02	FAIL ABUN
EU-152	-4.158E-02	1.175E-01	1.941E-01	NOT IDENT.
GD-153	1.386E-01	1.140E-01	1.434E-01	FAIL ABUN
EU-154	-8.736E-03	9.168E-02	1.766E-01	FAIL ABUN
EU-155	2.085E-02	9.005E-02	1.705E-01	NOT IDENT.
TB-160	-3.046E-02	1.388E-01	2.567E-01	FAIL ABUN
HO-166M	3.094E-02	4.844E-02	1.001E-01	FAIL ABUN
TM-171	6.342E+00	8.167E+00	1.670E+01	NOT IDENT.
HF-172	3.665E-02	1.878E-01	3.144E-01	FAIL ABUN
LU-172	-3.110E-02	4.609E-02	8.126E-02	FAIL ABUN
LU-176	3.335E-02	3.079E-02	5.225E-02	FAIL ABUN
HF-181	-2.377E-02	9.570E-02	1.549E-01	NOT IDENT.

TA-182	-1.716E-02	1.704E-01	3.250E-01	FAIL ABUN
RE-183	-3.445E-02	1.396E-01	2.667E-01	NOT IDENT.
RE-184	1.286E-01	2.273E-01	4.247E-01	NOT IDENT.
W-188	-5.270E-01	1.108E+01	1.815E+01	NOT IDENT.
IR-192	3.090E-03	5.326E-02	9.921E-02	FAIL ABUN
HG-203	2.345E-03	6.117E-02	1.153E-01	NOT IDENT.
BI-207	-1.482E-02	4.011E-02	7.464E-02	FAIL ABUN
BI-211	0.000E+00	4.358E-01	6.426E-01	FAIL ABUN
PB-211	9.815E-02	8.339E-01	1.534E+00	NOT IDENT.
BI-212	0.000E+00	4.517E-01	1.038E+00	FAIL ABUN
RN-219	-1.906E-01	5.155E-01	8.371E-01	FAIL ABUN
RA-223	-1.894E-01	6.764E-01	1.231E+00	FAIL ABUN
AC-227	1.455E-02	2.664E-01	5.032E-01	NOT IDENT.
TH-227	1.455E-02	2.664E-01	5.032E-01	NOT IDENT.
TH-229	4.233E-01	5.345E-01	1.064E+00	NOT IDENT.
TH-231	-1.894E-01	6.764E-01	1.231E+00	FAIL ABUN
PA-233	4.116E-02	6.909E-02	1.304E-01	NOT IDENT.
PA-234	3.759E-02	2.117E-01	4.330E-01	FAIL ABUN
PA-234M	-4.488E-01	3.810E+00	7.422E+00	NOT IDENT.
TH-234	-4.373E-01	8.138E-01	1.572E+00	FAIL ABUN
NP-237	4.116E-02	6.909E-02	1.304E-01	FAIL ABUN
NP-238	0.000E+00	8.504E+05	0.000E+00	SHORT HLIF
U-238	-4.373E-01	8.138E-01	1.572E+00	FAIL ABUN
NP-239	1.677E-01	2.398E-01	4.635E-01	FAIL ABUN
PU-239	0.000E+00	4.455E+02	6.063E+02	FAIL ABUN
AM-241	3.723E-02	8.090E-02	1.608E-01	NOT IDENT.
CM-243	-4.300E-02	1.043E-01	1.673E-01	FAIL ABUN
BK-247	-2.302E-02	8.860E-02	1.432E-01	NOT IDENT.
CM-247	-3.882E-02	4.541E-02	7.387E-02	NOT IDENT.
CF-249	1.420E-02	4.381E-02	8.250E-02	NOT IDENT.
CF-251	-3.228E-02	1.142E-01	2.175E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	150	10.66*	1.419E+00	4.868E+00	4.868E+00	19.62
BA-137M	661.66	1432	89.90*	2.746E+00	2.852E+00	2.860E+00	5.59
CS-137	661.66	1432	85.10*	2.746E+00	3.013E+00	3.022E+00	5.59
CE-141	145.44	22	48.29*	7.623E+00	2.899E-02	8.081E-02	163.67
TL-208	277.37	-----	6.60	5.181E+00	-----	Line Not Found	-----
	583.19	100	85.00*	3.027E+00	1.912E-01	1.912E-01	35.55
	860.56	23	12.50	2.225E+00	4.010E-01	4.010E-01	68.78
PB-210	46.54	20	4.25*	2.854E+00	8.015E-01	8.048E-01	331.85
BI-211	72.87	-----	1.23	6.838E+00	-----	Line Not Found	-----
	351.06	166	12.92*	4.384E+00	1.443E+00	1.443E+00	30.81
PB-212	74.82	135	10.28	7.025E+00	9.216E-01	9.216E-01	47.07
	77.11	240	17.10	7.212E+00	9.578E-01	9.578E-01	28.08
	238.63	362	43.60*	5.736E+00	7.121E-01	7.121E-01	15.71
	300.09	-----	3.30	4.906E+00	-----	Line Not Found	-----
BI-214	609.32	76	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67
	1120.29	10	14.92	1.780E+00	1.794E-01	1.794E-01	183.78
	1764.49	9	15.30	1.217E+00	2.294E-01	2.294E-01	150.61
PB-214	74.82	135	5.80	7.025E+00	1.633E+00	1.633E+00	47.07
	77.11	240	9.70	7.212E+00	1.689E+00	1.689E+00	28.08
	87.09	-----	3.41	7.783E+00	-----	Line Not Found	-----
	242.00	83	7.25	5.688E+00	9.836E-01	9.836E-01	50.78
	295.22	121	18.42	4.960E+00	6.494E-01	6.494E-01	36.61
	351.93	166	35.60*	4.384E+00	5.238E-01	5.238E-01	30.81
RN-222	609.32	76	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67
	1120.29	10	14.92	1.780E+00	1.794E-01	1.794E-01	183.78
	1764.49	9	15.30	1.217E+00	2.294E-01	2.294E-01	150.61
RA-224	240.99	83	4.10*	5.688E+00	1.739E+00	1.739E+00	50.78
RA-226	609.32	76	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67
	1120.29	10	14.92	1.780E+00	1.794E-01	1.794E-01	183.78
	1764.49	9	15.30	1.217E+00	2.294E-01	2.294E-01	150.61
AC-228	105.21	-----	1.10	8.138E+00	-----	Line Not Found	-----
	338.32	51	11.27	4.513E+00	4.885E-01	4.885E-01	89.72
	794.95	-----	4.25	2.373E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.278E+00	-----	Line Not Found	-----
	911.20	67	25.80*	2.121E+00	5.997E-01	5.997E-01	38.58
	968.97	43	15.80	2.015E+00	6.598E-01	6.598E-01	45.90
RA-228	105.21	-----	1.10	8.138E+00	-----	Line Not Found	-----
	338.32	51	11.27	4.513E+00	4.885E-01	4.885E-01	89.72
	794.95	-----	4.25	2.373E+00	-----	Line Not Found	-----
	835.71	-----	1.61	2.278E+00	-----	Line Not Found	-----
	911.20	67	25.80*	2.121E+00	5.997E-01	5.997E-01	38.58
	968.97	43	15.80	2.015E+00	6.598E-01	6.598E-01	45.90
TH-228	74.82	135	10.28	7.025E+00	9.216E-01	9.216E-01	47.07
	77.11	240	17.10	7.212E+00	9.578E-01	9.578E-01	28.08
	238.63	362	43.60*	5.736E+00	7.121E-01	7.121E-01	15.71
	300.09	-----	3.30	4.906E+00	-----	Line Not Found	-----
TH-230	609.32	76	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	1120.29	10	14.92	1.780E+00	1.794E-01	1.794E-01	183.78
	1764.49	9	15.30	1.217E+00	2.294E-01	2.294E-01	150.61
PA-231	283.69	-----	1.70	5.101E+00	-----	Line Not Found	-----
	301.36	31	5.35*	4.883E+00	5.825E-01	5.825E-01	149.75
TH-232	105.21	-----	1.10	8.138E+00	-----	Line Not Found	-----
	338.32	51	11.27	4.513E+00	4.885E-01	4.885E-01	89.72
	835.71	-----	1.61	2.278E+00	-----	Line Not Found	-----
	911.20	67	25.80*	2.121E+00	5.997E-01	5.997E-01	38.58
	968.97	43	15.80	2.015E+00	6.598E-01	6.598E-01	45.90
U-234	609.32	76	45.49*	2.927E+00	2.792E-01	2.792E-01	40.67
	1120.29	10	14.92	1.780E+00	1.794E-01	1.794E-01	183.78
	1764.49	9	15.30	1.217E+00	2.294E-01	2.294E-01	150.61
U-235	89.96	-----	3.47	7.889E+00	-----	Line Not Found	-----
	93.35	34	5.60	7.987E+00	3.711E-01	3.711E-01	277.62
	143.76	22	10.96*	7.623E+00	1.277E-01	1.277E-01	163.67
	163.33	-----	5.08	7.200E+00	-----	Line Not Found	-----
	185.72	32	57.20	6.712E+00	4.042E-02	4.042E-02	166.98
	205.31	-----	5.01	6.321E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	2.173E+00	-----	Line Not Found	-----
	74.66	135	67.20*	7.025E+00	1.410E-01	1.410E-01	47.07
ANH-511	511.00	41	100.00*	3.343E+00	6.030E-02	6.030E-02	126.18

Flag: "*" = Keyline

Total number of lines in spectrum 43
Number of unidentified lines 9
Number of lines tentatively identified by NID 34 79.07%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.868E+00	4.868E+00	0.955E+00	19.62	
BA-137M	30.08Y	1.00	2.852E+00	2.860E+00	0.160E+00	5.59	
CS-137	30.08Y	1.00	3.013E+00	3.022E+00	0.169E+00	5.59	
CE-141	32.51D	2.79	2.899E-02	8.081E-02	13.23E-02	163.67	
TL-208	1.41E+10Y	1.00	1.912E-01	1.912E-01	0.680E-01	35.55	
PB-210	22.20Y	1.00	8.015E-01	8.048E-01	26.71E-01	331.85	
BI-211	7.04E+08Y	1.00	1.443E+00	1.443E+00	0.445E+00	30.81	
PB-212	1.41E+10Y	1.00	7.121E-01	7.121E-01	1.119E-01	15.71	
BI-214	1600.00Y	1.00	2.792E-01	2.792E-01	1.136E-01	40.67	
PB-214	1600.00Y	1.00	5.238E-01	5.238E-01	1.614E-01	30.81	
RN-222	1600.00Y	1.00	2.792E-01	2.792E-01	1.136E-01	40.67	
RA-224	1.41E+10Y	1.00	1.739E+00	1.739E+00	0.883E+00	50.78	
RA-226	1600.00Y	1.00	2.792E-01	2.792E-01	1.136E-01	40.67	
AC-228	1.41E+10Y	1.00	5.997E-01	5.997E-01	2.314E-01	38.58	
RA-228	1.41E+10Y	1.00	5.997E-01	5.997E-01	2.314E-01	38.58	
TH-228	1.41E+10Y	1.00	7.121E-01	7.121E-01	1.119E-01	15.71	
TH-230	7.54E+04Y	1.00	2.792E-01	2.792E-01	1.135E-01	40.67	
PA-231	7.04E+08Y	1.00	5.825E-01	5.825E-01	8.724E-01	149.75	
TH-232	1.41E+10Y	1.00	5.997E-01	5.997E-01	2.314E-01	38.58	
U-234	2.45E+05Y	1.00	2.792E-01	2.792E-01	1.135E-01	40.67	
U-235	7.04E+08Y	1.00	1.277E-01	1.277E-01	2.091E-01	163.67	
AM-243	7370.00Y	1.00	1.410E-01	1.410E-01	0.664E-01	47.07	
ANH-511	1.00E+09Y	1.00	6.030E-02	6.030E-02	7.608E-02	126.18	
Total Activity :			2.099E+01	2.106E+01			

Grand Total Activity : 2.099E+01 2.106E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	98.55	58	137	1.25	196.45	194	8	1.27E-02	83.9	8.09E+00	T
0	129.18	74	117	2.47	257.73	254	8	1.66E-02	62.6	7.92E+00	T
0	154.64	62	97	1.95	308.66	305	8	1.43E-02	67.3	7.39E+00	T
0	209.20	36	127	1.01	417.82	414	8	8.46E-03	****	6.25E+00	
0	269.73	57	109	0.67	538.93	533	11	1.38E-02	81.5	5.28E+00	T
0	306.17	31	56	1.56	611.85	609	7	7.50E-03	94.2	4.84E+00	T
0	396.85	18	38	1.48	793.28	791	6	4.43E-03	****	4.02E+00	
0	452.01	16	50	1.24	903.65	897	8	3.94E-03	****	3.66E+00	
0	457.33	24	67	1.40	914.29	911	8	6.22E-03	****	3.63E+00	
0	487.25	23	53	0.59	974.16	966	12	5.85E-03	****	3.46E+00	T
0	624.90	19	26	0.94	1249.61	1244	12	4.96E-03	****	2.87E+00	
0	634.21	21	29	6.21	1268.23	1259	17	5.39E-03	****	2.84E+00	T
0	727.24	43	3	1.98	1454.39	1449	11	1.16E-02	36.7	2.55E+00	T
0	736.91	24	8	2.98	1473.73	1467	12	6.35E-03	66.6	2.52E+00	T
0	756.52	8	28	4.61	1512.97	1501	14	2.18E-03	****	2.47E+00	T
0	852.64	6	5	1.34	1705.33	1702	8	1.50E-03	****	2.24E+00	
0	918.94	8	11	0.62	1838.00	1832	11	2.22E-03	****	2.11E+00	
0	1038.47	8	10	1.46	2077.22	2071	9	2.11E-03	****	1.90E+00	T
0	1080.81	7	10	0.78	2161.95	2154	10	2.08E-03	****	1.84E+00	
0	1173.60	14	18	1.13	2347.65	2342	11	4.04E-03	****	1.71E+00	T
0	1330.85	21	0	3.97	2662.36	2657	12	6.11E-03	42.6	1.54E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677016.CNF;1  *
* Acquisition date   : 28-JUN-2016 12:50:21 Sensitivity      : 3.000          *
* Detector ID        : GAM27 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.86 Half life ratio  : *****      *
* Sample date        : 11-MAY-2016 11:25:00 Nuclide Library : SOLID        *
* Sample ID          : G398677016 Analyst initials: MXR1         *
* Batch Number       : 1572231 Sample Quantity : 1.5271E+02 GRAM    *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 8-SEP-2015 09:22:55 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;12        *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.297E-01
BA-137M	2.779E-02
CS-137	2.936E-02
CE-141	9.443E-02
TL-208	2.696E-02
PB-210	1.120E+00
PB-212	4.502E-02
BI-214	5.038E-02
PB-214	7.103E-02
RN-222	5.038E-02
RA-224	4.823E-01
RA-226	5.038E-02
AC-228	9.329E-02
RA-228	9.329E-02
TH-228	4.502E-02
TH-230	5.038E-02
PA-231	4.223E-01
TH-232	9.329E-02
U-234	5.038E-02
U-235	1.528E-01
AM-243	3.352E-02
ANH-511	2.616E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.996E-01	NOT IDENT.
NA-22	2.736E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.476E-02	NOT IDENT.
SC-46	3.448E-02	FAIL ABUN
V-48	2.072E-01	NOT IDENT.
CR-51	8.178E-01	NOT IDENT.
MN-54	2.897E-02	NOT IDENT.
CO-56	3.877E-02	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	1.950E-02	NOT IDENT.
CO-58	3.108E-02	NOT IDENT.
FE-59	9.638E-02	NOT IDENT.
CO-60	3.538E-02	FAIL ABUN
ZN-65	4.129E-02	NOT IDENT.
GE-68	9.736E-01	NOT IDENT.
AS-73	5.114E-01	NOT IDENT.
AS-74	2.485E-01	FAIL ABUN
SE-75	4.447E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.152E-01	NOT IDENT.
RB-83	8.637E-02	NOT IDENT.
KR-85	6.987E+00	NOT IDENT.
SR-85	5.231E-02	NOT IDENT.
RB-86	1.785E+00	NOT IDENT.
Y-88	2.674E-02	NOT IDENT.
Y-91	1.879E+01	NOT IDENT.
NB-94	2.243E-02	NOT IDENT.
NB-95	3.959E-02	NOT IDENT.
NB-95M	1.456E-01	NOT IDENT.
ZR-95	7.329E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.611E-02	NOT IDENT.
RH-102	4.252E-02	NOT IDENT.
RU-103	6.588E-02	FAIL ABUN
RH-106	2.195E-01	NOT IDENT.
RU-106	2.195E-01	NOT IDENT.
AG-108M	2.820E-02	NOT IDENT.
CD-109	6.500E-01	NOT IDENT.
AG-110M	3.700E-02	NOT IDENT.
SN-113	5.489E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.421E-01	FAIL ABUN
TE-123M	2.946E-02	NOT IDENT.
SB-124	7.459E-02	NOT IDENT.
SB-125	9.747E-02	NOT IDENT.
TE-125M	1.069E+01	NOT IDENT.
I-126	8.941E-01	NOT IDENT.
SB-126	5.989E-01	NOT IDENT.
SN-126	6.064E-02	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.898E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.018E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	2.868E-02	NOT IDENT.
CS-135	1.445E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.164E-01	FAIL ABUN
CE-139	3.068E-02	NOT IDENT.
BA-140	1.314E+00	FAIL ABUN
LA-140	2.968E-01	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	1.728E-01	NOT IDENT.
PM-144	2.610E-02	NOT IDENT.
PR-144	1.987E+00	NOT IDENT.
PM-146	4.329E-02	FAIL ABUN
ND-147	3.703E+00	NOT IDENT.
PM-147	5.503E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.410E-02	FAIL ABUN
EU-152	9.117E-02	NOT IDENT.
GD-153	6.822E-02	FAIL ABUN
EU-154	7.615E-02	FAIL ABUN
EU-155	8.104E-02	NOT IDENT.
TB-160	1.120E-01	FAIL ABUN
HO-166M	4.519E-02	FAIL ABUN
TM-171	7.933E+00	NOT IDENT.
HF-172	1.490E-01	FAIL ABUN
LU-172	3.445E-02	FAIL ABUN
LU-176	2.459E-02	FAIL ABUN
HF-181	7.211E-02	NOT IDENT.
TA-182	1.424E-01	FAIL ABUN

RE-183	1.264E-01	NOT IDENT.
RE-184	1.910E-01	NOT IDENT.
W-188	8.522E+00	NOT IDENT.
IR-192	4.683E-02	FAIL ABUN
HG-203	5.428E-02	NOT IDENT.
BI-207	3.245E-02	FAIL ABUN
BI-211	3.092E-01	FAIL ABUN
PB-211	7.211E-01	NOT IDENT.
BI-212	4.793E-01	FAIL ABUN
RN-219	3.924E-01	FAIL ABUN
RA-223	5.781E-01	FAIL ABUN
AC-227	2.382E-01	NOT IDENT.
TH-227	2.382E-01	NOT IDENT.
TH-229	5.080E-01	NOT IDENT.
TH-231	5.781E-01	FAIL ABUN
PA-233	6.143E-02	NOT IDENT.
PA-234	1.891E-01	FAIL ABUN
PA-234M	3.301E+00	NOT IDENT.
TH-234	7.522E-01	FAIL ABUN
NP-237	6.143E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	7.522E-01	FAIL ABUN
NP-239	2.207E-01	FAIL ABUN
PU-239	2.890E+02	FAIL ABUN
AM-241	7.648E-02	NOT IDENT.
CM-243	7.947E-02	FAIL ABUN
BK-247	6.725E-02	NOT IDENT.
CM-247	3.454E-02	NOT IDENT.
CF-249	3.870E-02	NOT IDENT.
CF-251	1.029E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677016.CNF;1
Acquisition date : 28-JUN-2016 12:50:21 Sensitivity : 3.000
Detector ID : GAM27 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.86 Half life ratio : *****
Sample date : 11-MAY-2016 11:25:00 Nuclide Library : SOLID
Sample ID : G398677016 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5271E+02 GRAM
Quantity Err(%) : 1.3097E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-SEP-2015 09:22:55 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM27_CAN.CNF;12

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.868E+00	1.028E+00	1.028E+00
BA-137M	2.860E+00	2.758E-01	2.758E-01
CS-137	3.022E+00	2.912E-01	2.912E-01
CE-141	5.435E-02	1.363E-01	1.363E-01
TL-208	1.912E-01	6.845E-02	6.845E-02
PB-210	8.048E-01	2.618E+00	2.618E+00
PB-212	7.121E-01	1.280E-01	1.280E-01
BI-214	2.792E-01	1.136E-01	1.136E-01
PB-214	5.238E-01	1.642E-01	1.642E-01
RN-222	2.792E-01	1.136E-01	1.136E-01
RA-224	5.910E-01	9.707E-01	9.707E-01
RA-226	2.792E-01	1.136E-01	1.136E-01
AC-228	5.997E-01	2.423E-01	2.423E-01
RA-228	5.997E-01	2.423E-01	2.423E-01
TH-228	7.121E-01	1.280E-01	1.280E-01
TH-230	2.792E-01	1.136E-01	1.136E-01
PA-231	5.825E-01	8.650E-01	8.650E-01
TH-232	5.997E-01	2.423E-01	2.423E-01
U-234	2.792E-01	1.136E-01	1.136E-01
U-235	1.277E-01	2.052E-01	2.052E-01
AM-243	8.493E-02	6.888E-02	6.888E-02
ANH-511	6.030E-02	7.473E-02	7.473E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.152E-02	5.634E-01	5.637E-01	NOT IDENT.
NA-22	2.139E-04	3.231E-02	3.231E-02	NOT IDENT.
NA-24	-2.529E+21	4.176E+21	0.000E+00	SHORT HLIF
AL-26	-3.562E-03	2.783E-02	2.787E-02	NOT IDENT.
SC-46	-1.475E-02	4.358E-02	4.408E-02	FAIL ABUN
V-48	-6.212E-02	2.476E-01	2.492E-01	NOT IDENT.
CR-51	1.987E-01	9.204E-01	9.247E-01	NOT IDENT.
MN-54	2.601E-02	3.049E-02	3.267E-02	NOT IDENT.

CO-56	2.104E-03	5.038E-02	5.039E-02	FAIL ABUN
MN-56	1.000E+41	2.124E+42	0.000E+00	SHORT HLIF
CO-57	-1.801E-02	2.363E-02	2.498E-02	NOT IDENT.
CO-58	-2.120E-02	4.052E-02	4.163E-02	NOT IDENT.
FE-59	8.510E-02	9.836E-02	1.056E-01	NOT IDENT.
CO-60	2.138E-02	4.312E-02	4.419E-02	FAIL ABUN
ZN-65	-7.537E-02	7.980E-02	8.673E-02	NOT IDENT.
GE-68	5.750E-01	1.181E+00	1.210E+00	NOT IDENT.
AS-73	6.188E-01	5.297E-01	5.986E-01	NOT IDENT.
AS-74	-1.173E-01	2.982E-01	3.029E-01	FAIL ABUN
SE-75	-3.686E-02	6.093E-02	6.316E-02	NOT IDENT.
BR-77	1.653E+06	2.313E+06	2.430E+06	SHORT HLIF
SR-82	-2.719E-01	6.493E-01	6.608E-01	NOT IDENT.
RB-83	2.371E-02	9.553E-02	9.612E-02	NOT IDENT.
KR-85	7.028E+00	8.257E+00	8.844E+00	NOT IDENT.
SR-85	5.234E-02	6.185E-02	6.619E-02	NOT IDENT.
RB-86	6.593E-01	2.246E+00	2.266E+00	NOT IDENT.
Y-88	-1.089E-02	3.521E-02	3.555E-02	NOT IDENT.
Y-91	7.988E+00	2.067E+01	2.098E+01	NOT IDENT.
NB-94	-8.288E-03	2.723E-02	2.749E-02	NOT IDENT.
NB-95	-6.562E-03	4.739E-02	4.748E-02	NOT IDENT.
NB-95M	-3.315E-02	1.875E-01	1.881E-01	NOT IDENT.
ZR-95	5.025E-02	1.447E-01	1.464E-01	FAIL ABUN
NB-97	1.000E+41	6.406E+40	0.000E+00	SHORT HLIF
ZR-97	1.526E+20	2.541E+20	0.000E+00	SHORT HLIF
MO-99	-1.626E+04	5.324E+04	5.374E+04	SHORT HLIF
TC-99M	-1.000E+41	2.441E+41	0.000E+00	SHORT HLIF
RH-101	8.917E-03	3.281E-02	3.306E-02	NOT IDENT.
RH-102	6.767E-03	8.205E-02	8.211E-02	NOT IDENT.
RU-103	3.208E-02	7.131E-02	7.276E-02	FAIL ABUN
RH-106	-7.374E-02	3.054E-01	3.072E-01	NOT IDENT.
RU-106	-7.374E-02	3.054E-01	3.072E-01	NOT IDENT.
AG-108M	-2.045E-02	3.502E-02	3.621E-02	NOT IDENT.
CD-109	3.520E-01	7.886E-01	8.044E-01	NOT IDENT.
AG-110M	-1.095E-03	4.424E-02	4.425E-02	NOT IDENT.
SN-113	1.251E-02	6.511E-02	6.535E-02	NOT IDENT.
CD-115	1.825E+05	3.363E+05	3.462E+05	SHORT HLIF
SN-117M	2.318E-01	2.774E-01	2.965E-01	FAIL ABUN
TE-123M	3.476E-02	3.334E-02	3.684E-02	NOT IDENT.
SB-124	4.414E-02	7.323E-02	7.588E-02	NOT IDENT.
SB-125	1.215E-02	1.134E-01	1.135E-01	NOT IDENT.
TE-125M	-2.719E+00	1.228E+01	1.234E+01	NOT IDENT.
I-126	-3.332E-01	1.257E+00	1.266E+00	NOT IDENT.
SB-126	2.654E-01	7.181E-01	7.280E-01	NOT IDENT.
SN-126	2.263E-02	7.421E-02	7.490E-02	NOT IDENT.
SB-127	7.969E+01	3.868E+02	3.885E+02	SHORT HLIF
I-131	9.461E-01	2.117E+00	2.159E+00	NOT IDENT.
I-132	-1.000E+41	4.982E+41	0.000E+00	SHORT HLIF
TE-132	-1.097E+03	8.668E+02	9.979E+02	SHORT HLIF
BA-133	1.405E-02	5.069E-02	5.108E-02	FAIL ABUN
I-133	-1.211E+15	1.683E+15	1.769E+15	SHORT HLIF
CS-134	-1.381E-03	3.398E-02	3.399E-02	NOT IDENT.
CS-135	1.271E-01	1.734E-01	1.826E-01	NOT IDENT.
I-135	1.000E+41	2.796E+41	0.000E+00	SHORT HLIF
CS-136	5.290E-02	4.739E-01	4.745E-01	FAIL ABUN
CE-139	1.679E-02	3.255E-02	3.342E-02	NOT IDENT.
BA-140	-2.725E-01	1.517E+00	1.522E+00	FAIL ABUN
LA-140	5.192E-02	3.314E-01	3.323E-01	FAIL ABUN
CE-143	4.865E+09	2.381E+09	3.238E+09	SHORT HLIF
CE-144	1.425E-01	2.098E-01	2.194E-01	NOT IDENT.
PM-144	2.106E-03	3.004E-02	3.006E-02	NOT IDENT.
PR-144	1.604E-01	2.287E+00	2.289E+00	NOT IDENT.
PM-146	-3.635E-02	8.987E-02	9.135E-02	FAIL ABUN
ND-147	-3.620E+00	4.560E+00	4.843E+00	NOT IDENT.
PM-147	-4.511E+02	6.612E+02	6.917E+02	NOT IDENT.
PM-149	3.604E+06	2.885E+06	3.311E+06	SHORT HLIF
EU-150	8.554E-04	3.149E-02	3.149E-02	FAIL ABUN
EU-152	-4.158E-02	1.175E-01	1.190E-01	NOT IDENT.
GD-153	1.386E-01	1.145E-01	1.304E-01	FAIL ABUN
EU-154	-8.736E-03	9.168E-02	9.176E-02	FAIL ABUN
EU-155	2.085E-02	9.007E-02	9.056E-02	NOT IDENT.
TB-160	-3.046E-02	1.389E-01	1.395E-01	FAIL ABUN
HO-166M	3.094E-02	4.853E-02	5.049E-02	FAIL ABUN
TM-171	6.342E+00	8.185E+00	8.670E+00	NOT IDENT.
HF-172	3.665E-02	1.879E-01	1.887E-01	FAIL ABUN
LU-172	-3.110E-02	4.658E-02	4.864E-02	FAIL ABUN
LU-176	3.335E-02	3.092E-02	3.438E-02	FAIL ABUN
HF-181	-2.377E-02	9.572E-02	9.632E-02	NOT IDENT.

TA-182	-1.716E-02	1.704E-01	1.706E-01	FAIL ABUN
RE-183	-3.445E-02	1.396E-01	1.405E-01	NOT IDENT.
RE-184	1.286E-01	2.282E-01	2.354E-01	NOT IDENT.
W-188	-5.270E-01	1.108E+01	1.108E+01	NOT IDENT.
IR-192	3.090E-03	5.326E-02	5.328E-02	FAIL ABUN
HG-203	2.345E-03	6.117E-02	6.118E-02	NOT IDENT.
BI-207	-1.482E-02	4.021E-02	4.076E-02	FAIL ABUN
BI-211	1.443E+00	4.529E-01	7.927E-01	FAIL ABUN
PB-211	9.815E-02	8.340E-01	8.352E-01	NOT IDENT.
BI-212	1.256E+00	4.678E-01	7.344E-01	FAIL ABUN
RN-219	-1.906E-01	5.162E-01	5.233E-01	FAIL ABUN
RA-223	-1.894E-01	6.767E-01	6.820E-01	FAIL ABUN
AC-227	1.455E-02	2.664E-01	2.664E-01	NOT IDENT.
TH-227	1.455E-02	2.664E-01	2.664E-01	NOT IDENT.
TH-229	4.233E-01	5.359E-01	5.689E-01	NOT IDENT.
TH-231	-1.894E-01	6.767E-01	6.820E-01	FAIL ABUN
PA-233	4.116E-02	6.918E-02	7.163E-02	NOT IDENT.
PA-234	3.759E-02	2.160E-01	2.167E-01	FAIL ABUN
PA-234M	-4.488E-01	3.811E+00	3.816E+00	NOT IDENT.
TH-234	-4.373E-01	8.196E-01	8.430E-01	FAIL ABUN
NP-237	4.116E-02	6.918E-02	7.163E-02	FAIL ABUN
NP-238	-2.093E+02	8.504E+05	8.504E+05	SHORT HLIF
U-238	-4.373E-01	8.196E-01	8.430E-01	FAIL ABUN
NP-239	1.677E-01	2.404E-01	2.520E-01	FAIL ABUN
PU-239	7.256E+02	4.487E+02	5.553E+02	FAIL ABUN
AM-241	3.723E-02	8.095E-02	8.267E-02	NOT IDENT.
CM-243	-4.300E-02	1.044E-01	1.062E-01	FAIL ABUN
BK-247	-2.302E-02	8.874E-02	8.934E-02	NOT IDENT.
CM-247	-3.882E-02	4.595E-02	4.917E-02	NOT IDENT.
CF-249	1.420E-02	4.383E-02	4.430E-02	NOT IDENT.
CF-251	-3.228E-02	1.143E-01	1.152E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	107.6926	87.09	194.6289	136.47	121.3165
45.60	122.6067	87.57	186.9516	140.51	0.0000
46.54	107.6908	88.03	180.8246	143.76	107.6538
49.72	0.0000	88.34	180.9308	144.24	110.0166
51.35	119.3738	88.47	180.9755	145.44	103.3072
51.87	109.2883	89.96	219.3551	152.43	118.1678
52.39	98.7863	1093.63	211.7325	153.25	113.0746
52.97	95.0581	91.11	197.6833	323.87	120.1825
53.44	93.2332	92.59	153.5033	156.02	115.2251
54.07	100.1959	93.35	153.7159	158.56	91.0770
57.36	0.0000	94.56	101.8535	159.00	92.5297
57.53	127.5816	94.65	101.8701	162.33	137.2629
57.98	117.8992	94.67	101.8735	162.66	137.3200
59.27	113.3470	94.87	101.9102	163.33	114.5276
59.32	113.3611	97.43	102.3765	165.86	112.2344
59.54	113.4222	98.43	102.5566	176.31	127.0733
60.96	152.4111	98.44	102.5586	176.60	124.4310
61.17	153.4781	99.53	134.8651	177.52	109.3301
62.93	128.2696	100.11	118.9295	181.07	0.0000
63.29	140.3203	102.03	117.7111	181.52	121.0022
63.58	140.4157	103.18	121.1735	184.41	105.5051
64.28	145.6328	103.37	134.1423	143.76	118.5079
66.73	133.4147	105.21	115.6456	193.51	121.3664
67.24	139.5942	105.31	115.6650	197.03	142.9032
125.81	132.6956	106.12	115.8220	198.01	133.8842
67.75	132.7164	106.47	122.3879	201.83	110.4941
69.67	151.4618	109.28	120.7801	203.43	107.5203
70.83	130.5885	111.00	96.0217	205.31	106.4663
72.81	150.9736	111.76	0.0000	210.85	108.5710
72.87	150.9933	114.06	131.5826	215.65	111.1617
74.66	161.2652	116.30	0.0000	222.11	111.8866
74.82	161.3198	116.74	111.2178	227.09	102.0443
74.97	161.3704	119.76	105.1012	227.38	106.7996
77.11	162.0913	121.12	118.6237	228.16	0.0000
78.74	138.9599	121.22	118.6422	228.18	116.3419
79.69	140.7747	121.78	120.9623	116.74	116.3419
80.12	136.2519	122.06	115.4628	235.69	111.2804
80.19	136.2707	122.92	113.3897	235.96	103.6851
80.57	147.2227	123.07	113.4156	238.63	86.9420
81.00	131.8391	265.00	106.8418	238.98	0.0000
81.07	150.4731	125.81	102.1584	240.99	87.1357
81.75	169.0064	127.23	115.7987	242.00	87.2183
83.79	161.1611	127.91	109.1953	244.70	84.5551
84.00	161.2273	129.30	114.4670	252.40	0.0000
85.43	170.0197	131.20	106.3433	252.80	91.9617
86.55	178.7486	133.02	91.3903	254.15	0.0000
86.79	189.2874	133.52	96.5363	256.23	103.8991
86.94	189.3426	136.00	112.1726	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	95.4823	355.39	0.0000	584.27	34.5252
264.80	95.4942	356.01	65.5726	595.83	38.5742
265.00	87.6818	364.49	65.5382	427.87	35.7615
268.22	81.6486	366.42	0.0000	602.52	0.0000
269.46	89.3990	372.51	75.4657	604.72	46.8064
270.03	89.4420	375.05	60.6895	607.14	32.3169
271.23	91.3061	377.52	69.3233	609.32	32.3494
273.65	82.0308	356.01	70.6880	610.33	35.6014
276.40	90.9205	388.16	68.7422	614.28	27.5607
277.37	93.9621	388.63	63.3915	618.01	26.4477
277.60	94.9702	391.69	77.5140	620.36	29.2635
278.00	93.0232	264.66	55.4430	621.93	27.6575
279.20	85.1917	401.81	85.2494	630.19	0.0000
279.54	76.2986	402.40	91.6831	631.29	29.4097
279.70	76.3091	404.85	79.2623	633.25	25.7565
280.46	95.1987	410.95	70.8498	634.78	25.7745
283.69	91.4792	413.71	77.5252	635.95	34.3839
284.31	83.5681	414.70	74.2951	636.99	40.9526
285.41	69.7031	423.72	70.3184	645.85	27.6295
285.90	0.0000	427.09	90.2818	657.76	41.3320
287.50	90.7709	427.87	78.2088	657.90	0.0000
290.67	80.0073	433.94	79.6036	661.66	33.7842
293.27	0.0000	439.40	77.6477	664.57	0.0000
351.93	83.7456	453.88	89.5044	666.33	31.5298
295.96	74.9948	463.37	70.7133	666.50	29.8726
879.38	60.3909	468.07	79.4127	667.71	0.0000
299.98	40.3058	473.00	0.0000	677.62	17.0091
300.09	60.4642	475.06	69.7634	685.70	0.0000
300.13	60.4660	476.78	71.6449	695.00	24.1904
301.36	84.7357	477.60	69.8630	696.49	27.2314
302.85	84.8357	482.18	66.7072	696.51	27.2320
256.23	48.5413	487.02	53.2057	697.00	29.2549
304.85	48.5544	492.35	0.0000	697.30	27.2406
306.78	68.0798	497.08	45.8582	697.49	26.2342
308.46	71.4151	505.52	46.0681	702.65	29.3243
311.90	73.2349	507.63	0.0000	706.68	27.3474
316.51	92.8912	511.00	54.5206	711.68	20.2993
319.41	89.0045	514.00	50.9059	720.70	17.4639
320.08	84.9554	514.00	50.9059	721.93	0.0000
321.04	89.1161	520.40	49.2204	722.78	16.9930
323.87	87.2542	520.69	0.0000	722.91	20.3931
325.23	97.6194	522.65	0.0000	723.31	20.3960
328.76	80.3625	527.90	0.0000	724.19	22.1036
333.37	72.7815	528.26	44.7609	727.33	16.3438
333.97	76.1235	529.59	52.2580	733.00	5.1191
334.37	72.8353	529.87	0.0000	735.93	16.4004
338.28	91.3059	531.02	56.0317	333.97	20.5132
338.32	91.3086	537.26	44.0338	739.50	0.0000
311.90	99.7661	546.56	0.0000	747.24	30.8899
340.48	99.7661	552.55	46.2653	748.06	32.6161
340.55	99.7705	563.25	37.9697	752.31	13.7562
344.28	90.3152	569.33	34.2756	753.82	23.7440
345.93	89.0313	946.00	36.1826	756.73	22.3929
351.06	73.7204	569.70	36.1863	756.80	22.3935
351.93	85.9207	583.19	34.5076	884.68	34.2020

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	25.9296	1274.44	16.8604	1620.50	7.5315
766.42	24.8982	1001.03	18.7618	1621.92	7.5338
766.84	22.8271	1002.74	17.8334	1678.03	0.0000
772.60	0.0000	1004.73	19.7225	1690.97	1.9105
776.52	23.9546	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	5.0891
778.90	23.9765	1028.54	0.0000	1063.66	5.0947
783.70	0.0000	1037.84	19.9250	1771.35	13.5889
785.37	25.0805	1038.76	0.0000	1791.20	0.0000
792.07	26.1920	631.29	13.3187	1808.65	2.9330
794.95	19.9277	1048.07	17.1313	1810.72	0.0000
795.86	23.0823	1049.04	19.0405	1836.06	5.8968
810.06	16.8766	1050.41	20.9535		
810.29	21.0977	1063.66	19.1243		
344.28	22.1536	1077.00	13.1657		
810.76	21.1011	1077.34	13.1674		
815.77	20.0836	1085.87	12.9941		
1048.07	20.1035	1093.63	17.3650		
832.01	19.1399	1099.45	7.7308		
834.85	14.9020	1112.07	13.7542		
835.71	27.6840	1112.84	15.5215		
836.80	0.0000	1115.54	19.9713		
846.75	0.0000	1120.29	10.6938		
846.77	22.9075	1120.55	11.6665		
856.80	21.4570	1221.41	26.6730		
860.56	16.1144	1129.67	17.5459		
871.09	14.0175	1131.51	0.0000		
873.19	12.9489	1147.95	0.0000		
875.33	0.0000	1173.23	13.8137		
879.38	18.3837	1177.95	15.2427		
880.51	17.3094	1189.05	11.8916		
883.24	20.5744	1204.77	11.9424		
884.68	19.5012	1221.41	17.9934		
889.28	22.7878	1231.02	17.0374		
894.76	16.3076	1235.36	13.0434		
898.04	19.5913	1238.28	15.0616		
900.72	28.3239	1260.41	0.0000		
903.28	18.6914	1271.87	11.1423		
911.20	19.1325	1274.44	14.1903		
912.08	21.8721	1274.54	13.1772		
923.98	0.0000	1291.59	4.0723		
926.50	13.1868	1298.22	0.0000		
929.11	23.0969	1312.11	6.1401		
937.49	22.0586	1332.49	12.3428		
944.13	16.5802	1362.66	0.0000		
946.00	11.9820	1365.19	8.2946		
949.00	19.3743	1368.63	0.0000		
667.71	0.0000	1384.29	12.4995		
962.31	17.4729	1408.01	10.4753		
964.08	22.2510	1457.56	0.0000		
966.17	11.1331	1460.82	9.0901		
911.20	23.8780	1489.16	8.5391		
968.97	23.8780	1505.03	13.9252		
983.53	22.3901	1584.12	7.4735		
984.45	0.0000	1596.21	4.6831		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:44:22.97

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677017.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM30.CNF;285
Background date    : 26-JUN-2016 12:05:40
Sample date       : 11-MAY-2016 11:35:00 Acquisition date : 28-JUN-2016 14:37:37
Sample ID        : G398677017 Sample quantity : 1.49630E+02 GRAM
Detector name     : GAM30 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:02.59 0.1%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.72*	23	309	0.52	93.17	91	7	6.50E-03	126.7	
2	2	74.93	125	355	1.19	149.59	142	21	3.48E-02	26.5	1.75E+00
3	2	77.22*	159	352	1.14	154.16	142	21	4.42E-02	21.3	
4	0	87.44*	83	368	1.19	174.60	171	7	2.32E-02	40.0	
5	0	92.84*	106	537	1.54	185.40	182	11	2.95E-02	44.0	
6	0	185.46*	86	519	0.77	370.65	367	9	2.39E-02	49.2	
7	0	209.18	62	376	1.51	418.10	415	7	1.71E-02	53.8	
8	0	238.88*	266	517	1.17	477.51	472	9	7.38E-02	16.7	
9	0	255.29	48	268	1.43	510.32	508	7	1.34E-02	57.9	
10	0	294.95*	130	318	1.41	589.65	585	10	3.61E-02	27.2	
11	0	332.68	26	235	1.03	665.11	661	6	7.28E-03	94.2	
12	0	338.34	88	278	0.75	676.44	673	8	2.45E-02	34.4	
13	0	352.14*	125	345	1.63	704.05	699	9	3.48E-02	28.3	
14	0	472.29	73	567	1.57	944.38	937	13	2.02E-02	69.0	
15	0	520.88	23	121	1.31	1041.58	1039	8	6.44E-03	85.4	
16	0	553.28	10	165	3.89	1106.40	1097	14	2.88E-03	264.5	
17	0	583.06*	133	119	1.52	1165.97	1159	13	3.70E-02	19.1	
18	0	609.64*	128	74	1.38	1219.14	1214	9	3.57E-02	15.2	
19	0	661.86	12542	94	1.40	1323.60	1316	15	3.48E+00	0.9	
20	0	719.66	16	5	3.32	1439.24	1434	10	4.55E-03	35.3	
21	0	727.48	32	7	1.56	1454.88	1450	9	8.96E-03	22.8	
22	0	768.41	17	22	0.72	1536.76	1531	11	4.72E-03	58.7	
23	0	795.77	9	18	1.06	1591.50	1586	8	2.44E-03	90.4	
24	0	807.87	20	2	2.99	1615.70	1611	9	5.49E-03	26.3	
25	0	860.74	19	10	2.60	1721.47	1716	10	5.28E-03	38.7	
26	0	879.45	6	7	3.14	1758.90	1754	7	1.78E-03	78.2	
27	0	911.51*	60	14	0.95	1823.05	1818	9	1.68E-02	17.7	
28	0	969.73*	40	29	1.54	1939.53	1932	13	1.12E-02	32.4	
29	0	982.53	11	10	1.55	1965.13	1956	13	3.11E-03	64.9	
30	0	997.27	13	2	1.88	1994.63	1991	9	3.69E-03	33.7	
31	0	1084.35	7	15	4.37	2168.86	2160	15	1.94E-03	126.4	
32	0	1120.55*	37	3	2.66	2241.29	2234	14	1.02E-02	20.2	
33	0	1202.09	8	4	1.53	2404.43	2399	9	2.20E-03	59.4	
34	0	1461.28*	182	6	2.10	2923.08	2916	13	5.06E-02	8.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1764.73	31	3	2.38	3530.34	3525	11	8.66E-03	20.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:44:24

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677017.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:35:00 Acquisition date : 28-JUN-2016 14:37:37
Sample ID        : G398677017 Sample quantity  : 149.63 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA30 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:02.59 0.1%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.307E+00	6.321E+00	6.321E+00	16.11	OK
CD-109	88.03	3.70*	6.565E+00	1.366E+00	1.469E+00	130.80	OK
SN-126	64.28	9.60	4.032E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	6.565E+00	5.680E-01	5.680E-01	130.80	OK
	87.57	37.00*	6.565E+00	1.366E-01	1.366E-01	130.80	OK
BA-137M	661.66	89.90*	2.541E+00	2.884E+01	2.893E+01	1.82	OK
CS-137	661.66	85.10*	2.541E+00	3.047E+01	3.056E+01	1.82	OK
TL-208	277.37	6.60	4.820E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.800E+00	2.977E-01	2.977E-01	38.29	OK
	860.56	12.50	2.058E+00	3.777E-01	3.777E-01	77.35	OK
PB-210	46.54	4.25*	1.278E+00	2.861E+00	2.872E+00	253.43	OK
PB-212	74.82	10.28	5.454E+00	9.374E-01	9.374E-01	85.56	OK
	77.11	17.10	5.702E+00	1.040E+00	1.040E+00	42.64	OK
	238.63	43.60*	5.353E+00	6.582E-01	6.582E-01	33.41	OK
	300.09	3.30	4.556E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34	OK
	1120.29	14.92	1.645E+00	7.469E-01	7.470E-01	40.47	OK
	1764.49	15.30	1.122E+00	8.609E-01	8.610E-01	41.36	OK
PB-214	74.82	5.80	5.442E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.702E+00	1.834E+00	1.834E+00	42.64	OK
	87.09	3.41	6.542E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.305E+00	----- Line	Not Found	-----	Absent
	295.22	18.42	4.613E+00	8.688E-01	8.689E-01	54.44	OK
	351.93	35.60*	4.059E+00	4.844E-01	4.844E-01	56.63	OK
RN-222	609.32	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34	OK
	1120.29	14.92	1.645E+00	7.469E-01	7.470E-01	40.47	OK
	1764.49	15.30	1.122E+00	8.609E-01	8.610E-01	41.36	OK
RA-226	609.32	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34	OK
	1120.29	14.92	1.645E+00	7.469E-01	7.470E-01	40.47	OK
	1764.49	15.30	1.122E+00	8.609E-01	8.610E-01	41.36	OK
AC-228	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.178E+00	1.050E+00	1.050E+00	68.81	OK
	794.95	4.25	2.195E+00	4.851E-01	4.851E-01	180.85	OK
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.962E+00	6.069E-01	6.069E-01	35.43	OK
	968.97	15.80	1.862E+00	6.894E-01	6.894E-01	64.88	OK
RA-228	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.178E+00	1.050E+00	1.050E+00	68.81	OK
	794.95	4.25	2.195E+00	4.851E-01	4.851E-01	180.85	OK
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.962E+00	6.069E-01	6.069E-01	35.43	OK
	968.97	15.80	1.862E+00	6.894E-01	6.894E-01	64.88	OK
TH-228	74.82	10.28	5.454E+00	9.374E-01	9.374E-01	85.56	OK
	77.11	17.10	5.702E+00	1.040E+00	1.040E+00	42.64	OK
	238.63	43.60*	5.353E+00	6.582E-01	6.582E-01	33.41	OK
	300.09	3.30	4.556E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34	OK
	1120.29	14.92	1.645E+00	7.469E-01	7.469E-01	40.47	OK
	1764.49	15.30	1.122E+00	8.609E-01	8.609E-01	41.36	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	105.21	1.10	7.278E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	4.178E+00	1.050E+00	1.050E+00	68.81	OK
	835.71	1.61	2.109E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.962E+00	6.069E-01	6.069E-01	35.43	OK
U-234	968.97	15.80	1.862E+00	6.894E-01	6.894E-01	64.88	OK
	609.32	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34	OK
	1120.29	14.92	1.645E+00	7.469E-01	7.469E-01	40.47	OK
	1764.49	15.30	1.122E+00	8.609E-01	8.609E-01	41.36	OK
AM-243	43.53	5.90	8.765E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.454E+00	1.434E-01	1.434E-01	85.56	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677017.CNF;1
Acquisition date : 28-JUN-2016 14:37:37 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:02.59 Half life ratio : *****
Sample date : 11-MAY-2016 11:35:00 Analyst initials: MXR1
Sample ID : G398677017 Sample Quantity : 1.4963E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.321E+00	9.980E-01	5.271E-01
CD-109	1.469E+00	1.883E+00	2.093E+00
SN-126	1.366E-01	1.751E-01	2.007E-01
BA-137M	2.893E+01	5.152E-01	8.621E-02
CS-137	3.056E+01	5.442E-01	9.108E-02
TL-208	2.977E-01	1.117E-01	1.066E-01
PB-210	2.872E+00	7.134E+00	8.135E+00
PB-212	6.582E-01	2.155E-01	2.178E-01
BI-214	5.524E-01	1.642E-01	1.924E-01
PB-214	4.844E-01	2.688E-01	2.995E-01
RN-222	5.524E-01	1.642E-01	1.924E-01
RA-226	5.524E-01	1.642E-01	1.924E-01
AC-228	6.069E-01	2.107E-01	2.064E-01
RA-228	6.069E-01	2.107E-01	2.064E-01
TH-228	6.582E-01	2.155E-01	2.178E-01
TH-230	5.524E-01	1.642E-01	1.924E-01
TH-232	6.069E-01	2.107E-01	2.064E-01
U-234	5.524E-01	1.642E-01	1.924E-01
AM-243	1.434E-01	1.202E-01	1.239E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.538E-01	1.540E+00	2.454E+00	NOT IDENT.
NA-22	-3.163E-03	3.504E-02	6.699E-02	NOT IDENT.
NA-24	0.000E+00	4.338E+21	0.000E+00	SHORT HLIF
AL-26	-3.588E-03	1.588E-02	3.561E-02	NOT IDENT.
SC-46	-4.395E-02	3.595E-02	5.549E-02	FAIL ABUN
V-48	2.479E-01	3.151E-01	5.521E-01	FAIL ABUN
CR-51	-2.253E+00	1.770E+00	3.096E+00	NOT IDENT.
MN-54	-6.072E-05	3.303E-02	6.464E-02	NOT IDENT.
CO-56	-3.507E-02	3.946E-02	6.730E-02	NOT IDENT.
MN-56	0.000E+00	1.125E+41	0.000E+00	SHORT HLIF
CO-57	-2.660E-02	4.783E-02	8.537E-02	NOT IDENT.

CO-58	2.552E-02	4.075E-02	8.189E-02	NOT IDENT.
FE-59	-2.323E-02	1.097E-01	2.085E-01	NOT IDENT.
CO-60	1.735E-03	3.856E-02	7.442E-02	NOT IDENT.
ZN-65	-2.355E-02	8.843E-02	1.390E-01	NOT IDENT.
GE-68	6.531E-01	1.255E+00	2.367E+00	NOT IDENT.
AS-73	-2.593E-01	1.490E+00	2.834E+00	NOT IDENT.
AS-74	-1.643E-01	5.407E-01	9.490E-01	NOT IDENT.
SE-75	-4.722E-03	1.087E-01	2.023E-01	NOT IDENT.
BR-77	0.000E+00	5.102E+05	0.000E+00	SHORT HLIF
SR-82	-2.145E-01	6.145E-01	1.165E+00	NOT IDENT.
RB-83	1.340E-01	2.241E-01	3.498E-01	FAIL ABUN
KR-85	-1.542E+01	1.573E+01	2.669E+01	NOT IDENT.
SR-85	-1.158E-01	1.179E-01	2.001E-01	NOT IDENT.
RB-86	1.201E+00	2.463E+00	4.623E+00	NOT IDENT.
Y-88	1.743E-02	3.669E-02	8.795E-02	NOT IDENT.
Y-91	1.490E+01	1.993E+01	4.206E+01	NOT IDENT.
NB-94	7.997E-03	2.561E-02	5.237E-02	NOT IDENT.
NB-95	5.704E-03	6.392E-02	1.092E-01	NOT IDENT.
NB-95M	2.146E-01	3.621E-01	6.156E-01	NOT IDENT.
ZR-95	-5.604E-02	5.981E-02	1.015E-01	NOT IDENT.
NB-97	0.000E+00	1.091E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.974E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	3.975E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-1.206E-02	5.472E-02	9.868E-02	NOT IDENT.
RH-102	-3.201E-02	8.141E-02	1.419E-01	NOT IDENT.
RU-103	-9.163E-03	1.715E-01	3.053E-01	FAIL ABUN
RH-106	4.169E-02	5.250E-01	9.491E-01	NOT IDENT.
RU-106	4.169E-02	5.250E-01	9.491E-01	NOT IDENT.
AG-108M	8.107E-02	8.471E-02	1.567E-01	NOT IDENT.
AG-110M	1.071E-02	4.158E-02	8.417E-02	NOT IDENT.
SN-113	-6.797E-02	1.381E-01	2.451E-01	NOT IDENT.
CD-115	0.000E+00	6.798E+05	0.000E+00	SHORT HLIF
SN-117M	1.318E-01	4.986E-01	9.049E-01	NOT IDENT.
TE-123M	9.490E-03	5.839E-02	1.055E-01	NOT IDENT.
SB-124	7.918E-02	6.940E-02	2.082E-01	NOT IDENT.
SB-125	-4.954E-02	2.484E-01	4.427E-01	NOT IDENT.
TE-125M	9.586E+00	2.178E+01	4.079E+01	NOT IDENT.
I-126	5.144E-01	1.531E+00	2.587E+00	NOT IDENT.
SB-126	9.941E-01	6.884E-01	1.401E+00	FAIL ABUN
SB-127	0.000E+00	4.145E+02	0.000E+00	SHORT HLIF
I-131	2.367E-01	4.602E+00	8.405E+00	NOT IDENT.
I-132	0.000E+00	9.867E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.778E+03	0.000E+00	SHORT HLIF
BA-133	-3.846E-02	1.073E-01	1.688E-01	NOT IDENT.
I-133	0.000E+00	3.545E+15	0.000E+00	SHORT HLIF
CS-134	2.522E-02	4.469E-02	8.564E-02	FAIL ABUN
CS-135	4.994E-02	3.150E-01	5.889E-01	NOT IDENT.
I-135	0.000E+00	1.177E+41	0.000E+00	SHORT HLIF
CS-136	4.431E-02	4.654E-01	9.303E-01	NOT IDENT.
CE-139	-1.333E-02	5.808E-02	1.031E-01	NOT IDENT.
BA-140	-2.650E+00	3.137E+00	5.333E+00	NOT IDENT.
LA-140	-5.775E-01	4.688E-01	6.861E-01	NOT IDENT.
CE-141	-2.400E-01	2.108E-01	3.631E-01	NOT IDENT.
CE-143	0.000E+00	4.475E+09	0.000E+00	SHORT HLIF
CE-144	5.885E-02	3.476E-01	6.358E-01	NOT IDENT.
PM-144	1.885E-02	3.071E-02	6.456E-02	NOT IDENT.
PR-144	1.435E+00	2.338E+00	4.916E+00	NOT IDENT.
PM-146	6.357E-02	1.291E-01	2.338E-01	NOT IDENT.
ND-147	-2.966E+00	9.291E+00	1.632E+01	NOT IDENT.
PM-147	-1.550E+02	1.294E+03	2.350E+03	NOT IDENT.
PM-149	0.000E+00	5.635E+06	0.000E+00	SHORT HLIF
EU-150	3.631E-02	6.706E-02	1.094E-01	FAIL ABUN
EU-152	8.069E-02	2.200E-01	3.955E-01	NOT IDENT.
GD-153	-9.099E-02	1.574E-01	2.524E-01	NOT IDENT.
EU-154	-1.079E-02	9.723E-02	1.853E-01	FAIL ABUN
EU-155	1.175E-01	1.608E-01	3.052E-01	FAIL ABUN
TB-160	8.546E-02	1.310E-01	2.990E-01	FAIL ABUN
HO-166M	6.124E-03	4.876E-02	9.806E-02	FAIL ABUN
TM-171	-4.724E-01	2.434E+01	4.662E+01	NOT IDENT.
HF-172	-3.915E-01	3.404E-01	5.923E-01	NOT IDENT.
LU-172	-3.313E-03	4.578E-02	8.998E-02	FAIL ABUN
LU-176	-3.452E-02	5.547E-02	9.998E-02	FAIL ABUN
HF-181	-1.127E-02	2.004E-01	3.563E-01	NOT IDENT.
TA-182	-1.171E-01	1.673E-01	2.831E-01	FAIL ABUN
RE-183	4.615E-02	3.622E-01	6.940E-01	NOT IDENT.
RE-184	7.100E-02	1.741E-01	3.689E-01	NOT IDENT.
W-188	-9.363E+00	2.253E+01	3.597E+01	NOT IDENT.

IR-192	-9.660E-03	9.965E-02	1.829E-01	FAIL ABUN
HG-203	-7.484E-02	1.231E-01	2.235E-01	NOT IDENT.
BI-207	1.567E-04	3.957E-02	7.799E-02	FAIL ABUN
BI-211	0.000E+00	7.407E-01	9.848E-01	FAIL ABUN
PB-211	-1.463E-01	1.755E+00	3.159E+00	NOT IDENT.
BI-212	0.000E+00	4.771E-01	1.039E+00	FAIL ABUN
RN-219	-6.941E-01	9.952E-01	1.750E+00	NOT IDENT.
RA-223	5.843E-01	1.355E+00	2.532E+00	FAIL ABUN
RA-224	0.000E+00	1.365E+00	2.435E+00	NOT IDENT.
AC-227	5.721E-01	6.489E-01	9.555E-01	FAIL ABUN
TH-227	5.721E-01	6.489E-01	9.555E-01	FAIL ABUN
TH-229	-2.570E-01	1.051E+00	1.838E+00	FAIL ABUN
PA-231	6.663E-01	9.722E-01	1.841E+00	NOT IDENT.
TH-231	5.843E-01	1.355E+00	2.532E+00	FAIL ABUN
PA-233	9.952E-02	1.341E-01	2.542E-01	NOT IDENT.
PA-234	1.404E-01	2.347E-01	5.039E-01	FAIL ABUN
PA-234M	-1.752E+00	3.536E+00	5.300E+00	NOT IDENT.
TH-234	4.739E-01	1.672E+00	3.235E+00	FAIL ABUN
U-235	8.737E-03	3.275E-01	5.920E-01	FAIL ABUN
NP-237	9.952E-02	1.341E-01	2.542E-01	NOT IDENT.
NP-238	0.000E+00	9.122E+05	0.000E+00	SHORT HLIF
U-238	4.739E-01	1.672E+00	3.235E+00	FAIL ABUN
NP-239	3.345E-01	4.248E-01	8.017E-01	NOT IDENT.
PU-239	5.713E+02	5.570E+02	1.052E+03	NOT IDENT.
AM-241	-1.276E-01	2.032E-01	3.775E-01	NOT IDENT.
CM-243	-2.537E-01	1.622E-01	2.804E-01	NOT IDENT.
BK-247	5.948E-03	1.621E-01	3.022E-01	NOT IDENT.
CM-247	1.011E-02	8.952E-02	1.625E-01	NOT IDENT.
CF-249	7.807E-04	9.980E-02	1.807E-01	FAIL ABUN
CF-251	4.868E-02	2.304E-01	4.139E-01	NOT IDENT.
ANH-511	8.867E-03	7.073E-02	1.357E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	176	10.66*	1.307E+00	6.321E+00	6.321E+00	16.11
CD-109	88.03	105	3.70*	6.565E+00	2.167E+00	2.330E+00	79.98
SN-126	64.28	-----	9.60	4.032E+00	-----	Line Not Found	-----
	86.94	105	8.90	6.565E+00	9.009E-01	9.009E-01	79.98
	87.57	105	37.00*	6.565E+00	2.167E-01	2.167E-01	79.98
BA-137M	661.66	13129	89.90*	2.541E+00	2.884E+01	2.893E+01	1.82
CS-137	661.66	13129	85.10*	2.541E+00	3.047E+01	3.056E+01	1.82
TL-208	277.37	-----	6.60	4.820E+00	-----	Line Not Found	-----
	583.19	141	85.00*	2.800E+00	2.977E-01	2.977E-01	38.29
	860.56	19	12.50	2.058E+00	3.777E-01	3.777E-01	77.35
PB-210	46.54	31	4.25*	1.278E+00	2.861E+00	2.872E+00	253.43
BI-211	72.87	-----	1.23	5.213E+00	-----	Line Not Found	-----
	351.06	139	12.92*	4.059E+00	1.335E+00	1.335E+00	56.63
PB-212	74.82	160	10.28	5.454E+00	1.428E+00	1.428E+00	52.98
	77.11	202	17.10	5.702E+00	1.040E+00	1.040E+00	42.64
	238.63	306	43.60*	5.353E+00	6.582E-01	6.582E-01	33.41
	300.09	-----	3.30	4.556E+00	-----	Line Not Found	-----
BI-214	609.32	136	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34
	1120.29	37	14.92	1.645E+00	7.469E-01	7.470E-01	40.47
	1764.49	29	15.30	1.122E+00	8.609E-01	8.610E-01	41.36
PB-214	74.82	160	5.80	5.454E+00	2.530E+00	2.530E+00	52.98
	77.11	202	9.70	5.702E+00	1.834E+00	1.834E+00	42.64
	87.09	105	3.41	6.565E+00	2.351E+00	2.351E+00	79.98
	242.00	-----	7.25	5.305E+00	-----	Line Not Found	-----
	295.22	147	18.42	4.613E+00	8.688E-01	8.689E-01	54.44
	351.93	139	35.60*	4.059E+00	4.844E-01	4.844E-01	56.63
RN-222	609.32	136	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34
	1120.29	37	14.92	1.645E+00	7.469E-01	7.470E-01	40.47
	1764.49	29	15.30	1.122E+00	8.609E-01	8.610E-01	41.36
RA-226	609.32	136	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34
	1120.29	37	14.92	1.645E+00	7.469E-01	7.470E-01	40.47
	1764.49	29	15.30	1.122E+00	8.609E-01	8.610E-01	41.36
AC-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	99	11.27	4.178E+00	1.050E+00	1.050E+00	68.81
	794.95	9	4.25	2.195E+00	4.851E-01	4.851E-01	180.85
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.962E+00	6.069E-01	6.069E-01	35.43
	968.97	40	15.80	1.862E+00	6.894E-01	6.894E-01	64.88
RA-228	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	99	11.27	4.178E+00	1.050E+00	1.050E+00	68.81
	794.95	9	4.25	2.195E+00	4.851E-01	4.851E-01	180.85
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.962E+00	6.069E-01	6.069E-01	35.43
	968.97	40	15.80	1.862E+00	6.894E-01	6.894E-01	64.88
TH-228	74.82	160	10.28	5.454E+00	1.428E+00	1.428E+00	52.98
	77.11	202	17.10	5.702E+00	1.040E+00	1.040E+00	42.64
	238.63	306	43.60*	5.353E+00	6.582E-01	6.582E-01	33.41

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	300.09	-----	3.30	4.556E+00	-----	Line Not Found	-----
TH-230	609.32	136	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34
	1120.29	37	14.92	1.645E+00	7.469E-01	7.469E-01	40.47
	1764.49	29	15.30	1.122E+00	8.609E-01	8.609E-01	41.36
TH-232	105.21	-----	1.10	7.278E+00	-----	Line Not Found	-----
	338.32	99	11.27	4.178E+00	1.050E+00	1.050E+00	68.81
	835.71	-----	1.61	2.109E+00	-----	Line Not Found	-----
	911.20	61	25.80*	1.962E+00	6.069E-01	6.069E-01	35.43
	968.97	40	15.80	1.862E+00	6.894E-01	6.894E-01	64.88
U-234	609.32	136	45.49*	2.707E+00	5.524E-01	5.524E-01	30.34
	1120.29	37	14.92	1.645E+00	7.469E-01	7.469E-01	40.47
	1764.49	29	15.30	1.122E+00	8.609E-01	8.609E-01	41.36
AM-243	43.53	-----	5.90	8.765E-01	-----	Line Not Found	-----
	74.66	160	67.20*	5.454E+00	2.184E-01	2.184E-01	52.98

Flag: "*" = Keyline

Total number of lines in spectrum 35
Number of unidentified lines 5
Number of lines tentatively identified by NID 30 85.71%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.321E+00	6.321E+00	1.018E+00	16.11	
CD-109	461.40D	1.08	2.167E+00	2.330E+00	1.863E+00	79.98	
SN-126	2.30E+05Y	1.00	2.167E-01	2.167E-01	1.733E-01	79.98	
BA-137M	30.08Y	1.00	2.884E+01	2.893E+01	0.053E+01	1.82	
CS-137	30.08Y	1.00	3.047E+01	3.056E+01	0.056E+01	1.82	
TL-208	1.41E+10Y	1.00	2.977E-01	2.977E-01	1.140E-01	38.29	
PB-210	22.20Y	1.00	2.861E+00	2.872E+00	7.279E+00	253.43	
BI-211	7.04E+08Y	1.00	1.335E+00	1.335E+00	0.756E+00	56.63	
PB-212	1.41E+10Y	1.00	6.582E-01	6.582E-01	2.199E-01	33.41	
BI-214	1600.00Y	1.00	5.524E-01	5.524E-01	1.676E-01	30.34	
PB-214	1600.00Y	1.00	4.844E-01	4.844E-01	2.743E-01	56.63	
RN-222	1600.00Y	1.00	5.524E-01	5.524E-01	1.676E-01	30.34	
RA-226	1600.00Y	1.00	5.524E-01	5.524E-01	1.676E-01	30.34	
AC-228	1.41E+10Y	1.00	6.069E-01	6.069E-01	2.150E-01	35.43	
RA-228	1.41E+10Y	1.00	6.069E-01	6.069E-01	2.150E-01	35.43	
TH-228	1.41E+10Y	1.00	6.582E-01	6.582E-01	2.199E-01	33.41	
TH-230	7.54E+04Y	1.00	5.524E-01	5.524E-01	1.676E-01	30.34	
TH-232	1.41E+10Y	1.00	6.069E-01	6.069E-01	2.150E-01	35.43	
U-234	2.45E+05Y	1.00	5.524E-01	5.524E-01	1.676E-01	30.34	
AM-243	7370.00Y	1.00	2.184E-01	2.184E-01	1.157E-01	52.98	

Total Activity : 7.910E+01 7.946E+01

Grand Total Activity : 7.910E+01 7.946E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	92.84	133	672	1.54	185.40	182	11	2.95E-02	88.1	6.87E+00	T
0	185.46	102	612	0.77	370.65	367	9	2.39E-02	98.4	6.30E+00	T
0	209.18	72	439	1.51	418.10	415	7	1.71E-02	****	5.85E+00	
0	255.29	55	307	1.43	510.32	508	7	1.34E-02	****	5.11E+00	T
0	332.68	29	263	1.03	665.11	661	6	7.28E-03	****	4.23E+00	T
0	472.29	79	614	1.57	944.38	937	13	2.02E-02	****	3.28E+00	T
0	520.88	25	129	1.31	1041.58	1039	8	6.44E-03	****	3.05E+00	T
0	553.28	11	175	3.89	1106.40	1097	14	2.88E-03	****	2.91E+00	T
0	719.66	17	5	3.32	1439.24	1434	10	4.55E-03	70.7	2.38E+00	T
0	727.48	33	7	1.56	1454.88	1450	9	8.96E-03	45.6	2.36E+00	T
0	768.41	18	23	0.72	1536.76	1531	11	4.72E-03	****	2.26E+00	
0	807.87	20	2	2.99	1615.70	1611	9	5.49E-03	52.6	2.17E+00	
0	879.45	7	7	3.14	1758.90	1754	7	1.78E-03	****	2.02E+00	T
0	982.53	11	10	1.55	1965.13	1956	13	3.11E-03	****	1.84E+00	T
0	997.27	13	2	1.88	1994.63	1991	9	3.69E-03	67.4	1.82E+00	T
0	1084.35	7	15	4.37	2168.86	2160	15	1.94E-03	****	1.69E+00	
0	1202.09	8	4	1.53	2404.43	2399	9	2.20E-03	****	1.55E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677017.CNF;1
Acquisition date : 28-JUN-2016 14:37:37 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:02.59 Half life ratio : *****
Sample date : 11-MAY-2016 11:35:00 Nuclide Library : SOLID
Sample ID : G398677017 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.4963E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.146E-01
CD-109	1.015E+00
SN-126	9.741E-02
BA-137M	4.006E-02
CS-137	4.232E-02
TL-208	5.037E-02
PB-210	3.930E+00
PB-212	1.059E-01
BI-214	9.057E-02
PB-214	1.450E-01
RN-222	9.057E-02
RA-226	9.057E-02
AC-228	8.958E-02
RA-228	8.958E-02
TH-228	1.059E-01
TH-230	9.056E-02
TH-232	8.958E-02
U-234	9.056E-02
AM-243	5.995E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.189E+00	NOT IDENT.
NA-22	2.867E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.161E-02	NOT IDENT.
SC-46	2.261E-02	FAIL ABUN
V-48	2.458E-01	FAIL ABUN
CR-51	1.494E+00	NOT IDENT.
MN-54	2.868E-02	NOT IDENT.
CO-56	2.854E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.141E-02	NOT IDENT.
CO-58	3.579E-02	NOT IDENT.

FE-59	8.884E-02	NOT IDENT.
CO-60	3.229E-02	NOT IDENT.
ZN-65	6.006E-02	NOT IDENT.
GE-68	1.042E+00	NOT IDENT.
AS-73	1.370E+00	NOT IDENT.
AS-74	4.466E-01	NOT IDENT.
SE-75	9.798E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	5.061E-01	NOT IDENT.
RB-83	1.674E-01	FAIL ABUN
KR-85	1.282E+01	NOT IDENT.
SR-85	9.613E-02	NOT IDENT.
RB-86	2.032E+00	NOT IDENT.
Y-88	3.538E-02	NOT IDENT.
Y-91	1.801E+01	NOT IDENT.
NB-94	2.332E-02	NOT IDENT.
NB-95	4.943E-02	NOT IDENT.
NB-95M	2.990E-01	NOT IDENT.
ZR-95	4.134E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	4.787E-02	NOT IDENT.
RH-102	6.613E-02	NOT IDENT.
RU-103	1.470E-01	FAIL ABUN
RH-106	4.459E-01	NOT IDENT.
RU-106	4.459E-01	NOT IDENT.
AG-108M	7.616E-02	NOT IDENT.
AG-110M	3.669E-02	NOT IDENT.
SN-113	1.188E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.385E-01	NOT IDENT.
TE-123M	5.113E-02	NOT IDENT.
SB-124	8.262E-02	NOT IDENT.
SB-125	2.145E-01	NOT IDENT.
TE-125M	1.975E+01	NOT IDENT.
I-126	1.183E+00	NOT IDENT.
SB-126	6.195E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	4.065E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.158E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.897E-02	FAIL ABUN
CS-135	2.856E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.029E-01	NOT IDENT.
CE-139	4.986E-02	NOT IDENT.
BA-140	2.536E+00	NOT IDENT.
LA-140	2.624E-01	NOT IDENT.
CE-141	1.757E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.080E-01	NOT IDENT.
PM-144	2.915E-02	NOT IDENT.
PR-144	2.219E+00	NOT IDENT.
PM-146	1.137E-01	NOT IDENT.
ND-147	7.793E+00	NOT IDENT.
PM-147	1.140E+03	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.296E-02	FAIL ABUN
EU-152	1.913E-01	NOT IDENT.
GD-153	1.222E-01	NOT IDENT.
EU-154	7.921E-02	FAIL ABUN
EU-155	1.478E-01	FAIL ABUN
TB-160	1.315E-01	FAIL ABUN
HO-166M	4.369E-02	FAIL ABUN
TM-171	2.255E+01	NOT IDENT.
HF-172	2.872E-01	NOT IDENT.
LU-172	3.817E-02	FAIL ABUN
LU-176	4.832E-02	FAIL ABUN
HF-181	1.723E-01	NOT IDENT.
TA-182	1.193E-01	FAIL ABUN
RE-183	3.357E-01	NOT IDENT.
RE-184	1.609E-01	NOT IDENT.
W-188	1.738E+01	NOT IDENT.
IR-192	8.844E-02	FAIL ABUN

HG-203	1.081E-01	NOT IDENT.
BI-207	3.363E-02	FAIL ABUN
BI-211	4.792E-01	FAIL ABUN
PB-211	1.529E+00	NOT IDENT.
BI-212	4.754E-01	FAIL ABUN
RN-219	8.462E-01	NOT IDENT.
RA-223	1.225E+00	FAIL ABUN
RA-224	1.185E+00	NOT IDENT.
AC-227	4.633E-01	FAIL ABUN
TH-227	4.633E-01	FAIL ABUN
TH-229	8.929E-01	FAIL ABUN
PA-231	8.915E-01	NOT IDENT.
TH-231	1.225E+00	FAIL ABUN
PA-233	1.230E-01	NOT IDENT.
PA-234	2.218E-01	FAIL ABUN
PA-234M	2.198E+00	NOT IDENT.
TH-234	1.567E+00	FAIL ABUN
U-235	2.869E-01	FAIL ABUN
NP-237	1.230E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.567E+00	FAIL ABUN
NP-239	3.887E-01	NOT IDENT.
PU-239	5.107E+02	NOT IDENT.
AM-241	1.826E-01	NOT IDENT.
CM-243	1.354E-01	NOT IDENT.
BK-247	1.464E-01	NOT IDENT.
CM-247	7.864E-02	NOT IDENT.
CF-249	8.756E-02	FAIL ABUN
CF-251	2.006E-01	NOT IDENT.
ANH-511	6.562E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677017.CNF;1
Acquisition date : 28-JUN-2016 14:37:37 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:02.59 Half life ratio : *****
Sample date : 11-MAY-2016 11:35:00 Nuclide Library : SOLID
Sample ID : G398677017 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.4963E+02 GRAM
Quantity Err(%) : 1.3366E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.321E+00	1.146E+00	1.146E+00
CD-109	1.469E+00	1.892E+00	1.892E+00
SN-126	1.366E-01	1.759E-01	1.759E-01
BA-137M	2.893E+01	2.328E+00	2.328E+00
CS-137	3.056E+01	2.457E+00	2.457E+00
TL-208	2.977E-01	1.143E-01	1.143E-01
PB-210	2.872E+00	7.138E+00	7.138E+00
PB-212	6.582E-01	2.221E-01	2.221E-01
BI-214	5.524E-01	1.702E-01	1.702E-01
PB-214	4.844E-01	2.718E-01	2.718E-01
RN-222	5.524E-01	1.702E-01	1.702E-01
RA-226	5.524E-01	1.702E-01	1.702E-01
AC-228	6.069E-01	2.271E-01	2.271E-01
RA-228	6.069E-01	2.271E-01	2.271E-01
TH-228	6.582E-01	2.221E-01	2.221E-01
TH-230	5.524E-01	1.702E-01	1.702E-01
TH-232	6.069E-01	2.271E-01	2.271E-01
U-234	5.524E-01	1.702E-01	1.702E-01
AM-243	1.434E-01	1.212E-01	1.212E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	5.538E-01	1.540E+00	1.560E+00	NOT IDENT.
NA-22	-3.163E-03	3.504E-02	3.507E-02	NOT IDENT.
NA-24	-1.527E+21	4.341E+21	0.000E+00	SHORT HLIF
AL-26	-3.588E-03	1.588E-02	1.597E-02	NOT IDENT.
SC-46	-4.395E-02	3.640E-02	4.144E-02	FAIL ABUN
V-48	2.479E-01	3.175E-01	3.366E-01	FAIL ABUN
CR-51	-2.253E+00	1.780E+00	2.050E+00	NOT IDENT.
MN-54	-6.072E-05	3.303E-02	3.303E-02	NOT IDENT.
CO-56	-3.507E-02	3.968E-02	4.272E-02	NOT IDENT.
MN-56	-1.000E+41	1.132E+41	0.000E+00	SHORT HLIF
CO-57	-2.660E-02	4.786E-02	4.934E-02	NOT IDENT.

CO-58	2.552E-02	4.085E-02	4.244E-02	NOT IDENT.
FE-59	-2.323E-02	1.098E-01	1.103E-01	NOT IDENT.
CO-60	1.735E-03	3.856E-02	3.856E-02	NOT IDENT.
ZN-65	-2.355E-02	8.855E-02	8.919E-02	NOT IDENT.
GE-68	6.531E-01	1.261E+00	1.295E+00	NOT IDENT.
AS-73	-2.593E-01	1.491E+00	1.495E+00	NOT IDENT.
AS-74	-1.643E-01	5.410E-01	5.460E-01	NOT IDENT.
SE-75	-4.722E-03	1.087E-01	1.088E-01	NOT IDENT.
BR-77	1.558E+06	2.228E+06	2.336E+06	SHORT HLIF
SR-82	-2.145E-01	6.149E-01	6.224E-01	NOT IDENT.
RB-83	1.340E-01	2.251E-01	2.330E-01	FAIL ABUN
KR-85	-1.542E+01	1.578E+01	1.724E+01	NOT IDENT.
SR-85	-1.158E-01	1.183E-01	1.293E-01	NOT IDENT.
RB-86	1.201E+00	2.474E+00	2.532E+00	NOT IDENT.
Y-88	1.743E-02	3.671E-02	3.754E-02	NOT IDENT.
Y-91	1.490E+01	1.998E+01	2.108E+01	NOT IDENT.
NB-94	7.997E-03	2.562E-02	2.588E-02	NOT IDENT.
NB-95	5.704E-03	6.393E-02	6.398E-02	NOT IDENT.
NB-95M	2.146E-01	3.627E-01	3.754E-01	NOT IDENT.
ZR-95	-5.604E-02	6.006E-02	6.516E-02	NOT IDENT.
NB-97	1.000E+41	1.093E+41	0.000E+00	SHORT HLIF
ZR-97	-9.581E+20	5.036E+20	0.000E+00	SHORT HLIF
MO-99	1.677E+04	3.978E+04	4.049E+04	SHORT HLIF
TC-99M	-1.000E+41	1.524E+42	0.000E+00	SHORT HLIF
RH-101	-1.206E-02	5.476E-02	5.503E-02	NOT IDENT.
RH-102	-3.201E-02	8.148E-02	8.275E-02	NOT IDENT.
RU-103	-9.163E-03	1.715E-01	1.715E-01	FAIL ABUN
RH-106	4.169E-02	5.250E-01	5.254E-01	NOT IDENT.
RU-106	4.169E-02	5.250E-01	5.254E-01	NOT IDENT.
AG-108M	8.107E-02	8.497E-02	9.249E-02	NOT IDENT.
AG-110M	1.071E-02	4.161E-02	4.188E-02	NOT IDENT.
SN-113	-6.797E-02	1.382E-01	1.415E-01	NOT IDENT.
CD-115	5.984E+05	6.823E+05	7.337E+05	SHORT HLIF
SN-117M	1.318E-01	4.987E-01	5.022E-01	NOT IDENT.
TE-123M	9.490E-03	5.840E-02	5.855E-02	NOT IDENT.
SB-124	7.918E-02	6.968E-02	7.829E-02	NOT IDENT.
SB-125	-4.954E-02	2.484E-01	2.494E-01	NOT IDENT.
TE-125M	9.586E+00	2.179E+01	2.221E+01	NOT IDENT.
I-126	5.144E-01	1.532E+00	1.549E+00	NOT IDENT.
SB-126	9.941E-01	7.001E-01	8.313E-01	FAIL ABUN
SB-127	-6.307E+01	4.147E+02	4.157E+02	SHORT HLIF
I-131	2.367E-01	4.602E+00	4.603E+00	NOT IDENT.
I-132	1.000E+41	3.128E+41	0.000E+00	SHORT HLIF
TE-132	-7.671E+02	1.780E+03	1.814E+03	SHORT HLIF
BA-133	-3.846E-02	1.073E-01	1.087E-01	NOT IDENT.
I-133	-2.082E+15	3.602E+15	3.722E+15	SHORT HLIF
CS-134	2.522E-02	4.477E-02	4.619E-02	FAIL ABUN
CS-135	4.994E-02	3.150E-01	3.159E-01	NOT IDENT.
I-135	-1.000E+41	1.607E+41	0.000E+00	SHORT HLIF
CS-136	4.431E-02	4.655E-01	4.660E-01	NOT IDENT.
CE-139	-1.333E-02	5.814E-02	5.845E-02	NOT IDENT.
BA-140	-2.650E+00	3.144E+00	3.364E+00	NOT IDENT.
LA-140	-5.775E-01	4.711E-01	5.382E-01	NOT IDENT.
CE-141	-2.400E-01	2.115E-01	2.375E-01	NOT IDENT.
CE-143	3.571E+09	4.486E+09	4.766E+09	SHORT HLIF
CE-144	5.885E-02	3.477E-01	3.487E-01	NOT IDENT.
PM-144	1.885E-02	3.075E-02	3.190E-02	NOT IDENT.
PR-144	1.435E+00	2.341E+00	2.429E+00	NOT IDENT.
PM-146	6.357E-02	1.292E-01	1.324E-01	NOT IDENT.
ND-147	-2.966E+00	9.294E+00	9.390E+00	NOT IDENT.
PM-147	-1.550E+02	1.294E+03	1.296E+03	NOT IDENT.
PM-149	2.645E+06	5.649E+06	5.774E+06	SHORT HLIF
EU-150	3.631E-02	6.713E-02	6.910E-02	FAIL ABUN
EU-152	8.069E-02	2.202E-01	2.231E-01	NOT IDENT.
GD-153	-9.099E-02	1.575E-01	1.628E-01	NOT IDENT.
EU-154	-1.079E-02	9.724E-02	9.736E-02	FAIL ABUN
EU-155	1.175E-01	1.612E-01	1.696E-01	FAIL ABUN
TB-160	8.546E-02	1.315E-01	1.371E-01	FAIL ABUN
HO-166M	6.124E-03	4.877E-02	4.884E-02	FAIL ABUN
TM-171	-4.724E-01	2.434E+01	2.434E+01	NOT IDENT.
HF-172	-3.915E-01	3.469E-01	3.892E-01	NOT IDENT.
LU-172	-3.313E-03	4.579E-02	4.581E-02	FAIL ABUN
LU-176	-3.452E-02	5.554E-02	5.768E-02	FAIL ABUN
HF-181	-1.127E-02	2.004E-01	2.005E-01	NOT IDENT.
TA-182	-1.171E-01	1.677E-01	1.758E-01	FAIL ABUN
RE-183	4.615E-02	3.622E-01	3.628E-01	NOT IDENT.
RE-184	7.100E-02	1.745E-01	1.774E-01	NOT IDENT.
W-188	-9.363E+00	2.256E+01	2.295E+01	NOT IDENT.

IR-192	-9.660E-03	9.966E-02	9.975E-02	FAIL ABUN
HG-203	-7.484E-02	1.233E-01	1.278E-01	NOT IDENT.
BI-207	1.567E-04	3.957E-02	3.957E-02	FAIL ABUN
BI-211	1.335E+00	7.492E-01	9.609E-01	FAIL ABUN
PB-211	-1.463E-01	1.755E+00	1.756E+00	NOT IDENT.
BI-212	1.067E+00	4.879E-01	6.851E-01	FAIL ABUN
RN-219	-6.941E-01	1.000E+00	1.048E+00	NOT IDENT.
RA-223	5.843E-01	1.356E+00	1.382E+00	FAIL ABUN
RA-224	2.555E+00	1.381E+00	1.798E+00	NOT IDENT.
AC-227	5.721E-01	6.544E-01	7.034E-01	FAIL ABUN
TH-227	5.721E-01	6.544E-01	7.034E-01	FAIL ABUN
TH-229	-2.570E-01	1.051E+00	1.057E+00	FAIL ABUN
PA-231	6.663E-01	9.837E-01	1.029E+00	NOT IDENT.
TH-231	5.843E-01	1.356E+00	1.382E+00	FAIL ABUN
PA-233	9.952E-02	1.343E-01	1.416E-01	NOT IDENT.
PA-234	1.404E-01	2.851E-01	2.920E-01	FAIL ABUN
PA-234M	-1.752E+00	3.547E+00	3.634E+00	NOT IDENT.
TH-234	4.739E-01	1.675E+00	1.689E+00	FAIL ABUN
U-235	8.737E-03	3.275E-01	3.275E-01	FAIL ABUN
NP-237	9.952E-02	1.343E-01	1.416E-01	NOT IDENT.
NP-238	3.063E+05	9.134E+05	9.238E+05	SHORT HLIF
U-238	4.739E-01	1.675E+00	1.689E+00	FAIL ABUN
NP-239	3.345E-01	4.260E-01	4.519E-01	NOT IDENT.
PU-239	5.713E+02	5.584E+02	6.149E+02	NOT IDENT.
AM-241	-1.276E-01	2.035E-01	2.115E-01	NOT IDENT.
CM-243	-2.537E-01	1.644E-01	2.002E-01	NOT IDENT.
BK-247	5.948E-03	1.621E-01	1.621E-01	NOT IDENT.
CM-247	1.011E-02	8.953E-02	8.965E-02	NOT IDENT.
CF-249	7.807E-04	9.980E-02	9.980E-02	FAIL ABUN
CF-251	4.868E-02	2.305E-01	2.315E-01	NOT IDENT.
ANH-511	8.867E-03	7.074E-02	7.085E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	214.0758	87.09	355.3664	136.47	338.7570
45.60	258.4272	87.57	355.1284	140.51	0.0000
46.54	267.3886	88.03	336.7300	143.76	317.7386
49.72	0.0000	88.34	336.8914	144.24	322.2485
51.35	283.0048	88.47	293.5769	145.44	359.6238
51.87	286.1554	89.96	294.2488	152.43	296.7040
52.39	285.5297	1093.63	294.5537	153.25	329.8403
52.97	288.7221	91.11	294.7624	323.87	332.3741
53.44	289.9571	92.59	343.1334	156.02	323.1296
54.07	292.2395	93.35	343.5237	158.56	309.6734
57.36	0.0000	94.56	344.1408	159.00	312.0215
57.53	294.3270	94.65	344.1855	162.33	302.0429
57.98	285.9843	94.67	344.1958	162.66	293.2943
59.27	314.5294	94.87	310.1731	163.33	301.2492
59.32	314.5611	97.43	334.3414	165.86	297.5933
59.54	318.5356	98.43	291.8188	176.31	342.2408
60.96	297.2951	98.44	291.8232	176.60	329.9933
61.17	297.4161	99.53	298.4331	177.52	317.9317
62.93	279.1100	100.11	287.3900	181.07	0.0000
63.29	286.0669	102.03	312.8723	181.52	346.7977
63.58	286.2245	103.18	340.1782	184.41	322.3123
64.28	321.4608	103.37	342.3311	143.76	401.9787
66.73	294.7226	105.21	281.1807	193.51	398.0710
67.24	284.2889	105.31	281.2194	197.03	411.9434
125.81	288.4151	106.12	260.8325	198.01	392.8394
67.75	288.4512	106.47	292.0231	201.83	420.6260
69.67	341.7726	109.28	284.8230	203.43	402.8147
70.83	324.8399	111.00	288.6051	205.31	421.9328
72.81	298.9315	111.76	0.0000	210.85	352.7441
72.87	298.9624	114.06	290.8206	215.65	368.7498
74.66	299.8886	116.30	0.0000	222.11	354.3969
74.82	299.9721	116.74	293.9339	227.09	354.1086
74.97	300.0479	119.76	329.8466	227.38	358.5998
77.11	301.1395	121.12	350.4720	228.16	0.0000
78.74	301.9605	121.22	350.5159	228.18	370.2974
79.69	302.4352	121.78	346.5364	116.74	370.2974
80.12	304.6397	122.06	373.0803	235.69	340.6348
80.19	304.6740	122.92	334.3340	235.96	340.7080
80.57	342.2246	123.07	343.9207	238.63	405.4570
81.00	349.9431	265.00	308.1751	238.98	0.0000
81.07	349.9824	125.81	393.9308	240.99	332.1018
81.75	341.3860	127.23	359.5144	242.00	359.4722
83.79	342.5062	127.91	338.5228	244.70	389.5399
84.00	304.5520	129.30	306.0352	252.40	0.0000
85.43	349.4231	131.20	363.3806	252.80	281.9510
86.55	348.5285	133.02	320.2516	254.15	0.0000
86.79	348.6589	133.52	306.5080	256.23	330.2847
86.94	355.2838	136.00	327.8260	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	317.5079	355.39	0.0000	584.27	101.9997
264.80	316.6327	356.01	294.6557	595.83	93.3723
265.00	316.6807	364.49	282.9730	427.87	75.0623
268.22	331.0803	366.42	0.0000	602.52	0.0000
269.46	312.2621	372.51	280.4150	604.72	94.1520
270.03	307.8391	375.05	310.0859	607.14	59.3390
271.23	333.6310	377.52	312.4805	609.32	86.2495
273.65	346.0943	356.01	333.2193	610.33	87.3755
276.40	281.8179	388.16	323.2319	614.28	92.7681
277.37	293.0029	388.63	337.0754	618.01	76.6928
277.60	290.3044	391.69	343.5682	620.36	84.4420
278.00	295.8829	264.66	344.2989	621.93	75.7151
279.20	313.5591	401.81	321.7518	630.19	0.0000
279.54	308.1299	402.40	290.1655	631.29	70.4922
279.70	310.0001	404.85	309.4006	633.25	70.5469
280.46	296.4053	410.95	329.3383	634.78	66.1780
283.69	292.4866	413.71	346.7681	635.95	65.1038
284.31	294.4531	414.70	315.0501	636.99	64.0269
285.41	273.5023	423.72	330.6042	645.85	57.6034
285.90	0.0000	427.09	340.2260	657.76	76.5644
287.50	270.2167	427.87	333.3374	657.90	0.0000
290.67	294.2926	433.94	342.4643	661.66	57.9557
293.27	0.0000	439.40	343.4344	664.57	0.0000
351.93	269.8153	453.88	383.6442	666.33	32.1557
295.96	262.7171	463.37	404.9006	666.50	32.1574
879.38	292.9269	468.07	383.7120	667.71	0.0000
299.98	288.7408	473.00	0.0000	677.62	19.0622
300.09	293.2299	475.06	312.6326	685.70	0.0000
300.13	293.2395	476.78	283.2541	695.00	22.5714
301.36	282.1253	477.60	294.8999	696.49	20.7769
302.85	287.9995	482.18	286.8869	696.51	20.7775
256.23	305.1155	487.02	244.1132	697.00	20.7809
304.85	286.5243	492.35	0.0000	697.30	22.5903
306.78	304.6500	497.08	225.5395	697.49	22.5922
308.46	277.8620	505.52	208.6975	702.65	17.2025
311.90	261.6179	507.63	0.0000	706.68	24.4819
316.51	284.0466	511.00	186.2147	711.68	20.8926
319.41	294.9515	514.00	238.8545	720.70	6.8350
320.08	308.2789	514.00	238.8545	721.93	0.0000
321.04	287.7153	520.40	146.2560	722.78	4.5601
323.87	278.7952	520.69	0.0000	722.91	4.5603
325.23	282.8218	522.65	0.0000	723.31	4.5609
328.76	294.2681	527.90	0.0000	724.19	4.5624
333.37	243.4063	528.26	156.0576	727.33	14.6160
333.97	258.7188	529.59	168.8135	733.00	20.9219
334.37	258.7852	529.87	0.0000	735.93	14.6605
338.28	276.5877	531.02	159.4237	333.97	22.0025
338.32	276.5921	537.26	152.4595	739.50	0.0000
311.90	290.3391	546.56	0.0000	747.24	12.8789
340.48	290.3391	552.55	103.3940	748.06	18.4038
340.55	290.3484	563.25	121.0108	752.31	12.9018
344.28	275.7041	569.33	105.2226	753.82	10.1422
345.93	295.6986	946.00	105.2286	756.73	14.7676
351.06	292.2363	569.70	102.0160	756.80	14.7676
351.93	296.2366	583.19	99.3616	884.68	20.0475

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	29.3187	1274.44	19.8823	1620.50	4.7776
766.42	33.9552	1001.03	13.2725	1621.92	7.6462
766.84	33.9596	1002.74	6.6395	1678.03	0.0000
772.60	0.0000	1004.73	10.9611	1690.97	0.0000
776.52	18.5845	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	0.9811
778.90	18.5996	1028.54	0.0000	1063.66	6.7344
783.70	0.0000	1037.84	20.1113	1771.35	14.7345
785.37	20.5042	1038.76	0.0000	1791.20	0.0000
792.07	23.3527	631.29	17.1345	1808.65	1.9775
794.95	15.8952	1048.07	13.1085	1810.72	0.0000
795.86	18.7056	1049.04	15.1289	1836.06	2.9803
810.06	12.5290	1050.41	15.1348		
810.29	12.5299	1063.66	13.1631		
344.28	9.3979	1077.00	11.8547		
810.76	9.3989	1077.34	11.8558		
815.77	13.1800	1085.87	22.0676		
1048.07	13.1920	1093.63	11.2261		
832.01	21.7675	1099.45	13.2869		
834.85	20.8398	1112.07	12.5331		
835.71	23.6884	1112.84	10.2563		
836.80	0.0000	1115.54	17.1053		
846.75	0.0000	1120.29	12.3311		
846.77	19.9685	1120.55	12.3316		
856.80	17.4878	1221.41	8.5653		
860.56	12.4151	1129.67	13.3904		
871.09	13.4142	1131.51	0.0000		
873.19	9.5876	1147.95	0.0000		
875.33	0.0000	1173.23	10.4131		
879.38	17.2912	1177.95	10.4248		
880.51	16.0156	1189.05	20.9063		
883.24	8.0145	1204.77	5.2466		
884.68	12.8291	1221.41	16.8563		
889.28	18.3070	1231.02	16.8945		
894.76	15.4422	1235.36	16.9117		
898.04	18.3562	1238.28	16.9234		
900.72	15.4703	1260.41	0.0000		
903.28	11.6115	1271.87	12.7928		
911.20	14.5492	1274.44	12.8004		
912.08	16.1698	1274.54	12.8004		
923.98	0.0000	1291.59	13.9217		
926.50	13.6411	1298.22	0.0000		
929.11	16.5771	1312.11	10.7588		
937.49	19.5508	1332.49	14.0505		
944.13	17.6295	1362.66	0.0000		
946.00	11.7595	1365.19	4.3545		
949.00	12.7505	1368.63	0.0000		
667.71	0.0000	1384.29	13.1174		
962.31	16.4099	1408.01	7.6908		
964.08	22.9853	1457.56	0.0000		
966.17	22.9995	1460.82	6.4805		
911.20	19.7295	1489.16	10.2427		
968.97	19.7295	1505.03	12.1441		
983.53	14.8583	1584.12	14.2334		
984.45	0.0000	1596.21	13.3153		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:45:10.26

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                   *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677018.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM31.CNF;292
Background date  : 26-JUN-2016 12:05:46
Sample date      : 11-MAY-2016 11:40:00 Acquisition date : 28-JUN-2016 14:38:00
Sample ID        : G398677018 Sample quantity : 1.54990E+02 GRAM
Detector name     : GAM31 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:06.68 0.2%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	52.62*	12	197	1.02	104.87	101	7	3.42E-03	199.1	
2	0	63.38*	13	265	0.87	126.38	123	8	3.53E-03	235.0	
3	2	74.79	78	150	0.86	149.19	146	13	2.15E-02	24.9	1.94E+00
4	2	77.18*	127	111	0.80	153.96	146	13	3.54E-02	16.0	
5	0	84.37*	32	91	1.04	168.34	166	6	9.02E-03	52.3	
6	0	87.11	36	103	0.83	173.80	172	6	1.01E-02	46.8	
7	2	89.86	39	77	1.17	179.31	177	14	1.09E-02	36.8	1.67E+00
8	2	92.79*	37	92	1.17	185.16	177	14	1.02E-02	54.1	
9	0	105.81	16	75	0.75	211.18	206	7	4.37E-03	94.8	
10	3	183.88	17	34	1.26	367.20	365	11	4.65E-03	51.4	2.17E+00
11	3	185.91*	34	66	1.25	371.26	365	11	9.35E-03	51.2	
12	0	238.37*	158	108	1.06	476.10	471	11	4.40E-02	15.4	
13	0	242.29	20	60	1.96	483.95	481	7	5.63E-03	65.3	
14	0	281.22	22	26	1.68	561.74	558	8	6.03E-03	46.1	
15	0	295.18*	44	50	0.83	589.64	586	9	1.21E-02	33.3	
16	0	338.86*	61	56	1.75	676.95	671	16	1.69E-02	30.7	
17	0	351.86*	85	39	0.94	702.93	697	12	2.37E-02	19.0	
18	0	409.67	16	22	1.06	818.47	815	7	4.31E-03	56.9	
19	0	480.55	20	76	6.38	960.13	944	25	5.68E-03	116.2	
20	0	583.44*	55	25	1.37	1165.78	1159	11	1.52E-02	22.8	
21	0	609.00*	74	18	1.16	1216.85	1210	12	2.05E-02	17.1	
22	0	642.93	14	4	2.11	1284.68	1281	8	3.89E-03	36.4	
23	0	655.31	20	9	1.49	1309.42	1303	12	5.56E-03	37.4	
24	0	661.51	389	22	1.52	1321.82	1316	13	1.08E-01	5.7	
25	0	670.19	36	21	8.09	1339.15	1328	22	1.00E-02	37.0	
26	0	728.00	10	8	1.72	1454.71	1450	11	2.89E-03	61.2	
27	0	737.20	8	1	1.51	1473.09	1470	6	2.11E-03	44.1	
28	0	755.59	14	5	3.14	1509.86	1504	10	3.93E-03	39.6	
29	0	785.89	8	4	1.11	1570.42	1567	6	2.26E-03	53.3	
30	0	911.10*	43	7	0.96	1820.69	1816	12	1.21E-02	21.1	
31	0	969.10*	22	0	0.93	1936.62	1932	10	6.12E-03	24.1	
32	0	973.35	9	2	1.40	1945.11	1942	8	2.39E-03	45.1	
33	0	1090.71	14	3	3.77	2179.69	2172	13	3.79E-03	38.5	
34	0	1150.78	7	1	0.76	2299.77	2298	5	2.00E-03	43.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1460.17*	87	3	1.39	2918.21	2912	13	2.42E-02	11.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:45:12

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677018.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:40:00 Acquisition date : 28-JUN-2016 14:38:00
Sample ID         : G398677018 Sample quantity  : 154.99 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA31 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:06.68 0.2%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Linear Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.950E-01	5.513E+00	5.513E+00	23.73	OK
AS-73	53.44	10.30*	5.707E+00	1.367E-01	2.071E-01	398.19	OK
CD-109	88.03	3.70*	5.392E+00	6.828E-01	7.340E-01	162.20	OK
SN-126	64.28	9.60	5.586E+00	1.520E-01	1.520E-01	469.96	OK
	86.94	8.90	5.392E+00	2.839E-01	2.839E-01	162.20	OK
	87.57	37.00*	5.392E+00	6.828E-02	6.828E-02	162.20	OK
BA-137M	661.66	89.90*	1.341E+00	1.652E+00	1.657E+00	11.33	OK
CS-137	661.66	85.10*	1.341E+00	1.745E+00	1.750E+00	11.33	OK
EU-155	86.55	30.70	5.392E+00	8.229E-02	8.389E-02	162.20	OK
	105.31	21.10*	5.208E+00	8.785E-02	8.955E-02	189.66	OK
TM-171	51.35	0.27	5.707E+00	5.215E+00	5.469E+00	398.19	OK
	52.39	0.47*	5.707E+00	2.996E+00	3.142E+00	398.19	OK
	66.73	0.14	5.547E+00	----- Line	Not Found	-----	Absent
TL-208	277.37	6.60	2.816E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.486E+00	2.255E-01	2.255E-01	45.64	OK
	860.56	12.50	1.084E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	5.491E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	2.286E+00	2.172E-01	2.172E-01	500.18	OK
BI-212	727.33	6.67*	1.241E+00	6.382E-01	6.382E-01	122.47	OK
	785.37	1.10	1.167E+00	3.184E+00	3.184E+00	106.59	OK
	1620.50	1.47	6.312E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	5.476E+00	5.924E-01	5.924E-01	79.57	OK
	77.11	17.10	5.460E+00	8.606E-01	8.606E-01	31.93	OK
	238.63	43.60*	3.206E+00	6.447E-01	6.447E-01	30.79	OK
	300.09	3.30	2.629E+00	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	5.476E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.460E+00	1.517E+00	1.517E+00	31.93	OK
	87.09	3.41	5.392E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.165E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	2.667E+00	4.944E-01	4.944E-01	66.57	OK
	351.93	35.60*	2.286E+00	----- Line	Not Found	-----	<<INT Reject
RA-224	240.99	4.10*	3.162E+00	1.291E-02	1.291E-02*****		OK
AC-228	105.21	1.10	5.208E+00	1.685E+00	1.685E+00	189.66	OK
	338.32	11.27	2.363E+00	1.254E+00	1.254E+00	61.49	OK
	794.95	4.25	1.156E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	8.037E-01	8.037E-01	42.21	OK
	968.97	15.80	9.847E-01	6.956E-01	6.956E-01	48.25	OK
RA-228	105.21	1.10	5.208E+00	1.685E+00	1.685E+00	189.66	OK
	338.32	11.27	2.363E+00	1.254E+00	1.254E+00	61.49	OK
	794.95	4.25	1.156E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	8.037E-01	8.037E-01	42.21	OK
	968.97	15.80	9.847E-01	6.956E-01	6.956E-01	48.25	OK
TH-228	74.82	10.28	5.476E+00	5.924E-01	5.924E-01	79.57	OK
	77.11	17.10	5.460E+00	8.606E-01	8.606E-01	31.93	OK
	238.63	43.60*	3.206E+00	6.447E-01	6.447E-01	30.79	OK
	300.09	3.30	2.629E+00	----- Line	Not Found	-----	Absent
TH-229	85.43	14.70	5.411E+00	2.556E-01	2.556E-01	104.55	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	88.47	24.00	5.392E+00	1.053E-01	1.053E-01	162.20	OK
	193.51	4.41*	3.791E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	3.546E+00	----- Line	Not Found	-----	Absent
TH-232	105.21	1.10	5.208E+00	1.685E+00	1.685E+00	189.66	OK
	338.32	11.27	2.363E+00	1.254E+00	1.254E+00	61.49	OK
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	8.037E-01	8.037E-01	42.21	OK
	968.97	15.80	9.847E-01	6.956E-01	6.956E-01	48.25	OK
TH-234	63.29	3.70*	5.586E+00	3.944E-01	3.944E-01	469.96	OK
	92.59	4.23	5.346E+00	1.003E+00	1.003E+00	108.13	OK
U-235	89.96	3.47	5.370E+00	1.305E+00	1.305E+00	73.55	OK
	93.35	5.60	5.346E+00	7.577E-01	7.577E-01	108.13	OK
	143.76	10.96*	4.611E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	4.273E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	3.906E+00	8.770E-02	8.770E-02	102.43	OK
	205.31	5.01	3.621E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	5.586E+00	3.944E-01	3.944E-01	469.96	OK
	92.59	4.23	5.346E+00	1.003E+00	1.003E+00	108.13	OK
AM-243	43.53	5.90	5.049E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.476E+00	9.062E-02	9.062E-02	79.57	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677018.CNF;1
Acquisition date : 28-JUN-2016 14:38:00 Sensitivity : 3.000
Detector ID : GAM31 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:06.68 Half life ratio : *****
Sample date : 11-MAY-2016 11:40:00 Analyst initials: MXR1
Sample ID : G398677018 Sample Quantity : 1.5499E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.513E+00	1.282E+00	1.001E+00
AS-73	2.071E-01	8.083E-01	8.776E-01
CD-109	7.340E-01	1.167E+00	1.419E+00
SN-126	6.828E-02	1.085E-01	1.191E-01
BA-137M	1.657E+00	1.840E-01	9.602E-02
CS-137	1.750E+00	1.944E-01	1.014E-01
EU-155	8.955E-02	1.665E-01	2.097E-01
TM-171	3.142E+00	1.226E+01	1.264E+01
TL-208	2.255E-01	1.008E-01	8.313E-02
BI-211	2.172E-01	1.065E+00	4.825E-01
BI-212	6.382E-01	7.660E-01	1.180E+00
PB-212	6.447E-01	1.946E-01	1.442E-01
PB-214	5.732E-01	2.129E-01	3.373E-01
RA-224	1.291E-02	1.270E+00	1.878E+00
AC-228	8.037E-01	3.324E-01	3.456E-01
RA-228	8.037E-01	3.324E-01	3.456E-01
TH-228	6.447E-01	1.946E-01	1.442E-01
TH-229	-7.841E-03	7.245E-01	1.333E+00
TH-232	8.037E-01	3.324E-01	3.456E-01
TH-234	3.944E-01	1.817E+00	1.654E+00
U-235	-6.318E-02	2.528E-01	4.670E-01
U-238	3.944E-01	1.817E+00	1.654E+00
AM-243	9.062E-02	7.066E-02	8.288E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.471E-01	7.691E-01	1.418E+00	NOT IDENT.
NA-22	-2.336E-02	5.376E-02	9.931E-02	NOT IDENT.
NA-24	0.000E+00	6.389E+21	0.000E+00	SHORT HLIF
AL-26	4.795E-04	3.309E-02	7.968E-02	NOT IDENT.
SC-46	-4.590E-02	5.911E-02	9.851E-02	NOT IDENT.
V-48	-2.428E-01	3.282E-01	5.939E-01	NOT IDENT.
CR-51	-7.560E-01	1.194E+00	2.164E+00	NOT IDENT.

MN-54	-6.767E-02	5.934E-02	9.352E-02	NOT IDENT.
CO-56	-2.961E-02	6.722E-02	1.224E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-3.398E-03	3.159E-02	5.995E-02	NOT IDENT.
CO-58	-2.383E-03	7.473E-02	1.459E-01	NOT IDENT.
FE-59	2.898E-02	1.519E-01	3.306E-01	NOT IDENT.
CO-60	1.259E-02	4.468E-02	9.925E-02	NOT IDENT.
ZN-65	-1.199E-01	1.333E-01	2.255E-01	NOT IDENT.
GE-68	1.220E+00	1.460E+00	3.500E+00	NOT IDENT.
AS-74	-2.268E-01	5.075E-01	9.448E-01	NOT IDENT.
SE-75	-2.228E-02	7.086E-02	1.348E-01	NOT IDENT.
BR-77	0.000E+00	4.602E+05	0.000E+00	SHORT HLIF
SR-82	1.612E-01	1.057E+00	2.148E+00	NOT IDENT.
RB-83	-8.668E-03	1.360E-01	2.550E-01	NOT IDENT.
KR-85	-2.773E+01	1.610E+01	2.453E+01	NOT IDENT.
SR-85	-2.083E-01	1.207E-01	1.838E-01	NOT IDENT.
RB-86	3.298E+00	2.580E+00	6.792E+00	NOT IDENT.
Y-88	4.810E-02	6.580E-02	1.686E-01	NOT IDENT.
Y-91	2.879E+01	3.899E+01	8.660E+01	NOT IDENT.
NB-94	9.777E-03	4.907E-02	9.814E-02	NOT IDENT.
NB-95	3.607E-02	8.030E-02	1.670E-01	NOT IDENT.
NB-95M	-2.247E-01	2.622E-01	4.108E-01	NOT IDENT.
ZR-95	1.839E-01	1.429E-01	2.645E-01	FAIL ABUN
NB-97	0.000E+00	1.598E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.695E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	8.596E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-3.646E-02	3.955E-02	7.002E-02	NOT IDENT.
RH-102	-4.014E-02	7.692E-02	1.416E-01	NOT IDENT.
RU-103	-2.732E-02	1.080E-01	1.974E-01	FAIL ABUN
RH-106	-1.682E-02	4.897E-01	9.619E-01	NOT IDENT.
RU-106	-1.682E-02	4.897E-01	9.619E-01	NOT IDENT.
AG-108M	1.667E-02	4.576E-02	9.031E-02	NOT IDENT.
AG-110M	-1.378E-03	6.201E-02	1.242E-01	NOT IDENT.
SN-113	-1.396E-02	8.080E-02	1.514E-01	NOT IDENT.
CD-115	0.000E+00	5.324E+05	0.000E+00	SHORT HLIF
SN-117M	4.050E-02	3.567E-01	6.762E-01	NOT IDENT.
TE-123M	3.640E-03	4.237E-02	8.006E-02	NOT IDENT.
SB-124	-3.643E-02	1.421E-01	2.976E-01	NOT IDENT.
SB-125	2.064E-02	1.423E-01	2.745E-01	NOT IDENT.
TE-125M	8.743E+00	1.601E+01	3.077E+01	NOT IDENT.
I-126	2.462E+00	2.444E+00	4.007E+00	NOT IDENT.
SB-126	8.217E-01	1.121E+00	2.449E+00	NOT IDENT.
SB-127	0.000E+00	7.908E+02	0.000E+00	SHORT HLIF
I-131	-2.048E+00	3.128E+00	5.575E+00	NOT IDENT.
I-132	0.000E+00	1.392E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.228E+03	0.000E+00	SHORT HLIF
BA-133	-2.951E-02	6.951E-02	1.098E-01	NOT IDENT.
I-133	0.000E+00	2.606E+15	0.000E+00	SHORT HLIF
CS-134	8.194E-02	5.911E-02	1.370E-01	NOT IDENT.
CS-135	-2.474E-02	2.233E-01	4.289E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-5.684E-01	6.960E-01	1.204E+00	NOT IDENT.
CE-139	-4.116E-02	4.277E-02	7.334E-02	NOT IDENT.
BA-140	-1.338E+00	2.300E+00	4.260E+00	NOT IDENT.
LA-140	-8.418E-01	7.546E-01	1.015E+00	NOT IDENT.
CE-141	6.226E-02	1.552E-01	3.011E-01	NOT IDENT.
CE-143	0.000E+00	2.843E+09	0.000E+00	SHORT HLIF
CE-144	2.742E-02	2.665E-01	5.085E-01	NOT IDENT.
PM-144	9.106E-03	5.078E-02	1.021E-01	NOT IDENT.
PR-144	6.933E-01	3.867E+00	7.776E+00	NOT IDENT.
PM-146	-1.439E-02	7.184E-02	1.319E-01	FAIL ABUN
ND-147	-5.072E-02	7.272E+00	1.361E+01	FAIL ABUN
PM-147	1.037E+02	8.228E+02	1.596E+03	NOT IDENT.
PM-149	0.000E+00	4.238E+06	0.000E+00	SHORT HLIF
EU-150	3.823E-03	4.119E-02	7.086E-02	FAIL ABUN
EU-152	-7.841E-03	1.316E-01	2.237E-01	NOT IDENT.
GD-153	9.035E-02	9.827E-02	1.854E-01	NOT IDENT.
EU-154	-6.151E-02	1.506E-01	2.798E-01	FAIL ABUN
TB-160	1.060E-02	2.210E-01	4.444E-01	FAIL ABUN
HO-166M	-2.210E-02	6.841E-02	1.305E-01	FAIL ABUN
HF-172	-1.039E-01	2.303E-01	4.241E-01	FAIL ABUN
LU-172	9.603E-03	9.863E-02	1.758E-01	FAIL ABUN
LU-176	-8.528E-03	3.569E-02	6.773E-02	FAIL ABUN
HF-181	3.616E-02	1.253E-01	2.427E-01	NOT IDENT.
TA-182	1.755E-01	2.690E-01	5.987E-01	NOT IDENT.
RE-183	6.570E-02	1.492E-01	2.999E-01	NOT IDENT.
RE-184	-1.392E-01	3.278E-01	5.918E-01	NOT IDENT.

W-188	-1.767E+00	1.412E+01	2.388E+01	FAIL ABUN
IR-192	1.939E-02	6.567E-02	1.307E-01	FAIL ABUN
HG-203	-4.411E-02	1.005E-01	1.626E-01	NOT IDENT.
BI-207	-3.258E-02	6.666E-02	1.238E-01	FAIL ABUN
PB-210	4.484E-01	7.682E-01	1.586E+00	NOT IDENT.
PB-211	-4.086E-01	1.238E+00	1.956E+00	NOT IDENT.
BI-214	0.000E+00	1.960E-01	3.606E-01	FAIL ABUN
RN-219	5.932E-01	6.134E-01	1.282E+00	NOT IDENT.
RN-222	0.000E+00	1.960E-01	3.606E-01	FAIL ABUN
RA-223	5.967E-01	9.327E-01	1.896E+00	FAIL ABUN
RA-226	0.000E+00	1.960E-01	3.606E-01	FAIL ABUN
AC-227	-1.968E-01	3.382E-01	6.287E-01	NOT IDENT.
TH-227	-1.968E-01	3.382E-01	6.287E-01	NOT IDENT.
TH-230	0.000E+00	1.959E-01	3.605E-01	FAIL ABUN
PA-231	1.820E-01	6.894E-01	1.321E+00	NOT IDENT.
TH-231	5.967E-01	9.327E-01	1.896E+00	FAIL ABUN
PA-233	3.708E-02	9.054E-02	1.818E-01	NOT IDENT.
PA-234	-2.188E-01	4.024E-01	7.054E-01	NOT IDENT.
PA-234M	-1.636E+00	6.153E+00	1.189E+01	NOT IDENT.
U-234	0.000E+00	1.959E-01	3.605E-01	FAIL ABUN
NP-237	3.708E-02	9.054E-02	1.818E-01	NOT IDENT.
NP-238	0.000E+00	1.093E+06	0.000E+00	SHORT HLIF
NP-239	-1.072E-01	2.882E-01	5.383E-01	FAIL ABUN
PU-239	5.994E+02	4.101E+02	8.567E+02	NOT IDENT.
AM-241	-1.711E-02	1.006E-01	1.762E-01	NOT IDENT.
CM-243	-5.199E-02	1.168E-01	1.936E-01	NOT IDENT.
BK-247	-2.435E-03	1.046E-01	2.042E-01	FAIL ABUN
CM-247	3.634E-02	5.663E-02	1.148E-01	NOT IDENT.
CF-249	4.555E-02	6.190E-02	1.263E-01	NOT IDENT.
CF-251	-3.544E-02	1.706E-01	3.114E-01	NOT IDENT.
ANH-511	5.966E-03	7.121E-02	1.537E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	84	10.66*	6.950E-01	5.513E+00	5.513E+00	23.73
AS-73	53.44	17	10.30*	5.707E+00	1.367E-01	2.071E-01	398.19
CD-109	88.03	47	3.70*	5.392E+00	1.138E+00	1.224E+00	93.57
SN-126	64.28	17	9.60	5.586E+00	1.520E-01	1.520E-01	469.96
	86.94	47	8.90	5.392E+00	4.733E-01	4.733E-01	93.57
	87.57	47	37.00*	5.392E+00	1.138E-01	1.138E-01	93.57
BA-137M	661.66	411	89.90*	1.341E+00	1.652E+00	1.657E+00	11.33
CS-137	661.66	411	85.10*	1.341E+00	1.745E+00	1.750E+00	11.33
EU-155	86.55	47	30.70	5.392E+00	1.372E-01	1.399E-01	93.57
	105.31	20	21.10*	5.208E+00	8.785E-02	8.955E-02	189.66
TM-171	51.35	17	0.27	5.707E+00	5.215E+00	5.469E+00	398.19
	52.39	17	0.47*	5.707E+00	2.996E+00	3.142E+00	398.19
	66.73	-----	0.14	5.547E+00	-----	Line Not Found	-----
TL-208	277.37	-----	6.60	2.816E+00	-----	Line Not Found	-----
	583.19	59	85.00*	1.486E+00	2.255E-01	2.255E-01	45.64
	860.56	-----	12.50	1.084E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	5.491E+00	-----	Line Not Found	-----
	351.06	96	12.92*	2.286E+00	1.579E+00	1.579E+00	37.90
BI-212	727.33	11	6.67*	1.241E+00	6.382E-01	6.382E-01	122.47
	785.37	8	1.10	1.167E+00	3.184E+00	3.184E+00	106.59
	1620.50	-----	1.47	6.312E-01	-----	Line Not Found	-----
PB-212	74.82	101	10.28	5.476E+00	8.713E-01	8.713E-01	49.72
	77.11	166	17.10	5.460E+00	8.606E-01	8.606E-01	31.93
	238.63	186	43.60*	3.206E+00	6.447E-01	6.447E-01	30.79
	300.09	-----	3.30	2.629E+00	-----	Line Not Found	-----
PB-214	74.82	101	5.80	5.476E+00	1.544E+00	1.544E+00	49.72
	77.11	166	9.70	5.460E+00	1.517E+00	1.517E+00	31.93
	87.09	47	3.41	5.392E+00	1.235E+00	1.235E+00	93.57
	242.00	24	7.25	3.162E+00	5.017E-01	5.017E-01	130.59
	295.22	50	18.42	2.667E+00	4.944E-01	4.944E-01	66.57
RA-224	351.93	96	35.60*	2.286E+00	5.732E-01	5.732E-01	37.90
AC-228	240.99	24	4.10*	3.162E+00	8.871E-01	8.871E-01	130.59
	105.21	20	1.10	5.208E+00	1.685E+00	1.685E+00	189.66
	338.32	69	11.27	2.363E+00	1.254E+00	1.254E+00	61.49
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	44	25.80*	1.035E+00	8.037E-01	8.037E-01	42.21
RA-228	968.97	22	15.80	9.847E-01	6.956E-01	6.956E-01	48.25
	105.21	20	1.10	5.208E+00	1.685E+00	1.685E+00	189.66
	338.32	69	11.27	2.363E+00	1.254E+00	1.254E+00	61.49
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	44	25.80*	1.035E+00	8.037E-01	8.037E-01	42.21
TH-228	968.97	22	15.80	9.847E-01	6.956E-01	6.956E-01	48.25
	74.82	101	10.28	5.476E+00	8.713E-01	8.713E-01	49.72
	77.11	166	17.10	5.460E+00	8.606E-01	8.606E-01	31.93
	238.63	186	43.60*	3.206E+00	6.447E-01	6.447E-01	30.79

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-229	300.09	-----	3.30	2.629E+00	-----	Line Not Found	-----
	85.43	42	14.70	5.411E+00	2.556E-01	2.556E-01	104.55
	88.47	47	24.00	5.392E+00	1.755E-01	1.755E-01	93.57
	193.51	-----	4.41*	3.791E+00	-----	Line Not Found	-----
TH-232	210.85	-----	2.80	3.546E+00	-----	Line Not Found	-----
	105.21	20	1.10	5.208E+00	1.685E+00	1.685E+00	189.66
	338.32	69	11.27	2.363E+00	1.254E+00	1.254E+00	61.49
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	44	25.80*	1.035E+00	8.037E-01	8.037E-01	42.21
TH-234	968.97	22	15.80	9.847E-01	6.956E-01	6.956E-01	48.25
	63.29	17	3.70*	5.586E+00	3.944E-01	3.944E-01	469.96
	92.59	47	4.23	5.346E+00	1.003E+00	1.003E+00	108.13
U-235	89.96	50	3.47	5.370E+00	1.305E+00	1.305E+00	73.55
	93.35	47	5.60	5.346E+00	7.577E-01	7.577E-01	108.13
	143.76	-----	10.96*	4.611E+00	-----	Line Not Found	-----
	163.33	-----	5.08	4.273E+00	-----	Line Not Found	-----
U-238	185.72	40	57.20	3.906E+00	8.770E-02	8.770E-02	102.43
	205.31	-----	5.01	3.621E+00	-----	Line Not Found	-----
	63.29	17	3.70*	5.586E+00	3.944E-01	3.944E-01	469.96
	92.59	47	4.23	5.346E+00	1.003E+00	1.003E+00	108.13
	43.53	-----	5.90	5.049E+00	-----	Line Not Found	-----
AM-243	74.66	101	67.20*	5.476E+00	1.333E-01	1.333E-01	49.72

Flag: "*" = Keyline

Total number of lines in spectrum 35
Number of unidentified lines 7
Number of lines tentatively identified by NID 28 80.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.513E+00	5.513E+00	1.309E+00	23.73	
AS-73	80.30D	1.52	1.367E-01	2.071E-01	8.248E-01	398.19	
CD-109	461.40D	1.08	1.138E+00	1.224E+00	1.145E+00	93.57	
SN-126	2.30E+05Y	1.00	1.138E-01	1.138E-01	1.065E-01	93.57	
BA-137M	30.08Y	1.00	1.652E+00	1.657E+00	0.188E+00	11.33	
CS-137	30.08Y	1.00	1.745E+00	1.750E+00	0.198E+00	11.33	
EU-155	4.75Y	1.02	8.785E-02	8.955E-02	16.98E-02	189.66	
TM-171	1.92Y	1.05	2.996E+00	3.142E+00	12.51E+00	398.19	
TL-208	1.41E+10Y	1.00	2.255E-01	2.255E-01	1.029E-01	45.64	
BI-211	7.04E+08Y	1.00	1.579E+00	1.579E+00	0.599E+00	37.90	
BI-212	1.41E+10Y	1.00	6.382E-01	6.382E-01	7.816E-01	122.47	
PB-212	1.41E+10Y	1.00	6.447E-01	6.447E-01	1.985E-01	30.79	
PB-214	1600.00Y	1.00	5.732E-01	5.732E-01	2.173E-01	37.90	
RA-224	1.41E+10Y	1.00	8.871E-01	8.871E-01	11.58E-01	130.59	
AC-228	1.41E+10Y	1.00	8.037E-01	8.037E-01	3.392E-01	42.21	
RA-228	1.41E+10Y	1.00	8.037E-01	8.037E-01	3.392E-01	42.21	
TH-228	1.41E+10Y	1.00	6.447E-01	6.447E-01	1.985E-01	30.79	
TH-229	7340.00Y	1.00	1.755E-01	1.755E-01	1.642E-01	93.57	K
TH-232	1.41E+10Y	1.00	8.037E-01	8.037E-01	3.392E-01	42.21	
TH-234	4.47E+09Y	1.00	3.944E-01	3.944E-01	18.54E-01	469.96	
U-235	7.04E+08Y	1.00	8.770E-02	8.770E-02	8.983E-02	102.43	K
U-238	4.47E+09Y	1.00	3.944E-01	3.944E-01	18.54E-01	469.96	
AM-243	7370.00Y	1.00	1.333E-01	1.333E-01	0.663E-01	49.72	
Total Activity :			2.217E+01	2.249E+01			

Grand Total Activity : 2.217E+01 2.249E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	183.88	20	41	1.26	367.20	365	11	4.65E-03	****	3.94E+00	T
0	281.22	25	30	1.68	561.74	558	8	6.03E-03	92.2	2.78E+00	T
0	409.67	17	25	1.06	818.47	815	7	4.31E-03	****	2.00E+00	T
0	480.55	22	83	6.38	960.13	944	25	5.68E-03	****	1.75E+00	
0	609.00	79	20	1.16	1216.85	1210	12	2.05E-02	34.2	1.43E+00	T
0	642.93	15	4	2.11	1284.68	1281	8	3.89E-03	72.8	1.37E+00	
0	655.31	21	10	1.49	1309.42	1303	12	5.56E-03	74.8	1.35E+00	
0	670.19	38	22	8.09	1339.15	1328	22	1.00E-02	74.1	1.33E+00	
0	737.20	8	1	1.51	1473.09	1470	6	2.11E-03	88.1	1.23E+00	T
0	755.59	15	5	3.14	1509.86	1504	10	3.93E-03	79.3	1.20E+00	T
0	973.35	9	2	1.40	1945.11	1942	8	2.39E-03	90.2	9.81E-01	
0	1090.71	14	3	3.77	2179.69	2172	13	3.79E-03	76.9	8.94E-01	
0	1150.78	7	1	0.76	2299.77	2298	5	2.00E-03	86.0	8.55E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                           *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677018.CNF;1      *
* Acquisition date   : 28-JUN-2016 14:38:00 Sensitivity      : 3.000                *
* Detector ID        : GAM31 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000  *
* Elapsed real time  : 0 01:00:06.68 Half life ratio  : ***** *
* Sample date        : 11-MAY-2016 11:40:00 Nuclide Library : SOLID          *
* Sample ID          : G398677018 Analyst initials: MXR1        *
* Batch Number       : 1572231 Sample Quantity : 1.5499E+02 GRAM *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000      *
*                                     Dry Weight    : 0.00000      *
*****
*
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 15-JUN-2016 06:54:07 Eff. Geometry   : CAN                *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	4.115E-01
AS-73	4.205E-01
CD-109	6.715E-01
SN-126	5.600E-02
BA-137M	4.241E-02
CS-137	4.480E-02
EU-155	9.836E-02
TM-171	6.039E+00
TL-208	3.621E-02
BI-211	2.181E-01
BI-212	5.087E-01
PB-212	6.717E-02
PB-214	1.603E-01
RA-224	8.864E-01
AC-228	1.478E-01
RA-228	1.478E-01
TH-228	6.717E-02
TH-229	6.252E-01
TH-232	1.478E-01
TH-234	7.930E-01
U-235	2.197E-01
U-238	7.930E-01
AM-243	3.952E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.395E-01	NOT IDENT.
NA-22	4.089E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.823E-02	NOT IDENT.
SC-46	3.981E-02	NOT IDENT.
V-48	2.415E-01	NOT IDENT.
CR-51	9.890E-01	NOT IDENT.
MN-54	4.005E-02	NOT IDENT.

CO-56	5.180E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.812E-02	NOT IDENT.
CO-58	6.347E-02	NOT IDENT.
FE-59	1.372E-01	NOT IDENT.
CO-60	4.069E-02	NOT IDENT.
ZN-65	9.559E-02	NOT IDENT.
GE-68	1.491E+00	NOT IDENT.
AS-74	4.211E-01	NOT IDENT.
SE-75	6.213E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	9.329E-01	NOT IDENT.
RB-83	1.139E-01	NOT IDENT.
KR-85	1.131E+01	NOT IDENT.
SR-85	8.476E-02	NOT IDENT.
RB-86	2.885E+00	NOT IDENT.
Y-88	6.811E-02	NOT IDENT.
Y-91	3.782E+01	NOT IDENT.
NB-94	4.380E-02	NOT IDENT.
NB-95	7.399E-02	NOT IDENT.
NB-95M	1.910E-01	NOT IDENT.
ZR-95	1.149E-01	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.285E-02	NOT IDENT.
RH-102	6.196E-02	NOT IDENT.
RU-103	8.844E-02	FAIL ABUN
RH-106	4.283E-01	NOT IDENT.
RU-106	4.283E-01	NOT IDENT.
AG-108M	4.121E-02	NOT IDENT.
AG-110M	5.218E-02	NOT IDENT.
SN-113	6.895E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.166E-01	NOT IDENT.
TE-123M	3.751E-02	NOT IDENT.
SB-124	1.091E-01	NOT IDENT.
SB-125	1.250E-01	NOT IDENT.
TE-125M	1.448E+01	NOT IDENT.
I-126	1.801E+00	NOT IDENT.
SB-126	1.075E+00	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.546E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.997E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.140E-02	NOT IDENT.
CS-135	1.997E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.881E-01	NOT IDENT.
CE-139	3.405E-02	NOT IDENT.
BA-140	1.891E+00	NOT IDENT.
LA-140	3.595E-01	NOT IDENT.
CE-141	1.418E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.395E-01	NOT IDENT.
PM-144	4.530E-02	NOT IDENT.
PR-144	3.449E+00	NOT IDENT.
PM-146	6.018E-02	FAIL ABUN
ND-147	6.134E+00	FAIL ABUN
PM-147	7.470E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	3.244E-02	FAIL ABUN
EU-152	1.007E-01	NOT IDENT.
GD-153	8.744E-02	NOT IDENT.
EU-154	1.155E-01	FAIL ABUN
TB-160	1.891E-01	FAIL ABUN
HO-166M	5.539E-02	FAIL ABUN
HF-172	1.988E-01	FAIL ABUN
LU-172	7.549E-02	FAIL ABUN
LU-176	3.102E-02	FAIL ABUN
HF-181	1.107E-01	NOT IDENT.
TA-182	2.589E-01	NOT IDENT.
RE-183	1.441E-01	NOT IDENT.
RE-184	2.527E-01	NOT IDENT.
W-188	1.092E+01	FAIL ABUN

IR-192	6.015E-02	FAIL ABUN
HG-203	7.512E-02	NOT IDENT.
BI-207	5.208E-02	FAIL ABUN
PB-210	7.625E-01	NOT IDENT.
PB-211	8.887E-01	NOT IDENT.
BI-214	1.700E-01	FAIL ABUN
RN-219	5.901E-01	NOT IDENT.
RN-222	1.700E-01	FAIL ABUN
RA-223	8.783E-01	FAIL ABUN
RA-226	1.700E-01	FAIL ABUN
AC-227	2.903E-01	NOT IDENT.
TH-227	2.903E-01	NOT IDENT.
TH-230	1.700E-01	FAIL ABUN
PA-231	6.115E-01	NOT IDENT.
TH-231	8.783E-01	FAIL ABUN
PA-233	8.388E-02	NOT IDENT.
PA-234	2.973E-01	NOT IDENT.
PA-234M	5.120E+00	NOT IDENT.
U-234	1.700E-01	FAIL ABUN
NP-237	8.388E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	2.517E-01	FAIL ABUN
PU-239	4.056E+02	NOT IDENT.
AM-241	8.461E-02	NOT IDENT.
CM-243	9.034E-02	NOT IDENT.
BK-247	9.429E-02	FAIL ABUN
CM-247	5.274E-02	NOT IDENT.
CF-249	5.822E-02	NOT IDENT.
CF-251	1.458E-01	NOT IDENT.
ANH-511	7.280E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677018.CNF;1
Acquisition date : 28-JUN-2016 14:38:00 Sensitivity : 3.000
Detector ID : GAM31 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:06.68 Half life ratio : *****
Sample date : 11-MAY-2016 11:40:00 Nuclide Library : SOLID
Sample ID : G398677018 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5499E+02 GRAM
Quantity Err(%) : 1.2904E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.513E+00	1.314E+00	1.314E+00
AS-73	2.071E-01	8.094E-01	8.094E-01
CD-109	7.340E-01	1.170E+00	1.170E+00
SN-126	6.828E-02	1.088E-01	1.088E-01
BA-137M	1.657E+00	1.974E-01	1.974E-01
CS-137	1.750E+00	2.085E-01	2.085E-01
EU-155	8.955E-02	1.666E-01	1.666E-01
TM-171	3.142E+00	1.226E+01	1.226E+01
TL-208	2.255E-01	1.013E-01	1.013E-01
BI-211	2.172E-01	1.068E+00	1.068E+00
BI-212	6.382E-01	7.667E-01	7.667E-01
PB-212	6.447E-01	1.975E-01	1.975E-01
PB-214	5.732E-01	2.143E-01	2.143E-01
RA-224	1.291E-02	1.272E+00	1.272E+00
AC-228	8.037E-01	3.350E-01	3.350E-01
RA-228	8.037E-01	3.350E-01	3.350E-01
TH-228	6.447E-01	1.975E-01	1.975E-01
TH-229	-7.841E-03	7.245E-01	7.245E-01
TH-232	8.037E-01	3.350E-01	3.350E-01
TH-234	3.944E-01	1.819E+00	1.819E+00
U-235	-6.318E-02	2.529E-01	2.529E-01
U-238	3.944E-01	1.819E+00	1.819E+00
AM-243	9.062E-02	7.109E-02	7.109E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.471E-01	7.691E-01	7.719E-01	NOT IDENT.
NA-22	-2.336E-02	5.377E-02	5.479E-02	NOT IDENT.
NA-24	-2.182E+21	6.392E+21	0.000E+00	SHORT HLIF
AL-26	4.795E-04	3.309E-02	3.309E-02	NOT IDENT.
SC-46	-4.590E-02	5.914E-02	6.265E-02	NOT IDENT.
V-48	-2.428E-01	3.284E-01	3.462E-01	NOT IDENT.
CR-51	-7.560E-01	1.194E+00	1.242E+00	NOT IDENT.

MN-54	-6.767E-02	5.941E-02	6.678E-02	NOT IDENT.
CO-56	-2.961E-02	6.723E-02	6.855E-02	NOT IDENT.
MN-56	-1.000E+41	2.248E+41	0.000E+00	SHORT HLIF
CO-57	-3.398E-03	3.159E-02	3.163E-02	NOT IDENT.
CO-58	-2.383E-03	7.473E-02	7.473E-02	NOT IDENT.
FE-59	2.898E-02	1.519E-01	1.524E-01	NOT IDENT.
CO-60	1.259E-02	4.468E-02	4.504E-02	NOT IDENT.
ZN-65	-1.199E-01	1.334E-01	1.439E-01	NOT IDENT.
GE-68	1.220E+00	1.461E+00	1.561E+00	NOT IDENT.
AS-74	-2.268E-01	5.078E-01	5.180E-01	NOT IDENT.
SE-75	-2.228E-02	7.087E-02	7.158E-02	NOT IDENT.
BR-77	1.525E+06	2.170E+06	2.276E+06	SHORT HLIF
SR-82	1.612E-01	1.057E+00	1.060E+00	NOT IDENT.
RB-83	-8.668E-03	1.360E-01	1.360E-01	NOT IDENT.
KR-85	-2.773E+01	1.614E+01	2.041E+01	NOT IDENT.
SR-85	-2.083E-01	1.210E-01	1.531E-01	NOT IDENT.
RB-86	3.298E+00	2.583E+00	2.980E+00	NOT IDENT.
Y-88	4.810E-02	6.587E-02	6.935E-02	NOT IDENT.
Y-91	2.879E+01	3.901E+01	4.111E+01	NOT IDENT.
NB-94	9.777E-03	4.908E-02	4.927E-02	NOT IDENT.
NB-95	3.607E-02	8.032E-02	8.195E-02	NOT IDENT.
NB-95M	-2.247E-01	2.628E-01	2.817E-01	NOT IDENT.
ZR-95	1.839E-01	1.431E-01	1.654E-01	FAIL ABUN
NB-97	1.000E+41	1.599E+41	0.000E+00	SHORT HLIF
ZR-97	-1.263E+21	4.723E+20	0.000E+00	SHORT HLIF
MO-99	-9.423E+04	8.613E+04	9.603E+04	SHORT HLIF
TC-99M	-1.000E+41	1.392E+42	0.000E+00	SHORT HLIF
RH-101	-3.646E-02	4.008E-02	4.332E-02	NOT IDENT.
RH-102	-4.014E-02	7.699E-02	7.909E-02	NOT IDENT.
RU-103	-2.732E-02	1.080E-01	1.087E-01	FAIL ABUN
RH-106	-1.682E-02	4.897E-01	4.898E-01	NOT IDENT.
RU-106	-1.682E-02	4.897E-01	4.898E-01	NOT IDENT.
AG-108M	1.667E-02	4.577E-02	4.638E-02	NOT IDENT.
AG-110M	-1.378E-03	6.201E-02	6.201E-02	NOT IDENT.
SN-113	-1.396E-02	8.081E-02	8.105E-02	NOT IDENT.
CD-115	2.455E+04	5.324E+05	5.325E+05	SHORT HLIF
SN-117M	4.050E-02	3.567E-01	3.572E-01	NOT IDENT.
TE-123M	3.640E-03	4.237E-02	4.240E-02	NOT IDENT.
SB-124	-3.643E-02	1.421E-01	1.431E-01	NOT IDENT.
SB-125	2.064E-02	1.423E-01	1.426E-01	NOT IDENT.
TE-125M	8.743E+00	1.602E+01	1.650E+01	NOT IDENT.
I-126	2.462E+00	2.449E+00	2.689E+00	NOT IDENT.
SB-126	8.217E-01	1.124E+00	1.184E+00	NOT IDENT.
SB-127	-5.099E+01	7.909E+02	7.912E+02	SHORT HLIF
I-131	-2.048E+00	3.129E+00	3.262E+00	NOT IDENT.
I-132	1.000E+41	3.278E+41	0.000E+00	SHORT HLIF
TE-132	1.189E+03	1.234E+03	1.346E+03	SHORT HLIF
BA-133	-2.951E-02	6.952E-02	7.078E-02	NOT IDENT.
I-133	2.714E+15	2.729E+15	2.990E+15	SHORT HLIF
CS-134	8.194E-02	5.921E-02	6.979E-02	NOT IDENT.
CS-135	-2.474E-02	2.233E-01	2.236E-01	NOT IDENT.
I-135	1.000E+41	1.322E+42	0.000E+00	SHORT HLIF
CS-136	-5.684E-01	6.976E-01	7.432E-01	NOT IDENT.
CE-139	-4.116E-02	4.356E-02	4.735E-02	NOT IDENT.
BA-140	-1.338E+00	2.301E+00	2.378E+00	NOT IDENT.
LA-140	-8.418E-01	7.557E-01	8.456E-01	NOT IDENT.
CE-141	6.226E-02	1.552E-01	1.577E-01	NOT IDENT.
CE-143	3.388E+09	2.848E+09	3.232E+09	SHORT HLIF
CE-144	2.742E-02	2.665E-01	2.668E-01	NOT IDENT.
PM-144	9.106E-03	5.079E-02	5.095E-02	NOT IDENT.
PR-144	6.933E-01	3.867E+00	3.880E+00	NOT IDENT.
PM-146	-1.439E-02	7.185E-02	7.214E-02	FAIL ABUN
ND-147	-5.072E-02	7.272E+00	7.273E+00	FAIL ABUN
PM-147	1.037E+02	8.228E+02	8.242E+02	NOT IDENT.
PM-149	1.428E+06	4.243E+06	4.291E+06	SHORT HLIF
EU-150	3.823E-03	4.119E-02	4.122E-02	FAIL ABUN
EU-152	-7.841E-03	1.316E-01	1.316E-01	NOT IDENT.
GD-153	9.035E-02	9.841E-02	1.065E-01	NOT IDENT.
EU-154	-6.151E-02	1.506E-01	1.531E-01	FAIL ABUN
TB-160	1.060E-02	2.210E-01	2.211E-01	FAIL ABUN
HO-166M	-2.210E-02	6.842E-02	6.914E-02	FAIL ABUN
HF-172	-1.039E-01	2.309E-01	2.356E-01	FAIL ABUN
LU-172	9.603E-03	9.864E-02	9.873E-02	FAIL ABUN
LU-176	-8.528E-03	3.570E-02	3.590E-02	FAIL ABUN
HF-181	3.616E-02	1.253E-01	1.264E-01	NOT IDENT.
TA-182	1.755E-01	2.690E-01	2.804E-01	NOT IDENT.
RE-183	6.570E-02	1.494E-01	1.523E-01	NOT IDENT.
RE-184	-1.392E-01	3.280E-01	3.340E-01	NOT IDENT.

W-188	-1.767E+00	1.412E+01	1.414E+01	FAIL ABUN
IR-192	1.939E-02	6.568E-02	6.626E-02	FAIL ABUN
HG-203	-4.411E-02	1.006E-01	1.025E-01	NOT IDENT.
BI-207	-3.258E-02	6.667E-02	6.827E-02	FAIL ABUN
PB-210	4.484E-01	7.691E-01	7.952E-01	NOT IDENT.
PB-211	-4.086E-01	1.238E+00	1.252E+00	NOT IDENT.
BI-214	5.846E-01	1.976E-01	3.294E-01	FAIL ABUN
RN-219	5.932E-01	6.179E-01	6.733E-01	NOT IDENT.
RN-222	5.846E-01	1.976E-01	3.294E-01	FAIL ABUN
RA-223	5.967E-01	9.334E-01	9.714E-01	FAIL ABUN
RA-226	5.846E-01	1.976E-01	3.294E-01	FAIL ABUN
AC-227	-1.968E-01	3.392E-01	3.506E-01	NOT IDENT.
TH-227	-1.968E-01	3.392E-01	3.506E-01	NOT IDENT.
TH-230	5.846E-01	1.976E-01	3.294E-01	FAIL ABUN
PA-231	1.820E-01	6.904E-01	6.953E-01	NOT IDENT.
TH-231	5.967E-01	9.334E-01	9.714E-01	FAIL ABUN
PA-233	3.708E-02	9.056E-02	9.209E-02	NOT IDENT.
PA-234	-2.188E-01	4.739E-01	4.841E-01	NOT IDENT.
PA-234M	-1.636E+00	6.154E+00	6.198E+00	NOT IDENT.
U-234	5.846E-01	1.976E-01	3.294E-01	FAIL ABUN
NP-237	3.708E-02	9.056E-02	9.209E-02	NOT IDENT.
NP-238	-2.026E+05	1.093E+06	1.097E+06	SHORT HLIF
NP-239	-1.072E-01	2.884E-01	2.924E-01	FAIL ABUN
PU-239	5.994E+02	4.109E+02	4.918E+02	NOT IDENT.
AM-241	-1.711E-02	1.006E-01	1.009E-01	NOT IDENT.
CM-243	-5.199E-02	1.169E-01	1.192E-01	NOT IDENT.
BK-247	-2.435E-03	1.046E-01	1.046E-01	FAIL ABUN
CM-247	3.634E-02	5.696E-02	5.927E-02	NOT IDENT.
CF-249	4.555E-02	6.201E-02	6.532E-02	NOT IDENT.
CF-251	-3.544E-02	1.706E-01	1.714E-01	NOT IDENT.
ANH-511	5.966E-03	7.121E-02	7.126E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	177.4658	87.09	100.4958	136.47	76.6424
45.60	161.6408	87.57	83.3560	140.51	0.0000
46.54	154.4357	88.03	103.5813	143.76	83.9021
49.72	0.0000	88.34	103.6516	144.24	65.8964
51.35	146.4215	88.47	103.6813	145.44	69.2129
51.87	155.3915	89.96	89.5706	152.43	63.4911
52.39	155.6445	1093.63	89.7021	153.25	71.1106
52.97	164.2470	91.11	89.7924	323.87	66.8955
53.44	173.6966	92.59	90.0762	156.02	77.8916
54.07	177.9883	93.35	90.2210	158.56	69.4935
57.36	0.0000	94.56	90.4499	159.00	71.7101
57.53	190.9425	94.65	90.4670	162.33	72.0526
57.98	181.4110	94.67	90.4707	162.66	65.5328
59.27	196.8174	94.87	90.5086	163.33	55.7558
59.32	199.5236	97.43	63.1044	165.86	78.9946
59.54	199.6498	98.43	78.8211	176.31	77.9048
60.96	196.4209	98.44	84.3129	176.60	75.7080
61.17	196.5373	99.53	85.4813	177.52	76.9161
62.93	176.7609	100.11	88.5320	181.07	0.0000
63.29	176.9364	102.03	71.0973	181.52	80.6843
63.58	177.0775	103.18	77.1966	184.41	65.2406
64.28	165.6485	103.37	77.2256	143.76	65.3509
66.73	166.7429	105.21	76.0125	193.51	76.2399
67.24	156.0194	105.31	76.0272	197.03	72.0016
125.81	156.1999	106.12	94.0631	198.01	67.5111
67.75	156.2281	106.47	94.1265	201.83	81.6207
69.67	169.8666	109.28	72.1000	203.43	50.6799
70.83	190.6312	111.00	79.3652	205.31	71.5733
72.81	170.7616	111.76	0.0000	210.85	69.7192
72.87	173.5640	114.06	65.6708	215.65	56.9633
74.66	140.3982	116.30	0.0000	222.11	47.6727
74.82	140.4535	116.74	78.1741	227.09	60.3669
74.97	140.5049	119.76	75.5341	227.38	53.2819
77.11	141.2368	121.12	68.5529	228.16	0.0000
78.74	105.6364	121.22	68.5649	228.18	55.1066
79.69	100.2267	121.78	75.8025	116.74	55.1066
80.12	97.9729	122.06	78.9143	235.69	80.2922
80.19	97.9888	122.92	74.9267	235.96	70.2760
80.57	104.6773	123.07	74.9463	238.63	61.8477
81.00	110.4462	265.00	72.9699	238.98	0.0000
81.07	84.9724	125.81	86.6468	240.99	93.7255
81.75	104.9641	127.23	101.3319	242.00	69.2865
83.79	111.1562	127.91	97.3080	244.70	59.3504
84.00	102.6546	129.30	67.4445	252.40	0.0000
85.43	85.8215	131.20	99.9268	252.80	52.9156
86.55	86.0362	133.02	99.1825	254.15	0.0000
86.79	86.0815	133.52	84.6354	256.23	60.4243
86.94	86.1104	136.00	70.2899	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	52.6252	355.39	0.0000	584.27	18.5171
264.80	48.9394	356.01	43.2112	595.83	28.8763
265.00	48.9491	364.49	49.3365	427.87	23.8641
268.22	63.0009	366.42	0.0000	602.52	0.0000
269.46	50.0902	372.51	32.4180	604.72	31.1930
270.03	48.2620	375.05	32.4800	607.14	29.6705
271.23	53.8936	377.52	46.7770	609.32	17.1969
273.65	78.2347	356.01	52.1066	610.33	23.4625
276.40	43.3294	388.16	33.8233	614.28	18.8076
277.37	52.3428	388.63	37.9361	618.01	22.6119
277.60	67.3121	391.69	38.0208	620.36	23.5822
278.00	62.8482	264.66	28.9592	621.93	22.6564
279.20	59.9238	401.81	28.9831	630.19	0.0000
279.54	65.9377	402.40	32.1021	631.29	22.7631
279.70	65.9474	404.85	39.8344	633.25	20.8866
280.46	62.9949	410.95	31.6715	634.78	19.0020
283.69	46.6377	413.71	43.4237	635.95	15.2105
284.31	45.1597	414.70	41.7822	636.99	17.6642
285.41	45.2058	423.72	27.3282	645.85	14.3291
285.90	0.0000	427.09	28.4444	657.76	19.2163
287.50	41.5192	427.87	32.6759	657.90	0.0000
290.67	40.8836	433.94	30.6935	661.66	19.2524
293.27	0.0000	439.40	35.0544	664.57	0.0000
351.93	45.6152	453.88	39.6789	666.33	9.6476
295.96	56.2958	463.37	25.8951	666.50	9.6484
879.38	53.3793	468.07	29.6832	667.71	0.0000
299.98	36.6486	473.00	0.0000	677.62	27.4811
300.09	44.2887	475.06	31.5218	685.70	0.0000
300.13	44.2901	476.78	31.5559	695.00	16.6223
301.36	46.9600	477.60	31.5718	696.49	18.5904
302.85	48.7993	482.18	31.6617	696.51	18.5909
256.23	49.8291	487.02	31.5369	697.00	17.6164
304.85	42.1758	492.35	0.0000	697.30	17.6186
306.78	44.1680	497.08	28.6454	697.49	20.5570
308.46	40.3869	505.52	32.1126	702.65	20.6052
311.90	40.5087	507.63	0.0000	706.68	15.7281
316.51	39.7019	511.00	29.9951	711.68	13.7932
319.41	55.3327	514.00	87.9185	720.70	9.8921
320.08	49.5362	514.00	87.9185	721.93	0.0000
321.04	41.7999	520.40	24.5754	722.78	21.4530
323.87	40.9259	520.69	0.0000	722.91	21.4540
325.23	52.6800	522.65	0.0000	723.31	24.7595
328.76	48.9220	527.90	0.0000	724.19	19.8152
333.37	34.5732	528.26	25.8097	727.33	13.2285
333.97	37.7350	529.59	17.9683	733.00	9.9463
334.37	44.0385	529.87	0.0000	735.93	11.9508
338.28	30.5710	531.02	28.0983	333.97	15.9453
338.32	30.5719	537.26	28.8750	739.50	0.0000
311.90	30.6258	546.56	0.0000	747.24	17.0141
340.48	30.6258	552.55	18.2021	748.06	18.7720
340.55	30.6277	563.25	27.4636	752.31	20.0605
344.28	28.5398	569.33	28.4729	753.82	13.3822
345.93	35.7220	946.00	31.2317	756.73	10.0493
351.06	29.8906	569.70	31.2350	756.80	10.0496
351.93	29.9112	583.19	15.4224	884.68	21.1687

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	15.1322	1274.44	15.5975	1620.50	1.8670
766.42	13.1181	1001.03	15.6228	1621.92	1.8677
766.84	15.1392	1002.74	11.0342	1678.03	0.0000
772.60	0.0000	1004.73	13.8022	1690.97	3.7927
776.52	13.1742	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.8895
778.90	18.0339	1028.54	0.0000	1063.66	9.6432
783.70	0.0000	1037.84	13.9557	1771.35	10.6098
785.37	9.1542	1038.76	0.0000	1791.20	0.0000
792.07	15.2996	631.29	14.9290	1808.65	1.9440
794.95	12.2543	1048.07	13.0692	1810.72	0.0000
795.86	9.1940	1049.04	4.6690	1836.06	1.9549
810.06	15.4127	1050.41	8.4078		
810.29	15.4138	1063.66	14.0735		
344.28	14.3873	1077.00	1.8845		
810.76	15.4167	1077.34	4.7119		
815.77	14.4184	1085.87	6.4794		
1048.07	10.3101	1093.63	11.3672		
832.01	16.5852	1099.45	6.6428		
834.85	25.9436	1112.07	9.5272		
835.71	20.7617	1112.84	9.5296		
836.80	0.0000	1115.54	20.0284		
846.75	0.0000	1120.29	12.4171		
846.77	14.5964	1120.55	11.4629		
856.80	12.5602	1221.41	10.5099		
860.56	8.3855	1129.67	12.4530		
871.09	8.4195	1131.51	0.0000		
873.19	8.4264	1147.95	0.0000		
875.33	0.0000	1173.23	9.7058		
879.38	10.5576	1177.95	11.6636		
880.51	8.4498	1189.05	9.7514		
883.24	10.5730	1204.77	8.8165		
884.68	9.5210	1221.41	7.8747		
889.28	12.7166	1231.02	8.8835		
894.76	7.4332	1235.36	7.9063		
898.04	14.8846	1238.28	7.9128		
900.72	11.7066	1260.41	0.0000		
903.28	15.9789	1271.87	10.9830		
911.20	11.7520	1274.44	10.9906		
912.08	7.1247	1274.54	10.9910		
923.98	0.0000	1291.59	3.0116		
926.50	10.7434	1298.22	0.0000		
929.11	13.9798	1312.11	9.0853		
937.49	15.1006	1332.49	5.0751		
944.13	12.9741	1362.66	0.0000		
946.00	15.1464	1365.19	5.1190		
949.00	17.3289	1368.63	0.0000		
667.71	0.0000	1384.29	10.2889		
962.31	10.8816	1408.01	9.3164		
964.08	9.0735	1457.56	0.0000		
966.17	10.8962	1460.82	7.1928		
911.20	12.7248	1489.16	4.2249		
968.97	12.7248	1505.03	11.6629		
983.53	8.7697	1584.12	5.4008		
984.45	0.0000	1596.21	9.7482		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:45:58.00

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677019.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;261
Background date    : 26-JUN-2016 12:05:51
Sample date       : 11-MAY-2016 00:00:00 Acquisition date : 28-JUN-2016 14:38:20
Sample ID        : G398677019 Sample quantity : 1.46480E+02 GRAM
Detector name    : GAM32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.55 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572231 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.56*	15	124	0.61	128.21	123	9	4.08E-03	142.9	
2	2	75.05	85	130	1.32	151.19	145	18	2.35E-02	25.5	1.51E+00
3	2	77.10*	109	101	1.17	155.31	145	18	3.02E-02	19.3	
4	0	88.82	70	273	4.51	178.74	169	16	1.95E-02	54.6	
5	0	93.44*	42	137	1.50	187.98	184	10	1.17E-02	57.2	
6	0	128.36	31	79	1.32	257.85	255	7	8.48E-03	51.6	
7	0	185.92*	57	79	1.41	372.99	368	9	1.58E-02	32.8	
8	0	210.92	36	137	1.17	423.00	416	13	9.95E-03	71.1	
9	5	238.90*	255	55	1.06	478.99	475	18	7.09E-02	8.0	1.27E+00
10	5	241.71	78	106	2.17	484.61	475	18	2.17E-02	37.1	
11	0	258.59	34	86	0.86	518.37	513	11	9.34E-03	56.0	
12	0	295.37*	94	65	1.24	591.95	587	9	2.60E-02	18.9	
13	0	338.82	68	65	1.52	678.87	673	11	1.88E-02	26.2	
14	0	352.08*	174	79	1.17	705.40	699	13	4.84E-02	13.0	
15	0	390.06	26	31	1.47	781.38	778	8	7.18E-03	42.6	
16	0	448.98	20	23	1.27	899.25	896	7	5.54E-03	45.6	
17	0	463.59	40	69	1.57	928.47	922	12	1.10E-02	44.9	
18	0	511.31*	28	68	2.14	1023.96	1016	16	7.65E-03	77.4	
19	0	569.04*	29	10	3.12	1139.44	1135	10	7.96E-03	29.2	
20	0	583.78*	101	24	1.69	1168.93	1163	14	2.80E-02	14.7	
21	0	604.54	15	25	2.98	1210.47	1203	11	4.21E-03	68.6	
22	0	609.74*	102	33	1.19	1220.87	1215	11	2.83E-02	15.1	
23	0	661.96*	712	25	1.45	1325.33	1319	14	1.98E-01	4.0	
24	0	674.98	11	12	3.63	1351.38	1345	10	2.95E-03	69.4	
25	0	688.84	9	10	0.73	1379.11	1373	10	2.50E-03	73.7	
26	0	712.42	17	8	0.64	1426.28	1421	11	4.76E-03	40.3	
27	0	718.71	28	7	1.44	1438.86	1432	14	7.78E-03	27.5	
28	0	727.57	18	12	0.88	1456.58	1452	8	4.97E-03	41.1	
29	0	752.72	13	14	1.45	1506.90	1501	11	3.60E-03	62.1	
30	0	767.54	13	24	5.56	1536.55	1526	19	3.70E-03	92.0	
31	0	787.13	27	8	1.42	1575.74	1568	15	7.36E-03	29.7	
32	0	792.57	15	4	1.54	1586.62	1583	7	4.03E-03	33.9	
33	0	795.64	9	1	1.20	1592.77	1590	6	2.43E-03	40.0	
34	0	856.22	9	2	3.26	1713.97	1708	9	2.37E-03	46.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.37*	87	0	1.43	1824.30	1818	13	2.43E-02	11.0	
36	0	925.33	9	0	1.37	1852.22	1847	9	2.50E-03	33.3	
37	0	957.11	8	2	1.53	1915.81	1911	8	2.28E-03	45.6	
38	0	969.58*	31	13	1.17	1940.75	1935	11	8.64E-03	30.3	
39	0	1117.91	8	9	0.82	2237.50	2231	9	2.22E-03	76.3	
40	0	1122.40	27	5	0.89	2246.49	2241	14	7.47E-03	27.9	
41	0	1150.33	10	5	1.64	2302.38	2296	10	2.81E-03	51.8	
42	0	1189.87	10	5	1.05	2381.47	2376	9	2.64E-03	51.7	
43	0	1461.31*	132	3	2.13	2924.54	2919	13	3.67E-02	9.3	
44	0	1765.32*	23	5	0.65	3532.77	3527	10	6.27E-03	28.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:46:00

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677019.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 00:00:00 Acquisition date : 28-JUN-2016 14:38:20
Sample ID         : G398677019 Sample quantity  : 146.48 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA32 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.55 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.119E+00	5.464E+00	5.464E+00	18.64	OK
CD-109	88.03	3.70*	5.097E+00	2.357E+00	2.536E+00	109.24	OK
SN-126	64.28	9.60	2.159E+00	4.622E-01	4.622E-01	285.73	OK
	86.94	8.90	4.942E+00	----- Line	Not Found	-----	Absent
	87.57	37.00*	5.097E+00	2.357E-01	2.357E-01	109.24	OK
CS-134	563.25	8.34	2.570E+00	----- Line	Not Found	-----	Absent
	569.33	15.37	2.550E+00	3.953E-01	4.133E-01	58.43	OK
	604.72	97.62	2.437E+00	3.428E-02	3.584E-02	137.12	OK
	795.86	85.46*	1.950E+00	2.752E-02	2.877E-02	80.00	OK
	801.95	8.69	1.936E+00	----- Line	Not Found	-----	Absent
	1365.19	3.02	1.187E+00	----- Line	Not Found	-----	Absent
BA-137M	661.66	89.90*	2.271E+00	1.860E+00	1.866E+00	8.07	OK
CS-137	661.66	85.10*	2.271E+00	1.965E+00	1.971E+00	8.07	OK
TL-208	277.37	6.60	4.192E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.502E+00	2.557E-01	2.557E-01	29.34	OK
	860.56	12.50	1.820E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	3.416E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.563E+00	1.358E-01	1.358E-01	691.04	OK
PB-212	74.82	10.28	3.691E+00	1.025E+00	1.025E+00	73.10	OK
	77.11	17.10	3.939E+00	1.036E+00	1.036E+00	38.65	OK
	238.63	43.60*	4.641E+00	7.374E-01	7.374E-01	15.95	OK
	300.09	3.30	3.972E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20	OK
	1120.29	14.92	1.425E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	9.781E-01	7.301E-01	7.302E-01	57.88	OK
PB-214	74.82	5.80	3.663E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.939E+00	1.827E+00	1.827E+00	38.65	OK
	87.09	3.41	4.955E+00	----- Line	Not Found	-----	Absent
	242.00	7.25	4.601E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.015E+00	7.265E-01	7.266E-01	37.73	OK
	351.93	35.60*	3.564E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20	OK
	1120.29	14.92	1.425E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	9.781E-01	7.301E-01	7.302E-01	57.88	OK
RA-224	240.99	4.10*	4.605E+00	1.134E+00	1.134E+00	164.08	OK
RA-226	609.32	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20	OK
	1120.29	14.92	1.425E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	9.781E-01	7.301E-01	7.302E-01	57.88	OK
AC-228	105.21	1.10	5.988E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.657E+00	9.288E-01	9.288E-01	52.46	OK
	794.95	4.25	1.950E+00	5.533E-01	5.533E-01	80.00	OK
	835.71	1.61	1.868E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.728E+00	1.014E+00	1.014E+00	21.93	OK
	968.97	15.80	1.632E+00	6.198E-01	6.198E-01	60.61	OK
RA-228	105.21	1.10	5.988E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.657E+00	9.288E-01	9.288E-01	52.46	OK
	794.95	4.25	1.950E+00	5.533E-01	5.533E-01	80.00	OK
	835.71	1.61	1.868E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.728E+00	1.014E+00	1.014E+00	21.93	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	1.632E+00	6.198E-01	6.198E-01	60.61	OK
	74.82	10.28	3.691E+00	1.025E+00	1.025E+00	73.10	OK
	77.11	17.10	3.939E+00	1.036E+00	1.036E+00	38.65	OK
	238.63	43.60*	4.641E+00	7.374E-01	7.374E-01	15.95	OK
TH-230	300.09	3.30	3.972E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20	OK
	1120.29	14.92	1.425E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	9.781E-01	7.301E-01	7.301E-01	57.88	OK
TH-232	105.21	1.10	5.988E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.657E+00	9.288E-01	9.288E-01	52.46	OK
	835.71	1.61	1.868E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.728E+00	1.014E+00	1.014E+00	21.93	OK
TH-234	968.97	15.80	1.632E+00	6.198E-01	6.198E-01	60.61	OK
	63.29	3.70*	2.159E+00	1.199E+00	1.199E+00	285.73	OK
	92.59	4.23	5.428E+00	1.163E+00	1.163E+00	114.50	OK
U-234	609.32	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20	OK
	1120.29	14.92	1.425E+00	----- Line	Not Found	-----	Absent
	1764.49	15.30	9.781E-01	7.301E-01	7.301E-01	57.88	OK
U-235	89.96	3.47	5.097E+00	2.513E+00	2.513E+00	109.24	OK
	93.35	5.60	5.428E+00	8.782E-01	8.782E-01	114.50	OK
	143.76	10.96*	6.142E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.845E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.453E+00	1.090E-01	1.090E-01	65.58	OK
U-238	205.31	5.01	5.130E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	2.159E+00	1.199E+00	1.199E+00	285.73	OK
	92.59	4.23	5.428E+00	1.163E+00	1.163E+00	114.50	OK
AM-243	43.53	5.90	1.916E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.691E+00	1.567E-01	1.567E-01	73.10	OK
	511.00	100.00*	2.756E+00	5.459E-02	5.459E-02	154.78	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677019.CNF;1  *
* Acquisition date   : 28-JUN-2016 14:38:20 Sensitivity      : 3.000          *
* Detector ID        : GAM32 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.55 Half life ratio : *****      *
* Sample date        : 11-MAY-2016 00:00:00 Analyst initials: MXR1      *
* Sample ID          : G398677019 Sample Quantity : 1.4648E+02 GRAM  *
* Batch Number       : 1572231 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 6-AUG-2015 09:24:00 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10        *
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.464E+00	9.979E-01	5.698E-01
CD-109	2.536E+00	2.715E+00	1.837E+00
SN-126	2.357E-01	2.523E-01	1.721E-01
CS-134	2.877E-02	2.256E-02	6.153E-02
BA-137M	1.866E+00	1.475E-01	6.629E-02
CS-137	1.971E+00	1.559E-01	7.003E-02
TL-208	2.557E-01	7.354E-02	7.311E-02
BI-211	1.358E-01	9.197E-01	4.408E-01
PB-212	7.374E-01	1.152E-01	1.275E-01
BI-214	4.972E-01	1.472E-01	1.447E-01
PB-214	7.759E-01	1.981E-01	3.048E-01
RN-222	4.972E-01	1.472E-01	1.447E-01
RA-224	1.134E+00	1.824E+00	1.322E+00
RA-226	4.972E-01	1.472E-01	1.447E-01
AC-228	1.014E+00	2.180E-01	1.990E-01
RA-228	1.014E+00	2.180E-01	1.990E-01
TH-228	7.374E-01	1.152E-01	1.275E-01
TH-230	4.972E-01	1.471E-01	1.447E-01
TH-232	1.014E+00	2.180E-01	1.990E-01
TH-234	1.199E+00	3.358E+00	3.517E+00
U-234	4.972E-01	1.471E-01	1.447E-01
U-235	-3.903E-02	2.210E-01	4.157E-01
U-238	1.199E+00	3.358E+00	3.517E+00
AM-243	1.567E-01	1.123E-01	1.202E-01
ANH-511	5.459E-02	8.280E-02	5.872E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.841E-01	6.843E-01	1.328E+00	NOT IDENT.
NA-22	-1.018E-02	4.167E-02	7.957E-02	NOT IDENT.
NA-24	0.000E+00	8.730E+21	0.000E+00	SHORT HLIF
AL-26	1.211E-02	2.194E-02	5.958E-02	NOT IDENT.
SC-46	3.030E-03	4.367E-02	8.671E-02	NOT IDENT.

V-48	-1.226E-01	2.414E-01	4.275E-01	NOT IDENT.
CR-51	-1.822E-01	1.048E+00	1.907E+00	NOT IDENT.
MN-54	7.685E-03	3.592E-02	7.156E-02	NOT IDENT.
CO-56	2.106E-02	4.783E-02	9.909E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	8.355E-03	3.079E-02	6.025E-02	NOT IDENT.
CO-58	-3.788E-02	4.357E-02	7.222E-02	NOT IDENT.
FE-59	-1.561E-02	1.314E-01	2.596E-01	NOT IDENT.
CO-60	1.184E-02	2.949E-02	6.725E-02	NOT IDENT.
ZN-65	5.365E-02	9.976E-02	1.902E-01	NOT IDENT.
GE-68	-5.005E-01	1.235E+00	2.202E+00	NOT IDENT.
AS-73	1.498E+00	2.238E+00	4.406E+00	NOT IDENT.
AS-74	4.518E-01	3.655E-01	7.795E-01	NOT IDENT.
SE-75	3.006E-02	6.797E-02	1.222E-01	NOT IDENT.
BR-77	0.000E+00	3.141E+05	0.000E+00	SHORT HLIF
SR-82	-1.318E-01	8.334E-01	1.526E+00	NOT IDENT.
RB-83	1.503E-02	9.372E-02	1.854E-01	NOT IDENT.
KR-85	1.726E+01	9.551E+00	1.907E+01	NOT IDENT.
SR-85	1.299E-01	7.197E-02	1.437E-01	NOT IDENT.
RB-86	-1.784E+00	2.543E+00	4.238E+00	NOT IDENT.
Y-88	-1.543E-02	3.714E-02	7.022E-02	NOT IDENT.
Y-91	1.974E+00	2.738E+01	5.494E+01	NOT IDENT.
NB-94	2.248E-03	3.026E-02	5.923E-02	NOT IDENT.
NB-95	-3.931E-03	5.462E-02	1.043E-01	NOT IDENT.
NB-95M	-2.110E-02	2.347E-01	3.799E-01	NOT IDENT.
ZR-95	-5.236E-02	1.106E-01	1.667E-01	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.575E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.238E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	4.538E-02	4.586E-02	6.901E-02	FAIL ABUN
RH-102	4.131E-02	5.429E-02	1.146E-01	FAIL ABUN
RU-103	-3.622E-02	7.850E-02	1.449E-01	FAIL ABUN
RH-106	3.395E-02	3.307E-01	6.482E-01	NOT IDENT.
RU-106	3.395E-02	3.307E-01	6.482E-01	NOT IDENT.
AG-108M	2.513E-02	3.981E-02	7.636E-02	NOT IDENT.
AG-110M	-1.383E-02	4.797E-02	8.900E-02	NOT IDENT.
SN-113	2.007E-02	7.321E-02	1.218E-01	NOT IDENT.
CD-115	0.000E+00	4.031E+05	0.000E+00	SHORT HLIF
SN-117M	4.464E-01	3.485E-01	7.098E-01	NOT IDENT.
TE-123M	4.981E-02	3.952E-02	8.049E-02	NOT IDENT.
SB-124	-4.605E-02	1.041E-01	1.947E-01	NOT IDENT.
SB-125	-1.687E-02	1.186E-01	2.133E-01	FAIL ABUN
TE-125M	1.082E+00	1.562E+01	3.042E+01	NOT IDENT.
I-126	9.982E-01	1.394E+00	2.643E+00	FAIL ABUN
SB-126	6.935E-01	1.137E+00	1.909E+00	FAIL ABUN
SB-127	0.000E+00	6.500E+02	0.000E+00	SHORT HLIF
I-131	-1.116E+00	2.449E+00	4.323E+00	NOT IDENT.
I-132	0.000E+00	1.778E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.157E+03	0.000E+00	SHORT HLIF
BA-133	7.754E-04	5.671E-02	9.153E-02	NOT IDENT.
I-133	0.000E+00	2.679E+15	0.000E+00	SHORT HLIF
CS-135	-1.209E-03	1.934E-01	3.582E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-4.556E-01	5.443E-01	8.797E-01	NOT IDENT.
CE-139	6.774E-03	4.091E-02	7.824E-02	NOT IDENT.
BA-140	-4.894E-01	1.722E+00	3.234E+00	NOT IDENT.
LA-140	-1.521E-01	5.344E-01	1.024E+00	NOT IDENT.
CE-141	2.066E-03	1.386E-01	2.638E-01	NOT IDENT.
CE-143	0.000E+00	3.678E+09	0.000E+00	SHORT HLIF
CE-144	-2.082E-02	2.501E-01	4.430E-01	NOT IDENT.
PM-144	3.280E-02	3.299E-02	7.189E-02	NOT IDENT.
PR-144	2.512E+00	2.515E+00	5.482E+00	NOT IDENT.
PM-146	-1.566E-02	6.049E-02	1.027E-01	NOT IDENT.
ND-147	7.900E-01	5.055E+00	9.917E+00	NOT IDENT.
PM-147	-2.127E+02	8.478E+02	1.610E+03	NOT IDENT.
PM-149	0.000E+00	3.924E+06	0.000E+00	SHORT HLIF
EU-150	-1.119E-02	3.522E-02	5.467E-02	FAIL ABUN
EU-152	3.256E-02	1.187E-01	2.094E-01	NOT IDENT.
GD-153	-3.752E-02	1.177E-01	1.971E-01	NOT IDENT.
EU-154	-4.942E-02	1.204E-01	2.225E-01	NOT IDENT.
EU-155	4.549E-03	1.153E-01	2.244E-01	NOT IDENT.
TB-160	-5.544E-02	1.586E-01	2.914E-01	NOT IDENT.
HO-166M	7.840E-02	6.191E-02	1.144E-01	FAIL ABUN
TM-171	2.545E+01	3.819E+01	7.524E+01	NOT IDENT.
HF-172	4.666E-03	2.376E-01	4.042E-01	FAIL ABUN
LU-172	6.352E-03	5.623E-02	1.157E-01	FAIL ABUN
LU-176	-1.560E-02	3.164E-02	5.619E-02	FAIL ABUN

HF-181	-3.323E-02	1.058E-01	1.962E-01	NOT IDENT.
TA-182	-9.792E-03	2.041E-01	4.012E-01	FAIL ABUN
RE-183	7.045E-02	4.628E-01	8.357E-01	NOT IDENT.
RE-184	1.124E-02	2.267E-01	4.307E-01	FAIL ABUN
W-188	7.684E+00	1.268E+01	2.213E+01	FAIL ABUN
IR-192	2.549E-02	5.693E-02	1.093E-01	FAIL ABUN
HG-203	-5.704E-03	7.992E-02	1.470E-01	NOT IDENT.
BI-207	2.866E-02	4.255E-02	9.347E-02	FAIL ABUN
PB-210	-1.091E+00	9.758E+00	1.846E+01	NOT IDENT.
PB-211	3.166E-01	9.037E-01	1.701E+00	NOT IDENT.
BI-212	6.743E-01	5.426E-01	1.114E+00	FAIL ABUN
RN-219	1.754E-01	4.990E-01	9.429E-01	NOT IDENT.
RA-223	-4.999E-02	7.975E-01	1.462E+00	FAIL ABUN
AC-227	3.082E-01	3.124E-01	5.679E-01	NOT IDENT.
TH-227	3.082E-01	3.124E-01	5.679E-01	NOT IDENT.
TH-229	1.094E-01	5.743E-01	1.098E+00	FAIL ABUN
PA-231	7.090E-02	5.780E-01	1.079E+00	NOT IDENT.
TH-231	-4.999E-02	7.975E-01	1.462E+00	FAIL ABUN
PA-233	-5.676E-02	7.576E-02	1.312E-01	NOT IDENT.
PA-234	-2.447E-02	2.629E-01	5.037E-01	FAIL ABUN
PA-234M	2.824E+00	4.508E+00	9.540E+00	FAIL ABUN
NP-237	-5.676E-02	7.576E-02	1.312E-01	FAIL ABUN
NP-238	0.000E+00	8.654E+05	0.000E+00	SHORT HLIF
NP-239	3.222E-01	2.857E-01	5.888E-01	NOT IDENT.
PU-239	4.755E+02	4.806E+02	7.397E+02	FAIL ABUN
AM-241	-1.513E-01	2.803E-01	4.392E-01	NOT IDENT.
CM-243	-8.944E-03	1.161E-01	2.247E-01	NOT IDENT.
BK-247	5.273E-02	9.500E-02	1.794E-01	NOT IDENT.
CM-247	8.709E-03	4.742E-02	8.800E-02	NOT IDENT.
CF-249	5.687E-02	5.679E-02	1.017E-01	NOT IDENT.
CF-251	-9.358E-02	1.401E-01	2.537E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	127	10.66*	1.119E+00	5.464E+00	5.464E+00	18.64
CD-109	88.03	87	3.70*	5.097E+00	2.357E+00	2.536E+00	109.24
SN-126	64.28	19	9.60	2.159E+00	4.622E-01	4.622E-01	285.73
	86.94	-----	8.90	4.942E+00	-----	Line Not Found	-----
	87.57	87	37.00*	5.097E+00	2.357E-01	2.357E-01	109.24
CS-134	563.25	-----	8.34	2.570E+00	-----	Line Not Found	-----
	569.33	30	15.37	2.550E+00	3.953E-01	4.133E-01	58.43
	604.72	16	97.62	2.437E+00	3.428E-02	3.584E-02	137.12
	795.86	9	85.46*	1.950E+00	2.752E-02	2.877E-02	80.00
	801.95	-----	8.69	1.936E+00	-----	Line Not Found	-----
	1365.19	-----	3.02	1.187E+00	-----	Line Not Found	-----
BA-137M	661.66	741	89.90*	2.271E+00	1.860E+00	1.866E+00	8.07
CS-137	661.66	741	85.10*	2.271E+00	1.965E+00	1.971E+00	8.07
TL-208	277.37	-----	6.60	4.192E+00	-----	Line Not Found	-----
	583.19	106	85.00*	2.502E+00	2.557E-01	2.557E-01	29.34
	860.56	-----	12.50	1.820E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.416E+00	-----	Line Not Found	-----
	351.06	192	12.92*	3.563E+00	2.138E+00	2.138E+00	26.05
PB-212	74.82	106	10.28	3.691E+00	1.434E+00	1.434E+00	51.09
	77.11	136	17.10	3.939E+00	1.036E+00	1.036E+00	38.65
	238.63	291	43.60*	4.641E+00	7.374E-01	7.374E-01	15.95
	300.09	-----	3.30	3.972E+00	-----	Line Not Found	-----
BI-214	609.32	107	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20
	1120.29	-----	14.92	1.425E+00	-----	Line Not Found	-----
	1764.49	21	15.30	9.781E-01	7.301E-01	7.302E-01	57.88
PB-214	74.82	106	5.80	3.691E+00	2.542E+00	2.543E+00	51.09
	77.11	136	9.70	3.939E+00	1.827E+00	1.827E+00	38.65
	87.09	-----	3.41	4.955E+00	-----	Line Not Found	-----
	242.00	89	7.25	4.605E+00	1.368E+00	1.368E+00	74.27
	295.22	105	18.42	4.015E+00	7.265E-01	7.266E-01	37.73
	351.93	192	35.60*	3.563E+00	7.758E-01	7.759E-01	26.05
RN-222	609.32	107	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20
	1120.29	-----	14.92	1.425E+00	-----	Line Not Found	-----
	1764.49	21	15.30	9.781E-01	7.301E-01	7.302E-01	57.88
RA-224	240.99	89	4.10*	4.605E+00	2.419E+00	2.419E+00	74.27
RA-226	609.32	107	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20
	1120.29	-----	14.92	1.425E+00	-----	Line Not Found	-----
	1764.49	21	15.30	9.781E-01	7.301E-01	7.302E-01	57.88
AC-228	105.21	-----	1.10	5.988E+00	-----	Line Not Found	-----
	338.32	75	11.27	3.657E+00	9.288E-01	9.288E-01	52.46
	794.95	9	4.25	1.950E+00	5.533E-01	5.533E-01	80.00
	835.71	-----	1.61	1.868E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.728E+00	1.014E+00	1.014E+00	21.93
	968.97	31	15.80	1.632E+00	6.198E-01	6.198E-01	60.61
RA-228	105.21	-----	1.10	5.988E+00	-----	Line Not Found	-----
	338.32	75	11.27	3.657E+00	9.288E-01	9.288E-01	52.46
	794.95	9	4.25	1.950E+00	5.533E-01	5.533E-01	80.00

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	1.868E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.728E+00	1.014E+00	1.014E+00	21.93
	968.97	31	15.80	1.632E+00	6.198E-01	6.198E-01	60.61
TH-228	74.82	106	10.28	3.691E+00	1.434E+00	1.434E+00	51.09
	77.11	136	17.10	3.939E+00	1.036E+00	1.036E+00	38.65
	238.63	291	43.60*	4.641E+00	7.374E-01	7.374E-01	15.95
	300.09	-----	3.30	3.972E+00	-----	Line Not Found	-----
TH-230	609.32	107	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20
	1120.29	-----	14.92	1.425E+00	-----	Line Not Found	-----
	1764.49	21	15.30	9.781E-01	7.301E-01	7.301E-01	57.88
TH-232	105.21	-----	1.10	5.988E+00	-----	Line Not Found	-----
	338.32	75	11.27	3.657E+00	9.288E-01	9.288E-01	52.46
	835.71	-----	1.61	1.868E+00	-----	Line Not Found	-----
	911.20	88	25.80*	1.728E+00	1.014E+00	1.014E+00	21.93
	968.97	31	15.80	1.632E+00	6.198E-01	6.198E-01	60.61
TH-234	63.29	19	3.70*	2.159E+00	1.199E+00	1.199E+00	285.73
	92.59	52	4.23	5.428E+00	1.163E+00	1.163E+00	114.50
U-234	609.32	107	45.49*	2.421E+00	4.972E-01	4.972E-01	30.20
	1120.29	-----	14.92	1.425E+00	-----	Line Not Found	-----
	1764.49	21	15.30	9.781E-01	7.301E-01	7.301E-01	57.88
U-235	89.96	87	3.47	5.097E+00	2.513E+00	2.513E+00	109.24
	93.35	52	5.60	5.428E+00	8.782E-01	8.782E-01	114.50
	143.76	-----	10.96*	6.142E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.845E+00	-----	Line Not Found	-----
	185.72	66	57.20	5.453E+00	1.090E-01	1.090E-01	65.58
	205.31	-----	5.01	5.130E+00	-----	Line Not Found	-----
U-238	63.29	19	3.70*	2.159E+00	1.199E+00	1.199E+00	285.73
	92.59	52	4.23	5.428E+00	1.163E+00	1.163E+00	114.50
AM-243	43.53	-----	5.90	1.916E-01	-----	Line Not Found	-----
	74.66	106	67.20*	3.691E+00	2.194E-01	2.194E-01	51.09
ANH-511	511.00	29	100.00*	2.756E+00	5.459E-02	5.459E-02	154.78

Flag: "*" = Keyline

Total number of lines in spectrum 44
Number of unidentified lines 9
Number of lines tentatively identified by NID 35 79.55%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.464E+00	5.464E+00	1.018E+00	18.64	
CD-109	461.40D	1.08	2.357E+00	2.536E+00	2.770E+00	109.24	
SN-126	2.30E+05Y	1.00	2.357E-01	2.357E-01	2.575E-01	109.24	
CS-134	2.07Y	1.05	2.752E-02	2.877E-02	2.302E-02	80.00	
BA-137M	30.08Y	1.00	1.860E+00	1.866E+00	0.151E+00	8.07	
CS-137	30.08Y	1.00	1.965E+00	1.971E+00	0.159E+00	8.07	
TL-208	1.41E+10Y	1.00	2.557E-01	2.557E-01	0.750E-01	29.34	
BI-211	7.04E+08Y	1.00	2.138E+00	2.138E+00	0.557E+00	26.05	
PB-212	1.41E+10Y	1.00	7.374E-01	7.374E-01	1.176E-01	15.95	
BI-214	1600.00Y	1.00	4.972E-01	4.972E-01	1.502E-01	30.20	
PB-214	1600.00Y	1.00	7.758E-01	7.759E-01	2.021E-01	26.05	
RN-222	1600.00Y	1.00	4.972E-01	4.972E-01	1.502E-01	30.20	
RA-224	1.41E+10Y	1.00	2.419E+00	2.419E+00	1.796E+00	74.27	
RA-226	1600.00Y	1.00	4.972E-01	4.972E-01	1.502E-01	30.20	
AC-228	1.41E+10Y	1.00	1.014E+00	1.014E+00	0.222E+00	21.93	
RA-228	1.41E+10Y	1.00	1.014E+00	1.014E+00	0.222E+00	21.93	
TH-228	1.41E+10Y	1.00	7.374E-01	7.374E-01	1.176E-01	15.95	
TH-230	7.54E+04Y	1.00	4.972E-01	4.972E-01	1.501E-01	30.20	
TH-232	1.41E+10Y	1.00	1.014E+00	1.014E+00	0.222E+00	21.93	
TH-234	4.47E+09Y	1.00	1.199E+00	1.199E+00	3.427E+00	285.73	
U-234	2.45E+05Y	1.00	4.972E-01	4.972E-01	1.501E-01	30.20	
U-235	7.04E+08Y	1.00	1.090E-01	1.090E-01	0.715E-01	65.58	K
U-238	4.47E+09Y	1.00	1.199E+00	1.199E+00	3.427E+00	285.73	
AM-243	7370.00Y	1.00	2.194E-01	2.194E-01	1.121E-01	51.09	
ANH-511	1.00E+09Y	1.00	5.459E-02	5.459E-02	8.449E-02	154.78	
Total Activity :			2.728E+01	2.747E+01			

Grand Total Activity : 2.728E+01 2.747E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	128.36	37	96	1.32	257.85	255	7	8.48E-03	****	6.27E+00	T
0	210.92	41	158	1.17	423.00	416	13	9.95E-03	****	5.04E+00	T
0	258.59	38	98	0.86	518.37	513	11	9.34E-03	****	4.40E+00	
0	390.06	28	34	1.47	781.38	778	8	7.18E-03	85.1	3.32E+00	T
0	448.98	22	25	1.27	899.25	896	7	5.54E-03	91.2	3.02E+00	
0	463.59	43	75	1.57	928.47	922	12	1.10E-02	89.8	2.95E+00	T
0	674.98	11	13	3.63	1351.38	1345	10	2.95E-03	****	2.24E+00	
0	688.84	9	10	0.73	1379.11	1373	10	2.50E-03	****	2.20E+00	
0	712.42	18	8	0.64	1426.28	1421	11	4.76E-03	80.6	2.14E+00	T
0	718.71	29	7	1.44	1438.86	1432	14	7.78E-03	55.1	2.12E+00	
0	727.57	18	12	0.88	1456.58	1452	8	4.97E-03	82.1	2.10E+00	T
0	752.72	13	14	1.45	1506.90	1501	11	3.60E-03	****	2.04E+00	T
0	767.54	14	24	5.56	1536.55	1526	19	3.70E-03	****	2.01E+00	T
0	787.13	27	8	1.42	1575.74	1568	15	7.36E-03	59.5	1.97E+00	
0	792.57	15	4	1.54	1586.62	1583	7	4.03E-03	67.7	1.96E+00	T
0	856.22	9	2	3.26	1713.97	1708	9	2.37E-03	93.8	1.83E+00	T
0	925.33	9	0	1.37	1852.22	1847	9	2.50E-03	66.7	1.70E+00	T
0	957.11	8	2	1.53	1915.81	1911	8	2.28E-03	91.3	1.65E+00	
0	1117.91	8	9	0.82	2237.50	2231	9	2.22E-03	****	1.43E+00	
0	1122.40	27	5	0.89	2246.49	2241	14	7.47E-03	55.9	1.42E+00	T
0	1150.33	10	5	1.64	2302.38	2296	10	2.81E-03	****	1.39E+00	
0	1189.87	9	4	1.05	2381.47	2376	9	2.64E-03	****	1.35E+00	T

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677019.CNF;1      *
* Acquisition date   : 28-JUN-2016 14:38:20 Sensitivity      : 3.000                *
* Detector ID        : GAM32 Energy tolerance: 1.500        *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000  *
* Elapsed real time  : 0 01:00:00.55 Half life ratio  : ***** *
* Sample date        : 11-MAY-2016 00:00:00 Nuclide Library : SOLID          *
* Sample ID          : G398677019 Analyst initials: MXR1        *
* Batch Number       : 1572231 Sample Quantity  : 1.4648E+02 GRAM *
* Wet wt corr        : 1.00000 Wet Weight       : 0.00000      *
*                                     Dry Weight    : 0.00000      *
*****
*
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 6-AUG-2015 09:24:00 Eff. Geometry    : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	2.265E-01
CD-109	8.762E-01
SN-126	8.205E-02
CS-134	2.633E-02
BA-137M	2.967E-02
CS-137	3.134E-02
TL-208	3.322E-02
BI-211	2.049E-01
PB-212	6.021E-02
BI-214	6.592E-02
PB-214	1.468E-01
RN-222	6.592E-02
RA-224	6.227E-01
RA-226	6.592E-02
AC-228	8.371E-02
RA-228	8.371E-02
TH-228	6.021E-02
TH-230	6.592E-02
TH-232	8.371E-02
TH-234	1.664E+00
U-234	6.592E-02
U-235	1.970E-01
U-238	1.664E+00
AM-243	5.710E-02
ANH-511	2.678E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.197E-01	NOT IDENT.
NA-22	3.405E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.259E-02	NOT IDENT.
SC-46	3.739E-02	NOT IDENT.
V-48	1.777E-01	NOT IDENT.

CR-51	8.893E-01	NOT IDENT.
MN-54	3.158E-02	NOT IDENT.
CO-56	4.364E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	2.858E-02	NOT IDENT.
CO-58	3.015E-02	NOT IDENT.
FE-59	1.116E-01	NOT IDENT.
CO-60	2.777E-02	NOT IDENT.
ZN-65	8.398E-02	NOT IDENT.
GE-68	9.339E-01	NOT IDENT.
AS-73	2.082E+00	NOT IDENT.
AS-74	3.572E-01	NOT IDENT.
SE-75	5.735E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.742E-01	NOT IDENT.
RB-83	8.410E-02	NOT IDENT.
KR-85	8.935E+00	NOT IDENT.
SR-85	6.731E-02	NOT IDENT.
RB-86	1.784E+00	NOT IDENT.
Y-88	2.510E-02	NOT IDENT.
Y-91	2.387E+01	NOT IDENT.
NB-94	2.634E-02	NOT IDENT.
NB-95	4.619E-02	NOT IDENT.
NB-95M	1.794E-01	NOT IDENT.
ZR-95	7.252E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.274E-02	FAIL ABUN
RH-102	5.179E-02	FAIL ABUN
RU-103	6.588E-02	FAIL ABUN
RH-106	2.913E-01	NOT IDENT.
RU-106	2.913E-01	NOT IDENT.
AG-108M	3.563E-02	NOT IDENT.
AG-110M	3.825E-02	NOT IDENT.
SN-113	5.644E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.380E-01	NOT IDENT.
TE-123M	3.831E-02	NOT IDENT.
SB-124	7.190E-02	NOT IDENT.
SB-125	9.872E-02	FAIL ABUN
TE-125M	1.441E+01	NOT IDENT.
I-126	1.192E+00	FAIL ABUN
SB-126	8.594E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	1.993E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.247E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-135	1.686E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.649E-01	NOT IDENT.
CE-139	3.712E-02	NOT IDENT.
BA-140	1.463E+00	NOT IDENT.
LA-140	4.138E-01	NOT IDENT.
CE-141	1.250E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.096E-01	NOT IDENT.
PM-144	3.237E-02	NOT IDENT.
PR-144	2.468E+00	NOT IDENT.
PM-146	4.764E-02	NOT IDENT.
ND-147	4.523E+00	NOT IDENT.
PM-147	7.624E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.531E-02	FAIL ABUN
EU-152	9.721E-02	NOT IDENT.
GD-153	9.341E-02	NOT IDENT.
EU-154	9.529E-02	NOT IDENT.
EU-155	1.063E-01	NOT IDENT.
TB-160	1.248E-01	NOT IDENT.
HO-166M	5.107E-02	FAIL ABUN
TM-171	3.555E+01	NOT IDENT.
HF-172	1.912E-01	FAIL ABUN
LU-172	4.982E-02	FAIL ABUN
LU-176	2.613E-02	FAIL ABUN
HF-181	9.129E-02	NOT IDENT.

TA-182	1.741E-01	FAIL ABUN
RE-183	3.933E-01	NOT IDENT.
RE-184	1.879E-01	FAIL ABUN
W-188	1.035E+01	FAIL ABUN
IR-192	5.109E-02	FAIL ABUN
HG-203	6.916E-02	NOT IDENT.
BI-207	4.044E-02	FAIL ABUN
PB-210	8.713E+00	NOT IDENT.
PB-211	7.924E-01	NOT IDENT.
BI-212	5.067E-01	FAIL ABUN
RN-219	4.382E-01	NOT IDENT.
RA-223	6.833E-01	FAIL ABUN
AC-227	2.668E-01	NOT IDENT.
TH-227	2.668E-01	NOT IDENT.
TH-229	5.181E-01	FAIL ABUN
PA-231	5.055E-01	NOT IDENT.
TH-231	6.833E-01	FAIL ABUN
PA-233	6.077E-02	NOT IDENT.
PA-234	2.168E-01	FAIL ABUN
PA-234M	4.243E+00	FAIL ABUN
NP-237	6.077E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	2.796E-01	NOT IDENT.
PU-239	3.514E+02	FAIL ABUN
AM-241	2.069E-01	NOT IDENT.
CM-243	1.064E-01	NOT IDENT.
BK-247	8.416E-02	NOT IDENT.
CM-247	4.095E-02	NOT IDENT.
CF-249	4.762E-02	NOT IDENT.
CF-251	1.194E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677019.CNF;1
Acquisition date : 28-JUN-2016 14:38:20 Sensitivity : 3.000
Detector ID : GAM32 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.55 Half life ratio : *****
Sample date : 11-MAY-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G398677019 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.4648E+02 GRAM
Quantity Err(%) : 1.3654E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 6-AUG-2015 09:24:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.464E+00	1.101E+00	1.101E+00
CD-109	2.536E+00	2.726E+00	2.726E+00
SN-126	2.357E-01	2.531E-01	2.531E-01
CS-134	2.877E-02	2.283E-02	2.283E-02
BA-137M	1.866E+00	2.261E-01	2.261E-01
CS-137	1.971E+00	2.388E-01	2.388E-01
TL-208	2.557E-01	7.702E-02	7.702E-02
BI-211	1.358E-01	9.590E-01	9.590E-01
PB-212	7.374E-01	1.343E-01	1.343E-01
BI-214	4.972E-01	1.539E-01	1.539E-01
PB-214	7.759E-01	2.100E-01	2.100E-01
RN-222	4.972E-01	1.539E-01	1.539E-01
RA-224	1.134E+00	1.835E+00	1.835E+00
RA-226	4.972E-01	1.539E-01	1.539E-01
AC-228	1.014E+00	2.697E-01	2.697E-01
RA-228	1.014E+00	2.697E-01	2.697E-01
TH-228	7.374E-01	1.343E-01	1.343E-01
TH-230	4.972E-01	1.539E-01	1.539E-01
TH-232	1.014E+00	2.697E-01	2.697E-01
TH-234	1.199E+00	3.370E+00	3.370E+00
U-234	4.972E-01	1.539E-01	1.539E-01
U-235	-3.903E-02	2.211E-01	2.211E-01
U-238	1.199E+00	3.370E+00	3.370E+00
AM-243	1.567E-01	1.136E-01	1.136E-01
ANH-511	5.459E-02	8.293E-02	8.293E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.841E-01	6.844E-01	6.895E-01	NOT IDENT.
NA-22	-1.018E-02	4.167E-02	4.193E-02	NOT IDENT.
NA-24	4.141E+21	8.741E+21	0.000E+00	SHORT HLIF
AL-26	1.211E-02	2.196E-02	2.263E-02	NOT IDENT.
SC-46	3.030E-03	4.367E-02	4.370E-02	NOT IDENT.

V-48	-1.226E-01	2.423E-01	2.486E-01	NOT IDENT.
CR-51	-1.822E-01	1.048E+00	1.051E+00	NOT IDENT.
MN-54	7.685E-03	3.594E-02	3.610E-02	NOT IDENT.
CO-56	2.106E-02	4.792E-02	4.885E-02	NOT IDENT.
MN-56	1.000E+41	2.275E+41	0.000E+00	SHORT HLIF
CO-57	8.355E-03	3.080E-02	3.103E-02	NOT IDENT.
CO-58	-3.788E-02	4.384E-02	4.705E-02	NOT IDENT.
FE-59	-1.561E-02	1.314E-01	1.316E-01	NOT IDENT.
CO-60	1.184E-02	2.950E-02	2.998E-02	NOT IDENT.
ZN-65	5.365E-02	1.004E-01	1.033E-01	NOT IDENT.
GE-68	-5.005E-01	1.239E+00	1.259E+00	NOT IDENT.
AS-73	1.498E+00	2.265E+00	2.364E+00	NOT IDENT.
AS-74	4.518E-01	3.690E-01	4.215E-01	NOT IDENT.
SE-75	3.006E-02	6.804E-02	6.937E-02	NOT IDENT.
BR-77	2.010E+06	2.845E+06	2.985E+06	SHORT HLIF
SR-82	-1.318E-01	8.336E-01	8.357E-01	NOT IDENT.
RB-83	1.503E-02	9.375E-02	9.399E-02	NOT IDENT.
KR-85	1.726E+01	9.666E+00	1.241E+01	NOT IDENT.
SR-85	1.299E-01	7.283E-02	9.345E-02	NOT IDENT.
RB-86	-1.784E+00	2.567E+00	2.690E+00	NOT IDENT.
Y-88	-1.543E-02	3.716E-02	3.781E-02	NOT IDENT.
Y-91	1.974E+00	2.738E+01	2.740E+01	NOT IDENT.
NB-94	2.248E-03	3.026E-02	3.028E-02	NOT IDENT.
NB-95	-3.931E-03	5.463E-02	5.465E-02	NOT IDENT.
NB-95M	-2.110E-02	2.347E-01	2.349E-01	NOT IDENT.
ZR-95	-5.236E-02	1.107E-01	1.132E-01	NOT IDENT.
NB-97	-1.000E+41	6.478E+41	0.000E+00	SHORT HLIF
ZR-97	1.216E+19	4.575E+20	0.000E+00	SHORT HLIF
MO-99	-1.789E+04	5.242E+04	5.304E+04	SHORT HLIF
TC-99M	1.000E+41	6.995E+41	0.000E+00	SHORT HLIF
RH-101	4.538E-02	4.670E-02	5.098E-02	FAIL ABUN
RH-102	4.131E-02	5.449E-02	5.759E-02	FAIL ABUN
RU-103	-3.622E-02	7.857E-02	8.025E-02	FAIL ABUN
RH-106	3.395E-02	3.307E-01	3.310E-01	NOT IDENT.
RU-106	3.395E-02	3.307E-01	3.310E-01	NOT IDENT.
AG-108M	2.513E-02	3.986E-02	4.144E-02	NOT IDENT.
AG-110M	-1.383E-02	4.802E-02	4.842E-02	NOT IDENT.
SN-113	2.007E-02	7.323E-02	7.378E-02	NOT IDENT.
CD-115	1.510E+05	4.034E+05	4.091E+05	SHORT HLIF
SN-117M	4.464E-01	3.501E-01	4.038E-01	NOT IDENT.
TE-123M	4.981E-02	3.969E-02	4.560E-02	NOT IDENT.
SB-124	-4.605E-02	1.041E-01	1.062E-01	NOT IDENT.
SB-125	-1.687E-02	1.186E-01	1.189E-01	FAIL ABUN
TE-125M	1.082E+00	1.562E+01	1.563E+01	NOT IDENT.
I-126	9.982E-01	1.398E+00	1.469E+00	FAIL ABUN
SB-126	6.935E-01	1.141E+00	1.183E+00	FAIL ABUN
SB-127	-7.238E+02	6.734E+02	7.483E+02	SHORT HLIF
I-131	-1.116E+00	2.451E+00	2.502E+00	NOT IDENT.
I-132	1.000E+41	3.486E+41	0.000E+00	SHORT HLIF
TE-132	7.767E+02	1.161E+03	1.213E+03	SHORT HLIF
BA-133	7.754E-04	5.671E-02	5.671E-02	NOT IDENT.
I-133	1.406E+15	2.715E+15	2.788E+15	SHORT HLIF
CS-135	-1.209E-03	1.934E-01	1.934E-01	NOT IDENT.
I-135	1.000E+41	4.951E+41	0.000E+00	SHORT HLIF
CS-136	-4.556E-01	5.521E-01	5.891E-01	NOT IDENT.
CE-139	6.774E-03	4.093E-02	4.104E-02	NOT IDENT.
BA-140	-4.894E-01	1.722E+00	1.737E+00	NOT IDENT.
LA-140	-1.521E-01	5.346E-01	5.390E-01	NOT IDENT.
CE-141	2.066E-03	1.386E-01	1.386E-01	NOT IDENT.
CE-143	4.285E+09	3.705E+09	4.178E+09	SHORT HLIF
CE-144	-2.082E-02	2.501E-01	2.503E-01	NOT IDENT.
PM-144	3.280E-02	3.315E-02	3.630E-02	NOT IDENT.
PR-144	2.512E+00	2.527E+00	2.769E+00	NOT IDENT.
PM-146	-1.566E-02	6.052E-02	6.093E-02	NOT IDENT.
ND-147	7.900E-01	5.055E+00	5.068E+00	NOT IDENT.
PM-147	-2.127E+02	8.480E+02	8.534E+02	NOT IDENT.
PM-149	-2.150E+06	3.940E+06	4.057E+06	SHORT HLIF
EU-150	-1.119E-02	3.524E-02	3.560E-02	FAIL ABUN
EU-152	3.256E-02	1.188E-01	1.197E-01	NOT IDENT.
GD-153	-3.752E-02	1.178E-01	1.190E-01	NOT IDENT.
EU-154	-4.942E-02	1.204E-01	1.225E-01	NOT IDENT.
EU-155	4.549E-03	1.153E-01	1.153E-01	NOT IDENT.
TB-160	-5.544E-02	1.589E-01	1.608E-01	NOT IDENT.
HO-166M	7.840E-02	6.248E-02	7.179E-02	FAIL ABUN
TM-171	2.545E+01	3.836E+01	4.004E+01	NOT IDENT.
HF-172	4.666E-03	2.376E-01	2.376E-01	FAIL ABUN
LU-172	6.352E-03	5.624E-02	5.632E-02	FAIL ABUN
LU-176	-1.560E-02	3.168E-02	3.245E-02	FAIL ABUN

HF-181	-3.323E-02	1.059E-01	1.069E-01	NOT IDENT.
TA-182	-9.792E-03	2.041E-01	2.042E-01	FAIL ABUN
RE-183	7.045E-02	4.629E-01	4.640E-01	NOT IDENT.
RE-184	1.124E-02	2.268E-01	2.268E-01	FAIL ABUN
W-188	7.684E+00	1.273E+01	1.319E+01	FAIL ABUN
IR-192	2.549E-02	5.699E-02	5.813E-02	FAIL ABUN
HG-203	-5.704E-03	7.993E-02	7.997E-02	NOT IDENT.
BI-207	2.866E-02	4.291E-02	4.481E-02	FAIL ABUN
PB-210	-1.091E+00	9.759E+00	9.772E+00	NOT IDENT.
PB-211	3.166E-01	9.041E-01	9.153E-01	NOT IDENT.
BI-212	6.743E-01	5.476E-01	6.263E-01	FAIL ABUN
RN-219	1.754E-01	4.996E-01	5.058E-01	NOT IDENT.
RA-223	-4.999E-02	7.975E-01	7.978E-01	FAIL ABUN
AC-227	3.082E-01	3.162E-01	3.453E-01	NOT IDENT.
TH-227	3.082E-01	3.162E-01	3.453E-01	NOT IDENT.
TH-229	1.094E-01	5.743E-01	5.764E-01	FAIL ABUN
PA-231	7.090E-02	5.782E-01	5.791E-01	NOT IDENT.
TH-231	-4.999E-02	7.975E-01	7.978E-01	FAIL ABUN
PA-233	-5.676E-02	7.598E-02	8.017E-02	NOT IDENT.
PA-234	-2.447E-02	2.644E-01	2.647E-01	FAIL ABUN
PA-234M	2.824E+00	4.535E+00	4.711E+00	FAIL ABUN
NP-237	-5.676E-02	7.598E-02	8.017E-02	FAIL ABUN
NP-238	-3.413E+05	8.674E+05	8.809E+05	SHORT HLIF
NP-239	3.222E-01	2.879E-01	3.225E-01	NOT IDENT.
PU-239	4.755E+02	4.824E+02	5.279E+02	FAIL ABUN
AM-241	-1.513E-01	2.809E-01	2.890E-01	NOT IDENT.
CM-243	-8.944E-03	1.161E-01	1.162E-01	NOT IDENT.
BK-247	5.273E-02	9.571E-02	9.861E-02	NOT IDENT.
CM-247	8.709E-03	4.744E-02	4.760E-02	NOT IDENT.
CF-249	5.687E-02	5.711E-02	6.260E-02	NOT IDENT.
CF-251	-9.358E-02	1.406E-01	1.468E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	86.5567	87.09	140.6256	136.47	102.0844
45.60	93.4981	87.57	140.7117	140.51	0.0000
46.54	88.1527	88.03	140.7935	143.76	112.1375
49.72	0.0000	88.34	140.8490	144.24	109.3822
51.35	85.5850	88.47	140.8722	145.44	103.8889
51.87	76.7627	89.96	42.3408	152.43	89.4829
52.39	80.1724	1093.63	42.3766	153.25	91.4341
52.97	75.7941	91.11	42.4014	323.87	101.8902
53.44	80.3172	92.59	42.4788	156.02	114.3385
54.07	91.5706	93.35	106.2959	158.56	94.7067
57.36	0.0000	94.56	102.1944	159.00	92.8477
57.53	87.6078	94.65	102.2058	162.33	132.0740
57.98	80.9279	94.67	102.2080	162.66	126.4095
59.27	97.9920	94.87	102.2331	163.33	109.3646
59.32	98.0000	97.43	119.6385	165.86	109.6015
59.54	104.7955	98.43	109.7988	176.31	111.5236
60.96	79.6216	98.44	109.8002	176.60	103.8571
61.17	79.6480	99.53	100.9664	177.52	102.0098
62.93	103.0915	100.11	106.2654	181.07	0.0000
63.29	103.1490	102.03	110.0827	181.52	92.6858
63.58	117.3703	103.18	108.4363	184.41	85.1587
64.28	102.1709	103.37	108.4603	143.76	87.1848
66.73	95.7138	105.21	105.9936	193.51	88.6915
67.24	95.7869	105.31	106.0053	197.03	104.5673
125.81	92.4265	106.12	107.9008	198.01	79.2177
67.75	92.4359	106.47	105.2448	201.83	109.8518
69.67	111.5809	109.28	105.5760	203.43	112.2280
70.83	120.3659	111.00	96.7357	205.31	105.4170
72.81	108.6369	111.76	0.0000	210.85	84.9148
72.87	108.6465	114.06	116.1069	215.65	103.0455
74.66	118.7181	116.30	0.0000	222.11	92.5707
74.82	118.7443	116.74	87.3307	227.09	92.8936
74.97	118.7695	119.76	121.3755	227.38	73.9306
77.11	119.1215	121.12	114.2364	228.16	0.0000
78.74	119.3866	121.22	114.2483	228.18	78.9693
79.69	121.8613	121.78	105.1698	116.74	78.9693
80.12	134.1249	122.06	106.1149	235.69	99.6730
80.19	134.1373	122.92	91.0364	235.96	99.6912
80.57	134.7864	123.07	97.3298	238.63	95.0388
81.00	136.0263	265.00	105.0706	238.98	0.0000
81.07	136.0394	125.81	102.8501	240.99	88.7352
81.75	118.7053	127.23	108.8831	242.00	88.7949
83.79	133.0273	127.91	115.9522	244.70	92.1894
84.00	131.3129	129.30	98.7882	252.40	0.0000
85.43	138.9233	131.20	103.4072	252.80	66.6635
86.55	140.5286	133.02	103.5927	254.15	0.0000
86.79	140.5713	133.52	106.1108	256.23	55.4044
86.94	140.5988	136.00	98.3277	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	66.8965	355.39	0.0000	584.27	33.2961
264.80	63.1965	356.01	55.2078	595.83	21.2288
265.00	63.2040	364.49	56.3132	427.87	33.4927
268.22	86.2007	366.42	0.0000	602.52	0.0000
269.46	67.7815	372.51	46.7544	604.72	38.3340
270.03	62.6689	375.05	56.6116	607.14	38.3662
271.23	77.1091	377.52	62.1311	609.32	35.1959
273.65	101.9351	356.01	60.1378	610.33	33.6080
276.40	70.1343	388.16	47.3344	614.28	36.8603
277.37	75.3358	388.63	45.5914	618.01	28.8853
277.60	74.3137	391.69	47.4155	620.36	25.0542
278.00	78.4620	264.66	50.7049	621.93	25.0682
279.20	85.7508	401.81	50.7329	630.19	0.0000
279.54	83.7018	402.40	56.2630	631.29	19.3457
279.70	90.9434	404.85	54.1186	633.25	26.1338
280.46	87.8832	410.95	59.8115	634.78	23.2424
283.69	74.5873	413.71	65.4333	635.95	26.1582
284.31	64.2516	414.70	48.8206	636.99	24.2291
285.41	67.4052	423.72	70.1915	645.85	25.2745
285.90	0.0000	427.09	54.6771	657.76	30.9067
287.50	82.0257	427.87	54.6966	657.90	0.0000
290.67	54.9245	433.94	51.4889	661.66	24.4318
293.27	0.0000	439.40	56.1028	664.57	0.0000
351.93	68.8400	453.88	60.6548	666.33	17.9444
295.96	75.1300	463.37	66.2169	666.50	17.9453
879.38	65.2117	468.07	68.1674	667.71	0.0000
299.98	76.9792	473.00	0.0000	677.62	32.7474
300.09	82.0044	475.06	65.6341	685.70	0.0000
300.13	82.0068	476.78	59.2958	695.00	23.4641
301.36	71.1782	477.60	59.3165	696.49	14.8268
302.85	62.8583	482.18	66.7444	696.51	14.8268
256.23	70.2582	487.02	46.7236	697.00	17.7948
304.85	68.1738	492.35	0.0000	697.30	19.7739
306.78	70.3492	497.08	41.3976	697.49	19.7754
308.46	57.8047	505.52	47.6933	702.65	20.7980
311.90	69.4996	507.63	0.0000	706.68	28.0968
316.51	58.0666	511.00	36.0798	711.68	11.5878
319.41	70.8491	514.00	33.9614	720.70	17.4308
320.08	67.7021	514.00	33.9623	721.93	0.0000
321.04	67.7373	520.40	29.7148	722.78	4.9835
323.87	69.9629	520.69	0.0000	722.91	4.9836
325.23	72.1369	522.65	0.0000	723.31	4.9843
328.76	48.8925	527.90	0.0000	724.19	4.9857
333.37	57.9644	528.26	28.8756	727.33	17.9662
333.97	59.6888	529.59	28.8899	733.00	15.7120
334.37	57.9959	529.87	0.0000	735.93	13.0102
338.28	57.6898	531.02	33.5689	333.97	16.0199
338.32	57.6906	537.26	34.5845	739.50	0.0000
311.90	58.1852	546.56	0.0000	747.24	21.7587
340.48	58.1852	552.55	29.1458	748.06	16.7415
340.55	61.6096	563.25	23.5999	752.31	17.0984
344.28	50.0138	569.33	30.2758	753.82	13.4167
345.93	54.9195	946.00	25.2318	756.73	21.8211
351.06	58.0787	569.70	25.2331	756.80	21.8217
351.93	58.1042	583.19	33.2833	884.68	20.1865

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	21.2076	1274.44	22.5740	1620.50	2.0339
766.42	21.2117	1001.03	11.8384	1621.92	3.0515
766.84	21.2143	1002.74	15.0732	1678.03	0.0000
772.60	0.0000	1004.73	22.6211	1690.97	5.1451
776.52	21.3879	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	6.2480
778.90	17.7418	1028.54	0.0000	1063.66	10.7206
783.70	0.0000	1037.84	17.3734	1771.35	15.6372
785.37	16.9295	1038.76	0.0000	1791.20	0.0000
792.07	25.4437	631.29	16.3220	1808.65	1.0486
794.95	18.6744	1048.07	16.3279	1810.72	0.0000
795.86	11.8868	1049.04	15.2428	1836.06	4.2124
810.06	15.3461	1050.41	8.7129		
810.29	15.3472	1063.66	7.6477		
344.28	16.3711	1077.00	15.3433		
810.76	17.3957	1077.34	13.1520		
815.77	10.2476	1085.87	16.4729		
1048.07	16.4090	1093.63	11.9183		
832.01	24.7072	1099.45	13.7701		
834.85	16.4848	1112.07	11.0479		
835.71	16.4887	1112.84	15.7854		
836.80	0.0000	1115.54	12.6362		
846.75	0.0000	1120.29	22.1367		
846.77	13.4386	1120.55	22.1387		
856.80	22.4601	1221.41	22.1426		
860.56	6.9180	1129.67	9.5073		
871.09	16.6508	1131.51	0.0000		
873.19	14.5780	1147.95	0.0000		
875.33	0.0000	1173.23	15.8656		
879.38	15.6453	1177.95	11.2109		
880.51	13.5634	1189.05	10.3013		
883.24	16.7059	1204.77	14.0948		
884.68	15.6676	1221.41	15.0879		
889.28	12.5496	1231.02	15.1185		
894.76	16.7574	1235.36	20.8067		
898.04	12.5792	1238.28	13.2486		
900.72	14.6860	1260.41	0.0000		
903.28	15.1624	1271.87	10.4821		
911.20	9.4674	1274.44	16.2087		
912.08	8.7679	1274.54	14.3018		
923.98	0.0000	1291.59	2.8704		
926.50	3.5204	1298.22	0.0000		
929.11	14.0915	1312.11	9.6073		
937.49	18.0056	1332.49	4.8232		
944.13	12.7315	1362.66	0.0000		
946.00	13.7992	1365.19	12.6213		
949.00	8.4982	1368.63	0.0000		
667.71	0.0000	1384.29	14.6167		
962.31	15.9884	1408.01	6.8522		
964.08	8.8863	1457.56	0.0000		
966.17	12.4474	1460.82	5.0841		
911.20	22.4212	1489.16	4.9687		
968.97	22.4212	1505.03	8.9692		
983.53	12.8590	1584.12	9.0956		
984.45	0.0000	1596.21	8.1019		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:46:46.03

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677020.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33.CNF;221
Background date : 27-JUN-2016 10:34:06
Sample date     : 11-MAY-2016 11:20:00 Acquisition date : 28-JUN-2016 14:38:38
Sample ID      : G398677020 Sample quantity : 1.53920E+02 GRAM
Detector name   : GAM33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.96 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572231 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	77.21	64	147	0.99	154.49	151	8	1.78E-02	36.5	
2	0	87.16	36	100	1.00	174.37	171	6	1.01E-02	46.6	
3	0	104.60	30	95	3.47	209.20	203	12	8.35E-03	66.9	
4	0	143.39*	27	61	1.36	286.68	283	7	7.52E-03	53.8	
5	0	185.60*	17	94	1.02	371.00	367	10	4.86E-03	116.5	
6	5	209.26	46	61	1.91	418.27	414	13	1.28E-02	33.6	1.95E+00
7	5	211.53	24	54	1.91	422.80	414	13	6.72E-03	64.3	
8	5	238.56*	248	46	1.08	476.80	470	21	6.88E-02	7.9	9.28E-01
9	5	241.42	60	60	1.97	482.51	470	21	1.66E-02	39.6	
10	0	277.64	19	45	1.24	554.88	551	8	5.33E-03	64.2	
11	0	295.53	54	78	1.43	590.63	583	13	1.50E-02	36.4	
12	0	323.88	14	37	0.92	647.27	642	8	4.01E-03	78.0	
13	0	328.11	37	36	1.28	655.71	651	11	1.03E-02	35.4	
14	0	333.54	32	15	0.63	666.56	662	8	8.82E-03	28.0	
15	0	338.53	74	43	1.53	676.53	671	14	2.06E-02	21.9	
16	0	352.05*	118	45	1.22	703.55	699	10	3.29E-02	14.3	
17	0	403.83	18	29	1.19	807.03	802	9	4.91E-03	60.0	
18	0	420.90	8	23	0.55	841.13	834	9	2.08E-03	119.7	
19	0	427.35	21	21	1.90	854.03	848	13	5.92E-03	50.5	
20	0	463.36	23	41	1.32	925.99	919	11	6.51E-03	56.9	
21	0	582.97*	81	20	1.41	1165.06	1157	16	2.26E-02	17.0	
22	0	609.26*	93	28	1.96	1217.60	1210	14	2.58E-02	16.3	
23	0	647.66	16	17	1.27	1294.36	1289	12	4.44E-03	58.4	
24	0	661.78	253	19	1.22	1322.60	1316	14	7.03E-02	7.3	
25	0	756.38	34	24	3.61	1511.72	1502	24	9.32E-03	42.4	
26	0	774.06	12	7	2.64	1547.09	1543	11	3.38E-03	48.0	
27	0	783.66	4	8	0.75	1566.28	1562	6	1.20E-03	111.3	
28	0	806.07	10	3	1.53	1611.09	1608	7	2.86E-03	42.4	
29	0	843.84	10	11	0.70	1686.62	1680	12	2.64E-03	78.8	
30	0	864.38*	3	13	1.42	1727.70	1723	10	9.45E-04	236.0	
31	0	884.16	16	5	3.90	1767.24	1762	10	4.43E-03	36.3	
32	0	911.19*	66	4	1.56	1821.31	1815	14	1.83E-02	14.5	
33	0	935.79	18	0	1.62	1870.50	1865	10	5.00E-03	23.6	
34	0	948.74	25	10	7.22	1896.41	1886	19	6.81E-03	36.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	969.73*	23	21	0.72	1938.40	1930	12	6.51E-03	44.8	
36	0	1121.23*	22	10	0.80	2241.46	2234	14	6.01E-03	39.1	
37	0	1127.56	8	0	1.50	2254.13	2251	7	2.22E-03	35.4	
38	0	1136.07*	7	7	1.47	2271.15	2265	10	1.88E-03	87.7	
39	0	1154.64	12	8	1.89	2308.30	2298	15	3.19E-03	59.7	
40	0	1242.52	11	4	1.33	2484.14	2480	8	3.06E-03	43.6	
41	0	1461.09*	146	3	1.69	2921.58	2916	12	4.06E-02	8.8	
42	0	1764.13	19	2	0.86	3528.33	3522	11	5.17E-03	28.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:46:47

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677020.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:20:00 Acquisition date : 28-JUN-2016 14:38:38
Sample ID        : G398677020 Sample quantity  : 153.92 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA33 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.96 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.133E+00	5.703E+00	5.703E+00	17.59	OK
CD-109	88.03	3.70*	4.897E+00	8.870E-01	9.536E-01	135.82	OK
SN-126	64.28	9.60	2.578E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.897E+00	3.688E-01	3.688E-01	135.82	OK
	87.57	37.00*	4.897E+00	8.870E-02	8.870E-02	135.82	OK
BA-137M	661.66	89.90*	2.114E+00	6.852E-01	6.873E-01	14.69	OK
CS-137	661.66	85.10*	2.114E+00	7.239E-01	7.261E-01	14.69	OK
EU-155	86.55	30.70	4.897E+00	1.069E-01	1.090E-01	135.82	OK
	105.31	21.10*	5.819E+00	1.507E-01	1.536E-01	133.75	OK
TL-208	277.37	6.60	4.255E+00	3.845E-01	3.845E-01	128.40	OK
	583.19	85.00*	2.335E+00	2.137E-01	2.137E-01	33.94	OK
	860.56	12.50	1.727E+00	----- Line	Not Found	-----	Absent
BI-211	72.87	1.23	3.591E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.511E+00	3.207E-01	3.207E-01	283.13	OK
PB-212	74.82	10.28	3.800E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	4.042E+00	5.856E-01	5.856E-01	73.04	OK
	238.63	43.60*	4.777E+00	6.781E-01	6.781E-01	15.74	OK
	300.09	3.30	3.999E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68	OK
	1120.29	14.92	1.407E+00	5.015E-01	5.015E-01	78.18	OK
	1764.49	15.30	9.594E-01	5.852E-01	5.852E-01	57.41	OK
PB-214	74.82	5.80	3.800E+00	----- Line	Not Found	-----	Absent
	77.11	9.70	4.042E+00	1.032E+00	1.032E+00	73.04	OK
	87.09	3.41	4.892E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.727E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.049E+00	4.037E-01	4.038E-01	72.88	OK
	351.93	35.60*	3.512E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68	OK
	1120.29	14.92	1.407E+00	5.015E-01	5.015E-01	78.18	OK
	1764.49	15.30	9.594E-01	5.852E-01	5.852E-01	57.41	OK
RA-224	240.99	4.10*	4.735E+00	1.042E+00	1.042E+00	142.55	OK
RA-226	609.32	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68	OK
	1120.29	14.92	1.407E+00	5.015E-01	5.015E-01	78.18	OK
	1764.49	15.30	9.594E-01	5.852E-01	5.852E-01	57.41	OK
AC-228	105.21	1.10	5.819E+00	2.891E+00	2.891E+00	133.75	OK
	338.32	11.27	3.626E+00	9.993E-01	9.993E-01	43.88	OK
	794.95	4.25	1.835E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	7.697E-01	7.697E-01	28.96	OK
	968.97	15.80	1.575E+00	4.653E-01	4.653E-01	89.65	OK
RA-228	105.21	1.10	5.819E+00	2.891E+00	2.891E+00	133.75	OK
	338.32	11.27	3.626E+00	9.993E-01	9.993E-01	43.88	OK
	794.95	4.25	1.835E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	7.697E-01	7.697E-01	28.96	OK
	968.97	15.80	1.575E+00	4.653E-01	4.653E-01	89.65	OK
TH-228	74.82	10.28	3.800E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	4.042E+00	5.856E-01	5.856E-01	73.04	OK
	238.63	43.60*	4.777E+00	6.781E-01	6.781E-01	15.74	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	300.09	3.30	3.999E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68	OK
	1120.29	14.92	1.407E+00	5.015E-01	5.015E-01	78.18	OK
TH-232	1764.49	15.30	9.594E-01	5.852E-01	5.852E-01	57.41	OK
	105.21	1.10	5.819E+00	2.891E+00	2.891E+00	133.75	OK
	338.32	11.27	3.626E+00	9.993E-01	9.993E-01	43.88	OK
U-234	835.71	1.61	1.766E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.653E+00	7.697E-01	7.697E-01	28.96	OK
	968.97	15.80	1.575E+00	4.653E-01	4.653E-01	89.65	OK
U-235	609.32	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68	OK
	1120.29	14.92	1.407E+00	5.015E-01	5.015E-01	78.18	OK
	1764.49	15.30	9.594E-01	5.852E-01	5.852E-01	57.41	OK
CM-247	89.96	3.47	5.092E+00	----- Line	Not Found	-----	Absent
	93.35	5.60	5.302E+00	----- Line	Not Found	-----	Absent
	143.76	10.96*	6.184E+00	2.389E-01	2.389E-01	107.66	OK
	163.33	5.08	5.963E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.620E+00	3.179E-02	3.179E-02	232.99	OK
	205.31	5.01	5.295E+00	----- Line	Not Found	-----	Absent
	278.00	3.40	4.255E+00	7.463E-01	7.463E-01	128.40	OK
	287.50	2.00	4.139E+00	----- Line	Not Found	-----	Absent
	402.40	72.00*	3.137E+00	4.243E-02	4.243E-02	120.07	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677020.CNF;1  *
* Acquisition date   : 28-JUN-2016 14:38:38 Sensitivity      : 3.000          *
* Detector ID        : GAM33 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 01:00:00.96 Half life ratio : *****          *
* Sample date        : 11-MAY-2016 11:20:00 Analyst initials: MXR1          *
* Sample ID          : G398677020 Sample Quantity : 1.5392E+02 GRAM          *
* Batch Number       : 1572231 Wet Weight : 0.00000          *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8          *
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.703E+00	9.830E-01	4.827E-01
CD-109	9.536E-01	1.269E+00	1.608E+00
SN-126	8.870E-02	1.181E-01	1.609E-01
BA-137M	6.873E-01	9.897E-02	6.277E-02
CS-137	7.261E-01	1.046E-01	6.631E-02
EU-155	1.536E-01	2.014E-01	1.738E-01
TL-208	2.137E-01	7.109E-02	5.989E-02
BI-211	3.207E-01	8.898E-01	4.248E-01
PB-212	6.781E-01	1.046E-01	9.872E-02
BI-214	4.698E-01	1.504E-01	1.361E-01
PB-214	5.202E-01	1.454E-01	2.505E-01
RN-222	4.698E-01	1.504E-01	1.361E-01
RA-224	1.042E+00	1.455E+00	1.058E+00
RA-226	4.698E-01	1.504E-01	1.361E-01
AC-228	7.697E-01	2.184E-01	1.860E-01
RA-228	7.697E-01	2.184E-01	1.860E-01
TH-228	6.781E-01	1.046E-01	9.872E-02
TH-230	4.698E-01	1.504E-01	1.361E-01
TH-232	7.697E-01	2.184E-01	1.860E-01
U-234	4.698E-01	1.504E-01	1.361E-01
U-235	2.389E-01	2.521E-01	3.237E-01
CM-247	4.243E-02	4.993E-02	6.114E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.184E-01	4.671E-01	8.622E-01	NOT IDENT.
NA-22	-1.791E-02	2.661E-02	4.774E-02	NOT IDENT.
NA-24	0.000E+00	4.962E+21	0.000E+00	SHORT HLIF
AL-26	6.175E-03	1.856E-02	5.039E-02	NOT IDENT.
SC-46	8.791E-03	3.322E-02	6.639E-02	FAIL ABUN
V-48	6.702E-02	2.517E-01	5.188E-01	NOT IDENT.
CR-51	-3.316E-01	9.099E-01	1.466E+00	NOT IDENT.
MN-54	-9.055E-03	3.419E-02	6.473E-02	NOT IDENT.

CO-56	-1.125E-02	4.456E-02	7.304E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	5.589E-03	2.686E-02	5.136E-02	NOT IDENT.
CO-58	1.972E-03	4.697E-02	8.332E-02	NOT IDENT.
FE-59	-4.250E-02	1.465E-01	2.678E-01	NOT IDENT.
CO-60	2.673E-02	3.152E-02	7.516E-02	NOT IDENT.
ZN-65	-9.435E-02	9.680E-02	1.188E-01	NOT IDENT.
GE-68	-2.469E-01	9.695E-01	1.848E+00	NOT IDENT.
AS-73	2.114E-01	1.225E+00	2.488E+00	NOT IDENT.
AS-74	7.409E-02	3.219E-01	6.264E-01	NOT IDENT.
SE-75	-2.890E-02	4.981E-02	9.200E-02	NOT IDENT.
BR-77	0.000E+00	2.484E+05	0.000E+00	SHORT HLIF
SR-82	1.380E-01	8.180E-01	1.398E+00	NOT IDENT.
RB-83	-6.516E-03	8.245E-02	1.553E-01	NOT IDENT.
KR-85	-1.782E+01	1.011E+01	1.545E+01	NOT IDENT.
SR-85	-1.340E-01	7.578E-02	1.158E-01	NOT IDENT.
RB-86	-9.473E-01	1.926E+00	3.459E+00	NOT IDENT.
Y-88	6.356E-03	3.842E-02	8.753E-02	NOT IDENT.
Y-91	1.047E+01	2.326E+01	4.924E+01	NOT IDENT.
NB-94	-1.315E-02	2.867E-02	5.331E-02	NOT IDENT.
NB-95	1.048E-02	6.588E-02	1.180E-01	NOT IDENT.
NB-95M	6.527E-02	1.830E-01	3.236E-01	NOT IDENT.
ZR-95	0.000E+00	2.296E-01	2.182E-01	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.196E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	4.068E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	6.925E-03	2.955E-02	5.662E-02	FAIL ABUN
RH-102	-2.743E-02	4.613E-02	8.507E-02	NOT IDENT.
RU-103	-3.088E-02	7.965E-02	1.428E-01	FAIL ABUN
RH-106	-7.959E-02	3.135E-01	6.035E-01	NOT IDENT.
RU-106	-7.959E-02	3.135E-01	6.035E-01	NOT IDENT.
AG-108M	-2.204E-02	3.139E-02	4.955E-02	NOT IDENT.
AG-110M	7.399E-02	5.262E-02	1.086E-01	FAIL ABUN
SN-113	1.731E-02	5.227E-02	1.035E-01	NOT IDENT.
CD-115	0.000E+00	2.864E+05	0.000E+00	SHORT HLIF
SN-117M	9.474E-02	2.636E-01	5.043E-01	NOT IDENT.
TE-123M	4.075E-03	3.055E-02	5.741E-02	NOT IDENT.
SB-124	-5.011E-03	8.489E-02	1.877E-01	NOT IDENT.
SB-125	1.330E-01	1.316E-01	1.696E-01	FAIL ABUN
TE-125M	-8.375E+00	1.431E+01	2.335E+01	NOT IDENT.
I-126	4.334E-01	1.211E+00	2.260E+00	NOT IDENT.
SB-126	3.621E-01	7.899E-01	1.667E+00	NOT IDENT.
SB-127	0.000E+00	3.637E+02	0.000E+00	SHORT HLIF
I-131	1.253E+00	1.927E+00	3.938E+00	NOT IDENT.
I-132	0.000E+00	1.741E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	8.447E+02	0.000E+00	SHORT HLIF
BA-133	3.157E-02	4.188E-02	7.873E-02	FAIL ABUN
I-133	0.000E+00	1.610E+15	0.000E+00	SHORT HLIF
CS-134	1.782E-02	3.788E-02	8.076E-02	NOT IDENT.
CS-135	-8.729E-03	1.484E-01	2.856E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	4.103E-02	5.258E-01	1.043E+00	NOT IDENT.
CE-139	-8.555E-03	2.946E-02	5.338E-02	NOT IDENT.
BA-140	-4.548E-02	1.562E+00	2.948E+00	NOT IDENT.
LA-140	7.636E-02	4.732E-01	1.015E+00	FAIL ABUN
CE-141	3.777E-02	1.263E-01	2.165E-01	NOT IDENT.
CE-143	0.000E+00	2.247E+09	0.000E+00	SHORT HLIF
CE-144	7.551E-02	1.943E-01	3.761E-01	NOT IDENT.
PM-144	6.469E-03	3.228E-02	6.560E-02	NOT IDENT.
PR-144	4.845E-01	2.457E+00	4.991E+00	NOT IDENT.
PM-146	3.680E-02	4.243E-02	8.831E-02	NOT IDENT.
ND-147	-2.925E+00	4.291E+00	7.364E+00	NOT IDENT.
PM-147	3.828E+02	7.226E+02	1.417E+03	NOT IDENT.
PM-149	0.000E+00	2.440E+06	0.000E+00	SHORT HLIF
EU-150	0.000E+00	2.737E-02	4.902E-02	FAIL ABUN
EU-152	-3.095E-02	1.010E-01	1.634E-01	NOT IDENT.
GD-153	-3.604E-02	8.443E-02	1.567E-01	FAIL ABUN
EU-154	-4.837E-02	7.458E-02	1.348E-01	FAIL ABUN
TB-160	1.024E-01	1.330E-01	2.887E-01	FAIL ABUN
HO-166M	3.520E-02	5.114E-02	1.114E-01	FAIL ABUN
TM-171	-4.453E+00	2.082E+01	4.099E+01	NOT IDENT.
HF-172	-4.799E-02	1.860E-01	3.427E-01	NOT IDENT.
LU-172	1.285E-02	6.385E-02	1.266E-01	FAIL ABUN
LU-176	3.118E-03	2.320E-02	4.565E-02	FAIL ABUN
HF-181	-1.047E-02	7.554E-02	1.408E-01	NOT IDENT.
TA-182	5.108E-02	1.480E-01	3.262E-01	FAIL ABUN
RE-183	1.378E-02	2.694E-01	5.391E-01	NOT IDENT.

RE-184	-3.542E-02	2.475E-01	4.426E-01	NOT IDENT.
W-188	6.719E-01	9.574E+00	1.657E+01	NOT IDENT.
IR-192	5.760E-03	4.498E-02	8.776E-02	FAIL ABUN
HG-203	9.908E-03	6.411E-02	1.114E-01	NOT IDENT.
BI-207	1.644E-02	4.021E-02	8.595E-02	NOT IDENT.
PB-210	1.485E+00	5.507E+00	1.126E+01	NOT IDENT.
PB-211	8.082E-01	9.511E-01	1.498E+00	FAIL ABUN
BI-212	3.792E-01	5.025E-01	1.081E+00	NOT IDENT.
RN-219	1.799E-01	4.134E-01	7.439E-01	NOT IDENT.
RA-223	5.332E-01	8.156E-01	1.162E+00	FAIL ABUN
AC-227	-1.760E-01	2.303E-01	4.192E-01	FAIL ABUN
TH-227	-1.760E-01	2.303E-01	4.192E-01	FAIL ABUN
TH-229	-2.272E-01	4.356E-01	8.270E-01	FAIL ABUN
PA-231	-1.318E-01	4.712E-01	8.176E-01	NOT IDENT.
TH-231	5.332E-01	8.156E-01	1.162E+00	FAIL ABUN
PA-233	-2.911E-02	5.457E-02	1.004E-01	NOT IDENT.
PA-234	1.721E-01	2.876E-01	6.079E-01	FAIL ABUN
PA-234M	-1.523E+00	3.987E+00	7.900E+00	NOT IDENT.
TH-234	-1.185E+00	1.439E+00	2.796E+00	NOT IDENT.
NP-237	-2.911E-02	5.457E-02	1.004E-01	NOT IDENT.
NP-238	0.000E+00	8.352E+05	0.000E+00	SHORT HLIF
U-238	-1.185E+00	1.439E+00	2.796E+00	NOT IDENT.
NP-239	1.855E-02	2.463E-01	4.692E-01	FAIL ABUN
PU-239	-1.391E+02	3.196E+02	5.794E+02	NOT IDENT.
AM-241	-4.127E-02	1.548E-01	3.001E-01	NOT IDENT.
AM-243	1.914E-03	7.183E-02	1.231E-01	NOT IDENT.
CM-243	1.526E-01	2.000E-01	1.795E-01	FAIL ABUN
BK-247	-2.874E-02	7.357E-02	1.382E-01	NOT IDENT.
CF-249	1.913E-02	3.941E-02	7.894E-02	FAIL ABUN
CF-251	-2.955E-02	1.241E-01	2.236E-01	NOT IDENT.
ANH-511	-1.390E-02	4.637E-02	1.001E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	141	10.66*	1.133E+00	5.703E+00	5.703E+00	17.59
CD-109	88.03	47	3.70*	4.897E+00	1.259E+00	1.354E+00	93.23
SN-126	64.28	-----	9.60	2.578E+00	-----	Line Not Found	-----
	86.94	47	8.90	4.897E+00	5.234E-01	5.234E-01	93.23
	87.57	47	37.00*	4.897E+00	1.259E-01	1.259E-01	93.23
BA-137M	661.66	267	89.90*	2.114E+00	6.852E-01	6.873E-01	14.69
CS-137	661.66	267	85.10*	2.114E+00	7.239E-01	7.261E-01	14.69
EU-155	86.55	47	30.70	4.897E+00	1.517E-01	1.547E-01	93.23
	105.31	38	21.10*	5.819E+00	1.507E-01	1.536E-01	133.75
TL-208	277.37	22	6.60	4.255E+00	3.845E-01	3.845E-01	128.40
	583.19	87	85.00*	2.335E+00	2.137E-01	2.137E-01	33.94
	860.56	-----	12.50	1.727E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.591E+00	-----	Line Not Found	-----
	351.06	133	12.92*	3.511E+00	1.433E+00	1.433E+00	28.51
PB-212	74.82	-----	10.28	3.800E+00	-----	Line Not Found	-----
	77.11	83	17.10	4.042E+00	5.856E-01	5.856E-01	73.04
	238.63	290	43.60*	4.777E+00	6.781E-01	6.781E-01	15.74
	300.09	-----	3.30	3.999E+00	-----	Line Not Found	-----
BI-214	609.32	99	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68
	1120.29	22	14.92	1.407E+00	5.015E-01	5.015E-01	78.18
	1764.49	18	15.30	9.594E-01	5.852E-01	5.852E-01	57.41
PB-214	74.82	-----	5.80	3.800E+00	-----	Line Not Found	-----
	77.11	83	9.70	4.042E+00	1.032E+00	1.032E+00	73.04
	87.09	47	3.41	4.897E+00	1.366E+00	1.366E+00	93.23
	242.00	70	7.25	4.735E+00	9.927E-01	9.928E-01	79.21
	295.22	62	18.42	4.049E+00	4.037E-01	4.038E-01	72.88
	351.93	133	35.60*	3.511E+00	5.201E-01	5.202E-01	28.51
RN-222	609.32	99	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68
	1120.29	22	14.92	1.407E+00	5.015E-01	5.015E-01	78.18
	1764.49	18	15.30	9.594E-01	5.852E-01	5.852E-01	57.41
RA-224	240.99	70	4.10*	4.735E+00	1.755E+00	1.755E+00	79.21
RA-226	609.32	99	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68
	1120.29	22	14.92	1.407E+00	5.015E-01	5.015E-01	78.18
	1764.49	18	15.30	9.594E-01	5.852E-01	5.852E-01	57.41
AC-228	105.21	38	1.10	5.819E+00	2.891E+00	2.891E+00	133.75
	338.32	84	11.27	3.626E+00	9.993E-01	9.993E-01	43.88
	794.95	-----	4.25	1.835E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.653E+00	7.697E-01	7.697E-01	28.96
	968.97	24	15.80	1.575E+00	4.653E-01	4.653E-01	89.65
RA-228	105.21	38	1.10	5.819E+00	2.891E+00	2.891E+00	133.75
	338.32	84	11.27	3.626E+00	9.993E-01	9.993E-01	43.88
	794.95	-----	4.25	1.835E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.653E+00	7.697E-01	7.697E-01	28.96
	968.97	24	15.80	1.575E+00	4.653E-01	4.653E-01	89.65
TH-228	74.82	-----	10.28	3.800E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	83	17.10	4.042E+00	5.856E-01	5.856E-01	73.04
	238.63	290	43.60*	4.777E+00	6.781E-01	6.781E-01	15.74
	300.09	-----	3.30	3.999E+00	-----	Line Not Found	-----
TH-230	609.32	99	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68
	1120.29	22	14.92	1.407E+00	5.015E-01	5.015E-01	78.18
TH-232	1764.49	18	15.30	9.594E-01	5.852E-01	5.852E-01	57.41
	105.21	38	1.10	5.819E+00	2.891E+00	2.891E+00	133.75
	338.32	84	11.27	3.626E+00	9.993E-01	9.993E-01	43.88
	835.71	-----	1.61	1.766E+00	-----	Line Not Found	-----
	911.20	67	25.80*	1.653E+00	7.697E-01	7.697E-01	28.96
	968.97	24	15.80	1.575E+00	4.653E-01	4.653E-01	89.65
U-234	609.32	99	45.49*	2.255E+00	4.698E-01	4.698E-01	32.68
	1120.29	22	14.92	1.407E+00	5.015E-01	5.015E-01	78.18
	1764.49	18	15.30	9.594E-01	5.852E-01	5.852E-01	57.41
U-235	89.96	-----	3.47	5.092E+00	-----	Line Not Found	-----
	93.35	-----	5.60	5.302E+00	-----	Line Not Found	-----
	143.76	33	10.96*	6.184E+00	2.389E-01	2.389E-01	107.66
	163.33	-----	5.08	5.963E+00	-----	Line Not Found	-----
	185.72	21	57.20	5.620E+00	3.179E-02	3.179E-02	232.99
	205.31	-----	5.01	5.295E+00	-----	Line Not Found	-----
CM-247	278.00	22	3.40	4.255E+00	7.463E-01	7.463E-01	128.40
	287.50	-----	2.00	4.139E+00	-----	Line Not Found	-----
	402.40	20	72.00*	3.137E+00	4.243E-02	4.243E-02	120.07

Flag: "*" = Keyline

Total number of lines in spectrum 42
Number of unidentified lines 11
Number of lines tentatively identified by NID 31 73.81%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.703E+00	5.703E+00	1.003E+00	17.59	
CD-109	461.40D	1.08	1.259E+00	1.354E+00	1.262E+00	93.23	
SN-126	2.30E+05Y	1.00	1.259E-01	1.259E-01	1.174E-01	93.23	
BA-137M	30.08Y	1.00	6.852E-01	6.873E-01	1.010E-01	14.69	
CS-137	30.08Y	1.00	7.239E-01	7.261E-01	1.067E-01	14.69	
EU-155	4.75Y	1.02	1.507E-01	1.536E-01	2.055E-01	133.75	
TL-208	1.41E+10Y	1.00	2.137E-01	2.137E-01	0.725E-01	33.94	
BI-211	7.04E+08Y	1.00	1.433E+00	1.433E+00	0.409E+00	28.51	
PB-212	1.41E+10Y	1.00	6.781E-01	6.781E-01	1.067E-01	15.74	
BI-214	1600.00Y	1.00	4.698E-01	4.698E-01	1.535E-01	32.68	
PB-214	1600.00Y	1.00	5.201E-01	5.202E-01	1.483E-01	28.51	
RN-222	1600.00Y	1.00	4.698E-01	4.698E-01	1.535E-01	32.68	
RA-224	1.41E+10Y	1.00	1.755E+00	1.755E+00	1.390E+00	79.21	
RA-226	1600.00Y	1.00	4.698E-01	4.698E-01	1.535E-01	32.68	
AC-228	1.41E+10Y	1.00	7.697E-01	7.697E-01	2.229E-01	28.96	
RA-228	1.41E+10Y	1.00	7.697E-01	7.697E-01	2.229E-01	28.96	
TH-228	1.41E+10Y	1.00	6.781E-01	6.781E-01	1.067E-01	15.74	
TH-230	7.54E+04Y	1.00	4.698E-01	4.698E-01	1.535E-01	32.68	
TH-232	1.41E+10Y	1.00	7.697E-01	7.697E-01	2.229E-01	28.96	
U-234	2.45E+05Y	1.00	4.698E-01	4.698E-01	1.535E-01	32.68	
U-235	7.04E+08Y	1.00	2.389E-01	2.389E-01	2.572E-01	107.66	
CM-247	1.56E+07Y	1.00	4.243E-02	4.243E-02	5.095E-02	120.07	

Total Activity : 1.887E+01 1.897E+01

Grand Total Activity : 1.887E+01 1.897E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	209.26	55	72	1.91	418.27	414	13	1.28E-02	67.1	5.23E+00	
5	211.53	29	64	1.91	422.80	414	13	6.72E-03	****	5.19E+00	T
0	323.88	16	42	0.92	647.27	642	8	4.01E-03	****	3.76E+00	T
0	328.11	42	41	1.28	655.71	651	11	1.03E-02	70.8	3.72E+00	T
0	333.54	36	17	0.63	666.56	662	8	8.82E-03	56.0	3.67E+00	T
0	420.90	8	25	0.55	841.13	834	9	2.08E-03	****	3.03E+00	
0	427.35	24	23	1.90	854.03	848	13	5.92E-03	****	3.00E+00	T
0	463.36	26	44	1.32	925.99	919	11	6.51E-03	****	2.80E+00	T
0	647.66	17	18	1.27	1294.36	1289	12	4.44E-03	****	2.15E+00	
0	756.38	35	25	3.61	1511.72	1502	24	9.32E-03	84.7	1.91E+00	T
0	774.06	13	7	2.64	1547.09	1543	11	3.38E-03	96.1	1.87E+00	T
0	783.66	4	8	0.75	1566.28	1562	6	1.20E-03	****	1.86E+00	T
0	806.07	11	3	1.53	1611.09	1608	7	2.86E-03	84.9	1.82E+00	
0	843.84	10	11	0.70	1686.62	1680	12	2.64E-03	****	1.75E+00	
0	864.38	3	13	1.42	1727.70	1723	10	9.45E-04	****	1.72E+00	
0	884.16	16	5	3.90	1767.24	1762	10	4.43E-03	72.6	1.69E+00	T
0	935.79	18	0	1.62	1870.50	1865	10	5.00E-03	47.1	1.62E+00	
0	948.74	25	10	7.22	1896.41	1886	19	6.81E-03	72.6	1.60E+00	T
0	1127.56	8	0	1.50	2254.13	2251	7	2.22E-03	70.7	1.40E+00	
0	1136.07	7	7	1.47	2271.15	2265	10	1.88E-03	****	1.39E+00	
0	1154.64	11	7	1.89	2308.30	2298	15	3.19E-03	****	1.37E+00	
0	1242.52	11	4	1.33	2484.14	2480	8	3.06E-03	87.2	1.30E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                           *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677020.CNF;1        *
* Acquisition date   : 28-JUN-2016 14:38:38 Sensitivity      : 3.000                *
* Detector ID        : GAM33 Energy tolerance: 1.500          *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 01:00:00.96 Half life ratio  : ***** *
* Sample date        : 11-MAY-2016 11:20:00 Nuclide Library : SOLID          *
* Sample ID          : G398677020 Analyst initials: MXR1         *
* Batch Number       : 1572231 Sample Quantity  : 1.5392E+02 GRAM *
* Wet wt corr        : 1.00000 Wet Weight       : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                         *
*
* Eff. Cal. date     : 10-JUN-2016 07:00:49 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	1.863E-01
CD-109	7.625E-01
SN-126	7.658E-02
BA-137M	2.781E-02
CS-137	2.938E-02
EU-155	8.107E-02
TL-208	2.652E-02
BI-211	1.973E-01
PB-212	4.603E-02
BI-214	6.144E-02
PB-214	1.198E-01
RN-222	6.144E-02
RA-224	4.934E-01
RA-226	6.144E-02
AC-228	7.723E-02
RA-228	7.723E-02
TH-228	4.603E-02
TH-230	6.144E-02
TH-232	7.723E-02
U-234	6.144E-02
U-235	1.515E-01
CM-247	2.754E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.864E-01	NOT IDENT.
NA-22	1.842E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.812E-02	NOT IDENT.
SC-46	2.724E-02	FAIL ABUN
V-48	2.246E-01	NOT IDENT.
CR-51	6.719E-01	NOT IDENT.
MN-54	2.812E-02	NOT IDENT.
CO-56	3.058E-02	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	2.417E-02	NOT IDENT.
CO-58	3.565E-02	NOT IDENT.
FE-59	1.164E-01	NOT IDENT.
CO-60	3.205E-02	NOT IDENT.
ZN-65	4.865E-02	NOT IDENT.
GE-68	7.618E-01	NOT IDENT.
AS-73	1.157E+00	NOT IDENT.
AS-74	2.804E-01	NOT IDENT.
SE-75	4.249E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	6.096E-01	NOT IDENT.
RB-83	6.891E-02	NOT IDENT.
KR-85	7.111E+00	NOT IDENT.
SR-85	5.328E-02	NOT IDENT.
RB-86	1.409E+00	NOT IDENT.
Y-88	3.391E-02	NOT IDENT.
Y-91	2.120E+01	NOT IDENT.
NB-94	2.330E-02	NOT IDENT.
NB-95	5.296E-02	NOT IDENT.
NB-95M	1.520E-01	NOT IDENT.
ZR-95	9.813E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.660E-02	FAIL ABUN
RH-102	3.687E-02	NOT IDENT.
RU-103	6.479E-02	FAIL ABUN
RH-106	2.680E-01	NOT IDENT.
RU-106	2.680E-01	NOT IDENT.
AG-108M	2.222E-02	NOT IDENT.
AG-110M	4.806E-02	FAIL ABUN
SN-113	4.736E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.365E-01	NOT IDENT.
TE-123M	2.688E-02	NOT IDENT.
SB-124	6.952E-02	NOT IDENT.
SB-125	7.685E-02	FAIL ABUN
TE-125M	1.089E+01	NOT IDENT.
I-126	1.001E+00	NOT IDENT.
SB-126	7.387E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	1.811E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.616E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	3.588E-02	NOT IDENT.
CS-135	1.329E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	4.501E-01	NOT IDENT.
CE-139	2.481E-02	NOT IDENT.
BA-140	1.320E+00	NOT IDENT.
LA-140	4.168E-01	FAIL ABUN
CE-141	1.017E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.766E-01	NOT IDENT.
PM-144	2.913E-02	NOT IDENT.
PR-144	2.216E+00	NOT IDENT.
PM-146	4.041E-02	NOT IDENT.
ND-147	3.249E+00	NOT IDENT.
PM-147	6.673E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.255E-02	FAIL ABUN
EU-152	7.443E-02	NOT IDENT.
GD-153	7.329E-02	FAIL ABUN
EU-154	5.223E-02	FAIL ABUN
TB-160	1.234E-01	FAIL ABUN
HO-166M	4.944E-02	FAIL ABUN
TM-171	1.901E+01	NOT IDENT.
HF-172	1.608E-01	NOT IDENT.
LU-172	5.552E-02	FAIL ABUN
LU-176	2.095E-02	FAIL ABUN
HF-181	6.356E-02	NOT IDENT.
TA-182	1.379E-01	FAIL ABUN
RE-183	2.506E-01	NOT IDENT.
RE-184	1.941E-01	NOT IDENT.

W-188	7.608E+00	NOT IDENT.
IR-192	4.046E-02	FAIL ABUN
HG-203	5.162E-02	NOT IDENT.
BI-207	3.684E-02	NOT IDENT.
PB-210	5.268E+00	NOT IDENT.
PB-211	6.911E-01	FAIL ABUN
BI-212	4.890E-01	NOT IDENT.
RN-219	3.390E-01	NOT IDENT.
RA-223	5.353E-01	FAIL ABUN
AC-227	1.935E-01	FAIL ABUN
TH-227	1.935E-01	FAIL ABUN
TH-229	3.847E-01	FAIL ABUN
PA-231	3.764E-01	NOT IDENT.
TH-231	5.353E-01	FAIL ABUN
PA-233	4.556E-02	NOT IDENT.
PA-234	2.691E-01	FAIL ABUN
PA-234M	3.431E+00	NOT IDENT.
TH-234	1.319E+00	NOT IDENT.
NP-237	4.556E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.319E+00	NOT IDENT.
NP-239	2.201E-01	FAIL ABUN
PU-239	2.718E+02	NOT IDENT.
AM-241	1.399E-01	NOT IDENT.
AM-243	5.877E-02	NOT IDENT.
CM-243	8.387E-02	FAIL ABUN
BK-247	6.389E-02	NOT IDENT.
CF-249	3.626E-02	FAIL ABUN
CF-251	1.048E-01	NOT IDENT.
ANH-511	4.744E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398677020.CNF;1
Acquisition date : 28-JUN-2016 14:38:38 Sensitivity : 3.000
Detector ID : GAM33 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.96 Half life ratio : *****
Sample date : 11-MAY-2016 11:20:00 Nuclide Library : SOLID
Sample ID : G398677020 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5392E+02 GRAM
Quantity Err(%) : 1.2994E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUN-2016 07:00:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.703E+00	1.027E+00	1.027E+00
CD-109	9.536E-01	1.273E+00	1.273E+00
SN-126	8.870E-02	1.183E-01	1.183E-01
BA-137M	6.873E-01	1.033E-01	1.033E-01
CS-137	7.261E-01	1.091E-01	1.091E-01
EU-155	1.536E-01	2.017E-01	2.017E-01
TL-208	2.137E-01	7.167E-02	7.167E-02
BI-211	3.207E-01	8.925E-01	8.925E-01
PB-212	6.781E-01	1.105E-01	1.105E-01
BI-214	4.698E-01	1.518E-01	1.518E-01
PB-214	5.202E-01	1.469E-01	1.469E-01
RN-222	4.698E-01	1.518E-01	1.518E-01
RA-224	1.042E+00	1.457E+00	1.457E+00
RA-226	4.698E-01	1.518E-01	1.518E-01
AC-228	7.697E-01	2.219E-01	2.219E-01
RA-228	7.697E-01	2.219E-01	2.219E-01
TH-228	6.781E-01	1.105E-01	1.105E-01
TH-230	4.698E-01	1.518E-01	1.518E-01
TH-232	7.697E-01	2.219E-01	2.219E-01
U-234	4.698E-01	1.518E-01	1.518E-01
U-235	2.389E-01	2.524E-01	2.524E-01
CM-247	4.243E-02	5.044E-02	5.044E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.184E-01	4.671E-01	4.702E-01	NOT IDENT.
NA-22	-1.791E-02	2.662E-02	2.782E-02	NOT IDENT.
NA-24	-1.795E+21	4.965E+21	0.000E+00	SHORT HLIF
AL-26	6.175E-03	1.856E-02	1.877E-02	NOT IDENT.
SC-46	8.791E-03	3.322E-02	3.346E-02	FAIL ABUN
V-48	6.702E-02	2.517E-01	2.535E-01	NOT IDENT.
CR-51	-3.316E-01	9.100E-01	9.222E-01	NOT IDENT.
MN-54	-9.055E-03	3.419E-02	3.443E-02	NOT IDENT.

CO-56	-1.125E-02	4.456E-02	4.485E-02	NOT IDENT.
MN-56	-1.000E+41	3.934E+41	0.000E+00	SHORT HLIF
CO-57	5.589E-03	2.686E-02	2.698E-02	NOT IDENT.
CO-58	1.972E-03	4.697E-02	4.698E-02	NOT IDENT.
FE-59	-4.250E-02	1.466E-01	1.478E-01	NOT IDENT.
CO-60	2.673E-02	3.154E-02	3.376E-02	NOT IDENT.
ZN-65	-9.435E-02	9.686E-02	1.058E-01	NOT IDENT.
GE-68	-2.469E-01	9.696E-01	9.759E-01	NOT IDENT.
AS-73	2.114E-01	1.226E+00	1.229E+00	NOT IDENT.
AS-74	7.409E-02	3.220E-01	3.237E-01	NOT IDENT.
SE-75	-2.890E-02	4.983E-02	5.151E-02	NOT IDENT.
BR-77	1.610E+06	2.254E+06	2.368E+06	SHORT HLIF
SR-82	1.380E-01	8.181E-01	8.204E-01	NOT IDENT.
RB-83	-6.516E-03	8.245E-02	8.251E-02	NOT IDENT.
KR-85	-1.782E+01	1.013E+01	1.293E+01	NOT IDENT.
SR-85	-1.340E-01	7.598E-02	9.705E-02	NOT IDENT.
RB-86	-9.473E-01	1.926E+00	1.973E+00	NOT IDENT.
Y-88	6.356E-03	3.842E-02	3.853E-02	NOT IDENT.
Y-91	1.047E+01	2.326E+01	2.374E+01	NOT IDENT.
NB-94	-1.315E-02	2.867E-02	2.928E-02	NOT IDENT.
NB-95	1.048E-02	6.588E-02	6.605E-02	NOT IDENT.
NB-95M	6.527E-02	1.831E-01	1.855E-01	NOT IDENT.
ZR-95	2.766E-01	2.299E-01	2.616E-01	FAIL ABUN
NB-97	1.000E+41	3.309E+41	0.000E+00	SHORT HLIF
ZR-97	-7.879E+20	3.212E+20	0.000E+00	SHORT HLIF
MO-99	-6.644E+03	4.068E+04	4.079E+04	SHORT HLIF
TC-99M	-1.000E+41	4.268E+41	0.000E+00	SHORT HLIF
RH-101	6.925E-03	2.958E-02	2.974E-02	FAIL ABUN
RH-102	-2.743E-02	4.619E-02	4.781E-02	NOT IDENT.
RU-103	-3.088E-02	7.967E-02	8.087E-02	FAIL ABUN
RH-106	-7.959E-02	3.135E-01	3.156E-01	NOT IDENT.
RU-106	-7.959E-02	3.135E-01	3.156E-01	NOT IDENT.
AG-108M	-2.204E-02	3.140E-02	3.293E-02	NOT IDENT.
AG-110M	7.399E-02	5.275E-02	6.242E-02	FAIL ABUN
SN-113	1.731E-02	5.228E-02	5.286E-02	NOT IDENT.
CD-115	6.585E+04	2.864E+05	2.880E+05	SHORT HLIF
SN-117M	9.474E-02	2.637E-01	2.671E-01	NOT IDENT.
TE-123M	4.075E-03	3.055E-02	3.060E-02	NOT IDENT.
SB-124	-5.011E-03	8.489E-02	8.492E-02	NOT IDENT.
SB-125	1.330E-01	1.318E-01	1.448E-01	FAIL ABUN
TE-125M	-8.375E+00	1.431E+01	1.480E+01	NOT IDENT.
I-126	4.334E-01	1.211E+00	1.227E+00	NOT IDENT.
SB-126	3.621E-01	7.907E-01	8.074E-01	NOT IDENT.
SB-127	-1.002E+02	3.644E+02	3.672E+02	SHORT HLIF
I-131	1.253E+00	1.928E+00	2.009E+00	NOT IDENT.
I-132	1.000E+41	3.441E+41	0.000E+00	SHORT HLIF
TE-132	2.840E+02	8.452E+02	8.548E+02	SHORT HLIF
BA-133	3.157E-02	4.190E-02	4.425E-02	FAIL ABUN
I-133	-8.379E+14	1.630E+15	1.673E+15	SHORT HLIF
CS-134	1.782E-02	3.789E-02	3.873E-02	NOT IDENT.
CS-135	-8.729E-03	1.484E-01	1.485E-01	NOT IDENT.
I-135	1.000E+41	3.061E+41	0.000E+00	SHORT HLIF
CS-136	4.103E-02	5.259E-01	5.262E-01	NOT IDENT.
CE-139	-8.555E-03	2.951E-02	2.976E-02	NOT IDENT.
BA-140	-4.548E-02	1.562E+00	1.562E+00	NOT IDENT.
LA-140	7.636E-02	4.732E-01	4.745E-01	FAIL ABUN
CE-141	3.777E-02	1.263E-01	1.275E-01	NOT IDENT.
CE-143	2.178E+09	2.250E+09	2.455E+09	SHORT HLIF
CE-144	7.551E-02	1.943E-01	1.973E-01	NOT IDENT.
PM-144	6.469E-03	3.228E-02	3.241E-02	NOT IDENT.
PR-144	4.845E-01	2.457E+00	2.466E+00	NOT IDENT.
PM-146	3.680E-02	4.251E-02	4.563E-02	NOT IDENT.
ND-147	-2.925E+00	4.293E+00	4.491E+00	NOT IDENT.
PM-147	3.828E+02	7.228E+02	7.431E+02	NOT IDENT.
PM-149	1.399E+06	2.447E+06	2.527E+06	SHORT HLIF
EU-150	4.991E-02	2.745E-02	3.549E-02	FAIL ABUN
EU-152	-3.095E-02	1.010E-01	1.020E-01	NOT IDENT.
GD-153	-3.604E-02	8.446E-02	8.601E-02	FAIL ABUN
EU-154	-4.837E-02	7.461E-02	7.773E-02	FAIL ABUN
TB-160	1.024E-01	1.331E-01	1.409E-01	FAIL ABUN
HO-166M	3.520E-02	5.118E-02	5.358E-02	FAIL ABUN
TM-171	-4.453E+00	2.082E+01	2.092E+01	NOT IDENT.
HF-172	-4.799E-02	1.861E-01	1.874E-01	NOT IDENT.
LU-172	1.285E-02	6.387E-02	6.413E-02	FAIL ABUN
LU-176	3.118E-03	2.320E-02	2.324E-02	FAIL ABUN
HF-181	-1.047E-02	7.554E-02	7.569E-02	NOT IDENT.
TA-182	5.108E-02	1.480E-01	1.498E-01	FAIL ABUN
RE-183	1.378E-02	2.694E-01	2.695E-01	NOT IDENT.

RE-184	-3.542E-02	2.476E-01	2.481E-01	NOT IDENT.
W-188	6.719E-01	9.575E+00	9.580E+00	NOT IDENT.
IR-192	5.760E-03	4.498E-02	4.505E-02	FAIL ABUN
HG-203	9.908E-03	6.411E-02	6.427E-02	NOT IDENT.
BI-207	1.644E-02	4.022E-02	4.089E-02	NOT IDENT.
PB-210	1.485E+00	5.508E+00	5.549E+00	NOT IDENT.
PB-211	8.082E-01	9.519E-01	1.019E+00	FAIL ABUN
BI-212	3.792E-01	5.029E-01	5.311E-01	NOT IDENT.
RN-219	1.799E-01	4.140E-01	4.218E-01	NOT IDENT.
RA-223	5.332E-01	8.162E-01	8.509E-01	FAIL ABUN
AC-227	-1.760E-01	2.314E-01	2.447E-01	FAIL ABUN
TH-227	-1.760E-01	2.314E-01	2.447E-01	FAIL ABUN
TH-229	-2.272E-01	4.358E-01	4.476E-01	FAIL ABUN
PA-231	-1.318E-01	4.721E-01	4.758E-01	NOT IDENT.
TH-231	5.332E-01	8.162E-01	8.509E-01	FAIL ABUN
PA-233	-2.911E-02	5.458E-02	5.614E-02	NOT IDENT.
PA-234	1.721E-01	3.486E-01	3.571E-01	FAIL ABUN
PA-234M	-1.523E+00	3.988E+00	4.047E+00	NOT IDENT.
TH-234	-1.185E+00	1.462E+00	1.557E+00	NOT IDENT.
NP-237	-2.911E-02	5.458E-02	5.614E-02	NOT IDENT.
NP-238	1.404E+05	8.352E+05	8.376E+05	SHORT HLIF
U-238	-1.185E+00	1.462E+00	1.557E+00	NOT IDENT.
NP-239	1.855E-02	2.463E-01	2.464E-01	FAIL ABUN
PU-239	-1.391E+02	3.197E+02	3.258E+02	NOT IDENT.
AM-241	-4.127E-02	1.548E-01	1.560E-01	NOT IDENT.
AM-243	1.914E-03	7.183E-02	7.183E-02	NOT IDENT.
CM-243	1.526E-01	2.005E-01	2.120E-01	FAIL ABUN
BK-247	-2.874E-02	7.380E-02	7.492E-02	NOT IDENT.
CF-249	1.913E-02	3.944E-02	4.037E-02	FAIL ABUN
CF-251	-2.955E-02	1.241E-01	1.249E-01	NOT IDENT.
ANH-511	-1.390E-02	4.637E-02	4.680E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	64.5408	87.09	125.7101	136.47	82.2380
45.60	63.9395	87.57	128.8788	140.51	0.0000
46.54	65.0313	88.03	112.0870	143.76	71.3539
49.72	0.0000	88.34	95.2459	144.24	69.7349
51.35	60.0631	88.47	95.2663	145.44	71.4969
51.87	50.5900	89.96	204.8607	152.43	62.5830
52.39	59.2514	1093.63	214.3390	153.25	70.4725
52.97	51.6745	91.11	155.5520	323.87	70.5494
53.44	54.6035	92.59	115.4977	156.02	78.5499
54.07	47.9659	93.35	82.5985	158.56	67.5208
57.36	0.0000	94.56	127.2385	159.00	68.6802
57.53	57.9997	94.65	127.2567	162.33	64.4138
57.98	57.0883	94.67	127.2604	162.66	61.0455
59.27	69.8591	94.87	160.4193	163.33	61.0906
59.32	69.8666	97.43	72.7370	165.86	64.6625
59.54	69.8992	98.43	62.4420	176.31	69.9728
60.96	84.7138	98.44	62.4431	176.60	75.7311
61.17	89.6215	99.53	57.8563	177.52	80.3970
62.93	80.1703	100.11	61.0375	181.07	0.0000
63.29	88.0564	102.03	59.6449	181.52	65.7358
63.58	88.1084	103.18	63.9400	184.41	72.8687
64.28	86.2726	103.37	63.9584	143.76	70.6485
66.73	70.9321	105.21	64.1324	193.51	70.9040
67.24	79.8786	105.31	64.1417	197.03	56.2144
125.81	79.9474	106.12	69.4818	198.01	66.8177
67.75	88.8423	106.47	69.5174	201.83	76.7675
69.67	110.9712	109.28	69.8000	203.43	64.6384
70.83	91.3561	111.00	65.7309	205.31	65.1569
72.81	113.6243	111.76	0.0000	210.85	61.4000
72.87	113.6370	114.06	84.1151	215.65	62.9208
74.66	145.5170	116.30	0.0000	222.11	74.6127
74.82	129.0531	116.74	74.8090	227.09	53.2711
74.97	129.0886	119.76	94.4328	227.38	57.7998
77.11	117.5350	121.12	75.2544	228.16	0.0000
78.74	66.4951	121.22	73.1143	228.18	63.2629
79.69	68.1204	121.78	77.4730	116.74	63.2629
80.12	69.6868	122.06	80.7312	235.69	71.3138
80.19	69.6952	122.92	66.8141	235.96	66.9634
80.57	97.0317	123.07	66.8273	238.63	63.8322
81.00	95.5875	265.00	87.3772	238.98	0.0000
81.07	95.5993	125.81	84.3766	240.99	63.9587
81.75	98.4468	127.23	74.7788	242.00	64.0127
83.79	76.2283	127.91	58.5742	244.70	45.4597
84.00	76.2558	129.30	88.0184	252.40	0.0000
85.43	107.0166	131.20	82.7856	252.80	53.5126
86.55	123.5553	133.02	62.2324	254.15	0.0000
86.79	125.6473	133.52	69.9189	256.23	63.8378
86.94	125.6789	136.00	79.9982	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	60.5408	355.39	0.0000	584.27	20.1462
264.80	60.5467	356.01	28.6040	595.83	21.3733
265.00	57.7617	364.49	32.9507	427.87	30.0594
268.22	61.6434	366.42	0.0000	602.52	0.0000
269.46	52.3539	372.51	42.1455	604.72	31.6179
270.03	54.2476	375.05	38.1913	607.14	33.1576
271.23	58.0417	377.52	41.2684	609.32	28.9648
273.65	60.0264	356.01	34.3533	610.33	24.1478
276.40	51.1295	388.16	34.4420	614.28	22.6764
277.37	50.7906	388.63	40.5316	618.01	25.4372
277.60	51.7404	391.69	33.4990	620.36	22.7344
278.00	54.2030	264.66	32.6553	621.93	24.5696
279.20	49.7312	401.81	27.7757	630.19	0.0000
279.54	49.7433	402.40	27.7852	631.29	21.0111
279.70	46.7346	404.85	34.3716	633.25	16.4571
280.46	55.8116	410.95	33.8762	634.78	19.2117
283.69	44.4175	413.71	39.7558	635.95	20.1362
284.31	43.4928	414.70	41.1499	636.99	25.6396
285.41	41.6354	423.72	16.5437	645.85	18.3804
285.90	0.0000	427.09	24.8621	657.76	18.4688
287.50	53.0734	427.87	24.8730	657.90	0.0000
290.67	41.0379	433.94	37.4343	661.66	20.3479
293.27	0.0000	439.40	32.3316	664.57	0.0000
351.93	43.8430	453.88	25.2264	666.33	15.4435
295.96	43.8662	463.37	28.7332	666.50	18.5337
879.38	38.2172	468.07	32.1919	667.71	0.0000
299.98	52.0276	473.00	0.0000	677.62	13.0307
300.09	58.1532	475.06	34.0088	685.70	0.0000
300.13	58.1550	476.78	26.5930	695.00	21.5524
301.36	51.0579	477.60	28.7324	696.49	18.7520
302.85	41.2094	482.18	30.9329	696.51	18.7520
256.23	37.4194	487.02	27.8008	697.00	18.7559
304.85	40.3081	492.35	0.0000	697.30	21.5715
306.78	39.4022	497.08	38.6873	697.49	20.6352
308.46	37.5248	505.52	48.5609	702.65	21.6158
311.90	41.4732	507.63	0.0000	706.68	18.8252
316.51	44.5085	511.00	29.2146	711.68	13.2026
319.41	54.2927	514.00	85.6034	720.70	15.1398
320.08	48.1098	514.00	85.6034	721.93	0.0000
321.04	38.8239	520.40	20.6519	722.78	27.4622
323.87	35.0090	520.69	0.0000	722.91	31.2517
325.23	23.3606	522.65	0.0000	723.31	31.2565
328.76	19.5135	527.90	0.0000	724.19	18.0022
333.37	35.2332	528.26	19.6381	727.33	16.1259
333.97	7.8326	529.59	26.2009	733.00	22.8141
334.37	7.8347	529.87	0.0000	735.93	15.2258
338.28	28.2779	531.02	28.4034	333.97	18.0908
338.32	28.2788	537.26	25.1998	739.50	0.0000
311.90	28.3188	546.56	0.0000	747.24	11.9446
340.48	28.3188	552.55	18.7582	748.06	12.7448
340.55	39.3335	563.25	22.1765	752.31	9.5732
344.28	41.0065	569.33	18.9014	753.82	15.3254
345.93	45.7876	946.00	23.3507	756.73	15.3418
351.06	57.0278	569.70	23.3526	756.80	15.3422
351.93	55.4745	583.19	20.1368	884.68	28.8398

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	19.2397	1274.44	14.5035	1620.50	2.0020
766.42	16.0364	1001.03	12.4488	1621.92	3.0039
766.84	20.6213	1002.74	6.2275	1678.03	0.0000
772.60	0.0000	1004.73	10.3850	1690.97	3.0443
776.52	13.5191	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	1.7636
778.90	14.4968	1028.54	0.0000	1063.66	18.5376
783.70	0.0000	1037.84	7.3384	1771.35	5.1503
785.37	9.6865	1038.76	0.0000	1791.20	0.0000
792.07	18.4475	631.29	13.6621	1808.65	1.0370
794.95	10.6909	1048.07	12.6164	1810.72	0.0000
795.86	12.6388	1049.04	10.5166	1836.06	3.1263
810.06	13.0264	1050.41	7.3644		
810.29	13.0273	1063.66	8.4473		
344.28	11.3995	1077.00	10.5981		
810.76	11.4006	1077.34	9.5392		
815.77	14.6832	1085.87	11.6859		
1048.07	11.7574	1093.63	14.9044		
832.01	14.7638	1099.45	18.1264		
834.85	17.7333	1112.07	6.4192		
835.71	16.4246	1112.84	9.3635		
836.80	0.0000	1115.54	17.8475		
846.75	0.0000	1120.29	9.3819		
846.77	11.5393	1120.55	9.3828		
856.80	20.8395	1221.41	9.3845		
860.56	16.5597	1129.67	5.3745		
871.09	11.2162	1131.51	0.0000		
873.19	9.9766	1147.95	0.0000		
875.33	0.0000	1173.23	3.2613		
879.38	4.9983	1177.95	13.0605		
880.51	3.3334	1189.05	14.1889		
883.24	11.6769	1204.77	8.7664		
884.68	8.3445	1221.41	7.3356		
889.28	5.0140	1231.02	13.7866		
894.76	17.0776	1235.36	20.9779		
898.04	10.0562	1238.28	20.5193		
900.72	18.1160	1260.41	0.0000		
903.28	18.8862	1271.87	4.6413		
911.20	8.0781	1274.44	8.3595		
912.08	8.0803	1274.54	8.3599		
923.98	0.0000	1291.59	9.3262		
926.50	9.1310	1298.22	0.0000		
929.11	8.7033	1312.11	6.5599		
937.49	8.4833	1332.49	4.7078		
944.13	8.5004	1362.66	0.0000		
946.00	13.2682	1365.19	3.7944		
949.00	13.2802	1368.63	0.0000		
667.71	0.0000	1384.29	7.6217		
962.31	8.5470	1408.01	7.6618		
964.08	13.6823	1457.56	0.0000		
966.17	20.5366	1460.82	3.8752		
911.20	13.7025	1489.16	5.8479		
968.97	13.7025	1505.03	4.8893		
983.53	11.3531	1584.12	12.9196		
984.45	0.0000	1596.21	5.9773		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:47:33.69

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561373.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;102
Background date    : 26-JUN-2016 12:06:12
Sample date       : 7-JUN-2016 00:00:00. Acquisition date : 28-JUN-2016 14:38:59
Sample ID        : G1203561373. Sample quantity : 1.62520E+02 GRAM
Detector name    : GAM41. Detector geometry: CAN
Elapsed live time: 0 01:00:00.00. Elapsed real time: 0 01:00:05.28 0.1%
Energy tolerance : 1.50000 keV. Analyst Initials : MXR1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID         : 1572231. Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	60.15	31	32	1.70	120.58	114	10	8.57E-03	38.9	
2	1	75.24*	28	35	1.36	150.75	144	16	7.88E-03	41.3	1.68E+00
3	1	76.99*	14	30	1.36	154.25	144	16	3.93E-03	83.8	
4	0	92.99*	6	93	1.10	186.24	181	12	1.77E-03	359.4	
5	0	103.73*	56	32	7.81	207.72	198	21	1.56E-02	28.7	
6	0	163.24*	10	22	1.55	326.71	323	8	2.80E-03	93.1	
7	0	186.05*	10	21	0.70	372.32	367	9	2.73E-03	116.3	
8	0	238.96*	14	25	1.04	478.11	474	8	3.91E-03	74.2	
9	0	260.55	16	5	2.03	521.28	517	8	4.33E-03	36.9	
10	0	283.13	16	24	3.91	566.44	559	12	4.44E-03	66.1	
11	0	447.46	14	8	1.22	895.02	890	11	3.84E-03	48.4	
12	0	457.99	12	4	0.61	916.10	912	10	3.45E-03	42.9	
13	0	462.90*	7	0	1.48	925.90	922	7	2.04E-03	47.4	
14	0	487.04	8	5	0.80	974.18	968	10	2.29E-03	61.4	
15	0	492.95	10	2	0.93	986.01	982	8	2.84E-03	39.2	
16	0	496.52	9	2	1.37	993.15	990	6	2.36E-03	41.2	
17	0	511.14*	11	9	2.78	1022.38	1013	17	3.05E-03	104.0	
18	0	516.63	6	4	0.72	1033.36	1029	7	1.53E-03	70.7	
19	0	615.86	7	5	1.13	1231.80	1229	6	1.90E-03	67.1	
20	0	674.11	8	3	3.84	1348.31	1342	10	2.34E-03	49.4	
21	0	754.81	5	3	1.25	1509.70	1506	6	1.39E-03	70.7	
22	0	781.71	6	7	1.16	1563.51	1558	9	1.71E-03	86.3	
23	0	840.34	8	2	0.92	1680.78	1676	8	2.29E-03	45.4	
24	0	955.83	7	2	0.54	1911.78	1907	7	1.94E-03	49.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:47:35

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561373.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 28-JUN-2016 14:38:59
Sample ID	: G1203561373	Sample quantity	: 162.52 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA41	Detector geometry	: CAN
Elapsed live time	: 0 01:00:00.00	Elapsed real time	: 0 01:00:05.28 0.1%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RU-103	497.08	9	91.00*	2.375E+00	2.016E-02	2.953E-02	82.35
	610.33	-----	5.76	1.968E+00	-----	Line Not Found	-----
PB-212	74.82	38	10.28	7.677E+00	2.242E-01	2.242E-01	82.54
	77.11	19	17.10	7.649E+00	6.728E-02	6.728E-02	167.68
	238.63	17	43.60*	4.382E+00	4.091E-02	4.091E-02	148.41
TH-228	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
	74.82	38	10.28	7.677E+00	2.242E-01	2.242E-01	82.54
	77.11	19	17.10	7.649E+00	6.728E-02	6.728E-02	167.68
	238.63	17	43.60*	4.382E+00	4.091E-02	4.091E-02	148.41
U-235	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
	89.96	-----	3.47	7.391E+00	-----	Line Not Found	-----
	93.35	8	5.60	7.322E+00	9.496E-02	9.496E-02	718.76
	143.76	-----	10.96*	6.093E+00	-----	Line Not Found	-----
	163.33	13	5.08	5.668E+00	2.021E-01	2.021E-01	186.27
AM-241	185.72	12	57.20	5.222E+00	1.880E-02	1.880E-02	232.68
	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
	59.54	43	35.90*	7.795E+00	7.021E-02	7.021E-02	77.85
AM-243	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
ANH-511	74.66	38	67.20*	7.677E+00	3.429E-02	3.429E-02	82.54
	511.00	12	100.00*	2.314E+00	2.427E-02	2.427E-02	207.93

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*                                     DETECTOR AND SAMPLE DATA                *
*                                     *                                       *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561373.CNF;1 *
* Acquisition date   : 28-JUN-2016 14:38:59 Sensitivity      : 3.000          *
* Detector ID        : GAM41 Energy tolerance: 1.500         *
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000        *
* Elapsed real time  : 0 01:00:05.28 Half life ratio : *****          *
* Sample date        : 7-JUN-2016 00:00:00 Analyst initials: MXR1       *
* Sample ID          : G1203561373 Sample Quantity : 1.6252E+02 GRAM    *
* Batch Number       : 1572231 Wet Weight : 0.00000         *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6                                         *
*****
*                                     CALIBRATION INFORMATION                  *
*                                     *                                       *
* Eff. Cal. date     : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN        *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3         *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
RU-103	2.953E-02	2.383E-02	5.695E-02
PB-212	4.091E-02	5.949E-02	7.182E-02
TH-228	4.091E-02	5.949E-02	7.182E-02
U-235	8.712E-02	1.189E-01	2.565E-01
AM-241	7.021E-02	5.356E-02	8.196E-02
AM-243	3.429E-02	2.774E-02	3.439E-02
ANH-511	2.427E-02	4.946E-02	3.366E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.382E-02	2.380E-01	5.018E-01	NOT IDENT.
NA-22	1.360E-02	2.452E-02	6.212E-02	NOT IDENT.
NA-24	0.000E+00	6.289E+08	0.000E+00	SHORT HLIF
AL-26	-1.209E-02	2.952E-02	5.781E-02	NOT IDENT.
K-40	2.549E-01	3.307E-01	8.170E-01	NOT IDENT.
SC-46	1.059E-03	3.025E-02	6.422E-02	NOT IDENT.
V-48	-1.618E-02	6.253E-02	1.257E-01	NOT IDENT.
CR-51	1.782E-01	2.762E-01	6.123E-01	NOT IDENT.
MN-54	3.212E-03	3.014E-02	5.632E-02	NOT IDENT.
CO-56	6.750E-03	3.458E-02	7.122E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.654E-03	1.196E-02	2.558E-02	NOT IDENT.
CO-58	1.147E-02	3.095E-02	6.922E-02	NOT IDENT.
FE-59	-6.119E-02	8.300E-02	1.435E-01	NOT IDENT.
CO-60	4.269E-03	2.159E-02	5.253E-02	NOT IDENT.
ZN-65	2.218E-02	5.490E-02	1.282E-01	NOT IDENT.
GE-68	3.827E-02	8.907E-01	1.902E+00	NOT IDENT.
AS-73	7.864E-04	1.333E-01	2.594E-01	NOT IDENT.
AS-74	2.775E-02	1.046E-01	2.142E-01	NOT IDENT.
SE-75	-1.398E-02	3.107E-02	4.807E-02	NOT IDENT.
BR-77	4.241E+01	6.168E+01	9.722E+01	FAIL ABUN
SR-82	-3.102E-02	3.033E-01	5.432E-01	NOT IDENT.
RB-83	-1.672E-02	5.603E-02	9.166E-02	NOT IDENT.

KR-85	0.000E+00	5.560E+00	1.507E+01	NOT IDENT.
SR-85	0.000E+00	3.154E-02	8.552E-02	NOT IDENT.
RB-86	1.363E-01	7.309E-01	1.596E+00	NOT IDENT.
Y-88	-1.203E-02	2.359E-02	6.770E-02	NOT IDENT.
Y-91	9.454E+00	1.386E+01	3.399E+01	NOT IDENT.
NB-94	-1.661E-02	3.164E-02	5.612E-02	NOT IDENT.
NB-95	3.110E-02	2.941E-02	7.285E-02	NOT IDENT.
NB-95M	-3.491E-04	9.343E-02	1.584E-01	NOT IDENT.
ZR-95	8.300E-02	5.476E-02	1.392E-01	NOT IDENT.
NB-97	0.000E+00	8.825E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	8.930E+08	0.000E+00	SHORT HLIF
MO-99	-1.526E+01	4.168E+01	7.831E+01	NOT IDENT.
TC-99M	0.000E+00	1.227E+24	0.000E+00	SHORT HLIF
RH-101	9.563E-03	1.784E-02	3.763E-02	NOT IDENT.
RH-102	-7.113E-03	4.028E-02	7.874E-02	NOT IDENT.
RH-106	1.214E-01	2.328E-01	5.059E-01	NOT IDENT.
RU-106	1.214E-01	2.328E-01	5.059E-01	NOT IDENT.
AG-108M	-2.348E-02	1.969E-02	3.176E-02	NOT IDENT.
CD-109	-1.531E-01	3.714E-01	6.270E-01	NOT IDENT.
AG-110M	-4.498E-03	3.523E-02	7.289E-02	NOT IDENT.
SN-113	-3.178E-03	2.985E-02	6.024E-02	NOT IDENT.
CD-115	-1.671E+01	5.449E+01	1.060E+02	FAIL ABUN
SN-117M	1.720E-02	3.990E-02	7.687E-02	NOT IDENT.
TE-123M	-1.723E-03	1.679E-02	2.913E-02	NOT IDENT.
SB-124	1.628E-02	5.302E-02	1.475E-01	NOT IDENT.
SB-125	1.980E-02	6.231E-02	1.330E-01	FAIL ABUN
TE-125M	-6.655E+00	6.681E+00	1.011E+01	NOT IDENT.
I-126	-9.442E-02	2.793E-01	4.829E-01	FAIL ABUN
SB-126	7.216E-03	1.149E-01	2.467E-01	NOT IDENT.
SN-126	-4.035E-02	3.752E-02	5.742E-02	NOT IDENT.
SB-127	-7.858E-01	3.054E+00	5.859E+00	NOT IDENT.
I-131	1.347E-01	1.399E-01	3.192E-01	FAIL ABUN
I-132	0.000E+00	1.142E+41	0.000E+00	SHORT HLIF
TE-132	1.839E-01	1.788E+00	3.554E+00	NOT IDENT.
BA-133	-1.051E-02	2.799E-02	5.416E-02	NOT IDENT.
I-133	0.000E+00	5.938E+05	0.000E+00	SHORT HLIF
CS-134	1.645E-02	3.045E-02	6.934E-02	NOT IDENT.
CS-135	-1.133E-02	9.468E-02	1.821E-01	NOT IDENT.
I-135	0.000E+00	4.223E+22	0.000E+00	SHORT HLIF
CS-136	-4.184E-02	1.065E-01	2.040E-01	NOT IDENT.
BA-137M	4.037E-03	2.539E-02	5.288E-02	NOT IDENT.
CS-137	4.265E-03	2.683E-02	5.586E-02	NOT IDENT.
CE-139	-4.401E-03	2.146E-02	3.595E-02	NOT IDENT.
BA-140	-3.019E-02	1.819E-01	3.792E-01	FAIL ABUN
LA-140	-5.235E-02	9.496E-02	1.774E-01	FAIL ABUN
CE-141	-3.365E-03	4.256E-02	8.379E-02	NOT IDENT.
CE-143	0.000E+00	2.067E+03	0.000E+00	SHORT HLIF
CE-144	-6.536E-02	1.015E-01	1.891E-01	NOT IDENT.
PM-144	1.090E-02	2.904E-02	6.077E-02	NOT IDENT.
PR-144	8.182E-01	2.181E+00	4.564E+00	NOT IDENT.
PM-146	2.369E-02	3.286E-02	6.042E-02	NOT IDENT.
ND-147	-1.490E-01	4.833E-01	9.499E-01	NOT IDENT.
PM-147	-1.339E+02	3.662E+02	7.123E+02	NOT IDENT.
PM-149	9.853E+01	4.658E+02	8.376E+02	NOT IDENT.
EU-150	-1.182E-03	1.736E-02	3.518E-02	NOT IDENT.
EU-152	2.480E-03	6.720E-02	1.371E-01	NOT IDENT.
GD-153	1.495E-02	5.340E-02	7.559E-02	FAIL ABUN
EU-154	3.724E-02	6.882E-02	1.742E-01	NOT IDENT.
EU-155	-5.068E-03	4.870E-02	9.819E-02	NOT IDENT.
TB-160	3.487E-03	8.112E-02	1.808E-01	NOT IDENT.
HO-166M	1.202E-02	4.425E-02	9.384E-02	NOT IDENT.
TM-171	1.664E+00	2.277E+00	5.032E+00	NOT IDENT.
HF-172	4.149E-03	9.982E-02	2.024E-01	FAIL ABUN
LU-172	3.944E-02	5.422E-02	1.251E-01	FAIL ABUN
LU-176	-3.283E-04	1.651E-02	3.388E-02	NOT IDENT.
HF-181	-6.558E-03	4.022E-02	6.803E-02	NOT IDENT.
TA-182	2.386E-03	1.505E-01	3.070E-01	NOT IDENT.
RE-183	2.870E-02	3.837E-02	7.814E-02	FAIL ABUN
RE-184	4.893E-02	1.019E-01	2.345E-01	NOT IDENT.
W-188	2.991E+00	4.625E+00	9.942E+00	NOT IDENT.
IR-192	-1.141E-02	2.452E-02	4.713E-02	NOT IDENT.
HG-203	-1.386E-04	3.039E-02	5.163E-02	NOT IDENT.
BI-207	-1.559E-02	3.693E-02	7.011E-02	FAIL ABUN
TL-208	-5.535E-03	2.913E-02	5.569E-02	NOT IDENT.
PB-210	-3.737E-01	3.105E-01	6.726E-01	NOT IDENT.
BI-211	-6.106E-02	1.667E-01	3.185E-01	NOT IDENT.
PB-211	1.083E-01	4.203E-01	9.066E-01	NOT IDENT.
BI-212	2.564E-02	2.803E-01	6.044E-01	NOT IDENT.

BI-214	-1.167E-02	7.259E-02	1.359E-01	NOT IDENT.
PB-214	4.861E-03	5.752E-02	1.162E-01	FAIL ABUN
RN-219	1.751E-01	2.683E-01	5.975E-01	NOT IDENT.
RN-222	-1.167E-02	7.259E-02	1.359E-01	NOT IDENT.
RA-223	-4.327E-02	4.298E-01	8.644E-01	NOT IDENT.
RA-224	2.326E-01	4.809E-01	8.714E-01	NOT IDENT.
RA-226	-1.167E-02	7.259E-02	1.359E-01	NOT IDENT.
AC-227	-3.150E-03	1.815E-01	3.089E-01	NOT IDENT.
TH-227	-3.150E-03	1.815E-01	3.089E-01	NOT IDENT.
AC-228	-7.919E-02	1.043E-01	1.996E-01	FAIL ABUN
RA-228	-7.919E-02	1.043E-01	1.996E-01	FAIL ABUN
TH-229	-1.007E-01	2.998E-01	5.678E-01	NOT IDENT.
TH-230	-1.167E-02	7.259E-02	1.359E-01	NOT IDENT.
PA-231	-4.922E-02	3.024E-01	6.064E-01	FAIL ABUN
TH-231	-4.327E-02	4.298E-01	8.644E-01	NOT IDENT.
TH-232	-7.919E-02	1.043E-01	1.996E-01	FAIL ABUN
PA-233	7.044E-03	4.290E-02	8.939E-02	NOT IDENT.
PA-234	-2.222E-02	2.031E-01	4.229E-01	NOT IDENT.
PA-234M	5.671E-01	3.500E+00	7.760E+00	NOT IDENT.
TH-234	-1.770E-01	4.209E-01	9.157E-01	FAIL ABUN
U-234	-1.167E-02	7.259E-02	1.359E-01	NOT IDENT.
NP-237	7.044E-03	4.290E-02	8.939E-02	NOT IDENT.
NP-238	0.000E+00	1.135E+02	0.000E+00	SHORT HLIF
U-238	-1.770E-01	4.209E-01	9.157E-01	FAIL ABUN
NP-239	-2.610E-02	1.376E-01	2.726E-01	FAIL ABUN
PU-239	2.305E+02	1.883E+02	4.226E+02	NOT IDENT.
CM-243	0.000E+00	1.299E-01	1.024E-01	FAIL ABUN
BK-247	-4.190E-02	5.883E-02	8.496E-02	NOT IDENT.
CM-247	1.196E-02	2.390E-02	5.252E-02	NOT IDENT.
CF-249	-1.263E-02	2.687E-02	5.102E-02	NOT IDENT.
CF-251	-1.431E-02	7.545E-02	1.461E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RU-103	497.08	9	91.00*	2.375E+00	2.016E-02	2.953E-02	82.35
	610.33	-----	5.76	1.968E+00	-----	Line Not Found	-----
PB-212	74.82	38	10.28	7.677E+00	2.242E-01	2.242E-01	82.54
	77.11	19	17.10	7.649E+00	6.728E-02	6.728E-02	167.68
	238.63	17	43.60*	4.382E+00	4.091E-02	4.091E-02	148.41
	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
TH-228	74.82	38	10.28	7.677E+00	2.242E-01	2.242E-01	82.54
	77.11	19	17.10	7.649E+00	6.728E-02	6.728E-02	167.68
	238.63	17	43.60*	4.382E+00	4.091E-02	4.091E-02	148.41
	300.09	-----	3.30	3.668E+00	-----	Line Not Found	-----
U-235	89.96	-----	3.47	7.391E+00	-----	Line Not Found	-----
	93.35	8	5.60	7.322E+00	9.496E-02	9.496E-02	718.76
	143.76	-----	10.96*	6.093E+00	-----	Line Not Found	-----
	163.33	13	5.08	5.668E+00	2.021E-01	2.021E-01	186.27
	185.72	12	57.20	5.222E+00	1.880E-02	1.880E-02	232.68
	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
AM-241	59.54	43	35.90*	7.795E+00	7.021E-02	7.021E-02	77.85
AM-243	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
	74.66	38	67.20*	7.677E+00	3.429E-02	3.429E-02	82.54
ANH-511	511.00	12	100.00*	2.314E+00	2.427E-02	2.427E-02	207.93

Flag: "*" = Keyline

Total number of lines in spectrum 24
Number of unidentified lines 7
Number of lines tentatively identified by NID 17 70.83%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RU-103	39.26D	1.47	2.016E-02	2.953E-02	2.432E-02	82.35	
PB-212	1.41E+10Y	1.00	4.091E-02	4.091E-02	6.071E-02	148.41	
TH-228	1.41E+10Y	1.00	4.091E-02	4.091E-02	6.071E-02	148.41	
U-235	7.04E+08Y	1.00	1.880E-02	1.880E-02	4.374E-02	232.68	K
AM-241	432.60Y	1.00	7.021E-02	7.021E-02	5.466E-02	77.85	
AM-243	7370.00Y	1.00	3.429E-02	3.429E-02	2.830E-02	82.54	
ANH-511	1.00E+09Y	1.00	2.427E-02	2.427E-02	5.047E-02	207.93	
Total Activity :			2.495E-01	2.589E-01			

Grand Total Activity : 2.495E-01 2.589E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	103.73	74	41	7.81	207.72	198	21	1.56E-02	57.5	7.06E+00	T
0	260.55	19	6	2.03	521.28	517	8	4.33E-03	73.8	4.10E+00	T
0	283.13	19	28	3.91	566.44	559	12	4.44E-03	***	3.84E+00	T
0	447.46	16	9	1.22	895.02	890	11	3.84E-03	96.8	2.61E+00	
0	457.99	14	4	0.61	916.10	912	10	3.45E-03	85.8	2.55E+00	
0	462.90	8	0	1.48	925.90	922	7	2.04E-03	94.7	2.53E+00	T
0	487.04	9	5	0.80	974.18	968	10	2.29E-03	***	2.42E+00	T
0	492.95	11	2	0.93	986.01	982	8	2.84E-03	78.4	2.39E+00	T
0	516.63	6	4	0.72	1033.36	1029	7	1.53E-03	***	2.29E+00	
0	615.86	7	6	1.13	1231.80	1229	6	1.90E-03	***	1.95E+00	
0	674.11	9	3	3.84	1348.31	1342	10	2.34E-03	98.8	1.80E+00	
0	754.81	5	3	1.25	1509.70	1506	6	1.39E-03	***	1.62E+00	T
0	781.71	6	7	1.16	1563.51	1558	9	1.71E-03	***	1.57E+00	
0	840.34	9	2	0.92	1680.78	1676	8	2.29E-03	90.7	1.47E+00	
0	955.83	7	2	0.54	1911.78	1907	7	1.94E-03	99.2	1.30E+00	T

Flags: "T" = Tentatively associated


```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561373.CNF;1
* Acquisition date   : 28-JUN-2016 14:38:59 Sensitivity      : 3.000
* Detector ID        : GAM41 Energy tolerance: 1.500
* Elapsed live time  : 0 01:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 01:00:05.28 Half life ratio : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203561373 Analyst initials: MXR1
* Batch Number       : 1572231 Sample Quantity : 1.6252E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                                     Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
RU-103	2.405E-02
PB-212	3.244E-02
TH-228	3.244E-02
U-235	1.182E-01
AM-241	3.853E-02
AM-243	1.587E-02
ANH-511	1.401E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	2.173E-01	NOT IDENT.
NA-22	2.465E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.048E-02	NOT IDENT.
K-40	3.423E-01	NOT IDENT.
SC-46	2.660E-02	NOT IDENT.
V-48	4.998E-02	NOT IDENT.
CR-51	2.733E-01	NOT IDENT.
MN-54	2.359E-02	NOT IDENT.
CO-56	3.026E-02	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	1.153E-02	NOT IDENT.
CO-58	2.934E-02	NOT IDENT.
FE-59	5.800E-02	NOT IDENT.
CO-60	1.966E-02	NOT IDENT.
ZN-65	5.229E-02	NOT IDENT.
GE-68	7.722E-01	NOT IDENT.
AS-73	1.192E-01	NOT IDENT.
AS-74	9.440E-02	NOT IDENT.
SE-75	2.089E-02	NOT IDENT.
BR-77	4.501E+01	FAIL ABUN
SR-82	2.227E-01	NOT IDENT.
RB-83	3.827E-02	NOT IDENT.
KR-85	6.885E+00	NOT IDENT.

SR-85	3.906E-02	NOT IDENT.
RB-86	6.568E-01	NOT IDENT.
Y-88	2.399E-02	NOT IDENT.
Y-91	1.401E+01	NOT IDENT.
NB-94	2.433E-02	NOT IDENT.
NB-95	3.133E-02	NOT IDENT.
NB-95M	7.155E-02	NOT IDENT.
ZR-95	6.036E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	3.160E+01	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.727E-02	NOT IDENT.
RH-102	3.325E-02	NOT IDENT.
RH-106	2.179E-01	NOT IDENT.
RU-106	2.179E-01	NOT IDENT.
AG-108M	1.318E-02	NOT IDENT.
CD-109	2.879E-01	NOT IDENT.
AG-110M	2.975E-02	NOT IDENT.
SN-113	2.620E-02	NOT IDENT.
CD-115	4.417E+01	FAIL ABUN
SN-117M	3.437E-02	NOT IDENT.
TE-123M	1.299E-02	NOT IDENT.
SB-124	5.224E-02	NOT IDENT.
SB-125	5.827E-02	FAIL ABUN
TE-125M	4.585E+00	NOT IDENT.
I-126	2.070E-01	FAIL ABUN
SB-126	9.945E-02	NOT IDENT.
SN-126	2.623E-02	NOT IDENT.
SB-127	2.442E+00	NOT IDENT.
I-131	1.429E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	1.596E+00	NOT IDENT.
BA-133	2.374E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	2.969E-02	NOT IDENT.
CS-135	8.071E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	8.121E-02	NOT IDENT.
BA-137M	2.250E-02	NOT IDENT.
CS-137	2.377E-02	NOT IDENT.
CE-139	1.631E-02	NOT IDENT.
BA-140	1.505E-01	FAIL ABUN
LA-140	6.284E-02	FAIL ABUN
CE-141	3.825E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	8.442E-02	NOT IDENT.
PM-144	2.651E-02	NOT IDENT.
PR-144	1.991E+00	NOT IDENT.
PM-146	2.628E-02	NOT IDENT.
ND-147	3.879E-01	NOT IDENT.
PM-147	3.198E+02	NOT IDENT.
PM-149	3.696E+02	NOT IDENT.
EU-150	1.555E-02	NOT IDENT.
EU-152	6.098E-02	NOT IDENT.
GD-153	3.433E-02	FAIL ABUN
EU-154	6.901E-02	NOT IDENT.
EU-155	4.447E-02	NOT IDENT.
TB-160	7.174E-02	NOT IDENT.
HO-166M	3.995E-02	NOT IDENT.
TM-171	2.321E+00	NOT IDENT.
HF-172	9.180E-02	FAIL ABUN
LU-172	5.361E-02	FAIL ABUN
LU-176	1.498E-02	NOT IDENT.
HF-181	2.929E-02	NOT IDENT.
TA-182	1.279E-01	NOT IDENT.
RE-183	3.587E-02	FAIL ABUN
RE-184	9.852E-02	NOT IDENT.
W-188	4.430E+00	NOT IDENT.
IR-192	2.078E-02	NOT IDENT.
HG-203	2.294E-02	NOT IDENT.
BI-207	2.782E-02	FAIL ABUN
TL-208	2.413E-02	NOT IDENT.
PB-210	3.147E-01	NOT IDENT.
BI-211	1.435E-01	NOT IDENT.
PB-211	3.924E-01	NOT IDENT.
BI-212	2.445E-01	NOT IDENT.
BI-214	6.075E-02	NOT IDENT.

PB-214	5.236E-02	FAIL ABUN
RN-219	2.642E-01	NOT IDENT.
RN-222	6.075E-02	NOT IDENT.
RA-223	3.843E-01	NOT IDENT.
RA-224	3.985E-01	NOT IDENT.
RA-226	6.075E-02	NOT IDENT.
AC-227	1.376E-01	NOT IDENT.
TH-227	1.376E-01	NOT IDENT.
AC-228	8.157E-02	FAIL ABUN
RA-228	8.157E-02	FAIL ABUN
TH-229	2.541E-01	NOT IDENT.
TH-230	6.075E-02	NOT IDENT.
PA-231	2.695E-01	FAIL ABUN
TH-231	3.843E-01	NOT IDENT.
TH-232	8.157E-02	FAIL ABUN
PA-233	3.988E-02	NOT IDENT.
PA-234	1.709E-01	NOT IDENT.
PA-234M	3.272E+00	NOT IDENT.
TH-234	4.341E-01	FAIL ABUN
U-234	6.075E-02	NOT IDENT.
NP-237	3.988E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	4.341E-01	FAIL ABUN
NP-239	1.237E-01	FAIL ABUN
PU-239	1.947E+02	NOT IDENT.
CM-243	4.658E-02	FAIL ABUN
BK-247	3.702E-02	NOT IDENT.
CM-247	2.308E-02	NOT IDENT.
CF-249	2.214E-02	NOT IDENT.
CF-251	6.585E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561373.CNF;1
Acquisition date : 28-JUN-2016 14:38:59 Sensitivity : 3.000
Detector ID : GAM41 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:05.28 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561373 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.6252E+02 GRAM
Quantity Err(%) : 1.2306E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
RU-103	2.953E-02	2.398E-02	2.398E-02
PB-212	4.091E-02	5.962E-02	5.962E-02
TH-228	4.091E-02	5.962E-02	5.962E-02
U-235	8.712E-02	1.193E-01	1.193E-01
AM-241	7.021E-02	5.440E-02	5.440E-02
AM-243	3.429E-02	2.798E-02	2.798E-02
ANH-511	2.427E-02	4.951E-02	4.951E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.382E-02	2.380E-01	2.385E-01	NOT IDENT.
NA-22	1.360E-02	2.454E-02	2.530E-02	NOT IDENT.
NA-24	2.399E+08	6.292E+08	6.384E+08	SHORT HLIF
AL-26	-1.209E-02	2.954E-02	3.004E-02	NOT IDENT.
K-40	2.549E-01	3.314E-01	3.507E-01	NOT IDENT.
SC-46	1.059E-03	3.025E-02	3.025E-02	NOT IDENT.
V-48	-1.618E-02	6.257E-02	6.299E-02	NOT IDENT.
CR-51	1.782E-01	2.766E-01	2.881E-01	NOT IDENT.
MN-54	3.212E-03	3.014E-02	3.017E-02	NOT IDENT.
CO-56	6.750E-03	3.459E-02	3.472E-02	NOT IDENT.
MN-56	1.000E+41	5.015E+41	0.000E+00	SHORT HLIF
CO-57	4.654E-03	1.197E-02	1.215E-02	NOT IDENT.
CO-58	1.147E-02	3.097E-02	3.140E-02	NOT IDENT.
FE-59	-6.119E-02	8.377E-02	8.819E-02	NOT IDENT.
CO-60	4.269E-03	2.159E-02	2.167E-02	NOT IDENT.
ZN-65	2.218E-02	5.505E-02	5.595E-02	NOT IDENT.
GE-68	3.827E-02	8.907E-01	8.909E-01	NOT IDENT.
AS-73	7.864E-04	1.333E-01	1.333E-01	NOT IDENT.
AS-74	2.775E-02	1.047E-01	1.054E-01	NOT IDENT.
SE-75	-1.398E-02	3.110E-02	3.173E-02	NOT IDENT.
BR-77	4.241E+01	6.724E+01	6.991E+01	FAIL ABUN
SR-82	-3.102E-02	3.033E-01	3.036E-01	NOT IDENT.
RB-83	-1.672E-02	5.609E-02	5.659E-02	NOT IDENT.

KR-85	1.734E+01	5.755E+00	9.706E+00	NOT IDENT.
SR-85	9.830E-02	3.265E-02	5.504E-02	NOT IDENT.
RB-86	1.363E-01	7.313E-01	7.338E-01	NOT IDENT.
Y-88	-1.203E-02	2.361E-02	2.422E-02	NOT IDENT.
Y-91	9.454E+00	1.389E+01	1.453E+01	NOT IDENT.
NB-94	-1.661E-02	3.167E-02	3.254E-02	NOT IDENT.
NB-95	3.110E-02	2.956E-02	3.271E-02	NOT IDENT.
NB-95M	-3.491E-04	9.343E-02	9.343E-02	NOT IDENT.
ZR-95	8.300E-02	5.531E-02	6.678E-02	NOT IDENT.
NB-97	-1.000E+41	8.863E+40	0.000E+00	SHORT HLIF
ZR-97	7.768E+08	8.955E+08	9.615E+08	SHORT HLIF
MO-99	-1.526E+01	4.171E+01	4.227E+01	NOT IDENT.
TC-99M	-4.025E+23	1.228E+24	0.000E+00	SHORT HLIF
RH-101	9.563E-03	1.795E-02	1.846E-02	NOT IDENT.
RH-102	-7.113E-03	4.029E-02	4.042E-02	NOT IDENT.
RH-106	1.214E-01	2.330E-01	2.394E-01	NOT IDENT.
RU-106	1.214E-01	2.330E-01	2.394E-01	NOT IDENT.
AG-108M	-2.348E-02	1.979E-02	2.244E-02	NOT IDENT.
CD-109	-1.531E-01	3.717E-01	3.781E-01	NOT IDENT.
AG-110M	-4.498E-03	3.524E-02	3.530E-02	NOT IDENT.
SN-113	-3.178E-03	2.985E-02	2.988E-02	NOT IDENT.
CD-115	-1.671E+01	5.451E+01	5.503E+01	FAIL ABUN
SN-117M	1.720E-02	3.993E-02	4.068E-02	NOT IDENT.
TE-123M	-1.723E-03	1.679E-02	1.681E-02	NOT IDENT.
SB-124	1.628E-02	5.304E-02	5.354E-02	NOT IDENT.
SB-125	1.980E-02	6.233E-02	6.297E-02	FAIL ABUN
TE-125M	-6.655E+00	6.720E+00	7.359E+00	NOT IDENT.
I-126	-9.442E-02	2.795E-01	2.827E-01	FAIL ABUN
SB-126	7.216E-03	1.149E-01	1.149E-01	NOT IDENT.
SN-126	-4.035E-02	3.768E-02	4.184E-02	NOT IDENT.
SB-127	-7.858E-01	3.055E+00	3.076E+00	NOT IDENT.
I-131	1.347E-01	1.404E-01	1.530E-01	FAIL ABUN
I-132	1.000E+41	1.758E+41	0.000E+00	SHORT HLIF
TE-132	1.839E-01	1.788E+00	1.790E+00	NOT IDENT.
BA-133	-1.051E-02	2.801E-02	2.840E-02	NOT IDENT.
I-133	-3.867E+05	5.972E+05	6.221E+05	SHORT HLIF
CS-134	1.645E-02	3.049E-02	3.138E-02	NOT IDENT.
CS-135	-1.133E-02	9.468E-02	9.482E-02	NOT IDENT.
I-135	1.412E+22	4.281E+22	0.000E+00	SHORT HLIF
CS-136	-4.184E-02	1.067E-01	1.084E-01	NOT IDENT.
BA-137M	4.037E-03	2.540E-02	2.546E-02	NOT IDENT.
CS-137	4.265E-03	2.683E-02	2.690E-02	NOT IDENT.
CE-139	-4.401E-03	2.148E-02	2.158E-02	NOT IDENT.
BA-140	-3.019E-02	1.819E-01	1.824E-01	FAIL ABUN
LA-140	-5.235E-02	9.504E-02	9.793E-02	FAIL ABUN
CE-141	-3.365E-03	4.256E-02	4.259E-02	NOT IDENT.
CE-143	-6.081E+02	2.068E+03	2.086E+03	SHORT HLIF
CE-144	-6.536E-02	1.018E-01	1.060E-01	NOT IDENT.
PM-144	1.090E-02	2.906E-02	2.947E-02	NOT IDENT.
PR-144	8.182E-01	2.182E+00	2.213E+00	NOT IDENT.
PM-146	2.369E-02	3.295E-02	3.464E-02	NOT IDENT.
ND-147	-1.490E-01	4.835E-01	4.881E-01	NOT IDENT.
PM-147	-1.339E+02	3.665E+02	3.714E+02	NOT IDENT.
PM-149	9.853E+01	4.661E+02	4.682E+02	NOT IDENT.
EU-150	-1.182E-03	1.736E-02	1.736E-02	NOT IDENT.
EU-152	2.480E-03	6.720E-02	6.721E-02	NOT IDENT.
GD-153	1.495E-02	5.342E-02	5.384E-02	FAIL ABUN
EU-154	3.724E-02	6.889E-02	7.091E-02	NOT IDENT.
EU-155	-5.068E-03	4.870E-02	4.876E-02	NOT IDENT.
TB-160	3.487E-03	8.112E-02	8.114E-02	NOT IDENT.
HO-166M	1.202E-02	4.426E-02	4.460E-02	NOT IDENT.
TM-171	1.664E+00	2.288E+00	2.408E+00	NOT IDENT.
HF-172	4.149E-03	9.983E-02	9.984E-02	FAIL ABUN
LU-172	3.944E-02	5.477E-02	5.759E-02	FAIL ABUN
LU-176	-3.283E-04	1.651E-02	1.651E-02	NOT IDENT.
HF-181	-6.558E-03	4.022E-02	4.033E-02	NOT IDENT.
TA-182	2.386E-03	1.505E-01	1.505E-01	NOT IDENT.
RE-183	2.870E-02	3.862E-02	4.073E-02	FAIL ABUN
RE-184	4.893E-02	1.020E-01	1.044E-01	NOT IDENT.
W-188	2.991E+00	4.643E+00	4.834E+00	NOT IDENT.
IR-192	-1.141E-02	2.454E-02	2.508E-02	NOT IDENT.
HG-203	-1.386E-04	3.039E-02	3.039E-02	NOT IDENT.
BI-207	-1.559E-02	3.702E-02	3.768E-02	FAIL ABUN
TL-208	-5.535E-03	2.913E-02	2.924E-02	NOT IDENT.
PB-210	-3.737E-01	3.141E-01	3.564E-01	NOT IDENT.
BI-211	-6.106E-02	1.668E-01	1.690E-01	NOT IDENT.
PB-211	1.083E-01	4.204E-01	4.232E-01	NOT IDENT.
BI-212	2.564E-02	2.803E-01	2.806E-01	NOT IDENT.

BI-214	-1.167E-02	7.260E-02	7.279E-02	NOT IDENT.
PB-214	4.861E-03	5.752E-02	5.757E-02	FAIL ABUN
RN-219	1.751E-01	2.695E-01	2.808E-01	NOT IDENT.
RN-222	-1.167E-02	7.260E-02	7.279E-02	NOT IDENT.
RA-223	-4.327E-02	4.298E-01	4.302E-01	NOT IDENT.
RA-224	2.326E-01	4.814E-01	4.927E-01	NOT IDENT.
RA-226	-1.167E-02	7.260E-02	7.279E-02	NOT IDENT.
AC-227	-3.150E-03	1.815E-01	1.815E-01	NOT IDENT.
TH-227	-3.150E-03	1.815E-01	1.815E-01	NOT IDENT.
AC-228	-7.919E-02	1.047E-01	1.106E-01	FAIL ABUN
RA-228	-7.919E-02	1.047E-01	1.106E-01	FAIL ABUN
TH-229	-1.007E-01	2.999E-01	3.034E-01	NOT IDENT.
TH-230	-1.167E-02	7.260E-02	7.279E-02	NOT IDENT.
PA-231	-4.922E-02	3.026E-01	3.034E-01	FAIL ABUN
TH-231	-4.327E-02	4.298E-01	4.302E-01	NOT IDENT.
TH-232	-7.919E-02	1.047E-01	1.106E-01	FAIL ABUN
PA-233	7.044E-03	4.290E-02	4.302E-02	NOT IDENT.
PA-234	-2.222E-02	2.047E-01	2.049E-01	NOT IDENT.
PA-234M	5.671E-01	3.501E+00	3.511E+00	NOT IDENT.
TH-234	-1.770E-01	4.232E-01	4.306E-01	FAIL ABUN
U-234	-1.167E-02	7.260E-02	7.279E-02	NOT IDENT.
NP-237	7.044E-03	4.290E-02	4.302E-02	NOT IDENT.
NP-238	3.230E+01	1.136E+02	1.145E+02	SHORT HLIF
U-238	-1.770E-01	4.232E-01	4.306E-01	FAIL ABUN
NP-239	-2.610E-02	1.377E-01	1.382E-01	FAIL ABUN
PU-239	2.305E+02	1.902E+02	2.167E+02	NOT IDENT.
CM-243	2.305E-01	1.330E-01	1.688E-01	FAIL ABUN
BK-247	-4.190E-02	5.952E-02	6.244E-02	NOT IDENT.
CM-247	1.196E-02	2.400E-02	2.460E-02	NOT IDENT.
CF-249	-1.263E-02	2.690E-02	2.750E-02	NOT IDENT.
CF-251	-1.431E-02	7.547E-02	7.575E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	76.9236	87.09	51.3386	136.47	29.8492
45.60	42.1352	87.57	61.6464	140.51	35.9657
46.54	42.2142	88.03	51.1532	143.76	25.0572
49.72	72.5627	88.34	57.1951	144.24	27.0746
51.35	29.2920	88.47	57.2050	145.44	38.1502
51.87	29.3204	89.96	40.7266	152.43	31.3335
52.39	29.3486	90.64	48.3121	153.25	24.2770
52.97	28.4896	91.11	55.8957	154.21	28.3491
53.44	38.0189	92.59	51.0850	156.02	33.4683
54.07	37.1109	93.35	51.1355	158.56	17.8922
57.36	0.0000	94.56	34.9025	159.00	24.4083
57.53	28.7231	94.65	34.9065	162.33	24.4832
57.98	28.7455	94.67	34.9075	162.66	33.6745
59.27	81.9272	94.87	37.9527	163.33	28.5898
59.32	81.9342	97.43	26.6537	165.86	36.0239
59.54	81.9651	98.43	30.4999	176.31	37.1846
60.96	122.7929	98.44	30.5002	176.60	36.1608
61.17	122.8363	99.53	34.3596	177.52	31.0197
62.93	36.2345	100.11	35.1486	181.07	38.1666
63.29	36.2561	102.03	32.5514	181.52	38.1813
63.58	30.4696	103.18	32.5972	184.41	24.9617
64.28	27.5994	103.37	32.6048	185.72	16.6594
66.73	104.8193	105.21	32.6776	193.51	29.3424
67.24	95.7823	105.31	32.6815	197.03	29.4261
67.68	60.2481	106.12	32.7134	198.01	32.6045
67.75	60.2546	106.47	32.7271	201.83	45.3637
69.67	36.6283	109.28	52.5381	203.43	34.8581
70.83	35.2261	111.00	34.0639	205.31	30.6782
72.81	39.7494	111.76	32.5442	210.85	27.6232
72.87	39.7530	114.06	39.8173	215.65	22.3931
74.66	47.9796	116.30	34.0771	222.11	21.4307
74.82	47.9911	116.74	35.0682	227.09	21.5096
74.97	48.0018	119.76	32.2548	227.38	24.7412
77.11	48.1533	121.12	29.3667	228.16	24.7555
78.74	46.0398	121.22	31.3279	228.18	24.7558
79.69	43.1283	121.78	22.5309	235.69	29.4358
80.12	44.6429	122.06	22.5378	235.96	27.7096
80.19	44.6473	122.92	24.5207	238.63	29.2806
80.57	46.1606	123.07	24.5247	238.98	28.2030
81.00	40.2289	123.68	39.2656	240.99	29.5466
81.07	40.2330	125.81	31.4850	242.00	31.3071
81.75	40.2716	127.23	32.5182	244.70	24.8938
83.79	37.3952	127.91	32.5420	252.40	16.4236
84.00	40.2115	129.30	25.6769	252.80	16.4281
85.43	53.4088	131.20	38.5927	254.15	0.0000
86.55	54.6973	133.02	32.7175	256.23	22.8335
86.79	56.3242	133.52	32.7344	260.90	15.8574
86.94	56.3358	136.00	27.8458	264.66	21.1963

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	21.1983	364.49	13.1159	600.60	21.8362
265.00	26.5012	366.42	15.0051	602.52	0.0000
268.22	22.1313	372.51	15.9942	604.72	27.0772
269.46	19.9344	375.05	14.1312	607.14	19.8048
270.03	15.5103	377.52	18.8657	609.32	22.0229
271.23	24.3922	383.85	15.1420	610.33	19.3808
273.65	21.0993	388.16	19.9177	614.28	15.6764
276.40	28.4789	388.63	18.9736	618.01	6.9769
277.37	21.3724	391.69	16.1527	620.36	13.9658
277.60	21.3756	400.66	15.2711	621.93	8.1513
278.00	23.1629	401.81	12.4149	630.19	0.0000
279.20	21.3976	402.40	12.4184	631.29	11.5675
279.54	23.1854	404.85	11.4771	633.25	8.4186
279.70	23.1880	410.95	15.3488	634.78	16.8465
280.46	16.0609	413.71	12.4877	635.95	11.5868
283.69	19.6703	414.70	11.5326	636.99	7.3761
284.31	14.3113	423.72	17.3744	645.85	8.4564
285.41	12.5310	427.09	12.5684	657.76	16.9840
285.90	16.1163	427.87	13.5401	657.90	0.0000
287.50	17.9250	433.94	20.3686	661.66	9.5665
290.67	14.5929	439.40	10.6965	664.57	0.0000
293.27	0.0000	453.88	6.5262	666.33	15.9697
295.22	24.3148	463.37	9.8314	666.50	11.9781
295.96	23.4248	468.07	9.8522	667.71	0.0000
298.58	16.2433	473.00	16.7854	677.62	8.9067
299.98	19.8698	475.06	15.8123	685.70	10.7175
300.09	19.8712	476.78	8.9012	695.00	12.9012
300.13	19.8716	477.60	9.8938	696.49	11.8320
301.36	23.5022	482.18	14.8705	696.51	11.8323
302.85	18.0947	487.02	6.6230	697.00	12.9100
304.50	17.2072	492.35	3.3192	697.30	13.9871
304.85	17.2109	497.08	9.9777	697.49	15.0640
306.78	19.9515	505.52	11.6825	702.65	20.4793
308.46	22.6947	507.63	0.0000	706.68	11.8723
311.90	20.9221	511.00	8.3639	711.68	8.6486
316.51	24.6273	514.00	0.0000	720.70	5.4215
319.41	16.4461	514.00	0.0000	721.93	0.0000
320.08	15.5384	520.40	11.7552	722.78	6.5102
321.04	21.0344	520.69	8.3976	722.91	6.5105
323.87	22.9007	522.65	0.0000	723.31	3.2556
325.23	23.8354	527.90	11.1179	724.19	7.5987
328.76	22.0465	528.26	10.1086	727.33	5.4331
333.37	22.1045	529.59	10.1140	733.00	7.6204
333.97	20.2692	529.87	0.0000	735.93	5.4482
334.37	19.3522	531.02	9.1081	737.46	7.6313
338.28	19.3948	537.26	6.0875	739.50	8.7271
338.32	19.3953	546.56	0.0000	747.24	8.7488
340.48	22.1927	552.55	9.1872	748.06	8.2042
340.55	22.1936	563.25	5.1255	752.31	10.9536
344.28	21.3129	569.33	11.3029	753.82	13.1508
345.93	23.1873	569.50	11.3035	756.73	1.8282
351.06	27.9031	569.70	11.3045	756.80	1.8282
351.93	21.4025	583.19	10.3303	763.94	10.9939
355.39	0.0000	584.27	7.2341	765.81	2.7501
356.01	21.4499	595.83	15.5695	766.42	4.5844

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	7.3358	1002.74	5.8796	1678.03	0.0000
772.60	0.0000	1004.73	6.8631	1690.97	0.9684
776.52	7.8835	1021.30	0.0000	1750.46	0.0000
777.92	4.7322	1025.87	0.0000	1764.49	2.9411
778.90	9.4671	1028.54	0.0000	1770.23	2.9439
783.70	7.9009	1037.84	7.9092	1771.35	2.9444
785.37	6.3239	1038.76	0.0000	1791.20	0.0000
792.07	11.0896	1046.59	4.9540	1808.65	3.9499
794.95	4.6247	1048.07	7.9294	1810.72	0.0000
795.86	7.4017	1049.04	10.9056	1836.06	0.0000
801.95	11.1230	1050.41	11.9009		
810.06	5.5751	1063.66	7.9596		
810.29	5.5754	1077.00	5.9893		
810.45	7.4342	1077.34	5.9897		
810.76	7.4349	1085.87	11.0036		
815.77	8.3769	1093.63	6.0132		
818.51	4.6576	1099.45	10.0358		
832.01	5.1013	1112.07	10.0659		
834.85	8.0230	1112.84	9.0612		
835.71	6.4201	1115.54	4.0296		
836.80	0.0000	1120.29	7.0598		
846.75	0.0000	1120.55	7.0601		
846.77	9.0172	1121.30	5.0439		
856.80	8.4780	1129.67	5.0537		
860.56	8.4871	1131.51	0.0000		
871.09	6.6210	1147.95	0.0000		
873.19	8.5177	1173.23	3.0627		
875.33	0.0000	1177.95	4.0881		
879.38	4.7404	1189.05	5.1229		
880.51	5.6903	1204.77	3.0845		
883.24	6.6437	1221.41	8.2555		
884.68	7.5959	1231.02	7.2390		
889.28	7.6056	1235.36	6.2107		
894.76	8.5695	1238.28	3.1073		
898.04	6.6712	1260.41	0.0000		
900.72	6.6761	1271.87	4.1732		
903.28	5.7264	1274.44	2.0877		
911.20	8.6085	1274.54	2.0877		
912.08	3.8269	1291.59	7.3335		
923.98	0.0000	1298.22	0.0000		
926.50	10.5654	1312.11	6.3130		
929.11	11.5342	1332.49	2.1132		
937.49	8.6702	1362.66	0.0000		
944.13	6.7555	1365.19	1.0636		
946.00	6.7589	1368.63	0.0000		
949.00	2.8990	1384.29	8.5417		
954.55	0.0000	1408.01	1.0728		
962.31	3.8789	1457.56	0.0000		
964.08	5.8210	1460.82	1.8580		
966.17	7.7658	1489.16	2.8019		
968.97	12.6287	1505.03	1.8735		
983.53	6.8258	1584.12	4.7522		
984.45	0.0000	1596.21	4.7625		
996.26	9.7833	1620.50	1.9132		
1001.03	3.9181	1621.92	0.9569		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 15:48:20.70

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561374.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;136
Background date    : 26-JUN-2016 12:06:18
Sample date       : 11-MAY-2016 11:25:00 Acquisition date : 28-JUN-2016 14:39:35
Sample ID        : G1203561374 Sample quantity : 1.52710E+02 GRAM
Detector name     : GAM43 Detector geometry: CAN
Elapsed live time : 0 01:00:00.00 Elapsed real time: 0 01:00:00.67 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572231 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	74.88*	58	96	1.07	149.55	144	15	1.61E-02	30.3	7.63E-01
2	2	77.01	96	135	1.36	153.81	144	15	2.67E-02	23.7	
3	1	87.48*	42	114	1.27	174.77	171	21	1.16E-02	47.4	2.66E+00
4	1	90.14	31	113	1.27	180.09	171	21	8.75E-03	60.2	
5	1	92.71*	49	110	1.28	185.23	171	21	1.37E-02	42.3	
6	1	94.21	32	109	1.28	188.23	171	21	8.88E-03	64.4	
7	6	118.59	27	66	1.22	237.00	234	9	7.41E-03	47.9	4.55E+00
8	6	120.12	19	64	1.08	240.05	234	9	5.33E-03	75.4	
9	0	164.50	41	191	5.18	328.84	321	17	1.14E-02	78.8	
10	0	185.79*	61	120	1.86	371.44	367	11	1.70E-02	37.8	
11	0	208.94	21	113	0.97	417.76	413	9	5.70E-03	96.4	
12	0	238.60*	240	101	1.23	477.10	472	9	6.67E-02	10.1	
13	0	270.29	23	51	1.27	540.49	537	6	6.29E-03	55.4	
14	0	283.38	57	39	2.71	566.67	562	10	1.59E-02	24.5	
15	0	287.77	27	37	1.13	575.46	572	8	7.58E-03	42.7	
16	0	295.06*	85	60	1.07	590.04	585	10	2.36E-02	20.6	
17	0	339.51	48	102	1.26	678.95	667	14	1.34E-02	46.6	
18	0	351.50*	143	96	1.43	702.95	695	16	3.97E-02	17.6	
19	0	510.60*	36	45	1.13	1021.23	1014	14	9.95E-03	50.4	
20	0	540.37	15	42	3.72	1080.78	1073	15	4.14E-03	100.9	
21	0	583.32*	53	50	1.10	1166.69	1160	14	1.46E-02	31.9	
22	0	608.99*	81	33	1.44	1218.04	1212	12	2.25E-02	18.4	
23	0	629.36	40	15	6.15	1258.79	1250	20	1.10E-02	28.8	
24	0	661.46	1101	52	1.44	1323.01	1315	16	3.06E-01	3.4	
25	0	684.24	11	13	1.39	1368.57	1361	10	2.92E-03	70.1	
26	0	692.30	12	6	0.99	1384.70	1379	11	3.19E-03	49.3	
27	0	727.23	22	15	1.36	1454.56	1447	12	6.05E-03	41.6	
28	0	741.11	13	2	1.11	1482.33	1479	8	3.73E-03	32.4	
29	0	749.40	11	0	1.94	1498.91	1496	7	3.06E-03	30.2	
30	0	755.61	13	5	2.51	1511.35	1506	10	3.61E-03	42.5	
31	0	768.98	8	10	1.51	1538.08	1532	9	2.15E-03	84.9	
32	0	771.81*	11	5	1.89	1543.75	1540	7	3.07E-03	47.6	
33	0	795.22	11	14	0.86	1590.57	1584	10	2.92E-03	74.7	
34	0	852.16	18	11	3.55	1704.47	1697	15	5.06E-03	46.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	911.65*	54	20	1.76	1823.46	1814	16	1.49E-02	23.5	
36	0	934.10	15	2	2.03	1868.38	1864	9	4.08E-03	32.0	
37	0	965.70	10	14	0.63	1931.58	1921	12	2.76E-03	83.6	
38	0	969.35	34	2	1.49	1938.88	1934	11	9.34E-03	19.6	
39	0	1004.37	11	5	3.81	2008.94	2002	11	2.99E-03	51.9	
40	0	1050.51	8	10	3.17	2101.22	2094	13	2.19E-03	89.4	
41	0	1095.90	7	4	1.45	2192.00	2187	9	1.99E-03	64.0	
42	0	1120.13	34	7	1.97	2240.46	2233	13	9.51E-03	23.0	
43	0	1149.47	7	3	1.31	2299.16	2295	8	1.92E-03	61.5	
44	0	1192.10	12	0	0.83	2384.42	2379	12	3.33E-03	28.9	
45	0	1332.36	9	4	1.72	2664.97	2656	12	2.36E-03	53.9	
46	0	1460.45*	124	14	2.29	2921.15	2914	14	3.44E-02	11.1	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 15:48:22

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561374.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 11-MAY-2016 11:25:00 Acquisition date : 28-JUN-2016 14:39:35
Sample ID        : G1203561374 Sample quantity  : 152.71 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA43 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:00.67 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.017E+00	5.432E+00	5.432E+00	22.28	OK
CD-109	88.03	3.70*	4.689E+00	8.986E-01	9.660E-01	161.83	OK
SN-126	64.28	9.60	1.984E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.689E+00	3.736E-01	3.736E-01	161.83	OK
	87.57	37.00*	4.689E+00	8.986E-02	8.986E-02	161.83	OK
BA-137M	661.66	89.90*	2.125E+00	2.983E+00	2.992E+00	6.70	OK
CS-137	661.66	85.10*	2.125E+00	3.152E+00	3.161E+00	6.70	OK
CE-139	165.86	80.00*	5.716E+00	5.321E-02	6.781E-02	157.52	OK
PM-147	121.22	0.00*	6.080E+00	6.754E+02	6.994E+02	150.74	OK
TL-208	277.37	6.60	4.073E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.355E+00	1.381E-01	1.381E-01	63.72	OK
	860.56	12.50	1.682E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.352E+00	6.910E-01	6.910E-01	96.17	OK
	77.11	17.10	3.609E+00	9.865E-01	9.865E-01	47.39	OK
	238.63	43.60*	4.535E+00	6.951E-01	6.951E-01	20.15	OK
	300.09	3.30	3.848E+00	----- Line	Not Found	-----	Absent
BI-214	609.32	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75	OK
	1120.29	14.92	1.304E+00	8.606E-01	8.607E-01	46.07	OK
	1764.49	15.30	8.855E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	3.345E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.609E+00	1.739E+00	1.739E+00	47.39	OK
	277.09	3.41	4.655E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.490E+00	----- Line	Not Found	-----	Absent
	295.22	18.42	3.895E+00	6.652E-01	6.653E-01	41.26	OK
	351.93	35.60*	3.433E+00	6.450E-01	6.451E-01	35.16	OK
RN-222	609.32	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75	OK
	1120.29	14.92	1.304E+00	8.606E-01	8.607E-01	46.07	OK
	1764.49	15.30	8.855E-01	----- Line	Not Found	-----	Absent
RA-226	609.32	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75	OK
	1120.29	14.92	1.304E+00	8.606E-01	8.607E-01	46.07	OK
	1764.49	15.30	8.855E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.520E+00	6.727E-01	6.727E-01	93.27	OK
	794.95	4.25	1.810E+00	6.933E-01	6.933E-01	149.38	OK
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.593E+00	6.543E-01	6.543E-01	46.91	OK
	968.97	15.80	1.502E+00	7.047E-01	7.047E-01	39.24	OK
RA-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.520E+00	6.727E-01	6.727E-01	93.27	OK
	794.95	4.25	1.810E+00	6.933E-01	6.933E-01	149.38	OK
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.593E+00	6.543E-01	6.543E-01	46.91	OK
	968.97	15.80	1.502E+00	7.047E-01	7.047E-01	39.24	OK
TH-228	74.82	10.28	3.352E+00	6.910E-01	6.910E-01	96.17	OK
	77.11	17.10	3.609E+00	9.865E-01	9.865E-01	47.39	OK
	238.63	43.60*	4.535E+00	6.951E-01	6.951E-01	20.15	OK
	300.09	3.30	3.848E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75	OK
	1120.29	14.92	1.304E+00	8.606E-01	8.606E-01	46.07	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-232	1764.49	15.30	8.855E-01	----- Line	Not Found	-----	Absent
	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.520E+00	6.727E-01	6.727E-01	93.27	OK
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
U-234	911.20	25.80*	1.593E+00	6.543E-01	6.543E-01	46.91	OK
	968.97	15.80	1.502E+00	7.047E-01	7.047E-01	39.24	OK
	609.32	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75	OK
	1120.29	14.92	1.304E+00	8.606E-01	8.606E-01	46.07	OK
U-235	1764.49	15.30	8.855E-01	----- Line	Not Found	-----	Absent
	89.96	3.47	4.909E+00	1.156E+00	1.156E+00	120.50	OK
	93.35	5.60	5.101E+00	1.079E+00	1.079E+00	84.54	OK
	143.76	10.96*	6.014E+00	----- Line	Not Found	-----	Absent
AM-243	163.33	5.08	5.716E+00	8.380E-01	8.380E-01	157.52	OK
	185.72	57.20	5.352E+00	1.172E-01	1.172E-01	75.65	OK
	205.31	5.01	5.027E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	1.429E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.352E+00	1.057E-01	1.057E-01	96.17	OK
	511.00	100.00*	2.612E+00	7.290E-02	7.290E-02	100.89	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561374.CNF;1
Acquisition date : 28-JUN-2016 14:39:35 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.67 Half life ratio : *****
Sample date : 11-MAY-2016 11:25:00 Analyst initials: MXR1
Sample ID : G1203561374 Sample Quantity : 1.5271E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.432E+00	1.186E+00	8.857E-01
CD-109	9.660E-01	1.532E+00	1.765E+00
SN-126	8.986E-02	1.425E-01	1.655E-01
BA-137M	2.992E+00	1.965E-01	7.399E-02
CS-137	3.161E+00	2.076E-01	7.816E-02
CE-139	6.781E-02	1.047E-01	7.151E-02
PM-147	6.994E+02	1.033E+03	1.560E+03
TL-208	1.381E-01	8.624E-02	7.646E-02
PB-212	6.951E-01	1.373E-01	1.611E-01
BI-214	4.095E-01	1.475E-01	1.592E-01
PB-214	6.451E-01	2.222E-01	1.683E-01
RN-222	4.095E-01	1.475E-01	1.592E-01
RA-226	4.095E-01	1.475E-01	1.592E-01
AC-228	6.543E-01	3.008E-01	2.575E-01
RA-228	6.543E-01	3.008E-01	2.575E-01
TH-228	6.951E-01	1.373E-01	1.611E-01
TH-230	4.095E-01	1.475E-01	1.592E-01
TH-232	6.543E-01	3.008E-01	2.575E-01
U-234	4.095E-01	1.475E-01	1.592E-01
U-235	2.263E-01	2.214E-01	4.480E-01
AM-243	1.057E-01	9.962E-02	1.228E-01
ANH-511	7.290E-02	7.208E-02	6.329E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L.	Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.181E-01		6.992E-01	1.333E+00	NOT IDENT.
NA-22	-1.634E-03		3.432E-02	6.967E-02	NOT IDENT.
NA-24	0.000E+00		4.245E+21	0.000E+00	SHORT HLIF
AL-26	-5.418E-03		2.909E-02	6.083E-02	NOT IDENT.
SC-46	1.508E-02		5.043E-02	1.025E-01	FAIL ABUN
V-48	-2.441E-01		2.918E-01	4.794E-01	NOT IDENT.
CR-51	2.792E-01		1.086E+00	2.114E+00	NOT IDENT.
MN-54	5.403E-04		3.552E-02	6.967E-02	NOT IDENT.

CO-56	-3.374E-03	6.272E-02	1.029E-01	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.648E-02	3.256E-02	5.329E-02	NOT IDENT.
CO-58	1.416E-02	4.730E-02	9.778E-02	NOT IDENT.
FE-59	-4.945E-02	1.305E-01	2.042E-01	NOT IDENT.
CO-60	3.761E-02	3.975E-02	8.868E-02	FAIL ABUN
ZN-65	1.140E-01	9.973E-02	2.108E-01	NOT IDENT.
GE-68	6.473E-01	1.058E+00	2.410E+00	NOT IDENT.
AS-73	1.059E+00	2.640E+00	5.203E+00	NOT IDENT.
AS-74	-2.497E-01	4.102E-01	7.064E-01	NOT IDENT.
SE-75	4.521E-03	6.916E-02	1.184E-01	FAIL ABUN
BR-77	0.000E+00	3.258E+05	0.000E+00	SHORT HLIF
SR-82	8.355E-01	8.177E-01	1.683E+00	NOT IDENT.
RB-83	-7.701E-02	9.919E-02	1.698E-01	NOT IDENT.
KR-85	1.471E+01	8.229E+00	1.686E+01	NOT IDENT.
SR-85	1.101E-01	6.169E-02	1.264E-01	NOT IDENT.
RB-86	1.620E+00	2.167E+00	4.988E+00	NOT IDENT.
Y-88	-1.318E-03	4.273E-02	9.230E-02	NOT IDENT.
Y-91	-2.198E+01	2.484E+01	4.123E+01	NOT IDENT.
NB-94	6.978E-03	2.824E-02	5.785E-02	NOT IDENT.
NB-95	3.212E-02	6.310E-02	1.161E-01	NOT IDENT.
NB-95M	1.347E-01	2.319E-01	3.948E-01	NOT IDENT.
ZR-95	1.085E-01	9.034E-02	2.101E-01	FAIL ABUN
NB-97	0.000E+00	1.889E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.525E+20	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.042E+04	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	8.139E-03	3.533E-02	6.915E-02	NOT IDENT.
RH-102	3.962E-02	5.798E-02	1.218E-01	NOT IDENT.
RU-103	-1.813E-02	7.916E-02	1.459E-01	FAIL ABUN
RH-106	-1.588E-01	3.894E-01	6.120E-01	FAIL ABUN
RU-106	-1.588E-01	3.894E-01	6.120E-01	FAIL ABUN
AG-108M	5.529E-03	4.556E-02	8.545E-02	NOT IDENT.
AG-110M	2.680E-02	4.959E-02	1.055E-01	NOT IDENT.
SN-113	3.191E-02	7.297E-02	1.421E-01	NOT IDENT.
CD-115	0.000E+00	3.932E+05	0.000E+00	SHORT HLIF
SN-117M	-1.264E-01	3.733E-01	6.052E-01	NOT IDENT.
TE-123M	1.404E-03	4.215E-02	7.076E-02	NOT IDENT.
SB-124	-3.314E-02	6.223E-02	1.462E-01	NOT IDENT.
SB-125	3.025E-03	1.317E-01	2.467E-01	NOT IDENT.
TE-125M	7.773E+00	1.691E+01	3.374E+01	NOT IDENT.
I-126	8.305E-01	1.561E+00	2.838E+00	NOT IDENT.
SB-126	4.233E-01	8.711E-01	1.644E+00	NOT IDENT.
SB-127	0.000E+00	5.708E+02	0.000E+00	SHORT HLIF
I-131	-3.177E+00	2.581E+00	4.417E+00	FAIL ABUN
I-132	0.000E+00	1.285E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.147E+03	0.000E+00	SHORT HLIF
BA-133	4.852E-03	6.335E-02	1.054E-01	NOT IDENT.
I-133	0.000E+00	2.026E+15	0.000E+00	SHORT HLIF
CS-134	3.603E-02	5.275E-02	8.625E-02	FAIL ABUN
CS-135	4.330E-02	2.364E-01	3.832E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	2.275E-01	7.168E-01	1.298E+00	FAIL ABUN
BA-140	-3.347E-01	2.590E+00	4.055E+00	NOT IDENT.
LA-140	-1.214E-01	4.911E-01	9.832E-01	NOT IDENT.
CE-141	1.292E-01	1.388E-01	2.798E-01	NOT IDENT.
CE-143	0.000E+00	3.497E+09	0.000E+00	SHORT HLIF
CE-144	-3.850E-02	2.258E-01	4.313E-01	NOT IDENT.
PM-144	-1.749E-02	3.349E-02	5.056E-02	NOT IDENT.
PR-144	-1.332E+00	2.550E+00	3.850E+00	NOT IDENT.
PM-146	6.731E-03	6.758E-02	1.259E-01	NOT IDENT.
ND-147	1.976E+00	5.591E+00	1.081E+01	FAIL ABUN
PM-149	0.000E+00	3.930E+06	0.000E+00	SHORT HLIF
EU-150	4.077E-03	3.800E-02	6.391E-02	FAIL ABUN
EU-152	-4.126E-02	1.496E-01	2.089E-01	NOT IDENT.
GD-153	6.305E-03	1.125E-01	1.969E-01	NOT IDENT.
EU-154	-9.502E-03	9.437E-02	1.898E-01	FAIL ABUN
EU-155	-5.510E-02	1.176E-01	2.241E-01	FAIL ABUN
TB-160	-3.487E-03	1.601E-01	3.146E-01	FAIL ABUN
HO-166M	2.551E-02	5.203E-02	1.100E-01	FAIL ABUN
TM-171	-1.860E+00	4.464E+01	8.555E+01	NOT IDENT.
HF-172	-6.380E-02	2.164E-01	4.111E-01	NOT IDENT.
LU-172	0.000E+00	7.157E-02	1.226E-01	FAIL ABUN
LU-176	1.488E-02	3.405E-02	6.715E-02	FAIL ABUN
HF-181	-3.316E-03	1.051E-01	1.948E-01	NOT IDENT.
TA-182	-3.044E-03	1.757E-01	3.542E-01	FAIL ABUN
RE-183	-5.712E-02	5.123E-01	9.702E-01	NOT IDENT.
RE-184	2.358E-02	2.582E-01	4.411E-01	NOT IDENT.

W-188	3.491E+00	1.777E+01	2.122E+01	NOT IDENT.
IR-192	-4.692E-02	5.921E-02	1.070E-01	FAIL ABUN
HG-203	2.842E-02	8.375E-02	1.392E-01	NOT IDENT.
BI-207	-1.122E-02	5.218E-02	1.003E-01	FAIL ABUN
PB-210	1.984E+00	1.098E+01	2.163E+01	NOT IDENT.
BI-211	0.000E+00	6.123E-01	7.911E-01	FAIL ABUN
PB-211	-6.352E-01	9.396E-01	1.672E+00	NOT IDENT.
BI-212	8.538E-01	6.960E-01	1.232E+00	FAIL ABUN
RN-219	3.750E-01	5.178E-01	1.033E+00	FAIL ABUN
RA-223	-1.691E-01	8.394E-01	1.579E+00	FAIL ABUN
RA-224	0.000E+00	1.077E+00	2.017E+00	NOT IDENT.
AC-227	-1.343E-01	3.030E-01	5.392E-01	NOT IDENT.
TH-227	-1.343E-01	3.030E-01	5.392E-01	NOT IDENT.
TH-229	-5.688E-01	6.113E-01	1.074E+00	FAIL ABUN
PA-231	1.807E-01	6.484E-01	1.192E+00	FAIL ABUN
TH-231	-1.691E-01	8.394E-01	1.579E+00	FAIL ABUN
PA-233	4.895E-03	7.959E-02	1.528E-01	FAIL ABUN
PA-234	-1.006E-01	2.694E-01	4.927E-01	FAIL ABUN
PA-234M	9.417E-02	5.388E+00	9.027E+00	NOT IDENT.
TH-234	-1.060E+00	2.123E+00	3.934E+00	FAIL ABUN
NP-237	4.895E-03	7.959E-02	1.528E-01	FAIL ABUN
NP-238	0.000E+00	9.821E+05	0.000E+00	SHORT HLIF
U-238	-1.060E+00	2.123E+00	3.934E+00	FAIL ABUN
NP-239	1.788E-01	3.182E-01	5.726E-01	NOT IDENT.
PU-239	1.664E+02	3.839E+02	7.573E+02	NOT IDENT.
AM-241	-3.178E-02	2.652E-01	5.012E-01	NOT IDENT.
CM-243	-7.157E-02	1.131E-01	2.138E-01	NOT IDENT.
BK-247	3.903E-03	1.037E-01	1.769E-01	FAIL ABUN
CM-247	2.530E-02	4.709E-02	9.277E-02	FAIL ABUN
CF-249	-2.673E-03	5.555E-02	1.042E-01	NOT IDENT.
CF-251	1.340E-01	1.424E-01	2.852E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	120	10.66*	1.017E+00	5.432E+00	5.432E+00	22.28
CD-109	88.03	53	3.70*	4.689E+00	1.512E+00	1.625E+00	94.73
SN-126	64.28	-----	9.60	1.984E+00	-----	Line Not Found	-----
	86.94	53	8.90	4.689E+00	6.285E-01	6.285E-01	94.73
	87.57	53	37.00*	4.689E+00	1.512E-01	1.512E-01	94.73
BA-137M	661.66	1160	89.90*	2.125E+00	2.983E+00	2.992E+00	6.70
CS-137	661.66	1160	85.10*	2.125E+00	3.152E+00	3.161E+00	6.70
CE-139	165.86	49	80.00*	5.716E+00	5.321E-02	6.781E-02	157.52
PM-147	121.22	24	0.00*	6.080E+00	6.754E+02	6.994E+02	150.74
TL-208	277.37	-----	6.60	4.073E+00	-----	Line Not Found	-----
	583.19	56	85.00*	2.355E+00	1.381E-01	1.381E-01	63.72
	860.56	-----	12.50	1.682E+00	-----	Line Not Found	-----
BI-211	72.87	-----	1.23	3.101E+00	-----	Line Not Found	-----
	351.06	160	12.92*	3.433E+00	1.777E+00	1.777E+00	35.16
PB-212	74.82	75	10.28	3.352E+00	1.066E+00	1.066E+00	60.60
	77.11	124	17.10	3.609E+00	9.865E-01	9.865E-01	47.39
	238.63	280	43.60*	4.535E+00	6.951E-01	6.951E-01	20.15
	300.09	-----	3.30	3.848E+00	-----	Line Not Found	-----
BI-214	609.32	86	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75
	1120.29	34	14.92	1.304E+00	8.606E-01	8.607E-01	46.07
	1764.49	-----	15.30	8.855E-01	-----	Line Not Found	-----
PB-214	74.82	75	5.80	3.352E+00	1.890E+00	1.890E+00	60.60
	77.11	124	9.70	3.609E+00	1.739E+00	1.739E+00	47.39
	87.09	53	3.41	4.689E+00	1.640E+00	1.640E+00	94.73
	242.00	-----	7.25	4.490E+00	-----	Line Not Found	-----
	295.22	97	18.42	3.895E+00	6.652E-01	6.653E-01	41.26
	351.93	160	35.60*	3.433E+00	6.450E-01	6.451E-01	35.16
RN-222	609.32	86	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75
	1120.29	34	14.92	1.304E+00	8.606E-01	8.607E-01	46.07
	1764.49	-----	15.30	8.855E-01	-----	Line Not Found	-----
RA-226	609.32	86	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75
	1120.29	34	14.92	1.304E+00	8.606E-01	8.607E-01	46.07
	1764.49	-----	15.30	8.855E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	54	11.27	3.520E+00	6.727E-01	6.727E-01	93.27
	794.95	11	4.25	1.810E+00	6.933E-01	6.933E-01	149.38
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.593E+00	6.543E-01	6.543E-01	46.91
	968.97	34	15.80	1.502E+00	7.047E-01	7.047E-01	39.24
RA-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	54	11.27	3.520E+00	6.727E-01	6.727E-01	93.27
	794.95	11	4.25	1.810E+00	6.933E-01	6.933E-01	149.38
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	55	25.80*	1.593E+00	6.543E-01	6.543E-01	46.91
	968.97	34	15.80	1.502E+00	7.047E-01	7.047E-01	39.24
TH-228	74.82	75	10.28	3.352E+00	1.066E+00	1.066E+00	60.60
	77.11	124	17.10	3.609E+00	9.865E-01	9.865E-01	47.39

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-230	238.63	280	43.60*	4.535E+00	6.951E-01	6.951E-01	20.15
	300.09	-----	3.30	3.848E+00	-----	Line Not Found	-----
	609.32	86	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75
	1120.29	34	14.92	1.304E+00	8.606E-01	8.606E-01	46.07
TH-232	1764.49	-----	15.30	8.855E-01	-----	Line Not Found	-----
	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	54	11.27	3.520E+00	6.727E-01	6.727E-01	93.27
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
U-234	911.20	55	25.80*	1.593E+00	6.543E-01	6.543E-01	46.91
	968.97	34	15.80	1.502E+00	7.047E-01	7.047E-01	39.24
	609.32	86	45.49*	2.275E+00	4.095E-01	4.095E-01	36.75
	1120.29	34	14.92	1.304E+00	8.606E-01	8.606E-01	46.07
U-235	1764.49	-----	15.30	8.855E-01	-----	Line Not Found	-----
	89.96	40	3.47	4.909E+00	1.156E+00	1.156E+00	120.50
	93.35	63	5.60	5.101E+00	1.079E+00	1.079E+00	84.54
	143.76	-----	10.96*	6.014E+00	-----	Line Not Found	-----
AM-243	163.33	49	5.08	5.716E+00	8.380E-01	8.380E-01	157.52
	185.72	73	57.20	5.352E+00	1.172E-01	1.172E-01	75.65
	205.31	-----	5.01	5.027E+00	-----	Line Not Found	-----
	43.53	-----	5.90	1.429E-01	-----	Line Not Found	-----
ANH-511	74.66	75	67.20*	3.352E+00	1.631E-01	1.631E-01	60.60
	511.00	39	100.00*	2.612E+00	7.290E-02	7.290E-02	100.89

Flag: "*" = Keyline

Total number of lines in spectrum 46
Number of unidentified lines 11
Number of lines tentatively identified by NID 35 76.09%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.432E+00	5.432E+00	1.210E+00	22.28	
CD-109	461.40D	1.08	1.512E+00	1.625E+00	1.539E+00	94.73	
SN-126	2.30E+05Y	1.00	1.512E-01	1.512E-01	1.432E-01	94.73	
BA-137M	30.08Y	1.00	2.983E+00	2.992E+00	0.201E+00	6.70	
CS-137	30.08Y	1.00	3.152E+00	3.161E+00	0.212E+00	6.70	
CE-139	137.64D	1.27	5.321E-02	6.781E-02	10.68E-02	157.52	
PM-147	2.62Y	1.04	6.754E+02	6.994E+02	10.54E+02	150.74	
TL-208	1.41E+10Y	1.00	1.381E-01	1.381E-01	0.880E-01	63.72	
BI-211	7.04E+08Y	1.00	1.777E+00	1.777E+00	0.625E+00	35.16	
PB-212	1.41E+10Y	1.00	6.951E-01	6.951E-01	1.401E-01	20.15	
BI-214	1600.00Y	1.00	4.095E-01	4.095E-01	1.505E-01	36.75	
PB-214	1600.00Y	1.00	6.450E-01	6.451E-01	2.268E-01	35.16	
RN-222	1600.00Y	1.00	4.095E-01	4.095E-01	1.505E-01	36.75	
RA-226	1600.00Y	1.00	4.095E-01	4.095E-01	1.505E-01	36.75	
AC-228	1.41E+10Y	1.00	6.543E-01	6.543E-01	3.069E-01	46.91	
RA-228	1.41E+10Y	1.00	6.543E-01	6.543E-01	3.069E-01	46.91	
TH-228	1.41E+10Y	1.00	6.951E-01	6.951E-01	1.401E-01	20.15	
TH-230	7.54E+04Y	1.00	4.095E-01	4.095E-01	1.505E-01	36.75	
TH-232	1.41E+10Y	1.00	6.543E-01	6.543E-01	3.069E-01	46.91	
U-234	2.45E+05Y	1.00	4.095E-01	4.095E-01	1.505E-01	36.75	
U-235	7.04E+08Y	1.00	1.172E-01	1.172E-01	0.886E-01	75.65	K
AM-243	7370.00Y	1.00	1.631E-01	1.631E-01	0.989E-01	60.60	
ANH-511	1.00E+09Y	1.00	7.290E-02	7.290E-02	7.355E-02	100.89	
Total Activity :			6.970E+02	7.211E+02			

Grand Total Activity : 6.970E+02 7.211E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	94.21	41	138	1.28	188.23	171	21	8.88E-03	****	5.20E+00	T
6	118.59	33	82	1.22	237.00	234	9	7.41E-03	95.9	6.06E+00	
0	208.94	24	134	0.97	417.76	413	9	5.70E-03	****	4.97E+00	
0	270.29	26	59	1.27	540.49	537	6	6.29E-03	****	4.15E+00	T
0	283.38	66	44	2.71	566.67	562	10	1.59E-02	49.0	4.01E+00	T
0	287.77	31	42	1.13	575.46	572	8	7.58E-03	85.4	3.97E+00	T
0	540.37	16	45	3.72	1080.78	1073	15	4.14E-03	****	2.50E+00	
0	629.36	42	16	6.15	1258.79	1250	20	1.10E-02	57.5	2.22E+00	T
0	684.24	11	13	1.39	1368.57	1361	10	2.92E-03	****	2.07E+00	T
0	692.30	12	6	0.99	1384.70	1379	11	3.19E-03	98.6	2.04E+00	
0	727.23	23	16	1.36	1454.56	1447	12	6.05E-03	83.2	1.96E+00	T
0	741.11	14	2	1.11	1482.33	1479	8	3.73E-03	64.9	1.93E+00	
0	749.40	11	0	1.94	1498.91	1496	7	3.06E-03	60.3	1.91E+00	T
0	755.61	14	5	2.51	1511.35	1506	10	3.61E-03	85.0	1.89E+00	T
0	768.98	8	11	1.51	1538.08	1532	9	2.15E-03	****	1.87E+00	
0	771.81	11	5	1.89	1543.75	1540	7	3.07E-03	95.2	1.86E+00	T
0	852.16	19	11	3.55	1704.47	1697	15	5.06E-03	92.6	1.70E+00	
0	934.10	15	2	2.03	1868.38	1864	9	4.08E-03	64.0	1.56E+00	
0	965.70	10	14	0.63	1931.58	1921	12	2.76E-03	****	1.51E+00	T
0	1004.37	11	5	3.81	2008.94	2002	11	2.99E-03	****	1.45E+00	T
0	1050.51	8	10	3.17	2101.22	2094	13	2.19E-03	****	1.39E+00	T
0	1095.90	7	4	1.45	2192.00	2187	9	1.99E-03	****	1.33E+00	
0	1149.47	7	3	1.31	2299.16	2295	8	1.92E-03	****	1.27E+00	
0	1192.10	12	0	0.83	2384.42	2379	12	3.33E-03	57.7	1.23E+00	
0	1332.36	8	3	1.72	2664.97	2656	12	2.36E-03	****	1.10E+00	T

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561374.CNF;1
Acquisition date : 28-JUN-2016 14:39:35 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.67 Half life ratio : *****
Sample date : 11-MAY-2016 11:25:00 Nuclide Library : SOLID
Sample ID : G1203561374 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5271E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	3.811E-01
CD-109	8.388E-01
SN-126	7.866E-02
BA-137M	3.341E-02
CS-137	3.530E-02
CE-139	3.379E-02
PM-147	7.380E+02
TL-208	3.482E-02
PB-212	7.702E-02
BI-214	7.300E-02
PB-214	7.848E-02
RN-222	7.300E-02
RA-226	7.300E-02
AC-228	1.123E-01
RA-228	1.123E-01
TH-228	7.702E-02
TH-230	7.300E-02
TH-232	1.123E-01
U-234	7.300E-02
U-235	2.133E-01
AM-243	5.821E-02
ANH-511	2.902E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.217E-01	NOT IDENT.
NA-22	2.878E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.277E-02	NOT IDENT.
SC-46	4.506E-02	FAIL ABUN
V-48	2.028E-01	NOT IDENT.
CR-51	9.934E-01	NOT IDENT.
MN-54	3.047E-02	NOT IDENT.
CO-56	4.534E-02	NOT IDENT.

MN-56	0.000E+00	SHORT HLIF
CO-57	2.511E-02	NOT IDENT.
CO-58	4.274E-02	NOT IDENT.
FE-59	8.306E-02	NOT IDENT.
CO-60	3.816E-02	FAIL ABUN
ZN-65	9.374E-02	NOT IDENT.
GE-68	1.030E+00	NOT IDENT.
AS-73	2.460E+00	NOT IDENT.
AS-74	3.205E-01	NOT IDENT.
SE-75	5.549E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	7.504E-01	NOT IDENT.
RB-83	7.619E-02	NOT IDENT.
KR-85	7.818E+00	NOT IDENT.
SR-85	5.859E-02	NOT IDENT.
RB-86	2.149E+00	NOT IDENT.
Y-88	3.557E-02	NOT IDENT.
Y-91	1.685E+01	NOT IDENT.
NB-94	2.554E-02	NOT IDENT.
NB-95	5.195E-02	NOT IDENT.
NB-95M	1.871E-01	NOT IDENT.
ZR-95	9.391E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.283E-02	NOT IDENT.
RH-102	5.524E-02	NOT IDENT.
RU-103	6.631E-02	FAIL ABUN
RH-106	2.723E-01	FAIL ABUN
RU-106	2.723E-01	FAIL ABUN
AG-108M	4.015E-02	NOT IDENT.
AG-110M	4.626E-02	NOT IDENT.
SN-113	6.658E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.863E-01	NOT IDENT.
TE-123M	3.347E-02	NOT IDENT.
SB-124	4.621E-02	NOT IDENT.
SB-125	1.154E-01	NOT IDENT.
TE-125M	1.607E+01	NOT IDENT.
I-126	1.289E+00	NOT IDENT.
SB-126	7.265E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.047E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	4.938E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	3.853E-02	FAIL ABUN
CS-135	1.812E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.725E-01	FAIL ABUN
BA-140	1.874E+00	NOT IDENT.
LA-140	3.902E-01	NOT IDENT.
CE-141	1.331E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.039E-01	NOT IDENT.
PM-144	2.159E-02	NOT IDENT.
PR-144	1.644E+00	NOT IDENT.
PM-146	5.920E-02	NOT IDENT.
ND-147	4.973E+00	FAIL ABUN
PM-149	0.000E+00	SHORT HLIF
EU-150	2.993E-02	FAIL ABUN
EU-152	9.694E-02	NOT IDENT.
GD-153	9.324E-02	NOT IDENT.
EU-154	7.806E-02	FAIL ABUN
EU-155	1.061E-01	FAIL ABUN
TB-160	1.356E-01	FAIL ABUN
HO-166M	4.872E-02	FAIL ABUN
TM-171	4.032E+01	NOT IDENT.
HF-172	1.948E-01	NOT IDENT.
LU-172	5.288E-02	FAIL ABUN
LU-176	3.162E-02	FAIL ABUN
HF-181	9.052E-02	NOT IDENT.
TA-182	1.493E-01	FAIL ABUN
RE-183	4.572E-01	NOT IDENT.
RE-184	1.921E-01	NOT IDENT.
W-188	9.902E+00	NOT IDENT.

IR-192	4.994E-02	FAIL ABUN
HG-203	6.532E-02	NOT IDENT.
BI-207	4.353E-02	FAIL ABUN
PB-210	1.017E+01	NOT IDENT.
BI-211	3.801E-01	FAIL ABUN
PB-211	7.774E-01	NOT IDENT.
BI-212	5.638E-01	FAIL ABUN
RN-219	4.831E-01	FAIL ABUN
RA-223	7.418E-01	FAIL ABUN
RA-224	9.708E-01	NOT IDENT.
AC-227	2.526E-01	NOT IDENT.
TH-227	2.526E-01	NOT IDENT.
TH-229	5.066E-01	FAIL ABUN
PA-231	5.624E-01	FAIL ABUN
TH-231	7.418E-01	FAIL ABUN
PA-233	7.157E-02	FAIL ABUN
PA-234	2.097E-01	FAIL ABUN
PA-234M	3.961E+00	NOT IDENT.
TH-234	1.863E+00	FAIL ABUN
NP-237	7.157E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	1.863E+00	FAIL ABUN
NP-239	2.715E-01	NOT IDENT.
PU-239	3.604E+02	NOT IDENT.
AM-241	2.362E-01	NOT IDENT.
CM-243	1.009E-01	NOT IDENT.
BK-247	8.294E-02	FAIL ABUN
CM-247	4.332E-02	FAIL ABUN
CF-249	4.882E-02	NOT IDENT.
CF-251	1.352E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561374.CNF;1
Acquisition date : 28-JUN-2016 14:39:35 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 01:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 01:00:00.67 Half life ratio : *****
Sample date : 11-MAY-2016 11:25:00 Nuclide Library : SOLID
Sample ID : G1203561374 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.5271E+02 GRAM
Quantity Err(%) : 1.3097E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.432E+00	1.273E+00	1.273E+00
CD-109	9.660E-01	1.539E+00	1.539E+00
SN-126	8.986E-02	1.431E-01	1.431E-01
BA-137M	2.992E+00	3.333E-01	3.333E-01
CS-137	3.161E+00	3.520E-01	3.520E-01
CE-139	6.781E-02	1.056E-01	1.056E-01
PM-147	6.994E+02	1.035E+03	1.035E+03
TL-208	1.381E-01	8.711E-02	8.711E-02
PB-212	6.951E-01	1.512E-01	1.512E-01
BI-214	4.095E-01	1.520E-01	1.520E-01
PB-214	6.451E-01	2.296E-01	2.296E-01
RN-222	4.095E-01	1.520E-01	1.520E-01
RA-226	4.095E-01	1.520E-01	1.520E-01
AC-228	6.543E-01	3.182E-01	3.182E-01
RA-228	6.543E-01	3.182E-01	3.182E-01
TH-228	6.951E-01	1.512E-01	1.512E-01
TH-230	4.095E-01	1.520E-01	1.520E-01
TH-232	6.543E-01	3.182E-01	3.182E-01
U-234	4.095E-01	1.520E-01	1.520E-01
U-235	2.263E-01	2.221E-01	2.221E-01
AM-243	1.057E-01	1.006E-01	1.006E-01
ANH-511	7.290E-02	7.236E-02	7.236E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.181E-01	6.994E-01	7.063E-01	NOT IDENT.
NA-22	-1.634E-03	3.432E-02	3.432E-02	NOT IDENT.
NA-24	6.421E+20	4.245E+21	0.000E+00	SHORT HLIF
AL-26	-5.418E-03	2.909E-02	2.919E-02	NOT IDENT.
SC-46	1.508E-02	5.048E-02	5.094E-02	FAIL ABUN
V-48	-2.441E-01	2.948E-01	3.147E-01	NOT IDENT.
CR-51	2.792E-01	1.087E+00	1.094E+00	NOT IDENT.
MN-54	5.403E-04	3.552E-02	3.553E-02	NOT IDENT.

CO-56	-3.374E-03	6.272E-02	6.274E-02	NOT IDENT.
MN-56	-1.000E+41	1.859E+42	0.000E+00	SHORT HLIF
CO-57	-1.648E-02	3.260E-02	3.343E-02	NOT IDENT.
CO-58	1.416E-02	4.733E-02	4.776E-02	NOT IDENT.
FE-59	-4.945E-02	1.310E-01	1.328E-01	NOT IDENT.
CO-60	3.761E-02	3.985E-02	4.331E-02	FAIL ABUN
ZN-65	1.140E-01	1.024E-01	1.146E-01	NOT IDENT.
GE-68	6.473E-01	1.066E+00	1.105E+00	NOT IDENT.
AS-73	1.059E+00	2.653E+00	2.695E+00	NOT IDENT.
AS-74	-2.497E-01	4.112E-01	4.263E-01	NOT IDENT.
SE-75	4.521E-03	6.916E-02	6.919E-02	FAIL ABUN
BR-77	1.650E+06	2.320E+06	2.437E+06	SHORT HLIF
SR-82	8.355E-01	8.236E-01	9.057E-01	NOT IDENT.
RB-83	-7.701E-02	9.992E-02	1.058E-01	NOT IDENT.
KR-85	1.471E+01	8.328E+00	1.065E+01	NOT IDENT.
SR-85	1.101E-01	6.243E-02	7.975E-02	NOT IDENT.
RB-86	1.620E+00	2.189E+00	2.308E+00	NOT IDENT.
Y-88	-1.318E-03	4.273E-02	4.274E-02	NOT IDENT.
Y-91	-2.198E+01	2.491E+01	2.681E+01	NOT IDENT.
NB-94	6.978E-03	2.825E-02	2.842E-02	NOT IDENT.
NB-95	3.212E-02	6.321E-02	6.484E-02	NOT IDENT.
NB-95M	1.347E-01	2.324E-01	2.402E-01	NOT IDENT.
ZR-95	1.085E-01	9.117E-02	1.035E-01	FAIL ABUN
NB-97	1.000E+41	2.092E+40	0.000E+00	SHORT HLIF
ZR-97	2.821E+20	3.534E+20	0.000E+00	SHORT HLIF
MO-99	2.508E+04	5.050E+04	5.175E+04	SHORT HLIF
TC-99M	-1.000E+41	1.968E+41	0.000E+00	SHORT HLIF
RH-101	8.139E-03	3.536E-02	3.555E-02	NOT IDENT.
RH-102	3.962E-02	5.815E-02	6.084E-02	NOT IDENT.
RU-103	-1.813E-02	7.917E-02	7.960E-02	FAIL ABUN
RH-106	-1.588E-01	3.897E-01	3.962E-01	FAIL ABUN
RU-106	-1.588E-01	3.897E-01	3.962E-01	FAIL ABUN
AG-108M	5.529E-03	4.556E-02	4.563E-02	NOT IDENT.
AG-110M	2.680E-02	4.976E-02	5.120E-02	NOT IDENT.
SN-113	3.191E-02	7.301E-02	7.442E-02	NOT IDENT.
CD-115	-1.885E+05	3.937E+05	4.028E+05	SHORT HLIF
SN-117M	-1.264E-01	3.734E-01	3.777E-01	NOT IDENT.
TE-123M	1.404E-03	4.215E-02	4.216E-02	NOT IDENT.
SB-124	-3.314E-02	6.228E-02	6.405E-02	NOT IDENT.
SB-125	3.025E-03	1.317E-01	1.317E-01	NOT IDENT.
TE-125M	7.773E+00	1.693E+01	1.729E+01	NOT IDENT.
I-126	8.305E-01	1.563E+00	1.607E+00	NOT IDENT.
SB-126	4.233E-01	8.730E-01	8.936E-01	NOT IDENT.
SB-127	4.151E+02	5.794E+02	6.089E+02	SHORT HLIF
I-131	-3.177E+00	2.596E+00	2.965E+00	FAIL ABUN
I-132	1.000E+41	3.236E+41	0.000E+00	SHORT HLIF
TE-132	9.849E+02	1.154E+03	1.236E+03	SHORT HLIF
BA-133	4.852E-03	6.335E-02	6.339E-02	NOT IDENT.
I-133	4.744E+14	2.031E+15	2.042E+15	SHORT HLIF
CS-134	3.603E-02	5.293E-02	5.537E-02	FAIL ABUN
CS-135	4.330E-02	2.364E-01	2.372E-01	NOT IDENT.
I-135	1.000E+41	1.762E+42	0.000E+00	SHORT HLIF
CS-136	2.275E-01	7.183E-01	7.256E-01	FAIL ABUN
BA-140	-3.347E-01	2.590E+00	2.595E+00	NOT IDENT.
LA-140	-1.214E-01	4.911E-01	4.942E-01	NOT IDENT.
CE-141	1.292E-01	1.392E-01	1.509E-01	NOT IDENT.
CE-143	5.720E+09	3.544E+09	4.383E+09	SHORT HLIF
CE-144	-3.850E-02	2.259E-01	2.265E-01	NOT IDENT.
PM-144	-1.749E-02	3.353E-02	3.445E-02	NOT IDENT.
PR-144	-1.332E+00	2.553E+00	2.623E+00	NOT IDENT.
PM-146	6.731E-03	6.758E-02	6.765E-02	NOT IDENT.
ND-147	1.976E+00	5.594E+00	5.665E+00	FAIL ABUN
PM-149	7.232E+06	4.101E+06	5.239E+06	SHORT HLIF
EU-150	4.077E-03	3.801E-02	3.805E-02	FAIL ABUN
EU-152	-4.126E-02	1.496E-01	1.508E-01	NOT IDENT.
GD-153	6.305E-03	1.125E-01	1.125E-01	NOT IDENT.
EU-154	-9.502E-03	9.438E-02	9.448E-02	FAIL ABUN
EU-155	-5.510E-02	1.177E-01	1.203E-01	FAIL ABUN
TB-160	-3.487E-03	1.601E-01	1.601E-01	FAIL ABUN
HO-166M	2.551E-02	5.210E-02	5.336E-02	FAIL ABUN
TM-171	-1.860E+00	4.464E+01	4.465E+01	NOT IDENT.
HF-172	-6.380E-02	2.167E-01	2.186E-01	NOT IDENT.
LU-172	0.000E+00	7.157E-02	0.000E+00	FAIL ABUN
LU-176	1.488E-02	3.408E-02	3.473E-02	FAIL ABUN
HF-181	-3.316E-03	1.051E-01	1.051E-01	NOT IDENT.
TA-182	-3.044E-03	1.757E-01	1.757E-01	FAIL ABUN
RE-183	-5.712E-02	5.123E-01	5.130E-01	NOT IDENT.
RE-184	2.358E-02	2.582E-01	2.585E-01	NOT IDENT.

W-188	3.491E+00	1.778E+01	1.785E+01	NOT IDENT.
IR-192	-4.692E-02	5.938E-02	6.303E-02	FAIL ABUN
HG-203	2.842E-02	8.379E-02	8.477E-02	NOT IDENT.
BI-207	-1.122E-02	5.222E-02	5.247E-02	FAIL ABUN
PB-210	1.984E+00	1.099E+01	1.102E+01	NOT IDENT.
BI-211	1.777E+00	6.333E-01	1.021E+00	FAIL ABUN
PB-211	-6.352E-01	9.412E-01	9.838E-01	NOT IDENT.
BI-212	8.538E-01	7.022E-01	8.008E-01	FAIL ABUN
RN-219	3.750E-01	5.206E-01	5.474E-01	FAIL ABUN
RA-223	-1.691E-01	8.395E-01	8.430E-01	FAIL ABUN
RA-224	2.612E+00	1.103E+00	1.614E+00	NOT IDENT.
AC-227	-1.343E-01	3.037E-01	3.097E-01	NOT IDENT.
TH-227	-1.343E-01	3.037E-01	3.097E-01	NOT IDENT.
TH-229	-5.688E-01	6.128E-01	6.643E-01	FAIL ABUN
PA-231	1.807E-01	6.497E-01	6.548E-01	FAIL ABUN
TH-231	-1.691E-01	8.395E-01	8.430E-01	FAIL ABUN
PA-233	4.895E-03	7.959E-02	7.962E-02	FAIL ABUN
PA-234	-1.006E-01	2.934E-01	2.969E-01	FAIL ABUN
PA-234M	9.417E-02	5.388E+00	5.388E+00	NOT IDENT.
TH-234	-1.060E+00	2.138E+00	2.191E+00	FAIL ABUN
NP-237	4.895E-03	7.959E-02	7.962E-02	FAIL ABUN
NP-238	-8.557E+05	9.931E+05	1.065E+06	SHORT HLIF
U-238	-1.060E+00	2.138E+00	2.191E+00	FAIL ABUN
NP-239	1.788E-01	3.188E-01	3.288E-01	NOT IDENT.
PU-239	1.664E+02	3.842E+02	3.914E+02	NOT IDENT.
AM-241	-3.178E-02	2.653E-01	2.657E-01	NOT IDENT.
CM-243	-7.157E-02	1.134E-01	1.179E-01	NOT IDENT.
BK-247	3.903E-03	1.037E-01	1.037E-01	FAIL ABUN
CM-247	2.530E-02	4.732E-02	4.867E-02	FAIL ABUN
CF-249	-2.673E-03	5.555E-02	5.556E-02	NOT IDENT.
CF-251	1.340E-01	1.434E-01	1.556E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	76.0535	87.09	121.9506	136.47	109.2668
45.60	92.0893	87.57	122.0724	140.51	0.0000
46.54	77.8364	88.03	122.1894	143.76	101.8978
49.72	0.0000	88.34	122.2681	144.24	100.0645
51.35	94.7926	88.47	122.3010	145.44	100.2407
51.87	85.4449	89.96	122.6763	152.43	100.2882
52.39	90.8582	1093.63	122.8461	153.25	105.2320
52.97	92.0708	91.11	122.9636	323.87	112.1405
53.44	89.0174	92.59	123.3308	156.02	102.7328
54.07	73.2544	93.35	123.5184	158.56	113.5982
57.36	0.0000	94.56	100.9213	159.00	101.2102
57.53	95.4133	94.65	99.5374	162.33	97.7592
57.98	92.3109	94.67	99.5413	162.66	97.8027
59.27	85.0959	94.87	99.5803	163.33	97.8912
59.32	85.1074	97.43	104.3082	165.86	98.2231
59.54	92.7037	98.43	107.3342	176.31	97.5768
60.96	111.4516	98.44	107.3361	176.60	96.6167
61.17	110.4313	99.53	101.0908	177.52	85.7605
62.93	89.1891	100.11	94.7507	181.07	0.0000
63.29	109.9577	102.03	103.0935	181.52	110.6468
63.58	110.0401	103.18	111.3305	184.41	96.5596
64.28	103.6898	103.37	111.3701	143.76	113.8423
66.73	99.9423	105.21	118.9011	193.51	118.9861
67.24	96.7701	105.31	118.9229	197.03	100.0793
125.81	92.4727	106.12	106.5623	198.01	105.3056
67.75	92.4885	106.47	102.1501	201.83	122.2049
69.67	111.1788	109.28	120.6815	203.43	105.3516
70.83	126.4670	111.00	117.4376	205.31	102.2788
72.81	107.0020	111.76	0.0000	210.85	116.2007
72.87	107.0171	114.06	139.5029	215.65	127.2506
74.66	109.7047	116.30	0.0000	222.11	112.3911
74.82	109.7456	116.74	94.8915	227.09	110.8776
74.97	109.7835	119.76	98.3126	227.38	106.6864
77.11	110.3233	121.12	101.4773	228.16	0.0000
78.74	110.1646	121.22	101.4943	228.18	89.8611
79.69	98.5091	121.78	107.4781	116.74	89.8611
80.12	98.6029	122.06	104.5818	235.69	90.3536
80.19	105.4192	122.92	109.1554	235.96	92.0841
80.57	105.5077	123.07	107.7071	238.63	159.0230
81.00	120.9381	265.00	95.9996	238.98	0.0000
81.07	119.2529	125.81	117.6382	240.99	116.5546
81.75	133.0794	127.23	110.4801	242.00	114.9575
83.79	106.2494	127.91	115.2484	244.70	129.0335
84.00	106.2971	129.30	115.5036	252.40	0.0000
85.43	92.8636	131.20	98.1002	252.80	83.4621
86.55	115.4921	133.02	116.1819	254.15	0.0000
86.79	136.2453	133.52	105.0205	256.23	84.8281
86.94	136.2887	136.00	114.8357	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	73.0886	355.39	0.0000	584.27	34.5133
264.80	73.0988	356.01	72.6087	595.83	42.7553
265.00	74.5742	364.49	81.0125	427.87	36.6309
268.22	95.0405	366.42	0.0000	602.52	0.0000
269.46	82.5954	372.51	71.9037	604.72	33.0352
270.03	83.7408	375.05	67.2340	607.14	42.5256
271.23	67.0678	377.52	67.3536	609.32	40.9941
273.65	77.8314	356.01	75.3921	610.33	34.7049
276.40	78.6930	388.16	75.6225	614.28	28.4502
277.37	76.9135	388.63	73.7085	618.01	33.2527
277.60	72.7870	391.69	64.1470	620.36	29.5918
278.00	72.8140	264.66	51.8335	621.93	28.5569
279.20	67.5595	401.81	53.8325	630.19	0.0000
279.54	74.6936	402.40	54.8331	631.29	22.3115
279.70	74.7048	404.85	73.5608	633.25	28.7132
280.46	81.8757	410.95	71.8959	634.78	30.3303
283.69	26.7762	413.71	69.0695	635.95	19.1669
284.31	26.7913	414.70	60.2286	636.99	25.5686
285.41	26.8173	423.72	72.5099	645.85	25.2751
285.90	0.0000	427.09	73.6667	657.76	20.9785
287.50	60.8995	427.87	68.7237	657.90	0.0000
290.67	58.3754	433.94	77.9952	661.66	29.2347
293.27	0.0000	439.40	77.2660	664.57	0.0000
351.93	79.6477	453.88	80.0020	666.33	24.3023
295.96	84.2096	463.37	79.4539	666.50	19.4431
879.38	91.9369	468.07	87.8561	667.71	0.0000
299.98	87.5204	473.00	0.0000	677.62	17.9137
300.09	86.0195	475.06	78.9955	685.70	0.0000
300.13	86.0219	476.78	67.7805	695.00	9.8477
301.36	82.7142	477.60	57.5388	696.49	18.0661
302.85	81.6844	482.18	58.7270	696.51	18.0661
256.23	89.0709	487.02	58.8954	697.00	21.3553
304.85	81.8240	492.35	0.0000	697.30	21.3585
306.78	76.4941	497.08	37.4168	697.49	23.0034
308.46	81.1614	505.52	43.5181	702.65	16.3311
311.90	70.4213	507.63	0.0000	706.68	25.0214
316.51	84.4610	511.00	40.8605	711.68	14.4672
319.41	69.9391	514.00	20.9897	720.70	13.2787
320.08	75.5017	514.00	20.9897	721.93	0.0000
321.04	70.0319	520.40	37.9178	722.78	21.5974
323.87	85.8944	520.69	0.0000	722.91	21.5988
325.23	79.5164	522.65	0.0000	723.31	23.2642
328.76	72.1191	527.90	0.0000	724.19	21.6106
333.37	72.9011	528.26	45.4901	727.33	11.6521
333.97	69.8318	529.59	34.9368	733.00	11.6804
334.37	62.0931	529.87	0.0000	735.93	15.0365
338.28	66.9557	531.02	38.1428	333.97	11.7026
338.32	66.9574	537.26	53.1580	739.50	0.0000
311.90	48.3530	546.56	0.0000	747.24	0.0000
340.48	48.3530	552.55	32.1592	748.06	5.8774
340.55	48.3561	563.25	36.6546	752.31	0.0000
344.28	63.3579	569.33	40.0162	753.82	0.0000
345.93	68.9210	946.00	35.6933	756.73	16.8537
351.06	64.1601	569.70	33.5331	756.80	10.1124
351.93	64.2024	583.19	34.8570	884.68	23.6655

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	16.9169	1274.44	16.1118	1620.50	5.7112
766.42	10.1526	1001.03	14.7539	1621.92	2.8565
766.84	13.5393	1002.74	7.5349	1678.03	0.0000
772.60	0.0000	1004.73	5.5395	1690.97	0.9665
776.52	10.1947	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	2.9440
778.90	21.6460	1028.54	0.0000	1063.66	8.8423
783.70	0.0000	1037.84	14.9314	1771.35	6.8789
785.37	15.9150	1038.76	0.0000	1791.20	0.0000
792.07	23.9370	631.29	6.5508	1808.65	3.9604
794.95	21.9673	1048.07	14.7458	1810.72	0.0000
795.86	13.6989	1049.04	19.6677	1836.06	3.9821
810.06	11.0495	1050.41	15.9280		
810.29	13.0598	1063.66	16.9359		
344.28	13.0606	1077.00	6.6135		
810.76	13.0622	1077.34	6.6143		
815.77	18.1216	1085.87	9.4737		
1048.07	11.0862	1093.63	13.2949		
832.01	18.2358	1099.45	9.9891		
834.85	16.2272	1112.07	20.0544		
835.71	19.2764	1112.84	20.0596		
836.80	0.0000	1115.54	8.3649		
846.75	0.0000	1120.29	5.0261		
846.77	19.2120	1120.55	5.0264		
856.80	12.2720	1221.41	6.7036		
860.56	13.6548	1129.67	7.6802		
871.09	16.4502	1131.51	0.0000		
873.19	13.3761	1147.95	0.0000		
875.33	0.0000	1173.23	6.8066		
879.38	13.4065	1177.95	20.4478		
880.51	14.4438	1189.05	11.9659		
883.24	20.6547	1204.77	14.7180		
884.68	11.3661	1221.41	9.8577		
889.28	14.4902	1231.02	12.8495		
894.76	14.5190	1235.36	14.8441		
898.04	12.4595	1238.28	13.8657		
900.72	18.1406	1260.41	0.0000		
903.28	14.2665	1271.87	9.9951		
911.20	15.6482	1274.44	8.0017		
912.08	16.1003	1274.54	8.0020		
923.98	0.0000	1291.59	12.0578		
926.50	7.5519	1298.22	0.0000		
929.11	16.1973	1312.11	4.0412		
937.49	10.8300	1332.49	3.5549		
944.13	18.9961	1362.66	0.0000		
946.00	14.7841	1365.19	7.1697		
949.00	12.6853	1368.63	0.0000		
667.71	0.0000	1384.29	10.2919		
962.31	12.7434	1408.01	2.0706		
964.08	12.7510	1457.56	0.0000		
966.17	0.0000	1460.82	12.8469		
911.20	5.4738	1489.16	10.5580		
968.97	5.4738	1505.03	5.2987		
983.53	19.2524	1584.12	6.6095		
984.45	0.0000	1596.21	6.6274		

VAX/VMS Nuclide Identification Report Generated 28-JUN-2016 13:10:10.90

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561375.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM30.CNF;285
Background date : 26-JUN-2016 12:05:40
Sample date     : 7-JUN-2016 00:00:00. Acquisition date : 28-JUN-2016 12:54:31
Sample ID      : G1203561375. Sample quantity : 1.15000E+02 GRAM
Detector name   : GAM30. Detector geometry: CAN
Elapsed live time: 0 00:15:00.00. Elapsed real time: 0 00:15:06.71 0.7%
Energy tolerance: 1.50000 keV. Analyst Initials : MXR1
Abundance limit : 75.00000. Sensitivity : 3.00000
Batch ID       : 1572231. Detector SN# :
Matrix Spike ID: : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.50*	10640	4732	0.98	92.73	87	10	1.18E+01	1.5	
2	0	59.56	22429	4417	0.97	118.84	113	12	2.49E+01	0.9	
3	1	85.74*	98	852	1.10	171.20	169	12	1.09E-01	44.3	7.24E+00
4	1	88.10*	3878	980	1.08	175.93	169	12	4.31E+00	2.1	
5	0	122.04	410	1086	1.33	243.81	239	10	4.56E-01	15.8	
6	0	169.51	62	548	1.35	338.75	336	6	6.92E-02	60.8	
7	0	369.63	56	584	1.46	739.02	735	8	6.27E-02	75.3	
8	0	457.10	55	487	1.27	913.99	911	6	6.13E-02	64.5	
9	0	466.48	93	607	1.24	932.76	929	8	1.03E-01	47.1	
10	0	512.95	15	373	1.30	1025.72	1024	7	1.63E-02	222.0	
11	0	518.16	124	699	4.91	1036.14	1030	16	1.38E-01	48.4	
12	0	527.61	46	310	0.93	1055.05	1052	7	5.09E-02	66.2	
13	0	553.16	29	320	1.35	1106.15	1102	8	3.26E-02	107.5	
14	0	561.36	44	292	1.39	1122.55	1120	8	4.84E-02	69.5	
15	0	580.73	32	281	2.26	1161.30	1159	8	3.55E-02	92.6	
16	0	587.54	44	529	6.15	1174.92	1166	15	4.90E-02	114.7	
17	0	609.58*	21	324	0.54	1219.01	1215	9	2.32E-02	157.8	
18	0	661.90	15185	470	1.40	1323.68	1316	15	1.69E+01	0.9	
19	0	828.80	57	233	1.21	1657.58	1655	7	6.30E-02	46.7	
20	0	1115.68	100	293	1.75	2231.55	2228	9	1.11E-01	32.5	
21	0	1173.68	9938	327	1.76	2347.58	2339	16	1.10E+01	1.1	
22	0	1268.27	23	31	1.46	2536.86	2533	8	2.58E-02	46.0	
23	0	1282.80	13	52	1.19	2565.92	2559	13	1.44E-02	117.7	
24	0	1298.37	29	21	3.10	2597.08	2592	10	3.24E-02	35.4	
25	0	1332.98	8962	92	1.89	2666.33	2658	18	9.96E+00	1.1	
26	0	1396.59	14	34	5.12	2793.63	2783	15	1.59E-02	92.2	
27	0	1410.86	9	9	3.23	2822.19	2816	9	1.02E-02	67.5	
28	0	1465.00*	29	21	7.50	2930.52	2922	21	3.19E-02	44.1	
29	0	1490.62	19	10	1.13	2981.79	2977	8	2.16E-02	36.0	
30	0	1527.42	17	36	5.41	3055.43	3046	20	1.93E-02	86.8	
31	0	1648.82	11	3	1.52	3298.38	3295	7	1.23E-02	40.5	
32	0	1817.89	21	8	5.12	3636.74	3629	16	2.33E-02	37.2	
33	0	1858.19	6	1	0.64	3717.39	3716	5	7.06E-03	46.0	
34	0	1946.90	9	10	0.82	3894.93	3890	10	9.77E-03	80.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1954.29	15	3	1.48	3909.73	3903	12	1.66E-02	34.7	
36	0	2009.31	7	14	3.06	4019.84	4006	15	7.38E-03	132.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 28-JUN-2016 13:10:12

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561375.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 28-JUN-2016 12:54:31
Sample ID	: G1203561375	Sample quantity	: 115.00 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA30	Detector geometry	: CAN
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:06.71 0.7%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	430	85.60*	7.377E+00	1.779E+00	1.880E+00	31.63
	136.47	-----	10.68	7.235E+00	-----	Line Not Found	-----
CO-60	1173.23	9465	99.85	1.580E+00	1.567E+02	1.579E+02	2.16
	1332.49	8488	99.98*	1.415E+00	1.567E+02	1.579E+02	2.17
ZN-65	1115.54	95	50.60*	1.651E+00	2.981E+00	3.169E+00	64.90
KR-85	514.00	14	0.43*	3.082E+00	2.821E+01	2.832E+01	444.04
SR-85	514.00	14	96.00*	3.082E+00	1.275E-01	1.605E-01	444.04
CD-109	88.03	4117	3.70*	6.608E+00	4.398E+02	4.542E+02	4.21
SN-126	64.28	-----	9.60	4.032E+00	-----	Line Not Found	-----
	86.94	4117	8.90	6.608E+00	1.828E+02	1.828E+02	4.21
	87.57	4117	37.00*	6.608E+00	4.398E+01	4.398E+01	4.21
BA-137M	661.66	14830	89.90*	2.541E+00	1.695E+02	1.698E+02	1.74
CS-137	661.66	14830	85.10*	2.541E+00	1.791E+02	1.794E+02	1.74
PM-147	121.22	430	0.00*	7.377E+00	5.343E+04	5.427E+04	31.63
PB-210	46.54	11585	4.25*	1.248E+00	5.702E+03	5.713E+03	3.09
TH-229	85.43	104	14.70	6.448E+00	2.874E+00	2.874E+00	88.61
	88.47	4117	24.00	6.608E+00	6.780E+01	6.780E+01	4.21
	193.51	-----	4.41*	6.145E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.821E+00	-----	Line Not Found	-----
AM-241	59.54	24187	35.90*	3.289E+00	5.349E+02	5.349E+02	1.80

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561375.CNF;1
Acquisition date : 28-JUN-2016 12:54:31 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:06.71 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561375 Sample Quantity : 1.1500E+02 GRAM
Batch Number : 1572231 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	1.880E+00	5.826E-01	5.679E-01
CO-60	1.579E+02	3.363E+00	6.967E-01
ZN-65	3.169E+00	2.016E+00	3.068E+00
KR-85	2.832E+01	1.232E+02	2.105E+02
SR-85	1.605E-01	6.986E-01	1.194E+00
CD-109	4.542E+02	1.876E+01	1.625E+01
SN-126	4.398E+01	1.816E+00	1.580E+00
BA-137M	1.698E+02	2.892E+00	9.914E-01
CS-137	1.794E+02	3.055E+00	1.047E+00
PM-147	5.427E+04	1.682E+04	1.638E+04
PB-210	5.713E+03	1.732E+02	1.243E+02
TH-229	3.276E+00	7.517E+00	1.279E+01
AM-241	5.349E+02	9.445E+00	4.897E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.748E-01	7.219E+00	1.236E+01	NOT IDENT.
NA-22	-4.790E-02	4.615E-01	6.948E-01	NOT IDENT.
NA-24	0.000E+00	6.989E+09	0.000E+00	SHORT HLIF
AL-26	2.435E-01	2.700E-01	5.666E-01	NOT IDENT.
K-40	3.345E+00	2.541E+00	5.275E+00	NOT IDENT.
SC-46	-3.213E-01	8.991E-01	1.548E+00	NOT IDENT.
V-48	-4.670E-01	2.014E+00	3.456E+00	NOT IDENT.
CR-51	5.444E-01	6.754E+00	1.193E+01	NOT IDENT.
MN-54	2.257E-01	7.224E-01	1.211E+00	NOT IDENT.
CO-56	-2.246E-01	8.224E-01	1.427E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-58	-1.147E-01	7.369E-01	1.291E+00	NOT IDENT.
FE-59	-7.430E-01	2.075E+00	3.516E+00	NOT IDENT.
GE-68	2.753E+01	2.584E+01	4.621E+01	NOT IDENT.
AS-73	-6.374E-01	1.990E+01	3.512E+01	NOT IDENT.
AS-74	1.736E-01	1.955E+00	3.340E+00	NOT IDENT.
SE-75	1.106E-02	6.946E-01	1.236E+00	FAIL ABUN

BR-77	-5.899E+01	8.195E+02	1.464E+03	NOT IDENT.
SR-82	-4.151E+00	6.973E+00	1.206E+01	NOT IDENT.
RB-83	8.797E-01	1.479E+00	2.279E+00	FAIL ABUN
RB-86	1.869E+01	2.031E+01	3.614E+01	NOT IDENT.
Y-88	-1.015E-01	3.443E-01	6.231E-01	NOT IDENT.
Y-91	4.329E+01	2.393E+02	4.235E+02	NOT IDENT.
NB-94	-4.032E-02	4.883E-01	8.687E-01	NOT IDENT.
NB-95	1.491E-02	7.026E-01	1.244E+00	NOT IDENT.
NB-95M	-8.997E-01	1.795E+00	3.172E+00	NOT IDENT.
ZR-95	-4.066E-01	1.309E+00	2.292E+00	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.616E+10	0.000E+00	SHORT HLIF
MO-99	7.701E+02	1.001E+03	1.825E+03	NOT IDENT.
TC-99M	0.000E+00	2.200E+25	0.000E+00	SHORT HLIF
RH-101	2.373E-02	4.266E-01	6.996E-01	NOT IDENT.
RH-102	-2.905E-01	9.227E-01	1.546E+00	NOT IDENT.
RU-103	6.009E-02	8.336E-01	1.433E+00	FAIL ABUN
RH-106	1.162E+00	5.361E+00	9.181E+00	NOT IDENT.
RU-106	1.162E+00	5.361E+00	9.181E+00	NOT IDENT.
AG-108M	5.530E-02	5.887E-01	1.019E+00	NOT IDENT.
AG-110M	6.126E-01	1.061E+00	1.884E+00	NOT IDENT.
SN-113	1.276E-01	8.112E-01	1.417E+00	NOT IDENT.
CD-115	1.159E+03	1.504E+03	2.550E+03	FAIL ABUN
SN-117M	7.797E-01	9.603E-01	1.673E+00	NOT IDENT.
TE-123M	2.617E-01	3.761E-01	6.527E-01	NOT IDENT.
SB-124	7.004E-01	7.710E-01	1.623E+00	NOT IDENT.
SB-125	-4.015E-01	1.761E+00	3.024E+00	NOT IDENT.
TE-125M	1.939E+01	1.315E+02	2.285E+02	NOT IDENT.
I-126	1.032E+00	5.497E+00	8.202E+00	NOT IDENT.
SB-126	2.270E-01	3.249E+00	5.792E+00	NOT IDENT.
SB-127	-2.638E+00	6.850E+01	1.154E+02	NOT IDENT.
I-131	-8.552E-01	3.896E+00	5.933E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	4.172E+01	4.272E+01	7.812E+01	NOT IDENT.
BA-133	4.012E-01	7.244E-01	1.285E+00	NOT IDENT.
I-133	0.000E+00	1.965E+07	0.000E+00	SHORT HLIF
CS-134	9.134E-01	6.960E-01	1.284E+00	NOT IDENT.
CS-135	-3.215E-01	2.319E+00	4.107E+00	NOT IDENT.
I-135	0.000E+00	5.693E+23	0.000E+00	SHORT HLIF
CS-136	2.525E+00	3.015E+00	5.357E+00	NOT IDENT.
CE-139	-1.219E-01	4.383E-01	6.555E-01	NOT IDENT.
BA-140	-2.095E+00	6.338E+00	1.073E+01	NOT IDENT.
LA-140	3.947E-01	8.445E-01	1.725E+00	NOT IDENT.
CE-141	3.135E-01	9.008E-01	1.554E+00	NOT IDENT.
CE-143	0.000E+00	4.569E+04	0.000E+00	SHORT HLIF
CE-144	-6.130E-01	2.565E+00	4.374E+00	NOT IDENT.
PM-144	-2.423E-01	5.129E-01	8.993E-01	NOT IDENT.
PR-144	-1.860E+01	3.850E+01	6.747E+01	FAIL ABUN
PM-146	1.178E+00	9.654E-01	1.522E+00	NOT IDENT.
ND-147	5.131E+00	1.639E+01	2.494E+01	NOT IDENT.
PM-149	-7.332E+03	1.017E+04	1.769E+04	NOT IDENT.
EU-150	-1.814E-01	4.226E-01	7.340E-01	NOT IDENT.
EU-152	-4.273E-01	1.592E+00	2.772E+00	FAIL ABUN
GD-153	5.622E-01	1.045E+00	1.843E+00	NOT IDENT.
EU-154	-7.397E-02	1.308E+00	1.981E+00	FAIL ABUN
EU-155	-3.355E-01	1.339E+00	2.307E+00	FAIL ABUN
TB-160	-1.934E-02	2.955E+00	5.154E+00	FAIL ABUN
HO-166M	5.740E-01	9.419E-01	1.714E+00	NOT IDENT.
TM-171	-3.512E+02	3.888E+02	6.794E+02	NOT IDENT.
HF-172	-4.027E-01	2.764E+00	4.220E+00	FAIL ABUN
LU-172	-4.222E-01	1.380E+00	2.343E+00	FAIL ABUN
LU-176	-5.738E-01	4.177E-01	7.104E-01	FAIL ABUN
HF-181	-1.801E-01	9.474E-01	1.617E+00	NOT IDENT.
TA-182	4.473E-02	1.888E+00	3.320E+00	NOT IDENT.
RE-183	0.000E+00	6.896E+00	1.552E+01	FAIL ABUN
RE-184	5.224E-01	3.073E+00	5.372E+00	NOT IDENT.
W-188	1.085E+02	1.143E+02	2.075E+02	NOT IDENT.
IR-192	-2.861E-02	5.780E-01	1.018E+00	NOT IDENT.
HG-203	1.414E-01	6.275E-01	1.120E+00	NOT IDENT.
BI-207	-2.113E-01	1.083E+00	1.851E+00	NOT IDENT.
TL-208	0.000E+00	7.661E-01	9.690E-01	NOT IDENT.
BI-211	-2.924E-01	3.369E+00	5.887E+00	NOT IDENT.
PB-211	4.780E+00	1.296E+01	2.271E+01	NOT IDENT.
BI-212	6.805E+00	8.050E+00	1.471E+01	NOT IDENT.
PB-212	-1.069E-01	8.230E-01	1.468E+00	NOT IDENT.
BI-214	4.331E-01	1.340E+00	1.881E+00	FAIL ABUN
PB-214	3.317E-02	1.221E+00	2.139E+00	FAIL ABUN
RN-219	-3.401E+00	7.385E+00	1.266E+01	NOT IDENT.

RN-222	4.331E-01	1.340E+00	1.881E+00	FAIL ABUN
RA-223	-3.136E+00	1.002E+01	1.750E+01	NOT IDENT.
RA-224	-7.973E+00	8.658E+00	1.513E+01	NOT IDENT.
RA-226	4.331E-01	1.340E+00	1.881E+00	FAIL ABUN
AC-227	-9.694E-01	3.708E+00	6.567E+00	NOT IDENT.
TH-227	-9.694E-01	3.708E+00	6.567E+00	NOT IDENT.
AC-228	-3.597E-01	3.043E+00	5.272E+00	NOT IDENT.
RA-228	-3.597E-01	3.043E+00	5.272E+00	NOT IDENT.
TH-228	-1.069E-01	8.230E-01	1.468E+00	NOT IDENT.
TH-230	4.331E-01	1.339E+00	1.881E+00	FAIL ABUN
PA-231	-1.679E+00	7.180E+00	1.261E+01	NOT IDENT.
TH-231	-3.136E+00	1.002E+01	1.750E+01	NOT IDENT.
TH-232	-3.597E-01	3.043E+00	5.272E+00	NOT IDENT.
PA-233	2.483E-01	1.035E+00	1.836E+00	NOT IDENT.
PA-234	-3.401E+00	7.277E+00	1.241E+01	NOT IDENT.
PA-234M	-7.172E-01	9.389E+01	1.622E+02	NOT IDENT.
TH-234	-1.004E+01	1.654E+01	2.579E+01	NOT IDENT.
U-234	4.331E-01	1.339E+00	1.881E+00	FAIL ABUN
U-235	5.073E-01	2.536E+00	4.360E+00	NOT IDENT.
NP-237	2.483E-01	1.035E+00	1.836E+00	NOT IDENT.
NP-238	0.000E+00	3.574E+03	0.000E+00	SHORT HLIF
U-238	-1.004E+01	1.654E+01	2.579E+01	NOT IDENT.
NP-239	7.368E-01	3.621E+00	5.989E+00	NOT IDENT.
PU-239	1.782E+03	4.332E+03	7.524E+03	NOT IDENT.
AM-243	3.686E-01	6.245E-01	1.111E+00	NOT IDENT.
CM-243	8.576E-01	1.348E+00	2.376E+00	NOT IDENT.
BK-247	-2.226E-01	1.204E+00	2.133E+00	NOT IDENT.
CM-247	2.522E-01	6.697E-01	1.174E+00	NOT IDENT.
CF-249	-5.113E-01	6.952E-01	1.185E+00	NOT IDENT.
CF-251	6.952E-01	1.712E+00	2.931E+00	NOT IDENT.
ANH-511	-3.170E-01	6.005E-01	8.911E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	430	85.60*	7.377E+00	1.779E+00	1.880E+00	31.63
	136.47	-----	10.68	7.235E+00	-----	Line Not Found	-----
CO-60	1173.23	9465	99.85	1.580E+00	1.567E+02	1.579E+02	2.16
	1332.49	8488	99.98*	1.415E+00	1.567E+02	1.579E+02	2.17
ZN-65	1115.54	95	50.60*	1.651E+00	2.981E+00	3.169E+00	64.90
KR-85	514.00	14	0.43*	3.082E+00	2.821E+01	2.832E+01	444.04
SR-85	514.00	14	96.00*	3.082E+00	1.275E-01	1.605E-01	444.04
CD-109	88.03	4117	3.70*	6.608E+00	4.398E+02	4.542E+02	4.21
SN-126	64.28	-----	9.60	4.032E+00	-----	Line Not Found	-----
	86.94	4117	8.90	6.608E+00	1.828E+02	1.828E+02	4.21
	87.57	4117	37.00*	6.608E+00	4.398E+01	4.398E+01	4.21
BA-137M	661.66	14830	89.90*	2.541E+00	1.695E+02	1.698E+02	1.74
CS-137	661.66	14830	85.10*	2.541E+00	1.791E+02	1.794E+02	1.74
PM-147	121.22	430	0.00*	7.377E+00	5.343E+04	5.427E+04	31.63
PB-210	46.54	11585	4.25*	1.248E+00	5.702E+03	5.713E+03	3.09
TH-229	85.43	104	14.70	6.448E+00	2.874E+00	2.874E+00	88.61
	88.47	4117	24.00	6.608E+00	6.780E+01	6.780E+01	4.21
	193.51	-----	4.41*	6.145E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.821E+00	-----	Line Not Found	-----
AM-241	59.54	24187	35.90*	3.289E+00	5.349E+02	5.349E+02	1.80

Flag: "*" = Keyline

Total number of lines in spectrum 36
Number of unidentified lines 21
Number of lines tentatively identified by NID 15 41.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.06	1.779E+00	1.880E+00	0.595E+00	31.63	
CO-60	5.27Y	1.01	1.567E+02	1.579E+02	0.034E+02	2.17	
ZN-65	244.06D	1.06	2.981E+00	3.169E+00	2.057E+00	64.90	
KR-85	10.56Y	1.00	2.821E+01	2.832E+01	12.57E+01	444.04	
SR-85	64.84D	1.26	1.275E-01	1.605E-01	7.128E-01	444.04	
CD-109	461.40D	1.03	4.398E+02	4.542E+02	0.191E+02	4.21	
SN-126	2.30E+05Y	1.00	4.398E+01	4.398E+01	0.185E+01	4.21	
BA-137M	30.08Y	1.00	1.695E+02	1.698E+02	0.030E+02	1.74	
CS-137	30.08Y	1.00	1.791E+02	1.794E+02	0.031E+02	1.74	
PM-147	2.62Y	1.02	5.343E+04	5.427E+04	1.717E+04	31.63	
PB-210	22.20Y	1.00	5.702E+03	5.713E+03	0.177E+03	3.09	
TH-229	7340.00Y	1.00	6.780E+01	6.780E+01	0.286E+01	4.21	K
AM-241	432.60Y	1.00	5.349E+02	5.349E+02	0.096E+02	1.80	
Total Activity :			6.076E+04	6.163E+04			

Grand Total Activity : 6.076E+04 6.163E+04

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	169.51	64	566	1.35	338.75	336	6	6.92E-02	****	6.63E+00	
0	369.63	57	584	1.46	739.02	735	8	6.27E-02	****	3.92E+00	
0	457.10	55	483	1.27	913.99	911	6	6.13E-02	****	3.36E+00	
0	466.48	92	602	1.24	932.76	929	8	1.03E-01	94.2	3.31E+00	
0	518.16	123	690	4.91	1036.14	1030	16	1.38E-01	96.8	3.06E+00	
0	527.61	45	306	0.93	1055.05	1052	7	5.09E-02	****	3.02E+00	T
0	553.16	29	315	1.35	1106.15	1102	8	3.26E-02	****	2.91E+00	T
0	561.36	43	288	1.39	1122.55	1120	8	4.84E-02	****	2.88E+00	
0	580.73	31	276	2.26	1161.30	1159	8	3.55E-02	****	2.81E+00	
0	587.54	43	519	6.15	1174.92	1166	15	4.90E-02	****	2.78E+00	
0	609.58	20	318	0.54	1219.01	1215	9	2.32E-02	****	2.71E+00	T
0	828.80	55	226	1.21	1657.58	1655	7	6.30E-02	93.3	2.12E+00	
0	1268.27	22	29	1.46	2536.86	2533	8	2.58E-02	92.0	1.48E+00	
0	1282.80	12	49	1.19	2565.92	2559	13	1.44E-02	****	1.46E+00	
0	1298.37	28	20	3.10	2597.08	2592	10	3.24E-02	70.7	1.45E+00	T
0	1396.59	14	32	5.12	2793.63	2783	15	1.59E-02	****	1.36E+00	
0	1410.86	9	8	3.23	2822.19	2816	9	1.02E-02	****	1.35E+00	
0	1465.00	27	20	7.50	2930.52	2922	21	3.19E-02	88.3	1.30E+00	
0	1490.62	18	9	1.13	2981.79	2977	8	2.16E-02	72.0	1.29E+00	T
0	1527.42	16	34	5.41	3055.43	3046	20	1.93E-02	****	1.26E+00	
0	1648.82	10	3	1.52	3298.38	3295	7	1.23E-02	81.0	1.18E+00	
0	1817.89	20	7	5.12	3636.74	3629	16	2.33E-02	74.4	1.10E+00	
0	1858.19	6	1	0.64	3717.39	3716	5	7.06E-03	92.1	1.08E+00	
0	1946.90	8	10	0.82	3894.93	3890	10	9.77E-03	****	1.04E+00	
0	1954.29	14	3	1.48	3909.73	3903	12	1.66E-02	69.4	1.04E+00	
0	2009.31	6	13	3.06	4019.84	4006	15	7.38E-03	****	1.02E+00	

Flags: "T" = Tentatively associated


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*****
*
*               GEL Laboratories LLC
*             2040 Savage Road
*             Charleston, SC 29407
*
*****
*
*               DETECTOR AND SAMPLE DATA
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561375.CNF;1
* Acquisition date   : 28-JUN-2016 12:54:31 Sensitivity      : 3.000
* Detector ID        : GAM30 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:06.71 Half life ratio  : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203561375 Analyst initials: MXR1
* Batch Number       : 1572231 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                      Dry Weight      : 0.00000
*****
*
*               CALIBRATION INFORMATION
*
* Eff. Cal. date     : 11-MAR-2016 05:58:49 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	2.781E-01
CO-60	3.234E-01
ZN-65	1.490E+00
KR-85	1.027E+02
SR-85	5.820E-01
CD-109	7.975E+00
SN-126	7.753E-01
BA-137M	4.804E-01
CS-137	5.075E-01
PM-147	8.022E+03
PB-210	6.151E+01
TH-229	6.268E+00
AM-241	2.419E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.046E+00	NOT IDENT.
NA-22	3.232E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.514E-01	NOT IDENT.
K-40	2.386E+00	NOT IDENT.
SC-46	7.534E-01	NOT IDENT.
V-48	1.680E+00	NOT IDENT.
CR-51	5.826E+00	NOT IDENT.
MN-54	5.884E-01	NOT IDENT.
CO-56	6.933E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	6.254E-01	NOT IDENT.
FE-59	1.707E+00	NOT IDENT.
GE-68	2.244E+01	NOT IDENT.
AS-73	1.738E+01	NOT IDENT.
AS-74	1.620E+00	NOT IDENT.
SE-75	6.046E-01	FAIL ABUN
BR-77	7.167E+02	NOT IDENT.

SR-82	5.843E+00	NOT IDENT.
RB-83	1.110E+00	FAIL ABUN
RB-86	1.755E+01	NOT IDENT.
Y-88	2.743E-01	NOT IDENT.
Y-91	2.005E+02	NOT IDENT.
NB-94	4.199E-01	NOT IDENT.
NB-95	6.028E-01	NOT IDENT.
NB-95M	1.553E+00	NOT IDENT.
ZR-95	1.111E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	8.842E+02	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.427E-01	NOT IDENT.
RH-102	7.489E-01	NOT IDENT.
RU-103	6.989E-01	FAIL ABUN
RH-106	4.453E+00	NOT IDENT.
RU-106	4.453E+00	NOT IDENT.
AG-108M	4.983E-01	NOT IDENT.
AG-110M	9.168E-01	NOT IDENT.
SN-113	6.925E-01	NOT IDENT.
CD-115	1.241E+03	FAIL ABUN
SN-117M	8.185E-01	NOT IDENT.
TE-123M	3.194E-01	NOT IDENT.
SB-124	7.299E-01	NOT IDENT.
SB-125	1.478E+00	NOT IDENT.
TE-125M	1.120E+02	NOT IDENT.
I-126	3.968E+00	NOT IDENT.
SB-126	2.804E+00	NOT IDENT.
SB-127	5.587E+01	NOT IDENT.
I-131	2.897E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	3.830E+01	NOT IDENT.
BA-133	6.285E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.229E-01	NOT IDENT.
CS-135	2.010E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	2.601E+00	NOT IDENT.
CE-139	3.204E-01	NOT IDENT.
BA-140	5.208E+00	NOT IDENT.
LA-140	7.648E-01	NOT IDENT.
CE-141	7.609E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.141E+00	NOT IDENT.
PM-144	4.347E-01	NOT IDENT.
PR-144	3.261E+01	FAIL ABUN
PM-146	7.450E-01	NOT IDENT.
ND-147	1.212E+01	NOT IDENT.
PM-149	8.641E+03	NOT IDENT.
EU-150	3.584E-01	NOT IDENT.
EU-152	1.354E+00	FAIL ABUN
GD-153	9.030E-01	NOT IDENT.
EU-154	9.219E-01	FAIL ABUN
EU-155	1.131E+00	FAIL ABUN
TB-160	2.507E+00	FAIL ABUN
HO-166M	8.299E-01	NOT IDENT.
TM-171	3.362E+02	NOT IDENT.
HF-172	2.067E+00	FAIL ABUN
LU-172	1.138E+00	FAIL ABUN
LU-176	3.469E-01	FAIL ABUN
HF-181	7.896E-01	NOT IDENT.
TA-182	1.563E+00	NOT IDENT.
RE-183	7.722E+00	FAIL ABUN
RE-184	2.616E+00	NOT IDENT.
W-188	1.015E+02	NOT IDENT.
IR-192	4.971E-01	NOT IDENT.
HG-203	5.475E-01	NOT IDENT.
BI-207	8.985E-01	NOT IDENT.
TL-208	4.699E-01	NOT IDENT.
BI-211	2.877E+00	NOT IDENT.
PB-211	1.110E+01	NOT IDENT.
BI-212	7.135E+00	NOT IDENT.
PB-212	7.189E-01	NOT IDENT.
BI-214	9.123E-01	FAIL ABUN
PB-214	1.046E+00	FAIL ABUN
RN-219	6.186E+00	NOT IDENT.
RN-222	9.123E-01	FAIL ABUN

RA-223	8.547E+00	NOT IDENT.
RA-224	7.406E+00	NOT IDENT.
RA-226	9.123E-01	FAIL ABUN
AC-227	3.211E+00	NOT IDENT.
TH-227	3.211E+00	NOT IDENT.
AC-228	2.568E+00	NOT IDENT.
RA-228	2.568E+00	NOT IDENT.
TH-228	7.189E-01	NOT IDENT.
TH-230	9.123E-01	FAIL ABUN
PA-231	6.163E+00	NOT IDENT.
TH-231	8.547E+00	NOT IDENT.
TH-232	2.568E+00	NOT IDENT.
PA-233	8.978E-01	NOT IDENT.
PA-234	6.054E+00	NOT IDENT.
PA-234M	7.884E+01	NOT IDENT.
TH-234	1.265E+01	NOT IDENT.
U-234	9.123E-01	FAIL ABUN
U-235	2.135E+00	NOT IDENT.
NP-237	8.978E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.265E+01	NOT IDENT.
NP-239	2.935E+00	NOT IDENT.
PU-239	3.686E+03	NOT IDENT.
AM-243	5.457E-01	NOT IDENT.
CM-243	1.165E+00	NOT IDENT.
BK-247	1.043E+00	NOT IDENT.
CM-247	5.741E-01	NOT IDENT.
CF-249	5.787E-01	NOT IDENT.
CF-251	1.434E+00	NOT IDENT.
ANH-511	4.343E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561375.CNF;1
Acquisition date : 28-JUN-2016 12:54:31 Sensitivity : 3.000
Detector ID : GAM30 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:06.71 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561375 Analyst initials: MXR1
Batch Number : 1572231 Sample Quantity : 1.1500E+02 GRAM
Quantity Err(%) : 1.7391E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 11-MAR-2016 05:58:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM30_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	1.880E+00	5.970E-01	5.970E-01
CO-60	1.579E+02	1.362E+01	1.362E+01
ZN-65	3.169E+00	2.112E+00	2.112E+00
KR-85	2.832E+01	1.232E+02	1.232E+02
SR-85	1.605E-01	6.987E-01	6.987E-01
CD-109	4.542E+02	4.761E+01	4.761E+01
SN-126	4.398E+01	3.978E+00	3.978E+00
BA-137M	1.698E+02	1.363E+01	1.363E+01
CS-137	1.794E+02	1.439E+01	1.439E+01
PM-147	5.427E+04	1.724E+04	1.724E+04
PB-210	5.713E+03	5.197E+02	5.197E+02
TH-229	3.276E+00	7.521E+00	7.521E+00
AM-241	5.349E+02	4.344E+01	4.344E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-4.748E-01	7.219E+00	7.223E+00	NOT IDENT.
NA-22	-4.790E-02	4.615E-01	4.620E-01	NOT IDENT.
NA-24	5.823E+09	7.008E+09	7.483E+09	SHORT HLIF
AL-26	2.435E-01	2.706E-01	2.921E-01	NOT IDENT.
K-40	3.345E+00	2.559E+00	2.970E+00	NOT IDENT.
SC-46	-3.213E-01	9.000E-01	9.116E-01	NOT IDENT.
V-48	-4.670E-01	2.015E+00	2.026E+00	NOT IDENT.
CR-51	5.444E-01	6.754E+00	6.759E+00	NOT IDENT.
MN-54	2.257E-01	7.229E-01	7.300E-01	NOT IDENT.
CO-56	-2.246E-01	8.229E-01	8.291E-01	NOT IDENT.
MN-56	-1.000E+41	3.654E+41	0.000E+00	SHORT HLIF
CO-58	-1.147E-01	7.370E-01	7.388E-01	NOT IDENT.
FE-59	-7.430E-01	2.080E+00	2.107E+00	NOT IDENT.
GE-68	2.753E+01	2.635E+01	2.912E+01	NOT IDENT.
AS-73	-6.374E-01	1.990E+01	1.990E+01	NOT IDENT.
AS-74	1.736E-01	1.955E+00	1.957E+00	NOT IDENT.
SE-75	1.106E-02	6.946E-01	6.946E-01	FAIL ABUN

BR-77	-5.899E+01	8.203E+02	8.207E+02	NOT IDENT.
SR-82	-4.151E+00	6.986E+00	7.233E+00	NOT IDENT.
RB-83	8.797E-01	1.485E+00	1.537E+00	FAIL ABUN
RB-86	1.869E+01	2.061E+01	2.227E+01	NOT IDENT.
Y-88	-1.015E-01	3.444E-01	3.474E-01	NOT IDENT.
Y-91	4.329E+01	2.393E+02	2.401E+02	NOT IDENT.
NB-94	-4.032E-02	4.884E-01	4.887E-01	NOT IDENT.
NB-95	1.491E-02	7.026E-01	7.027E-01	NOT IDENT.
NB-95M	-8.997E-01	1.797E+00	1.842E+00	NOT IDENT.
ZR-95	-4.066E-01	1.310E+00	1.323E+00	NOT IDENT.
NB-97	-1.000E+41	8.620E+41	0.000E+00	SHORT HLIF
ZR-97	-1.107E+10	1.619E+10	1.694E+10	SHORT HLIF
MO-99	7.701E+02	1.004E+03	1.062E+03	NOT IDENT.
TC-99M	1.291E+24	2.200E+25	0.000E+00	SHORT HLIF
RH-101	2.373E-02	4.266E-01	4.268E-01	NOT IDENT.
RH-102	-2.905E-01	9.232E-01	9.324E-01	NOT IDENT.
RU-103	6.009E-02	8.336E-01	8.341E-01	FAIL ABUN
RH-106	1.162E+00	5.363E+00	5.388E+00	NOT IDENT.
RU-106	1.162E+00	5.363E+00	5.388E+00	NOT IDENT.
AG-108M	5.530E-02	5.887E-01	5.892E-01	NOT IDENT.
AG-110M	6.126E-01	1.064E+00	1.099E+00	NOT IDENT.
SN-113	1.276E-01	8.112E-01	8.133E-01	NOT IDENT.
CD-115	1.159E+03	1.508E+03	1.595E+03	FAIL ABUN
SN-117M	7.797E-01	9.618E-01	1.024E+00	NOT IDENT.
TE-123M	2.617E-01	3.765E-01	3.945E-01	NOT IDENT.
SB-124	7.004E-01	7.729E-01	8.349E-01	NOT IDENT.
SB-125	-4.015E-01	1.761E+00	1.770E+00	NOT IDENT.
TE-125M	1.939E+01	1.315E+02	1.318E+02	NOT IDENT.
I-126	1.032E+00	5.497E+00	5.517E+00	NOT IDENT.
SB-126	2.270E-01	3.249E+00	3.251E+00	NOT IDENT.
SB-127	-2.638E+00	6.850E+01	6.851E+01	NOT IDENT.
I-131	-8.552E-01	3.897E+00	3.916E+00	NOT IDENT.
I-132	-1.000E+41	4.800E+41	0.000E+00	SHORT HLIF
TE-132	4.172E+01	4.295E+01	4.689E+01	NOT IDENT.
BA-133	4.012E-01	7.251E-01	7.474E-01	NOT IDENT.
I-133	2.615E+06	1.966E+07	1.969E+07	SHORT HLIF
CS-134	9.134E-01	7.029E-01	8.146E-01	NOT IDENT.
CS-135	-3.215E-01	2.319E+00	2.324E+00	NOT IDENT.
I-135	-3.521E+22	5.696E+23	0.000E+00	SHORT HLIF
CS-136	2.525E+00	3.054E+00	3.259E+00	NOT IDENT.
CE-139	-1.219E-01	4.391E-01	4.425E-01	NOT IDENT.
BA-140	-2.095E+00	6.341E+00	6.411E+00	NOT IDENT.
LA-140	3.947E-01	8.451E-01	8.636E-01	NOT IDENT.
CE-141	3.135E-01	9.010E-01	9.120E-01	NOT IDENT.
CE-143	-4.426E+04	4.585E+04	5.000E+04	SHORT HLIF
CE-144	-6.130E-01	2.565E+00	2.580E+00	NOT IDENT.
PM-144	-2.423E-01	5.133E-01	5.248E-01	NOT IDENT.
PR-144	-1.860E+01	3.853E+01	3.943E+01	FAIL ABUN
PM-146	1.178E+00	9.728E-01	1.108E+00	NOT IDENT.
ND-147	5.131E+00	1.640E+01	1.656E+01	NOT IDENT.
PM-149	-7.332E+03	1.023E+04	1.075E+04	NOT IDENT.
EU-150	-1.814E-01	4.229E-01	4.307E-01	NOT IDENT.
EU-152	-4.273E-01	1.593E+00	1.605E+00	FAIL ABUN
GD-153	5.622E-01	1.045E+00	1.076E+00	NOT IDENT.
EU-154	-7.397E-02	1.308E+00	1.308E+00	FAIL ABUN
EU-155	-3.355E-01	1.339E+00	1.348E+00	FAIL ABUN
TB-160	-1.934E-02	2.955E+00	2.955E+00	FAIL ABUN
HO-166M	5.740E-01	9.435E-01	9.783E-01	NOT IDENT.
TM-171	-3.512E+02	3.901E+02	4.210E+02	NOT IDENT.
HF-172	-4.027E-01	2.765E+00	2.771E+00	FAIL ABUN
LU-172	-4.222E-01	1.383E+00	1.396E+00	FAIL ABUN
LU-176	-5.738E-01	4.204E-01	4.936E-01	FAIL ABUN
HF-181	-1.801E-01	9.475E-01	9.510E-01	NOT IDENT.
TA-182	4.473E-02	1.888E+00	1.888E+00	NOT IDENT.
RE-183	2.714E+02	2.990E+01	1.260E+02	FAIL ABUN
RE-184	5.224E-01	3.074E+00	3.083E+00	NOT IDENT.
W-188	1.085E+02	1.152E+02	1.252E+02	NOT IDENT.
IR-192	-2.861E-02	5.780E-01	5.782E-01	NOT IDENT.
HG-203	1.414E-01	6.276E-01	6.308E-01	NOT IDENT.
BI-207	-2.113E-01	1.083E+00	1.088E+00	NOT IDENT.
TL-208	1.298E+00	7.734E-01	9.697E-01	NOT IDENT.
BI-211	-2.924E-01	3.369E+00	3.372E+00	NOT IDENT.
PB-211	4.780E+00	1.297E+01	1.314E+01	NOT IDENT.
BI-212	6.805E+00	8.076E+00	8.639E+00	NOT IDENT.
PB-212	-1.069E-01	8.231E-01	8.245E-01	NOT IDENT.
BI-214	4.331E-01	1.340E+00	1.354E+00	FAIL ABUN
PB-214	3.317E-02	1.221E+00	1.221E+00	FAIL ABUN
RN-219	-3.401E+00	7.401E+00	7.558E+00	NOT IDENT.

RN-222	4.331E-01	1.340E+00	1.354E+00	FAIL ABUN
RA-223	-3.136E+00	1.003E+01	1.013E+01	NOT IDENT.
RA-224	-7.973E+00	8.683E+00	9.397E+00	NOT IDENT.
RA-226	4.331E-01	1.340E+00	1.354E+00	FAIL ABUN
AC-227	-9.694E-01	3.711E+00	3.737E+00	NOT IDENT.
TH-227	-9.694E-01	3.711E+00	3.737E+00	NOT IDENT.
AC-228	-3.597E-01	3.043E+00	3.048E+00	NOT IDENT.
RA-228	-3.597E-01	3.043E+00	3.048E+00	NOT IDENT.
TH-228	-1.069E-01	8.231E-01	8.245E-01	NOT IDENT.
TH-230	4.331E-01	1.340E+00	1.354E+00	FAIL ABUN
PA-231	-1.679E+00	7.190E+00	7.230E+00	NOT IDENT.
TH-231	-3.136E+00	1.003E+01	1.013E+01	NOT IDENT.
TH-232	-3.597E-01	3.043E+00	3.048E+00	NOT IDENT.
PA-233	2.483E-01	1.035E+00	1.041E+00	NOT IDENT.
PA-234	-3.401E+00	8.266E+00	8.406E+00	NOT IDENT.
PA-234M	-7.172E-01	9.389E+01	9.389E+01	NOT IDENT.
TH-234	-1.004E+01	1.670E+01	1.730E+01	NOT IDENT.
U-234	4.331E-01	1.340E+00	1.354E+00	FAIL ABUN
U-235	5.073E-01	2.536E+00	2.547E+00	NOT IDENT.
NP-237	2.483E-01	1.035E+00	1.041E+00	NOT IDENT.
NP-238	1.786E+03	3.585E+03	3.674E+03	SHORT HLIF
U-238	-1.004E+01	1.670E+01	1.730E+01	NOT IDENT.
NP-239	7.368E-01	3.622E+00	3.637E+00	NOT IDENT.
PU-239	1.782E+03	4.334E+03	4.408E+03	NOT IDENT.
AM-243	3.686E-01	6.251E-01	6.468E-01	NOT IDENT.
CM-243	8.576E-01	1.351E+00	1.405E+00	NOT IDENT.
BK-247	-2.226E-01	1.205E+00	1.209E+00	NOT IDENT.
CM-247	2.522E-01	6.712E-01	6.808E-01	NOT IDENT.
CF-249	-5.113E-01	6.973E-01	7.345E-01	NOT IDENT.
CF-251	6.952E-01	1.714E+00	1.743E+00	NOT IDENT.
ANH-511	-3.170E-01	6.011E-01	6.179E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2703.7490	87.09	920.1271	136.47	728.0588
45.60	2731.4131	87.57	920.8152	140.51	706.6106
46.54	2737.3503	88.03	921.4706	143.76	709.2185
49.72	2609.9026	88.34	921.9123	144.24	713.9377
51.35	2715.9023	88.47	922.0936	145.44	682.3073
51.87	2854.9429	89.96	794.7752	152.43	734.6434
52.39	2897.8428	90.64	781.9338	153.25	632.2853
52.97	3015.9626	91.11	764.2551	154.21	652.6818
53.44	2982.9570	92.59	738.5490	156.02	704.5106
54.07	2910.5349	93.35	730.5468	158.56	623.7550
57.36	0.0000	94.56	815.5527	159.00	635.0684
57.53	3345.5806	94.65	815.6586	162.33	669.3625
57.98	2087.0159	94.67	815.6830	162.66	655.2083
59.27	2092.3872	94.87	811.8489	163.33	642.3696
59.32	2092.5981	97.43	743.3217	165.86	644.6004
59.54	2093.5083	98.43	751.5615	176.31	695.7025
60.96	831.2717	98.44	751.5728	176.60	684.6801
61.17	831.6101	99.53	772.2341	177.52	644.8508
62.93	873.5465	100.11	791.3487	181.07	695.5497
63.29	900.2408	102.03	773.9471	181.52	702.6178
63.58	963.1070	103.18	766.9473	184.41	775.8114
64.28	961.4776	103.37	754.7782	185.72	736.0174
66.73	894.8671	105.21	789.7869	193.51	724.2840
67.24	941.4636	105.31	789.8957	197.03	784.9810
67.68	941.2466	106.12	778.3572	198.01	746.7384
67.75	941.3646	106.47	782.8704	201.83	695.2971
69.67	1000.3815	109.28	749.4794	203.43	748.0845
70.83	1005.3869	111.00	804.3434	205.31	738.9588
72.81	1010.8604	111.76	768.6530	210.85	758.7763
72.87	1041.4513	114.06	780.4034	215.65	814.2740
74.66	969.7055	116.30	803.6634	222.11	784.2348
74.82	969.9755	116.74	754.5704	227.09	781.3290
74.97	1009.7005	119.76	741.3644	227.38	749.7996
77.11	1072.8094	121.12	718.8899	228.16	735.2921
78.74	997.2643	121.22	718.9800	228.18	735.3048
79.69	980.9247	121.78	719.4857	235.69	753.1222
80.12	1030.3990	122.06	719.7385	235.96	753.2841
80.19	1030.5149	122.92	720.5109	238.63	749.5620
80.57	1051.0828	123.07	720.6461	238.98	723.9813
81.00	1102.6697	123.68	743.4327	240.99	755.4247
81.07	1102.7935	125.81	748.5748	242.00	749.7920
81.75	1119.9855	127.23	740.3018	244.70	709.3915
83.79	995.9720	127.91	693.0136	252.40	660.6151
84.00	1017.3439	129.30	725.1010	252.80	630.2540
85.43	1052.7877	131.20	759.8928	254.15	0.0000
86.55	919.3508	133.02	710.1230	256.23	657.1440
86.79	919.6948	133.52	719.1148	260.90	656.7522
86.94	919.9133	136.00	725.5165	264.66	647.7162

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	654.1324	364.49	579.9009	600.60	331.7973
265.00	654.2314	366.42	599.1953	602.52	0.0000
268.22	675.8040	372.51	616.9131	604.72	345.2238
269.46	679.1473	375.05	590.6398	607.14	317.6380
270.03	653.9304	1093.63	588.8304	609.32	347.1817
271.23	630.7996	383.85	585.0939	610.33	305.8142
273.65	662.9669	388.16	604.2176	614.28	334.3153
276.40	648.7302	388.63	630.9108	618.01	325.3966
277.37	600.6560	391.69	575.8951	620.36	326.8015
277.60	592.5140	400.66	644.0764	621.93	332.4881
278.00	591.7658	401.81	635.5836	630.19	0.0000
279.20	624.3678	402.40	592.2149	631.29	337.0408
279.54	631.8497	404.85	605.9096	633.25	325.1770
279.70	620.9174	410.95	631.8122	634.78	334.1988
280.46	634.1055	413.71	674.6034	635.95	325.5191
283.69	561.9791	414.70	636.0822	636.99	326.7581
284.31	581.5449	423.72	604.1041	645.85	334.5428
285.41	626.2006	427.09	655.3615	657.76	402.4080
285.90	625.4973	427.87	639.5660	657.90	0.0000
287.50	643.7244	433.94	652.6967	661.66	323.2144
290.67	561.0416	439.40	644.4446	664.57	0.0000
293.27	0.0000	453.88	604.0615	666.33	280.4688
295.22	600.8258	463.37	799.9854	666.50	280.4842
295.96	577.9405	468.07	708.3914	667.71	0.0000
298.58	610.5741	473.00	661.6192	677.62	296.0251
299.98	602.7836	475.06	715.7640	685.70	299.1688
300.09	603.7633	476.78	689.6085	695.00	298.8455
300.13	603.7831	477.60	645.6083	696.49	298.1038
301.36	609.8748	482.18	568.6139	696.51	298.1118
302.85	574.1350	487.02	483.0546	697.00	306.2918
304.50	595.3018	492.35	485.3243	697.30	290.9635
304.85	580.5150	497.08	498.8892	697.49	290.9871
306.78	654.1565	505.52	494.6131	702.65	281.5780
308.46	611.8577	507.63	0.0000	706.68	309.1978
311.90	605.7532	511.00	497.1306	711.68	284.3211
316.51	578.4393	514.00	499.4992	720.70	305.2949
319.41	591.7877	514.00	499.4992	721.93	0.0000
320.08	563.7639	520.40	400.1026	722.78	321.0281
321.04	574.4873	520.69	400.1607	722.91	321.0453
323.87	594.4480	522.65	0.0000	723.31	307.4055
325.23	606.3170	527.90	387.9790	724.19	321.1914
328.76	555.5447	528.26	417.5596	727.33	298.7148
333.37	604.7124	529.59	396.7117	733.00	328.6042
333.97	585.9219	529.87	0.0000	735.93	326.1971
334.37	566.0925	531.02	381.7723	737.46	307.1188
338.28	553.1754	537.26	386.4424	739.50	283.4864
338.32	553.1842	546.56	0.0000	747.24	284.2559
340.48	570.1725	552.55	358.1484	748.06	284.3388
340.55	570.1907	563.25	339.2587	752.31	337.2901
344.28	601.1881	569.33	343.5840	753.82	337.4598
345.93	567.3032	569.50	345.7510	756.73	337.8083
351.06	612.3505	569.70	341.4851	756.80	337.8083
351.93	604.0150	583.19	216.0034	763.94	326.6198
355.39	0.0000	584.27	216.1011	765.81	312.9388
356.01	612.2592	595.83	342.0030	766.42	308.3746

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	300.0797	1002.74	426.2550	1678.03	0.0000
772.60	0.0000	1004.73	403.5663	1690.97	15.4909
776.52	353.1050	1021.30	0.0000	1750.46	0.0000
777.92	330.0304	1025.87	0.0000	1764.49	18.6413
778.90	331.0730	1028.54	0.0000	1770.23	20.6240
783.70	358.6252	1037.84	387.1431	1771.35	20.6283
785.37	342.0465	1038.76	0.0000	1791.20	0.0000
792.07	355.8945	1046.59	372.9268	1808.65	10.6787
794.95	311.3582	1048.07	325.6969	1810.72	0.0000
795.86	289.9363	1049.04	345.9477	1836.06	21.8559
801.95	356.1294	1050.41	366.2613		
810.06	337.3426	1063.66	370.5929		
810.29	333.6099	1077.00	317.0273		
810.45	339.2660	1077.34	312.9930		
810.76	328.0225	1085.87	361.5696		
815.77	350.2122	1093.63	393.9348		
818.51	334.5112	1099.45	380.2102		
832.01	370.6777	1112.07	357.1947		
834.85	361.1450	1112.84	321.3656		
835.71	374.2760	1115.54	372.5536		
836.80	0.0000	1120.29	320.2649		
846.75	0.0000	1120.55	320.2801		
846.77	398.4183	1121.30	313.4888		
856.80	347.2130	1129.67	253.3872		
860.56	414.4721	1131.51	0.0000		
871.09	421.5879	1147.95	0.0000		
873.19	422.8152	1173.23	196.8073		
875.33	0.0000	1177.95	159.8470		
879.38	416.9091	1189.05	168.2953		
880.51	418.9688	1204.77	100.7344		
883.24	420.2818	1221.41	86.3883		
884.68	399.3058	1231.02	81.3049		
889.28	451.8934	1235.36	68.7039		
894.76	447.8235	1238.28	81.4440		
898.04	459.8699	1260.41	0.0000		
900.72	471.8445	1271.87	62.1871		
903.28	442.2055	1274.44	62.2241		
911.20	462.6644	1274.54	62.2241		
912.08	482.1847	1291.59	62.7241		
923.98	0.0000	1298.22	0.0000		
926.50	486.2083	1312.11	49.4904		
929.11	518.7650	1332.49	56.2021		
937.49	542.5342	1362.66	0.0000		
944.13	531.8245	1365.19	30.4814		
946.00	546.8155	1368.63	0.0000		
949.00	504.1366	1384.29	27.3279		
954.55	0.0000	1408.01	32.9604		
962.31	508.0509	1457.56	0.0000		
964.08	488.6012	1460.82	11.1094		
966.17	481.0183	1489.16	21.4165		
968.97	446.8730	1505.03	21.4858		
983.53	412.0695	1584.12	21.8245		
984.45	0.0000	1596.21	15.2174		
996.26	400.6288	1620.50	21.0216		
1001.03	391.2058	1621.92	32.4962		

Continuing Calibration Data

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
 28-JUN-2016 10:39:39.31

Run Date	Detector	Parameter		Flag
28-JUN-2016	GAM01	All Parameters Passed		
28-JUN-2016	GAM02	Cal Check	PSFWHM-59	Investigate <i>OK</i>
28-JUN-2016	GAM03	Cal Check	PSFWHM-662	Action
28-JUN-2016	GAM03	Cal Check	PSFWHM-59	Action <i>looked out</i>
28-JUN-2016	GAM05	All Parameters Passed		
28-JUN-2016	GAM06	All Parameters Passed		
7-JUN-2016	GAM07	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM07	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM08	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
28-JUN-2016	GAM09	All Parameters Passed		
28-JUN-2016	GAM10	All Parameters Passed		
28-JUN-2016	GAM11	All Parameters Passed		
		Weekly Background check completed on 28-JUN-2016.		
		No daily Bkg Check necessary.		
28-JUN-2016	GAM12	All Parameters Passed		
		Weekly Background check completed on 28-JUN-2016.		
		No daily Bkg Check necessary.		
-----	GAM13	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM13	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM14	Cal Check	PSFWHM-1332	Investigate <i>OK</i>
27-JUN-2016	GAM15	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM15	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM16	All Parameters Passed		
28-JUN-2016	GAM17	Cal Check	PSFWHM-662	Action
28-JUN-2016	GAM17	Cal Check	PSFWHM-59	Action <i>below -OK</i>
27-JUN-2016	GAM18	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM18	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM19	All Parameters Passed		<i>OK</i>
27-JUN-2016	GAM20	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM20	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM22	Cal Check	PSFWHM-1332	Investigate <i>OK</i>

28-JUN-2016	GAM24	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
28-JUN-2016	GAM25	All Parameters Passed		
28-JUN-2016	GAM26	All Parameters Passed		
28-JUN-2016	GAM27	Cal Check	PSFWHM-662	Action <i>below-OK</i>
28-JUN-2016	GAM28	All Parameters Passed		
27-JUN-2016	GAM29	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM29	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM30	All Parameters Passed		
28-JUN-2016	GAM31	All Parameters Passed		
28-JUN-2016	GAM32	Cal Check	PSFWHM-662	Investigate <i>OK</i>
28-JUN-2016	GAM33	All Parameters Passed		
		Weekly Background check completed on 28-JUN-2016.		
		No daily Bkg Check necessary.		
28-JUN-2016	GAM36	Cal Check	PSFWHM-662	Investigate <i>OK</i>
-----	GAM40	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM40	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM41	All Parameters Passed		
28-JUN-2016	GAM43	All Parameters Passed		
28-JUN-2016	GAM44	Cal Check	PSFWHM-1332	Investigate <i>OK</i>
28-JUN-2016	GAM44	Cal Check	NLACTVTY-59	Investigate <i>OK</i>
28-JUN-2016	WELL	All Parameters Passed		
28-JUN-2016	XRAY1	All Parameters Passed		
28-JUN-2016	XRAY2	All Parameters Passed		
28-JUN-2016	XRAY3	Cal Check	NLACTVTY-109	Investigate <i>OK</i>
28-JUN-2016	XRAY4	All Parameters Passed		
28-JUN-2016	XRAY5	All Parameters Passed		
28-JUN-2016	XRAY6	All Parameters Passed		

APPROVAL DATE: *6/28/16*

APPROVAL TIME: *11:06*

APPROVED BY: *Uftampv*

PROCEDURE # GL-RAD-I-001

Report completed at 28-JUN-2016 10:43:30.74

Runlogs

Instrument Run Log

Instrument Type: GAMMA SPECTROMETER

Batch ID: 1572231

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398677016	SAMPLE	MXR1	GAM27	JUN-28-16 12:50:21	DONE CAN		08-SEP-15 00:00
398677002	SAMPLE	MXR1	GAM41	JUN-28-16 12:50:40	DONE CAN		26-JAN-16 00:00
398677003	SAMPLE	MXR1	GAM43	JUN-28-16 12:51:00	DONE CAN		10-SEP-15 00:00
1203561375	LCS	MXR1	GAM30	JUN-28-16 12:54:31	DONE CAN		11-MAR-16 00:00
398677004	SAMPLE	MXR1	GAM05	JUN-28-16 13:07:29	DONE CAN		17-SEP-15 00:00
398677005	SAMPLE	MXR1	GAM19	JUN-28-16 13:07:49	DONE CAN		15-JUN-16 00:00
398677006	SAMPLE	MXR1	GAM28	JUN-28-16 13:08:10	DONE CAN		27-JUL-15 00:00
398677007	SAMPLE	MXR1	GAM31	JUN-28-16 13:08:29	DONE CAN		15-JUN-16 00:00
398677008	SAMPLE	MXR1	GAM16	JUN-28-16 13:08:49	DONE CAN		28-SEP-15 00:00
398677001	SAMPLE	MXR1	GAM30	JUN-28-16 13:11:09	DONE CAN		11-MAR-16 00:00
398677009	SAMPLE	MXR1	GAM14	JUN-28-16 14:35:10	DONE CAN		13-OCT-15 00:00
398677010	SAMPLE	MXR1	GAM16	JUN-28-16 14:35:32	DONE CAN		28-SEP-15 00:00
398677011	SAMPLE	MXR1	GAM17	JUN-28-16 14:35:52	DONE CAN		01-JUN-16 00:00
398677012	SAMPLE	MXR1	GAM19	JUN-28-16 14:36:15	DONE CAN		15-JUN-16 00:00
398677013	SAMPLE	MXR1	GAM25	JUN-28-16 14:36:36	DONE CAN		15-JUL-15 00:00
398677014	SAMPLE	MXR1	GAM27	JUN-28-16 14:36:54	DONE CAN		08-SEP-15 00:00
398677015	SAMPLE	MXR1	GAM28	JUN-28-16 14:37:15	DONE CAN		27-JUL-15 00:00
398677017	SAMPLE	MXR1	GAM30	JUN-28-16 14:37:37	DONE CAN		11-MAR-16 00:00
398677018	SAMPLE	MXR1	GAM31	JUN-28-16 14:38:00	DONE CAN		15-JUN-16 00:00
398677019	SAMPLE	MXR1	GAM32	JUN-28-16 14:38:20	DONE CAN		06-AUG-15 00:00
398677020	SAMPLE	MXR1	GAM33	JUN-28-16 14:38:38	DONE CAN		10-JUN-16 00:00
1203561373	MB	MXR1	GAM41	JUN-28-16 14:38:59	DONE CAN		26-JAN-16 00:00
1203561374	DUP	MXR1	GAM43	JUN-28-16 14:39:35	DONE CAN		10-SEP-15 00:00

Instrument Run Log

Instrument Type: GAMMA SPECTROMETER

Batch ID: 1572486

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398677021	SAMPLE	MXR1	GAM01	JUN-28-16 11:36:35	DONE CAN		10-JUL-15 00:00
398677022	SAMPLE	MXR1	GAM08	JUN-28-16 11:36:57	DONE CAN		08-JUL-15 00:00
398677023	SAMPLE	MXR1	GAM09	JUN-28-16 11:37:18	DONE CAN		03-JUN-16 00:00
398677024	SAMPLE	MXR1	GAM14	JUN-28-16 11:37:39	DONE CAN		13-OCT-15 00:00
398677025	SAMPLE	MXR1	GAM17	JUN-28-16 11:38:00	DONE CAN		01-JUN-16 00:00
398677026	SAMPLE	MXR1	GAM32	JUN-28-16 11:38:22	DONE CAN		06-AUG-15 00:00
398677027	SAMPLE	MXR1	GAM41	JUN-28-16 11:38:44	DONE CAN		26-JAN-16 00:00
398677028	SAMPLE	MXR1	GAM43	JUN-28-16 11:39:09	DONE CAN		10-SEP-15 00:00
398677031	SAMPLE	MXR1	GAM02	JUN-28-16 11:42:50	DONE CAN		18-AUG-15 00:00
398677029	SAMPLE	MXR1	GAM06	JUN-28-16 12:14:27	DONE CAN		08-MAR-16 00:00
398677030	SAMPLE	MXR1	GAM24	JUN-28-16 12:14:48	DONE CAN		17-JUN-16 00:00
1203561992	LCS	MXR1	GAM30	JUN-28-16 12:36:58	DONE CAN		11-MAR-16 00:00
398677032	SAMPLE	MXR1	GAM01	JUN-28-16 12:44:13	DONE CAN		10-JUL-15 00:00
398677033	SAMPLE	MXR1	GAM02	JUN-28-16 12:44:44	DONE CAN		18-AUG-15 00:00
398677034	SAMPLE	MXR1	GAM08	JUN-28-16 12:45:06	DONE CAN		08-JUL-15 00:00
398677035	SAMPLE	MXR1	GAM09	JUN-28-16 12:45:31	DONE CAN		03-JUN-16 00:00
398677036	SAMPLE	MXR1	GAM11	JUN-28-16 12:45:52	DONE CAN		16-JUL-15 00:00
398677038	SAMPLE	MXR1	GAM14	JUN-28-16 12:46:23	DONE CAN		13-OCT-15 00:00
398677037	SAMPLE	MXR1	GAM12	JUN-28-16 12:47:30	DONE CAN		29-SEP-15 00:00
398677039	SAMPLE	MXR1	GAM17	JUN-28-16 12:47:55	DONE CAN		01-JUN-16 00:00
398677040	SAMPLE	MXR1	GAM25	JUN-28-16 12:48:19	DONE CAN		15-JUL-15 00:00
1203561990	MB	MXR1	GAM32	JUN-28-16 12:48:44	DONE CAN		06-AUG-15 00:00
1203561991	DUP	MXR1	GAM33	JUN-28-16 12:49:09	DONE CAN		10-JUN-16 00:00

Gas Flow Raw Data

Batch# 1575872 Product: Sc-90 Date: 6/28/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: K. Ost 6/28/16

Secondary Review Performed By: [Signature]

BRKL
7/3

Strontium 90 Queue Sheet

06/24/16

Batch #: 1575872 Analyst: KSD1 First Client Due Date: 07/03/2016 Internal Due Date: 06/29/2016 Comments

Sr-90 Spike Code: 12430 Expiration Date: 12/18/16 Vol: 0.1

Sr-90 LCS Code: 12430 Expiration Date: 12/18/16 Vol: 0.1

Sr Carrier Code: 1414995 Exp Date: 03/17 Vol: 0.5 Sdt Wt: 337

Prep Date: 06/24/16 Initials: KSD Balance #: 16107662 Analytical Scale #: F30560 Witness: 6-24-16 PL

Sample ID	Client Description	Type	RDL	Collection Date	Matrix	Client	Rad	Pos. #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)
398677021-1	37801-021	SAMPLE	2 pCi/g	MAY-11-16 02:30 PM	SOIL	BRKL007		1	0.323	1A	0.0246	0.0315	6.7
398677022-1	37801-022	SAMPLE	2 pCi/g	MAY-11-16 02:20 PM	SOIL	BRKL007		2	0.317	1B	0.0245	0.0305	6.0
398677023-1	37801-023	SAMPLE	2 pCi/g	MAY-11-16 02:10 PM	SOIL	BRKL007		3	0.304	1A	0.0245	0.0312	6.7
398677024-1	37801-024	SAMPLE	2 pCi/g	MAY-11-16 01:57 PM	SOIL	BRKL007		4	0.326	2B	0.0244	0.0301	5.7
398677025-1	37801-025	SAMPLE	2 pCi/g	MAY-11-16 01:51 PM	SOIL	BRKL007		5	0.301	3C	0.0244	0.0312	6.8
398677026-1	37801-026	SAMPLE	2 pCi/g	MAY-11-16 02:35 PM	SOIL	BRKL007		6	0.377	3D	0.0245	0.0309	6.4
398677027-1	37801-027	SAMPLE	2 pCi/g	MAY-11-16 02:55 PM	SOIL	BRKL007		7	0.315	1A	0.0244	0.0312	6.8
398677028-1	37801-028	SAMPLE	2 pCi/g	MAY-11-16 02:50 PM	SOIL	BRKL007		8	0.318	6A	0.0243	0.0310	6.7
398677029-1	37801-029	SAMPLE	2 pCi/g	MAY-11-16 02:45 PM	SOIL	BRKL007		9	0.334	6C	0.0244	0.0314	7.0
398677030-1	37801-030	SAMPLE	2 pCi/g	MAY-11-16 02:40 PM	SOIL	BRKL007		10	0.346	7A	0.0244	0.0312	6.8
398677031-1	37801-031	SAMPLE	2 pCi/g	MAY-11-16 03:10 PM	SOIL	BRKL007		11	0.311	7B	0.0244	0.0310	6.6
398677032-1	37801-032	SAMPLE	2 pCi/g	MAY-11-16 03:05 PM	SOIL	BRKL007		12	0.321	7C	0.0247	0.0314	6.7
398677033-1	37801-033	SAMPLE	2 pCi/g	MAY-11-16 03:15 PM	SOIL	BRKL007		13	0.375	9A	0.0246	0.0311	6.5
398677034-1	37801-034	SAMPLE	2 pCi/g	MAY-11-16 03:00 PM	SOIL	BRKL007		14	0.329	8B	0.0246	0.0314	6.8
398677035-1	37801-035	SAMPLE	2 pCi/g	MAY-11-16 03:35 PM	SOIL	BRKL007		15	0.336	8D	0.0245	0.0312	6.7
398677036-1	37801-036	SAMPLE	2 pCi/g	MAY-11-16 03:30 PM	SOIL	BRKL007		16	0.343	9A	0.0244	0.0313	6.9
398677037-1	37801-037	SAMPLE	2 pCi/g	MAY-11-16 03:25 PM	SOIL	BRKL007		17	0.327	9B	0.0243	0.0311	6.8
398677038-1	37801-038	SAMPLE	2 pCi/g	MAY-11-16 03:20 PM	SOIL	BRKL007		18	0.356	9C	0.0245	0.0315	7.0
398677039-1	37801-039	SAMPLE	2 pCi/g	MAY-11-16 03:40 PM	SOIL	BRKL007		19	0.335	9D	0.0247	0.0315	6.8
398677040-1	37801-040	SAMPLE	2 pCi/g	MAY-11-16 12:00 AM	SOIL	BRKL007		20	0.370	10A	0.0248	0.0312	6.4
1203570890-1	MB for batch 1575872	MB	2 pCi/g		SOIL	QC ACCOUNT		21	0.377	10B	0.0246	0.0310	6.4
1203570891-1	37801-031(398677031DUP)	DUP	2 pCi/g	MAY-11-16 03:10 PM	SOIL	QC ACCOUNT		22	0.369	10C	0.0244	0.0312	6.8
1203570892-1	37801-031(398677031MS)	MS	2 pCi/g	MAY-11-16 03:10 PM	SOIL	QC ACCOUNT		23	0.321	11A	0.0246	0.0315	6.9
1203570893-1	37801-031(398677031MSD)	MSD	2 pCi/g	MAY-11-16 03:10 PM	SOIL	QC ACCOUNT		24	0.352	11B	0.0246	0.0311	6.5
1203570894-1	LCS for batch 1575872	LCS	2 pCi/g		SOIL	QC ACCOUNT		25	0.377	11C	0.0246	0.0315	6.9

Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: Wbat 6/29/16

Circle One

Strontium-90 Solid

Filename : SR90.XLS
File type : Excel
Version # : 1.3.10

Carrier S/N :	2414995
Carrier Exp Date :	6/3/2017
Carrier Volume Added:	0.50
Carrier Weight (mg/ml):	14.73
Carrier Weight StDev.:	0.10

Batch : 1575872
Analyst : KSD1
Prep Date: 6/24/2016
Method Uncertainty : 0.089724

Procedure Code :	GFC90SR
Parname :	Strontium-90
Required MDA :	2 pCi/G
Sr-90 Abundance :	1.00
Halflife of Sr-90 :	28.90 years
Halflife of Y-90 :	64.053 hours

Geometry: Tuffryn Filter

Sample Characteristics				Carrier Calculations				
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot SDev. G	Carrier Weight (mg) (Standard)	Net Weight (mg) (Sample)	Net Weight SDev. (mg)	Carrier Aliquot (mL)	Carrier Aliquot SDev. (mL)
1	398677021.1	0.3230	3.2528E-03	14.73	6.90	0.036986	0.5	0.001000
2	398677022.1	0.3170	3.2521E-03	14.73	6.00	0.033118	0.5	0.001000
3	398677023.1	0.3040	3.2508E-03	14.73	6.70	0.036127	0.5	0.001000
4	398677024.1	0.3260	3.2531E-03	14.73	5.70	0.031829	0.5	0.001000
5	398677025.1	0.3010	3.2505E-03	14.73	6.80	0.036556	0.5	0.001000
6	398677026.1	0.3770	3.2584E-03	14.73	6.40	0.034837	0.5	0.001000
7	398677027.1	0.3150	3.2519E-03	14.73	6.80	0.036556	0.5	0.001000
8	398677028.1	0.3180	3.2522E-03	14.73	6.70	0.036127	0.5	0.001000
9	398677029.1	0.3340	3.2539E-03	14.73	7.00	0.037416	0.5	0.001000
10	398677030.1	0.3460	3.2552E-03	14.73	6.80	0.036556	0.5	0.001000
11	398677031.1	0.3110	3.2515E-03	14.73	6.60	0.035697	0.5	0.001000
12	398677032.1	0.3210	3.2525E-03	14.73	6.70	0.036127	0.5	0.001000
13	398677033.1	0.3750	3.2582E-03	14.73	6.50	0.035267	0.5	0.001000
14	398677034.1	0.3290	3.2534E-03	14.73	6.80	0.036556	0.5	0.001000
15	398677035.1	0.3360	3.2541E-03	14.73	6.70	0.036127	0.5	0.001000
16	398677036.1	0.3430	3.2548E-03	14.73	6.90	0.036986	0.5	0.001000
17	398677037.1	0.3270	3.2532E-03	14.73	6.80	0.036556	0.5	0.001000
18	398677038.1	0.3560	3.2562E-03	14.73	7.00	0.037416	0.5	0.001000
19	398677039.1	0.3350	3.2540E-03	14.73	6.80	0.036556	0.5	0.001000
20	398677040.1	0.3700	3.2577E-03	14.73	6.40	0.034837	0.5	0.001000
21	1203570890.1	0.3770	3.2584E-03	14.73	6.40	0.034837	0.5	0.001000
22	1203570891.1	0.3690	3.2576E-03	14.73	6.80	0.036556	0.5	0.001000
23	1203570892.1	0.3210	3.2525E-03	14.73	6.90	0.036986	0.5	0.001000
24	1203570893.1	0.3520	3.2558E-03	14.73	6.50	0.035267	0.5	0.001000
25	1203570894.1	0.3770	3.2584E-03	14.73	6.90	0.036986	0.5	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data														Calculated			
Detector			Counting		Gross Counts		Gross Beta	Count		Strontium		Yttrium					
Pos.	ID	Time (min.)	Alpha	Beta	CPM	Start Date/Time	Separation Date/Time	Ingrowth	Decay	Sample Recovery %	Sample Recovery Error %						
1	1A	60	2	65	1.081	6/27/2016 17:19	6/27/2016 10:50	0.073	0.997	93.7%	1.04%						
2	1B	60	7	76	1.257	6/27/2016 17:19	6/27/2016 10:50	0.073	0.997	81.5%	1.05%						
3	11A	60	8	62	1.019	6/28/2016 11:28	6/27/2016 10:50	0.238	0.997	91.0%	1.04%						
4	2B	60	3	22	0.353	6/27/2016 17:19	6/27/2016 10:50	0.073	0.997	77.4%	1.06%						
5	3C	60	14	32	0.524	6/27/2016 17:19	6/27/2016 10:50	0.073	0.997	92.3%	1.04%						
6	3D	60	16	36	0.584	6/27/2016 17:19	6/27/2016 10:50	0.073	0.997	86.9%	1.05%						
7	11B	60	6	65	1.076	6/28/2016 11:28	6/27/2016 10:50	0.238	0.997	92.3%	1.04%						
8	6A	60	7	37	0.609	6/27/2016 17:22	6/27/2016 10:50	0.073	0.997	91.0%	1.04%						
9	6C	60	2	36	0.598	6/27/2016 17:22	6/27/2016 10:50	0.073	0.997	95.0%	1.04%						
10	11C	60	1	35	0.581	6/28/2016 11:28	6/27/2016 10:50	0.238	0.997	92.3%	1.04%						
11	7B	60	6	28	0.461	6/27/2016 17:22	6/27/2016 10:50	0.073	0.997	89.6%	1.04%						
12	7C	60	2	40	0.663	6/27/2016 17:22	6/27/2016 10:50	0.073	0.997	91.0%	1.04%						
13	8A	60	3	40	0.663	6/27/2016 17:22	6/27/2016 10:50	0.073	0.997	88.3%	1.04%						
14	8B	60	3	15	0.246	6/27/2016 17:22	6/27/2016 10:50	0.073	0.997	92.3%	1.04%						
15	8D	60	13	33	0.539	6/27/2016 17:23	6/27/2016 10:50	0.073	0.997	91.0%	1.04%						
16	9A	60	1	58	0.965	6/27/2016 17:23	6/27/2016 10:50	0.073	0.997	93.7%	1.04%						
17	9B	60	3	33	0.547	6/27/2016 17:23	6/27/2016 10:50	0.073	0.997	92.3%	1.04%						
18	9C	60	5	61	1.011	6/27/2016 17:23	6/27/2016 10:50	0.073	0.997	95.0%	1.04%						
19	9D	60	9	53	0.874	6/27/2016 17:23	6/27/2016 10:50	0.074	0.997	92.3%	1.04%						
20	11D	60	3	73	1.213	6/28/2016 11:28	6/27/2016 10:50	0.238	0.997	86.9%	1.05%						
21	10B	60	2	37	0.611	6/27/2016 17:22	6/27/2016 10:50	0.073	1.000	86.9%	1.05%						
22	10C	60	2	42	0.692	6/27/2016 17:22	6/27/2016 10:50	0.073	0.997	92.3%	1.04%						
23	11A	60	8	1339	22.302	6/27/2016 17:26	6/27/2016 10:50	0.074	0.997	93.7%	1.04%						
24	11B	60	1	1305	21.749	6/27/2016 17:26	6/27/2016 10:50	0.074	0.997	88.3%	1.04%						
25	11C	60	1	1246	20.764	6/27/2016 17:26	6/27/2016 10:50	0.074	1.000	93.7%	1.04%						

Calibration Data				Detector			Alpha		Weekly Bkg		Weekly Bkg	
Pos.	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)		Error (cpm/dpm)	X-Talk	CPM	Weekly Bkg Count	Weekly Bkg Start Date/Time	Weekly Bkg Count	Weekly Bkg Time (min.)
				Sr-90	Y-90							
1	PIC	4/1/2016	2/28/2017	0.4225	0.5477	0.00738	0.08149	0.720		6/24/2016 17:26		500
2	PIC	4/1/2016	2/28/2017	0.4272	0.5497	0.00711	0.08136	1.000		6/24/2016 17:27		500
3	PIC	4/1/2016	2/28/2017	0.4244	0.5473	0.01317	0.10778	0.918		6/25/2016 12:48		500
4	PIC	4/1/2016	2/28/2017	0.4005	0.5091	0.02111	0.27043	0.426		6/24/2016 17:27		500
5	PIC	4/1/2016	2/28/2017	0.4176	0.5563	0.00988	0.04185	0.566		6/24/2016 17:27		500
6	PIC	4/1/2016	2/28/2017	0.4032	0.5395	0.02297	0.05896	0.610		6/24/2016 17:27		500
7	PIC	4/1/2016	2/28/2017	0.4319	0.5589	0.00697	0.07167	0.838		6/24/2016 17:35		500
8	PIC	4/1/2016	2/28/2017	0.4133	0.5572	0.02228	0.06299	0.758		6/24/2016 17:30		500
9	PIC	4/1/2016	2/28/2017	0.4225	0.5617	0.01970	0.04667	0.714		6/24/2016 17:30		500
10	PIC	4/1/2016	2/28/2017	0.4171	0.5497	0.01278	0.16542	0.474		6/24/2016 17:35		500
11	PIC	4/1/2016	2/28/2017	0.4307	0.5632	0.00627	0.05286	0.496		6/24/2016 17:30		500
12	PIC	4/1/2016	2/28/2017	0.4149	0.5415	0.00790	0.11682	0.456		6/24/2016 17:30		500
13	PIC	4/1/2016	2/28/2017	0.4128	0.5573	0.01579	0.06370	0.878		6/24/2016 17:30		500
14	PIC	4/1/2016	2/28/2017	0.4294	0.5567	0.02148	0.07575	0.366		6/24/2016 17:30		500
15	PIC	4/1/2016	2/28/2017	0.4259	0.5674	0.00609	0.05194	0.744		6/24/2016 17:31		500
16	PIC	4/1/2016	2/28/2017	0.4240	0.5591	0.00758	0.12587	0.760		6/24/2016 17:31		500
17	PIC	4/1/2016	2/28/2017	0.4203	0.5570	0.00754	0.06036	0.582		6/24/2016 17:31		500
18	PIC	4/1/2016	2/28/2017	0.4143	0.5526	0.00584	0.06888	0.680		6/24/2016 17:31		500
19	PIC	4/1/2016	2/28/2017	0.4213	0.5596	0.02610	0.05933	1.134		6/24/2016 17:31		500
20	PIC	4/1/2016	2/28/2017	0.4301	0.5699	0.01068	0.06673	1.324		6/24/2016 17:35		500
21	PIC	4/1/2016	2/28/2017	0.4099	0.5325	0.00652	0.17326	0.568		6/24/2016 17:31		500
22	PIC	4/1/2016	2/28/2017	0.4061	0.5237	0.00638	0.24115	0.716		6/24/2016 17:31		500
23	PIC	4/1/2016	2/28/2017	0.4242	0.5473	0.01317	0.10799	0.918		6/25/2016 12:48		500
24	PIC	4/1/2016	2/28/2017	0.4324	0.5589	0.00697	0.07107	0.838		6/24/2016 17:35		500
25	PIC	4/1/2016	2/28/2017	0.4170	0.5497	0.01278	0.16568	0.474		6/24/2016 17:35		500

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1243-O
 Spike Exp Date : 12/18/2016
 Spike Activity (dpm/ml): 486.16
 Spike Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 486.16
 LCS Volume Added: 0.10

Results		2 SIGMA				2 SIGMA				2 SIGMA				2 SIGMA							
Pos.	Decision Level		Critical Level	Required MDA		MDA		Sample Act.		Sample Error %	Net Count		Net Count Rate Error CPM	Counting Uncertainty pCi/G	Total Prop. Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
	pCi/G	pCi/G		pCi/G	pCi/G	Conc. pCi/G	Rate CPM	Rate CPM	Rate Error CPM		Rate Error CPM										
1	0.8722	0.6158	2	1.3931	1.1645	38.71%	0.3606	0.1395	0.8827	0.9070	SAMPLE										
2	1.1920	0.8416	2	1.8703	0.9630	58.93%	0.2572	0.1515	1.1119	1.1252	SAMPLE										
3	0.8984	0.6343	2	1.4159	0.2974	135.89%	0.1010	0.1372	0.7920	0.7939	SAMPLE										
4	0.8503	0.6003	2	1.4052	-0.2981	112.70%	-0.0729	0.0821	0.6584	0.6585	SAMPLE										
5	0.8500	0.6001	2	1.3776	-0.1506	234.00%	-0.0424	0.0993	0.6906	0.6907	SAMPLE										
6	0.7750	0.5472	2	1.2502	-0.0802	406.96%	-0.0257	0.1047	0.6395	0.6396	SAMPLE										
7	0.8014	0.5658	2	1.2691	0.6550	58.82%	0.2382	0.1400	0.7548	0.7639	SAMPLE										
8	0.9531	0.6729	2	1.5178	-0.5113	72.71%	-0.1487	0.1080	0.7282	0.7283	SAMPLE										
9	0.8257	0.5829	2	1.3194	-0.3547	92.44%	-0.1156	0.1068	0.6424	0.6425	SAMPLE										
10	0.5657	0.3994	2	0.9279	0.2751	96.73%	0.1066	0.1031	0.5215	0.5239	SAMPLE										
11	0.7701	0.5437	2	1.2591	-0.1189	269.15%	-0.0346	0.0932	0.6273	0.6274	SAMPLE										
12	0.7316	0.5165	2	1.2032	0.7037	52.91%	0.2068	0.1094	0.7294	0.7403	SAMPLE										
13	0.8975	0.6337	2	1.4177	-0.6455	52.81%	-0.2145	0.1132	0.6676	0.6676	SAMPLE										
14	0.6091	0.4300	2	1.0182	-0.3788	58.11%	-0.1198	0.0695	0.4311	0.4312	SAMPLE										
15	0.8682	0.6129	2	1.3840	-0.6490	49.87%	-0.2053	0.1023	0.6340	0.6341	SAMPLE										
16	0.8391	0.5924	2	1.3360	0.6185	64.86%	0.2046	0.1327	0.7861	0.7939	SAMPLE										
17	0.7880	0.5563	2	1.2748	-0.1136	289.55%	-0.0350	0.1014	0.6448	0.6449	SAMPLE										
18	0.7705	0.5440	2	1.2348	0.9714	40.80%	0.3309	0.1349	0.7763	0.7955	SAMPLE										
19	1.0709	0.7580	2	1.6700	-0.8199	50.09%	-0.2596	0.1298	0.8035	0.8036	SAMPLE										
20	0.9098	0.6423	2	1.4088	-0.2749	136.66%	-0.1107	0.1512	0.7362	0.7362	SAMPLE										
21	0.7349	0.5188	2	1.1908	0.1314	248.04%	0.0429	0.1064	0.6387	0.6391	MB										
22	0.8037	0.5674	2	1.2840	-0.0717	473.67%	-0.0240	0.1139	0.6658	0.6659	398677031.1	DUP	* 0.0%								
23	0.9861	0.6962	2	1.5540	69.1344	3.46%	21.3843	0.6112	3.8728	13.1546	398677031.1	MS									
24	0.8946	0.6316	2	1.4166	64.1915	3.28%	20.9108	0.6035	3.6308	12.0513	398677031.1	LCS	7.4%								
25	0.6108	0.4312	2	1.0018	56.5439	3.45%	20.2899	0.5891	3.2176	10.7462											

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
398677021	1A	60	2	65	6/27/2016 17:19	6/27/2016 18:19	PIC	1575872
398677022	1B	60	7	76	6/27/2016 17:19	6/27/2016 18:19	PIC	1575872
398677023	11A	60	8	62	6/28/2016 11:28	6/28/2016 12:28	PIC	1575872
398677024	2B	60	3	22	6/27/2016 17:19	6/27/2016 18:19	PIC	1575872
398677025	3C	60	14	32	6/27/2016 17:19	6/27/2016 18:19	PIC	1575872
398677026	3D	60	16	36	6/27/2016 17:19	6/27/2016 18:19	PIC	1575872
398677027	11B	60	6	65	6/28/2016 11:28	6/28/2016 12:28	PIC	1575872
398677028	6A	60	7	37	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
398677029	6C	60	2	36	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
398677030	11C	60	1	35	6/28/2016 11:28	6/28/2016 12:28	PIC	1575872
398677031	7B	60	6	28	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
398677032	7C	60	2	40	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
398677033	8A	60	3	40	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
398677034	8B	60	3	15	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
398677035	8D	60	13	33	6/27/2016 17:23	6/27/2016 18:23	PIC	1575872
398677036	9A	60	1	58	6/27/2016 17:23	6/27/2016 18:23	PIC	1575872
398677037	9B	60	3	33	6/27/2016 17:23	6/27/2016 18:23	PIC	1575872
398677038	9C	60	5	61	6/27/2016 17:23	6/27/2016 18:23	PIC	1575872
398677039	9D	60	9	53	6/27/2016 17:23	6/27/2016 18:23	PIC	1575872
398677040	11D	60	3	73	6/28/2016 11:28	6/28/2016 12:28	PIC	1575872
1203570890	10B	60	2	37	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
1203570891	10C	60	2	42	6/27/2016 17:22	6/27/2016 18:22	PIC	1575872
1203570892	11A	60	8	1339	6/27/2016 17:26	6/27/2016 18:26	PIC	1575872
1203570893	11B	60	1	1305	6/27/2016 17:26	6/27/2016 18:26	PIC	1575872
1203570894	11C	60	1	1246	6/27/2016 17:26	6/27/2016 18:26	PIC	1575872

28-Jun-2016

Batch# 1578836 Product: Sr90 Date: 7/5/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.	✓		
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Amanda Lehu

Secondary Review Performed By: Sophia Lopez

~~BRKL~~ 7/5/16
BRKL 7/3

Strontium 90 Queue Sheet

07/01/16

Barch #: 1578836 Analyst: KSD1 First Client Due Date: 07/03/2016 Internal Due Date: 06/30/2016 Comments
 Sr-90 Spike Code: 12430 Expiration Date: 12/18/10 Vol: 0.1 Sr Sep. Date/time: 9/15 7/5/16
 Sr-90 LCS Code: 12430 Expiration Date: 12/18/10 Vol: 0.1
 Sr Carrier Code: 141499C Exp Date: 03/17 Vol: 0.5 Sdt Wt: 437
 Prep Date: 07/11/16 Initials: 160 Pipet ID: 1795419 Balance #: 1850299 Analytical Scale #: 83560 Witness: NA

Sample ID	Client Description	Type	RDL	Collection Date	Matrix	Client	Rad	Pos. #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)
398677001-2	37801-001	SAMPLE	2 pCi/g	MAY-11-16 10:00 AM	SOIL	BRKL007		1	0.346 2B		0.0947	0.0308	6.1
398677002-2	37801-002	SAMPLE	2 pCi/g	MAY-11-16 10:05 AM	SOIL	BRKL007		2	0.324 3C		0.0942	0.0307	6.5
398677003-2	37801-003	SAMPLE	2 pCi/g	MAY-11-16 10:10 AM	SOIL	BRKL007		3	0.341 3D		0.0240	0.0302	6.2
398677004-2	37801-004	SAMPLE	2 pCi/g	MAY-11-16 10:15 AM	SOIL	BRKL007		4	0.351 11A		0.0245	0.0307	6.2
398677005-2	37801-005	SAMPLE	2 pCi/g	MAY-11-16 10:19 AM	SOIL	BRKL007		5	0.340 11C		0.0239	0.0308	6.9
398677006-2	37801-006	SAMPLE	2 pCi/g	MAY-11-16 10:24 AM	SOIL	BRKL007		6	0.308 13D		0.0249	0.0304	6.2
398677007-2	37801-007	SAMPLE	2 pCi/g	MAY-11-16 10:30 AM	SOIL	BRKL007		7	0.326 13A		0.0249	0.0307	6.5
398677008-2	37801-008	SAMPLE	2 pCi/g	MAY-11-16 10:35 AM	SOIL	BRKL007		8	0.308 13B		0.0240	0.0301	6.7
398677009-2	37801-009	SAMPLE	2 pCi/g	MAY-11-16 10:40 AM	SOIL	BRKL007		9	0.308 13D		0.0245	0.0306	6.3
398677010-2	37801-010	SAMPLE	2 pCi/g	MAY-11-16 10:50 AM	SOIL	BRKL007		10	0.341 14A		0.0238	0.0306	6.8
398677011-2	37801-011	SAMPLE	2 pCi/g	MAY-11-16 10:55 AM	SOIL	BRKL007		11	0.301 14C		0.0241	0.0310	6.9
398677012-2	37801-012	SAMPLE	2 pCi/g	MAY-11-16 11:00 AM	SOIL	BRKL007		12	0.324 2B	2B	0.0243	0.0314	7.1
398677013-2	37801-013	SAMPLE	2 pCi/g	MAY-11-16 11:03 AM	SOIL	BRKL007		13	0.326 5C		0.0245	0.0307	7
398677014-2	37801-014	SAMPLE	2 pCi/g	MAY-11-16 11:10 AM	SOIL	BRKL007		14	0.308 5A		0.0238	0.0318	6.0
398677015-2	37801-015	SAMPLE	2 pCi/g	MAY-11-16 11:15 AM	SOIL	BRKL007		15	0.331 2A		0.0245	0.0308	6.3
398677016-2	37801-016	SAMPLE	2 pCi/g	MAY-11-16 11:25 AM	SOIL	BRKL007		16	0.350 2B	8B	0.0237	0.0306	6.5
398677017-2	37801-017	SAMPLE	2 pCi/g	MAY-11-16 11:35 AM	SOIL	BRKL007		17	0.302 2C		0.0238	0.0306	6.8
398677018-2	37801-018	SAMPLE	2 pCi/g	MAY-11-16 11:40 AM	SOIL	BRKL007		18	0.382 2B		0.0246	0.0307	6.4
398677019-2	37801-019	SAMPLE	2 pCi/g	MAY-11-16 12:00 AM	SOIL	BRKL007		19	0.417 3C		0.0249	0.0306	6.9
398677020-2	37801-020	SAMPLE	2 pCi/g	MAY-11-16 11:20 AM	SOIL	BRKL007		20	0.402 3D		0.0235	0.0318	6.3
1203578113-1	MB for batch 1578836	MB	UCF pCi/g		SOIL	QC ACCOUNT		21	0.417 7C		0.0232	0.0301	6.9
1203578114-2	37801-017(398677016DUP)	DUP	2 pCi/g	MAY-11-16 11:25 AM	SOIL	QC ACCOUNT		22	0.324 8B		0.0249	0.0302	6.0
1203578115-2	37801-017(398677016MS)	MS	2 pCi/g	MAY-11-16 11:25 AM	SOIL	QC ACCOUNT		23	0.307 4B		0.0249	0.0306	6.1
1203578116-2	37801-017(398677016MSD)	MSD	2 pCi/g	MAY-11-16 11:25 AM	SOIL	QC ACCOUNT		24	0.307 4C		0.0236	0.0308	6.2
1203578117-1	LCS for batch 1578836	LCS	UCF pCi/g		SOIL	QC ACCOUNT		25	0.417 4D		0.0238	0.0301	6.8

115116
 115116

Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: Manda

Circle One

Strontium-90 Solid

Filename : SR90.XLS
File type : Excel
Version # : 1.3.10

Carrier SN : 2414995
Carrier Exp Date : 6/3/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 14.73
Carrier Weight StDev.: 0.10

Batch : 1578836
Analyst : KSD1
Prep Date : 7/1/2016
Method Uncertainty : 0.089724205

Procedure Code : GFC90SRS
Parname : Strontium-90
Required MDA : 2 pCi/G
Sr-90 Abundance : 1.00 years
Half-life of Sr-90 : 28.90 years
Half-life of Y-90 : 64.053 hours

Geometry: Tuffryn Filter

Sample Characteristics				Carrier Calculations					
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Carrier Weight (mg) (Standard)	Net Weight (mg) (Sample)	Net Weight StDev. (mg)	Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)
1	398677001.2	0.3460	3.2552E-03	5/11/2016 10:00	14.73	6.10	0.033548	0.5	0.001000
2	398677002.2	0.3240	3.2529E-03	5/11/2016 10:05	14.73	6.50	0.035267	0.5	0.001000
3	398677003.2	0.3410	3.2546E-03	5/11/2016 10:10	14.73	6.20	0.033978	0.5	0.001000
4	398677004.2	0.3510	3.2557E-03	5/11/2016 10:15	14.73	6.20	0.033978	0.5	0.001000
5	398677005.2	0.3400	3.2545E-03	5/11/2016 10:19	14.73	6.90	0.036986	0.5	0.001000
6	398677006.2	0.3680	3.2575E-03	5/11/2016 10:24	14.73	6.20	0.033978	0.5	0.001000
7	398677007.2	0.3260	3.2531E-03	5/11/2016 10:30	14.73	6.50	0.035267	0.5	0.001000
8	398677008.2	0.3080	3.2512E-03	5/11/2016 10:35	14.73	6.20	0.033978	0.5	0.001000
9	398677009.2	0.3080	3.2512E-03	5/11/2016 10:40	14.73	6.30	0.034407	0.5	0.001000
10	398677010.2	0.3410	3.2546E-03	5/11/2016 10:50	14.73	6.80	0.036556	0.5	0.001000
11	398677011.2	0.3010	3.2505E-03	5/11/2016 10:55	14.73	6.90	0.036986	0.5	0.001000
12	398677012.2	0.3740	3.2581E-03	5/11/2016 11:00	14.73	7.10	0.037846	0.5	0.001000
13	398677013.2	0.3720	3.2579E-03	5/11/2016 11:03	14.73	5.70	0.031829	0.5	0.001000
14	398677014.2	0.3680	3.2575E-03	5/11/2016 11:10	14.73	6.00	0.033118	0.5	0.001000
15	398677015.2	0.3310	3.2536E-03	5/11/2016 11:15	14.73	6.30	0.034407	0.5	0.001000
16	398677016.2	0.3900	3.2598E-03	5/11/2016 11:25	14.73	6.50	0.035267	0.5	0.001000
17	398677017.2	0.3020	3.2506E-03	5/11/2016 11:35	14.73	6.80	0.036556	0.5	0.001000
18	398677018.2	0.3820	3.2589E-03	5/11/2016 11:40	14.73	6.40	0.034837	0.5	0.001000
19	398677019.2	0.4170	3.2626E-03	5/11/2016 0:00	14.73	5.90	0.032688	0.5	0.001000
20	398677020.2	0.4020	3.2610E-03	5/11/2016 11:20	14.73	6.30	0.034407	0.5	0.001000
21	1203578113.1	0.4170	3.2626E-03	7/1/2016 0:00	14.73	6.90	0.036986	0.5	0.001000
22	1203578114.2	0.3240	3.2529E-03	5/11/2016 11:25	14.73	6.00	0.033118	0.5	0.001000
23	1203578115.2	0.3670	3.2574E-03	5/11/2016 11:25	14.73	6.10	0.033548	0.5	0.001000
24	1203578116.2	0.3640	3.2570E-03	5/11/2016 11:25	14.73	6.20	0.033978	0.5	0.001000
25	1203578117.1	0.4170	3.2626E-03	7/1/2016 0:00	14.73	6.30	0.034407	0.5	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data														Calculated	
Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Sample Recovery %	Sample Recovery Error %				
			Alpha	Beta											
1	2B	60	5	31	0.494	7/5/2016 10:33	7/5/2016 9:15	0.019	0.996	82.8%	1.05%				
2	3C	60	11	42	0.692	7/5/2016 10:33	7/5/2016 9:15	0.019	0.996	88.3%	1.04%				
3	3D	60	10	38	0.624	7/5/2016 10:33	7/5/2016 9:15	0.019	0.996	84.2%	1.05%				
4	11A	70	8	58	0.816	7/5/2016 10:42	7/5/2016 9:15	0.022	0.996	84.2%	1.05%				
5	11C	60	2	28	0.461	7/5/2016 10:42	7/5/2016 9:15	0.021	0.996	93.7%	1.04%				
6	12D	100	9	144	1.431	7/5/2016 10:42	7/5/2016 9:15	0.024	0.996	84.2%	1.05%				
7	13A	60	3	21	0.343	7/5/2016 10:42	7/5/2016 9:15	0.021	0.996	88.3%	1.04%				
8	13B	60	2	43	0.712	7/5/2016 10:42	7/5/2016 9:15	0.021	0.996	84.2%	1.05%				
9	13D	60	3	17	0.272	7/5/2016 10:42	7/5/2016 9:15	0.021	0.996	85.5%	1.05%				
10	14A	60	0	34	0.567	7/5/2016 10:42	7/5/2016 9:15	0.021	0.996	92.3%	1.04%				
11	14C	70	10	90	1.264	7/5/2016 10:42	7/5/2016 9:15	0.022	0.996	93.7%	1.04%				
12	2B	60	6	18	0.272	7/5/2016 13:27	7/5/2016 9:15	0.050	0.996	96.4%	1.03%				
13	5C	60	7	49	0.812	7/5/2016 11:17	7/5/2016 9:15	0.027	0.996	77.4%	1.06%				
14	5A	60	4	82	1.363	7/5/2016 11:17	7/5/2016 9:15	0.027	0.996	81.5%	1.05%				
15	2A	60	29	50	0.770	7/5/2016 11:17	7/5/2016 9:15	0.027	0.996	85.5%	1.05%				
16	8B	60	4	35	0.578	7/5/2016 13:30	7/5/2016 9:15	0.050	0.996	88.3%	1.04%				
17	2C	60	14	39	0.635	7/5/2016 11:17	7/5/2016 9:15	0.027	0.996	92.3%	1.04%				
18	2B	60	6	29	0.456	7/5/2016 11:38	7/5/2016 9:15	0.031	0.996	86.9%	1.05%				
19	3C	60	12	32	0.525	7/5/2016 11:38	7/5/2016 9:15	0.031	0.996	80.1%	1.06%				
20	3D	60	13	44	0.721	7/5/2016 11:38	7/5/2016 9:15	0.031	0.996	85.5%	1.05%				
21	7C	60	1	27	0.448	7/5/2016 11:41	7/5/2016 9:15	0.031	1.000	93.7%	1.04%				
22	8B	60	5	24	0.394	7/5/2016 11:41	7/5/2016 9:15	0.031	0.996	81.5%	1.05%				
23	4B	60	8	1251	20.832	7/5/2016 10:33	7/5/2016 9:15	0.019	0.996	82.8%	1.05%				
24	4C	60	6	1200	19.996	7/5/2016 10:33	7/5/2016 9:15	0.019	0.996	84.2%	1.05%				
25	4D	60	35	1321	21.994	7/5/2016 10:34	7/5/2016 9:15	0.019	1.000	85.5%	1.05%				

Calibration Data			Calibration		Detector		Alpha		Weekly Bkg		Weekly Bkg	
Pos.	Counted on	Calibration Date	Due Date	Efficiency Sr-90	Efficiency Y-90	Error (cpm/dpm)	X-Talk	CPM	Count Start Date/Time	Count Time (min.)		
1	PIC	4/1/2016	2/28/2017	0.4006	0.5091	0.02111	0.27242	0.398	7/1/2016 16:59	500		
2	PIC	4/1/2016	2/28/2017	0.4178	0.5563	0.00988	0.04141	0.496	7/1/2016 16:59	500		
3	PIC	4/1/2016	2/28/2017	0.4032	0.5395	0.02297	0.05869	0.620	7/1/2016 16:59	500		
4	PIC	4/1/2016	2/28/2017	0.4248	0.5473	0.01317	0.10725	0.982	7/1/2016 16:23	500		
5	PIC	4/1/2016	2/28/2017	0.4170	0.5497	0.01278	0.16568	0.402	7/1/2016 16:23	500		
6	PIC	4/1/2016	2/28/2017	0.4220	0.5487	0.01845	0.10202	1.484	7/1/2016 16:23	500		
7	PIC	4/1/2016	2/28/2017	0.4132	0.5113	0.00714	0.13743	0.380	7/1/2016 16:22	1000		
8	PIC	4/1/2016	2/28/2017	0.4200	0.5214	0.00967	0.12905	0.464	7/1/2016 16:23	1000		
9	PIC	4/1/2016	2/28/2017	0.3811	0.4297	0.01144	0.23142	0.320	7/1/2016 16:23	1000		
10	PIC	4/1/2016	2/28/2017	0.4308	0.5582	0.02119	0.18236	0.495	7/1/2016 16:23	1000		
11	PIC	4/1/2016	2/28/2017	0.4264	0.5645	0.01828	0.15261	1.370	7/1/2016 16:23	1000		
12	PIC	4/1/2016	2/28/2017	0.4006	0.5091	0.02111	0.27722	0.398	7/1/2016 16:59	500		
13	PIC	4/1/2016	2/28/2017	0.4207	0.5622	0.00657	0.04176	0.508	7/1/2016 16:21	500		
14	PIC	4/1/2016	2/28/2017	0.4341	0.5685	0.00851	0.04899	1.382	7/1/2016 16:21	500		
15	PIC	4/1/2016	2/28/2017	0.4142	0.5406	0.01914	0.13134	0.608	7/1/2016 17:14	500		
16	PIC	4/1/2016	2/28/2017	0.4298	0.5567	0.02148	0.07514	0.342	7/1/2016 16:21	500		
17	PIC	4/1/2016	2/28/2017	0.4095	0.5331	0.01274	0.06373	0.396	7/1/2016 16:59	500		
18	PIC	4/1/2016	2/28/2017	0.4006	0.5091	0.02111	0.27388	0.398	7/1/2016 16:59	500		
19	PIC	4/1/2016	2/28/2017	0.4182	0.5563	0.00988	0.04050	0.496	7/1/2016 16:59	500		
20	PIC	4/1/2016	2/28/2017	0.4032	0.5395	0.02297	0.05883	0.620	7/1/2016 16:59	500		
21	PIC	4/1/2016	2/28/2017	0.4148	0.5415	0.00790	0.11724	0.452	7/1/2016 16:21	500		
22	PIC	4/1/2016	2/28/2017	0.4304	0.5567	0.02148	0.07412	0.342	7/1/2016 16:21	500		
23	PIC	4/1/2016	2/28/2017	0.4243	0.5578	0.01519	0.13305	1.600	7/1/2016 16:21	500		
24	PIC	4/1/2016	2/28/2017	0.4265	0.5613	0.00889	0.04410	0.784	7/1/2016 16:21	500		
25	PIC	4/1/2016	2/28/2017	0.4139	0.5536	0.00773	0.03919	1.780	7/1/2016 16:21	500		

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1243-O
 Spike Exp Date : 12/18/2016
 Spike Activity (dpm/ml): 485.94
 Spike Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 485.94
 LCS Volume Added: 0.10

Results										2 SIGMA			2 SIGMA			Total Prop.			Sample			Nominal		
Pos.	Decision Level		Critical Level	Required MDA	MDA pCi/G	Sample Act.		Sample Act. Error %	Net Count		Rate Error CPM	Counting Uncertainty pCi/G	2 SIGMA Counting Uncertainty pCi/G	Sample QC	Sample Type	RPD	RER	pCi/G	Recovery					
	pCi/G	pCi/G				Conc. pCi/G	%		Rate CPM	CPM										Uncertainty pCi/G	Uncertainty pCi/G	QC	Type	RPD
1	0.7719	0.5450	2	1.2821	0.3689	99.05%	0.0960	0.0950	0.7158	0.7192	SAMPLE													
2	0.8270	0.5839	2	1.3522	0.7245	57.02%	0.1964	0.1119	0.8094	0.8198	SAMPLE													
3	0.9542	0.6737	2	1.5377	0.0135	3037.27%	0.0036	0.1079	0.8047	0.8048	SAMPLE													
4	1.0322	0.7287	2	1.6076	-0.5804	70.48%	-0.1657	0.1167	0.8015	0.8015	SAMPLE													
5	0.6685	0.4720	2	1.1095	0.1959	155.80%	0.0591	0.0921	0.5981	0.5992	SAMPLE													
6	1.0422	0.7358	2	1.5722	-0.1783	247.16%	-0.0532	0.1314	0.8635	0.8635	SAMPLE													
7	0.7076	0.4996	2	1.1845	-0.1367	211.81%	-0.0369	0.0781	0.5673	0.5675	SAMPLE													
8	0.8536	0.6027	2	1.4076	1.0050	44.76%	0.2484	0.1111	0.8809	0.8993	SAMPLE													
9	0.7706	0.5441	2	1.3080	-0.2122	144.38%	-0.0482	0.0696	0.6004	0.6005	SAMPLE													
10	0.7071	0.4992	2	1.1607	0.2326	139.14%	0.0717	0.0997	0.6341	0.6356	SAMPLE													
11	1.2321	0.8699	2	1.8963	-0.3876	131.40%	-0.1061	0.1394	0.9982	0.9983	SAMPLE													
12	0.5912	0.4174	2	0.9820	-0.3701	58.15%	-0.1257	0.0730	0.4214	0.4215	SAMPLE													
13	0.8172	0.5770	2	1.3340	1.0942	39.73%	0.3038	0.1206	0.8514	0.8736	SAMPLE													
14	1.2553	0.8863	2	1.9402	-0.0624	858.35%	-0.0186	0.1596	1.0496	1.0497	SAMPLE													
15	0.9241	0.6524	2	1.4910	0.6025	73.27%	0.1619	0.1185	0.8648	0.8720	SAMPLE													
16	0.5342	0.3772	2	0.8978	0.6781	43.07%	0.2363	0.1016	0.5714	0.5854	SAMPLE													
17	0.7661	0.5409	2	1.2730	0.9145	44.65%	0.2391	0.1067	0.7995	0.8166	SAMPLE													
18	0.6571	0.4639	2	1.0914	0.1896	158.14%	0.0579	0.0916	0.5875	0.5886	SAMPLE													
19	0.6969	0.4920	2	1.1395	0.0909	337.71%	0.0292	0.0987	0.6015	0.6017	SAMPLE													
20	0.7850	0.5542	2	1.2650	0.3150	114.47%	0.1006	0.1151	0.7065	0.7090	SAMPLE													
21	0.5717	0.4036	2	0.9408	-0.0106	2313.96%	-0.0040	0.0915	0.4790	0.4791	MB													
22	0.7119	0.5026	2	1.1963	0.1982	164.30%	0.0518	0.0851	0.6380	0.6391	398677016.2	DUP				0.0%		59.8412	109.9%					
23	1.3764	0.9717	2	2.1143	65.7374	3.70%	19.2323	0.5919	3.9657	12.6563	398677016.2	MS				1.4%		60.3344	107.4%					
24	0.9508	0.6713	2	1.5112	64.8037	3.43%	19.2116	0.5786	3.8256	12.2527	398677016.2	MSD						52.4916	114.5%					
25	1.2632	0.8918	2	1.9323	60.1193	3.37%	20.2138	0.6084	3.5465	11.3308	LCS													

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
398677001	2B	60	5	31	7/5/2016 10:33	7/5/2016 11:33	PIC	1578836
398677002	3C	60	11	42	7/5/2016 10:33	7/5/2016 11:33	PIC	1578836
398677003	3D	60	10	38	7/5/2016 10:33	7/5/2016 11:33	PIC	1578836
398677004	11A	70	8	58	7/5/2016 10:42	7/5/2016 11:52	PIC	1578836
398677005	11C	60	2	28	7/5/2016 10:42	7/5/2016 11:42	PIC	1578836
398677006	12D	100	9	144	7/5/2016 10:42	7/5/2016 12:22	PIC	1578836
398677007	13A	60	3	21	7/5/2016 10:42	7/5/2016 11:42	PIC	1578836
398677008	13B	60	2	43	7/5/2016 10:42	7/5/2016 11:42	PIC	1578836
398677009	13D	60	3	17	7/5/2016 10:42	7/5/2016 11:42	PIC	1578836
398677010	14A	60	0	34	7/5/2016 10:42	7/5/2016 11:42	PIC	1578836
398677011	14C	70	10	90	7/5/2016 10:42	7/5/2016 11:52	PIC	1578836
398677012	2B	60	6	18	7/5/2016 13:27	7/5/2016 14:27	PIC	1578836
398677013	5C	60	7	49	7/5/2016 11:17	7/5/2016 12:17	PIC	1578836
398677014	5A	60	4	82	7/5/2016 11:17	7/5/2016 12:17	PIC	1578836
398677015	2A	60	29	50	7/5/2016 11:17	7/5/2016 12:17	PIC	1578836
398677016	8B	60	4	35	7/5/2016 13:30	7/5/2016 14:30	PIC	1578836
398677017	2C	60	14	39	7/5/2016 11:17	7/5/2016 12:17	PIC	1578836
398677018	2B	60	6	29	7/5/2016 11:38	7/5/2016 12:38	PIC	1578836
398677019	3C	60	12	32	7/5/2016 11:38	7/5/2016 12:38	PIC	1578836
398677020	3D	60	13	44	7/5/2016 11:38	7/5/2016 12:38	PIC	1578836
1203578113	7C	60	1	27	7/5/2016 11:41	7/5/2016 12:41	PIC	1578836
1203578114	8B	60	5	24	7/5/2016 11:41	7/5/2016 12:41	PIC	1578836
1203578115	4B	60	8	1251	7/5/2016 10:33	7/5/2016 11:33	PIC	1578836
1203578116	4C	60	6	1200	7/5/2016 10:33	7/5/2016 11:33	PIC	1578836
1203578117	4D	60	35	1321	7/5/2016 10:34	7/5/2016 11:34	PIC	1578836

Continuing Calibration Data

Gas Flow Proportional Counter Checks for 27-Jun-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B2	Below	Alpha bkg	27-Jun 06:47	60	0.067	0.096	0.359	-3.68
LB4100C1	Above	Alpha bkg	27-Jun 06:48	60	0.333	0.149	0.367	+2.07
LB4100C4	Above	Alpha bkg	27-Jun 08:41	60	0.567	4.08E-6	0.304	+8.18
LB4100C4	Above	Beta bkg	27-Jun 08:41	60	2.083	0.686	2.113	+2.88
LB4100E3	Above	Beta bkg	27-Jun 06:47	60	2.600	0.401	2.311	+3.91
LB4100F1	Below	Alpha eff	27-Jun 07:49	5	10753	10840	11730	-3.58
LB4100F1	Above	Beta bkg	27-Jun 06:47	60	2.100	0.941	2.413	+1.72
LB4100F3	Above	Alpha bkg	27-Jun 06:47	60	0.433	-8.91E-2	0.322	+4.63
LB4100F3	Below	Alpha eff	27-Jun 07:49	5	17632	19270	21960	-6.65
LB4100F4	Above	Alpha bkg	27-Jun 06:47	60	0.350	0.013	0.357	+2.87
LB4100F4	need 2nd	Beta bkg	27-Jun 06:47	60	1.783	1.327	2.176	+0.22
LB4100F4	Below	Beta eff	27-Jun 07:55	5	37058	37500	39290	-4.48
LB4100G1	Below	Alpha eff	27-Jun 08:59	5	6971	8145	10050	-6.70
LB4100H4	need 2nd	Alpha eff	27-Jun 09:11	5	11496	11490	13890	-2.98
LB4100H4	Above	Alpha XTalk	27-Jun 09:11	5	0.381	0.307	0.379	+3.12
LB4100H4	Below	Beta eff	27-Jun 09:27	5	35160	35210	36600	-3.21
LB4100I3	Above	Beta bkg	27-Jun 06:47	60	2.167	0.091	2.093	+3.22
LB4100J2	Above	Alpha XTalk	27-Jun 09:20	5	0.170	0.134	0.168	+3.23
LB4100J3	Below	Beta eff	27-Jun 09:20	5	20000	20130	22000	-3.42
PIC1C	Above	Alpha bkg	27-Jun 11:08	60	0.750	0.013	0.373	+9.27
PIC1C	Above	Beta bkg	27-Jun 11:08	60	3.283	-1.72E-1	2.166	+5.87
PIC3A	Above	Alpha bkg	27-Jun 06:54	60	0.333	-1.09E-1	0.333	+3.00
PIC3A	Above	Beta bkg	27-Jun 06:54	60	7.533	-1.30E-1	1.970	+18.89
PIC4A	Below	Alpha eff	27-Jun 11:46	5	10370	10430	11040	-3.59
PIC4D	Above	Alpha bkg	27-Jun 09:12	60	0.317	0.039	0.372	+2.01
PIC4D	Above	Beta bkg	27-Jun 09:12	60	2.033	1.235	2.253	+1.71
PIC5B	Above	Alpha bkg	27-Jun 08:29	60	0.550	-3.15E-2	0.362	+5.87
PIC5D	Above	Alpha bkg	27-Jun 08:29	60	0.383	0.015	0.356	+3.48

PIC5D	Below	Alpha eff	27-Jun 06:53	5	10745	10870	11550	-4.10
PIC5D	Above	Alpha XTalk	27-Jun 06:53	5	0.270	0.251	0.269	+3.21
PIC6B	Above	Alpha bkg	27-Jun 07:11	60	0.417	-1.82E-2	0.339	+4.31
PIC6B	need 2nd	Beta bkg	27-Jun 07:11	60	1.350	-3.24E-2	2.184	+0.74
PIC10D	Above	Alpha eff	27-Jun 10:28	5	15722	12350	14940	+4.81
PIC12A	Above	Alpha bkg	27-Jun 07:31	60	0.583	0.069	0.375	+7.07
PIC12A	need 2nd	Alpha eff	27-Jun 07:25	5	10629	10520	11150	-1.96
PIC12B	Above	Alpha bkg	27-Jun 08:32	60	0.317	0.015	0.358	+2.28
PIC13B	Above	Alpha bkg	27-Jun 09:44	60	0.417	-5.05E-2	0.410	+3.08
PIC14B	Below	Alpha eff	27-Jun 10:31	5	8043	8786	10030	-6.58
PIC14B	Above	Alpha XTalk	27-Jun 10:31	5	0.476	0.242	0.396	+6.13
PIC14B	Below	Beta eff	27-Jun 07:34	5	15327	21030	22930	-21.01
PIC14D	Above	Alpha bkg	27-Jun 07:40	60	0.517	-3.96E-2	0.348	+5.60
PIC14D	Above	Beta bkg	27-Jun 07:40	60	2.183	-3.04E-2	1.908	+3.85
PIC14D	need 2nd	Beta XTalk	27-Jun 07:34	5	2.23E-4	9.44E-5	2.74E-4	+1.30

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by

Date

6/27/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 28-Jun-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100B3	Below	Alpha bkg	28-Jun 06:37	60	0.117	0.121	0.383	-3.10
LB4100B3	Above	Beta bkg	28-Jun 06:37	60	1.950	0.965	1.943	+3.04
LB4100C1	Above	Alpha bkg	28-Jun 05:26	60	0.583	0.149	0.367	+8.92
LB4100C4	Above	Alpha bkg	28-Jun 06:44	60	0.383	4.08E-6	0.304	+4.57
LB4100C4	need 2nd	Beta bkg	28-Jun 06:44	60	2.000	0.686	2.113	+2.53
LB4100E3	Above	Beta bkg	28-Jun 05:05	60	3.750	0.401	2.311	+7.52
LB4100F1	Above	Alpha bkg	28-Jun 06:46	60	0.350	0.059	0.384	+2.37
LB4100F1	need 2nd	Alpha eff	28-Jun 06:33	5	11270	10840	11730	-0.10
LB4100F3	Above	Alpha bkg	28-Jun 05:05	60	0.317	-8.91E-2	0.322	+2.93
LB4100F3	Below	Alpha eff	28-Jun 06:33	5	18390	19270	21960	-4.96
LB4100F3	Above	Beta bkg	28-Jun 05:05	60	3.050	0.579	1.652	+10.82
LB4100F4	Above	Alpha bkg	28-Jun 05:05	60	0.333	0.013	0.357	+2.58
LB4100F4	Above	Beta bkg	28-Jun 05:05	60	2.233	1.327	2.176	+3.41
LB4100F4	Below	Beta eff	28-Jun 06:25	5	36724	37500	39290	-5.60
LB4100G1	Below	Alpha eff	28-Jun 06:25	5	6729	8145	10050	-7.46
LB4100H4	need 2nd	Alpha XTalk	28-Jun 06:25	5	0.376	0.307	0.379	+2.76
LB4100H4	Below	Beta eff	28-Jun 06:33	5	35053	35210	36600	-3.68
LB4100I2	Above	Beta bkg	28-Jun 06:49	60	2.300	0.408	2.304	+2.99
LB4100I3	Above	Alpha bkg	28-Jun 05:05	60	0.367	-4.11E-2	0.337	+3.47
LB4100I3	Above	Beta bkg	28-Jun 05:05	60	2.417	0.091	2.093	+3.97
LB4100J2	Above	Alpha XTalk	28-Jun 06:49	5	0.169	0.134	0.168	+3.11
LB4100J3	Below	Beta eff	28-Jun 06:17	5	19998	20130	22000	-3.42
PIC1A	Above	Beta XTalk	28-Jun 09:10	5	0.001	1.90E-4	9.28E-4	+3.59
PIC2A	Above	Alpha bkg	28-Jun 09:09	60	0.383	-2.85E-2	0.318	+4.14
PIC2C	Above	Alpha eff	28-Jun 09:02	5	23407	19710	21880	+7.22
PIC3A	need 2nd	Alpha bkg	28-Jun 05:33	60	0.183	-1.09E-1	0.333	+0.97
PIC3A	Above	Beta bkg	28-Jun 05:33	60	8.233	-1.30E-1	1.970	+20.89
PIC4A	Below	Alpha eff	28-Jun 07:51	5	10406	10430	11040	-3.23

PIC4D	need 2nd	Alpha bkg	28-Jun 08:07	60	0.300	0.039	0.372	+1.71
PIC4D	Above	Beta bkg	28-Jun 08:07	60	2.150	1.235	2.253	+2.39
PIC5B	Above	Alpha bkg	28-Jun 07:22	60	0.350	-3.15E-2	0.362	+2.82
PIC5D	Below	Alpha eff	28-Jun 11:20	5	10807	10870	11550	-3.56
PIC6B	need 2nd	Alpha bkg	28-Jun 05:50	60	0.217	-1.82E-2	0.339	+0.95
PIC7B	Above	Alpha bkg	28-Jun 08:34	60	0.400	0.017	0.350	+3.91
PIC8D	Below	Alpha eff	28-Jun 08:12	5	16583	16660	18000	-3.34
PIC8D	Above	Alpha XTalk	28-Jun 08:12	5	0.284	0.250	0.279	+4.10
PIC8D	Below	Beta eff	28-Jun 05:34	5	42310	42590	44960	-3.71
PIC10D	Above	Alpha eff	28-Jun 05:48	5	15741	12350	14940	+4.86
PIC12A	Above	Alpha bkg	28-Jun 06:11	60	0.450	0.069	0.375	+4.46
PIC12B	Above	Alpha bkg	28-Jun 06:11	60	0.500	0.015	0.358	+5.49
PIC12C	Above	Alpha bkg	28-Jun 08:46	60	0.467	-8.91E-2	0.437	+3.33
PIC13D	Above	Alpha bkg	28-Jun 08:46	60	0.333	-1.18E-1	0.434	+1.91
PIC14B	Below	Alpha eff	28-Jun 07:32	5	8472	8786	10030	-4.51
PIC14B	Above	Alpha XTalk	28-Jun 07:32	5	0.416	0.242	0.396	+3.79
PIC14B	Below	Beta eff	28-Jun 05:16	5	18624	21030	22930	-10.60
PIC14D	Above	Alpha bkg	28-Jun 05:25	60	0.433	-3.96E-2	0.348	+4.32
PIC14D	need 2nd	Beta bkg	28-Jun 05:25	60	1.483	-3.04E-2	1.908	+1.69

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by B. Smith-Hawman

Date 6/28/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 05-Jul-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100C1	Above	Alpha bkg	05-Jul 06:22	60	0.333	0.149	0.367	+2.07
LB4100C1	need 2nd	Beta bkg	05-Jul 06:22	60	1.533	0.933	2.060	+0.20
LB4100C4	need 2nd	Alpha bkg	05-Jul 06:22	60	0.217	4.08E-6	0.304	+1.28
LB4100C4	need 2nd	Beta bkg	05-Jul 06:22	60	1.800	0.686	2.113	+1.68
LB4100E3	need 2nd	Beta bkg	05-Jul 06:07	60	1.967	0.401	2.311	+1.92
LB4100F3	Above	Alpha bkg	05-Jul 07:50	60	0.350	-8.91E-2	0.322	+3.41
LB4100F3	Below	Alpha eff	05-Jul 07:33	5	18199	19270	21960	-5.39
LB4100F3	Above	Beta bkg	05-Jul 07:50	60	1.733	0.579	1.652	+3.45
LB4100F4	Above	Alpha bkg	05-Jul 06:07	60	0.317	0.013	0.357	+2.29
LB4100F4	Above	Beta bkg	05-Jul 06:07	60	2.150	1.327	2.176	+2.82
LB4100F4	Below	Beta eff	05-Jul 07:27	5	36760	37500	39290	-5.48
LB4100G1	Below	Alpha eff	05-Jul 07:27	5	6879	8145	10050	-6.99
LB4100H2	Above	Alpha XTalk	05-Jul 07:27	5	0.279	0.239	0.277	+3.36
LB4100H4	Below	Alpha eff	05-Jul 07:27	5	11288	11490	13890	-3.50
LB4100H4	Above	Alpha XTalk	05-Jul 07:27	5	0.386	0.307	0.379	+3.54
LB4100H4	Below	Beta eff	05-Jul 07:33	5	34973	35210	36600	-4.02
LB4100J2	Above	Alpha XTalk	05-Jul 07:13	5	0.169	0.134	0.168	+3.14
LB4100J3	Below	Beta eff	05-Jul 07:41	5	19754	20130	22000	-4.21
PIC1A	Above	Beta XTalk	05-Jul 08:04	5	9.55E-4	1.90E-4	9.28E-4	+3.22
PIC1C	Above	Alpha bkg	05-Jul 07:31	60	0.333	0.013	0.373	+2.34
PIC1C	Above	Beta bkg	05-Jul 07:31	60	2.183	-1.72E-1	2.166	+3.04
PIC1D	Above	Alpha bkg	05-Jul 07:31	60	0.683	-1.49E-4	0.357	+8.48
PIC1D	need 2nd	Alpha XTalk	05-Jul 06:14	5	0.263	0.250	0.266	+2.06
PIC3A	Above	Beta bkg	05-Jul 06:29	60	4.750	-1.30E-1	1.970	+10.94
PIC4A	Below	Alpha eff	05-Jul 07:37	5	10410	10430	11040	-3.20
PIC4A	Below	Beta eff	05-Jul 06:14	5	53065	53250	55080	-3.61
PIC5B	Above	Alpha bkg	05-Jul 06:41	60	0.650	-3.15E-2	0.362	+7.40
PIC5D	Below	Alpha eff	05-Jul 10:57	5	10789	10870	11550	-3.71
PIC5D	Above	Alpha XTalk	05-Jul 10:57	5	0.271	0.251	0.269	+3.64

PIC6B	Above	Alpha bkg	05-Jul 06:44	60	0.333	-1.82E-2	0.339	+2.91
PIC6B	Above	Beta bkg	05-Jul 06:44	60	2.517	-3.24E-2	2.184	+3.90
PIC6C	need 2nd	Alpha bkg	05-Jul 06:44	60	0.100	-1.21E-2	0.376	-1.27
PIC7B	Above	Beta bkg	05-Jul 07:53	60	2.333	0.020	0.967	+11.66
PIC8A	Above	Alpha bkg	05-Jul 07:53	60	0.350	0.050	0.372	+2.59
PIC8A	Below	Alpha eff	05-Jul 06:37	5	10893	10900	11360	-3.09
PIC8A	Above	Beta bkg	05-Jul 07:53	60	3.283	0.395	1.522	+12.37
PIC8C	Above	Alpha bkg	05-Jul 07:53	60	0.350	0.079	0.379	+2.42
PIC8C	Above	Beta bkg	05-Jul 07:53	60	2.350	0.561	2.416	+2.79
PIC9A	Above	Alpha bkg	05-Jul 08:07	60	0.333	-3.92E-2	0.376	+2.38
PIC9A	need 2nd	Beta bkg	05-Jul 08:07	60	1.767	-2.82E-1	1.823	+2.84
PIC9C	Above	Alpha bkg	05-Jul 08:07	60	0.383	-3.52E-2	0.366	+3.26
PIC9D	Above	Alpha bkg	05-Jul 08:07	60	0.333	0.017	0.369	+2.40
PIC9D	need 2nd	Beta bkg	05-Jul 08:07	60	1.317	0.069	1.632	+1.79
PIC10D	Above	Alpha eff	05-Jul 06:43	5	16057	12350	14940	+5.59
PIC10D	Above	Beta XTalk	05-Jul 06:50	5	3.62E-4	6.80E-5	3.57E-4	+3.12
PIC11D	Above	Alpha bkg	05-Jul 08:10	60	0.317	-6.39E-2	0.347	+2.56
PIC11D	need 2nd	Beta bkg	05-Jul 08:10	60	1.567	-2.09E-1	1.714	+2.54
PIC12A	Above	Alpha bkg	05-Jul 07:00	60	0.317	0.069	0.375	+1.85
PIC12B	need 2nd	Alpha bkg	05-Jul 07:01	60	0.250	0.015	0.358	+1.11
PIC12B	Below	Alpha XTalk	05-Jul 06:54	5	0.266	0.266	0.303	-3.04
PIC12C	Above	Alpha bkg	05-Jul 08:10	60	0.400	-8.91E-2	0.437	+2.57
PIC14B	need 2nd	Alpha eff	05-Jul 06:12	5	8852	8786	10030	-2.68
PIC14B	Below	Beta eff	05-Jul 08:12	5	20864	21030	22930	-3.52
PIC14D	Above	Alpha bkg	05-Jul 06:21	60	0.550	-3.96E-2	0.348	+6.12

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by B. Bird-Hanna

Date 7/5/16

GEL Laboratories LLC

Runlogs

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1575872

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398677021	SAMPLE	KSD1	PIC1A	JUN-27-16 17:19:28	DONE	Tuffryn Filter	01-APR-16 00:00
398677022	SAMPLE	KSD1	PIC1B	JUN-27-16 17:19:29	DONE	Tuffryn Filter	01-APR-16 00:00
398677024	SAMPLE	KSD1	PIC2B	JUN-27-16 17:19:35	DONE	Tuffryn Filter	01-APR-16 00:00
398677025	SAMPLE	KSD1	PIC3C	JUN-27-16 17:19:38	DONE	Tuffryn Filter	01-APR-16 00:00
398677026	SAMPLE	KSD1	PIC3D	JUN-27-16 17:19:40	DONE	Tuffryn Filter	01-APR-16 00:00
1203570890	MB	KSD1	PIC10B	JUN-27-16 17:22:37	DONE	Tuffryn Filter	01-APR-16 00:00
1203570891	DUP	KSD1	PIC10C	JUN-27-16 17:22:39	DONE	Tuffryn Filter	01-APR-16 00:00
398677028	SAMPLE	KSD1	PIC6A	JUN-27-16 17:22:43	DONE	Tuffryn Filter	01-APR-16 00:00
398677029	SAMPLE	KSD1	PIC6C	JUN-27-16 17:22:45	DONE	Tuffryn Filter	01-APR-16 00:00
398677031	SAMPLE	KSD1	PIC7B	JUN-27-16 17:22:50	DONE	Tuffryn Filter	01-APR-16 00:00
398677032	SAMPLE	KSD1	PIC7C	JUN-27-16 17:22:53	DONE	Tuffryn Filter	01-APR-16 00:00
398677033	SAMPLE	KSD1	PIC8A	JUN-27-16 17:22:57	DONE	Tuffryn Filter	01-APR-16 00:00
398677034	SAMPLE	KSD1	PIC8B	JUN-27-16 17:22:58	DONE	Tuffryn Filter	01-APR-16 00:00
398677035	SAMPLE	KSD1	PIC8D	JUN-27-16 17:23:01	DONE	Tuffryn Filter	01-APR-16 00:00
398677036	SAMPLE	KSD1	PIC9A	JUN-27-16 17:23:07	DONE	Tuffryn Filter	01-APR-16 00:00
398677037	SAMPLE	KSD1	PIC9B	JUN-27-16 17:23:10	DONE	Tuffryn Filter	01-APR-16 00:00
398677038	SAMPLE	KSD1	PIC9C	JUN-27-16 17:23:11	DONE	Tuffryn Filter	01-APR-16 00:00
398677039	SAMPLE	KSD1	PIC9D	JUN-27-16 17:23:17	DONE	Tuffryn Filter	01-APR-16 00:00
1203570892	MS	KSD1	PIC11A	JUN-27-16 17:26:50	DONE	Tuffryn Filter	01-APR-16 00:00
1203570893	MSD	KSD1	PIC11B	JUN-27-16 17:26:53	DONE	Tuffryn Filter	01-APR-16 00:00
1203570894	LCS	KSD1	PIC11C	JUN-27-16 17:26:56	DONE	Tuffryn Filter	01-APR-16 00:00
398677023	SAMPLE	KSD1	PIC11A	JUN-28-16 11:28:01	DONE	Tuffryn Filter	01-APR-16 00:00
398677027	SAMPLE	KSD1	PIC11B	JUN-28-16 11:28:06	DONE	Tuffryn Filter	01-APR-16 00:00
398677030	SAMPLE	KSD1	PIC11C	JUN-28-16 11:28:13	DONE	Tuffryn Filter	01-APR-16 00:00
398677040	SAMPLE	KSD1	PIC11D	JUN-28-16 11:28:18	DONE	Tuffryn Filter	01-APR-16 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1578836

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398677001	SAMPLE	KSD1	PIC2B	JUL-05-16 10:33:34	DONE	Tuffryn Filter	01-APR-16 00:00
398677002	SAMPLE	KSD1	PIC3C	JUL-05-16 10:33:40	DONE	Tuffryn Filter	01-APR-16 00:00
398677003	SAMPLE	KSD1	PIC3D	JUL-05-16 10:33:46	DONE	Tuffryn Filter	01-APR-16 00:00
1203578115	MS	KSD1	PIC4B	JUL-05-16 10:33:55	DONE	Tuffryn Filter	01-APR-16 00:00
1203578116	MSD	KSD1	PIC4C	JUL-05-16 10:33:58	DONE	Tuffryn Filter	01-APR-16 00:00
1203578117	LCS	KSD1	PIC4D	JUL-05-16 10:34:02	DONE	Tuffryn Filter	01-APR-16 00:00
398677004	SAMPLE	KSD1	PIC11A	JUL-05-16 10:42:06	DONE	Tuffryn Filter	01-APR-16 00:00
398677005	SAMPLE	KSD1	PIC11C	JUL-05-16 10:42:11	DONE	Tuffryn Filter	01-APR-16 00:00
398677006	SAMPLE	KSD1	PIC12D	JUL-05-16 10:42:18	DONE	Tuffryn Filter	01-APR-16 00:00
398677007	SAMPLE	KSD1	PIC13A	JUL-05-16 10:42:22	DONE	Tuffryn Filter	01-APR-16 00:00
398677008	SAMPLE	KSD1	PIC13B	JUL-05-16 10:42:27	DONE	Tuffryn Filter	01-APR-16 00:00
398677009	SAMPLE	KSD1	PIC13D	JUL-05-16 10:42:31	DONE	Tuffryn Filter	01-APR-16 00:00
398677010	SAMPLE	KSD1	PIC14A	JUL-05-16 10:42:37	DONE	Tuffryn Filter	01-APR-16 00:00
398677011	SAMPLE	KSD1	PIC14C	JUL-05-16 10:42:43	DONE	Tuffryn Filter	01-APR-16 00:00
398677013	SAMPLE	KSD1	PIC5C	JUL-05-16 11:17:28	DONE	Tuffryn Filter	01-APR-16 00:00
398677014	SAMPLE	KSD1	PIC5A	JUL-05-16 11:17:31	DONE	Tuffryn Filter	01-APR-16 00:00
398677015	SAMPLE	KSD1	PIC2A	JUL-05-16 11:17:36	DONE	Tuffryn Filter	01-APR-16 00:00
398677017	SAMPLE	KSD1	PIC2C	JUL-05-16 11:17:47	DONE	Tuffryn Filter	01-APR-16 00:00
398677018	SAMPLE	KSD1	PIC2B	JUL-05-16 11:38:29	DONE	Tuffryn Filter	01-APR-16 00:00
398677019	SAMPLE	KSD1	PIC3C	JUL-05-16 11:38:33	DONE	Tuffryn Filter	01-APR-16 00:00
398677020	SAMPLE	KSD1	PIC3D	JUL-05-16 11:38:37	DONE	Tuffryn Filter	01-APR-16 00:00
1203578113	MB	KSD1	PIC7C	JUL-05-16 11:41:37	DONE	Tuffryn Filter	01-APR-16 00:00
1203578114	DUP	KSD1	PIC8B	JUL-05-16 11:41:47	DONE	Tuffryn Filter	01-APR-16 00:00
398677012	SAMPLE	KSD1	PIC2B	JUL-05-16 13:27:37	DONE	Tuffryn Filter	01-APR-16 00:00
398677016	SAMPLE	KSD1	PIC8B	JUL-05-16 13:30:09	DONE	Tuffryn Filter	01-APR-16 00:00

Liquid Scintillation Raw Data

01-Jul-2016

Batch# 1578004 Product: H-3 Date: 7/1/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/ MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: [Signature]

Secondary Review Performed By: [Signature]

BRKL 7/3/16

Prep Logbook

The Determination of Tritium

Batch ID: 1578004

Analyst: Christina Sanchez

Method: EPA 906.0 Modified

Lab SOP: GL-RAD-A-002 REV# 21

Instrument: LSC-J93763

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units
LCS	1203576087	Tritium SPIKE	1753-B	.1	mL
MS	1203576086	Tritium SPIKE	1753-B	.1	mL

Sample ID	Prep Date	Matrix	Dry or Wet	Unadjusted Aliquot (g)	Aliquot (g)	Rig #	Volume Added (mL)	Aliquot in vial (mL)
398677006	30-JUN-2016 16:25:54	Soil	W	0.15	0.15	15	50	10
398677013	30-JUN-2016 16:25:54	Soil	W	0.11	0.11	17	50	10
398677018	30-JUN-2016 16:25:54	Soil	W	0.16	0.16	27	50	10
398677026	30-JUN-2016 16:25:54	Soil	W	0.17	0.17	28	50	10
398677033	30-JUN-2016 16:25:54	Soil	W	0.19	0.19	33	50	10
398677039	30-JUN-2016 16:25:54	Soil	W	0.13	0.13	40	50	10
1203576084 MB	30-JUN-2016 16:25:54	Soil	W	0.13	0.13	41	50	10
1203576085 DUP (398677006)	30-JUN-2016 16:25:54	Soil	W	0.13	0.13	48	50	10
1203576086 MS (398677006)	30-JUN-2016 16:25:54	Soil	W	0.15	0.15	69	50	10
1203576087 LCS	30-JUN-2016 16:25:54	Soil	W			71	50	10

Reagent/Solvent Lot ID	Description	Amount	Comments:
2373671	Sodium Hydroxide, Pellet ACS	2 g	Spike Pipet ID: RAD-LSC-2970968
2418926	Quenching Agent	20 uL	Vial Pipet ID: RAD-LSC-8036326
2423204	RL-Potassium Permanganate	2 mL	Bkg prepared with dead water: Yes
2424009.3	Ecosint Ultra Scintillation Solution	13 mL	

Christina Sanchez 7/1/16

Tritium Solid

Filename : H3DST.XLS
File type : Excel
Version # : 1.2.13

Batch : 1578004
Analyst : CHR02061
Prep Date : 6/30/2016
Method Uncertainty : 0.1155

Procedure Code : LSCDSH3S
Parname : Tritium
Required MDA : 300 pCi/G
H-3 Abundance : 1.00
Half-life of Tritium : 12.32 years

Geometry:

10mL DW/13mL Ecoscint Ultra

Sample Characteristics		Total Sample Volume (L)	Sample Aliquot G	Sample Aliquot StdDev. G	Distilled Sample Counted L	Sample Counted StdDev. L	Rig number	Sample Date/Time
Pos.	Sample ID							
1	398677006.1	0.0500	0.1500	3.2347E-03	0.0100	1.0000E-05	15	5/11/2016 10:24
2	398677013.1	0.0500	0.1100	3.2305E-03	0.0100	1.0000E-05	17	5/11/2016 11:03
3	398677018.1	0.0500	0.1600	3.2357E-03	0.0100	1.0000E-05	27	5/11/2016 11:40
4	398677026.1	0.0500	0.1700	3.2368E-03	0.0100	1.0000E-05	28	5/11/2016 14:35
5	398677033.1	0.0500	0.1900	3.2389E-03	0.0100	1.0000E-05	33	5/11/2016 15:15
6	398677039.1	0.0500	0.1300	3.2326E-03	0.0100	1.0000E-05	40	5/11/2016 15:40
7	1203576084.1	0.0500	0.1900	3.2389E-03	0.0100	1.0000E-05	41	6/30/2016 0:00
8	1203576085.1	0.0500	0.1300	3.2326E-03	0.0100	1.0000E-05	48	5/11/2016 10:24
9	1203576086.1	0.0500	0.1500	3.2347E-03	0.0100	1.0000E-05	69	5/11/2016 10:24
10	1203576087.1	0.0500	0.1900	3.2389E-03	0.0100	1.0000E-05	71	6/30/2016 0:00

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1.0 ml Stdev : +/- 0.002000 ml
 Pipet, 5.0 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-002
 Instrument SOP: GL-RAD-I-004

Count raw Data										Calibration Data					Background		
Pos.	Rack Position #	Counting Time (min.)	Quench#	Gross cpm	Bkg cpm	Bkg Count Time (min.)	Bkg Quench#	Corrected Bkg cpm	Count Start Date/Time	Sample Decay	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Background Rack Position #	Background Count Start Date/Time
1	48-2	30	155.9	4.03	3.77	30	158.4	3.7760	6/30/2016 21:16	0.992	LSCBROWN	8/1/2015	6/30/2016	0.2027	0.00792	48-1	6/30/2016 20:44
2	48-3	30	155.8	4.37	3.77	30	158.4	3.7763	6/30/2016 21:47	0.992	LSCBROWN	8/1/2015	6/30/2016	0.2029	0.00792	48-1	6/30/2016 20:44
3	48-4	30	157.5	4	3.77	30	158.4	3.7722	6/30/2016 22:19	0.992	LSCBROWN	8/1/2015	6/30/2016	0.1997	0.00792	48-1	6/30/2016 20:44
4	48-5	30	158.2	3.5	3.77	30	158.4	3.7705	6/30/2016 22:51	0.992	LSCBROWN	8/1/2015	6/30/2016	0.1985	0.00792	48-1	6/30/2016 20:44
5	48-6	30	157.6	4.3	3.77	30	158.4	3.7720	6/30/2016 23:22	0.992	LSCBROWN	8/1/2015	6/30/2016	0.1996	0.00792	48-1	6/30/2016 20:44
6	48-7	30	157.5	3.87	3.77	30	158.4	3.7722	6/30/2016 23:54	0.992	LSCBROWN	8/1/2015	6/30/2016	0.1997	0.00792	48-1	6/30/2016 20:44
7	48-8	30	157.9	3.1	3.77	30	158.4	3.7524	7/1/2016 0:26	1.000	LSCBROWN	7/1/2016	6/30/2017	0.2005	0.00792	48-1	6/30/2016 20:44
8	48-9	30	155.4	3.77	3.77	30	158.4	3.6610	7/1/2016 0:57	0.992	LSCBROWN	7/1/2016	6/30/2017	0.2058	0.00792	48-1	6/30/2016 20:44
9	48-11	30	159.2	13.93	3.77	30	158.4	3.7977	7/1/2016 2:01	0.992	LSCBROWN	7/1/2016	6/30/2017	0.1978	0.00792	48-1	6/30/2016 20:44
10	48-10	30	157.5	14.07	3.77	30	158.4	3.7381	7/1/2016 1:29	1.000	LSCBROWN	7/1/2016	6/30/2017	0.2013	0.00792	48-1	6/30/2016 20:44

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1753-B
 Spike Exp Date : 11/2/2016
 Spike Activity (dpm/ml): 2582.45
 Spike Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1753-B
 LCS Exp Date : 11/2/2016
 LCS Activity (dpm/ml): 2582.45
 LCS Volume Added: 0.10

Results		Decision Level		Critical Level		Required MDA		Sample Act. Conc.		Sample Act. Error %		Net Count Rate		Net Count Rate Error		2 SIGMA Counting Uncertainty		2 SIGMA Total Prop. Uncertainty		Sample QC		Sample Type		RPD		RER		Nominal pCi/G		Recovery	
Pos.	pCi/G	Level	pCi/G	MDA	pCi/G	MDA	pCi/G	MDA	pCi/G	Conc.	%	CPM	Rate	CPM	Rate	CPM	pCi/G	pCi/G	pCi/G	Sample	Type	Sample	QC	Sample	Type	RPD	RER	pCi/G	Recovery		
1	87.2700	61.6133	300	130.6918	18.9587	200.87%	0.2540	0.5101	74.6358	74.7640																					
2	118.8991	83.9438	300	178.0579	60.3844	87.82%	0.5937	0.5211	103.8751	104.8327																					
3	82.9860	58.5888	300	124.2799	16.1783	223.46%	0.2278	0.5090	70.8540	70.9519																					
4	78.5922	55.4868	300	117.7013	-18.1982	182.01%	-0.2705	0.4923	64.9154	64.9174																					
5	69.9440	49.3811	300	104.7485	31.6096	98.25%	0.5280	0.5187	60.8614	61.2917																					
6	102.1350	72.1082	300	152.9575	8.5480	516.13%	0.0978	0.5047	86.4712	86.4939																					
7	68.9079	48.6496	300	103.2121	-38.5756	73.28%	-0.6524	0.4779	55.3887	55.3906																					
8	97.6724	68.9575	300	146.4003	9.2512	456.49%	0.1090	0.4977	82.7716	82.7995																					
9	89.6928	63.3239	300	134.2982	775.1644	7.93%	10.1323	0.7687	115.2678	212.8459																					
10	68.4915	48.3556	300	102.5995	608.3822	7.69%	10.3319	0.7705	88.9207	165.4704																					

1578004

PAGE: 1

ID: TRITIUM

30 JUN 2016 21:11

USER: 6

COMMENT: BROWN

PRESET TIME : 30.00

DATA CALC : CPM H# : YES SAMPLE REPEATS: 1 PRINTER : STD

COUNT BLANK : NO IC# : NO REPLICATES : 1 RS232 : EDIT

TWO PHASE : NO AQC : NO CYCLE REPEATS : 1 DISK : OFF

SCINTILLATOR: LIQUID LUMEX: YES LOW SAMPLE REJ: 0

LOW LEVEL : NO HALF LIFE CORRECTION DATE: none

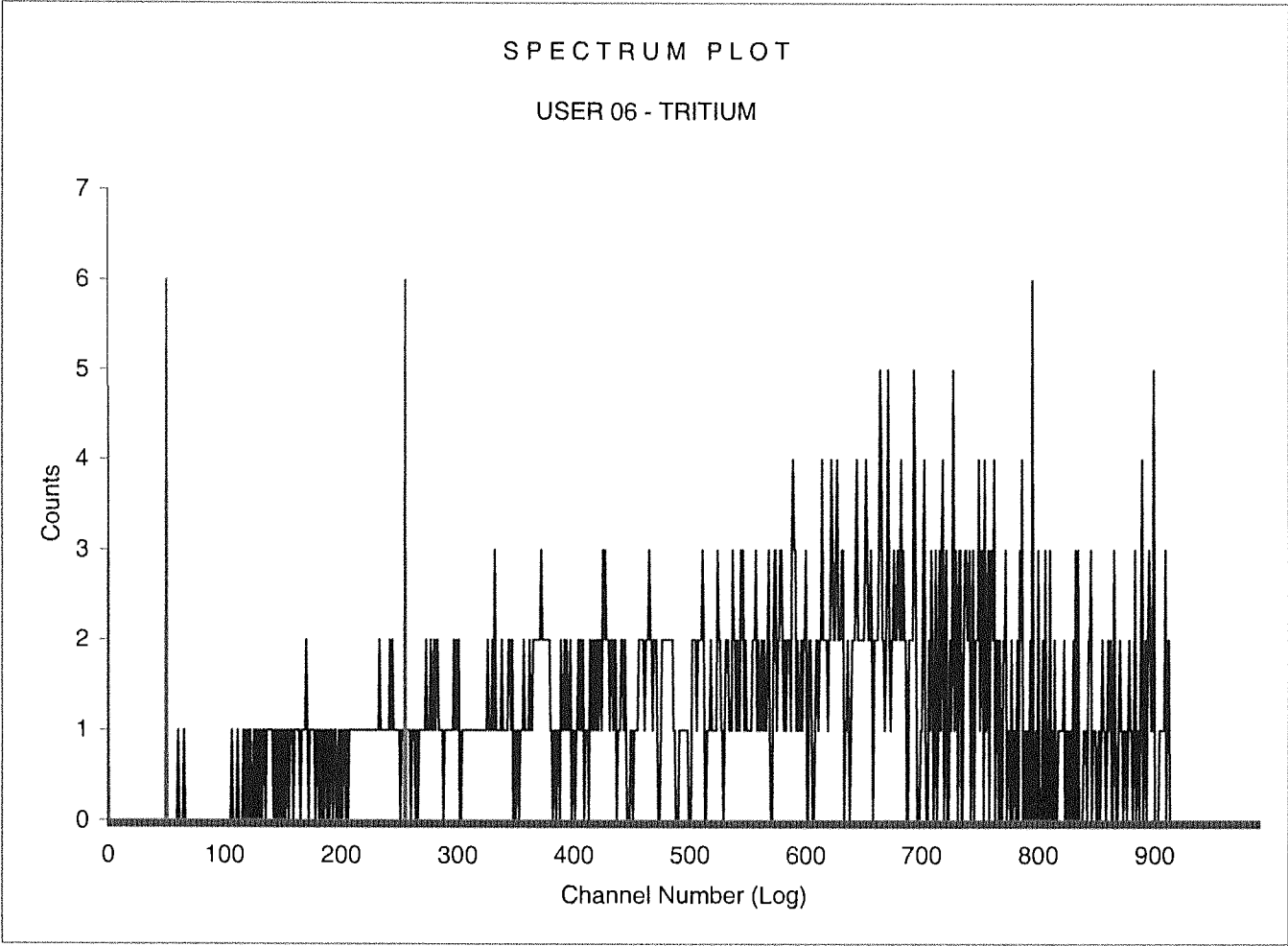
CHAN: 50.0 - 255.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

CHAN: 0.0 - 900.0 %ERROR: 2.00 FACTOR: 1.000000 BKG. SUB: 0

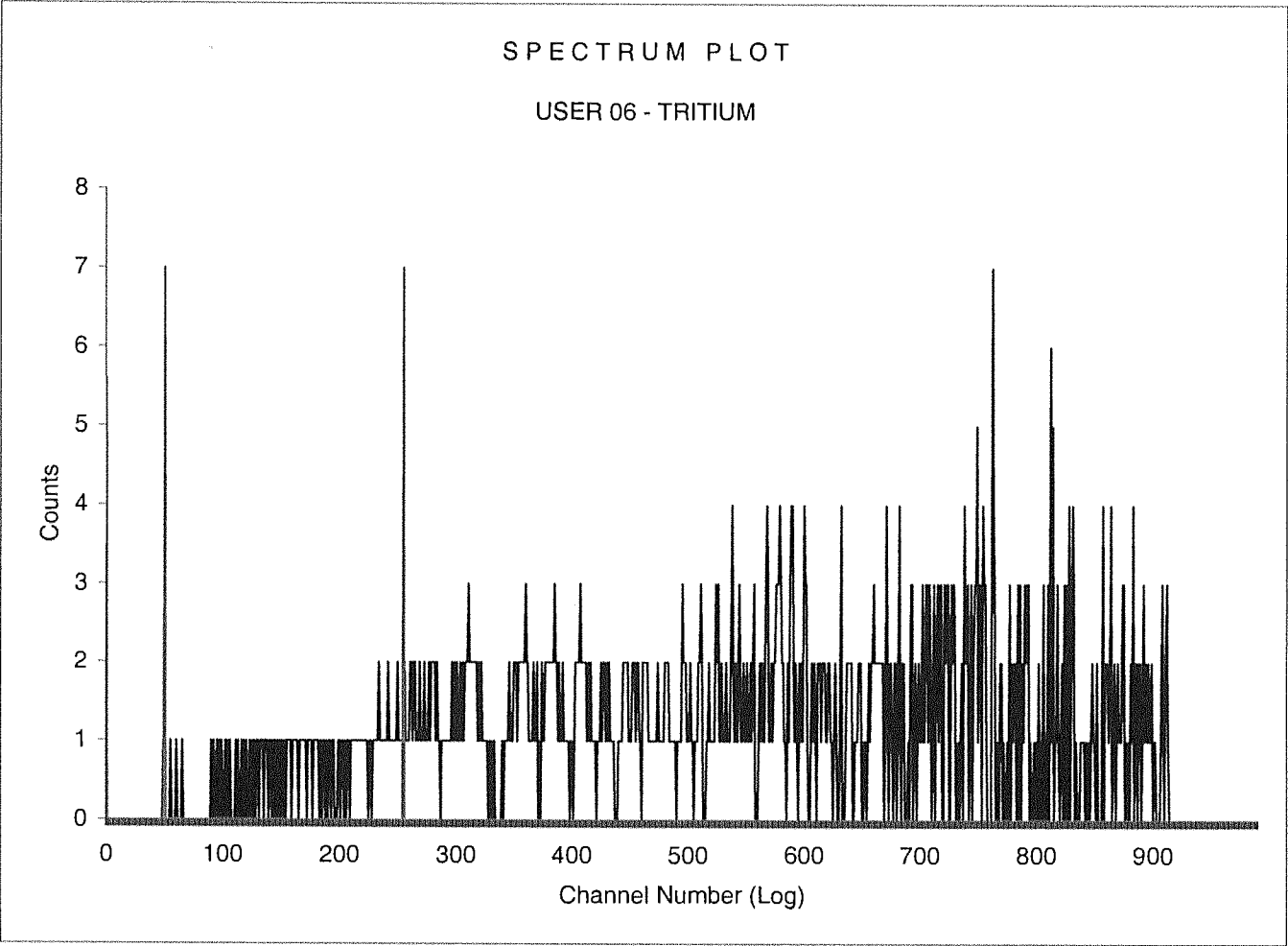
SAM NO	POS	TIME MIN	H#	WIND1		WIND2		LUMEX %	ELAPSED TIME
				CPM	%ERROR	CPM	%ERROR		
Alg 1	48-1	30.00	158.4	3.77	20.34	34.87	6.24	1.72	31.23
2	48-2	30.00	155.9	4.03	18.85	34.40	6.25	0.89	62.90
3	48-3	30.00	155.8	4.37	18.19	33.50	6.34	1.09	94.57
4	48-4	30.00	157.5	4.00	19.22	33.40	6.36	1.22	126.27
5	48-5	30.00	158.2	3.50	20.52	34.47	6.25	1.01	157.93
6	48-6	30.00	157.6	4.30	18.34	35.37	6.17	1.03	189.59
7	48-7	30.00	157.5	3.87	19.51	34.83	6.22	1.11	221.27
8	48-8	30.00	157.9	3.10	21.93	33.03	6.39	1.02	252.95
9	48-9	30.00	155.4	3.77	19.87	33.53	6.35	1.25	284.66
10	48-10	30.00	157.5	14.07	9.84	43.67	5.54	0.68	316.33
* 11	48-11	30.00	159.2	13.93	9.91	44.37	5.50	0.85	347.99

* 9 & 10 out of order # 7/1/16

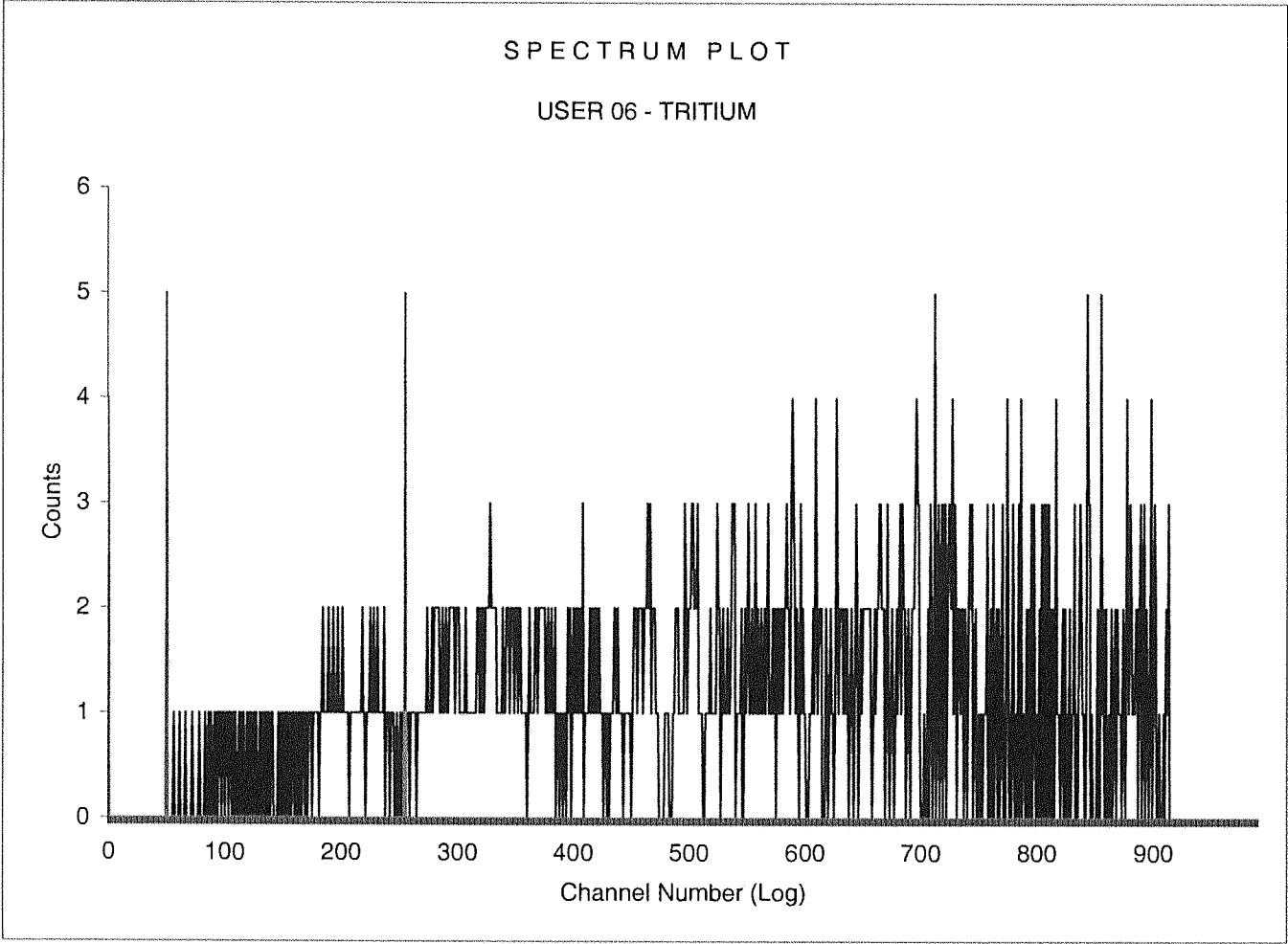
Sample Count Start Time:	30 Jun 2016 20:44:20		
Data Capture Date	30 Jun 2016 21:14:43		
User Filename	S06063048-1A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	1	48-1	30.00
H#, Total Counts:	158.4	1058	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time:	30 Jun 2016 21:16:00		
Data Capture Date	30 Jun 2016 21:46:23		
User Filename	S06063048-2A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	2	48-2	30.00
H#, Total Counts:	155.9	1045	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time:	30 Jun 2016 21:47:40		
Data Capture Date	30 Jun 2016 22:18:03		
User Filename	S06063048-3A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	3	48-3	30.00
H#, Total Counts:	155.8	1018	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time:

Data Capture Date

User Filename

Spectrum Type

User Number

User Id

User Comment

Scintillator

Sample, Rack-Pos, Time:

H#, Total Counts:

Win1: Tritium - Start, End:

Win2: - Start, End:

30 Jun 2016 22:19:22

30 Jun 2016 22:49:45

S06063048-4A.XLS

U06063048-1A.XLS

Log Counts

06

TRITIUM

BROWN

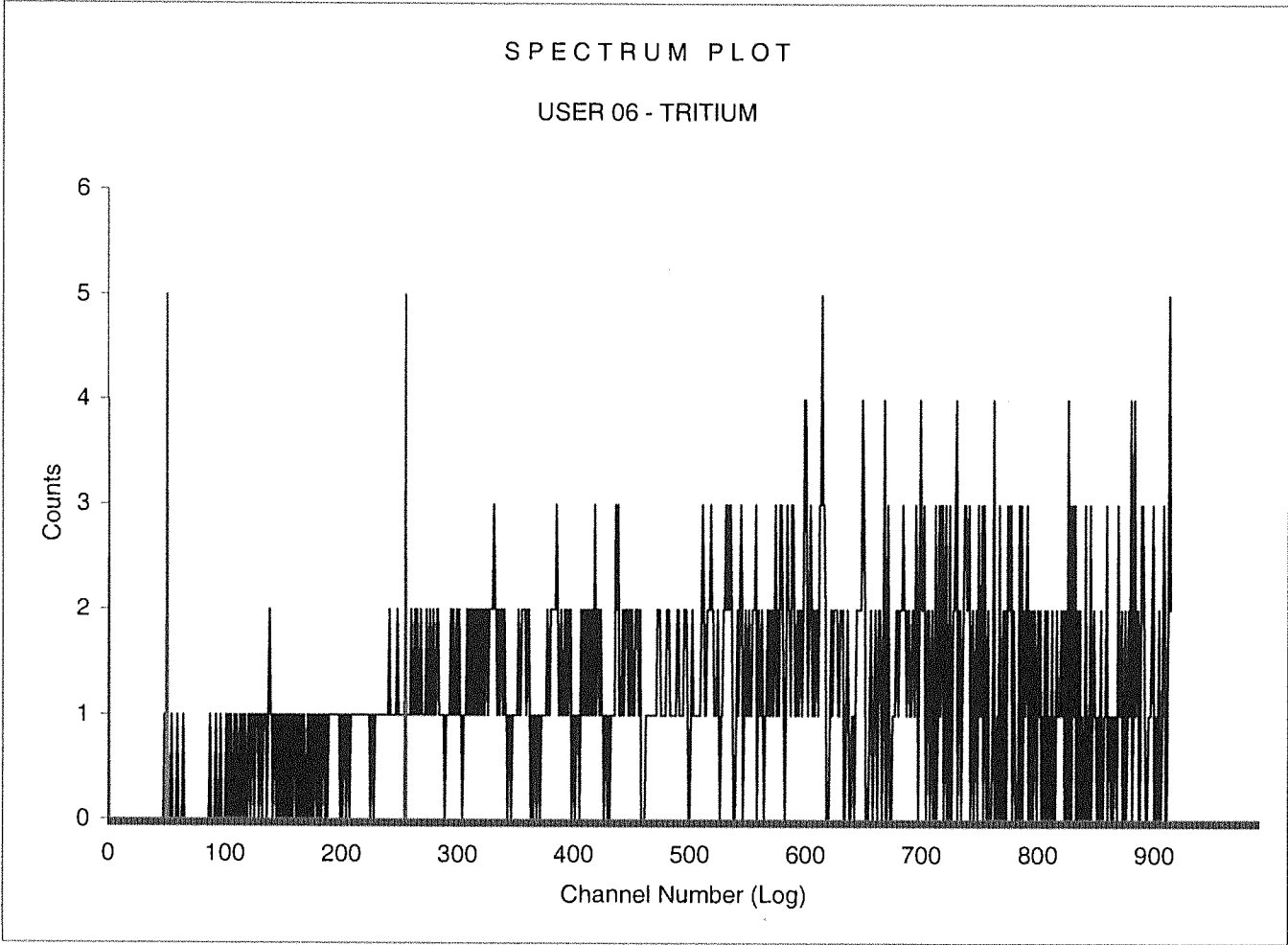
LIQUID

448-430.00

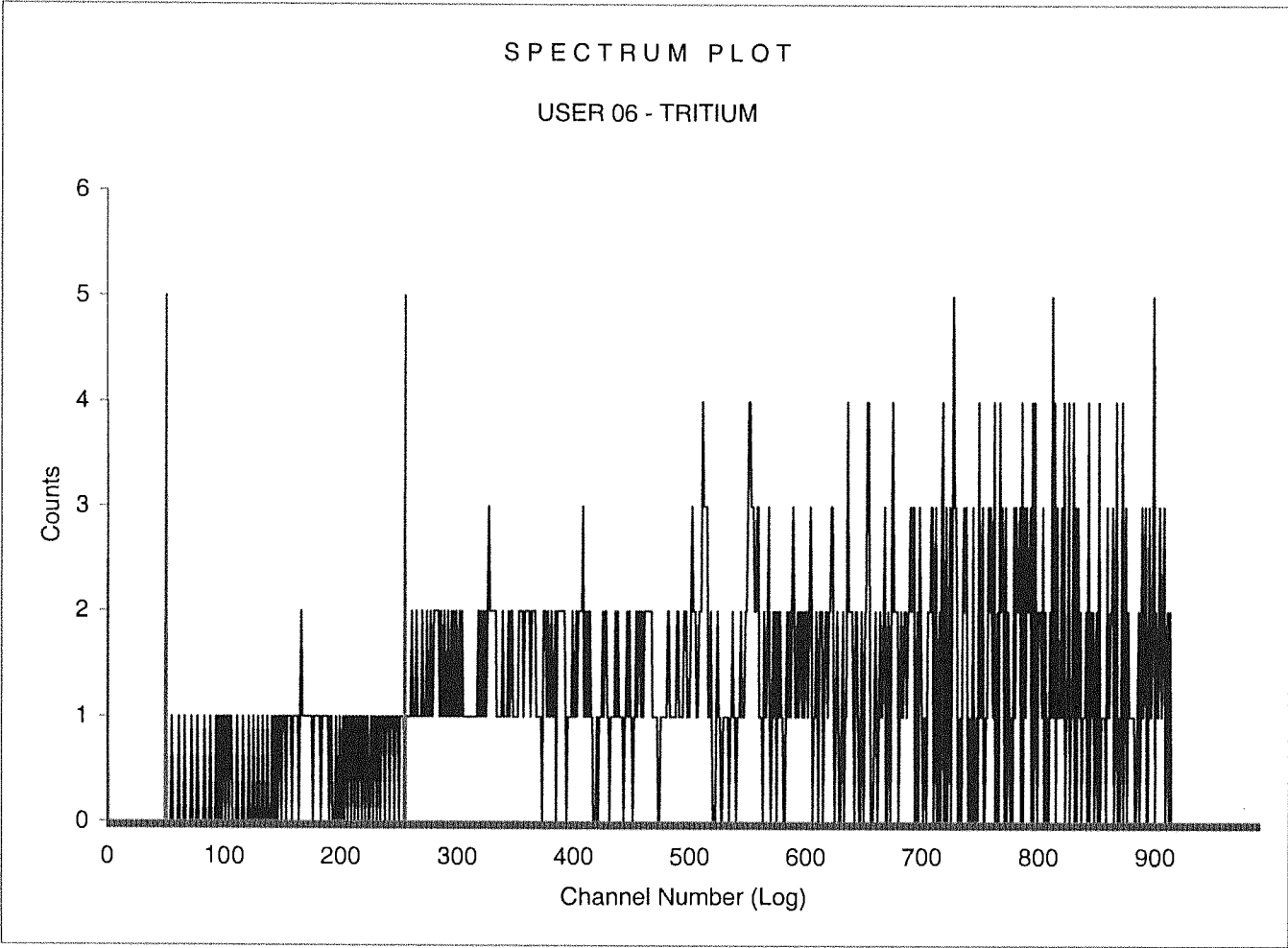
157.51020

50255

0990



Sample Count Start Time:	30 Jun 2016 22:51:02		
Data Capture Date	30 Jun 2016 23:21:24		
User Filename	S06063048-5A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	5	48-5	30.00
H#, Total Counts:	158.2	1054	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Sample Count Start Time:

Data Capture Date

User Filename

Spectrum Type

User Number

User Id

User Comment

Scintillator

Sample, Rack-Pos, Time:

H#, Total Counts:

Win1: Tritium - Start, End:

Win2: - Start, End:

30 Jun 2016 23:22:41

30 Jun 2016 23:53:04

S06063048-6A.XLS

U06063048-1A.XLS

Log Counts

06

TRITIUM

BROWN

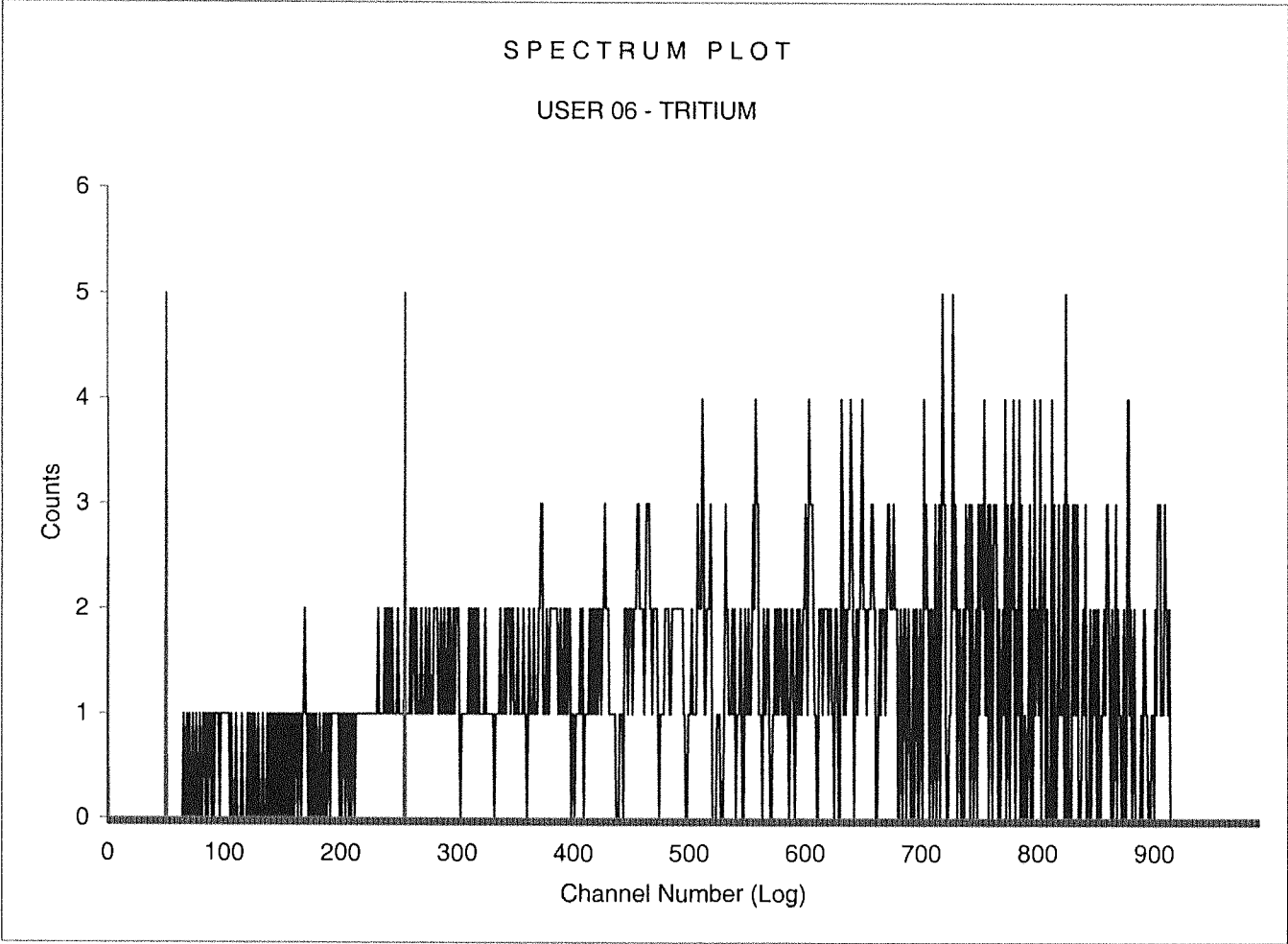
LIQUID

648-630.00

157.61086

50255

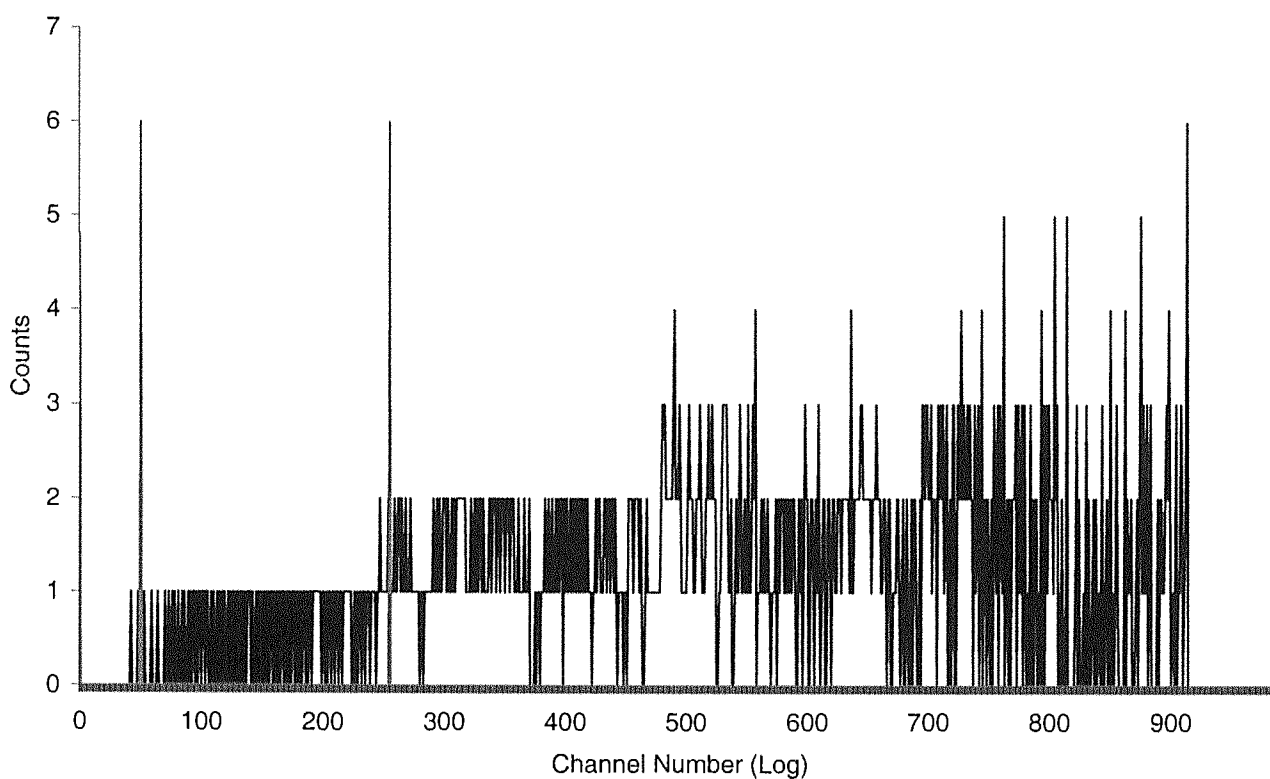
0990



Sample Count Start Time:	30 Jun 2016 23:54:22		
Data Capture Date	01 Jul 2016 00:24:45		
User Filename	S06070148-7A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	7	48-7	30.00
H#, Total Counts:	157.5	1066	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

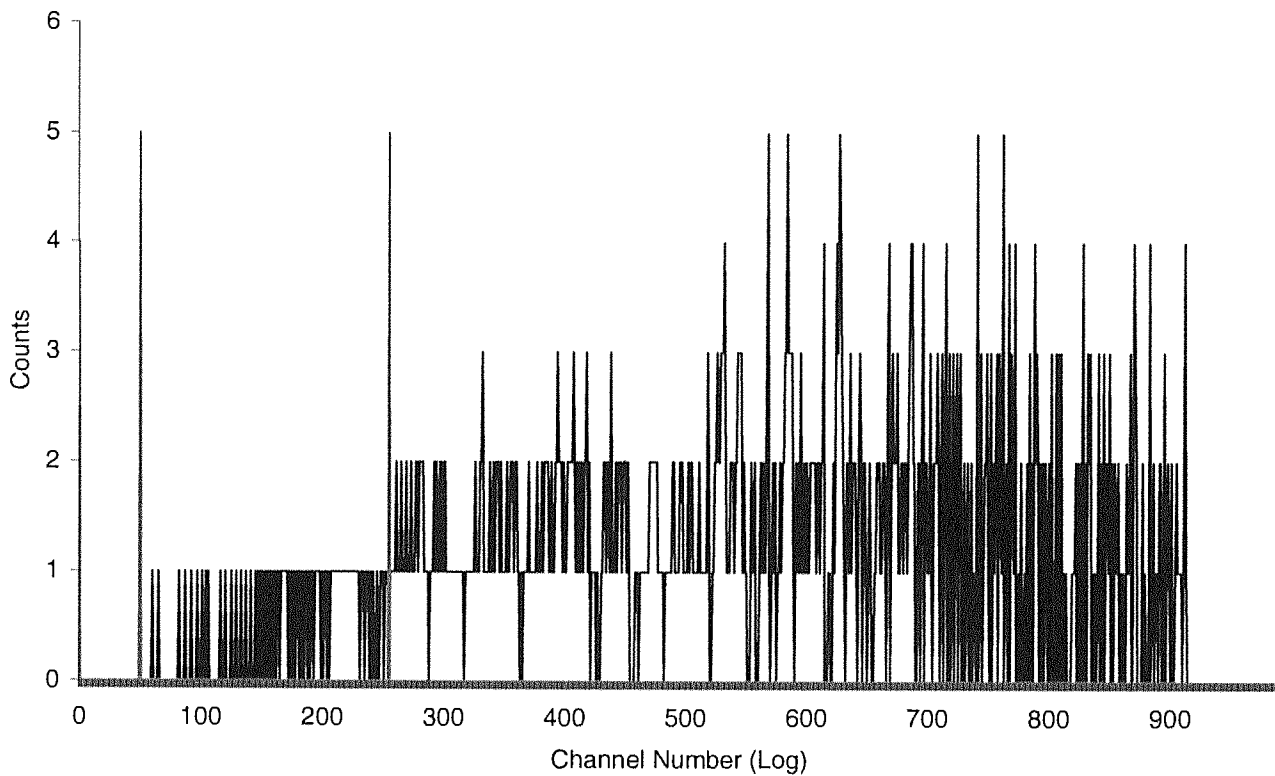
USER 06 - TRITIUM



Sample Count Start Time:	1 Jul 2016 00:26:03		
Data Capture Date	01 Jul 2016 00:56:26		
User Filename	S06070148-8A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	8	48-8	30.00
H#, Total Counts:	157.9	1006	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

USER 06 - TRITIUM



Sample Count Start Time:
Data Capture Date
User Filename

1 Jul 2016 00:57:46
01 Jul 2016 01:28:08
S06070148-9A.XLS
U06063048-1A.XLS

Spectrum Type
User Number
User Id
User Comment
Scintillator

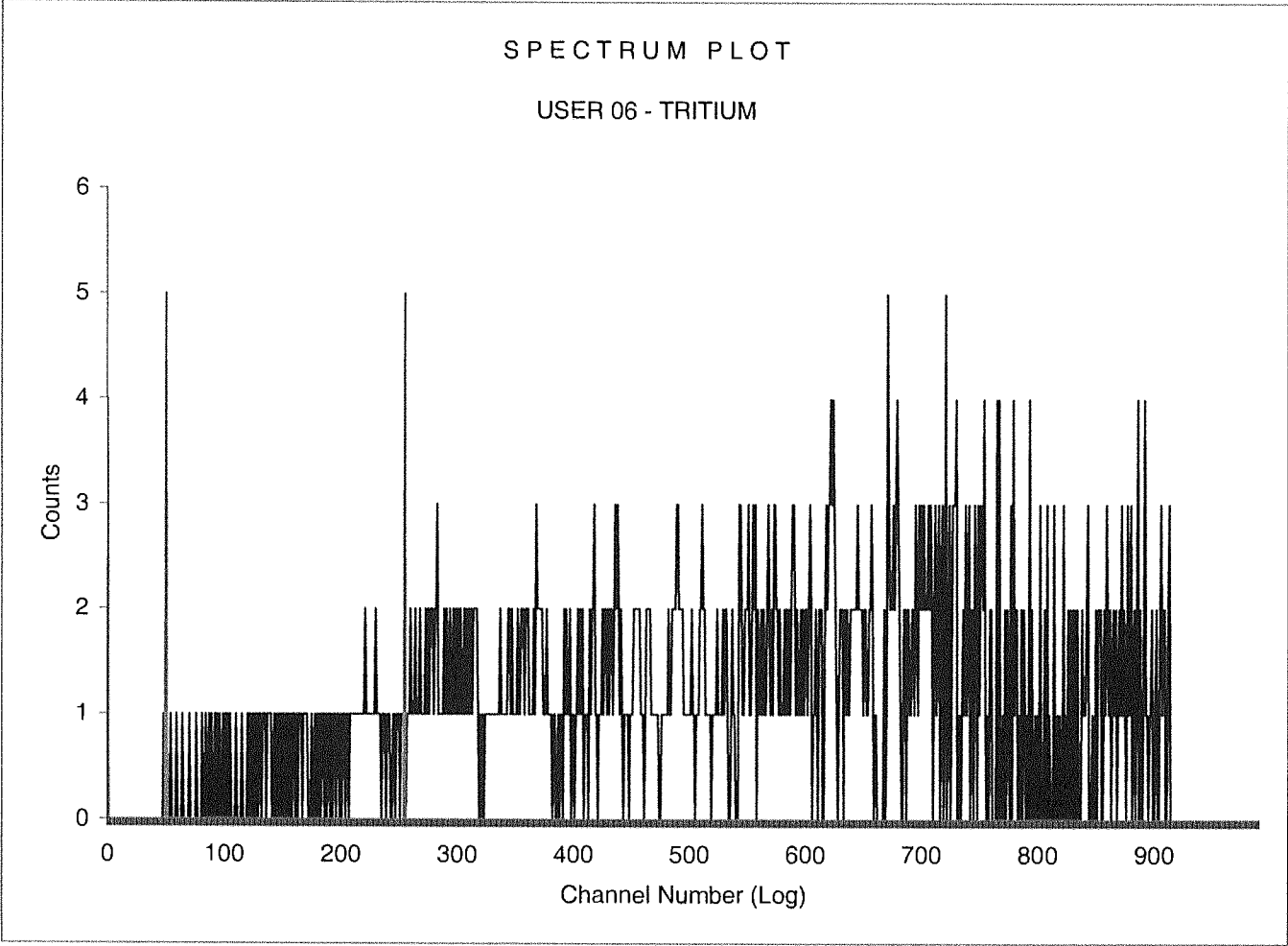
Log Counts
06
TRITIUM
BROWN
LIQUID

Sample, Rack-Pos, Time:
H#, Total Counts:
Win1: Tritium - Start, End:
Win2: - Start, End:

9
155.4
50
0

48-9
1024
255
990

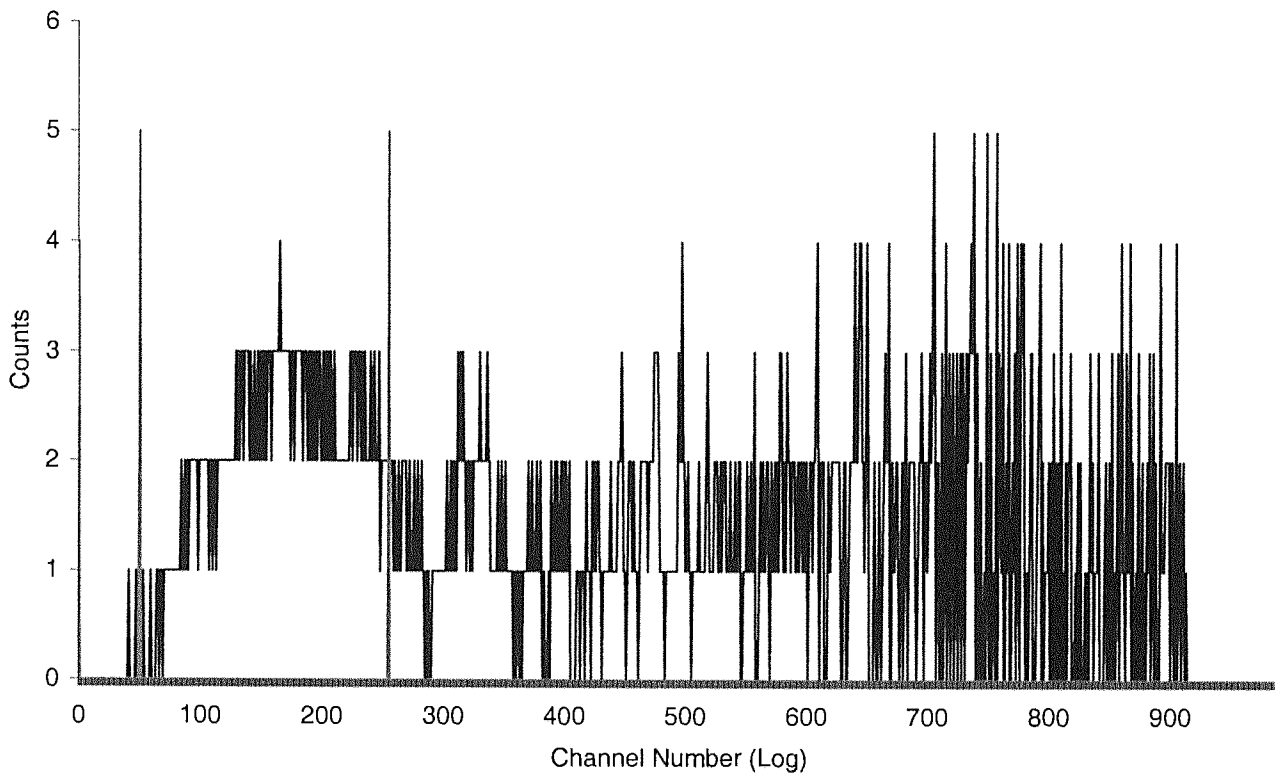
30.00



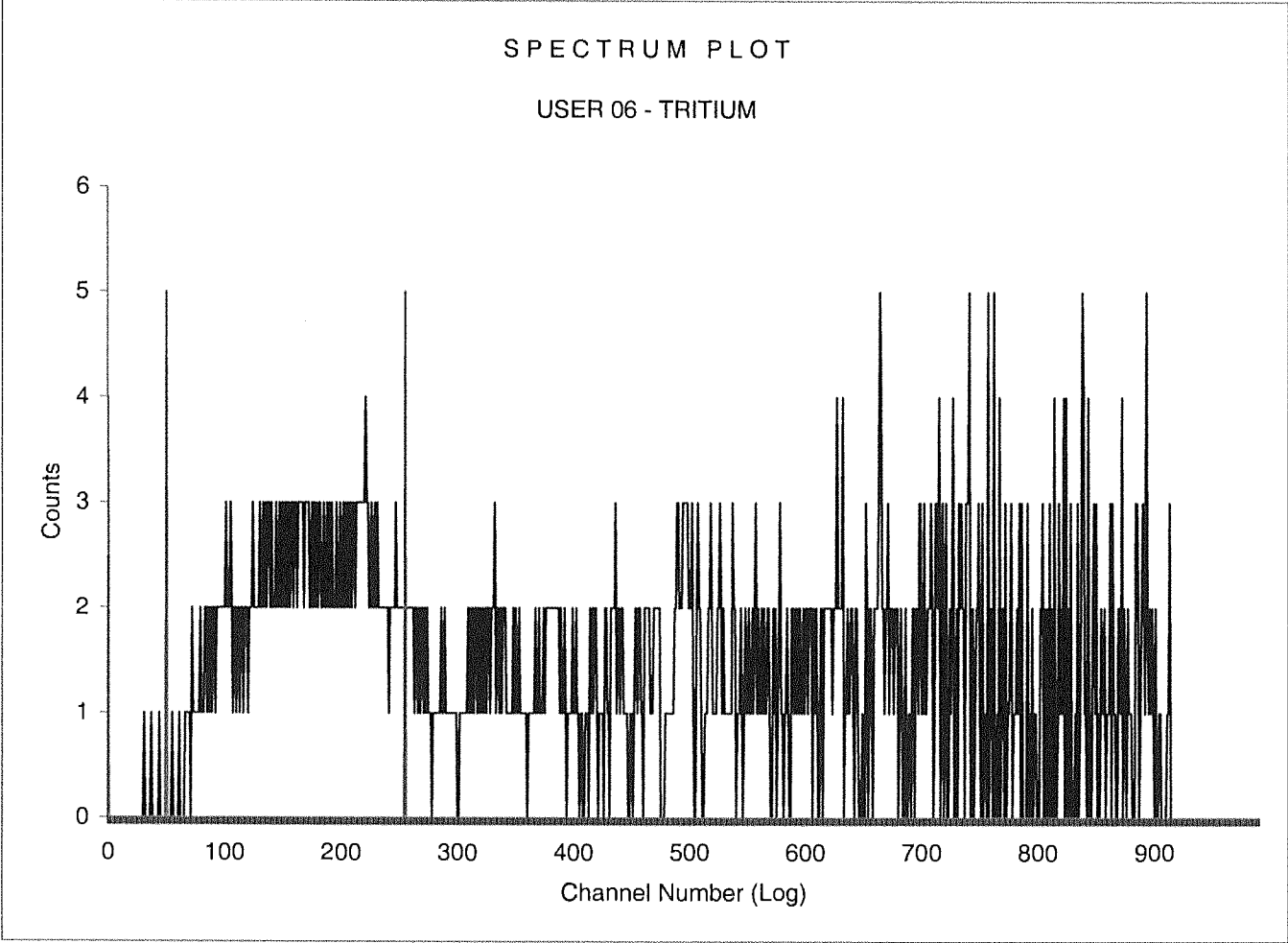
Sample Count Start Time:	1 Jul 2016 01:29:26		
Data Capture Date	01 Jul 2016 01:59:48		
User Filename	S06070148-10A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	10	48-10	30.00
H#, Total Counts:	157.5	1325	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	

SPECTRUM PLOT

USER 06 - TRITIUM



Sample Count Start Time:	1 Jul 2016 02:01:05		
Data Capture Date	01 Jul 2016 02:31:28		
User Filename	S06070148-11A.XLS		
	U06063048-1A.XLS		
Spectrum Type	Log Counts		
User Number	06		
User Id	TRITIUM		
User Comment	BROWN		
Scintillator	LIQUID		
Sample, Rack-Pos, Time:	11	48-11	30.00
H#, Total Counts:	159.2	1340	
Win1: Tritium - Start, End:	50	255	
Win2: - Start, End:	0	990	



Continuing Calibration Data



Liquid Scintillation Counter Checks for 30-JUN-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	03:38	1.4		114963	0.61		
	Carbon-14	03:40	1.4		115050	0.93		
	Tritium	03:42	1.3		161628	1.4		
	Tritium	03:43	1.3		161585	1.3		
	BKG	03:46	30		25	-0.73		
	BKG	04:16	30		26	-0.41		
LSCBROWN	Carbon-14	03:23	1.4		114998	-1.1		
	Carbon-14	03:24	1.4		115346	0.16		
	Tritium	03:26	1.25		168239	2.62		
	Tritium	03:28	1.25		167229	-0.2		
	BKG	03:30	30		26	-0.59		
	BKG	04:00	30		27	0.02		
LSCGOLD	BKG	00:17	30		22	-0.76		
	Carbon-14	06:22	1.3		126078	0.5		
	Carbon-14	06:24	1.3		126086	0.53		
	Tritium	06:26	1.35		150948	-1.2		
	Tritium	06:27	1.35		151774	0.33		
	BKG	06:29	30		22	-0.35		
	BKG	07:00	30		23	-0.17		
LSCGREEN	BKG	00:03	30		27	0.9		
	Carbon-14	09:30	1.4		115293	0.32		
	Carbon-14	09:31	1.4		115388	0.65		
	Tritium	09:33	1.25		172748	-0.54		
	Tritium	09:35	1.25		172861	-0.3		
	BKG	09:37	30		27	0.39		
	BKG	10:07	30		26	-0.06		
LSCORANGE	Carbon-14	06:23	1.012433		107665	0.19		
	Tritium	06:26	1.012433		180168	1.16		
	BKG	06:59	30.01243		11	-0.57		
	Carbon-14	07:00	1.012433		107478	-0.35		

LSCPINK	Tritium	07:01	1.012433	179882	0.45
	BKG	07:32	30.01243	12	1.38
	Carbon-14	02:08	1.012433	119273	0.74
	Tritium	02:12	1.012433	137692	-0.85
	BKG	02:44	30.01243	9.75	1.25
	Carbon-14	02:46	1.012433	119135	0.37
LSCRED	Tritium	02:47	1.012333	136965	-2.4
	BKG	03:17	30.01243	9.61	1.03
	Carbon-14	03:25	1.4	115015	0.38
	Carbon-14	03:27	1.4	114881	-0.06
	Tritium	03:29	1.3	165444	0.55
	Tritium	03:31	1.3	165438	0.53
LSCSILVER	BKG	03:33	30	25	-1.2
	BKG	04:03	30	26	-0.27
	Carbon-14	01:56	1.35	121310	0.35
	Carbon-14	01:58	1.35	121236	0.11
	Tritium	02:00	1.25	169709	-0.62
	Tritium	02:02	1.25	169913	-0.18
LSCTEAL	BKG	02:04	30	25	-0.55
	BKG	02:35	30	24	-1.3
	Carbon-14	05:44	1.583	105994	-0.68
	Carbon-14	05:47	1.583	106157	-0.14
	Carbon-14	05:49	1.583	105992	-0.69
	Carbon-14	05:51	1.617	106069	-0.43
	Tritium	05:54	1.2	145571	-1.9
	Tritium	05:56	1.2	145539	-1.9
	Tritium	05:58	1.2	145960	-1.4
	Tritium	06:00	1.2	145850	-1.5
	BKG	06:02	30	15	0.08
	BKG	06:33	30	15	0.08
LSCYELLOW	BKG	07:04	30	15	0.69
	BKG	07:35	30	15	-0.4
	Carbon-14	00:11	1.467	114759	1.33
	Carbon-14	00:13	1.467	114694	1.09

Tritium	00:16	1.467	149614	-0.79
Tritium	00:18	1.467	149204	-1.9
BKG	00:20	30	16	0.7
BKG	00:51	30	14	-1.8

Reviewed by: 
Lyndsey Pace

Date: 30-JUN-16

GEL Laboratories LLC



Liquid Scintillation Counter Checks for 01-JUL-2016

Short Name	Parmname	Run Time	Count Time	Counts	CPM	Stdev	Status	Comments
LSCBLUE	Carbon-14	02:43	1.4		114505	-1.1		
	Carbon-14	02:45	1.4		115062	0.98		
	Tritium	02:47	1.3		161668	1.49		
	Tritium	02:49	1.3		162308	2.91		
	BKG	02:51	30		25	-0.72		
	BKG	03:22	30		24	-1.3		
LSCBROWN	Carbon-14	02:32	1.4		115055	-0.86		
	Carbon-14	02:33	1.4		115153	-0.52		
	Tritium	02:35	1.25		167350	0.14		
	Tritium	02:37	1.25		166871	-1.2		
	BKG	02:39	30		25	-1.1		
	BKG	03:10	30		26	-0.43		
LSCGOLD	Carbon-14	01:54	1.3		125486	-1.2		
	Carbon-14	01:56	1.3		125887	-0.04		
	Tritium	01:58	1.35		151972	0.71		
	Tritium	01:59	1.35		151005	-1.1		
	BKG	02:02	30		22	-0.35		
	BKG	02:32	30		24	1.09		
LSCGREEN	Carbon-14	05:05	1.4		115188	-0.04		
	Carbon-14	05:07	1.4		115709	1.76		
	Tritium	05:09	1.25		173373	0.8		
	Tritium	05:11	1.25		172097	-1.9		
	BKG	05:13	30		26	-0.06		
	BKG	05:43	30		28	2.15		
LSCORANGE	Carbon-14	02:59	1.012433		107525	-0.22		
	Tritium	03:03	1.012433		179864	0.4		
	BKG	03:35	30.01243		12	0.75		
	Carbon-14	03:36	1.012433		106875	-2.1		
	Tritium	03:38	1.01235		178917	-1.9		
	BKG	04:08	30.01243		12	0.9		

LSCPINK	Carbon-14	04:16	1.012433	119293	0.8
	Tritium	04:19	1.012433	137943	-0.33
	BKG	04:52	30.01243	9.85	1.42
	Carbon-14	04:53	1.012433	118943	-0.15
	Tritium	04:55	1.012333	137788	-0.65
	BKG	05:25	30.01243	9.95	1.58
LSCRED	Carbon-14	00:28	1.4	114992	0.31
	Carbon-14	00:30	1.4	114743	-0.53
	Tritium	00:32	1.3	165209	0.02
	Tritium	00:34	1.3	164530	-1.5
	BKG	00:36	30	25	-1.1
	BKG	01:06	30	23	-2.9
LSCSILVER	Carbon-14	04:06	1.35	121402	0.65
	Carbon-14	04:07	1.35	121408	0.67
	Tritium	04:09	1.25	170275	0.58
	Tritium	04:11	1.25	169656	-0.73
	BKG	04:13	30	25	-0.34
	BKG	04:43	30	25	-0.31
LSCTEAL	Carbon-14	04:06	1.617	106160	-0.13
	Carbon-14	04:09	1.583	106491	0.96
	Carbon-14	04:11	1.583	105825	-1.2
	Carbon-14	04:14	1.617	105781	-1.4
	Tritium	04:16	1.183	146422	-0.82
	Tritium	04:18	1.183	146603	-0.6
	Tritium	04:20	1.183	146532	-0.69
	Tritium	04:22	1.183	146138	-1.2
	BKG	04:25	30	16	0.81
	BKG	04:55	30	15	-0.4
	BKG	05:26	30	15	0.45
	BKG	05:57	30	15	0.45
LSCYELLOW	Carbon-14	01:08	1.467	114835	1.61
	Carbon-14	01:11	1.483	114156	-0.9
	Tritium	01:13	1.467	150294	1.09
	Tritium	01:16	1.467	149212	-1.9

BKG	01:18	30	16	0.36
BKG	01:49	30	15	-0.68

Reviewed by: 
Lyndsey Pace

Date: 01-JUL-16

GEL Laboratories LLC

Runlogs

Instrument Run Log

Instrument Type: LSC

Batch ID: 1578004

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398677006	SAMPLE	CXS7	LSCBROWN	JUN-30-16 21:16:00	DONE	10mL DW/13mL Ecoscint Ultra	01-AUG-15 00:00
398677013	SAMPLE	CXS7	LSCBROWN	JUN-30-16 21:47:40	DONE	10mL DW/13mL Ecoscint Ultra	01-AUG-15 00:00
398677018	SAMPLE	CXS7	LSCBROWN	JUN-30-16 22:19:22	DONE	10mL DW/13mL Ecoscint Ultra	01-AUG-15 00:00
398677026	SAMPLE	CXS7	LSCBROWN	JUN-30-16 22:51:02	DONE	10mL DW/13mL Ecoscint Ultra	01-AUG-15 00:00
398677033	SAMPLE	CXS7	LSCBROWN	JUN-30-16 23:22:41	DONE	10mL DW/13mL Ecoscint Ultra	01-AUG-15 00:00
398677039	SAMPLE	CXS7	LSCBROWN	JUN-30-16 23:54:22	DONE	10mL DW/13mL Ecoscint Ultra	01-AUG-15 00:00
1203576084	MB	CXS7	LSCBROWN	JUL-01-16 00:26:03	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203576085	DUP	CXS7	LSCBROWN	JUL-01-16 00:57:46	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203576087	LCS	CXS7	LSCBROWN	JUL-01-16 01:29:26	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00
1203576086	MS	CXS7	LSCBROWN	JUL-01-16 02:01:05	DONE	10mL DW/13mL Ecoscint Ultra	01-JUL-16 00:00

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Case Narrative

**Case Narrative
for
Brookhaven National Laboratory (310464)
SDG: 37695
Work Order: 398656**

June 29, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 03, 2016 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
398656001	37695-001
398656002	37695-002
398656003	37695-003
398656004	37695-004
398656005	37695-005
398656006	37695-006
398656007	37695-007
398656008	37695-008
398656009	37695-009
398656010	37695-010
398656011	37695-011
398656012	37695-012
398656013	37695-013
398656014	37695-014
398656015	37695-015
398656016	37695-016
398656017	37695-017
398656018	37695-018
398656019	37695-019
398656020	37695-020
398656021	37695-021
398656022	37695-022
398656023	37695-023
398656024	37695-024
398656025	37695-025
398656026	37695-026

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.



Kaitlyn Stone for
Edith Kent
Project Manager

Chain of Custody

Requires EDD

Analysis Requested By

W. Dorsch

Life No. 21133

Ext. 5186

Dept. ES

Accel No. 20802/20804

Email Reports To:

W. Dorsch

2. Andrew Lockwood

Project Name:

AOC10FSS

Project Manager:

W. Dorsch

Field Engineer:

R. Lagattolia

Additional Sample Information

Com. Vol/Units

Conc. Type

Preservative

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

SPDES TAT for EDD

Sample Information

Site ID/Bldg/Life #

Depth/RWP

Date

Time

Permit

Name/Description

Com. Vol/Units

Conc. Type

Preservative

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

1. Relinquished By/Date/Time

Print

Signature

1. Received By/Date/Time

Print

Signature

2. Relinquished By/Date/Time

Print

Signature

3. Relinquished By/Date/Time

Print

Signature

3. Received By/Date/Time

Print

Signature

Contractor Lab Sample Disposal:

Return To Client

Archive For

Months

Disposal by Lab

Data Package:

Full

Summary

Turn-Around Time Required:

Rush (1 Day)

14 Days

30 Days

Other ()

Goldenrod (4) - Field Copy - (Sampler)

SPDES TAT for EDD

Sample Information

Site ID/Bldg/Life #

Depth/RWP

Date

Time

Permit

Name/Description

Com. Vol/Units

Conc. Type

Preservative

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

1. Relinquished By/Date/Time

Print

Signature

1. Received By/Date/Time

Print

Signature

2. Relinquished By/Date/Time

Print

Signature

3. Relinquished By/Date/Time

Print

Signature

3. Received By/Date/Time

Print

Signature

Contractor Lab Sample Disposal:

Return To Client

Archive For

Months

Disposal by Lab

Data Package:

Full

Summary

Turn-Around Time Required:

Rush (1 Day)

14 Days

30 Days

Other ()

Goldenrod (4) - Field Copy - (Sampler)

SPDES TAT for EDD

Sample Information

Site ID/Bldg/Life #

Depth/RWP

Date

Time

Permit

Name/Description

Com. Vol/Units

Conc. Type

Preservative

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

1. Relinquished By/Date/Time

Print

Signature

1. Received By/Date/Time

Print

Signature

2. Relinquished By/Date/Time

Print

Signature

3. Relinquished By/Date/Time

Print

Signature

3. Received By/Date/Time

Print

Signature

Contractor Lab Sample Disposal:

Return To Client

Archive For

Months

Disposal by Lab

Data Package:

Full

Summary

Turn-Around Time Required:

Rush (1 Day)

14 Days

30 Days

Other ()

Goldenrod (4) - Field Copy - (Sampler)

SPDES TAT for EDD

Sample Information

Site ID/Bldg/Life #

Depth/RWP

Date

Time

Permit

Name/Description

Com. Vol/Units

Conc. Type

Preservative

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

PCBs

Metals

Analysis Requested

Gamma

1. Relinquished By/Date/Time

Print

Signature

1. Received By/Date/Time

Print

Signature

2. Relinquished By/Date/Time

Print

Signature

3. Relinquished By/Date/Time

Print

Signature

3. Received By/Date/Time

Print

Signature

Contractor Lab Sample Disposal:

Return To Client

Archive For

Months

Disposal by Lab

Data Package:

Full

Summary

Turn-Around Time Required:

Rush (1 Day)

14 Days

30 Days

Other ()

Goldenrod (4) - Field Copy - (Sampler)

SPDES TAT for EDD

Sample Information

Site ID/Bldg/Life #

Depth/RWP

Date

Time

Permit

Name/Description

Com. Vol/Units

Conc. Type

Preservative

Analysis Requested

Gamma

Sr-90

524.2

624

Nuclide-Specific Alpha

SAMPLING CHAIN OF CUSTODY

398656

Requires EDD ☒

Analysis Requested By		Sampling Contractor		Analytical Laboratory	
Name: W. Dorsch	Name: EPD Field Sampling Team	Name: GEL			
Life No: 21133	Contact: R. Lagattolia	Address: 2040 Savage Rd.			
Ext: 5186	Phone: 631 344 7129	City: Charleston	SC	Zip: 29407	
Acct No: 20802/20804	Dept: ES	Contact: E. Kent			
	Email Reports To: R. Metz, J. Milligan	Phone: 843-556-8171			
	Email/Fax: flagattolia@bnl.gov	Email/Fax:			
W. Dorsch	Sampler:	Field Engineer: R. Lagattolia			
2 Andrew Lockwood	Project Manager: W. Dorsch				
	Project Name: AOC10FSS				

Comments: SPDES TAT for EDD

Type	Sample Information			Additional Sample Information			Analysis Requested		
	UID	Site ID/Bldg/Life #	Depth/RWP	Date	Time	Name/Description	Cont. Vol/Unit	Conc. Type	Preservative
E C	015	B 811-GP-SU-2-2	4.0-6.0	5/17/16	1145	Bldg. 811 Geoprobe soil cores (4.0ft-6.0ft)	16oz	P	1
E C	016	B 811-GP-SU-2-2	6.0-8.0		1150	Bldg. 811 Geoprobe soil cores (6.0ft-8.0ft)	16oz	P	1
E C	017	B 811-GP-SU-2-8	8.0-10.0		1330	Bldg. 811 Geoprobe soil cores (8.0ft-10.0ft)	16oz	P	1
E C	018	B 811-GP-SU-2-8	10.0-12.0		1335	Bldg. 811 Geoprobe soil cores (10.0ft-12.0ft)	16oz	P	1
E C	019	B 811-GP-SU-2-8	12.0-14.0		1345	Bldg. 811 Geoprobe soil cores (12.0ft-14.0ft)	16oz	P	1
E C	020	B 811-GP-SU-2-8	14.0-16.0		1355	Bldg. 811 Geoprobe soil cores (14.0ft-16.0ft)	16oz	P	1
E C	021	B 811-GP-SU-2-15	0.5-2.0		1430	Bldg. 811 Geoprobe soil cores (0.5.0ft-2.0ft)	16oz	P	1
E C	022	B 811-GP-SU-2-15	2.0-4.0		1435	Bldg. 811 Geoprobe soil cores (2.0ft-4.0ft)	16oz	P	1
E C	023	B 811-GP-SU-2-15	4.0-6.0		1440	Bldg. 811 Geoprobe soil cores (4.0ft-6.0ft)	16oz	P	1
E C	024	B 811-GP-SU-2-15	6.0-8.0		1445	Bldg. 811 Geoprobe soil cores (6.0ft-8.0ft)	16oz	P	1
E C	025	B 811-BD-1	0			Blind Duplicate	16oz	P	1
E C	026	B 811-EB-1	0		1000	Equipment Blank	2L	P	1 HNO3

1. Relinquished By/Date/Time		2. Relinquished By/Date/Time		3. Relinquished By/Date/Time	
Print R. Metz	5/18/16	Print Ty Rorsch	6-2-16	Print R. Metz	6/2/16
Signature R. Metz	1400	Signature Ty Rorsch	10:30	Signature R. Metz	1350
1 Received By/Date/Time		2 Received By/Date/Time		3 Received By/Date/Time	
Print Ty Rorsch	5.18.16	Print R. Metz	6/2/16	Print Cheryle	06/03/16
Signature Ty Rorsch	14:00	Signature R. Metz	10:30	Signature Cheryle	0900

Contractor Lab Sample Disposal	
☐ Return To Client	☒ Disposal by Lab
☐ Archive For	☐ Months
Data Package: ☒ Full ☐ Summary	
Turn-Around Time Required:	
☐ Rush (1 Day)	☐ 14 Days
☐ 7 Days	☒ 30 Days

SAMPLE RECEIPT & REVIEW FORM

Client: <u>BKLL</u>		SDG/AR/COC/Work Order: <u>37095</u>	
Received By: <u>CAW</u>		Date Received: <u>06/03/16</u>	
Suspected Hazard Information		Yes	No
COC/Samples marked as radioactive?		☒	☐
Classified Radioactive II or III by RSO?		☒	☐
COC/Samples marked containing PCBs?		☒	☐
Package, COC, and/or Samples marked as beryllium or asbestos containing?		☒	☐
Shipped as a DOT Hazardous?		☒	☐
Samples identified as Foreign Soil?		☒	☐

*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.

Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0 cpm

If yes, Were swipes taken of sample containers < action levels?

If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group

Hazard Class Shipped: UN#:

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	☒	☐	☐	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	☒	☐	☐	Preservation Method: Ice bags Blue ice Dry ice <u>None</u> Other (describe) *all temperatures are recorded in Celsius <u>23°C</u>
2a Daily check performed and passed on IR temperature gun?	☒	☐	☐	Temperature Device Serial #: <u>5102009184</u> Secondary Temperature Device Serial # (If Applicable):
3 Chain of custody documents included with shipment?	☒	☐	☐	
4 Sample containers intact and sealed?	☒	☐	☐	Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?	☒	☐	☐	Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6 Do Low Level Perchlorate samples have headspace as required?	☒	☐	☐	Sample ID's and containers affected:
7 VOA vials contain acid preservation?	☒	☐	☐	(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?	☒	☐	☐	Sample ID's and containers affected:
9 Are Encore containers present?	☒	☐	☐	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	☒	☐	☐	ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	☒	☐	☐	Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	☒	☐	☐	Sample ID's affected:
13 Number of containers received match number indicated on COC?	☒	☐	☐	Sample ID's affected:
14 Are sample containers identifiable as GEL provided?	☒	☐	☐	
15 COC form is properly signed in relinquished/received sections?	☒	☐	☐	
16 Carrier and tracking number.	☒	☐	☐	Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other <u>0583 4847 8210</u>

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials EM Date 6/3/16 Page 1 of 1

Work Order Containers

Sample ID: 398656001
Client Sample ID: 37695-001
Description: B811-GP-SU-1-4 Soil

Label: 398656001.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656001.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656001.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656002
Client Sample ID: 37695-002
Description: B811-GP-SU-1-4 Soil

Label: 398656002.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656002.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656002.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656003
Client Sample ID: 37695-003
Description: B811-GP-SU-1-4 Soil

Label: 398656003.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656003.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656003.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656004
Client Sample ID: 37695-004
Description: B811-GP-SU-1-4 Soil

Label: 398656004.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656004.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656004.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656005
Client Sample ID: 37695-005
Description: B811-GP-SU-1-10 Soil

Label: 398656005.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656005.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656005.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656006
Client Sample ID: 37695-006
Description: B811-GP-SU-1-10 Soil

Label: 398656006.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656006.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656006.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656007
Client Sample ID: 37695-007
Description: B811-GP-SU-1-10 Soil

Label: 398656007.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656007.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656007.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656008
Client Sample ID: 37695-008
Description: B811-GP-SU-1-10 Soil

Label: 398656008.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656008.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656008.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656009
Client Sample ID: 37695-009
Description: B811-GP-SU-1-14 Soil

Label: 398656009.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205	
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398656009.01.01		Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234	
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398656009.01.02		Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826	

Sample ID: 398656010
Client Sample ID: 37695-010
Description: B811-GP-SU-1-14 Soil

Label: 398656010.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205	
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398656010.01.01		Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234	
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398656010.01.02		Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826	

Work Order Containers

Sample ID: 398656011
Client Sample ID: 37695-011
Description: B811-GP-SU-1-14 Soil

Label: 398656011.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656011.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656011.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656012
Client Sample ID: 37695-012
Description: B811-GP-SU-1-14 Soil

Label: 398656012.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656012.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656012.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656013
Client Sample ID: 37695-013
Description: B811-GP-SU-2-2 Soil

Label: 398656013.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656013.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656013.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656014
Client Sample ID: 37695-014
Description: B811-GP-SU-2-2 Soil

Label: 398656014.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656014.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656014.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656015
Client Sample ID: 37695-015
Description: B811-GP-SU-2-2 Soil

Label: 398656015.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656015.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656015.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656016
Client Sample ID: 37695-016
Description: B811-GP-SU-2-2 Soil

Label: 398656016.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656016.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656016.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656017
Client Sample ID: 37695-017
Description: B811-GP-SU-2-8 Soil

Label: 398656017.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205	
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398656017.01.01		Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234	
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398656017.01.02		Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826	

Sample ID: 398656018
Client Sample ID: 37695-018
Description: B811-GP-SU-2-8 Soil

Label: 398656018.01		Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler	
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205	
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation	
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples	
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler	
Label: 398656018.01.01		Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234	
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room	
Label: 398656018.01.02		Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826	

Work Order Containers

Sample ID: 398656019
Client Sample ID: 37695-019
Description: B811-GP-SU-2-8 Soil

Label: 398656019.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656019.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656019.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Sample ID: 398656020
Client Sample ID: 37695-020
Description: B811-GP-SU-2-8 Soil

Label: 398656020.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:14:38	Lisa Trill	Transferred custody to batch 1572205
06-JUN-16 02:14:38	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656020.01.01	Type: Gamma Can	
09-JUN-16 09:52:15	Maggie Stamps	Transferred custody to batch 1572234
09-JUN-16 09:52:15	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656020.01.02	Type: Dried Other	
24-JUN-16 12:01:01	Kelli Dorrell	Transferred custody to batch 1575826

Work Order Containers

Sample ID: 398656021
Client Sample ID: 37695-021
Description: B811-GP-SU-2-15 Soil

Label: 398656021.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:16:41	Lisa Trill	Transferred custody to batch 1572209
06-JUN-16 02:16:41	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656021.01.01	Type: Gamma Can	
09-JUN-16 09:54:27	Maggie Stamps	Transferred custody to batch 1572236
09-JUN-16 09:54:27	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656021.01.02	Type: Dried Other	
24-JUN-16 12:03:25	Kelli Dorrell	Transferred custody to batch 1575827
24-JUN-16 12:03:25	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398656022
Client Sample ID: 37695-022
Description: B811-GP-SU-2-15 Soil

Label: 398656022.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:16:41	Lisa Trill	Transferred custody to batch 1572209
06-JUN-16 02:16:41	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656022.01.01	Type: Gamma Can	
09-JUN-16 09:54:27	Maggie Stamps	Transferred custody to batch 1572236
09-JUN-16 09:54:27	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656022.01.02	Type: Dried Other	
24-JUN-16 12:03:25	Kelli Dorrell	Transferred custody to batch 1575827
24-JUN-16 12:03:25	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Work Order Containers

Sample ID: 398656023
Client Sample ID: 37695-023
Description: B811-GP-SU-2-15 Soil

Label: 398656023.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:16:41	Lisa Trill	Transferred custody to batch 1572209
06-JUN-16 02:16:41	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656023.01.01	Type: Gamma Can	
09-JUN-16 09:54:27	Maggie Stamps	Transferred custody to batch 1572236
09-JUN-16 09:54:27	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656023.01.02	Type: Dried Other	
24-JUN-16 12:03:25	Kelli Dorrell	Transferred custody to batch 1575827
24-JUN-16 12:03:25	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398656024
Client Sample ID: 37695-024
Description: B811-GP-SU-2-15 Soil

Label: 398656024.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:16:41	Lisa Trill	Transferred custody to batch 1572209
06-JUN-16 02:16:41	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656024.01.01	Type: Gamma Can	
09-JUN-16 09:54:27	Maggie Stamps	Transferred custody to batch 1572236
09-JUN-16 09:54:27	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656024.01.02	Type: Dried Other	
24-JUN-16 12:03:25	Kelli Dorrell	Transferred custody to batch 1575827
24-JUN-16 12:03:25	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Work Order Containers

Sample ID: 398656025
Client Sample ID: 37695-025
Description: B811-BD-1 Soil

Label: 398656025.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
03-JUN-16 13:23:52	Chelsea Seagle	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 02:16:41	Lisa Trill	Transferred custody to batch 1572209
06-JUN-16 02:16:41	Lisa Trill	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 09:51:46	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
06-JUN-16 12:09:42	Caroline Gause	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398656025.01.01	Type: Gamma Can	
09-JUN-16 09:54:27	Maggie Stamps	Transferred custody to batch 1572236
09-JUN-16 09:54:27	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398656025.01.02	Type: Dried Other	
24-JUN-16 12:03:25	Kelli Dorrell	Transferred custody to batch 1575827
24-JUN-16 12:03:25	Kelli Dorrell	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Prep Laboratory

Sample ID: 398656026
Client Sample ID: 37695-026
Description: B811-EB-1 Water

Label: 398656026.01	Type: Plastic 2000 ml	Preservative: Nitric pH<2
03-JUN-16 13:20:14	Chelsea Seagle	Changed sample location from Barcode Generated to Radiochemistry Storage
20-JUN-16 13:36:35	Michael Hilton	Transferred custody to batch 1572406
20-JUN-16 13:36:35	Michael Hilton	Changed sample location from Radiochemistry Storage to Radiochemistry Prep Laboratory
21-JUN-16 11:59:39	Maggie Stamps	Changed sample location from Radiochemistry Prep Laboratory to Return Shelf Radiochemistry Samples
24-JUN-16 11:56:02	Caroline Gause	Changed batch_id from 1572406 to
24-JUN-16 11:56:02	Caroline Gause	Changed sample location from Return Shelf Radiochemistry Samples to Radiochemistry Storage
Label: 398656026.01.01	Type: Plastic Gamma Marinelli (Liquid 2L)	Preservative: Nitric pH<2
21-JUN-16 11:59:23	Maggie Stamps	Changed sample location from Radiochemistry Prep Laboratory to Radiochemistry Count Room
23-JUN-16 08:56:02	Kelli Dorrell	Transferred custody to batch 1575817

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: **BRKL**

Qualifier	Qualifier Definition	Department	Fraction
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.		
J	Value is estimated		
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The target analyte was detected in the associated blank.	Organics	
E	Concentration of the target analyte exceeds the instrument calibration range	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Metals--The Matrix spike sample recovery is not within specified control limits	Inorganics	
*	A quality control analyte recovery is outside of specified acceptance criteria		
N	Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor	Organics	Semi-Volatile
H	Analytical holding time was exceeded		
**	Analyte is a surrogate compound	Organics	
<	Result is less than value reported		
>	Result is greater than value reported		
UI	Gamma Spectroscopy--Uncertain identification	Radiological	
BD	Results are either below the MDC or tracer recovery is low	Radiological	
h	Preparation or preservation holding time was exceeded		
R	Sample results are rejected		
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.	General Chemistry	General Chem
d	5-day BOD--The 2:1 depletion requirement was not met for this sample	General Chemistry	
B	Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL	Inorganics	Metals
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.		
D	Results are reported from a diluted aliquot of the sample	Organics	
N/A	RPD or %Recovery limits do not apply.		
ND	Analyte concentration is not detected above the detection limit		
E	%difference of sample and SD is >10%. Sample concentration must meet flagging criteria	Inorganics	Metals
M	M if above MDC and less than LLD	Radiological	
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
FA	Failed analysis.	Radiological	Bioassay
M	REMP Result > MDC/CL and < RDL	Radiological	
E	General Chemistry--Concentration of the target analyte exceeds the instrument calibration range	General Chemistry	General Chem
JNX	Non Calibrated Compound	Organics	Volatile

Project Specific Qualifier Definitions for GEL Client Code: **BRKL**

Qualifier	Qualifier Definition	Department	Fraction
UJ	Compound cannot be extracted	Organics	Semi-Volatile
UJ	Gamma Spectroscopy--Uncertain identification	Radiological	Rad
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.		
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.	Radiological	
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.	Radiological	
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.	Radiological	
FB	Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies	Inorganics	Metals
N1	See case narrative		
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.	Inorganics	
Y	QC Samples were not spiked with this compound	Organics	
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.	General Chemistry	General Chem
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.	Radiological	Rad
**	Analyte is a Tracer compound	Radiological	
B	The target analyte was detected in the associated blank.	General Chemistry	
N	Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor	Organics	Volatile
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes	General Chemistry	General Chem

Data Review Qualifier Definitions

Qualifier Explanation

*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

- P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Laboratory Certifications

List of current GEL Certifications as of 29 June 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
Brookhaven National Laboratory (BRKL)
SDG #: 37695
Work Order #: 398656**

Method/Analysis Information

Product: **Gammasepec, Gamma, Solid (Long List) Remediation**

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Prep Method: Dry Soil Prep

Analytical Batch Number: 1572234

Prep Batch Number: 1572205

Sample ID	Client ID
398656001	37695-001
398656002	37695-002
398656003	37695-003
398656004	37695-004
398656005	37695-005
398656006	37695-006
398656007	37695-007
398656008	37695-008
398656009	37695-009
398656010	37695-010
398656011	37695-011
398656012	37695-012
398656013	37695-013
398656014	37695-014
398656015	37695-015
398656016	37695-016
398656017	37695-017
398656018	37695-018
398656019	37695-019
398656020	37695-020
1203561383	Method Blank (MB)
1203561385	Laboratory Control Sample (LCS)
1203561384	398656001(37695-001) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398656001 (37695-001).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:

Data Exception (DER) Documentation

A data exception report (DER) 1533607 was generated for samples 398656013 (37695-013), 398656014 (37695-014), 398656015 (37695-015) and 398656017 (37695-017) in this SDG/batch. DER 1533607 was generated due to RDL less than MDA. The required detection limit for Be-7 was not achieved in samples 398656013, 014, 015, and 017. The required detection limit for Co-57 was not achieved in sample 398656014. The detection limits cannot be met due to a limited sample volume. The results have been reported.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample

UI	Data rejected due to high counting uncertainty.	Europium-155	398656013	37695-013
UI	Data rejected due to high peak-width.	Cesium-137	398656016	37695-016
UI	Data rejected due to interference.	Europium-155	398656001	37695-001
			398656002	37695-002
			398656003	37695-003
			398656006	37695-006
			398656007	37695-007
			398656009	37695-009
			398656015	37695-015
			1203561384	37695-001(398656001DUP)
UI	Data rejected due to low abundance.	Cesium-134	398656001	37695-001
			398656002	37695-002
			398656003	37695-003
			398656004	37695-004
			398656005	37695-005
			398656007	37695-007
			398656008	37695-008
			398656009	37695-009
			398656010	37695-010
			398656011	37695-011
			398656012	37695-012
			398656013	37695-013
			398656014	37695-014
			398656015	37695-015
			1203561384	37695-001(398656001DUP)
		Zinc-65	398656002	37695-002
UI	Data rejected due to no valid peak.	Manganese-54	398656011	37695-011

Method/Analysis Information

Product: Gammaspec, Gamma, Solid (Long List) Remediation
Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R
Prep Method: Dry Soil Prep
Analytical Batch Number: 1572236
Prep Batch Number: 1572209

Sample ID	Client ID
398656021	37695-021
398656022	37695-022
398656023	37695-023
398656024	37695-024
398656025	37695-025
1203561386	Method Blank (MB)
1203561388	Laboratory Control Sample (LCS)
1203561387	398656021(37695-021) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398656021 (37695-021).

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to interference.	Europium-155	398656021	37695-021
			1203561387	37695-021(398656021DUP)
		Manganese-54	398656021	37695-021
			1203561387	37695-021(398656021DUP)
UI	Data rejected due to low abundance.	Cesium-134	398656021	37695-021
			398656022	37695-022
			398656023	37695-023
			1203561387	37695-021(398656021DUP)

Method/Analysis Information

Product: Gammaspec, Gamma, Liquid Remediation Standard
Analytical Method: EPA 901.1

Analytical Batch Number: 1572406

Sample ID	Client ID
398656026	37695-026
1203561781	Method Blank (MB)
1203561782	Laboratory Control Sample (LCS)
1203561783	Laboratory Control Sample Duplicate (LCSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

A laboratory duplicate was not run with the analytical batch since it was designated by the client as a field QC. A laboratory control sample and duplicate, 1203561782 (LCS) and 1203561783 (LCSD), were analyzed for precision.

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, liquid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Analytical Batch Number: 1575817

Sample ID	Client ID
398656026	37695-026
1203570734	Method Blank (MB)
1203570738	Laboratory Control Sample (LCS)
1203570735	398675001(NonSDG) Sample Duplicate (DUP)
1203570736	398675001(NonSDG) Matrix Spike (MS)
1203570737	398675001(NonSDG) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:**Calibration Information**

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398675001 (NonSDG).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

Sample 1203570735 (Non SDG 398675001DUP) was recounted due to a suspected false positive. The recount is reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

The matrix spike and matrix spike duplicate, 1203570736 (Non SDG 398675001MS) and 1203570737 (Non SDG 398675001MSD), aliquots were reduced to conserve sample volume.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product:	GFPC, Sr90, solid
Analytical Method:	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified
Prep Method:	Dry Soil Prep

Analytical Batch Number: 1575826

Prep Batch Number: 1572205

Sample ID	Client ID
398656001	37695-001
398656002	37695-002
398656003	37695-003
398656004	37695-004
398656005	37695-005
398656006	37695-006
398656007	37695-007
398656008	37695-008
398656009	37695-009
398656010	37695-010
398656011	37695-011
398656012	37695-012
398656013	37695-013
398656014	37695-014
398656015	37695-015
398656016	37695-016
398656017	37695-017
398656018	37695-018
398656019	37695-019
398656020	37695-020
1203570739	Method Blank (MB)
1203570743	Laboratory Control Sample (LCS)
1203570740	398656005(37695-005) Sample Duplicate (DUP)
1203570741	398656005(37695-005) Matrix Spike (MS)
1203570742	398656005(37695-005) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398656005 (37695-005).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

Samples 398656017 (37695-017) and 398656020 (37695-020) were recounted due to results more negative than the three sigma TPU. The second counts are reported. Samples 398656014 (37695-014) and 398656015 (37695-015) were recounted due to a suspected false positive. The recounts are reported.

Miscellaneous Information:

Data Exception (DER) Documentation

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integration

No manual integrations were performed on data in this batch.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Method/Analysis Information

Product: GFPC, Sr90, solid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Prep Method: Dry Soil Prep
Analytical Batch Number: 1575827
Prep Batch Number: 1572209

Sample ID	Client ID
398656021	37695-021
398656022	37695-022
398656023	37695-023
398656024	37695-024
398656025	37695-025
1203570747	Method Blank (MB)
1203570751	Laboratory Control Sample (LCS)
1203570748	398656024(37695-024) Sample Duplicate (DUP)
1203570749	398656024(37695-024) Matrix Spike (MS)
1203570750	398656024(37695-024) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398656024 (37695-024).

Technical Information:

Holding Time

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report for

BRKL007 Brookhaven National Laboratory (310464)

Client SDG: 37695 GEL Work Order: 398656

The Qualifiers in this report are defined as follows:

DL Failed required detection limit.

J Estimated value; the result was greater than the MDA but less than the required detection limit.

U Undetected; sample result < MDA

UI Uncertain identification for gamma spectroscopy.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Theresa Austin

Date: 30 JUN 2016

Title: Group Leader

DATA EXCEPTION REPORT			
Mo.Day Yr. 27-JUN-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE HASL 300, 4.5.2.3/Ga-01-R	Matrix Type: Solid	Client Code: BRKL
Batch ID: 1572234	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 398656(37695) Application Issues: RDL less than MDA			
Specification and Requirements Exception Description:		DER Disposition:	
The required detection limit for Be-7 was not achieved in samples 398656 013, 014, 015, and 017. The required detection limit for Co-57 was not achieved in sample 398656014.		The detection limits cannot be met due to a limited sample volume. The results have been reported.	

Originator's Name:
Tim Winters 27-JUN-16

Data Validator/Group Leader:
Michael Hilton 27-JUN-16

Moisture LogBook

Batch: 1572205
Analyst: CXC1
Date/Time: 06-JUN-2016
Procedure Code ____PREPD
Procedure Description Dry Soil Prep GL-RAD-A-021
Lab Sop: GL-RAD-A-021

Sample St	Sample Id	Rpd(%)

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
398656001	SAMPLE		SP-39020004	09:24	13.163	532.38	502.43	519.217	489.267	5.768
398656002	SAMPLE		SP-39020004	09:24	13.176	594.09	567.07	580.914	553.894	4.651
398656003	SAMPLE		SP-39020004	09:24	13.167	546.45	519.51	533.283	506.343	5.051
398656004	SAMPLE		SP-39020004	09:24	13.163	610.97	588.44	597.807	575.277	3.768
398656005	SAMPLE		SP-39020004	09:24	13.165	572.4	538.97	559.235	525.805	5.977
398656006	SAMPLE		SP-39020004	09:24	13.163	669.58	615.73	656.417	602.567	8.203
398656007	SAMPLE		SP-39020004	09:24	13.176	684.35	651.45	671.174	638.274	4.901
398656008	SAMPLE		SP-39020004	09:24	13.176	652.68	616.36	639.504	603.184	5.679
398656009	SAMPLE		SP-39020004	09:24	13.23	646.47	590.87	633.24	577.64	8.78
398656010	SAMPLE		SP-39020004	09:24	13.282	549.8	498.24	536.518	484.958	9.61
398656011	SAMPLE		SP-39020004	09:24	13.248	647.26	615	634.012	601.752	5.088
398656012	SAMPLE		SP-39020004	09:24	13.246	616.45	584.16	603.204	570.914	5.353
398656013	SAMPLE		SP-39020004	09:24	13.22	571.39	536.16	558.17	522.94	6.311
398656014	SAMPLE		SP-39020004	09:24	13.3	660.58	612.78	647.28	599.48	7.384
398656015	SAMPLE		SP-39020004	09:24	13.275	569.02	536.98	555.745	523.705	5.765
398656016	SAMPLE		SP-39020004	09:24	13.265	551.8	527.46	538.535	514.195	4.519
398656017	SAMPLE		SP-39020004	09:24	13.251	596.97	579.49	583.719	566.239	2.994
398656018	SAMPLE		SP-39020004	09:24	13.193	567.36	550.41	554.167	537.217	3.058
398656019	SAMPLE		SP-39020004	09:24	13.138	514.13	502.34	500.992	489.202	2.353
398656020	SAMPLE		SP-39020004	09:24	13.159	546.01	531.69	532.851	518.531	2.687

Comments:

A) Result = (Net Initial - Net Final) /Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Batch: 1572209

Analyst: CXC1

Date/Time: 06-JUN-2016

Procedure Code __PREPD

Procedure Description Dry Soil Prep GL-RAD-A-021

Lab Sop: GL-RAD-A-021

Moisture LogBook

Sample St	Sample Id	Rpd(%)

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
398656021	SAMPLE		SP-39020004	09:32	13.271	606.77	557.79	593.499	544.519	8.252
398656022	SAMPLE		SP-39020004	09:32	13.241	650.16	617.43	636.919	604.189	5.138
398656023	SAMPLE		SP-39020004	09:32	13.25	539.93	518.08	526.68	504.83	4.148
398656024	SAMPLE		SP-39020004	09:32	13.183	663.64	643.44	650.457	630.257	3.105
398656025	SAMPLE		SP-39020004	09:32	13.244	489.1	477.58	475.856	464.336	2.42

Comments:

A) Result = (Net Initial - Net Final) /Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-001	Project:	BRKL00700
Sample ID:	398656001	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 10:20	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.00635	+/-0.047	0.0836	4.00	pCi/g		MXR1	06/16/16	1410	1572234	1
Beryllium-7	U	-0.0674	+/-0.103	0.179	0.300	pCi/g						
Cesium-134	UI	0.0412	+/-0.0112	0.0184	0.040	pCi/g						
Cesium-137	J	1.42	+/-0.0331	0.0145	2.30	pCi/g						
Cobalt-57	U	-0.00317	+/-0.00651	0.0118	0.020	pCi/g						
Cobalt-60	U	0.00614	+/-0.00812	0.0148	0.300	pCi/g						
Europium-152	U	0.0137	+/-0.0264	0.0431	4.80	pCi/g						
Europium-154	U	-0.018	+/-0.0232	0.0401	17.0	pCi/g						
Europium-155	J-UI	0.0642	+/-0.0461	0.0473	0.300	pCi/g						
Manganese-54	U	0.00964	+/-0.0117	0.0131	0.050	pCi/g						
Sodium-22	U	-0.00663	+/-0.00826	0.0142	0.050	pCi/g						
Zinc-65	U	0.0317	+/-0.0335	0.0326	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.0924	+/-0.569	1.05	2.00	pCi/g		KSD1	06/29/16	0819	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			81.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-002	Project:	BRKL00700
Sample ID:	398656002	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 10:25	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0104	+/-0.0379	0.0663	4.00	pCi/g		MXR1	06/16/16	1523	1572234	1
Beryllium-7	U	0.059	+/-0.0752	0.139	0.300	pCi/g						
Cesium-134	J-UI	0.024	+/-0.0112	0.0162	0.040	pCi/g						
Cesium-137	U	-0.00174	+/-0.00841	0.0129	2.30	pCi/g						
Cobalt-57	U	-0.000513	+/-0.00588	0.0105	0.020	pCi/g						
Cobalt-60	U	0.00113	+/-0.00868	0.0133	0.300	pCi/g						
Europium-152	U	-0.0195	+/-0.0365	0.0356	4.80	pCi/g						
Europium-154	U	-9.97E-05	+/-0.0237	0.0413	17.0	pCi/g						
Europium-155	J-UI	0.0768	+/-0.0404	0.0415	0.300	pCi/g						
Manganese-54	U	0.00215	+/-0.00787	0.014	0.050	pCi/g						
Sodium-22	U	-8.28E-07	+/-0.00842	0.0147	0.050	pCi/g						
Zinc-65	J-UI	0.0609	+/-0.0215	0.0366	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.598	+/-0.496	1.18	2.00	pCi/g		KSD1	06/29/16	0817	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			74.7	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-003	Project:	BRKL00700
Sample ID:	398656003	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 10:30	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0314	+/-0.0384	0.068	4.00	pCi/g		MXR1	06/22/16	1250	1572234	1
Beryllium-7	U	-0.0583	+/-0.082	0.146	0.300	pCi/g						
Cesium-134	UI	0.0431	+/-0.017	0.0174	0.040	pCi/g						
Cesium-137	U	0.0012	+/-0.00844	0.0132	2.30	pCi/g						
Cobalt-57	U	-0.00496	+/-0.00578	0.0106	0.020	pCi/g						
Cobalt-60	U	0.00139	+/-0.00756	0.0137	0.300	pCi/g						
Europium-152	U	-0.0141	+/-0.0304	0.0354	4.80	pCi/g						
Europium-154	U	-0.0147	+/-0.0235	0.040	17.0	pCi/g						
Europium-155	J-UI	0.0526	+/-0.0451	0.0433	0.300	pCi/g						
Manganese-54	U	-0.00886	+/-0.00808	0.0138	0.050	pCi/g						
Sodium-22	U	-0.00536	+/-0.00838	0.0142	0.050	pCi/g						
Zinc-65	U	0.0306	+/-0.0209	0.0337	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.419	+/-0.603	1.04	2.00	pCi/g	KSD1	06/29/16	0817	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			84.2	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-004	Project:	BRKL00700
Sample ID:	398656004	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 10:35	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0261	+/-0.059	0.101	4.00	pCi/g		MXR1	06/22/16	1518	1572234	1
Beryllium-7	U	0.0388	+/-0.0895	0.166	0.300	pCi/g						
Cesium-134	J-UI	0.0204	+/-0.0143	0.0174	0.040	pCi/g						
Cesium-137	U	0.00152	+/-0.00781	0.0145	2.30	pCi/g						
Cobalt-57	U	0.00435	+/-0.00536	0.0105	0.020	pCi/g						
Cobalt-60	U	-0.00203	+/-0.00838	0.0149	0.300	pCi/g						
Europium-152	U	0.013	+/-0.0246	0.0387	4.80	pCi/g						
Europium-154	U	-0.0712	+/-0.0268	0.0403	17.0	pCi/g						
Europium-155	U	-0.012	+/-0.0214	0.041	0.300	pCi/g						
Manganese-54	U	0.0106	+/-0.0103	0.0151	0.050	pCi/g						
Sodium-22	U	-0.0253	+/-0.00958	0.0144	0.050	pCi/g						
Zinc-65	U	-0.00401	+/-0.0226	0.0348	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.241	+/-0.529	1.05	2.00	pCi/g		KSD1	06/29/16	0819	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			93.7	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-005	Project:	BRKL00700
Sample ID:	398656005	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 10:45	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-10
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0408	+/-0.039	0.068	4.00	pCi/g		MXR1	06/23/16	1200	1572234	1
Beryllium-7	U	0.0101	+/-0.0922	0.165	0.300	pCi/g						
Cesium-134	J-UI	0.0295	+/-0.014	0.0174	0.040	pCi/g						
Cesium-137	J	0.232	+/-0.0183	0.0139	2.30	pCi/g						
Cobalt-57	U	0.00228	+/-0.00625	0.0111	0.020	pCi/g						
Cobalt-60	U	-0.00085	+/-0.00793	0.0141	0.300	pCi/g						
Europium-152	U	-0.00302	+/-0.0294	0.0385	4.80	pCi/g						
Europium-154	U	-0.0183	+/-0.0244	0.041	17.0	pCi/g						
Europium-155	U	0.0326	+/-0.0329	0.0418	0.300	pCi/g						
Manganese-54	U	0.0133	+/-0.0156	0.0137	0.050	pCi/g						
Sodium-22	U	-0.00676	+/-0.00868	0.0146	0.050	pCi/g						
Zinc-65	U	0.0161	+/-0.0222	0.0345	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.431	+/-0.510	1.09	2.00	pCi/g		KSD1	06/29/16	0817	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			84.2	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-006	Project:	BRKL00700
Sample ID:	398656006	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 10:50	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-10
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	-0.0395	+/-0.0604	0.0987	4.00	pCi/g		MXR1	06/23/16	1203	1572234	1
Beryllium-7	U	-0.0414	+/-0.129	0.233	0.300	pCi/g						
Cesium-134	U	0.0168	+/-0.0146	0.0228	0.040	pCi/g						
Cesium-137	J	0.346	+/-0.0295	0.0203	2.30	pCi/g						
Cobalt-57	U	0.0072	+/-0.0081	0.0147	0.020	pCi/g						
Cobalt-60	U	-0.00474	+/-0.011	0.0188	0.300	pCi/g						
Europium-152	U	0.00982	+/-0.0392	0.0517	4.80	pCi/g						
Europium-154	U	0.0307	+/-0.0371	0.060	17.0	pCi/g						
Europium-155	J-UI	0.0745	+/-0.0518	0.0579	0.300	pCi/g						
Manganese-54	U	0.00528	+/-0.0106	0.0203	0.050	pCi/g						
Sodium-22	U	0.011	+/-0.0132	0.0214	0.050	pCi/g						
Zinc-65	U	0.0147	+/-0.0293	0.0463	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.678	+/-0.516	1.26	2.00	pCi/g	KSD1	06/29/16	0819	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			59.7	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-007	Project:	BRKL00700
Sample ID:	398656007	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 10:55	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-10
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.00661	+/-0.0266	0.0482	4.00	pCi/g		MXR1	06/23/16	1304	1572234	1
Beryllium-7	U	-0.0628	+/-0.0889	0.157	0.300	pCi/g						
Cesium-134	UI	0.0407	+/-0.0115	0.0173	0.040	pCi/g						
Cesium-137	U	0.00489	+/-0.0171	0.0139	2.30	pCi/g						
Cobalt-57	U	-0.00122	+/-0.00508	0.00959	0.020	pCi/g						
Cobalt-60	U	0.0132	+/-0.00831	0.0134	0.300	pCi/g						
Europium-152	U	-0.00269	+/-0.0198	0.0355	4.80	pCi/g						
Europium-154	U	-0.00128	+/-0.0218	0.0396	17.0	pCi/g						
Europium-155	J-UI	0.0511	+/-0.0418	0.0362	0.300	pCi/g						
Manganese-54	U	0.00393	+/-0.00726	0.0135	0.050	pCi/g						
Sodium-22	U	-0.000784	+/-0.0078	0.0142	0.050	pCi/g						
Zinc-65	U	-0.00906	+/-0.0205	0.030	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.124	+/-0.634	1.15	2.00	pCi/g	KSD1	06/29/16	0817	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-008	Project:	BRKL00700
Sample ID:	398656008	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:00	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-10
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0442	+/-0.0645	0.115	4.00	pCi/g		MXR1	06/23/16	1305	1572234	1
Beryllium-7	U	0.0569	+/-0.106	0.195	0.300	pCi/g						
Cesium-134	UI	0.0419	+/-0.0169	0.0218	0.040	pCi/g						
Cesium-137	U	0.00216	+/-0.00862	0.0161	2.30	pCi/g						
Cobalt-57	U	-0.000857	+/-0.00664	0.0123	0.020	pCi/g						
Cobalt-60	U	0.00199	+/-0.00908	0.0168	0.300	pCi/g						
Europium-152	U	-0.0311	+/-0.0327	0.0468	4.80	pCi/g						
Europium-154	U	-7.97E-05	+/-0.028	0.0512	17.0	pCi/g						
Europium-155	U	0.0231	+/-0.0265	0.0506	0.300	pCi/g						
Manganese-54	U	0.00427	+/-0.00911	0.0168	0.050	pCi/g						
Sodium-22	U	-9.35E-05	+/-0.010	0.0183	0.050	pCi/g						
Zinc-65	U	0.000487	+/-0.0252	0.0382	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.766	+/-0.784	1.31	2.00	pCi/g		KSD1	06/29/16	0819	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-009	Project:	BRKL00700
Sample ID:	398656009	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:10	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0311	+/-0.058	0.0856	4.00	pCi/g		MXR1	06/23/16	1305	1572234	1
Beryllium-7	U	-0.104	+/-0.103	0.175	0.300	pCi/g						
Cesium-134	UI	0.0464	+/-0.0162	0.0192	0.040	pCi/g						
Cesium-137	J	0.292	+/-0.0218	0.0155	2.30	pCi/g						
Cobalt-57	U	-0.00599	+/-0.00757	0.0117	0.020	pCi/g						
Cobalt-60	U	0.00394	+/-0.00991	0.0152	0.300	pCi/g						
Europium-152	U	-0.0163	+/-0.0266	0.0412	4.80	pCi/g						
Europium-154	U	-0.0111	+/-0.0271	0.047	17.0	pCi/g						
Europium-155	J-UI	0.0508	+/-0.0378	0.0465	0.300	pCi/g						
Manganese-54	U	0.0033	+/-0.0161	0.0148	0.050	pCi/g						
Sodium-22	U	-0.00387	+/-0.00968	0.0168	0.050	pCi/g						
Zinc-65	U	0.0106	+/-0.0249	0.0374	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.467	+/-0.469	0.765	2.00	pCi/g		KSD1	06/29/16	0833	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			89.6	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-010	Project:	BRKL00700
Sample ID:	398656010	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:15	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0278	+/-0.032	0.0532	4.00	pCi/g		MXR1	06/23/16	1306	1572234	1
Beryllium-7	U	0.00958	+/-0.102	0.188	0.300	pCi/g						
Cesium-134	UI	0.0548	+/-0.0173	0.0217	0.040	pCi/g						
Cesium-137	U	-0.00014	+/-0.00939	0.0147	2.30	pCi/g						
Cobalt-57	U	-0.00373	+/-0.00714	0.0119	0.020	pCi/g						
Cobalt-60	U	0.0065	+/-0.00873	0.0164	0.300	pCi/g						
Europium-152	U	0.017	+/-0.0363	0.0419	4.80	pCi/g						
Europium-154	U	-0.0108	+/-0.025	0.0441	17.0	pCi/g						
Europium-155	U	0.041	+/-0.0415	0.0449	0.300	pCi/g						
Manganese-54	U	0.0143	+/-0.012	0.0154	0.050	pCi/g						
Sodium-22	U	-0.00616	+/-0.00903	0.0157	0.050	pCi/g						
Zinc-65	U	-0.0141	+/-0.0247	0.0371	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.306	+/-0.463	0.806	2.00	pCi/g		KSD1	06/29/16	0833	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-011	Project:	BRKL00700
Sample ID:	398656011	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:20	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	-0.0276	+/-0.0478	0.0788	4.00	pCi/g		MXR1	06/23/16	1459	1572234	1
Beryllium-7	U	-0.0281	+/-0.0901	0.163	0.300	pCi/g						
Cesium-134	J-UI	0.0339	+/-0.0136	0.0191	0.040	pCi/g						
Cesium-137	U	0.0106	+/-0.0107	0.0162	2.30	pCi/g						
Cobalt-57	U	-0.00588	+/-0.00608	0.0101	0.020	pCi/g						
Cobalt-60	U	-0.00101	+/-0.00735	0.0135	0.300	pCi/g						
Europium-152	U	-0.0131	+/-0.0211	0.0377	4.80	pCi/g						
Europium-154	U	-0.0125	+/-0.0256	0.0435	17.0	pCi/g						
Europium-155	U	0.0258	+/-0.0219	0.0436	0.300	pCi/g						
Manganese-54	J-UI	0.0145	+/-0.0113	0.0141	0.050	pCi/g						
Sodium-22	U	-0.00473	+/-0.0091	0.0155	0.050	pCi/g						
Zinc-65	U	-0.015	+/-0.0222	0.0322	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.19	+/-0.622	1.20	2.00	pCi/g	KSD1	06/29/16	0952	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			82.8	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-012	Project:	BRKL00700
Sample ID:	398656012	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:25	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-1-14
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	-0.0803	+/-0.0571	0.102	4.00	pCi/g		MXR1	06/23/16	1307	1572234	1
Beryllium-7	U	-0.0115	+/-0.0988	0.183	0.300	pCi/g						
Cesium-134	J-UI	0.0271	+/-0.0131	0.019	0.040	pCi/g						
Cesium-137	U	-0.000703	+/-0.00822	0.0149	2.30	pCi/g						
Cobalt-57	U	0.00462	+/-0.00644	0.0125	0.020	pCi/g						
Cobalt-60	U	0.00369	+/-0.00861	0.0161	0.300	pCi/g						
Europium-152	U	-0.0175	+/-0.0247	0.0415	4.80	pCi/g						
Europium-154	U	0.0187	+/-0.0249	0.0473	17.0	pCi/g						
Europium-155	U	0.0419	+/-0.039	0.0471	0.300	pCi/g						
Manganese-54	U	0.00959	+/-0.0102	0.0156	0.050	pCi/g						
Sodium-22	U	0.00489	+/-0.009	0.0169	0.050	pCi/g						
Zinc-65	U	-0.00451	+/-0.0256	0.0363	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.194	+/-0.435	0.788	2.00	pCi/g		KSD1	06/29/16	0952	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			85.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-013	Project:	BRKL00700
Sample ID:	398656013	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:35	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0249	+/-0.0157	0.0283	4.00	pCi/g		MXR1	06/23/16	1308	1572234	1
Beryllium-7	U-DL	-0.165	+/-0.219	0.377	0.300	pCi/g						
Cesium-134	J-UI	0.0393	+/-0.0113	0.0207	0.040	pCi/g						
Cesium-137		10.9	+/-0.0931	0.0184	2.30	pCi/g						
Cobalt-57	U	-0.00196	+/-0.00735	0.0135	0.020	pCi/g						
Cobalt-60	U	0.00888	+/-0.00867	0.0164	0.300	pCi/g						
Europium-152	U	0.00543	+/-0.0401	0.0674	4.80	pCi/g						
Europium-154	U	-0.0262	+/-0.0517	0.0452	17.0	pCi/g						
Europium-155	J-UI	0.0475	+/-0.0471	0.0473	0.300	pCi/g						
Manganese-54	U	0.00806	+/-0.0163	0.0154	0.050	pCi/g						
Sodium-22	U	0.0042	+/-0.0161	0.0162	0.050	pCi/g						
Zinc-65	U	0.00639	+/-0.0223	0.0356	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.181	+/-0.470	0.854	2.00	pCi/g		KSD1	06/29/16	0953	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-014	Project:	BRKL00700
Sample ID:	398656014	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:40	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	-0.0537	+/-0.192	0.309	4.00	pCi/g		MXR1	06/23/16	1459	1572234	1
Beryllium-7	U-DL	-0.513	+/-0.544	0.946	0.300	pCi/g						
Cesium-134	J-UI	0.0352	+/-0.0157	0.0228	0.040	pCi/g						
Cesium-137		50.5	+/-0.220	0.0383	2.30	pCi/g						
Cobalt-57	U-DL	0.00106	+/-0.0215	0.0384	0.020	pCi/g						
Cobalt-60	U	0.00337	+/-0.0102	0.0186	0.300	pCi/g						
Europium-152	U	0.0247	+/-0.109	0.169	4.80	pCi/g						
Europium-154	U	-0.0242	+/-0.029	0.0493	17.0	pCi/g						
Europium-155	U	-0.0553	+/-0.0845	0.151	0.300	pCi/g						
Manganese-54	U	0.00509	+/-0.0109	0.0202	0.050	pCi/g						
Sodium-22	U	-0.00835	+/-0.0104	0.0177	0.050	pCi/g						
Zinc-65	U	-0.0125	+/-0.0256	0.0381	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.096	+/-0.502	0.996	2.00	pCi/g		KSD1	06/29/16	1226	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			82.8	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-015	Project:	BRKL00700
Sample ID:	398656015	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:45	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0206	+/-0.0235	0.0393	4.00	pCi/g		MXR1	06/23/16	1500	1572234	1
Beryllium-7	U-DL	0.0832	+/-0.288	0.507	0.300	pCi/g						
Cesium-134	UI	0.0482	+/-0.0242	0.0294	0.040	pCi/g						
Cesium-137		6.91	+/-0.0957	0.0274	2.30	pCi/g						
Cobalt-57	U	0.00323	+/-0.00959	0.0174	0.020	pCi/g						
Cobalt-60	U	0.00296	+/-0.0127	0.0235	0.300	pCi/g						
Europium-152	U	-0.0496	+/-0.0622	0.0891	4.80	pCi/g						
Europium-154	U	0.0135	+/-0.0377	0.0701	17.0	pCi/g						
Europium-155	J-UI	0.0792	+/-0.0512	0.0627	0.300	pCi/g						
Manganese-54	U	0.00323	+/-0.0133	0.0242	0.050	pCi/g						
Sodium-22	U	0.00482	+/-0.0135	0.025	0.050	pCi/g						
Zinc-65	U	-0.0227	+/-0.0351	0.0501	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	1.21	+/-0.810	1.28	2.00	pCi/g	KSD1	06/29/16	1402	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			78.8	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-016	Project:	BRKL00700
Sample ID:	398656016	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 11:50	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-2
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.039	+/-0.0439	0.0775	4.00	pCi/g		MXR1	06/23/16	1500	1572234	1
Beryllium-7	U	-0.0604	+/-0.0979	0.171	0.300	pCi/g						
Cesium-134	U	0.0184	+/-0.0119	0.0187	0.040	pCi/g						
Cesium-137	J-UI	0.0249	+/-0.018	0.0164	2.30	pCi/g						
Cobalt-57	U	-0.00379	+/-0.00603	0.0109	0.020	pCi/g						
Cobalt-60	U	-0.00666	+/-0.00815	0.0141	0.300	pCi/g						
Europium-152	U	-0.0145	+/-0.0227	0.0393	4.80	pCi/g						
Europium-154	U	-0.00897	+/-0.0224	0.0402	17.0	pCi/g						
Europium-155	U	0.025	+/-0.029	0.0422	0.300	pCi/g						
Manganese-54	U	0.0102	+/-0.0109	0.0153	0.050	pCi/g						
Sodium-22	U	-0.00201	+/-0.00792	0.0144	0.050	pCi/g						
Zinc-65	U	-0.0122	+/-0.0209	0.0302	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.155	+/-0.454	0.901	2.00	pCi/g		KSD1	06/29/16	0957	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			89.6	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-017	Project:	BRKL00700
Sample ID:	398656017	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 13:30	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-8
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0247	+/-0.0878	0.152	4.00	pCi/g		MXR1	06/23/16	1501	1572234	1
Beryllium-7	U-DL	0.350	+/-0.294	0.518	0.300	pCi/g						
Cesium-134	U	0.0118	+/-0.0139	0.0167	0.040	pCi/g						
Cesium-137		15.0	+/-0.118	0.022	2.30	pCi/g						
Cobalt-57	U	-0.00102	+/-0.0106	0.0193	0.020	pCi/g						
Cobalt-60	U	0.00401	+/-0.00823	0.0154	0.300	pCi/g						
Europium-152	U	-0.0117	+/-0.0535	0.0921	4.80	pCi/g						
Europium-154	U	0.0294	+/-0.0232	0.0458	17.0	pCi/g						
Europium-155	U	-0.0194	+/-0.0401	0.0732	0.300	pCi/g						
Manganese-54	U	0.00352	+/-0.00835	0.0153	0.050	pCi/g						
Sodium-22	U	0.0101	+/-0.00826	0.0163	0.050	pCi/g						
Zinc-65	U	-0.00329	+/-0.0204	0.0316	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.164	+/-0.656	1.25	2.00	pCi/g	KSD1	06/29/16	1226	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			85.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-018	Project:	BRKL00700
Sample ID:	398656018	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 13:35	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-8
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	-0.0105	+/-0.0503	0.0934	4.00	pCi/g		MXR1	06/23/16	1717	1572234	1
Beryllium-7	U	0.0221	+/-0.0886	0.162	0.300	pCi/g						
Cesium-134	U	0.00542	+/-0.00848	0.0159	0.040	pCi/g						
Cesium-137	U	0.00372	+/-0.00741	0.014	2.30	pCi/g						
Cobalt-57	U	-0.00129	+/-0.00504	0.00956	0.020	pCi/g						
Cobalt-60	U	-0.00278	+/-0.0103	0.0153	0.300	pCi/g						
Europium-152	U	0.00703	+/-0.0232	0.0381	4.80	pCi/g						
Europium-154	U	-0.0517	+/-0.0275	0.044	17.0	pCi/g						
Europium-155	U	0.000806	+/-0.0197	0.038	0.300	pCi/g						
Manganese-54	U	-0.00111	+/-0.00805	0.0144	0.050	pCi/g						
Sodium-22	U	-0.0186	+/-0.00979	0.0157	0.050	pCi/g						
Zinc-65	U	-0.00568	+/-0.0225	0.0344	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.125	+/-0.462	0.941	2.00	pCi/g		KSD1	06/29/16	0957	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			86.9	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-019	Project:	BRKL00700
Sample ID:	398656019	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 13:45	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-8
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0359	+/-0.0417	0.0411	4.00	pCi/g		MXR1	06/24/16	1553	1572234	1
Beryllium-7	U	-0.0669	+/-0.147	0.256	0.300	pCi/g						
Cesium-134	U	0.0152	+/-0.0141	0.0268	0.040	pCi/g						
Cesium-137	J	0.0313	+/-0.0196	0.0218	2.30	pCi/g						
Cobalt-57	U	-0.00583	+/-0.00671	0.0121	0.020	pCi/g						
Cobalt-60	U	-0.00507	+/-0.013	0.0227	0.300	pCi/g						
Europium-152	U	0.00303	+/-0.0317	0.0564	4.80	pCi/g						
Europium-154	U	-0.0225	+/-0.0365	0.0632	17.0	pCi/g						
Europium-155	U	0.0277	+/-0.025	0.0482	0.300	pCi/g						
Manganese-54	U	-0.0023	+/-0.0133	0.0235	0.050	pCi/g						
Sodium-22	U	-0.00842	+/-0.013	0.0225	0.050	pCi/g						
Zinc-65	U	0.00324	+/-0.0332	0.0526	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.251	+/-0.448	0.793	2.00	pCi/g	KSD1	06/29/16	0957	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			84.2	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-020	Project:	BRKL00700
Sample ID:	398656020	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 13:55	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-8
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0101	+/-0.0456	0.0782	4.00	pCi/g		MXR1	06/24/16	1553	1572234	1
Beryllium-7	U	-0.00351	+/-0.0977	0.181	0.300	pCi/g						
Cesium-134	U	0.0149	+/-0.0167	0.018	0.040	pCi/g						
Cesium-137	U	-0.0185	+/-0.0123	0.0154	2.30	pCi/g						
Cobalt-57	U	-0.00324	+/-0.00631	0.0113	0.020	pCi/g						
Cobalt-60	U	-0.000894	+/-0.00894	0.0159	0.300	pCi/g						
Europium-152	U	-0.0242	+/-0.024	0.040	4.80	pCi/g						
Europium-154	U	-0.00498	+/-0.0265	0.0468	17.0	pCi/g						
Europium-155	U	0.00264	+/-0.0238	0.0437	0.300	pCi/g						
Manganese-54	U	0.00685	+/-0.00882	0.0162	0.050	pCi/g						
Sodium-22	U	-0.00152	+/-0.00949	0.0168	0.050	pCi/g						
Zinc-65	U	0.00355	+/-0.0227	0.0357	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.516	+/-0.670	1.33	2.00	pCi/g		KSD1	06/29/16	1402	1575826	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0924	1572205

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			82.8	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-021	Project:	BRKL00700
Sample ID:	398656021	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 14:30	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-15
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	-0.0122	+/-0.0337	0.058	4.00	pCi/g		MXR1	06/24/16	1550	1572236	1
Beryllium-7	U	-0.0323	+/-0.107	0.188	0.300	pCi/g						
Cesium-134	UI	0.0417	+/-0.016	0.0219	0.040	pCi/g						
Cesium-137	J	0.0367	+/-0.0161	0.0159	2.30	pCi/g						
Cobalt-57	U	0.0053	+/-0.00621	0.0116	0.020	pCi/g						
Cobalt-60	U	-0.00175	+/-0.00933	0.0159	0.300	pCi/g						
Europium-152	U	0.0124	+/-0.0238	0.0427	4.80	pCi/g						
Europium-154	U	0.0403	+/-0.0269	0.0475	17.0	pCi/g						
Europium-155	J-UI	0.0446	+/-0.0389	0.0427	0.300	pCi/g						
Manganese-54	J-UI	0.0183	+/-0.0122	0.0157	0.050	pCi/g						
Sodium-22	U	0.016	+/-0.00949	0.017	0.050	pCi/g						
Zinc-65	U	-0.0086	+/-0.0248	0.0361	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.332	+/-0.604	1.07	2.00	pCi/g	KSD1	06/29/16	0802	1575827	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0932	1572209

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			89.6	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-022	Project:	BRKL00700
Sample ID:	398656022	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 14:35	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-15
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	-0.111	+/-0.0665	0.122	4.00	pCi/g		MXR1	06/24/16	1551	1572236	1
Beryllium-7	U	0.0255	+/-0.109	0.200	0.300	pCi/g						
Cesium-134	J-UI	0.0283	+/-0.0113	0.0204	0.040	pCi/g						
Cesium-137	U	-0.00175	+/-0.0104	0.0166	2.30	pCi/g						
Cobalt-57	U	0.0065	+/-0.0111	0.0132	0.020	pCi/g						
Cobalt-60	U	0.000149	+/-0.00877	0.0158	0.300	pCi/g						
Europium-152	U	-1.81E-05	+/-0.0304	0.0459	4.80	pCi/g						
Europium-154	U	-0.00991	+/-0.0321	0.0482	17.0	pCi/g						
Europium-155	U	0.0511	+/-0.0472	0.0554	0.300	pCi/g						
Manganese-54	U	0.000825	+/-0.00918	0.017	0.050	pCi/g						
Sodium-22	U	-0.00329	+/-0.0115	0.0173	0.050	pCi/g						
Zinc-65	U	0.0188	+/-0.0232	0.0384	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.509	+/-0.433	1.00	2.00	pCi/g	KSD1	06/29/16	0802	1575827	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0932	1572209

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			91	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-023	Project:	BRKL00700
Sample ID:	398656023	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 14:40	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-15
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.012	+/-0.0385	0.0609	4.00	pCi/g		MXR1	06/24/16	1551	1572236	1
Beryllium-7	U	0.0422	+/-0.0914	0.166	0.300	pCi/g						
Cesium-134	J-UI	0.0333	+/-0.0131	0.018	0.040	pCi/g						
Cesium-137	J	0.0267	+/-0.0122	0.0139	2.30	pCi/g						
Cobalt-57	U	0.00537	+/-0.00568	0.0106	0.020	pCi/g						
Cobalt-60	U	0.00454	+/-0.0085	0.0141	0.300	pCi/g						
Europium-152	U	0.00752	+/-0.0224	0.0364	4.80	pCi/g						
Europium-154	U	-0.0206	+/-0.0283	0.0442	17.0	pCi/g						
Europium-155	U	0.0349	+/-0.0348	0.0395	0.300	pCi/g						
Manganese-54	U	0.00449	+/-0.00801	0.0148	0.050	pCi/g						
Sodium-22	U	-0.00761	+/-0.0101	0.0158	0.050	pCi/g						
Zinc-65	U	0.0131	+/-0.0298	0.0322	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.0659	+/-0.520	0.977	2.00	pCi/g		KSD1	06/29/16	0802	1575827	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0932	1572209

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			95	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-024	Project:	BRKL00700
Sample ID:	398656024	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 14:45	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-GP-SU-2-15
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0309	+/-0.0592	0.105	4.00	pCi/g		MXR1	06/24/16	1551	1572236	1
Beryllium-7	U	0.016	+/-0.104	0.189	0.300	pCi/g						
Cesium-134	U	0.0174	+/-0.0147	0.0191	0.040	pCi/g						
Cesium-137	U	0.00234	+/-0.00804	0.0151	2.30	pCi/g						
Cobalt-57	U	0.00314	+/-0.00629	0.0118	0.020	pCi/g						
Cobalt-60	U	-0.00378	+/-0.00778	0.0138	0.300	pCi/g						
Europium-152	U	-0.00322	+/-0.0297	0.0442	4.80	pCi/g						
Europium-154	U	-0.0157	+/-0.0256	0.0429	17.0	pCi/g						
Europium-155	U	0.0123	+/-0.0242	0.046	0.300	pCi/g						
Manganese-54	U	0.00353	+/-0.00967	0.0156	0.050	pCi/g						
Sodium-22	U	-0.00562	+/-0.00915	0.0153	0.050	pCi/g						
Zinc-65	U	0.00826	+/-0.0227	0.0357	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.0838	+/-0.611	1.18	2.00	pCi/g		KSD1	06/29/16	0802	1575827	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0932	1572209

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			89.6	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-025	Project:	BRKL00700
Sample ID:	398656025	Client ID:	BRKL007
Matrix:	S	COC:	37695
Collect Date:	17-MAY-16 00:00	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-BD-1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0187	+/-0.0165	0.0284	4.00	pCi/g		MXR1	06/24/16	1552	1572236	1
Beryllium-7	U	0.0423	+/-0.157	0.247	0.300	pCi/g						
Cesium-134	U	0.0164	+/-0.0171	0.0237	0.040	pCi/g						
Cesium-137	J	0.027	+/-0.0168	0.0193	2.30	pCi/g						
Cobalt-57	U	0.00305	+/-0.00627	0.0113	0.020	pCi/g						
Cobalt-60	U	0.00758	+/-0.0105	0.0204	0.300	pCi/g						
Europium-152	U	-0.0291	+/-0.0353	0.0503	4.80	pCi/g						
Europium-154	U	0.0185	+/-0.0307	0.0589	17.0	pCi/g						
Europium-155	U	0.0255	+/-0.0431	0.0406	0.300	pCi/g						
Manganese-54	U	0.00913	+/-0.0117	0.0219	0.050	pCi/g						
Sodium-22	U	0.00659	+/-0.011	0.021	0.050	pCi/g						
Zinc-65	U	-0.00661	+/-0.0293	0.0437	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	-0.269	+/-0.501	1.02	2.00	pCi/g	KSD1	06/29/16	0805	1575827	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	0932	1572209

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			88.3	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

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Certificate of Analysis

Report Date: June 30, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37695-026	Project:	BRKL00700
Sample ID:	398656026	Client ID:	BRKL007
Matrix:	W	COC:	37695
Collect Date:	17-MAY-16 10:00	Samp Recv.:	
Receive Date:	03-JUN-16 09:00	Client Desc.:	B811-EB-1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time Batch	Method
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Liquid Remediation Standard "As Received"											
Americium-241	U	-6.31	+/-15.1	22.7	25.0	pCi/L		MXR1	06/22/16	1214 1572406	1
Beryllium-7	U	21.1	+/-26.8	51.3	60.0	pCi/L					
Cesium-134	U	0.790	+/-2.26	4.36	5.00	pCi/L					
Cesium-137	U	-0.0313	+/-2.27	3.68	12.0	pCi/L					
Cobalt-57	U	0.198	+/-2.13	3.73	5.00	pCi/L					
Cobalt-60	U	0.197	+/-2.04	4.01	22.0	pCi/L					
Europium-152	U	0.706	+/-6.30	11.4	84.0	pCi/L					
Europium-154	U	3.17	+/-5.45	11.5	57.0	pCi/L					
Europium-155	U	-1.75	+/-8.31	14.4	359	pCi/L					
Manganese-54	U	-0.469	+/-1.74	3.15	6.00	pCi/L					
Sodium-22	U	1.13	+/-1.94	4.12	7.00	pCi/L					
Zinc-65	U	2.07	+/-4.20	8.66	15.0	pCi/L					

Rad Gas Flow Proportional Counting

GFPC, Sr90, liquid "As Received"

Strontium-90	U	0.284	+/-0.376	0.643	0.800	pCi/L		KSD1	06/24/16	1227 1575817	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 901.1	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, liquid "As Received"			76	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: June 30, 2016

Page 1 of 7

Brookhaven National Laboratory
Building 462
Upton, New York

Contact: Mr. John Burke

Workorder: 398656

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572234										
QC1203561384	398656001	DUP									
Americium-241	U	0.00635	U	-0.000693	pCi/g	N/A		N/A MXR1		06/24/16	15:54
	Uncertainty	+/-0.047		+/-0.0599							
Beryllium-7	U	-0.0674	U	0.0128	pCi/g	N/A		N/A			
	Uncertainty	+/-0.103		+/-0.133							
Cesium-134	UI	0.0412	UI	0.0414	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0112		+/-0.0143							
Cesium-137	J	1.42	J	1.49	pCi/g	5.09		(0%-20%)			
	Uncertainty	+/-0.0331		+/-0.0424							
Cobalt-57	U	-0.00317	U	-0.000478	pCi/g	N/A		N/A			
	Uncertainty	+/-0.00651		+/-0.00776							
Cobalt-60	U	0.00614	U	0.0111	pCi/g	N/A		N/A			
	Uncertainty	+/-0.00812		+/-0.0141							
Europium-152	U	0.0137	U	-0.00831	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0264		+/-0.0271							
Europium-154	U	-0.018	U	-0.0191	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0232		+/-0.0263							
Europium-155	J-UI	0.0642	J-UI	0.0596	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0461		+/-0.0492							
Manganese-54	U	0.00964	U	0.0151	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0117		+/-0.00984							
Sodium-22	U	-0.00663	U	-0.00671	pCi/g	N/A		N/A			
	Uncertainty	+/-0.00826		+/-0.0094							
Zinc-65	U	0.0317	U	0.00524	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0335		+/-0.0245							
QC1203561385	LCS										
Americium-241	489			545	pCi/g		111	(75%-125%)		06/25/16	09:20
	Uncertainty			+/-15.0							
Beryllium-7			U-DL	-1.89	pCi/g						
	Uncertainty			+/-8.58							
Cesium-134			U-DL	-0.802	pCi/g						
	Uncertainty			+/-0.896							
Cesium-137	180			172	pCi/g		95.3	(75%-125%)			
	Uncertainty			+/-3.50							
Cobalt-57				2.03	pCi/g						
	Uncertainty			+/-0.842							
Cobalt-60	167			160	pCi/g		95.6	(75%-125%)			
	Uncertainty			+/-4.02							
Europium-152			U	-0.716	pCi/g						
	Uncertainty			+/-2.19							
Europium-154			U	0.206	pCi/g						

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QC Summary

Workorder: 398656

Page 2 of 7

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572234										
	Uncertainty			+/-1.40							
Europium-155			U-DL	-1.5	pCi/g				MXR1	06/25/16	09:20
	Uncertainty			+/-1.79							
Manganese-54			U-DL	0.230	pCi/g						
	Uncertainty			+/-1.07							
Sodium-22			U-DL	0.0432	pCi/g						
	Uncertainty			+/-0.499							
Zinc-65				4.64	pCi/g						
	Uncertainty			+/-3.36							
QC1203561383 MB											
Americium-241			U	0.00204	pCi/g					06/24/16	15:53
	Uncertainty			+/-0.0228							
Beryllium-7			U	0.0116	pCi/g						
	Uncertainty			+/-0.0539							
Cesium-134			U	-0.00639	pCi/g						
	Uncertainty			+/-0.0113							
Cesium-137			U	0.00378	pCi/g						
	Uncertainty			+/-0.00612							
Cobalt-57			U	-0.00126	pCi/g						
	Uncertainty			+/-0.00333							
Cobalt-60			U	0.00464	pCi/g						
	Uncertainty			+/-0.00672							
Europium-152			U	0.00237	pCi/g						
	Uncertainty			+/-0.0162							
Europium-154			U	-0.00337	pCi/g						
	Uncertainty			+/-0.0163							
Europium-155			U	0.0175	pCi/g						
	Uncertainty			+/-0.0221							
Manganese-54			U	-0.00164	pCi/g						
	Uncertainty			+/-0.00601							
Sodium-22			U	-0.00113	pCi/g						
	Uncertainty			+/-0.00577							
Zinc-65			U	0.00969	pCi/g						
	Uncertainty			+/-0.0115							
Batch	1572236										
QC1203561387 398656021 DUP											
Americium-241	U	-0.0122	U	0.0528	pCi/g	N/A			N/A MXR1	06/25/16	09:39
	Uncertainty	+/-0.0337		+/-0.0449							
Beryllium-7	U	-0.0323	U	0.0154	pCi/g	N/A			N/A		
	Uncertainty	+/-0.107		+/-0.101							
Cesium-134	UI	0.0417	J-UI	0.0374	pCi/g	N/A			N/A		
	Uncertainty	+/-0.016		+/-0.014							
Cesium-137	J	0.0367	J	0.0231	pCi/g	45.5		(0% - 100%)			
	Uncertainty	+/-0.0161		+/-0.0176							

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QC Summary

Workorder: 398656

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572236										
Cobalt-57	U	0.0053	U	-0.00484	pCi/g	N/A			N/A MXR1	06/25/16	09:39
	Uncertainty	+/-0.00621		+/-0.00689							
Cobalt-60	U	-0.00175	U	0.00426	pCi/g	N/A			N/A		
	Uncertainty	+/-0.00933		+/-0.00861							
Europium-152	U	0.0124	U	-0.00479	pCi/g	N/A			N/A		
	Uncertainty	+/-0.0238		+/-0.0313							
Europium-154	U	0.0403	U	-0.0342	pCi/g	N/A			N/A		
	Uncertainty	+/-0.0269		+/-0.0326							
Europium-155	J-UI	0.0446	J-UI	0.0641	pCi/g	N/A			N/A		
	Uncertainty	+/-0.0389		+/-0.0397							
Manganese-54	J-UI	0.0183	J-UI	0.016	pCi/g	N/A			N/A		
	Uncertainty	+/-0.0122		+/-0.0119							
Sodium-22	U	0.016	U	-0.0121	pCi/g	N/A			N/A		
	Uncertainty	+/-0.00949		+/-0.0117							
Zinc-65	U	-0.0086	U	0.0267	pCi/g	N/A			N/A		
	Uncertainty	+/-0.0248		+/-0.0249							
QC1203561388	LCS										
Americium-241	489			552	pCi/g		113	(75%-125%)		06/25/16	11:03
	Uncertainty			+/-14.6							
Beryllium-7			U-DL	-0.682	pCi/g						
	Uncertainty			+/-8.72							
Cesium-134			U-DL	-0.454	pCi/g						
	Uncertainty			+/-0.950							
Cesium-137	180			172	pCi/g		95.5	(75%-125%)			
	Uncertainty			+/-3.54							
Cobalt-57				2.07	pCi/g						
	Uncertainty			+/-0.588							
Cobalt-60	167			156	pCi/g		93.4	(75%-125%)			
	Uncertainty			+/-3.89							
Europium-152			U	0.967	pCi/g						
	Uncertainty			+/-2.15							
Europium-154			U	0.309	pCi/g						
	Uncertainty			+/-1.70							
Europium-155			U-DL	0.162	pCi/g						
	Uncertainty			+/-1.82							
Manganese-54			U-DL	-0.327	pCi/g						
	Uncertainty			+/-0.869							
Sodium-22			U-DL	0.0945	pCi/g						
	Uncertainty			+/-0.600							
Zinc-65				6.42	pCi/g						
	Uncertainty			+/-3.81							
QC1203561386	MB										
Americium-241			U	0.00593	pCi/g					06/24/16	15:52

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QC Summary

Workorder: 398656

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572236										
	Uncertainty			+/-0.0234							
Beryllium-7			U	-0.0277	pCi/g				MXR1	06/24/16	15:52
	Uncertainty			+/-0.065							
Cesium-134			U	-0.000258	pCi/g						
	Uncertainty			+/-0.00818							
Cesium-137			U	-0.00183	pCi/g						
	Uncertainty			+/-0.010							
Cobalt-57			U	0.000888	pCi/g						
	Uncertainty			+/-0.00371							
Cobalt-60			U	0.00288	pCi/g						
	Uncertainty			+/-0.00643							
Europium-152			U	-0.0131	pCi/g						
	Uncertainty			+/-0.0154							
Europium-154			U	-0.00185	pCi/g						
	Uncertainty			+/-0.0171							
Europium-155			U	0.00483	pCi/g						
	Uncertainty			+/-0.0147							
Manganese-54			U	0.0017	pCi/g						
	Uncertainty			+/-0.00651							
Sodium-22			U	-0.000288	pCi/g						
	Uncertainty			+/-0.00606							
Zinc-65			U	0.0108	pCi/g						
	Uncertainty			+/-0.0129							
Batch	1572406										
QC1203561782	LCS										
Americium-241	34400			36100	pCi/L		105	(75%-125%)	MXR1	06/22/16	13:48
	Uncertainty			+/-1210							
Beryllium-7		U-DL		121	pCi/L						
	Uncertainty			+/-632							
Cesium-134		U-DL		-9.59	pCi/L						
	Uncertainty			+/-79.2							
Cesium-137	13400			14200	pCi/L		106	(75%-125%)			
	Uncertainty			+/-333							
Cobalt-57				216	pCi/L						
	Uncertainty			+/-91.2							
Cobalt-60	13500			13900	pCi/L		103	(75%-125%)			
	Uncertainty			+/-361							
Europium-152		U-DL		41.8	pCi/L						
	Uncertainty			+/-199							
Europium-154		U-DL		47.2	pCi/L						
	Uncertainty			+/-123							
Europium-155		U-DL		52.3	pCi/L						
	Uncertainty			+/-233							

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572406										
Manganese-54			U-DL	2.26	pCi/L						
	Uncertainty			+/-73.8							
Sodium-22			U-DL	17.9	pCi/L				MXR1	06/22/16	13:48
	Uncertainty			+/-43.1							
Zinc-65				686	pCi/L						
	Uncertainty			+/-320							
QC1203561783	LCSD										
Americium-241	34400			40500	pCi/L	11.4	118	(0%-20%)		06/22/16	14:06
	Uncertainty			+/-2000							
Beryllium-7			U-DL	-211	pCi/L	0					
	Uncertainty			+/-828							
Cesium-134			U-DL	-27.7	pCi/L	0					
	Uncertainty			+/-106							
Cesium-137	13400			13800	pCi/L	3.28	103	(0%-20%)			
	Uncertainty			+/-367							
Cobalt-57				257	pCi/L	17.1					
	Uncertainty			+/-96.5							
Cobalt-60	13500			13900	pCi/L	0.0721	103	(0%-20%)			
	Uncertainty			+/-405							
Europium-152			U-DL	-90.3	pCi/L	0					
	Uncertainty			+/-259							
Europium-154			U-DL	99.6	pCi/L	0					
	Uncertainty			+/-162							
Europium-155			U-DL	83.9	pCi/L	0					
	Uncertainty			+/-307							
Manganese-54			U-DL	-2.31	pCi/L	0					
	Uncertainty			+/-102							
Sodium-22			U-DL	37.8	pCi/L	0					
	Uncertainty			+/-57.0							
Zinc-65				736	pCi/L	7.11					
	Uncertainty			+/-330							
QC1203561781	MB										
Americium-241			U	0.717	pCi/L					06/22/16	11:21
	Uncertainty			+/-3.57							
Beryllium-7			U	13.1	pCi/L						
	Uncertainty			+/-16.8							
Cesium-134			U	-0.624	pCi/L						
	Uncertainty			+/-2.94							
Cesium-137			U	-0.834	pCi/L						
	Uncertainty			+/-2.50							
Cobalt-57			U	0.837	pCi/L						
	Uncertainty			+/-1.44							
Cobalt-60			U	-0.0375	pCi/L						
	Uncertainty			+/-2.51							
Europium-152			U	6.65	pCi/L						

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QC Summary

Workorder: 398656

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572406										
		Uncertainty		+/-6.67							
Europium-154			U	0.211	pCi/L				MXR1	06/22/16	11:21
		Uncertainty		+/-6.69							
Europium-155			U	4.29	pCi/L						
		Uncertainty		+/-5.67							
Manganese-54			U	-0.794	pCi/L						
		Uncertainty		+/-2.29							
Sodium-22			U	0.193	pCi/L						
		Uncertainty		+/-2.30							
Zinc-65			U	-3.03	pCi/L						
		Uncertainty		+/-5.17							
Rad Gas Flow											
Batch	1575817										
QC1203570735	398675001	DUP									
Strontium-90			U	0.302	pCi/L	N/A			N/A	KSD1	06/24/16 16:21
		Uncertainty		+/-0.461							
QC1203570738	LCS										
Strontium-90				31.3	pCi/L		114	(75%-125%)			06/24/16 12:27
		Uncertainty		+/-2.10							
QC1203570734	MB										
Strontium-90			U	0.165	pCi/L						06/24/16 12:27
		Uncertainty		+/-0.338							
QC1203570736	398675001	MS									
Strontium-90			U	0.302	pCi/L		108	(75%-125%)			06/24/16 12:27
		Uncertainty		+/-0.461							
QC1203570737	398675001	MSD									
Strontium-90			U	0.302	pCi/L	2.68	111	(0%-35%)			06/24/16 12:27
		Uncertainty		+/-0.461							
Batch	1575826										
QC1203570740	398656005	DUP									
Strontium-90			U	-0.431	pCi/g	N/A			N/A	KSD1	06/29/16 09:57
		Uncertainty		+/-0.510							
QC1203570743	LCS										
Strontium-90				53.8	pCi/g		91.3	(75%-125%)			06/29/16 09:58
		Uncertainty		+/-2.61							
QC1203570739	MB										
Strontium-90			U	-0.234	pCi/g						06/29/16 09:57
		Uncertainty		+/-0.230							
QC1203570741	398656005	MS									
Strontium-90			U	-0.431	pCi/g		106	(75%-125%)			06/29/16 09:58
		Uncertainty		+/-0.510							
QC1203570742	398656005	MSD									
Strontium-90			U	-0.431	pCi/g	8.37	106	(0%-35%)			06/29/16 09:58
		Uncertainty		+/-0.510							
Batch	1575827										

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QC Summary

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Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1575827										
QC1203570748	398656024	DUP									
Strontium-90		U	-0.0838	U	-0.116	pCi/g	N/A		N/A	KSD1	06/29/16 08:05
		Uncertainty	+/-0.611		+/-0.408						
QC1203570751	LCS										
Strontium-90		60.5			63.1	pCi/g		104	(75%-125%)		06/29/16 08:07
		Uncertainty			+/-3.01						
QC1203570747	MB										
Strontium-90			U	-0.375	pCi/g						06/29/16 08:05
		Uncertainty			+/-0.449						
QC1203570749	398656024	MS									
Strontium-90		73.7	U	-0.0838	72.9	pCi/g		98.9	(75%-125%)		06/29/16 08:05
		Uncertainty	+/-0.611		+/-3.60						
QC1203570750	398656024	MSD									
Strontium-90		64.2	U	-0.0838	66.4	pCi/g	9.26	103	(0%-35%)		06/29/16 08:05
		Uncertainty	+/-0.611		+/-3.23						

- Notes:**
- Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).
- The Qualifiers in this report are defined as follows:
- DL Failed required detection limit.
 - H Holding time exceeded
 - J Estimated value; the result was greater than the MDA but less than the required detection limit.
 - JN Presumptive evidence of the analyte at an estimated quantity.
 - R The data are unusable (radionuclide may or may not be present).
 - U Undetected; sample result < MDA
 - UI Uncertain identification for gamma spectroscopy.

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Gamma Spectroscopy

Raw Data

21-Jun-2016

Batch# 1572234 Product: GAMMA | BRKL Date: 6/27/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.	NA		
Samples have been blank corrected (if required). Blank correction reported included (if required).	NA		
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits. Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.		✓	DER# - 1533607
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	NA		
Smears Taken for Radioactive batches.	NA		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	NA		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)	NA		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		DER# - 1533607
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.	NA		
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	NA		

Primary Review Performed By: [Signature] 6/27/16

Secondary Review Performed By: [Signature] 6-27-16

Gamma Spec Queue Sheet

06/09/2016

Batch #: 1572234 Analyst: MXRI First Client Due Date: 07/03/2016 Internal Due Date: 06/29/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 1.0 mL
 Initials: H.S. Prep Date: 6/7/16 Library: 80LID Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Detector	Sealing Date/Time (if Applicable)	Wet/Dry Aliquot (1/g F)	
										Wet	Dry
398656001-1	37695-001	SAMPLE	BRKL007	SOIL	17-MAY-16 10:20:00	WS	CAN	18	47/16		
398656002-1	37695-002	SAMPLE	BRKL007	SOIL	17-MAY-16 10:25:00	WS		22			
398656003-1	37695-003	SAMPLE	BRKL007	SOIL	17-MAY-16 10:30:00	WS		22	47/16		
398656004-1	37695-004	SAMPLE	BRKL007	SOIL	17-MAY-16 10:35:00	WS		43			
398656005-1	37695-005	SAMPLE	BRKL007	SOIL	17-MAY-16 10:45:00	12		22			
398656006-1	37695-006	SAMPLE	BRKL007	SOIL	17-MAY-16 10:50:00	12		2			
398656007-1	37695-007	SAMPLE	BRKL007	SOIL	17-MAY-16 10:55:00	28		11			
398656008-1	37695-008	SAMPLE	BRKL007	SOIL	17-MAY-16 11:00:00	14		15			
398656009-1	37695-009	SAMPLE	BRKL007	SOIL	17-MAY-16 11:10:00	12		18			
398656010-1	37695-010	SAMPLE	BRKL007	SOIL	17-MAY-16 11:15:00	12		20			
398656011-1	37695-011	SAMPLE	BRKL007	SOIL	17-MAY-16 11:20:00	12		9	47/16		
398656012-1	37695-012	SAMPLE	BRKL007	SOIL	17-MAY-16 11:25:00	12		32			
398656013-1	37695-013	SAMPLE	BRKL007	SOIL	17-MAY-16 11:35:00	12		5			
398656014-1	37695-014	SAMPLE	BRKL007	SOIL	17-MAY-16 11:40:00	WS		12			
398656015-1	37695-015	SAMPLE	BRKL007	SOIL	17-MAY-16 11:45:00	WS		17			
398656016-1	37695-016	SAMPLE	BRKL007	SOIL	17-MAY-16 11:50:00	WS		33			
398656017-1	37695-017	SAMPLE	BRKL007	SOIL	17-MAY-16 13:30:00	WS		44			
398656018-1	37695-018	SAMPLE	BRKL007	SOIL	17-MAY-16 13:35:00	0		43			
398656019-1	37695-019	SAMPLE	BRKL007	SOIL	17-MAY-16 13:45:00	MS		31			
398656020-1	37695-020	SAMPLE	BRKL007	SOIL	17-MAY-16 13:55:00	WS		2			
1203561383-1	MB	MB	QC ACCOUNT	SOIL	6/7/16	WS		179.87			
1203561384-1	DUP 37695-001(398656001)	DUP	QC ACCOUNT	SOIL	17-MAY-16 10:20:00	MS		168.08			
1203561385-1	LCS	LCS	QC ACCOUNT	SOIL	6/7/16	12		115			

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: 2.06 4/22/16

VAX/VMS Nuclide Identification Report Generated 17-JUN-2016 02:11:16.03

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                   *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656001.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM18.CNF;495
Background date  : 12-JUN-2016 11:26:46
Sample date      : 17-MAY-2016 10:20:00 Acquisition date : 16-JUN-2016 14:10:47
Sample ID        : G398656001 Sample quantity : 1.68080E+02 GRAM
Detector name     : GAM18 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:11.78 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	40.20*	92	394	1.16	81.02	78	12	2.12E-03	70.4	3.85E+00
2	9	41.68*	208	1192	1.89	83.99	78	12	4.81E-03	43.0	
3	0	63.27*	207	2053	1.04	127.12	124	7	4.78E-03	41.8	
4	0	66.27*	9	1775	1.14	133.12	131	6	2.11E-04	832.4	
5	3	74.99	1501	2307	1.10	150.55	145	15	3.47E-02	5.9	6.48E-01
6	3	77.26	2472	1794	1.00	155.07	145	15	5.72E-02	3.5	
7	5	84.28	479	1939	1.55	169.11	165	19	1.11E-02	15.9	1.27E+00
8	5	87.33	983	1669	1.03	175.19	165	19	2.28E-02	7.3	
9	5	90.05	529	1675	0.96	180.64	165	19	1.22E-02	12.9	
10	0	93.02*	654	2284	1.69	186.57	183	8	1.51E-02	15.5	
11	0	99.53	238	1877	0.97	199.57	196	8	5.51E-03	32.2	
12	0	105.44	204	1797	1.43	211.38	208	8	4.73E-03	36.6	
13	0	129.03	316	1971	1.10	258.53	256	8	7.32E-03	24.9	
14	0	143.88*	150	1572	1.19	288.21	285	7	3.48E-03	51.5	
15	0	154.57	186	1547	1.85	309.56	307	7	4.31E-03	35.9	
16	0	180.94	215	1386	1.80	362.25	359	7	4.98E-03	29.6	
17	0	185.98*	876	2124	1.38	372.32	367	10	2.03E-02	11.4	
18	0	198.94*	165	1840	0.98	398.21	394	9	3.83E-03	53.1	
19	0	204.79*	99	1590	2.18	409.91	406	8	2.28E-03	79.3	
20	0	209.44	474	1823	1.10	419.19	415	9	1.10E-02	16.9	
21	3	238.84*	6319	1272	1.19	477.94	470	26	1.46E-01	1.7	1.50E+00
22	3	241.80	1415	1803	1.80	483.85	470	26	3.28E-02	8.1	
23	0	270.29	516	1297	1.74	540.80	536	9	1.19E-02	13.3	
24	0	277.96	268	1258	1.36	556.12	552	9	6.20E-03	24.6	
25	0	295.31*	1869	1369	1.28	590.79	584	12	4.33E-02	5.0	
26	0	300.29*	278	1176	1.22	600.75	597	9	6.44E-03	25.3	
27	0	328.14	330	1223	1.21	656.38	652	10	7.63E-03	20.6	
28	0	338.54*	1356	997	1.28	677.17	673	9	3.14E-02	5.5	
29	0	352.07*	3291	1283	1.35	704.20	698	13	7.62E-02	3.0	
30	0	409.93	184	1095	1.13	819.84	815	11	4.26E-03	35.7	
31	0	463.03	503	1055	1.41	925.94	920	12	1.16E-02	13.7	
32	0	511.10*	799	1260	2.13	1022.01	1013	20	1.85E-02	14.7	
33	0	563.40	158	690	2.44	1126.53	1120	13	3.66E-03	35.1	
34	0	570.27*	31	583	1.46	1140.27	1137	10	7.16E-04	172.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	583.40*	1979	924	1.73	1166.51	1159	15	4.58E-02	4.4	
36	0	609.43*	2310	1119	1.67	1218.52	1210	18	5.35E-02	4.3	
37	0	661.80*	10653	846	1.68	1323.19	1314	17	2.47E-01	1.2	
38	0	690.59	6	391	1.29	1380.73	1375	9	1.33E-04	624.2	
39	0	727.62	588	585	1.67	1454.74	1446	17	1.36E-02	10.3	
40	0	754.92	196	523	2.67	1509.30	1500	17	4.54E-03	27.7	
41	2	768.22	269	378	2.54	1535.89	1530	25	6.22E-03	15.3	7.39E-01
42	2	772.34	97	513	2.55	1544.12	1530	25	2.25E-03	53.6	
43	0	785.94	101	397	1.67	1571.30	1566	11	2.34E-03	39.5	
44	0	795.31	272	323	1.89	1590.02	1585	10	6.30E-03	13.8	
45	1	803.30*	58	448	2.14	1606.00	1599	19	1.34E-03	81.4	4.52E+00
46	1	806.09	105	382	2.36	1611.57	1599	19	2.42E-03	39.2	
47	0	835.45	69	451	1.94	1670.25	1667	12	1.61E-03	62.0	
48	0	860.72	308	435	1.67	1720.76	1714	16	7.14E-03	16.2	
49	0	911.41*	1703	473	1.92	1822.07	1813	17	3.94E-02	4.0	
50	0	934.56	78	322	1.17	1868.35	1863	11	1.81E-03	45.9	
51	3	965.25	425	495	2.90	1929.70	1917	28	9.83E-03	13.6	1.16E+00
52	3	969.33*	924	293	1.85	1937.84	1917	28	2.14E-02	5.9	
53	0	1001.36*	85	161	1.81	2001.87	1998	9	1.96E-03	37.9	
54	0	1006.53	49	145	1.97	2012.21	2008	8	1.13E-03	45.2	
55	0	1110.84	39	196	1.08	2220.70	2216	10	9.05E-04	69.7	
56	0	1120.27*	564	394	2.09	2239.56	2230	19	1.31E-02	10.4	
57	0	1228.45	42	228	4.20	2455.81	2453	11	9.69E-04	71.9	
58	0	1238.01	197	459	2.49	2474.91	2465	18	4.56E-03	26.5	
59	0	1377.95	169	194	2.23	2754.66	2747	15	3.90E-03	19.6	
60	0	1386.16	46	106	1.19	2771.09	2767	10	1.06E-03	44.9	
61	0	1408.81	111	140	2.10	2816.36	2810	14	2.57E-03	24.5	
62	0	1460.88*	3350	202	2.51	2920.45	2907	23	7.76E-02	2.2	
63	0	1510.28	51	166	1.93	3019.22	3012	13	1.18E-03	54.4	
64	1	1588.98	165	161	3.13	3176.57	3165	30	3.82E-03	20.2	2.45E+00
65	1	1592.70	84	95	2.85	3184.00	3165	30	1.94E-03	35.7	
66	0	1603.02	20	94	3.83	3204.64	3194	13	4.56E-04	104.1	
67	8	1621.17	118	131	3.61	3240.92	3232	19	2.72E-03	24.6	4.60E+00
68	8	1624.72	25	47	1.24	3248.01	3232	19	5.69E-04	52.3	
69	0	1633.89	67	200	1.40	3266.36	3254	25	1.55E-03	58.1	
70	4	1727.19	46	32	2.90	3452.88	3447	20	1.06E-03	32.2	2.66E+00
71	4	1729.99	172	59	3.30	3458.49	3447	20	3.98E-03	12.5	
72	0	1764.75*	423	151	2.60	3527.98	3517	25	9.79E-03	10.4	
73	0	1785.02	32	83	2.25	3568.51	3559	15	7.29E-04	65.3	
74	0	1847.48	138	95	2.67	3693.41	3681	22	3.18E-03	17.5	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 17-JUN-2016 02:11:17

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656001.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:20:00 Acquisition date : 16-JUN-2016 14:10:47
Sample ID        : G398656001 Sample quantity  : 168.08 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA18 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:11.78 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.929E+00	5.915E+00	5.915E+00	4.41	OK
MN-54	834.85	99.98*	3.017E+00	9.014E-03	9.643E-03	123.99	OK
CD-109	88.03	3.70*	6.352E+00	1.412E+00	1.478E+00	22.52	OK
SN-126	64.28	9.60	3.057E+00	3.685E-01	3.685E-01	83.69	OK
	86.94	8.90	6.352E+00	5.869E-01	5.869E-01	22.52	OK
	87.57	37.00*	6.352E+00	1.412E-01	1.412E-01	22.52	OK
BA-137M	661.66	89.90*	3.572E+00	1.339E+00	1.341E+00	2.38	OK
CS-137	661.66	85.10*	3.572E+00	1.414E+00	1.417E+00	2.38	OK
EU-155	86.55	30.70	6.352E+00	1.702E-01	1.722E-01	22.52	OK
	105.31	21.10*	7.592E+00	6.344E-02	6.421E-02	73.24	OK
HG-203	70.83	3.69	4.263E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	4.569E+00	----- Line	Not Found	-----	Absent
	279.20	81.56*	6.066E+00	4.138E-03	6.506E-03	291.69	OK
TL-208	277.37	6.60	6.073E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	3.888E+00	2.455E-01	2.455E-01	8.77	OK
	860.56	12.50	2.949E+00	3.263E-01	3.263E-01	32.35	OK
BI-212	727.33	6.67*	3.341E+00	1.052E+00	1.052E+00	20.60	OK
	785.37	1.10	3.158E+00	1.148E+00	1.148E+00	79.03	OK
	1620.50	1.47	1.787E+00	1.602E+00	1.602E+00	49.13	OK
PB-212	74.82	10.28	4.875E+00	1.107E+00	1.107E+00	16.81	OK
	77.11	17.10	5.187E+00	1.431E+00	1.431E+00	6.93	OK
	238.63	43.60*	6.596E+00	1.001E+00	1.001E+00	3.43	OK
	300.09	3.30	5.805E+00	6.445E-01	6.445E-01	50.50	OK
BI-214	609.32	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62	OK
	1120.29	14.92	2.389E+00	5.958E-01	5.958E-01	20.71	OK
	1764.49	15.30	1.690E+00	5.783E-01	5.784E-01	20.85	OK
PB-214	74.82	5.80	4.851E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.187E+00	2.522E+00	2.522E+00	6.93	OK
	87.09	3.41	6.329E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	6.549E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	5.861E+00	7.701E-01	7.701E-01	9.97	OK
	351.93	35.60*	5.295E+00	7.609E-01	7.609E-01	6.02	OK
RN-222	609.32	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62	OK
	1120.29	14.92	2.389E+00	5.958E-01	5.958E-01	20.71	OK
	1764.49	15.30	1.690E+00	5.783E-01	5.784E-01	20.85	OK
RA-224	240.99	4.10*	6.552E+00	1.036E+00	1.036E+00	39.58	OK
RA-226	609.32	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62	OK
	1120.29	14.92	2.389E+00	5.958E-01	5.958E-01	20.71	OK
	1764.49	15.30	1.690E+00	5.783E-01	5.784E-01	20.85	OK
AC-228	105.21	1.10	7.592E+00	1.217E+00	1.217E+00	73.24	OK
	338.32	11.27	5.418E+00	9.726E-01	9.726E-01	11.10	OK
	794.95	4.25	3.131E+00	8.060E-01	8.060E-01	27.64	OK
	835.71	1.61	3.017E+00	5.597E-01	5.597E-01	123.99	OK
	911.20	25.80*	2.821E+00	9.059E-01	9.059E-01	8.07	OK
	968.97	15.80	2.687E+00	8.357E-01	8.357E-01	11.74	OK
RA-228	105.21	1.10	7.592E+00	1.217E+00	1.217E+00	73.24	OK
	338.32	11.27	5.418E+00	9.726E-01	9.726E-01	11.10	OK
	794.95	4.25	3.131E+00	8.060E-01	8.060E-01	27.64	OK
	835.71	1.61	3.017E+00	5.597E-01	5.597E-01	123.99	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	911.20	25.80*	2.821E+00	9.059E-01	9.059E-01	8.07	OK
	968.97	15.80	2.687E+00	8.357E-01	8.357E-01	11.74	OK
	74.82	10.28	4.875E+00	1.107E+00	1.107E+00	16.81	OK
	77.11	17.10	5.187E+00	1.431E+00	1.431E+00	6.93	OK
TH-229	238.63	43.60*	6.596E+00	1.001E+00	1.001E+00	3.43	OK
	300.09	3.30	5.805E+00	6.445E-01	6.445E-01	50.50	OK
	85.43	14.70	6.038E+00	2.749E-01	2.749E-01	31.82	OK
	88.47	24.00	6.352E+00	2.177E-01	2.177E-01	22.52	OK
TH-230	193.51	4.41*	7.325E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	7.058E+00	1.110E+00	1.110E+00	33.75	OK
	609.32	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62	OK
	1120.29	14.92	2.389E+00	5.958E-01	5.958E-01	20.71	OK
PA-231	1764.49	15.30	1.690E+00	5.783E-01	5.783E-01	20.85	OK
	283.69	1.70	5.996E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	5.805E+00	3.976E-01	3.976E-01	50.50	OK
	105.21	1.10	7.592E+00	1.217E+00	1.217E+00	73.24	OK
	338.32	11.27	5.418E+00	9.726E-01	9.726E-01	11.10	OK
	835.71	1.61	3.017E+00	5.597E-01	5.597E-01	123.99	OK
TH-234	911.20	25.80*	2.821E+00	9.059E-01	9.059E-01	8.07	OK
	968.97	15.80	2.687E+00	8.357E-01	8.357E-01	11.74	OK
	63.29	3.70*	3.057E+00	9.561E-01	9.561E-01	83.69	OK
	92.59	4.23	6.852E+00	1.137E+00	1.137E+00	31.03	OK
U-234	609.32	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62	OK
	1120.29	14.92	2.389E+00	5.958E-01	5.958E-01	20.71	OK
U-235	1764.49	15.30	1.690E+00	5.783E-01	5.783E-01	20.85	OK
	89.96	3.47	6.605E+00	1.166E+00	1.166E+00	25.85	OK
	93.35	5.60	6.852E+00	8.587E-01	8.587E-01	31.03	OK
	143.76	10.96*	8.042E+00	8.203E-02	8.203E-02	103.05	OK
U-238	163.33	5.08	7.815E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	7.452E+00	9.622E-02	9.622E-02	22.88	OK
	205.31	5.01	7.135E+00	1.277E-01	1.277E-01	158.70	OK
	63.29	3.70*	3.057E+00	9.561E-01	9.561E-01	83.69	OK
AM-243	92.59	4.23	6.852E+00	1.137E+00	1.137E+00	31.03	OK
	43.53	5.90	4.367E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	4.875E+00	1.693E-01	1.693E-01	16.81	OK
	511.00	100.00*	4.232E+00	7.869E-02	7.869E-02	29.32	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656001.CNF;1
* Acquisition date   : 16-JUN-2016 14:10:47 Sensitivity      : 3.000
* Detector ID        : GAM18 Energy tolerance: 1.500
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 12:00:11.78 Half life ratio : *****
* Sample date        : 17-MAY-2016 10:20:00 Analyst initials: MXR1
* Sample ID          : G398656001 Sample Quantity : 1.6808E+02 GRAM
* Batch Number       : 1572234 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 22-JUN-2015 09:18:06 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;9
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.915E+00	2.558E-01	1.235E-01
MN-54	9.643E-03	1.172E-02	1.309E-02
CD-109	1.478E+00	3.261E-01	3.552E-01
SN-126	1.412E-01	3.116E-02	3.415E-02
BA-137M	1.341E+00	3.129E-02	1.370E-02
CS-137	1.417E+00	3.305E-02	1.447E-02
EU-155	6.421E-02	4.609E-02	4.730E-02
HG-203	6.506E-03	1.860E-02	2.021E-02
TL-208	2.455E-01	2.111E-02	1.417E-02
BI-212	1.052E+00	2.123E-01	1.803E-01
PB-212	1.001E+00	3.366E-02	2.404E-02
BI-214	5.483E-01	4.632E-02	2.903E-02
PB-214	7.609E-01	4.488E-02	3.154E-02
RN-222	5.483E-01	4.632E-02	2.903E-02
RA-224	1.036E+00	4.017E-01	2.574E-01
RA-226	5.483E-01	4.632E-02	2.903E-02
AC-228	9.059E-01	7.167E-02	4.851E-02
RA-228	9.059E-01	7.167E-02	4.851E-02
TH-228	1.001E+00	3.366E-02	2.404E-02
TH-229	5.456E-02	1.369E-01	2.388E-01
TH-230	5.483E-01	4.632E-02	2.903E-02
PA-231	3.976E-01	1.968E-01	2.009E-01
TH-232	9.059E-01	7.167E-02	4.851E-02
TH-234	9.561E-01	7.841E-01	6.758E-01
U-234	5.483E-01	4.632E-02	2.903E-02
U-235	8.203E-02	8.284E-02	8.758E-02
U-238	9.561E-01	7.841E-01	6.758E-01
AM-243	1.693E-01	2.790E-02	2.521E-02
ANH-511	7.869E-02	2.261E-02	1.216E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-6.736E-02	1.026E-01	1.794E-01	NOT IDENT.

NA-22	-6.628E-03	8.259E-03	1.422E-02	NOT IDENT.
NA-24	0.000E+00	3.607E+12	0.000E+00	SHORT HLIF
AL-26	4.738E-03	6.427E-03	1.196E-02	NOT IDENT.
SC-46	-1.295E-03	8.843E-03	1.583E-02	FAIL ABUN
V-48	1.496E-02	2.592E-02	4.710E-02	NOT IDENT.
CR-51	-6.963E-02	1.363E-01	2.374E-01	NOT IDENT.
CO-56	-9.865E-03	9.020E-03	1.573E-02	FAIL ABUN
MN-56	0.000E+00	9.207E+40	0.000E+00	SHORT HLIF
CO-57	-3.172E-03	6.506E-03	1.179E-02	NOT IDENT.
CO-58	1.167E-02	1.031E-02	1.637E-02	NOT IDENT.
FE-59	-1.328E-02	2.189E-02	3.744E-02	NOT IDENT.
CO-60	6.142E-03	8.115E-03	1.480E-02	NOT IDENT.
ZN-65	3.172E-02	3.350E-02	3.255E-02	NOT IDENT.
GE-68	3.617E-01	2.560E-01	4.731E-01	NOT IDENT.
AS-73	1.261E-01	2.947E-01	5.899E-01	NOT IDENT.
AS-74	-5.274E-02	3.877E-02	6.781E-02	NOT IDENT.
SE-75	1.115E-02	1.354E-02	2.185E-02	NOT IDENT.
BR-77	0.000E+00	4.513E+02	0.000E+00	SHORT HLIF
SR-82	-6.188E-03	1.231E-01	1.847E-01	NOT IDENT.
RB-83	3.291E-03	2.122E-02	3.397E-02	NOT IDENT.
KR-85	0.000E+00	2.141E+00	4.063E+00	NOT IDENT.
SR-85	0.000E+00	1.332E-02	2.527E-02	NOT IDENT.
RB-86	3.634E-01	2.743E-01	5.052E-01	NOT IDENT.
Y-88	-2.075E-04	1.005E-02	1.499E-02	NOT IDENT.
Y-91	-2.447E+00	4.549E+00	7.974E+00	NOT IDENT.
NB-94	-7.108E-04	7.507E-03	1.329E-02	NOT IDENT.
NB-95	0.000E+00	1.216E-02	2.039E-02	NOT IDENT.
NB-95M	0.000E+00	3.935E-02	6.620E-02	NOT IDENT.
ZR-95	2.897E-02	2.157E-02	3.446E-02	NOT IDENT.
NB-97	0.000E+00	7.994E+39	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.703E+12	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.201E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	2.275E+34	0.000E+00	SHORT HLIF
RH-101	4.776E-03	8.818E-03	1.447E-02	FAIL ABUN
RH-102	-4.062E-03	1.198E-02	2.139E-02	FAIL ABUN
RU-103	9.128E-04	1.263E-02	2.239E-02	FAIL ABUN
RH-106	-5.980E-02	7.265E-02	1.281E-01	NOT IDENT.
RU-106	-5.980E-02	7.265E-02	1.281E-01	NOT IDENT.
AG-108M	1.323E-03	7.589E-03	1.369E-02	NOT IDENT.
AG-110M	1.032E-02	1.011E-02	1.883E-02	NOT IDENT.
SN-113	-4.402E-03	1.190E-02	2.148E-02	NOT IDENT.
CD-115	0.000E+00	3.112E+02	0.000E+00	SHORT HLIF
SN-117M	2.271E-02	3.114E-02	5.332E-02	FAIL ABUN
TE-123M	3.096E-03	8.164E-03	1.387E-02	NOT IDENT.
SB-124	9.424E-03	2.156E-02	3.929E-02	NOT IDENT.
SB-125	-2.718E-02	2.324E-02	4.076E-02	FAIL ABUN
TE-125M	3.593E+00	3.124E+00	5.304E+00	NOT IDENT.
I-126	0.000E+00	1.295E-01	2.230E-01	FAIL ABUN
SB-126	-4.225E-02	8.088E-02	1.200E-01	NOT IDENT.
SB-127	-1.310E-01	4.961E+00	7.593E+00	NOT IDENT.
I-131	8.771E-02	1.057E-01	1.973E-01	NOT IDENT.
I-132	0.000E+00	7.174E+40	0.000E+00	SHORT HLIF
TE-132	-4.885E-01	4.849E+00	8.868E+00	NOT IDENT.
BA-133	7.940E-04	1.144E-02	1.835E-02	NOT IDENT.
I-133	0.000E+00	2.811E+08	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.116E-02	1.840E-02	FAIL ABUN
CS-135	5.813E-02	4.424E-02	7.200E-02	NOT IDENT.
I-135	0.000E+00	6.380E+31	0.000E+00	SHORT HLIF
CS-136	-1.147E-02	4.535E-02	7.919E-02	FAIL ABUN
CE-139	-5.571E-03	7.328E-03	1.374E-02	NOT IDENT.
BA-140	4.993E-02	1.465E-01	2.592E-01	NOT IDENT.
LA-140	0.000E+00	5.553E-02	7.634E-02	FAIL ABUN
CE-141	6.534E-03	2.701E-02	3.815E-02	NOT IDENT.
CE-143	0.000E+00	8.197E+04	0.000E+00	SHORT HLIF
CE-144	9.786E-03	5.677E-02	9.182E-02	NOT IDENT.
PM-144	4.386E-03	8.733E-03	1.414E-02	NOT IDENT.
PR-144	2.342E-01	6.401E-01	1.066E+00	NOT IDENT.
PM-146	9.312E-03	1.119E-02	2.034E-02	NOT IDENT.
ND-147	-2.021E-01	3.511E-01	6.068E-01	FAIL ABUN
PM-147	-2.535E+01	2.179E+02	3.380E+02	NOT IDENT.
PM-149	0.000E+00	2.695E+03	0.000E+00	SHORT HLIF
EU-150	2.776E-03	1.102E-02	1.215E-02	FAIL ABUN
EU-152	1.366E-02	2.640E-02	4.309E-02	FAIL ABUN
GD-153	-7.608E-03	2.973E-02	3.898E-02	NOT IDENT.
EU-154	-1.803E-02	2.324E-02	4.006E-02	NOT IDENT.
TB-160	-3.364E-02	3.026E-02	5.244E-02	FAIL ABUN
HO-166M	-5.538E-03	1.296E-02	2.271E-02	FAIL ABUN
TM-171	-1.284E+00	5.641E+00	1.119E+01	FAIL ABUN

HF-172	3.768E-02	5.657E-02	8.673E-02	FAIL ABUN
LU-172	1.195E-02	1.285E-02	2.328E-02	FAIL ABUN
LU-176	-2.381E-03	6.779E-03	1.148E-02	FAIL ABUN
HF-181	-1.044E-02	1.437E-02	2.505E-02	NOT IDENT.
TA-182	5.632E-02	4.217E-02	7.201E-02	FAIL ABUN
RE-183	1.690E-02	6.516E-02	1.291E-01	FAIL ABUN
RE-184	8.876E-03	4.027E-02	6.240E-02	NOT IDENT.
W-188	-7.884E-01	2.317E+00	3.569E+00	FAIL ABUN
IR-192	1.053E-03	1.003E-02	1.773E-02	FAIL ABUN
BI-207	5.333E-03	1.307E-02	1.844E-02	FAIL ABUN
PB-210	-3.608E+00	1.890E+00	2.429E+00	NOT IDENT.
BI-211	0.000E+00	1.237E-01	1.767E-01	FAIL ABUN
PB-211	-3.230E-02	2.072E-01	3.240E-01	NOT IDENT.
RN-219	9.256E-02	1.016E-01	1.878E-01	FAIL ABUN
RA-223	6.735E-02	1.708E-01	2.801E-01	FAIL ABUN
AC-227	-1.963E-02	6.189E-02	1.113E-01	FAIL ABUN
TH-227	-1.963E-02	6.189E-02	1.113E-01	FAIL ABUN
TH-231	6.735E-02	1.708E-01	2.801E-01	FAIL ABUN
PA-233	4.198E-03	1.598E-02	2.841E-02	FAIL ABUN
PA-234	-4.995E-03	5.725E-02	1.020E-01	FAIL ABUN
PA-234M	1.471E+00	1.092E+00	1.650E+00	FAIL ABUN
NP-237	4.198E-03	1.598E-02	2.841E-02	FAIL ABUN
NP-238	0.000E+00	5.750E+02	0.000E+00	SHORT HLIF
NP-239	-4.583E-02	6.445E-02	1.169E-01	FAIL ABUN
PU-239	0.000E+00	1.474E+02	1.657E+02	FAIL ABUN
AM-241	6.348E-03	4.703E-02	8.357E-02	NOT IDENT.
CM-243	1.622E-02	3.539E-02	4.731E-02	FAIL ABUN
BK-247	1.144E-02	2.242E-02	3.585E-02	FAIL ABUN
CM-247	1.046E-03	9.681E-03	1.713E-02	FAIL ABUN
CF-249	-5.182E-04	1.094E-02	1.769E-02	NOT IDENT.
CF-251	-2.847E-02	3.452E-02	5.627E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	3268	10.66*	1.929E+00	5.915E+00	5.915E+00	4.41
MN-54	834.85	73	99.98*	3.017E+00	9.014E-03	9.643E-03	123.99
CD-109	88.03	1340	3.70*	6.352E+00	2.122E+00	2.221E+00	14.61
SN-126	64.28	291	9.60	3.057E+00	3.685E-01	3.685E-01	83.69
	86.94	1340	8.90	6.352E+00	8.820E-01	8.820E-01	14.61
	87.57	1340	37.00*	6.352E+00	2.122E-01	2.122E-01	14.61
BA-137M	661.66	11550	89.90*	3.572E+00	1.339E+00	1.341E+00	2.38
CS-137	661.66	11550	85.10*	3.572E+00	1.414E+00	1.417E+00	2.38
EU-155	86.55	1340	30.70	6.352E+00	2.557E-01	2.588E-01	14.61
	105.31	273	21.10*	7.592E+00	6.344E-02	6.421E-02	73.24
HG-203	70.83	-----	3.69	4.263E+00	-----	Line Not Found	-----
	72.87	-----	6.19	4.569E+00	-----	Line Not Found	-----
	279.20	323	81.56*	6.066E+00	2.426E-02	3.815E-02	49.25
TL-208	277.37	323	6.60	6.066E+00	2.998E-01	2.998E-01	49.25
	583.19	2179	85.00*	3.888E+00	2.455E-01	2.455E-01	8.77
	860.56	323	12.50	2.949E+00	3.263E-01	3.263E-01	32.35
BI-211	72.87	-----	1.23	4.569E+00	-----	Line Not Found	-----
	351.06	3853	12.92*	5.295E+00	2.096E+00	2.096E+00	6.02
BI-212	727.33	630	6.67*	3.341E+00	1.052E+00	1.052E+00	20.60
	785.37	107	1.10	3.158E+00	1.148E+00	1.148E+00	79.03
	1620.50	113	1.47	1.787E+00	1.602E+00	1.602E+00	49.13
PB-212	74.82	2076	10.28	4.875E+00	1.541E+00	1.541E+00	11.74
	77.11	3409	17.10	5.187E+00	1.431E+00	1.431E+00	6.93
	238.63	7735	43.60*	6.596E+00	1.001E+00	1.001E+00	3.43
	300.09	332	3.30	5.805E+00	6.445E-01	6.445E-01	50.50
BI-214	609.32	2531	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62
	1120.29	571	14.92	2.389E+00	5.958E-01	5.958E-01	20.71
	1764.49	402	15.30	1.690E+00	5.783E-01	5.784E-01	20.85
PB-214	74.82	2076	5.80	4.875E+00	2.732E+00	2.732E+00	11.74
	77.11	3409	9.70	5.187E+00	2.522E+00	2.522E+00	6.93
	87.09	1340	3.41	6.352E+00	2.302E+00	2.302E+00	14.61
	242.00	1730	7.25	6.552E+00	1.356E+00	1.356E+00	16.13
	295.22	2234	18.42	5.861E+00	7.701E-01	7.701E-01	9.97
	351.93	3853	35.60*	5.295E+00	7.609E-01	7.609E-01	6.02
RN-222	609.32	2531	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62
	1120.29	571	14.92	2.389E+00	5.958E-01	5.958E-01	20.71
	1764.49	402	15.30	1.690E+00	5.783E-01	5.784E-01	20.85
RA-224	240.99	1730	4.10*	6.552E+00	2.397E+00	2.397E+00	16.13
RA-226	609.32	2531	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62
	1120.29	571	14.92	2.389E+00	5.958E-01	5.958E-01	20.71
	1764.49	402	15.30	1.690E+00	5.783E-01	5.784E-01	20.85
AC-228	105.21	273	1.10	7.592E+00	1.217E+00	1.217E+00	73.24
	338.32	1595	11.27	5.418E+00	9.726E-01	9.726E-01	11.10
	794.95	288	4.25	3.131E+00	8.060E-01	8.060E-01	27.64
	835.71	73	1.61	3.017E+00	5.597E-01	5.597E-01	123.99
	911.20	1771	25.80*	2.821E+00	9.059E-01	9.059E-01	8.07
	968.97	953	15.80	2.687E+00	8.357E-01	8.357E-01	11.74

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	105.21	273	1.10	7.592E+00	1.217E+00	1.217E+00	73.24
	338.32	1595	11.27	5.418E+00	9.726E-01	9.726E-01	11.10
	794.95	288	4.25	3.131E+00	8.060E-01	8.060E-01	27.64
	835.71	73	1.61	3.017E+00	5.597E-01	5.597E-01	123.99
	911.20	1771	25.80*	2.821E+00	9.059E-01	9.059E-01	8.07
TH-228	968.97	953	15.80	2.687E+00	8.357E-01	8.357E-01	11.74
	74.82	2076	10.28	4.875E+00	1.541E+00	1.541E+00	11.74
	77.11	3409	17.10	5.187E+00	1.431E+00	1.431E+00	6.93
	238.63	7735	43.60*	6.596E+00	1.001E+00	1.001E+00	3.43
	300.09	332	3.30	5.805E+00	6.445E-01	6.445E-01	50.50
TH-229	85.43	655	14.70	6.038E+00	2.749E-01	2.749E-01	31.82
	88.47	1340	24.00	6.352E+00	3.271E-01	3.271E-01	14.61
	193.51	-----	4.41*	7.325E+00	-----	Line Not Found	-----
TH-230	210.85	589	2.80	7.058E+00	1.110E+00	1.110E+00	33.75
	609.32	2531	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62
	1120.29	571	14.92	2.389E+00	5.958E-01	5.958E-01	20.71
	1764.49	402	15.30	1.690E+00	5.783E-01	5.783E-01	20.85
PA-231	283.69	-----	1.70	5.996E+00	-----	Line Not Found	-----
TH-232	301.36	332	5.35*	5.805E+00	3.976E-01	3.976E-01	50.50
	105.21	273	1.10	7.592E+00	1.217E+00	1.217E+00	73.24
	338.32	1595	11.27	5.418E+00	9.726E-01	9.726E-01	11.10
	835.71	73	1.61	3.017E+00	5.597E-01	5.597E-01	123.99
	911.20	1771	25.80*	2.821E+00	9.059E-01	9.059E-01	8.07
TH-234	968.97	953	15.80	2.687E+00	8.357E-01	8.357E-01	11.74
	63.29	291	3.70*	3.057E+00	9.561E-01	9.561E-01	83.69
	92.59	885	4.23	6.852E+00	1.137E+00	1.137E+00	31.03
U-234	609.32	2531	45.49*	3.777E+00	5.483E-01	5.483E-01	8.62
	1120.29	571	14.92	2.389E+00	5.958E-01	5.958E-01	20.71
	1764.49	402	15.30	1.690E+00	5.783E-01	5.783E-01	20.85
U-235	89.96	718	3.47	6.605E+00	1.166E+00	1.166E+00	25.85
	93.35	885	5.60	6.852E+00	8.587E-01	8.587E-01	31.03
	143.76	194	10.96*	8.042E+00	8.203E-02	8.203E-02	103.05
	163.33	-----	5.08	7.815E+00	-----	Line Not Found	-----
	185.72	1102	57.20	7.452E+00	9.622E-02	9.622E-02	22.88
U-238	205.31	123	5.01	7.135E+00	1.277E-01	1.277E-01	158.70
	63.29	291	3.70*	3.057E+00	9.561E-01	9.561E-01	83.69
	92.59	885	4.23	6.852E+00	1.137E+00	1.137E+00	31.03
AM-243	43.53	-----	5.90	4.367E-01	-----	Line Not Found	-----
ANH-511	74.66	2076	67.20*	4.875E+00	2.358E-01	2.358E-01	11.74
	511.00	895	100.00*	4.232E+00	7.869E-02	7.869E-02	29.32

Flag: "*" = Keyline

Total number of lines in spectrum 74
Number of unidentified lines 19
Number of lines tentatively identified by NID 55 74.32%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.915E+00	5.915E+00	0.261E+00	4.41	
MN-54	312.05D	1.07	9.014E-03	9.643E-03	11.96E-03	123.99	
CD-109	461.40D	1.05	2.122E+00	2.221E+00	0.324E+00	14.61	
SN-126	2.30E+05Y	1.00	2.122E-01	2.122E-01	0.310E-01	14.61	
BA-137M	30.08Y	1.00	1.339E+00	1.341E+00	0.032E+00	2.38	
CS-137	30.08Y	1.00	1.414E+00	1.417E+00	0.034E+00	2.38	
EU-155	4.75Y	1.01	6.344E-02	6.421E-02	4.703E-02	73.24	
HG-203	46.59D	1.57	2.426E-02	3.815E-02	1.879E-02	49.25	
TL-208	1.41E+10Y	1.00	2.455E-01	2.455E-01	0.215E-01	8.77	
BI-211	7.04E+08Y	1.00	2.096E+00	2.096E+00	0.126E+00	6.02	
BI-212	1.41E+10Y	1.00	1.052E+00	1.052E+00	0.217E+00	20.60	
PB-212	1.41E+10Y	1.00	1.001E+00	1.001E+00	0.034E+00	3.43	
BI-214	1600.00Y	1.00	5.483E-01	5.483E-01	0.473E-01	8.62	
PB-214	1600.00Y	1.00	7.609E-01	7.609E-01	0.458E-01	6.02	
RN-222	1600.00Y	1.00	5.483E-01	5.483E-01	0.473E-01	8.62	
RA-224	1.41E+10Y	1.00	2.397E+00	2.397E+00	0.387E+00	16.13	
RA-226	1600.00Y	1.00	5.483E-01	5.483E-01	0.473E-01	8.62	
AC-228	1.41E+10Y	1.00	9.059E-01	9.059E-01	0.731E-01	8.07	
RA-228	1.41E+10Y	1.00	9.059E-01	9.059E-01	0.731E-01	8.07	
TH-228	1.41E+10Y	1.00	1.001E+00	1.001E+00	0.034E+00	3.43	
TH-229	7340.00Y	1.00	3.271E-01	3.271E-01	0.478E-01	14.61	K
TH-230	7.54E+04Y	1.00	5.483E-01	5.483E-01	0.473E-01	8.62	
PA-231	7.04E+08Y	1.00	3.976E-01	3.976E-01	2.008E-01	50.50	
TH-232	1.41E+10Y	1.00	9.059E-01	9.059E-01	0.731E-01	8.07	
TH-234	4.47E+09Y	1.00	9.561E-01	9.561E-01	8.001E-01	83.69	
U-234	2.45E+05Y	1.00	5.483E-01	5.483E-01	0.473E-01	8.62	
U-235	7.04E+08Y	1.00	8.203E-02	8.203E-02	8.453E-02	103.05	
U-238	4.47E+09Y	1.00	9.561E-01	9.561E-01	8.001E-01	83.69	
AM-243	7370.00Y	1.00	2.358E-01	2.358E-01	0.277E-01	11.74	
ANH-511	1.00E+09Y	1.00	7.869E-02	7.869E-02	2.307E-02	29.32	
Total Activity :			2.815E+01	2.826E+01			

Grand Total Activity : 2.815E+01 2.826E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
9	40.20	135	579	1.16	81.02	78	12	2.12E-03	****	2.32E-01	
9	41.68	304	1744	1.89	83.99	78	12	4.81E-03	86.1	3.13E-01	
0	66.27	13	2486	1.14	133.12	131	6	2.11E-04	****	3.54E+00	T
0	99.53	320	2523	0.97	199.57	196	8	5.51E-03	64.4	7.29E+00	T
0	129.03	414	2579	1.10	258.53	256	8	7.32E-03	49.8	8.08E+00	T
0	154.57	239	1986	1.85	309.56	307	7	4.31E-03	71.8	7.93E+00	T
0	180.94	271	1749	1.80	362.25	359	7	4.98E-03	59.1	7.54E+00	T
0	198.94	207	2299	0.98	398.21	394	9	3.83E-03	****	7.23E+00	T
0	270.29	623	1566	1.74	540.80	536	9	1.19E-02	26.6	6.16E+00	T
0	328.14	389	1444	1.21	656.38	652	10	7.63E-03	41.2	5.52E+00	T
0	409.93	212	1259	1.13	819.84	815	11	4.26E-03	71.4	4.84E+00	T
0	463.03	570	1196	1.41	925.94	920	12	1.16E-02	27.3	4.50E+00	T
0	563.40	175	763	2.44	1126.53	1120	13	3.66E-03	70.2	3.98E+00	T
0	570.27	34	644	1.46	1140.27	1137	10	7.16E-04	****	3.95E+00	T
0	690.59	6	422	1.29	1380.73	1375	9	1.33E-04	****	3.47E+00	
0	754.92	209	557	2.67	1509.30	1500	17	4.54E-03	55.3	3.25E+00	T
2	768.22	286	402	2.54	1535.89	1530	25	6.22E-03	30.6	3.21E+00	T
2	772.34	103	545	2.55	1544.12	1530	25	2.25E-03	****	3.20E+00	T
1	803.30	61	473	2.14	1606.00	1599	19	1.34E-03	****	3.11E+00	T
1	806.09	111	403	2.36	1611.57	1599	19	2.42E-03	78.5	3.10E+00	
0	934.56	81	334	1.17	1868.35	1863	11	1.81E-03	91.9	2.77E+00	
3	965.25	438	511	2.90	1929.70	1917	28	9.83E-03	27.1	2.70E+00	T
0	1001.36	87	165	1.81	2001.87	1998	9	1.96E-03	75.8	2.62E+00	T
0	1006.53	50	149	1.97	2012.21	2008	8	1.13E-03	90.4	2.61E+00	
0	1110.84	40	198	1.08	2220.70	2216	10	9.05E-04	****	2.41E+00	T
0	1228.45	42	228	4.20	2455.81	2453	11	9.69E-04	****	2.22E+00	
0	1238.01	197	458	2.49	2474.91	2465	18	4.56E-03	52.9	2.20E+00	T
0	1377.95	166	191	2.23	2754.66	2747	15	3.90E-03	39.2	2.02E+00	
0	1386.16	45	105	1.19	2771.09	2767	10	1.06E-03	89.9	2.01E+00	
0	1408.81	109	137	2.10	2816.36	2810	14	2.57E-03	49.0	1.98E+00	T
0	1510.28	49	161	1.93	3019.22	3012	13	1.18E-03	****	1.88E+00	
1	1588.98	159	155	3.13	3176.57	3165	30	3.82E-03	40.4	1.81E+00	
1	1592.70	81	91	2.85	3184.00	3165	30	1.94E-03	71.4	1.81E+00	
0	1603.02	19	91	3.83	3204.64	3194	13	4.56E-04	****	1.80E+00	
8	1624.72	24	45	1.24	3248.01	3232	19	5.69E-04	****	1.78E+00	
0	1633.89	64	192	1.40	3266.36	3254	25	1.55E-03	****	1.78E+00	
4	1727.19	44	30	2.90	3452.88	3447	20	1.06E-03	64.5	1.71E+00	
4	1729.99	164	56	3.30	3458.49	3447	20	3.98E-03	25.1	1.71E+00	
0	1785.02	30	78	2.25	3568.51	3559	15	7.29E-04	****	1.68E+00	
0	1847.48	130	90	2.67	3693.41	3681	22	3.18E-03	35.1	1.65E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656001.CNF;1  *
* Acquisition date   : 16-JUN-2016 14:10:47 Sensitivity      : 3.000          *
* Detector ID        : GAM18 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:11.78 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 10:20:00 Nuclide Library : SOLID          *
* Sample ID          : G398656001 Analyst initials: MXR1          *
* Batch Number       : 1572234 Sample Quantity : 1.6808E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 22-JUN-2015 09:18:06 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;9          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	5.931E-02
MN-54	6.365E-03
CD-109	1.752E-01
SN-126	1.685E-02
BA-137M	6.689E-03
CS-137	7.066E-03
EU-155	2.331E-02
HG-203	9.937E-03
TL-208	6.928E-03
BI-212	8.786E-02
PB-212	1.184E-02
BI-214	1.422E-02
PB-214	1.550E-02
RN-222	1.422E-02
RA-224	1.268E-01
RA-226	1.422E-02
AC-228	2.356E-02
RA-228	2.356E-02
TH-228	1.184E-02
TH-229	1.178E-01
TH-230	1.422E-02
PA-231	9.878E-02
TH-232	2.356E-02
TH-234	3.331E-01
U-234	1.422E-02
U-235	4.319E-02
U-238	3.331E-01
AM-243	1.244E-02
ANH-511	5.960E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.803E-02	NOT IDENT.
NA-22	6.869E-03	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	5.679E-03	NOT IDENT.
SC-46	7.686E-03	FAIL ABUN
V-48	2.283E-02	NOT IDENT.
CR-51	1.167E-01	NOT IDENT.
CO-56	7.643E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.811E-03	NOT IDENT.
CO-58	7.960E-03	NOT IDENT.
FE-59	1.812E-02	NOT IDENT.
CO-60	7.154E-03	NOT IDENT.
ZN-65	1.582E-02	NOT IDENT.
GE-68	2.297E-01	NOT IDENT.
AS-73	2.904E-01	NOT IDENT.
AS-74	3.317E-02	NOT IDENT.
SE-75	1.075E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	8.989E-02	NOT IDENT.
RB-83	1.664E-02	NOT IDENT.
KR-85	2.004E+00	NOT IDENT.
SR-85	1.246E-02	NOT IDENT.
RB-86	2.453E-01	NOT IDENT.
Y-88	7.122E-03	NOT IDENT.
Y-91	3.863E+00	NOT IDENT.
NB-94	6.496E-03	NOT IDENT.
NB-95	9.977E-03	NOT IDENT.
NB-95M	3.266E-02	NOT IDENT.
ZR-95	1.683E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.139E-03	FAIL ABUN
RH-102	1.044E-02	FAIL ABUN
RU-103	1.097E-02	FAIL ABUN
RH-106	6.261E-02	NOT IDENT.
RU-106	6.261E-02	NOT IDENT.
AG-108M	6.724E-03	NOT IDENT.
AG-110M	9.150E-03	NOT IDENT.
SN-113	1.055E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.630E-02	FAIL ABUN
TE-123M	6.840E-03	NOT IDENT.
SB-124	1.878E-02	NOT IDENT.
SB-125	2.001E-02	FAIL ABUN
TE-125M	2.615E+00	NOT IDENT.
I-126	1.093E-01	FAIL ABUN
SB-126	5.845E-02	NOT IDENT.
SB-127	3.701E+00	NOT IDENT.
I-131	9.696E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	4.371E+00	NOT IDENT.
BA-133	9.016E-03	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	9.004E-03	FAIL ABUN
CS-135	3.548E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.835E-02	FAIL ABUN
CE-139	6.773E-03	NOT IDENT.
BA-140	1.269E-01	NOT IDENT.
LA-140	3.665E-02	FAIL ABUN
CE-141	1.881E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.528E-02	NOT IDENT.
PM-144	6.911E-03	NOT IDENT.
PR-144	5.212E-01	NOT IDENT.
PM-146	9.997E-03	NOT IDENT.
ND-147	2.969E-01	FAIL ABUN
PM-147	1.666E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.975E-03	FAIL ABUN
EU-152	2.118E-02	FAIL ABUN
GD-153	1.921E-02	NOT IDENT.
EU-154	1.935E-02	NOT IDENT.
TB-160	2.544E-02	FAIL ABUN
HO-166M	1.108E-02	FAIL ABUN
TM-171	5.507E+00	FAIL ABUN
HF-172	4.277E-02	FAIL ABUN

LU-172	1.130E-02	FAIL ABUN
LU-176	5.644E-03	FAIL ABUN
HF-181	1.229E-02	NOT IDENT.
TA-182	3.500E-02	FAIL ABUN
RE-183	6.357E-02	FAIL ABUN
RE-184	3.035E-02	NOT IDENT.
W-188	1.755E+00	FAIL ABUN
IR-192	8.719E-03	FAIL ABUN
BI-207	8.945E-03	FAIL ABUN
PB-210	1.196E+00	NOT IDENT.
BI-211	8.763E-02	FAIL ABUN
PB-211	1.592E-01	NOT IDENT.
RN-219	9.231E-02	FAIL ABUN
RA-223	1.377E-01	FAIL ABUN
AC-227	5.476E-02	FAIL ABUN
TH-227	5.476E-02	FAIL ABUN
TH-231	1.377E-01	FAIL ABUN
PA-233	1.397E-02	FAIL ABUN
PA-234	4.944E-02	FAIL ABUN
PA-234M	8.019E-01	FAIL ABUN
NP-237	1.397E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.760E-02	FAIL ABUN
PU-239	8.184E+01	FAIL ABUN
AM-241	4.117E-02	NOT IDENT.
CM-243	2.331E-02	FAIL ABUN
BK-247	1.765E-02	FAIL ABUN
CM-247	8.418E-03	FAIL ABUN
CF-249	8.688E-03	NOT IDENT.
CF-251	2.773E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656001.CNF;1
Acquisition date : 16-JUN-2016 14:10:47 Sensitivity : 3.000
Detector ID : GAM18 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:11.78 Half life ratio : *****
Sample date : 17-MAY-2016 10:20:00 Nuclide Library : SOLID
Sample ID : G398656001 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6808E+02 GRAM
Quantity Err(%) : 1.1899E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 22-JUN-2015 09:18:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.915E+00	5.721E-01	5.721E-01
MN-54	9.643E-03	1.179E-02	1.179E-02
CD-109	1.478E+00	3.729E-01	3.729E-01
SN-126	1.412E-01	3.484E-02	3.484E-02
BA-137M	1.341E+00	1.129E-01	1.129E-01
CS-137	1.417E+00	1.192E-01	1.192E-01
EU-155	6.421E-02	4.643E-02	4.643E-02
HG-203	6.269E-03	1.915E-02	1.915E-02
TL-208	2.455E-01	2.938E-02	2.938E-02
BI-212	1.052E+00	2.380E-01	2.380E-01
PB-212	1.001E+00	8.695E-02	8.695E-02
BI-214	5.483E-01	6.481E-02	6.481E-02
PB-214	7.609E-01	7.684E-02	7.684E-02
RN-222	5.483E-01	6.481E-02	6.481E-02
RA-224	1.036E+00	4.377E-01	4.377E-01
RA-226	5.483E-01	6.481E-02	6.481E-02
AC-228	9.059E-01	1.622E-01	1.622E-01
RA-228	9.059E-01	1.622E-01	1.622E-01
TH-228	1.001E+00	8.695E-02	8.695E-02
TH-229	5.456E-02	1.369E-01	1.369E-01
TH-230	5.483E-01	6.481E-02	6.481E-02
PA-231	3.976E-01	2.160E-01	2.160E-01
TH-232	9.059E-01	1.622E-01	1.622E-01
TH-234	9.561E-01	8.135E-01	8.135E-01
U-234	5.483E-01	6.481E-02	6.481E-02
U-235	8.203E-02	8.308E-02	8.308E-02
U-238	9.561E-01	8.135E-01	8.135E-01
AM-243	1.693E-01	3.239E-02	3.239E-02
ANH-511	7.869E-02	2.355E-02	2.355E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	-6.736E-02	1.027E-01	1.071E-01 NOT IDENT.

NA-22	-6.628E-03	8.281E-03	8.803E-03	NOT IDENT.
NA-24	-1.366E+12	3.609E+12	3.661E+12	SHORT HLIF
AL-26	4.738E-03	6.437E-03	6.782E-03	NOT IDENT.
SC-46	-1.295E-03	8.845E-03	8.864E-03	FAIL ABUN
V-48	1.496E-02	2.606E-02	2.692E-02	NOT IDENT.
CR-51	-6.963E-02	1.364E-01	1.400E-01	NOT IDENT.
CO-56	-9.865E-03	9.119E-03	1.015E-02	FAIL ABUN
MN-56	-1.000E+41	9.307E+40	0.000E+00	SHORT HLIF
CO-57	-3.172E-03	6.511E-03	6.666E-03	NOT IDENT.
CO-58	1.167E-02	1.042E-02	1.167E-02	NOT IDENT.
FE-59	-1.328E-02	2.211E-02	2.290E-02	NOT IDENT.
CO-60	6.142E-03	8.130E-03	8.588E-03	NOT IDENT.
ZN-65	3.172E-02	3.428E-02	3.714E-02	NOT IDENT.
GE-68	3.617E-01	2.676E-01	3.134E-01	NOT IDENT.
AS-73	1.261E-01	2.959E-01	3.013E-01	NOT IDENT.
AS-74	-5.274E-02	3.917E-02	4.582E-02	NOT IDENT.
SE-75	1.115E-02	1.357E-02	1.447E-02	NOT IDENT.
BR-77	1.342E+04	1.183E+04	1.329E+04	SHORT HLIF
SR-82	-6.188E-03	1.231E-01	1.231E-01	NOT IDENT.
RB-83	3.291E-03	2.123E-02	2.128E-02	NOT IDENT.
KR-85	1.892E+01	2.662E+00	8.934E+00	NOT IDENT.
SR-85	1.174E-01	1.654E-02	5.544E-02	NOT IDENT.
RB-86	3.634E-01	2.852E-01	3.289E-01	NOT IDENT.
Y-88	-2.075E-04	1.005E-02	1.005E-02	NOT IDENT.
Y-91	-2.447E+00	4.556E+00	4.688E+00	NOT IDENT.
NB-94	-7.108E-04	7.507E-03	7.514E-03	NOT IDENT.
NB-95	3.326E-02	1.270E-02	1.965E-02	NOT IDENT.
NB-95M	8.610E-02	4.026E-02	5.593E-02	NOT IDENT.
ZR-95	2.897E-02	2.180E-02	2.541E-02	NOT IDENT.
NB-97	1.000E+41	1.138E+40	0.000E+00	SHORT HLIF
ZR-97	6.966E+12	1.799E+12	3.619E+12	SHORT HLIF
MO-99	-8.811E+01	1.205E+02	1.269E+02	SHORT HLIF
TC-99M	-6.630E+33	2.276E+34	0.000E+00	SHORT HLIF
RH-101	4.776E-03	8.863E-03	9.121E-03	FAIL ABUN
RH-102	-4.062E-03	1.199E-02	1.213E-02	FAIL ABUN
RU-103	9.128E-04	1.263E-02	1.264E-02	FAIL ABUN
RH-106	-5.980E-02	7.287E-02	7.769E-02	NOT IDENT.
RU-106	-5.980E-02	7.287E-02	7.769E-02	NOT IDENT.
AG-108M	1.323E-03	7.590E-03	7.613E-03	NOT IDENT.
AG-110M	1.032E-02	1.023E-02	1.124E-02	NOT IDENT.
SN-113	-4.402E-03	1.190E-02	1.207E-02	NOT IDENT.
CD-115	-1.065E+02	3.114E+02	3.151E+02	SHORT HLIF
SN-117M	2.271E-02	3.118E-02	3.282E-02	FAIL ABUN
TE-123M	3.096E-03	8.167E-03	8.286E-03	NOT IDENT.
SB-124	9.424E-03	2.157E-02	2.198E-02	NOT IDENT.
SB-125	-2.718E-02	2.335E-02	2.637E-02	FAIL ABUN
TE-125M	3.593E+00	3.136E+00	3.530E+00	NOT IDENT.
I-126	4.183E-01	1.352E-01	2.320E-01	FAIL ABUN
SB-126	-4.225E-02	8.107E-02	8.328E-02	NOT IDENT.
SB-127	-1.310E-01	4.961E+00	4.961E+00	NOT IDENT.
I-131	8.771E-02	1.060E-01	1.131E-01	NOT IDENT.
I-132	1.000E+41	2.001E+41	0.000E+00	SHORT HLIF
TE-132	-4.885E-01	4.850E+00	4.855E+00	NOT IDENT.
BA-133	7.940E-04	1.144E-02	1.144E-02	NOT IDENT.
I-133	-3.127E+08	2.885E+08	3.211E+08	SHORT HLIF
CS-134	4.122E-02	1.220E-02	2.223E-02	FAIL ABUN
CS-135	5.813E-02	4.457E-02	5.171E-02	NOT IDENT.
I-135	2.732E+30	6.383E+31	0.000E+00	SHORT HLIF
CS-136	-1.147E-02	4.541E-02	4.571E-02	FAIL ABUN
CE-139	-5.571E-03	7.419E-03	7.833E-03	NOT IDENT.
BA-140	4.993E-02	1.466E-01	1.483E-01	NOT IDENT.
LA-140	1.580E-01	5.691E-02	9.117E-02	FAIL ABUN
CE-141	6.534E-03	2.702E-02	2.718E-02	NOT IDENT.
CE-143	6.006E+05	9.604E+04	2.873E+05	SHORT HLIF
CE-144	9.786E-03	5.678E-02	5.695E-02	NOT IDENT.
PM-144	4.386E-03	8.742E-03	8.962E-03	NOT IDENT.
PR-144	2.342E-01	6.405E-01	6.491E-01	NOT IDENT.
PM-146	9.312E-03	1.123E-02	1.199E-02	NOT IDENT.
ND-147	-2.021E-01	3.515E-01	3.631E-01	FAIL ABUN
PM-147	-2.535E+01	2.179E+02	2.182E+02	NOT IDENT.
PM-149	5.154E+01	2.695E+03	2.696E+03	SHORT HLIF
EU-150	2.776E-03	1.103E-02	1.110E-02	FAIL ABUN
EU-152	1.366E-02	2.642E-02	2.713E-02	FAIL ABUN
GD-153	-7.608E-03	2.973E-02	2.993E-02	NOT IDENT.
EU-154	-1.803E-02	2.330E-02	2.468E-02	NOT IDENT.
TB-160	-3.364E-02	3.069E-02	3.423E-02	FAIL ABUN
HO-166M	-5.538E-03	1.297E-02	1.321E-02	FAIL ABUN
TM-171	-1.284E+00	5.642E+00	5.672E+00	FAIL ABUN

HF-172	3.768E-02	5.694E-02	5.942E-02	FAIL ABUN
LU-172	1.195E-02	1.317E-02	1.423E-02	FAIL ABUN
LU-176	-2.381E-03	6.782E-03	6.866E-03	FAIL ABUN
HF-181	-1.044E-02	1.439E-02	1.514E-02	NOT IDENT.
TA-182	5.632E-02	4.253E-02	4.953E-02	FAIL ABUN
RE-183	1.690E-02	6.519E-02	6.564E-02	FAIL ABUN
RE-184	8.876E-03	4.029E-02	4.049E-02	NOT IDENT.
W-188	-7.884E-01	2.319E+00	2.346E+00	FAIL ABUN
IR-192	1.053E-03	1.003E-02	1.004E-02	FAIL ABUN
BI-207	5.333E-03	1.312E-02	1.333E-02	FAIL ABUN
PB-210	-3.608E+00	1.921E+00	2.517E+00	NOT IDENT.
BI-211	2.096E+00	2.144E-01	9.691E-01	FAIL ABUN
PB-211	-3.230E-02	2.073E-01	2.078E-01	NOT IDENT.
RN-219	9.256E-02	1.025E-01	1.107E-01	FAIL ABUN
RA-223	6.735E-02	1.710E-01	1.736E-01	FAIL ABUN
AC-227	-1.963E-02	6.195E-02	6.258E-02	FAIL ABUN
TH-227	-1.963E-02	6.195E-02	6.258E-02	FAIL ABUN
TH-231	6.735E-02	1.710E-01	1.736E-01	FAIL ABUN
PA-233	4.198E-03	1.598E-02	1.609E-02	FAIL ABUN
PA-234	-4.995E-03	5.754E-02	5.758E-02	FAIL ABUN
PA-234M	1.471E+00	1.127E+00	1.307E+00	FAIL ABUN
NP-237	4.198E-03	1.598E-02	1.609E-02	FAIL ABUN
NP-238	3.471E+02	5.785E+02	5.993E+02	SHORT HLIF
NP-239	-4.583E-02	6.462E-02	6.784E-02	FAIL ABUN
PU-239	3.022E+02	1.490E+02	2.019E+02	FAIL ABUN
AM-241	6.348E-03	4.704E-02	4.712E-02	NOT IDENT.
CM-243	1.622E-02	3.543E-02	3.618E-02	FAIL ABUN
BK-247	1.144E-02	2.255E-02	2.314E-02	FAIL ABUN
CM-247	1.046E-03	9.683E-03	9.694E-03	FAIL ABUN
CF-249	-5.182E-04	1.094E-02	1.095E-02	NOT IDENT.
CF-251	-2.847E-02	3.470E-02	3.700E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1299.4744	87.09	1723.2709	136.47	1621.9353
45.60	1243.3740	87.57	1726.0687	140.51	0.0000
46.54	1287.4618	88.03	1728.7494	143.76	1630.1613
49.72	1201.6241	88.34	1730.5454	144.24	1512.6731
51.35	1276.3398	88.47	1731.3036	145.44	1521.8757
51.87	1267.9613	89.96	1739.9050	152.43	1654.6665
52.39	1296.5743	1093.63	1468.1563	153.25	1681.9030
52.97	1294.4366	91.11	1470.4131	323.87	1744.5558
53.44	1266.9828	92.59	1649.5815	156.02	1607.9504
54.07	1281.9742	93.35	1692.2836	158.56	1546.2573
57.36	0.0000	94.56	1453.0122	159.00	1580.0276
57.53	1347.5122	94.65	1453.4280	162.33	1576.9089
57.98	1325.2345	94.67	1453.5171	162.66	1577.9824
59.27	1387.1460	94.87	1454.4380	163.33	1533.9941
59.32	1387.4659	97.43	1509.3298	165.86	1562.3667
59.54	1388.8596	98.43	1539.6796	176.31	1594.6072
60.96	1422.8207	98.44	1539.7339	176.60	1588.2040
61.17	1424.1609	99.53	1448.3497	177.52	1611.4196
62.93	1524.2474	100.11	1432.1769	181.07	0.0000
63.29	1526.6428	102.03	1377.8430	181.52	1485.3362
63.58	1528.5697	103.18	1397.8846	184.41	1493.2885
64.28	1610.6622	103.37	1398.6779	143.76	1602.1022
66.73	1618.0353	105.21	1500.8204	193.51	1609.3611
67.24	1644.4741	105.31	1501.2585	197.03	1621.0728
125.81	1708.4380	106.12	1567.6648	198.01	1564.7454
67.75	1708.9286	106.47	1573.8934	201.83	1539.9664
69.67	1854.9000	109.28	1446.1672	203.43	1555.6124
70.83	1729.0586	111.00	1547.7402	205.31	1526.0472
72.81	1875.3938	111.76	1585.5770	210.85	1502.9757
72.87	1897.9724	114.06	1444.9375	215.65	1551.2104
74.66	1763.4965	116.30	1482.3530	222.11	1525.8369
74.82	1764.5686	116.74	1542.4896	227.09	1498.9866
74.97	1765.5828	119.76	1469.2806	227.38	1501.6410
77.11	1779.8972	121.12	1511.0178	228.16	1494.4915
78.74	1629.4219	121.22	1493.1499	228.18	1494.5374
79.69	1620.8973	121.78	1540.5028	116.74	1494.5374
80.12	1535.2954	122.06	1573.9136	235.69	1461.1241
80.19	1535.6827	122.92	1563.3750	235.96	1461.7115
80.57	1626.0728	123.07	1563.9792	238.63	1344.4855
81.00	1611.4777	265.00	1581.5607	238.98	0.0000
81.07	1611.8828	125.81	1444.4818	240.99	1349.1566
81.75	1632.9645	127.23	1585.4260	242.00	1351.1470
83.79	1703.8118	127.91	1563.5404	244.70	1356.4579
84.00	1705.0573	129.30	1651.1400	252.40	1250.8816
85.43	1713.5322	131.20	1586.1621	252.80	1312.4122
86.55	1720.1119	133.02	1593.1641	254.15	0.0000
86.79	1721.5109	133.52	1570.1598	256.23	1301.1001
86.94	1722.3954	136.00	1582.2461	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	1187.1100	355.39	0.0000	584.27	618.1005
264.80	1210.8130	356.01	1010.4842	595.83	741.8913
265.00	1211.1479	364.49	977.2889	427.87	676.6593
268.22	1285.4576	366.42	0.0000	602.52	0.0000
269.46	1193.0969	372.51	988.1270	604.72	801.5991
270.03	1258.1697	375.05	977.3176	607.14	799.5868
271.23	1302.4580	377.52	912.8796	609.32	733.1794
273.65	1327.8429	356.01	964.7200	610.33	733.6625
276.40	1328.3613	388.16	942.7239	614.28	646.9176
277.37	1301.0492	388.63	960.5297	618.01	633.8358
277.60	1261.1434	391.69	993.3864	620.36	633.3409
278.00	1261.7932	264.66	971.6311	621.93	645.5621
279.20	1138.3462	401.81	985.3963	630.19	0.0000
279.54	1157.6436	402.40	1043.3203	631.29	577.5684
279.70	1157.8915	404.85	1047.3632	633.25	567.5917
280.46	1215.5110	410.95	974.4349	634.78	581.7579
283.69	1213.3923	413.71	1037.8619	635.95	586.0780
284.31	1243.0140	414.70	971.1933	636.99	565.0256
285.41	1201.6890	423.72	906.6809	645.85	592.6297
285.90	0.0000	427.09	975.4523	657.76	539.5920
287.50	1144.3976	427.87	1012.1724	657.90	0.0000
290.67	1153.2944	433.94	959.2471	661.66	567.7172
293.27	0.0000	439.40	966.8647	664.57	0.0000
351.93	1079.5778	453.88	960.5111	666.33	516.8912
295.96	1056.1208	463.37	928.9490	666.50	482.9248
879.38	1094.5282	468.07	991.2687	667.71	0.0000
299.98	1087.6338	473.00	919.6859	677.62	463.3109
300.09	1087.7700	475.06	947.2708	685.70	491.8917
300.13	1087.8306	476.78	933.9814	695.00	586.2032
301.36	1101.7505	477.60	957.5776	696.49	581.5195
302.85	1077.3202	482.18	903.4690	696.51	592.2884
256.23	1081.2206	487.02	794.3813	697.00	609.9598
304.85	1081.6696	492.35	0.0000	697.30	609.6664
306.78	1114.2356	497.08	760.3946	697.49	610.9401
308.46	1084.3453	505.52	763.2398	702.65	618.0295
311.90	1074.2874	507.63	0.0000	706.68	551.4070
316.51	1089.0175	511.00	772.8702	711.68	540.7553
319.41	1078.0896	514.00	691.1907	720.70	494.8081
320.08	1127.1868	514.00	691.1907	721.93	0.0000
321.04	1125.0558	520.40	718.6821	722.78	472.5513
323.87	1061.4131	520.69	0.0000	722.91	472.5888
325.23	1096.1768	522.65	0.0000	723.31	470.9348
328.76	1145.8983	527.90	0.0000	724.19	479.9495
333.37	1103.1649	528.26	712.3430	727.33	476.6781
333.97	1117.5883	529.59	742.3957	733.00	445.2012
334.37	1107.4333	529.87	0.0000	735.93	427.3334
338.28	1108.2303	531.02	719.2409	333.97	454.1800
338.32	1108.2747	537.26	694.1127	739.50	0.0000
311.90	1068.9261	546.56	0.0000	747.24	429.0879
340.48	1068.9261	552.55	662.1699	748.06	420.3750
340.55	1069.0114	563.25	677.0086	752.31	392.7727
344.28	1021.0459	569.33	665.3367	753.82	428.3759
345.93	1049.0437	946.00	665.4238	756.73	470.6519
351.06	1012.0442	569.70	665.5110	756.80	470.6702
351.93	1012.9747	583.19	642.5081	884.68	445.1619

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	456.7517	1274.44	273.4189	1620.50	127.4693
766.42	460.4911	1001.03	282.7425	1621.92	195.2952
766.84	465.9958	1002.74	295.2458	1678.03	0.0000
772.60	0.0000	1004.73	320.1163	1690.97	142.3088
776.52	444.8626	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	127.0799
778.90	513.3098	1028.54	0.0000	1063.66	125.2720
783.70	455.3003	1037.84	323.9447	1771.35	121.3282
785.37	408.0050	1038.76	0.0000	1791.20	0.0000
792.07	497.6785	631.29	325.0871	1808.65	96.3385
794.95	421.7329	1048.07	322.2070	1810.72	0.0000
795.86	440.1999	1049.04	321.3046	1836.06	121.8170
810.06	342.1915	1050.41	324.5513		
810.29	342.2304	1063.66	315.9620		
344.28	340.4163	1077.00	295.8851		
810.76	340.4679	1077.34	291.7862		
815.77	411.1288	1085.87	346.7324		
1048.07	369.6573	1093.63	313.4087		
832.01	436.1461	1099.45	336.0156		
834.85	404.1580	1112.07	324.7773		
835.71	401.0713	1112.84	301.0137		
836.80	0.0000	1115.54	301.3140		
846.75	0.0000	1120.29	350.7134		
846.77	438.3582	1120.55	350.7483		
856.80	344.2364	1221.41	335.1071		
860.56	356.4053	1129.67	349.7073		
871.09	340.4969	1131.51	0.0000		
873.19	331.9824	1147.95	0.0000		
875.33	0.0000	1173.23	321.8347		
879.38	405.2438	1177.95	358.0944		
880.51	389.2789	1189.05	337.8101		
883.24	349.7457	1204.77	346.3200		
884.68	338.5389	1221.41	317.8839		
889.28	379.3945	1231.02	359.1648		
894.76	358.3210	1235.36	383.5693		
898.04	409.7097	1238.28	346.4062		
900.72	377.7126	1260.41	0.0000		
903.28	398.9105	1271.87	249.4942		
911.20	370.6674	1274.44	306.0599		
912.08	331.2225	1274.54	306.0695		
923.98	0.0000	1291.59	275.5541		
926.50	367.3872	1298.22	0.0000		
929.11	326.9414	1312.11	237.0726		
937.49	384.5558	1332.49	244.5653		
944.13	349.6849	1362.66	0.0000		
946.00	338.2076	1365.19	200.0793		
949.00	310.1808	1368.63	0.0000		
667.71	0.0000	1384.29	193.2188		
962.31	349.4874	1408.01	256.4513		
964.08	349.7528	1457.56	0.0000		
966.17	350.0676	1460.82	193.5881		
911.20	350.4874	1489.16	202.4506		
968.97	350.4874	1505.03	220.6394		
983.53	303.8458	1584.12	156.9346		
984.45	0.0000	1596.21	51.3413		

VAX/VMS Nuclide Identification Report Generated 17-JUN-2016 03:42:03.82

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656002.CNF;2
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM22.CNF;464
Background date  : 12-JUN-2016 11:27:01
Sample date     : 17-MAY-2016 10:25:00 Acquisition date : 16-JUN-2016 15:23:55
Sample ID       : G398656002 Sample quantity : 1.75160E+02 GRAM
Detector name   : GAM22 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.72 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572234 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.72*	113	1645	2.05	93.71	89	10	2.61E-03	80.9	
2	0	53.84*	89	1437	1.78	107.96	104	8	2.06E-03	83.7	
3	0	63.41*	141	1980	1.54	127.10	123	9	3.25E-03	67.3	
4	3	74.78*	1309	2375	1.67	149.83	142	24	3.03E-02	8.3	2.05E+00
5	3	77.14*	1871	1805	1.33	154.55	142	24	4.33E-02	5.1	
6	3	84.27*	309	1578	1.59	168.81	165	29	7.15E-03	26.2	1.53E+00
7	3	87.30	960	1730	1.44	174.88	165	29	2.22E-02	8.6	
8	3	89.96	616	1507	1.41	180.19	165	29	1.43E-02	12.1	
9	3	92.74*	497	1827	1.67	185.75	165	29	1.15E-02	23.1	
10	0	105.35	264	1451	1.43	210.96	207	9	6.10E-03	26.8	
11	0	109.09	64	975	1.25	218.46	215	6	1.48E-03	78.1	
12	0	128.86	306	1852	1.34	257.99	253	11	7.07E-03	27.9	
13	0	140.44*	50	1498	2.47	281.15	276	9	1.15E-03	157.1	
14	0	144.23*	11	1505	0.82	288.73	285	9	2.58E-04	736.4	
15	0	153.73	109	1156	1.83	307.74	305	7	2.52E-03	52.6	
16	0	185.75*	419	1832	1.67	371.76	366	12	9.70E-03	24.9	
17	0	198.57*	19	992	0.90	397.41	395	7	4.44E-04	329.1	
18	0	209.29	380	1274	1.51	418.85	415	9	8.80E-03	17.7	
19	2	238.66*	4494	1135	1.52	477.59	471	18	1.04E-01	2.4	1.16E+00
20	2	241.59	1020	1271	1.81	483.43	471	18	2.36E-02	9.1	
21	0	270.28	376	1281	2.19	540.82	534	13	8.71E-03	20.3	
22	0	278.21	180	1028	1.03	556.69	552	11	4.17E-03	35.3	
23	2	295.21	1466	892	1.60	590.68	584	22	3.39E-02	4.6	1.46E+00
24	2	299.98	304	825	1.50	600.22	584	22	7.04E-03	17.7	
25	0	327.78	243	857	1.78	655.82	651	10	5.63E-03	23.4	
26	0	338.24*	936	1095	1.65	676.73	671	13	2.17E-02	8.8	
27	0	351.78*	2348	1306	1.71	703.83	694	19	5.44E-02	4.5	
28	0	409.85	85	664	1.48	819.95	815	10	1.98E-03	57.4	
29	0	462.78	326	721	1.85	925.81	919	15	7.55E-03	18.8	
30	0	510.72*	471	1108	2.75	1021.70	1012	23	1.09E-02	24.3	
31	0	583.02*	1564	742	1.90	1166.28	1157	18	3.62E-02	5.6	
32	0	609.10	1975	684	2.05	1218.45	1210	16	4.57E-02	3.7	
33	0	659.35	27	447	0.92	1318.94	1315	13	6.14E-04	166.1	
34	0	727.41	383	574	1.70	1455.06	1446	17	8.87E-03	15.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	756.31	39	353	2.47	1512.86	1504	13	9.12E-04	100.1	
36	0	766.69	213	553	3.05	1533.62	1525	17	4.93E-03	26.2	
37	0	794.72	163	336	1.86	1589.67	1584	12	3.77E-03	23.8	
38	0	804.91	111	520	5.19	1610.07	1598	19	2.57E-03	50.4	
39	0	809.96	63	218	0.83	1620.17	1617	10	1.46E-03	45.5	
40	0	860.57	241	399	2.56	1721.39	1714	16	5.58E-03	19.8	
41	0	893.53	31	229	1.20	1787.30	1783	10	7.24E-04	93.1	
42	0	910.79*	1193	556	2.58	1821.83	1811	25	2.76E-02	6.5	
43	1	964.46	264	330	2.80	1929.16	1920	26	6.11E-03	18.1	1.28E+00
44	1	968.79*	724	256	2.53	1937.82	1920	26	1.67E-02	7.3	
45	1	999.88*	40	263	2.58	2000.00	1986	25	9.27E-04	119.4	1.72E+00
46	1	1002.88	64	196	2.58	2006.00	1986	25	1.48E-03	45.2	
47	0	1013.60	15	253	3.23	2027.45	2016	13	3.42E-04	224.0	
48	0	1025.78	10	292	3.33	2051.80	2048	16	2.23E-04	400.3	
49	0	1048.84	161	466	13.04	2097.93	2084	30	3.74E-03	39.7	
50	0	1094.07	22	226	0.94	2188.39	2183	11	5.02E-04	138.1	
51	0	1119.66	460	325	2.96	2239.56	2232	16	1.06E-02	9.9	
52	0	1237.56	264	314	1.90	2475.37	2465	20	6.11E-03	17.6	
53	0	1317.05	48	221	6.72	2634.35	2623	19	1.11E-03	76.1	
54	0	1335.06*	18	138	3.62	2670.37	2663	15	4.25E-04	168.9	
55	0	1376.83	204	184	3.98	2753.93	2742	23	4.73E-03	18.6	
56	0	1460.07*	3197	237	3.46	2920.40	2906	27	7.40E-02	2.4	
57	0	1495.73	50	143	2.39	2991.73	2984	15	1.16E-03	53.9	
58	0	1509.10	105	122	3.47	3018.47	3010	20	2.44E-03	27.3	
59	0	1588.45	25	224	1.61	3177.16	3167	16	5.79E-04	116.4	
60	0	1621.01	39	114	1.94	3242.28	3233	16	9.00E-04	55.1	
61	0	1678.13	22	68	1.99	3356.54	3350	12	5.18E-04	67.1	
62	0	1729.08	114	124	2.36	3458.43	3446	20	2.64E-03	22.3	
63	0	1763.90	421	160	2.84	3528.09	3516	26	9.75E-03	8.5	
64	0	1847.81	42	86	2.84	3695.90	3687	16	9.66E-04	45.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 17-JUN-2016 03:42:05

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656002.CNF;2
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:25:00 Acquisition date : 16-JUN-2016 15:23:55
Sample ID         : G398656002 Sample quantity  : 175.16 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA22 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:05.72 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated : No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PA-234M	766.42	NB-95	765.81
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.909E+00	5.499E+00	5.499E+00	4.77	OK
CO-58	810.76	99.45*	3.081E+00	7.858E-03	1.059E-02	91.01	OK
AS-73	53.44	10.30*	2.057E+00	2.208E-01	2.872E-01	167.37	OK
NB-95	765.81	99.81*	3.225E+00	2.321E-02	3.228E-02	61.73	OK
CD-109	88.03	3.70*	7.016E+00	1.326E+00	1.388E+00	24.19	OK
TE-125M	109.28	0.27*	8.196E+00	1.416E+00	2.045E+00	156.17	OK
SN-126	64.28	9.60	3.749E+00	2.023E-01	2.023E-01	134.67	OK
	86.94	8.90	7.016E+00	5.513E-01	5.513E-01	24.19	OK
	87.57	37.00*	7.016E+00	1.326E-01	1.326E-01	24.19	OK
EU-155	86.55	30.70	7.016E+00	1.598E-01	1.618E-01	24.19	OK
	105.31	21.10*	8.084E+00	7.584E-02	7.677E-02	53.66	OK
HG-203	70.83	3.69	4.992E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	5.303E+00	----- Line	Not Found	-----	Absent
	279.20	81.56*	6.280E+00	3.170E-04	4.988E-04	3479.07	OK
TL-208	277.37	6.60	6.290E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	3.986E+00	1.843E-01	1.843E-01	11.25	OK
	860.56	12.50	2.927E+00	2.493E-01	2.493E-01	39.53	OK
PB-210	46.54	4.25*	9.875E-01	1.435E+00	1.438E+00	161.79	OK
BI-212	727.33	6.67*	3.366E+00	6.614E-01	6.614E-01	30.48	OK
	785.37	1.10	3.162E+00	----- Line	Not Found	-----	Absent
	1620.50	1.47	1.801E+00	5.056E-01	5.056E-01	110.21	OK
PB-212	74.82	10.28	5.579E+00	8.407E-01	8.407E-01	23.33	OK
	77.11	17.10	5.899E+00	9.413E-01	9.413E-01	10.24	OK
	238.63	43.60*	6.806E+00	6.770E-01	6.770E-01	4.84	OK
	300.09	3.30	6.027E+00	6.646E-01	6.646E-01	35.37	OK
BI-214	609.32	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44	OK
	1120.29	14.92	2.335E+00	4.806E-01	4.806E-01	19.84	OK
	1764.49	15.30	1.745E+00	5.361E-01	5.361E-01	16.97	OK
PB-214	74.82	5.80	5.585E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.899E+00	1.659E+00	1.660E+00	10.24	OK
	87.09	3.41	6.996E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	6.758E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	6.080E+00	5.700E-01	5.701E-01	9.26	OK
	351.93	35.60*	5.510E+00	5.103E-01	5.103E-01	8.98	OK
RN-222	609.32	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44	OK
	1120.29	14.92	2.335E+00	4.806E-01	4.806E-01	19.84	OK
	1764.49	15.30	1.745E+00	5.361E-01	5.361E-01	16.97	OK
RA-224	240.99	4.10*	6.764E+00	6.338E-01	6.338E-01	49.53	OK
RA-226	609.32	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44	OK
	1120.29	14.92	2.335E+00	4.806E-01	4.806E-01	19.84	OK
	1764.49	15.30	1.745E+00	5.361E-01	5.361E-01	16.97	OK
AC-228	105.21	1.10	8.084E+00	1.455E+00	1.455E+00	53.66	OK
	338.32	11.27	5.635E+00	6.312E-01	6.312E-01	17.51	OK
	794.95	4.25	3.131E+00	4.687E-01	4.687E-01	47.63	OK
	835.71	1.61	3.001E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.789E+00	6.222E-01	6.222E-01	13.09	OK
	968.97	15.80	2.644E+00	6.442E-01	6.442E-01	14.68	OK
RA-228	105.21	1.10	8.084E+00	1.455E+00	1.455E+00	53.66	OK
	338.32	11.27	5.635E+00	6.312E-01	6.312E-01	17.51	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	794.95	4.25	3.131E+00	4.687E-01	4.687E-01	47.63	OK
	835.71	1.61	3.001E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.789E+00	6.222E-01	6.222E-01	13.09	OK
	968.97	15.80	2.644E+00	6.442E-01	6.442E-01	14.68	OK
TH-228	74.82	10.28	5.579E+00	8.407E-01	8.407E-01	23.33	OK
	77.11	17.10	5.899E+00	9.413E-01	9.413E-01	10.24	OK
	238.63	43.60*	6.806E+00	6.770E-01	6.770E-01	4.84	OK
	300.09	3.30	6.027E+00	6.646E-01	6.646E-01	35.37	OK
TH-229	85.43	14.70	6.726E+00	1.570E-01	1.570E-01	52.40	OK
	88.47	24.00	7.016E+00	2.044E-01	2.045E-01	24.19	OK
	193.51	4.41*	7.524E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	7.235E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44	OK
	1120.29	14.92	2.335E+00	4.806E-01	4.806E-01	19.84	OK
	1764.49	15.30	1.745E+00	5.361E-01	5.361E-01	16.97	OK
PA-231	283.69	1.70	6.214E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	6.027E+00	4.100E-01	4.100E-01	35.37	OK
TH-232	105.21	1.10	8.084E+00	1.455E+00	1.455E+00	53.66	OK
	338.32	11.27	5.635E+00	6.312E-01	6.312E-01	17.51	OK
	835.71	1.61	3.001E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.789E+00	6.222E-01	6.222E-01	13.09	OK
	968.97	15.80	2.644E+00	6.442E-01	6.442E-01	14.68	OK
PA-234M	766.42	0.32	3.226E+00	----- Line	Not Found	-----	<<INT Reject
	1001.03	0.84*	2.573E+00	6.863E-01	6.863E-01	238.77	OK
TH-234	63.29	3.70*	3.749E+00	5.249E-01	5.249E-01	134.67	OK
	92.59	4.23	7.446E+00	7.860E-01	7.860E-01	46.16	OK
U-234	609.32	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44	OK
	1120.29	14.92	2.335E+00	4.806E-01	4.806E-01	19.84	OK
	1764.49	15.30	1.745E+00	5.361E-01	5.361E-01	16.97	OK
U-235	89.96	3.47	7.239E+00	1.224E+00	1.224E+00	24.11	OK
	93.35	5.60	7.446E+00	5.937E-01	5.937E-01	46.16	OK
	143.76	10.96*	8.300E+00	5.796E-03	5.796E-03	1472.89	OK
	163.33	5.08	8.034E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	7.657E+00	4.406E-02	4.406E-02	49.75	OK
	205.31	5.01	7.326E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	3.749E+00	5.249E-01	5.249E-01	134.67	OK
	92.59	4.23	7.446E+00	7.860E-01	7.860E-01	46.16	OK
AM-243	43.53	5.90	6.275E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.579E+00	1.286E-01	1.286E-01	23.33	OK
ANH-511	511.00	100.00*	4.372E+00	4.376E-02	4.376E-02	48.51	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656002.CNF;2
Acquisition date : 16-JUN-2016 15:23:55 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.72 Half life ratio : *****
Sample date : 17-MAY-2016 10:25:00 Analyst initials: MXR1
Sample ID : G398656002 Sample Quantity : 1.7516E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.499E+00	2.573E-01	1.179E-01
CO-58	1.059E-02	9.441E-03	1.581E-02
AS-73	2.872E-01	4.710E-01	4.365E-01
NB-95	3.228E-02	1.953E-02	1.684E-02
CD-109	1.388E+00	3.291E-01	2.932E-01
TE-125M	2.045E+00	3.130E+00	4.780E+00
SN-126	1.326E-01	3.143E-02	2.816E-02
EU-155	7.677E-02	4.037E-02	4.149E-02
HG-203	4.988E-04	1.701E-02	1.756E-02
TL-208	1.843E-01	2.031E-02	1.239E-02
PB-210	1.438E+00	2.281E+00	1.616E+00
BI-212	6.614E-01	1.976E-01	1.682E-01
PB-212	6.770E-01	3.213E-02	2.130E-02
BI-214	4.462E-01	3.253E-02	2.540E-02
PB-214	5.103E-01	4.490E-02	2.618E-02
RN-222	4.462E-01	3.253E-02	2.540E-02
RA-224	6.338E-01	3.076E-01	2.279E-01
RA-226	4.462E-01	3.253E-02	2.540E-02
AC-228	6.222E-01	7.985E-02	4.589E-02
RA-228	6.222E-01	7.985E-02	4.589E-02
TH-228	6.770E-01	3.213E-02	2.130E-02
TH-229	-5.133E-02	1.211E-01	2.056E-01
TH-230	4.462E-01	3.253E-02	2.540E-02
PA-231	4.100E-01	1.421E-01	1.757E-01
TH-232	6.222E-01	7.985E-02	4.589E-02
PA-234M	6.863E-01	1.606E+00	1.352E+00
TH-234	5.249E-01	6.928E-01	5.546E-01
U-234	4.462E-01	3.253E-02	2.540E-02
U-235	5.796E-03	8.367E-02	7.722E-02
U-238	5.249E-01	6.928E-01	5.546E-01
AM-243	1.286E-01	2.940E-02	2.197E-02
ANH-511	4.376E-02	2.081E-02	1.023E-02

---- Non-Identified Nuclides ----

Key-Line
Activity K.L. Cnt Uncert MDA

Nuclide	(pCi/GRAM)	(1.96-sigma)	(pCi/GRAM)	
BE-7	5.899E-02	7.521E-02	1.391E-01	NOT IDENT.
NA-22	-8.276E-07	8.419E-03	1.469E-02	NOT IDENT.
NA-24	0.000E+00	3.612E+12	0.000E+00	SHORT HLIF
AL-26	2.431E-03	5.672E-03	1.051E-02	NOT IDENT.
SC-46	5.539E-03	1.041E-02	1.600E-02	FAIL ABUN
V-48	2.073E-02	2.472E-02	4.591E-02	NOT IDENT.
CR-51	9.039E-02	1.144E-01	2.040E-01	NOT IDENT.
MN-54	2.148E-03	7.869E-03	1.402E-02	NOT IDENT.
CO-56	2.182E-03	9.531E-03	1.694E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-5.134E-04	5.875E-03	1.052E-02	NOT IDENT.
FE-59	-1.469E-02	2.495E-02	3.633E-02	NOT IDENT.
CO-60	1.126E-03	8.675E-03	1.332E-02	NOT IDENT.
ZN-65	0.000E+00	2.151E-02	3.658E-02	NOT IDENT.
GE-68	1.587E-01	2.435E-01	4.442E-01	NOT IDENT.
AS-74	-1.040E-02	3.474E-02	6.075E-02	NOT IDENT.
SE-75	-3.092E-03	1.163E-02	1.827E-02	FAIL ABUN
BR-77	0.000E+00	4.367E+02	0.000E+00	SHORT HLIF
SR-82	-1.057E-01	1.064E-01	1.710E-01	NOT IDENT.
RB-83	1.907E-02	1.789E-02	2.874E-02	NOT IDENT.
KR-85	0.000E+00	1.743E+00	3.711E+00	NOT IDENT.
SR-85	0.000E+00	1.085E-02	2.309E-02	NOT IDENT.
RB-86	2.271E-01	2.585E-01	4.757E-01	NOT IDENT.
Y-88	-3.557E-03	8.106E-03	1.277E-02	NOT IDENT.
Y-91	-1.438E+00	4.766E+00	8.260E+00	NOT IDENT.
NB-94	2.005E-03	6.621E-03	1.203E-02	NOT IDENT.
NB-95M	0.000E+00	3.861E-02	7.284E-02	NOT IDENT.
ZR-95	1.190E-02	2.334E-02	2.917E-02	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.618E+12	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.125E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	3.244E+34	0.000E+00	SHORT HLIF
RH-101	0.000E+00	7.867E-03	1.344E-02	FAIL ABUN
RH-102	3.207E-03	1.059E-02	1.949E-02	FAIL ABUN
RU-103	2.309E-04	1.037E-02	1.869E-02	FAIL ABUN
RH-106	-1.565E-02	6.370E-02	1.155E-01	NOT IDENT.
RU-106	-1.565E-02	6.370E-02	1.155E-01	NOT IDENT.
AG-108M	-4.306E-03	5.760E-03	1.032E-02	NOT IDENT.
AG-110M	1.314E-03	1.050E-02	1.783E-02	NOT IDENT.
SN-113	5.425E-03	9.466E-03	1.770E-02	NOT IDENT.
CD-115	0.000E+00	2.595E+02	0.000E+00	SHORT HLIF
SN-117M	-1.936E-02	3.041E-02	4.725E-02	NOT IDENT.
TE-123M	-6.488E-03	7.483E-03	1.225E-02	NOT IDENT.
SB-124	-1.537E-02	1.893E-02	3.169E-02	NOT IDENT.
SB-125	1.363E-02	1.775E-02	3.310E-02	FAIL ABUN
I-126	1.120E-01	1.089E-01	1.765E-01	NOT IDENT.
SB-126	4.808E-04	7.851E-02	1.205E-01	NOT IDENT.
SB-127	-8.718E-01	3.862E+00	6.943E+00	NOT IDENT.
I-131	4.070E-02	8.624E-02	1.619E-01	NOT IDENT.
I-132	0.000E+00	1.433E+41	0.000E+00	SHORT HLIF
TE-132	1.201E-01	4.261E+00	7.908E+00	NOT IDENT.
BA-133	6.605E-03	9.555E-03	1.569E-02	NOT IDENT.
I-133	0.000E+00	2.362E+08	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.119E-02	1.622E-02	FAIL ABUN
CS-135	0.000E+00	3.758E-02	6.387E-02	NOT IDENT.
I-135	0.000E+00	7.365E+31	0.000E+00	SHORT HLIF
CS-136	0.000E+00	1.164E-01	7.930E-02	FAIL ABUN
BA-137M	-1.646E-03	7.962E-03	1.225E-02	NOT IDENT.
CS-137	-1.739E-03	8.412E-03	1.294E-02	NOT IDENT.
CE-139	-8.338E-04	6.602E-03	1.259E-02	NOT IDENT.
BA-140	-2.567E-02	1.189E-01	2.112E-01	NOT IDENT.
LA-140	9.999E-03	4.364E-02	6.640E-02	FAIL ABUN
CE-141	2.518E-03	3.635E-02	3.568E-02	FAIL ABUN
CE-143	0.000E+00	7.607E+04	0.000E+00	SHORT HLIF
CE-144	1.809E-02	5.469E-02	8.268E-02	NOT IDENT.
PM-144	0.000E+00	6.871E-03	1.307E-02	NOT IDENT.
PR-144	0.000E+00	5.185E-01	9.862E-01	NOT IDENT.
PM-146	3.880E-03	8.828E-03	1.550E-02	NOT IDENT.
ND-147	-7.390E-02	2.851E-01	5.063E-01	FAIL ABUN
PM-147	4.040E+01	1.600E+02	2.989E+02	NOT IDENT.
PM-149	0.000E+00	2.332E+03	0.000E+00	SHORT HLIF
EU-150	-3.732E-03	8.532E-03	1.001E-02	FAIL ABUN
EU-152	-1.953E-02	3.646E-02	3.559E-02	FAIL ABUN
GD-153	7.887E-03	2.159E-02	3.619E-02	NOT IDENT.
EU-154	-9.966E-05	2.366E-02	4.129E-02	FAIL ABUN
TB-160	-2.019E-02	3.005E-02	5.163E-02	FAIL ABUN

HO-166M	-7.055E-04	1.210E-02	2.173E-02	FAIL ABUN
TM-171	4.986E+00	8.178E+00	8.470E+00	FAIL ABUN
HF-172	2.402E-02	4.723E-02	7.755E-02	FAIL ABUN
LU-172	5.452E-03	1.476E-02	2.307E-02	FAIL ABUN
LU-176	-4.883E-04	5.851E-03	9.918E-03	FAIL ABUN
HF-181	-2.131E-03	1.099E-02	1.976E-02	NOT IDENT.
TA-182	-1.331E-03	3.903E-02	6.819E-02	FAIL ABUN
RE-183	-5.075E-02	6.980E-02	1.005E-01	NOT IDENT.
RE-184	6.222E-03	4.066E-02	5.850E-02	FAIL ABUN
W-188	2.226E-01	1.969E+00	3.098E+00	FAIL ABUN
IR-192	-7.896E-03	8.225E-03	1.446E-02	FAIL ABUN
BI-207	1.568E-02	9.963E-03	1.826E-02	FAIL ABUN
BI-211	0.000E+00	1.237E-01	1.425E-01	FAIL ABUN
PB-211	-6.680E-02	1.637E-01	2.553E-01	NOT IDENT.
RN-219	1.115E-02	8.348E-02	1.471E-01	FAIL ABUN
RA-223	-3.621E-02	1.566E-01	2.402E-01	FAIL ABUN
AC-227	2.911E-02	5.288E-02	9.820E-02	FAIL ABUN
TH-227	2.911E-02	5.288E-02	9.820E-02	FAIL ABUN
TH-231	-3.621E-02	1.566E-01	2.402E-01	FAIL ABUN
PA-233	1.084E-02	1.312E-02	2.412E-02	FAIL ABUN
PA-234	4.116E-03	5.510E-02	9.989E-02	NOT IDENT.
NP-237	1.084E-02	1.312E-02	2.412E-02	FAIL ABUN
NP-238	0.000E+00	5.569E+02	0.000E+00	SHORT HLIF
NP-239	-5.249E-03	5.765E-02	1.074E-01	FAIL ABUN
PU-239	0.000E+00	1.511E+02	1.443E+02	FAIL ABUN
AM-241	1.037E-02	3.792E-02	6.632E-02	NOT IDENT.
CM-243	-3.298E-02	2.701E-02	4.328E-02	FAIL ABUN
BK-247	1.202E-03	1.893E-02	3.005E-02	FAIL ABUN
CM-247	4.417E-04	7.923E-03	1.353E-02	FAIL ABUN
CF-249	-5.063E-03	7.720E-03	1.403E-02	NOT IDENT.
CF-251	1.310E-02	2.720E-02	5.206E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	3132	10.66*	1.909E+00	5.499E+00	5.499E+00	4.77
CO-58	810.76	67	99.45*	3.081E+00	7.858E-03	1.059E-02	91.01
AS-73	53.44	131	10.30*	2.057E+00	2.208E-01	2.872E-01	167.37
NB-95	765.81	229	99.81*	3.225E+00	2.541E-02	3.534E-02	52.46
CD-109	88.03	1346	3.70*	7.016E+00	1.852E+00	1.938E+00	17.12
TE-125M	109.28	88	0.27*	8.196E+00	1.416E+00	2.045E+00	156.17
SN-126	64.28	204	9.60	3.749E+00	2.023E-01	2.023E-01	134.67
	86.94	1346	8.90	7.016E+00	7.697E-01	7.697E-01	17.12
	87.57	1346	37.00*	7.016E+00	1.852E-01	1.852E-01	17.12
CE-141	145.44	15	48.29*	8.300E+00	1.316E-03	2.518E-03	1472.89
EU-155	86.55	1346	30.70	7.016E+00	2.231E-01	2.259E-01	17.12
	105.31	362	21.10*	8.084E+00	7.584E-02	7.677E-02	53.66
HG-203	70.83	-----	3.69	4.992E+00	-----	Line Not Found	-----
	72.87	-----	6.19	5.303E+00	-----	Line Not Found	-----
	279.20	222	81.56*	6.280E+00	1.545E-02	2.431E-02	70.59
TL-208	277.37	222	6.60	6.280E+00	1.909E-01	1.909E-01	70.59
	583.19	1748	85.00*	3.986E+00	1.843E-01	1.843E-01	11.25
	860.56	255	12.50	2.927E+00	2.493E-01	2.493E-01	39.53
PB-210	46.54	169	4.25*	9.875E-01	1.435E+00	1.438E+00	161.79
BI-211	72.87	-----	1.23	5.303E+00	-----	Line Not Found	-----
	351.06	2802	12.92*	5.510E+00	1.406E+00	1.406E+00	8.98
BI-212	727.33	416	6.67*	3.366E+00	6.614E-01	6.614E-01	30.48
	785.37	-----	1.10	3.162E+00	-----	Line Not Found	-----
	1620.50	37	1.47	1.801E+00	5.056E-01	5.056E-01	110.21
PB-212	74.82	1866	10.28	5.579E+00	1.162E+00	1.162E+00	16.68
	77.11	2659	17.10	5.899E+00	9.413E-01	9.413E-01	10.24
	238.63	5625	43.60*	6.806E+00	6.770E-01	6.770E-01	4.84
	300.09	370	3.30	6.027E+00	6.646E-01	6.646E-01	35.37
BI-214	609.32	2194	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44
	1120.29	469	14.92	2.335E+00	4.806E-01	4.806E-01	19.84
	1764.49	401	15.30	1.745E+00	5.361E-01	5.361E-01	16.97
PB-214	74.82	1866	5.80	5.579E+00	2.060E+00	2.060E+00	16.68
	77.11	2659	9.70	5.899E+00	1.659E+00	1.660E+00	10.24
	87.09	1346	3.41	7.016E+00	2.009E+00	2.009E+00	17.12
	242.00	1275	7.25	6.764E+00	9.285E-01	9.285E-01	18.25
	295.22	1788	18.42	6.080E+00	5.700E-01	5.701E-01	9.26
	351.93	2802	35.60*	5.510E+00	5.103E-01	5.103E-01	8.98
RN-222	609.32	2194	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44
	1120.29	469	14.92	2.335E+00	4.806E-01	4.806E-01	19.84
	1764.49	401	15.30	1.745E+00	5.361E-01	5.361E-01	16.97
RA-224	240.99	1275	4.10*	6.764E+00	1.642E+00	1.642E+00	18.25
RA-226	609.32	2194	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44
	1120.29	469	14.92	2.335E+00	4.806E-01	4.806E-01	19.84
	1764.49	401	15.30	1.745E+00	5.361E-01	5.361E-01	16.97
AC-228	105.21	362	1.10	8.084E+00	1.455E+00	1.455E+00	53.66
	338.32	1122	11.27	5.635E+00	6.312E-01	6.312E-01	17.51
	794.95	175	4.25	3.131E+00	4.687E-01	4.687E-01	47.63

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	835.71	-----	1.61	3.001E+00	-----	Line Not Found	-----
	911.20	1253	25.80*	2.789E+00	6.222E-01	6.222E-01	13.09
	968.97	753	15.80	2.644E+00	6.442E-01	6.442E-01	14.68
	105.21	362	1.10	8.084E+00	1.455E+00	1.455E+00	53.66
	338.32	1122	11.27	5.635E+00	6.312E-01	6.312E-01	17.51
	794.95	175	4.25	3.131E+00	4.687E-01	4.687E-01	47.63
TH-228	835.71	-----	1.61	3.001E+00	-----	Line Not Found	-----
	911.20	1253	25.80*	2.789E+00	6.222E-01	6.222E-01	13.09
	968.97	753	15.80	2.644E+00	6.442E-01	6.442E-01	14.68
	74.82	1866	10.28	5.579E+00	1.162E+00	1.162E+00	16.68
	77.11	2659	17.10	5.899E+00	9.413E-01	9.413E-01	10.24
	238.63	5625	43.60*	6.806E+00	6.770E-01	6.770E-01	4.84
TH-229	300.09	370	3.30	6.027E+00	6.646E-01	6.646E-01	35.37
	85.43	435	14.70	6.726E+00	1.570E-01	1.570E-01	52.40
	88.47	1346	24.00	7.016E+00	2.854E-01	2.854E-01	17.12
	193.51	-----	4.41*	7.524E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	7.235E+00	-----	Line Not Found	-----
	609.32	2194	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44
	1120.29	469	14.92	2.335E+00	4.806E-01	4.806E-01	19.84
	1764.49	401	15.30	1.745E+00	5.361E-01	5.361E-01	16.97
PA-231	283.69	-----	1.70	6.214E+00	-----	Line Not Found	-----
TH-232	301.36	370	5.35*	6.027E+00	4.100E-01	4.100E-01	35.37
	105.21	362	1.10	8.084E+00	1.455E+00	1.455E+00	53.66
	338.32	1122	11.27	5.635E+00	6.312E-01	6.312E-01	17.51
	835.71	-----	1.61	3.001E+00	-----	Line Not Found	-----
PA-234M	911.20	1253	25.80*	2.789E+00	6.222E-01	6.222E-01	13.09
	968.97	753	15.80	2.644E+00	6.442E-01	6.442E-01	14.68
	766.42	229	0.32	3.225E+00	7.927E+00	7.927E+00	52.46
	1001.03	42	0.84*	2.573E+00	6.863E-01	6.863E-01	238.77
TH-234	63.29	204	3.70*	3.749E+00	5.249E-01	5.249E-01	134.67
	92.59	693	4.23	7.446E+00	7.860E-01	7.860E-01	46.16
U-234	609.32	2194	45.49*	3.861E+00	4.462E-01	4.462E-01	7.44
	1120.29	469	14.92	2.335E+00	4.806E-01	4.806E-01	19.84
	1764.49	401	15.30	1.745E+00	5.361E-01	5.361E-01	16.97
	89.96	861	3.47	7.239E+00	1.224E+00	1.224E+00	24.11
U-235	93.35	693	5.60	7.446E+00	5.937E-01	5.937E-01	46.16
	143.76	15	10.96*	8.300E+00	5.796E-03	5.796E-03	1472.89
	163.33	-----	5.08	8.034E+00	-----	Line Not Found	-----
	185.72	540	57.20	7.657E+00	4.406E-02	4.406E-02	49.75
U-238	205.31	-----	5.01	7.326E+00	-----	Line Not Found	-----
	63.29	204	3.70*	3.749E+00	5.249E-01	5.249E-01	134.67
	92.59	693	4.23	7.446E+00	7.860E-01	7.860E-01	46.16
	43.53	-----	5.90	6.275E-01	-----	Line Not Found	-----
AM-243	74.66	1866	67.20*	5.579E+00	1.778E-01	1.778E-01	16.68
ANH-511	511.00	536	100.00*	4.372E+00	4.376E-02	4.376E-02	48.51

Flag: "*" = Keyline

Total number of lines in spectrum 64
Number of unidentified lines 11
Number of lines tentatively identified by NID 53 82.81%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.499E+00	5.499E+00	0.263E+00	4.77	
CO-58	70.86D	1.35	7.858E-03	1.059E-02	0.963E-02	91.01	
AS-73	80.30D	1.30	2.208E-01	2.872E-01	4.806E-01	167.37	
NB-95	64.03D	1.39	2.541E-02	3.534E-02	1.854E-02	52.46	
CD-109	461.40D	1.05	1.852E+00	1.938E+00	0.332E+00	17.12	
TE-125M	57.40D	1.44	1.416E+00	2.045E+00	3.194E+00	156.17	
SN-126	2.30E+05Y	1.00	1.852E-01	1.852E-01	0.317E-01	17.12	
CE-141	32.51D	1.91	1.316E-03	2.518E-03	37.09E-03	1472.89	
EU-155	4.75Y	1.01	7.584E-02	7.677E-02	4.120E-02	53.66	
HG-203	46.59D	1.57	1.545E-02	2.431E-02	1.716E-02	70.59	
TL-208	1.41E+10Y	1.00	1.843E-01	1.843E-01	0.207E-01	11.25	
PB-210	22.20Y	1.00	1.435E+00	1.438E+00	2.327E+00	161.79	
BI-211	7.04E+08Y	1.00	1.406E+00	1.406E+00	0.126E+00	8.98	
BI-212	1.41E+10Y	1.00	6.614E-01	6.614E-01	2.016E-01	30.48	
PB-212	1.41E+10Y	1.00	6.770E-01	6.770E-01	0.328E-01	4.84	
BI-214	1600.00Y	1.00	4.462E-01	4.462E-01	0.332E-01	7.44	
PB-214	1600.00Y	1.00	5.103E-01	5.103E-01	0.458E-01	8.98	
RN-222	1600.00Y	1.00	4.462E-01	4.462E-01	0.332E-01	7.44	
RA-224	1.41E+10Y	1.00	1.642E+00	1.642E+00	0.300E+00	18.25	
RA-226	1600.00Y	1.00	4.462E-01	4.462E-01	0.332E-01	7.44	
AC-228	1.41E+10Y	1.00	6.222E-01	6.222E-01	0.815E-01	13.09	
RA-228	1.41E+10Y	1.00	6.222E-01	6.222E-01	0.815E-01	13.09	
TH-228	1.41E+10Y	1.00	6.770E-01	6.770E-01	0.328E-01	4.84	
TH-229	7340.00Y	1.00	2.854E-01	2.854E-01	0.489E-01	17.12	K
TH-230	7.54E+04Y	1.00	4.462E-01	4.462E-01	0.332E-01	7.44	
PA-231	7.04E+08Y	1.00	4.100E-01	4.100E-01	1.450E-01	35.37	
TH-232	1.41E+10Y	1.00	6.222E-01	6.222E-01	0.815E-01	13.09	
PA-234M	4.47E+09Y	1.00	6.863E-01	6.863E-01	16.39E-01	238.77	
TH-234	4.47E+09Y	1.00	5.249E-01	5.249E-01	7.069E-01	134.67	
U-234	2.45E+05Y	1.00	4.462E-01	4.462E-01	0.332E-01	7.44	
U-235	7.04E+08Y	1.00	5.796E-03	5.796E-03	85.38E-03	1472.89	
U-238	4.47E+09Y	1.00	5.249E-01	5.249E-01	7.069E-01	134.67	
AM-243	7370.00Y	1.00	1.778E-01	1.778E-01	0.297E-01	16.68	
ANH-511	1.00E+09Y	1.00	4.376E-02	4.376E-02	2.123E-02	48.51	
Total Activity :			2.325E+01	2.406E+01			

Grand Total Activity : 2.325E+01 2.406E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	128.86	411	2490	1.34	257.99	253	11	7.07E-03	55.8	8.40E+00	T
0	140.44	66	1994	2.47	281.15	276	9	1.15E-03	****	8.34E+00	T
0	153.73	144	1523	1.83	307.74	305	7	2.52E-03	****	8.18E+00	T
0	198.57	25	1269	0.90	397.41	395	7	4.44E-04	****	7.44E+00	T
0	209.29	483	1619	1.51	418.85	415	9	8.80E-03	35.4	7.26E+00	
0	270.28	464	1579	2.19	540.82	534	13	8.71E-03	40.6	6.38E+00	T
0	327.78	293	1032	1.78	655.82	651	10	5.63E-03	46.8	5.74E+00	T
0	409.85	100	777	1.48	819.95	815	10	1.98E-03	****	5.03E+00	T
0	462.78	376	831	1.85	925.81	919	15	7.55E-03	37.6	4.67E+00	T
0	659.35	29	492	0.92	1318.94	1315	13	6.14E-04	****	3.64E+00	T
0	756.31	42	380	2.47	1512.86	1504	13	9.12E-04	****	3.26E+00	T
0	804.91	119	556	5.19	1610.07	1598	19	2.57E-03	****	3.10E+00	
0	893.53	33	241	1.20	1787.30	1783	10	7.24E-04	****	2.83E+00	T
1	964.46	275	344	2.80	1929.16	1920	26	6.11E-03	36.2	2.65E+00	T
1	1002.88	66	203	2.58	2006.00	1986	25	1.48E-03	90.3	2.57E+00	T
0	1013.60	15	262	3.23	2027.45	2016	13	3.42E-04	****	2.54E+00	
0	1025.78	10	302	3.33	2051.80	2048	16	2.23E-04	****	2.52E+00	T
0	1048.84	166	479	13.04	2097.93	2084	30	3.74E-03	79.4	2.47E+00	T
0	1094.07	22	232	0.94	2188.39	2183	11	5.02E-04	****	2.38E+00	T
0	1237.56	265	315	1.90	2475.37	2465	20	6.11E-03	35.1	2.15E+00	T
0	1317.05	48	220	6.72	2634.35	2623	19	1.11E-03	****	2.05E+00	
0	1335.06	18	137	3.62	2670.37	2663	15	4.25E-04	****	2.03E+00	
0	1376.83	202	182	3.98	2753.93	2742	23	4.73E-03	37.2	1.99E+00	
0	1495.73	49	140	2.39	2991.73	2984	15	1.16E-03	****	1.88E+00	
0	1509.10	103	119	3.47	3018.47	3010	20	2.44E-03	54.7	1.87E+00	
0	1588.45	24	217	1.61	3177.16	3167	16	5.79E-04	****	1.82E+00	
0	1678.13	21	65	1.99	3356.54	3350	12	5.18E-04	****	1.77E+00	T
0	1729.08	109	118	2.36	3458.43	3446	20	2.64E-03	44.6	1.76E+00	
0	1847.81	39	81	2.84	3695.90	3687	16	9.66E-04	91.2	1.73E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656002.CNF;2
Acquisition date : 16-JUN-2016 15:23:55 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.72 Half life ratio : *****
Sample date : 17-MAY-2016 10:25:00 Nuclide Library : SOLID
Sample ID : G398656002 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.7516E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	5.656E-02
CO-58	7.686E-03
AS-73	2.149E-01
NB-95	8.206E-03
CD-109	1.445E-01
TE-125M	2.357E+00
SN-126	1.388E-02
EU-155	2.044E-02
HG-203	8.625E-03
TL-208	6.049E-03
PB-210	7.950E-01
BI-212	8.190E-02
PB-212	1.048E-02
BI-214	1.242E-02
PB-214	1.283E-02
RN-222	1.242E-02
RA-224	1.121E-01
RA-226	1.242E-02
AC-228	2.226E-02
RA-228	2.226E-02
TH-228	1.048E-02
TH-229	1.013E-01
TH-230	1.242E-02
PA-231	8.630E-02
TH-232	2.226E-02
PA-234M	6.535E-01
TH-234	2.735E-01
U-234	1.242E-02
U-235	3.805E-02
U-238	2.735E-01
AM-243	1.085E-02
ANH-511	5.002E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)

BE-7	6.798E-02	NOT IDENT.
NA-22	7.110E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.977E-03	NOT IDENT.
SC-46	7.776E-03	FAIL ABUN
V-48	2.225E-02	NOT IDENT.
CR-51	1.002E-01	NOT IDENT.
MN-54	6.834E-03	NOT IDENT.
CO-56	8.254E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.184E-03	NOT IDENT.
FE-59	1.758E-02	NOT IDENT.
CO-60	6.418E-03	NOT IDENT.
ZN-65	1.785E-02	NOT IDENT.
GE-68	2.153E-01	NOT IDENT.
AS-74	2.968E-02	NOT IDENT.
SE-75	8.975E-03	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	8.314E-02	NOT IDENT.
RB-83	1.404E-02	NOT IDENT.
KR-85	1.829E+00	NOT IDENT.
SR-85	1.138E-02	NOT IDENT.
RB-86	2.306E-01	NOT IDENT.
Y-88	6.041E-03	NOT IDENT.
Y-91	4.008E+00	NOT IDENT.
NB-94	5.871E-03	NOT IDENT.
NB-95M	3.602E-02	NOT IDENT.
ZR-95	1.420E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.631E-03	FAIL ABUN
RH-102	9.508E-03	FAIL ABUN
RU-103	9.135E-03	FAIL ABUN
RH-106	5.639E-02	NOT IDENT.
RU-106	5.639E-02	NOT IDENT.
AG-108M	5.044E-03	NOT IDENT.
AG-110M	8.660E-03	NOT IDENT.
SN-113	8.673E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.328E-02	NOT IDENT.
TE-123M	6.037E-03	NOT IDENT.
SB-124	1.503E-02	NOT IDENT.
SB-125	1.620E-02	FAIL ABUN
I-126	8.613E-02	NOT IDENT.
SB-126	5.875E-02	NOT IDENT.
SB-127	3.380E+00	NOT IDENT.
I-131	7.938E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	3.893E+00	NOT IDENT.
BA-133	7.699E-03	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	7.922E-03	FAIL ABUN
CS-135	3.145E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.842E-02	FAIL ABUN
BA-137M	5.972E-03	NOT IDENT.
CS-137	6.309E-03	NOT IDENT.
CE-139	6.200E-03	NOT IDENT.
BA-140	1.031E-01	NOT IDENT.
LA-140	3.174E-02	FAIL ABUN
CE-141	1.760E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	4.075E-02	NOT IDENT.
PM-144	6.382E-03	NOT IDENT.
PR-144	4.817E-01	NOT IDENT.
PM-146	7.586E-03	NOT IDENT.
ND-147	2.471E-01	FAIL ABUN
PM-147	1.473E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	4.914E-03	FAIL ABUN
EU-152	1.745E-02	FAIL ABUN
GD-153	1.785E-02	NOT IDENT.
EU-154	1.998E-02	FAIL ABUN
TB-160	2.505E-02	FAIL ABUN
HO-166M	1.060E-02	FAIL ABUN

TM-171	4.171E+00	FAIL ABUN
HF-172	3.822E-02	FAIL ABUN
LU-172	1.120E-02	FAIL ABUN
LU-176	4.869E-03	FAIL ABUN
HF-181	9.654E-03	NOT IDENT.
TA-182	3.310E-02	FAIL ABUN
RE-183	4.950E-02	NOT IDENT.
RE-184	2.842E-02	FAIL ABUN
W-188	1.521E+00	FAIL ABUN
IR-192	7.090E-03	FAIL ABUN
BI-207	8.862E-03	FAIL ABUN
BI-211	7.055E-02	FAIL ABUN
PB-211	1.250E-01	NOT IDENT.
RN-219	7.207E-02	FAIL ABUN
RA-223	1.179E-01	FAIL ABUN
AC-227	4.829E-02	FAIL ABUN
TH-227	4.829E-02	FAIL ABUN
TH-231	1.179E-01	FAIL ABUN
PA-233	1.184E-02	FAIL ABUN
PA-234	4.843E-02	NOT IDENT.
NP-237	1.184E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.291E-02	FAIL ABUN
PU-239	7.120E+01	FAIL ABUN
AM-241	3.268E-02	NOT IDENT.
CM-243	2.133E-02	FAIL ABUN
BK-247	1.476E-02	FAIL ABUN
CM-247	6.631E-03	FAIL ABUN
CF-249	6.869E-03	NOT IDENT.
CF-251	2.565E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656002.CNF;2
Acquisition date : 16-JUN-2016 15:23:55 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.72 Half life ratio : *****
Sample date : 17-MAY-2016 10:25:00 Nuclide Library : SOLID
Sample ID : G398656002 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.7516E+02 GRAM
Quantity Err(%) : 1.1418E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.499E+00	5.351E-01	5.351E-01
CO-58	1.059E-02	9.495E-03	9.495E-03
AS-73	2.872E-01	4.747E-01	4.747E-01
NB-95	3.228E-02	1.976E-02	1.976E-02
CD-109	1.388E+00	3.646E-01	3.646E-01
TE-125M	2.045E+00	3.134E+00	3.134E+00
SN-126	1.326E-01	3.411E-02	3.411E-02
EU-155	7.677E-02	4.090E-02	4.090E-02
HG-203	3.342E-04	1.734E-02	1.734E-02
TL-208	1.843E-01	2.569E-02	2.569E-02
PB-210	1.438E+00	2.284E+00	2.284E+00
BI-212	6.614E-01	2.072E-01	2.072E-01
PB-212	6.770E-01	6.182E-02	6.182E-02
BI-214	4.462E-01	5.029E-02	5.029E-02
PB-214	5.103E-01	5.995E-02	5.995E-02
RN-222	4.462E-01	5.029E-02	5.029E-02
RA-224	6.338E-01	3.299E-01	3.299E-01
RA-226	4.462E-01	5.029E-02	5.029E-02
AC-228	6.222E-01	1.032E-01	1.032E-01
RA-228	6.222E-01	1.032E-01	1.032E-01
TH-228	6.770E-01	6.182E-02	6.182E-02
TH-229	-5.133E-02	1.212E-01	1.212E-01
TH-230	4.462E-01	5.029E-02	5.029E-02
PA-231	4.100E-01	1.689E-01	1.689E-01
TH-232	6.222E-01	1.032E-01	1.032E-01
PA-234M	6.863E-01	1.607E+00	1.607E+00
TH-234	5.249E-01	7.027E-01	7.027E-01
U-234	4.462E-01	5.029E-02	5.029E-02
U-235	5.796E-03	8.367E-02	8.367E-02
U-238	5.249E-01	7.027E-01	7.027E-01
AM-243	1.286E-01	3.177E-02	3.177E-02
ANH-511	4.376E-02	2.112E-02	2.112E-02

---- Non-Identified Nuclides ----

Key-Line Activity	K.L Act error	TPU

Nuclide	(pCi/GRAM)	(1.96-sigma)	(1.96-sigma)	
BE-7	5.899E-02	7.536E-02	7.991E-02	NOT IDENT.
NA-22	-8.276E-07	8.419E-03	8.419E-03	NOT IDENT.
NA-24	-3.884E+11	3.612E+12	3.616E+12	SHORT HLIF
AL-26	2.431E-03	5.675E-03	5.780E-03	NOT IDENT.
SC-46	5.539E-03	1.043E-02	1.072E-02	FAIL ABUN
V-48	2.073E-02	2.481E-02	2.651E-02	NOT IDENT.
CR-51	9.039E-02	1.146E-01	1.216E-01	NOT IDENT.
MN-54	2.148E-03	7.871E-03	7.931E-03	NOT IDENT.
CO-56	2.182E-03	9.533E-03	9.584E-03	FAIL ABUN
MN-56	1.000E+41	4.307E+41	0.000E+00	SHORT HLIF
CO-57	-5.134E-04	5.875E-03	5.880E-03	NOT IDENT.
FE-59	-1.469E-02	2.501E-02	2.587E-02	NOT IDENT.
CO-60	1.126E-03	8.676E-03	8.691E-03	NOT IDENT.
ZN-65	6.089E-02	2.230E-02	3.537E-02	NOT IDENT.
GE-68	1.587E-01	2.440E-01	2.542E-01	NOT IDENT.
AS-74	-1.040E-02	3.476E-02	3.508E-02	NOT IDENT.
SE-75	-3.092E-03	1.163E-02	1.171E-02	FAIL ABUN
BR-77	9.202E+03	8.128E+03	9.125E+03	SHORT HLIF
SR-82	-1.057E-01	1.068E-01	1.170E-01	NOT IDENT.
RB-83	1.907E-02	1.813E-02	2.007E-02	NOT IDENT.
KR-85	1.745E+01	2.268E+00	8.189E+00	NOT IDENT.
SR-85	1.084E-01	1.410E-02	5.088E-02	NOT IDENT.
RB-86	2.271E-01	2.595E-01	2.790E-01	NOT IDENT.
Y-88	-3.557E-03	8.111E-03	8.267E-03	NOT IDENT.
Y-91	-1.438E+00	4.767E+00	4.811E+00	NOT IDENT.
NB-94	2.005E-03	6.623E-03	6.684E-03	NOT IDENT.
NB-95M	3.210E-01	4.975E-02	1.530E-01	NOT IDENT.
ZR-95	1.190E-02	2.336E-02	2.397E-02	FAIL ABUN
NB-97	1.000E+41	3.257E+41	0.000E+00	SHORT HLIF
ZR-97	1.619E+13	2.102E+12	7.593E+12	SHORT HLIF
MO-99	-3.383E+01	1.125E+02	1.135E+02	SHORT HLIF
TC-99M	1.054E+34	3.246E+34	0.000E+00	SHORT HLIF
RH-101	1.750E-02	8.515E-03	1.161E-02	FAIL ABUN
RH-102	3.207E-03	1.059E-02	1.069E-02	FAIL ABUN
RU-103	2.309E-04	1.037E-02	1.037E-02	FAIL ABUN
RH-106	-1.565E-02	6.372E-02	6.410E-02	NOT IDENT.
RU-106	-1.565E-02	6.372E-02	6.410E-02	NOT IDENT.
AG-108M	-4.306E-03	5.770E-03	6.088E-03	NOT IDENT.
AG-110M	1.314E-03	1.050E-02	1.052E-02	NOT IDENT.
SN-113	5.425E-03	9.475E-03	9.786E-03	NOT IDENT.
CD-115	-1.587E+02	2.599E+02	2.696E+02	SHORT HLIF
SN-117M	-1.936E-02	3.044E-02	3.167E-02	NOT IDENT.
TE-123M	-6.488E-03	7.496E-03	8.047E-03	NOT IDENT.
SB-124	-1.537E-02	1.897E-02	2.019E-02	NOT IDENT.
SB-125	1.363E-02	1.778E-02	1.881E-02	FAIL ABUN
I-126	1.120E-01	1.094E-01	1.205E-01	NOT IDENT.
SB-126	4.808E-04	7.851E-02	7.851E-02	NOT IDENT.
SB-127	-8.718E-01	3.865E+00	3.885E+00	NOT IDENT.
I-131	4.070E-02	8.630E-02	8.823E-02	NOT IDENT.
I-132	1.000E+41	2.357E+41	0.000E+00	SHORT HLIF
TE-132	1.201E-01	4.261E+00	4.261E+00	NOT IDENT.
BA-133	6.605E-03	9.569E-03	1.002E-02	NOT IDENT.
I-133	-2.776E+07	2.363E+08	2.366E+08	SHORT HLIF
CS-134	2.397E-02	1.142E-02	1.572E-02	FAIL ABUN
CS-135	9.878E-02	3.862E-02	5.895E-02	NOT IDENT.
I-135	9.470E+30	7.395E+31	0.000E+00	SHORT HLIF
CS-136	1.495E-01	1.179E-01	1.358E-01	FAIL ABUN
BA-137M	-1.646E-03	7.964E-03	7.998E-03	NOT IDENT.
CS-137	-1.739E-03	8.413E-03	8.449E-03	NOT IDENT.
CE-139	-8.338E-04	6.604E-03	6.615E-03	NOT IDENT.
BA-140	-2.567E-02	1.189E-01	1.195E-01	NOT IDENT.
LA-140	9.999E-03	4.365E-02	4.388E-02	FAIL ABUN
CE-141	2.518E-03	3.635E-02	3.637E-02	FAIL ABUN
CE-143	7.285E+05	9.553E+04	3.420E+05	SHORT HLIF
CE-144	1.809E-02	5.471E-02	5.531E-02	NOT IDENT.
PM-144	1.319E-02	6.970E-03	9.161E-03	NOT IDENT.
PR-144	1.000E+00	5.261E-01	6.928E-01	NOT IDENT.
PM-146	3.880E-03	8.836E-03	9.008E-03	NOT IDENT.
ND-147	-7.390E-02	2.851E-01	2.871E-01	FAIL ABUN
PM-147	4.040E+01	1.600E+02	1.610E+02	NOT IDENT.
PM-149	-4.027E+02	2.333E+03	2.340E+03	SHORT HLIF
EU-150	-3.732E-03	8.537E-03	8.701E-03	FAIL ABUN
EU-152	-1.953E-02	3.650E-02	3.755E-02	FAIL ABUN
GD-153	7.887E-03	2.160E-02	2.189E-02	NOT IDENT.
EU-154	-9.966E-05	2.366E-02	2.366E-02	FAIL ABUN
TB-160	-2.019E-02	3.013E-02	3.147E-02	FAIL ABUN

HO-166M	-7.055E-04	1.210E-02	1.210E-02	FAIL	ABUN
TM-171	4.986E+00	8.191E+00	8.494E+00	FAIL	ABUN
HF-172	2.402E-02	4.741E-02	4.863E-02	FAIL	ABUN
LU-172	5.452E-03	1.478E-02	1.498E-02	FAIL	ABUN
LU-176	-4.883E-04	5.851E-03	5.855E-03	FAIL	ABUN
HF-181	-2.131E-03	1.099E-02	1.103E-02	NOT	IDENT.
TA-182	-1.331E-03	3.903E-02	3.904E-02	FAIL	ABUN
RE-183	-5.075E-02	7.001E-02	7.366E-02	NOT	IDENT.
RE-184	6.222E-03	4.066E-02	4.076E-02	FAIL	ABUN
W-188	2.226E-01	1.970E+00	1.972E+00	FAIL	ABUN
IR-192	-7.896E-03	8.247E-03	8.983E-03	FAIL	ABUN
BI-207	1.568E-02	1.008E-02	1.231E-02	FAIL	ABUN
BI-211	1.406E+00	1.668E-01	6.554E-01	FAIL	ABUN
PB-211	-6.680E-02	1.638E-01	1.666E-01	NOT	IDENT.
RN-219	1.115E-02	8.349E-02	8.364E-02	FAIL	ABUN
RA-223	-3.621E-02	1.566E-01	1.574E-01	FAIL	ABUN
AC-227	2.911E-02	5.305E-02	5.465E-02	FAIL	ABUN
TH-227	2.911E-02	5.305E-02	5.465E-02	FAIL	ABUN
TH-231	-3.621E-02	1.566E-01	1.574E-01	FAIL	ABUN
PA-233	1.084E-02	1.315E-02	1.403E-02	FAIL	ABUN
PA-234	4.116E-03	5.530E-02	5.533E-02	NOT	IDENT.
NP-237	1.084E-02	1.315E-02	1.403E-02	FAIL	ABUN
NP-238	5.480E+02	5.596E+02	6.117E+02	SHORT	HLIF
NP-239	-5.249E-03	5.765E-02	5.770E-02	FAIL	ABUN
PU-239	2.766E+02	1.523E+02	1.969E+02	FAIL	ABUN
AM-241	1.037E-02	3.793E-02	3.822E-02	NOT	IDENT.
CM-243	-3.298E-02	2.723E-02	3.102E-02	FAIL	ABUN
BK-247	1.202E-03	1.893E-02	1.894E-02	FAIL	ABUN
CM-247	4.417E-04	7.923E-03	7.926E-03	FAIL	ABUN
CF-249	-5.063E-03	7.738E-03	8.068E-03	NOT	IDENT.
CF-251	1.310E-02	2.725E-02	2.789E-02	NOT	IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1213.6578	87.09	1520.2880	136.47	1502.7850
45.60	1214.4902	87.57	1522.0155	140.51	0.0000
46.54	1186.3715	88.03	1523.6656	143.76	1440.3773
49.72	1113.5167	88.34	1524.7736	144.24	1492.9082
51.35	1211.3461	88.47	1525.2383	145.44	1446.9755
51.87	1188.7958	89.96	1530.5341	152.43	1496.8567
52.39	1220.9220	1093.63	1532.9407	153.25	1479.1295
52.97	1230.7324	91.11	1534.5968	323.87	1452.5924
53.44	1295.2509	92.59	1539.7853	156.02	1482.2168
54.07	1331.8879	93.35	1542.4303	158.56	1521.9069
57.36	0.0000	94.56	1546.6240	159.00	1535.1143
57.53	1480.5150	94.65	1548.5187	162.33	1426.0160
57.98	1482.6053	94.67	1548.5903	162.66	1459.2319
59.27	1360.3142	94.87	1549.2820	163.33	1449.4783
59.32	1436.4097	97.43	1530.9492	165.86	1414.4279
59.54	1431.9622	98.43	1420.8157	176.31	1363.7590
60.96	1489.0433	98.44	1420.8481	176.60	1385.3599
61.17	1489.9912	99.53	1355.7148	177.52	1408.2350
62.93	1458.4177	100.11	1358.0721	181.07	0.0000
63.29	1624.7313	102.03	1658.9136	181.52	1441.9320
63.58	1626.1244	103.18	1648.4065	184.41	1396.8053
64.28	1734.1921	103.37	1649.0670	143.76	1409.5059
66.73	1844.0298	105.21	1395.9824	193.51	1430.0652
67.24	1851.5125	105.31	1396.2715	197.03	1342.1587
125.81	1797.6426	106.12	1210.1748	198.01	1355.4916
67.75	1797.9980	106.47	1211.0479	201.83	1462.5259
69.67	1777.3909	109.28	1540.0526	203.43	1425.9919
70.83	1796.5145	111.00	1448.5803	205.31	1361.5712
72.81	1885.8245	111.76	1491.8434	210.85	1335.6121
72.87	1886.1232	114.06	1411.1310	215.65	1341.0886
74.66	1895.1312	116.30	1469.0741	222.11	1300.6031
74.82	1895.9279	116.74	1465.1337	227.09	1357.0825
74.97	1896.6785	119.76	1424.5651	227.38	1325.3113
77.11	1907.2798	121.12	1403.1094	228.16	1307.9473
78.74	1915.2538	121.22	1381.4152	228.18	1301.1289
79.69	1919.8651	121.78	1401.6992	116.74	1301.1289
80.12	1921.9409	122.06	1419.6365	235.69	1301.5825
80.19	1922.2780	122.92	1384.7351	235.96	1301.9773
80.57	1924.1086	123.07	1358.2599	238.63	1200.0586
81.00	1496.4323	265.00	1383.3171	238.98	0.0000
81.07	1496.6941	125.81	1412.3455	240.99	1203.2422
81.75	1499.2231	127.23	1377.0631	242.00	1070.8632
83.79	1506.7511	127.91	1422.7987	244.70	1042.5333
84.00	1507.5188	129.30	1471.9653	252.40	1070.7496
85.43	1514.2833	131.20	1446.4921	252.80	1078.2458
86.55	1518.3400	133.02	1432.3131	254.15	0.0000
86.79	1519.1979	133.52	1436.9824	256.23	1078.1868
86.94	1519.7458	136.00	1522.1960	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	1048.1055	355.39	0.0000	584.27	545.3267
264.80	1010.9398	356.01	798.6704	595.83	599.1523
265.00	1011.1581	364.49	773.8280	427.87	569.2627
268.22	1014.5290	366.42	0.0000	602.52	0.0000
269.46	1021.6092	372.51	705.8925	604.72	663.4368
270.03	1022.2068	375.05	726.9948	607.14	643.0756
271.23	1039.8546	377.52	758.4453	609.32	628.4260
273.65	1057.8246	356.01	765.0315	610.33	577.1369
276.40	1060.7667	388.16	760.9554	614.28	557.0551
277.37	997.3683	388.63	761.2335	618.01	562.3336
277.60	997.5927	391.69	711.7767	620.36	556.9613
278.00	1012.9512	264.66	723.3099	621.93	550.8466
279.20	984.5564	401.81	743.6339	630.19	0.0000
279.54	971.1191	402.40	753.9081	631.29	495.9137
279.70	971.2798	404.85	773.9089	633.25	516.2739
280.46	972.0142	410.95	680.0256	634.78	508.1666
283.69	938.8160	413.71	697.9440	635.95	516.9976
284.31	942.8505	414.70	703.4097	636.99	507.7998
285.41	972.8794	423.72	680.2469	645.85	508.2051
285.90	0.0000	427.09	640.9783	657.76	440.6502
287.50	985.2805	427.87	638.4091	657.90	0.0000
290.67	953.9384	433.94	688.1396	661.66	517.0524
293.27	0.0000	439.40	695.6915	664.57	0.0000
351.93	921.0426	453.88	655.0116	666.33	457.6802
295.96	921.6964	463.37	645.2180	666.50	457.7217
879.38	923.9900	468.07	575.3840	667.71	0.0000
299.98	925.2119	473.00	633.2620	677.62	483.4333
300.09	911.6078	475.06	603.9185	685.70	456.2141
300.13	911.6500	476.78	567.3126	695.00	482.6388
301.36	970.7393	477.60	565.5997	696.49	460.5424
302.85	947.4325	482.18	611.7760	696.51	460.5424
256.23	908.3329	487.02	587.3107	697.00	476.2646
304.85	908.6263	492.35	0.0000	697.30	508.5438
306.78	935.8895	497.08	607.4079	697.49	508.5892
308.46	909.1970	505.52	605.2034	702.65	529.4147
311.90	843.8783	507.63	0.0000	706.68	506.8933
316.51	920.1853	511.00	624.0313	711.68	518.8937
319.41	837.8398	514.00	625.1810	720.70	502.5807
320.08	849.1987	514.00	625.1810	721.93	0.0000
321.04	854.8781	520.40	514.8835	722.78	509.9751
323.87	958.5861	520.69	0.0000	722.91	510.0111
325.23	932.7787	522.65	0.0000	723.31	527.3928
328.76	930.2739	527.90	0.0000	724.19	539.7158
333.37	977.4756	528.26	566.0911	727.33	452.4016
333.97	963.4923	529.59	548.8404	733.00	432.4825
334.37	964.7338	529.87	0.0000	735.93	435.9663
338.28	896.5439	531.02	548.2698	333.97	462.9510
338.32	896.5740	537.26	552.3955	739.50	0.0000
311.90	837.7742	546.56	0.0000	747.24	447.5234
340.48	837.7742	552.55	560.5252	748.06	465.1834
340.55	837.8210	563.25	671.2429	752.31	431.0255
344.28	926.3539	569.33	606.4147	753.82	401.5117
345.93	935.8873	946.00	590.4847	756.73	442.4073
351.06	805.7723	569.70	590.5524	756.80	442.4227
351.93	806.3522	583.19	553.1284	884.68	473.4187

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	485.4882	1274.44	265.9185	1620.50	139.2650
766.42	485.6227	1001.03	272.4493	1621.92	182.5409
766.84	485.7152	1002.74	283.7236	1678.03	0.0000
772.60	0.0000	1004.73	286.5016	1690.97	138.3974
776.52	468.8229	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	117.0632
778.90	511.5785	1028.54	0.0000	1063.66	126.4765
783.70	405.0396	1037.84	263.1726	1771.35	121.3099
785.37	387.5607	1038.76	0.0000	1791.20	0.0000
792.07	533.0956	631.29	287.7155	1808.65	94.1503
794.95	417.7194	1048.07	287.8586	1810.72	0.0000
795.86	407.1617	1049.04	287.9569	1836.06	117.3316
810.06	434.7773	1050.41	288.0910		
810.29	431.2207	1063.66	276.5308		
344.28	431.2500	1077.00	287.6813		
810.76	411.5403	1077.34	297.6379		
815.77	374.5879	1085.87	353.3898		
1048.07	399.5367	1093.63	280.2797		
832.01	486.9415	1099.45	330.4446		
834.85	480.2462	1112.07	324.6614		
835.71	463.8140	1112.84	328.3090		
836.80	0.0000	1115.54	333.9460		
846.75	0.0000	1120.29	323.7221		
846.77	455.4877	1120.55	323.7516		
856.80	413.9011	1221.41	325.6192		
860.56	389.8981	1129.67	317.5187		
871.09	389.2524	1131.51	0.0000		
873.19	359.2025	1147.95	0.0000		
875.33	0.0000	1173.23	328.3471		
879.38	391.7549	1177.95	310.3790		
880.51	389.8167	1189.05	327.8784		
883.24	388.1199	1204.77	369.7119		
884.68	364.1766	1221.41	364.2825		
889.28	367.3043	1231.02	327.5057		
894.76	399.4213	1235.36	353.8660		
898.04	365.8959	1238.28	307.8097		
900.72	327.9429	1260.41	0.0000		
903.28	370.8970	1271.87	291.7427		
911.20	348.5012	1274.44	297.2239		
912.08	348.6206	1274.54	297.2325		
923.98	0.0000	1291.59	237.2480		
926.50	398.9104	1298.22	0.0000		
929.11	409.6577	1312.11	228.3954		
937.49	393.9408	1332.49	226.2562		
944.13	333.3516	1362.66	0.0000		
946.00	331.6872	1365.19	201.2386		
949.00	329.2095	1368.63	0.0000		
667.71	0.0000	1384.29	189.4727		
962.31	320.3269	1408.01	239.0532		
964.08	313.8593	1457.56	0.0000		
966.17	314.0952	1460.82	186.1853		
911.20	302.4127	1489.16	167.8735		
968.97	302.4127	1505.03	125.5078		
983.53	287.2428	1584.12	166.3105		
984.45	0.0000	1596.21	146.6250		

VAX/VMS Nuclide Identification Report Generated 23-JUN-2016 00:51:16.65

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656003.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM22.CNF;465
Background date  : 20-JUN-2016 14:40:04
Sample date     : 17-MAY-2016 10:30:00 Acquisition date : 22-JUN-2016 12:50:03
Sample ID      : G398656003 Sample quantity : 1.75780E+02 GRAM
Detector name   : GAM22 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.77 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572234 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.25*	116	1415	1.19	92.77	89	8	2.70E-03	62.1	
2	0	63.23*	150	2105	1.25	126.73	123	9	3.48E-03	65.3	
3	2	74.98*	1474	2182	1.52	150.24	144	19	3.41E-02	7.0	3.34E+00
4	2	77.17*	2089	1794	1.37	154.62	144	19	4.83E-02	4.5	
5	5	84.33*	360	2406	2.08	168.92	163	33	8.33E-03	29.7	2.15E+00
6	5	87.36*	867	1739	1.43	175.00	163	33	2.01E-02	10.2	
7	5	90.01*	646	1491	1.25	180.29	163	33	1.50E-02	12.7	
8	5	92.90*	1021	1958	1.84	186.08	163	33	2.36E-02	11.7	
9	0	99.71	313	1643	1.72	199.69	196	10	7.26E-03	24.9	
10	0	104.83	180	1722	2.31	209.92	206	10	4.17E-03	43.7	
11	0	129.70	161	1682	1.18	259.66	255	9	3.74E-03	46.5	
12	0	144.01*	138	1341	1.64	288.30	285	8	3.20E-03	53.4	
13	0	163.21*	68	1227	0.92	326.69	324	8	1.57E-03	103.6	
14	0	186.09*	767	2122	1.68	372.44	365	14	1.78E-02	15.1	
15	0	209.55	441	1407	1.52	419.36	415	10	1.02E-02	16.7	
16	3	238.91*	4816	1182	1.60	478.09	469	22	1.11E-01	2.4	1.43E+00
17	3	241.96	1192	1340	2.14	484.18	469	22	2.76E-02	8.8	
18	0	258.86	14	827	0.90	517.98	516	8	3.21E-04	360.9	
19	0	270.73	366	1109	1.56	541.73	536	11	8.47E-03	18.4	
20	0	277.88	172	941	1.55	556.01	552	9	3.97E-03	33.1	
21	0	295.55*	1443	1405	1.74	591.36	582	15	3.34E-02	6.6	
22	0	300.11	216	807	2.17	600.48	597	9	5.01E-03	24.6	
23	0	328.46	296	1002	1.60	657.19	651	12	6.85E-03	22.2	
24	0	338.72*	1034	1099	1.79	677.70	671	14	2.39E-02	8.4	
25	0	352.26*	2486	1195	1.81	704.78	697	16	5.76E-02	3.9	
26	0	463.29	256	579	1.97	926.83	922	11	5.93E-03	19.2	
27	0	511.37*	537	989	2.85	1022.99	1012	25	1.24E-02	21.3	
28	0	583.70*	1652	718	2.12	1167.65	1158	16	3.82E-02	4.8	
29	0	609.77*	1880	802	2.40	1219.79	1211	18	4.35E-02	4.5	
30	0	666.39	63	451	1.04	1333.03	1326	12	1.45E-03	69.4	
31	0	727.80	357	652	2.18	1455.85	1448	19	8.26E-03	17.9	
32	0	770.75	258	631	7.35	1541.74	1532	21	5.98E-03	25.2	
33	0	787.00	84	415	1.99	1574.25	1565	14	1.94E-03	53.0	
34	0	795.91	292	519	2.39	1592.06	1583	20	6.76E-03	20.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	861.52	288	434	2.21	1723.29	1715	18	6.68E-03	18.0	
36	0	911.94*	1200	603	3.07	1824.13	1814	24	2.78E-02	6.6	
37	0	922.04	43	175	2.23	1844.32	1839	9	9.90E-04	57.9	
38	1	933.88	112	197	2.52	1868.00	1863	14	2.59E-03	24.4	3.58E+00
39	1	936.38	92	200	2.52	1873.00	1863	14	2.14E-03	29.8	
40	8	966.26	449	653	4.81	1932.77	1918	33	1.04E-02	17.7	8.45E-01
41	8	970.07*	529	286	2.39	1940.39	1918	33	1.22E-02	10.9	
42	0	1002.19*	50	287	3.25	2004.63	1996	14	1.16E-03	89.1	
43	0	1096.60	60	222	3.31	2193.45	2187	12	1.40E-03	51.6	
44	0	1121.76	375	526	2.75	2243.77	2234	24	8.68E-03	17.3	
45	0	1154.68	19	258	0.90	2309.62	2303	12	4.31E-04	174.1	
46	2	1238.59	140	388	3.37	2477.43	2468	20	3.24E-03	34.3	1.42E+00
47	2	1240.87*	36	234	2.78	2482.00	2468	20	8.24E-04	110.9	
48	0	1379.96	106	291	4.12	2760.18	2751	24	2.46E-03	44.1	
49	0	1411.38	59	224	5.85	2823.02	2811	22	1.36E-03	66.4	
50	0	1461.72*	3323	398	3.72	2923.70	2910	27	7.69E-02	2.5	
51	0	1512.09	29	123	1.98	3024.44	3018	12	6.62E-04	80.5	
52	1	1589.37	72	144	3.05	3179.00	3173	19	1.66E-03	30.3	3.74E+00
53	1	1593.37	62	86	3.05	3187.00	3173	19	1.43E-03	28.9	
54	0	1622.75	76	111	1.88	3245.76	3236	18	1.76E-03	30.1	
55	0	1655.53	21	82	2.22	3311.34	3302	14	4.91E-04	81.6	
56	1	1728.05	38	66	3.46	3456.37	3452	24	8.75E-04	34.4	3.35E+00
57	1	1731.18	118	130	3.46	3462.63	3452	24	2.72E-03	22.5	
58	0	1766.17	375	201	3.34	3532.62	3519	30	8.68E-03	10.7	
59	0	1850.91	59	69	1.96	3702.12	3693	15	1.36E-03	29.9	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656003.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:30:00 Acquisition date : 22-JUN-2016 12:50:03
Sample ID        : G398656003 Sample quantity   : 175.78 GRAM
Sample type      : SOLID Sample geometry      :
Detector name    : GAMMA22 Detector geometry   : CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.77 0.0%
Energy tolerance : 1.50 keV Half life ratio    : 10.00
Errors propagated: No Systematic Error      : 0.00 %
Efficiency type  : Empirical Efficiencies at   : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
TL-208	277.37	CM-243	277.60
TL-208	277.37	NP-239	277.60
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.907E+00	5.702E+00	5.702E+00	5.05	OK
CD-109	88.03	3.70*	7.021E+00	1.153E+00	1.218E+00	30.14	OK
SN-126	64.28	9.60	3.716E+00	2.179E-01	2.179E-01	130.67	OK
	86.94	8.90	7.021E+00	4.794E-01	4.794E-01	30.14	OK
	87.57	37.00*	7.021E+00	1.153E-01	1.153E-01	30.14	OK
EU-155	86.55	30.70	7.021E+00	1.390E-01	1.410E-01	30.14	OK
	105.31	21.10*	8.066E+00	5.189E-02	5.264E-02	87.36	OK
TL-208	277.37	6.60	6.284E+00	1.812E-01	1.812E-01	66.26	OK
	583.19	85.00*	3.983E+00	1.943E-01	1.943E-01	9.51	OK
	860.56	12.50	2.925E+00	2.976E-01	2.976E-01	36.08	OK
PB-210	46.54	4.25*	9.291E-01	1.577E+00	1.582E+00	124.29	OK
PB-212	74.82	10.28	5.607E+00	9.842E-01	9.842E-01	19.10	OK
	77.11	17.10	5.904E+00	1.049E+00	1.049E+00	9.06	OK
	238.63	43.60*	6.802E+00	7.246E-01	7.246E-01	4.70	OK
	300.09	3.30	6.026E+00	4.721E-01	4.721E-01	49.23	OK
BI-214	609.32	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98	OK
	1120.29	14.92	2.332E+00	3.912E-01	3.913E-01	34.63	OK
	1764.49	15.30	1.744E+00	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	5.585E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.904E+00	1.849E+00	1.849E+00	9.06	OK
	87.09	3.41	6.996E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	6.758E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	6.077E+00	5.604E-01	5.605E-01	13.26	OK
	351.93	35.60*	5.506E+00	5.396E-01	5.396E-01	7.83	OK
RN-222	609.32	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98	OK
	1120.29	14.92	2.332E+00	3.912E-01	3.913E-01	34.63	OK
	1764.49	15.30	1.744E+00	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	6.758E+00	9.250E-01	9.250E-01	39.06	OK
RA-226	609.32	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98	OK
	1120.29	14.92	2.332E+00	3.912E-01	3.913E-01	34.63	OK
	1764.49	15.30	1.744E+00	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	8.066E+00	9.952E-01	9.952E-01	87.36	OK
	338.32	11.27	5.631E+00	6.962E-01	6.962E-01	16.82	OK
	794.95	4.25	3.127E+00	8.390E-01	8.390E-01	40.12	OK
	835.71	1.61	3.001E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.786E+00	6.248E-01	6.248E-01	13.21	OK
	968.97	15.80	2.641E+00	4.700E-01	4.700E-01	21.85	OK
RA-228	105.21	1.10	8.066E+00	9.952E-01	9.952E-01	87.36	OK
	338.32	11.27	5.631E+00	6.962E-01	6.962E-01	16.82	OK
	794.95	4.25	3.127E+00	8.390E-01	8.390E-01	40.12	OK
	835.71	1.61	3.001E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.786E+00	6.248E-01	6.248E-01	13.21	OK
	968.97	15.80	2.641E+00	4.700E-01	4.700E-01	21.85	OK
TH-228	74.82	10.28	5.607E+00	9.842E-01	9.842E-01	19.10	OK
	77.11	17.10	5.904E+00	1.049E+00	1.049E+00	9.06	OK
	238.63	43.60*	6.802E+00	7.246E-01	7.246E-01	4.70	OK
	300.09	3.30	6.026E+00	4.721E-01	4.721E-01	49.23	OK
TH-229	85.43	14.70	6.732E+00	1.826E-01	1.826E-01	59.47	OK
	88.47	24.00	7.021E+00	1.778E-01	1.778E-01	30.14	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	193.51	4.41*	7.524E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	7.256E+00	9.830E-01	9.830E-01	33.35	OK
	609.32	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98	OK
	1120.29	14.92	2.332E+00	3.912E-01	3.912E-01	34.63	OK
PA-231	1764.49	15.30	1.744E+00	----- Line	Not Found	-----	Absent
	283.69	1.70	6.214E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	6.026E+00	2.912E-01	2.912E-01	49.23	OK
TH-232	105.21	1.10	8.066E+00	9.952E-01	9.952E-01	87.36	OK
	338.32	11.27	5.631E+00	6.962E-01	6.962E-01	16.82	OK
	835.71	1.61	3.001E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	2.786E+00	6.248E-01	6.248E-01	13.21	OK
TH-234	968.97	15.80	2.641E+00	4.700E-01	4.700E-01	21.85	OK
	63.29	3.70*	3.716E+00	5.653E-01	5.653E-01	130.67	OK
	92.59	4.23	7.458E+00	1.609E+00	1.609E+00	23.36	OK
U-234	609.32	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98	OK
	1120.29	14.92	2.332E+00	3.912E-01	3.912E-01	34.63	OK
	1764.49	15.30	1.744E+00	----- Line	Not Found	-----	Absent
U-235	89.96	3.47	7.243E+00	1.282E+00	1.282E+00	25.33	OK
	93.35	5.60	7.458E+00	1.216E+00	1.216E+00	23.36	OK
	143.76	10.96*	8.302E+00	7.199E-02	7.199E-02	106.87	OK
	163.33	5.08	8.036E+00	7.761E-02	7.761E-02	207.27	OK
	185.72	57.20	7.651E+00	8.061E-02	8.061E-02	30.24	OK
U-238	205.31	5.01	7.326E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.716E+00	5.653E-01	5.653E-01	130.67	OK
	92.59	4.23	7.458E+00	1.609E+00	1.609E+00	23.36	OK
AM-243	43.53	5.90	6.275E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	5.607E+00	1.506E-01	1.506E-01	19.10	OK
	511.00	100.00*	4.369E+00	4.980E-02	4.980E-02	42.59	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656003.CNF;1
Acquisition date : 22-JUN-2016 12:50:03 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.77 Half life ratio : *****
Sample date : 17-MAY-2016 10:30:00 Analyst initials: MXR1
Sample ID : G398656003 Sample Quantity : 1.7578E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.702E+00	2.822E-01	1.193E-01
CD-109	1.218E+00	3.597E-01	2.804E-01
SN-126	1.153E-01	3.406E-02	2.669E-02
EU-155	5.264E-02	4.507E-02	4.332E-02
TL-208	1.943E-01	1.811E-02	1.255E-02
PB-210	1.582E+00	1.926E+00	1.676E+00
PB-212	7.246E-01	3.339E-02	2.141E-02
BI-214	4.240E-01	3.731E-02	2.596E-02
PB-214	5.396E-01	4.143E-02	2.613E-02
RN-222	4.240E-01	3.731E-02	2.596E-02
RA-224	9.250E-01	3.541E-01	2.290E-01
RA-226	4.240E-01	3.731E-02	2.596E-02
AC-228	6.248E-01	8.089E-02	5.120E-02
RA-228	6.248E-01	8.089E-02	5.120E-02
TH-228	7.246E-01	3.339E-02	2.141E-02
TH-229	-6.129E-02	1.137E-01	2.066E-01
TH-230	4.240E-01	3.731E-02	2.596E-02
PA-231	2.912E-01	1.405E-01	1.695E-01
TH-232	6.248E-01	8.089E-02	5.120E-02
TH-234	5.653E-01	7.240E-01	5.621E-01
U-234	4.240E-01	3.731E-02	2.596E-02
U-235	7.199E-02	7.540E-02	8.061E-02
U-238	5.653E-01	7.240E-01	5.621E-01
AM-243	1.506E-01	2.818E-02	2.206E-02
ANH-511	4.980E-02	2.078E-02	9.737E-03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.832E-02	8.199E-02	1.455E-01	NOT IDENT.
NA-22	-5.357E-03	8.377E-03	1.424E-02	NOT IDENT.
NA-24	0.000E+00	2.493E+15	0.000E+00	SHORT HLIF
AL-26	4.184E-03	5.931E-03	1.112E-02	NOT IDENT.
SC-46	-1.463E-02	9.352E-03	1.550E-02	FAIL ABUN

V-48	-1.325E-02	3.345E-02	5.935E-02	NOT IDENT.
CR-51	2.061E-01	1.347E-01	2.445E-01	NOT IDENT.
MN-54	-8.863E-03	8.081E-03	1.378E-02	NOT IDENT.
CO-56	-1.036E-02	1.267E-02	1.731E-02	FAIL ABUN
MN-56	0.000E+00	1.223E+41	0.000E+00	SHORT HLIF
CO-57	-4.960E-03	5.784E-03	1.058E-02	NOT IDENT.
CO-58	3.761E-03	9.226E-03	1.663E-02	NOT IDENT.
FE-59	9.028E-03	2.747E-02	4.217E-02	NOT IDENT.
CO-60	1.394E-03	7.561E-03	1.367E-02	NOT IDENT.
ZN-65	3.058E-02	2.086E-02	3.366E-02	NOT IDENT.
GE-68	3.297E-01	2.447E-01	4.579E-01	NOT IDENT.
AS-73	-2.246E-01	2.801E-01	4.706E-01	NOT IDENT.
AS-74	-1.391E-02	4.354E-02	7.612E-02	NOT IDENT.
SE-75	9.093E-03	1.759E-02	1.916E-02	NOT IDENT.
BR-77	0.000E+00	2.528E+03	0.000E+00	SHORT HLIF
SR-82	1.837E-01	1.557E-01	2.170E-01	NOT IDENT.
RB-83	-9.252E-03	1.893E-02	2.847E-02	NOT IDENT.
KR-85	0.000E+00	1.866E+00	4.141E+00	NOT IDENT.
SR-85	0.000E+00	1.236E-02	2.741E-02	NOT IDENT.
RB-86	3.414E-01	3.251E-01	6.015E-01	NOT IDENT.
Y-88	-2.626E-03	7.772E-03	1.366E-02	NOT IDENT.
Y-91	-8.216E-01	5.168E+00	9.003E+00	NOT IDENT.
NB-94	4.142E-03	6.934E-03	1.268E-02	NOT IDENT.
NB-95	0.000E+00	1.217E-02	1.999E-02	NOT IDENT.
NB-95M	0.000E+00	4.025E-02	7.195E-02	NOT IDENT.
ZR-95	1.138E-02	1.812E-02	3.302E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.825E+14	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.209E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	8.682E-03	8.024E-03	1.334E-02	NOT IDENT.
RH-102	1.218E-03	1.084E-02	1.985E-02	NOT IDENT.
RU-103	-4.031E-03	1.108E-02	1.977E-02	FAIL ABUN
RH-106	-4.356E-02	6.439E-02	1.154E-01	NOT IDENT.
RU-106	-4.356E-02	6.439E-02	1.154E-01	NOT IDENT.
AG-108M	4.542E-03	5.817E-03	1.084E-02	NOT IDENT.
AG-110M	6.003E-03	1.043E-02	1.873E-02	FAIL ABUN
SN-113	-5.245E-04	9.923E-03	1.829E-02	NOT IDENT.
CD-115	0.000E+00	1.628E+03	0.000E+00	SHORT HLIF
SN-117M	-2.328E-02	4.071E-02	6.341E-02	NOT IDENT.
TE-123M	-3.147E-03	8.070E-03	1.263E-02	NOT IDENT.
SB-124	8.798E-03	1.972E-02	3.576E-02	NOT IDENT.
SB-125	-4.139E-03	1.804E-02	3.282E-02	FAIL ABUN
TE-125M	-1.752E+00	3.157E+00	5.118E+00	NOT IDENT.
I-126	1.449E-01	1.971E-01	2.509E-01	FAIL ABUN
SB-126	3.794E-02	1.089E-01	1.697E-01	FAIL ABUN
SB-127	-6.820E-01	1.152E+01	2.081E+01	NOT IDENT.
I-131	-8.073E-02	1.428E-01	2.619E-01	NOT IDENT.
I-132	0.000E+00	1.360E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.533E+01	0.000E+00	SHORT HLIF
BA-133	0.000E+00	9.844E-03	1.719E-02	FAIL ABUN
I-133	0.000E+00	2.672E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.696E-02	1.736E-02	FAIL ABUN
CS-135	0.000E+00	3.818E-02	6.370E-02	NOT IDENT.
I-135	0.000E+00	2.150E+38	0.000E+00	SHORT HLIF
CS-136	1.553E-02	6.028E-02	1.088E-01	NOT IDENT.
BA-137M	1.134E-03	7.985E-03	1.247E-02	NOT IDENT.
CS-137	1.198E-03	8.435E-03	1.318E-02	NOT IDENT.
CE-139	1.109E-04	7.942E-03	1.323E-02	NOT IDENT.
BA-140	5.381E-02	1.644E-01	2.968E-01	FAIL ABUN
LA-140	7.587E-02	5.919E-02	9.751E-02	FAIL ABUN
CE-141	3.547E-02	3.714E-02	4.068E-02	FAIL ABUN
CE-143	0.000E+00	1.465E+06	0.000E+00	SHORT HLIF
CE-144	-1.011E-02	5.265E-02	8.441E-02	NOT IDENT.
PM-144	9.823E-03	7.398E-03	1.380E-02	NOT IDENT.
PR-144	7.457E-01	5.599E-01	1.045E+00	NOT IDENT.
PM-146	8.264E-03	8.421E-03	1.570E-02	NOT IDENT.
ND-147	-1.702E-01	4.216E-01	7.455E-01	FAIL ABUN
PM-147	-3.839E+01	1.618E+02	2.998E+02	NOT IDENT.
PM-149	0.000E+00	1.524E+04	0.000E+00	SHORT HLIF
EU-150	2.719E-03	9.657E-03	1.004E-02	FAIL ABUN
EU-152	-1.411E-02	3.035E-02	3.541E-02	NOT IDENT.
GD-153	0.000E+00	2.876E-02	3.678E-02	NOT IDENT.
EU-154	-1.472E-02	2.349E-02	3.995E-02	NOT IDENT.
TB-160	-8.887E-03	3.312E-02	5.774E-02	FAIL ABUN
HO-166M	-6.085E-03	1.203E-02	2.132E-02	NOT IDENT.
TM-171	-4.577E+00	5.078E+00	8.517E+00	NOT IDENT.
HF-172	9.909E-03	4.844E-02	7.895E-02	FAIL ABUN

LU-172	1.095E-02	1.497E-02	2.344E-02	FAIL ABUN
LU-176	-3.089E-03	5.755E-03	9.637E-03	FAIL ABUN
HF-181	3.170E-03	1.206E-02	2.197E-02	NOT IDENT.
TA-182	-6.112E-03	3.961E-02	6.895E-02	FAIL ABUN
RE-183	4.917E-02	5.935E-02	1.108E-01	FAIL ABUN
RE-184	4.707E-03	4.516E-02	6.763E-02	NOT IDENT.
W-188	6.179E-01	2.158E+00	3.413E+00	FAIL ABUN
IR-192	-7.416E-03	8.859E-03	1.563E-02	FAIL ABUN
HG-203	0.000E+00	1.635E-02	2.142E-02	FAIL ABUN
BI-207	1.374E-02	1.011E-02	1.886E-02	FAIL ABUN
BI-211	0.000E+00	1.141E-01	1.447E-01	FAIL ABUN
PB-211	-1.207E-01	1.414E-01	2.547E-01	NOT IDENT.
BI-212	0.000E+00	2.161E-01	2.273E-01	FAIL ABUN
RN-219	-5.985E-02	7.945E-02	1.436E-01	FAIL ABUN
RA-223	-1.170E-01	1.571E-01	2.370E-01	FAIL ABUN
AC-227	-1.748E-02	6.036E-02	9.516E-02	FAIL ABUN
TH-227	-1.748E-02	6.036E-02	9.516E-02	FAIL ABUN
TH-231	-1.170E-01	1.571E-01	2.370E-01	FAIL ABUN
PA-233	1.232E-02	1.305E-02	2.406E-02	FAIL ABUN
PA-234	-3.725E-02	5.580E-02	9.851E-02	FAIL ABUN
PA-234M	8.569E-01	1.497E+00	1.681E+00	FAIL ABUN
NP-237	1.232E-02	1.305E-02	2.406E-02	FAIL ABUN
NP-238	0.000E+00	3.938E+03	0.000E+00	SHORT HLIF
NP-239	-5.321E-02	5.883E-02	1.080E-01	FAIL ABUN
PU-239	1.458E+02	1.329E+02	1.460E+02	FAIL ABUN
AM-241	3.144E-02	3.838E-02	6.799E-02	NOT IDENT.
CM-243	0.000E+00	4.495E-02	4.309E-02	FAIL ABUN
BK-247	-1.290E-03	2.902E-02	3.052E-02	FAIL ABUN
CM-247	-6.331E-03	7.317E-03	1.318E-02	FAIL ABUN
CF-249	9.055E-03	9.233E-03	1.497E-02	NOT IDENT.
CF-251	-3.414E-03	2.797E-02	5.165E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	3257	10.66*	1.907E+00	5.702E+00	5.702E+00	5.05
CD-109	88.03	1219	3.70*	7.021E+00	1.670E+00	1.763E+00	20.41
SN-126	64.28	218	9.60	3.716E+00	2.179E-01	2.179E-01	130.67
	86.94	1219	8.90	7.021E+00	6.941E-01	6.941E-01	20.41
	87.57	1219	37.00*	7.021E+00	1.670E-01	1.670E-01	20.41
CE-141	145.44	184	48.29*	8.302E+00	1.634E-02	3.547E-02	106.87
EU-155	86.55	1219	30.70	7.021E+00	2.012E-01	2.042E-01	20.41
	105.31	248	21.10*	8.066E+00	5.189E-02	5.264E-02	87.36
HG-203	70.83	-----	3.69	4.992E+00	-----	Line Not Found	-----
	72.87	-----	6.19	5.303E+00	-----	Line Not Found	-----
TL-208	279.20	211	81.56*	6.284E+00	1.466E-02	2.518E-02	66.26
	277.37	211	6.60	6.284E+00	1.812E-01	1.812E-01	66.26
	583.19	1849	85.00*	3.983E+00	1.943E-01	1.943E-01	9.51
	860.56	306	12.50	2.925E+00	2.976E-01	2.976E-01	36.08
PB-210	46.54	175	4.25*	9.291E-01	1.577E+00	1.582E+00	124.29
BI-211	72.87	-----	1.23	5.303E+00	-----	Line Not Found	-----
	351.06	2971	12.92*	5.506E+00	1.487E+00	1.487E+00	7.83
PB-212	74.82	2106	10.28	5.607E+00	1.300E+00	1.300E+00	14.09
	77.11	2975	17.10	5.904E+00	1.049E+00	1.049E+00	9.06
	238.63	6038	43.60*	6.802E+00	7.246E-01	7.246E-01	4.70
	300.09	264	3.30	6.026E+00	4.721E-01	4.721E-01	49.23
BI-214	609.32	2091	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98
	1120.29	382	14.92	2.332E+00	3.912E-01	3.913E-01	34.63
	1764.49	-----	15.30	1.744E+00	-----	Line Not Found	-----
PB-214	74.82	2106	5.80	5.607E+00	2.305E+00	2.305E+00	14.09
	77.11	2975	9.70	5.904E+00	1.849E+00	1.849E+00	9.06
	87.09	1219	3.41	7.021E+00	1.812E+00	1.812E+00	20.41
	242.00	1492	7.25	6.758E+00	1.084E+00	1.084E+00	17.57
	295.22	1763	18.42	6.077E+00	5.604E-01	5.605E-01	13.26
	351.93	2971	35.60*	5.506E+00	5.396E-01	5.396E-01	7.83
RN-222	609.32	2091	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98
	1120.29	382	14.92	2.332E+00	3.912E-01	3.913E-01	34.63
	1764.49	-----	15.30	1.744E+00	-----	Line Not Found	-----
RA-224	240.99	1492	4.10*	6.758E+00	1.916E+00	1.916E+00	17.57
RA-226	609.32	2091	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98
	1120.29	382	14.92	2.332E+00	3.912E-01	3.913E-01	34.63
	1764.49	-----	15.30	1.744E+00	-----	Line Not Found	-----
AC-228	105.21	248	1.10	8.066E+00	9.952E-01	9.952E-01	87.36
	338.32	1241	11.27	5.631E+00	6.962E-01	6.962E-01	16.82
	794.95	313	4.25	3.127E+00	8.390E-01	8.390E-01	40.12
	835.71	-----	1.61	3.001E+00	-----	Line Not Found	-----
	911.20	1262	25.80*	2.786E+00	6.248E-01	6.248E-01	13.21
	968.97	551	15.80	2.641E+00	4.700E-01	4.700E-01	21.85
RA-228	105.21	248	1.10	8.066E+00	9.952E-01	9.952E-01	87.36
	338.32	1241	11.27	5.631E+00	6.962E-01	6.962E-01	16.82
	794.95	313	4.25	3.127E+00	8.390E-01	8.390E-01	40.12
	835.71	-----	1.61	3.001E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	911.20	1262	25.80*	2.786E+00	6.248E-01	6.248E-01	13.21
	968.97	551	15.80	2.641E+00	4.700E-01	4.700E-01	21.85
	74.82	2106	10.28	5.607E+00	1.300E+00	1.300E+00	14.09
	77.11	2975	17.10	5.904E+00	1.049E+00	1.049E+00	9.06
TH-229	238.63	6038	43.60*	6.802E+00	7.246E-01	7.246E-01	4.70
	300.09	264	3.30	6.026E+00	4.721E-01	4.721E-01	49.23
	85.43	508	14.70	6.732E+00	1.826E-01	1.826E-01	59.47
	88.47	1219	24.00	7.021E+00	2.574E-01	2.574E-01	20.41
TH-230	193.51	-----	4.41*	7.524E+00	-----	Line Not Found	-----
	210.85	561	2.80	7.256E+00	9.830E-01	9.830E-01	33.35
	609.32	2091	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98
	1120.29	382	14.92	2.332E+00	3.912E-01	3.912E-01	34.63
PA-231	1764.49	-----	15.30	1.744E+00	-----	Line Not Found	-----
	283.69	-----	1.70	6.214E+00	-----	Line Not Found	-----
TH-232	301.36	264	5.35*	6.026E+00	2.912E-01	2.912E-01	49.23
	105.21	248	1.10	8.066E+00	9.952E-01	9.952E-01	87.36
	338.32	1241	11.27	5.631E+00	6.962E-01	6.962E-01	16.82
	835.71	-----	1.61	3.001E+00	-----	Line Not Found	-----
TH-234	911.20	1262	25.80*	2.786E+00	6.248E-01	6.248E-01	13.21
	968.97	551	15.80	2.641E+00	4.700E-01	4.700E-01	21.85
	63.29	218	3.70*	3.716E+00	5.653E-01	5.653E-01	130.67
	92.59	1426	4.23	7.458E+00	1.609E+00	1.609E+00	23.36
U-234	609.32	2091	45.49*	3.858E+00	4.240E-01	4.240E-01	8.98
	1120.29	382	14.92	2.332E+00	3.912E-01	3.912E-01	34.63
	1764.49	-----	15.30	1.744E+00	-----	Line Not Found	-----
	89.96	905	3.47	7.243E+00	1.282E+00	1.282E+00	25.33
U-235	93.35	1426	5.60	7.458E+00	1.216E+00	1.216E+00	23.36
	143.76	184	10.96*	8.302E+00	7.199E-02	7.199E-02	106.87
	163.33	89	5.08	8.036E+00	7.761E-02	7.761E-02	207.27
	185.72	991	57.20	7.651E+00	8.061E-02	8.061E-02	30.24
U-238	205.31	-----	5.01	7.326E+00	-----	Line Not Found	-----
	63.29	218	3.70*	3.716E+00	5.653E-01	5.653E-01	130.67
	92.59	1426	4.23	7.458E+00	1.609E+00	1.609E+00	23.36
	99.53	434	14.00	7.854E+00	1.406E-01	1.406E-01	49.73
NP-239	103.37	248	22.20	8.066E+00	4.931E-02	4.931E-02	87.36
	106.12	248	26.30	8.066E+00	4.163E-02	4.163E-02	87.36
	116.74	-----	7.94*	8.341E+00	-----	Line Not Found	-----
	228.18	-----	11.14	6.962E+00	-----	Line Not Found	-----
AM-243	277.60	211	14.44	6.284E+00	8.282E-02	8.282E-02	66.26
	43.53	-----	5.90	6.275E-01	-----	Line Not Found	-----
	74.66	2106	67.20*	5.607E+00	1.989E-01	1.989E-01	14.09
	99.53	434	13.10	7.854E+00	1.503E-01	1.506E-01	49.73
CM-243	103.37	248	20.90*	8.066E+00	5.238E-02	5.251E-02	87.36
	228.18	-----	10.60	6.962E+00	-----	Line Not Found	-----
	277.60	211	14.00	6.284E+00	8.542E-02	8.563E-02	66.26
	511.00	611	100.00*	4.369E+00	4.980E-02	4.980E-02	42.59

Flag: "*" = Keyline

Total number of lines in spectrum 59
Number of unidentified lines 18
Number of lines tentatively identified by NID 41 69.49%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.702E+00	5.702E+00	0.288E+00	5.05	
CD-109	461.40D	1.06	1.670E+00	1.763E+00	0.360E+00	20.41	
SN-126	2.30E+05Y	1.00	1.670E-01	1.670E-01	0.341E-01	20.41	
CE-141	32.51D	2.17	1.634E-02	3.547E-02	3.790E-02	106.87	
EU-155	4.75Y	1.01	5.189E-02	5.264E-02	4.599E-02	87.36	
HG-203	46.59D	1.72	1.466E-02	2.518E-02	1.668E-02	66.26	
TL-208	1.41E+10Y	1.00	1.943E-01	1.943E-01	0.185E-01	9.51	
PB-210	22.20Y	1.00	1.577E+00	1.582E+00	1.966E+00	124.29	
BI-211	7.04E+08Y	1.00	1.487E+00	1.487E+00	0.116E+00	7.83	
PB-212	1.41E+10Y	1.00	7.246E-01	7.246E-01	0.341E-01	4.70	
BI-214	1600.00Y	1.00	4.240E-01	4.240E-01	0.381E-01	8.98	
PB-214	1600.00Y	1.00	5.396E-01	5.396E-01	0.423E-01	7.83	
RN-222	1600.00Y	1.00	4.240E-01	4.240E-01	0.381E-01	8.98	
RA-224	1.41E+10Y	1.00	1.916E+00	1.916E+00	0.337E+00	17.57	
RA-226	1600.00Y	1.00	4.240E-01	4.240E-01	0.381E-01	8.98	
AC-228	1.41E+10Y	1.00	6.248E-01	6.248E-01	0.825E-01	13.21	
RA-228	1.41E+10Y	1.00	6.248E-01	6.248E-01	0.825E-01	13.21	
TH-228	1.41E+10Y	1.00	7.246E-01	7.246E-01	0.341E-01	4.70	
TH-229	7340.00Y	1.00	2.574E-01	2.574E-01	0.525E-01	20.41	K
TH-230	7.54E+04Y	1.00	4.240E-01	4.240E-01	0.381E-01	8.98	
PA-231	7.04E+08Y	1.00	2.912E-01	2.912E-01	1.434E-01	49.23	
TH-232	1.41E+10Y	1.00	6.248E-01	6.248E-01	0.825E-01	13.21	
TH-234	4.47E+09Y	1.00	5.653E-01	5.653E-01	7.388E-01	130.67	
U-234	2.45E+05Y	1.00	4.240E-01	4.240E-01	0.381E-01	8.98	
U-235	7.04E+08Y	1.00	7.199E-02	7.199E-02	7.694E-02	106.87	
U-238	4.47E+09Y	1.00	5.653E-01	5.653E-01	7.388E-01	130.67	
NP-239	7370.00Y	1.00	4.163E-02	4.163E-02	3.637E-02	87.36	K
AM-243	7370.00Y	1.00	1.989E-01	1.989E-01	0.280E-01	14.09	
CM-243	29.10Y	1.00	5.238E-02	5.251E-02	4.587E-02	87.36	
ANH-511	1.00E+09Y	1.00	4.980E-02	4.980E-02	2.121E-02	42.59	
Total Activity :			2.087E+01	2.100E+01			

Grand Total Activity : 2.087E+01 2.100E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.70	217	2264	1.18	259.66	255	9	3.74E-03	93.0	8.40E+00	T
0	258.86	17	1027	0.90	517.98	516	8	3.21E-04	****	6.53E+00	
0	270.73	452	1369	1.56	541.73	536	11	8.47E-03	36.9	6.37E+00	T
0	328.46	357	1208	1.60	657.19	651	12	6.85E-03	44.3	5.73E+00	T
0	463.29	296	668	1.97	926.83	922	11	5.93E-03	38.5	4.66E+00	T
0	666.39	69	496	1.04	1333.03	1326	12	1.45E-03	****	3.61E+00	T
0	727.80	387	708	2.18	1455.85	1448	19	8.26E-03	35.9	3.36E+00	T
0	770.75	278	679	7.35	1541.74	1532	21	5.98E-03	50.5	3.21E+00	
0	787.00	90	446	1.99	1574.25	1565	14	1.94E-03	****	3.16E+00	
0	922.04	45	184	2.23	1844.32	1839	9	9.90E-04	****	2.76E+00	
1	933.88	117	206	2.52	1868.00	1863	14	2.59E-03	48.8	2.73E+00	
1	936.38	97	210	2.52	1873.00	1863	14	2.14E-03	59.5	2.72E+00	T
8	966.26	468	681	4.81	1932.77	1918	33	1.04E-02	35.3	2.65E+00	T
0	1002.19	52	297	3.25	2004.63	1996	14	1.16E-03	****	2.57E+00	T
0	1096.60	62	227	3.31	2193.45	2187	12	1.40E-03	****	2.38E+00	
0	1154.68	19	262	0.90	2309.62	2303	12	4.31E-04	****	2.28E+00	
2	1238.59	141	390	3.37	2477.43	2468	20	3.24E-03	68.7	2.15E+00	T
2	1240.87	36	235	2.78	2482.00	2468	20	8.24E-04	****	2.15E+00	
0	1379.96	105	287	4.12	2760.18	2751	24	2.46E-03	88.2	1.98E+00	
0	1411.38	58	221	5.85	2823.02	2811	22	1.36E-03	****	1.95E+00	
0	1512.09	28	120	1.98	3024.44	3018	12	6.62E-04	****	1.87E+00	
1	1589.37	69	139	3.05	3179.00	3173	19	1.66E-03	60.5	1.82E+00	
1	1593.37	60	84	3.05	3187.00	3173	19	1.43E-03	57.8	1.82E+00	
0	1622.75	73	107	1.88	3245.76	3236	18	1.76E-03	60.1	1.80E+00	T
0	1655.53	20	79	2.22	3311.34	3302	14	4.91E-04	****	1.78E+00	
1	1728.05	36	63	3.46	3456.37	3452	24	8.75E-04	68.8	1.76E+00	
1	1731.18	112	124	3.46	3462.63	3452	24	2.72E-03	45.0	1.75E+00	
0	1766.17	357	191	3.34	3532.62	3519	30	8.68E-03	21.3	1.74E+00	
0	1850.91	56	65	1.96	3702.12	3693	15	1.36E-03	59.8	1.73E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656003.CNF;1      *
* Acquisition date   : 22-JUN-2016 12:50:03 Sensitivity      : 3.000                *
* Detector ID        : GAM22 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000  *
* Elapsed real time  : 0 12:00:05.77 Half life ratio  : ***** *
* Sample date        : 17-MAY-2016 10:30:00 Nuclide Library : SOLID          *
* Sample ID          : G398656003 Analyst initials: MXR1        *
* Batch Number       : 1572234 Sample Quantity : 1.7578E+02 GRAM *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000      *
*                                     Dry Weight    : 0.00000      *
*****
*
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 7-JUL-2015 09:05:06 Eff. Geometry    : CAN                *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15              *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	5.726E-02
CD-109	1.381E-01
SN-126	1.314E-02
EU-155	2.136E-02
TL-208	6.128E-03
PB-210	8.249E-01
PB-212	1.054E-02
BI-214	1.270E-02
PB-214	1.281E-02
RN-222	1.270E-02
RA-224	1.127E-01
RA-226	1.270E-02
AC-228	2.492E-02
RA-228	2.492E-02
TH-228	1.054E-02
TH-229	1.018E-01
TH-230	1.270E-02
PA-231	8.319E-02
TH-232	2.492E-02
TH-234	2.773E-01
U-234	1.270E-02
U-235	3.975E-02
U-238	2.773E-01
AM-243	1.089E-02
ANH-511	4.755E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.106E-02	NOT IDENT.
NA-22	6.883E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	5.285E-03	NOT IDENT.
SC-46	7.518E-03	FAIL ABUN
V-48	2.877E-02	NOT IDENT.

CR-51	1.201E-01	NOT IDENT.
MN-54	6.714E-03	NOT IDENT.
CO-56	8.427E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.214E-03	NOT IDENT.
CO-58	8.089E-03	NOT IDENT.
FE-59	2.044E-02	NOT IDENT.
CO-60	6.592E-03	NOT IDENT.
ZN-65	1.638E-02	NOT IDENT.
GE-68	2.221E-01	NOT IDENT.
AS-73	2.318E-01	NOT IDENT.
AS-74	3.718E-02	NOT IDENT.
SE-75	9.416E-03	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.058E-01	NOT IDENT.
RB-83	1.389E-02	NOT IDENT.
KR-85	2.044E+00	NOT IDENT.
SR-85	1.354E-02	NOT IDENT.
RB-86	2.917E-01	NOT IDENT.
Y-88	6.477E-03	NOT IDENT.
Y-91	4.372E+00	NOT IDENT.
NB-94	6.198E-03	NOT IDENT.
NB-95	9.769E-03	NOT IDENT.
NB-95M	3.554E-02	NOT IDENT.
ZR-95	1.610E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.580E-03	NOT IDENT.
RH-102	9.686E-03	NOT IDENT.
RU-103	9.653E-03	FAIL ABUN
RH-106	5.632E-02	NOT IDENT.
RU-106	5.632E-02	NOT IDENT.
AG-108M	5.306E-03	NOT IDENT.
AG-110M	9.107E-03	FAIL ABUN
SN-113	8.960E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.124E-02	NOT IDENT.
TE-123M	6.222E-03	NOT IDENT.
SB-124	1.701E-02	NOT IDENT.
SB-125	1.606E-02	FAIL ABUN
TE-125M	2.523E+00	NOT IDENT.
I-126	1.225E-01	FAIL ABUN
SB-126	8.280E-02	FAIL ABUN
SB-127	1.014E+01	NOT IDENT.
I-131	1.283E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.446E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	8.492E-03	FAIL ABUN
CS-135	3.136E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.271E-02	NOT IDENT.
BA-137M	6.085E-03	NOT IDENT.
CS-137	6.428E-03	NOT IDENT.
CE-139	6.522E-03	NOT IDENT.
BA-140	1.449E-01	FAIL ABUN
LA-140	4.675E-02	FAIL ABUN
CE-141	2.007E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	4.160E-02	NOT IDENT.
PM-144	6.749E-03	NOT IDENT.
PR-144	5.108E-01	NOT IDENT.
PM-146	7.685E-03	NOT IDENT.
ND-147	3.640E-01	FAIL ABUN
PM-147	1.477E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	4.927E-03	FAIL ABUN
EU-152	1.736E-02	NOT IDENT.
GD-153	1.813E-02	NOT IDENT.
EU-154	1.931E-02	NOT IDENT.
TB-160	2.807E-02	FAIL ABUN
HO-166M	1.040E-02	NOT IDENT.
TM-171	4.194E+00	NOT IDENT.
HF-172	3.892E-02	FAIL ABUN
LU-172	1.139E-02	FAIL ABUN

LU-176	4.729E-03	FAIL ABUN
HF-181	1.074E-02	NOT IDENT.
TA-182	3.345E-02	FAIL ABUN
RE-183	5.460E-02	FAIL ABUN
RE-184	3.289E-02	NOT IDENT.
W-188	1.677E+00	FAIL ABUN
IR-192	7.669E-03	FAIL ABUN
HG-203	1.054E-02	FAIL ABUN
BI-207	9.163E-03	FAIL ABUN
BI-211	7.165E-02	FAIL ABUN
PB-211	1.247E-01	NOT IDENT.
BI-212	1.115E-01	FAIL ABUN
RN-219	7.030E-02	FAIL ABUN
RA-223	1.163E-01	FAIL ABUN
AC-227	4.677E-02	FAIL ABUN
TH-227	4.677E-02	FAIL ABUN
TH-231	1.163E-01	FAIL ABUN
PA-233	1.181E-02	FAIL ABUN
PA-234	4.775E-02	FAIL ABUN
PA-234M	8.182E-01	FAIL ABUN
NP-237	1.181E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.323E-02	FAIL ABUN
PU-239	7.204E+01	FAIL ABUN
AM-241	3.352E-02	NOT IDENT.
CM-243	2.124E-02	FAIL ABUN
BK-247	1.500E-02	FAIL ABUN
CM-247	6.455E-03	FAIL ABUN
CF-249	7.342E-03	NOT IDENT.
CF-251	2.545E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656003.CNF;1
Acquisition date : 22-JUN-2016 12:50:03 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance : 1.500
Elapsed live time : 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time : 0 12:00:05.77 Half life ratio : *****
Sample date : 17-MAY-2016 10:30:00 Nuclide Library : SOLID
Sample ID : G398656003 Analyst initials : MXR1
Batch Number : 1572234 Sample Quantity : 1.7578E+02 GRAM
Quantity Err(%) : 1.1378E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.702E+00	5.624E-01	5.624E-01
CD-109	1.218E+00	3.870E-01	3.870E-01
SN-126	1.153E-01	3.613E-02	3.613E-02
EU-155	5.264E-02	4.530E-02	4.530E-02
TL-208	1.943E-01	2.457E-02	2.457E-02
PB-210	1.582E+00	1.932E+00	1.932E+00
PB-212	7.246E-01	6.566E-02	6.566E-02
BI-214	4.240E-01	5.216E-02	5.216E-02
PB-214	5.396E-01	5.900E-02	5.900E-02
RN-222	4.240E-01	5.216E-02	5.216E-02
RA-224	9.250E-01	3.768E-01	3.768E-01
RA-226	4.240E-01	5.216E-02	5.216E-02
AC-228	6.248E-01	1.042E-01	1.042E-01
RA-228	6.248E-01	1.042E-01	1.042E-01
TH-228	7.246E-01	6.566E-02	6.566E-02
TH-229	-6.129E-02	1.138E-01	1.138E-01
TH-230	4.240E-01	5.216E-02	5.216E-02
PA-231	2.912E-01	1.547E-01	1.547E-01
TH-232	6.248E-01	1.042E-01	1.042E-01
TH-234	5.653E-01	7.350E-01	7.350E-01
U-234	4.240E-01	5.216E-02	5.216E-02
U-235	7.199E-02	7.559E-02	7.559E-02
U-238	5.653E-01	7.350E-01	7.350E-01
AM-243	1.506E-01	3.116E-02	3.116E-02
ANH-511	4.980E-02	2.119E-02	2.119E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.832E-02	8.213E-02	8.624E-02	NOT IDENT.
NA-22	-5.357E-03	8.389E-03	8.730E-03	NOT IDENT.
NA-24	6.494E+14	2.494E+15	2.511E+15	SHORT HLIF
AL-26	4.184E-03	5.939E-03	6.232E-03	NOT IDENT.
SC-46	-1.463E-02	9.466E-03	1.154E-02	FAIL ABUN

V-48	-1.325E-02	3.348E-02	3.401E-02	NOT IDENT.
CR-51	2.061E-01	1.356E-01	1.644E-01	NOT IDENT.
MN-54	-8.863E-03	8.127E-03	9.056E-03	NOT IDENT.
CO-56	-1.036E-02	1.271E-02	1.354E-02	FAIL ABUN
MN-56	-1.000E+41	1.227E+41	0.000E+00	SHORT HLIF
CO-57	-4.960E-03	5.794E-03	6.211E-03	NOT IDENT.
CO-58	3.761E-03	9.233E-03	9.387E-03	NOT IDENT.
FE-59	9.028E-03	2.749E-02	2.779E-02	NOT IDENT.
CO-60	1.394E-03	7.562E-03	7.588E-03	NOT IDENT.
ZN-65	3.058E-02	2.107E-02	2.518E-02	NOT IDENT.
GE-68	3.297E-01	2.469E-01	2.882E-01	NOT IDENT.
AS-73	-2.246E-01	2.840E-01	3.015E-01	NOT IDENT.
AS-74	-1.391E-02	4.357E-02	4.401E-02	NOT IDENT.
SE-75	9.093E-03	1.761E-02	1.808E-02	NOT IDENT.
BR-77	5.487E+04	5.776E+04	6.283E+04	SHORT HLIF
SR-82	1.837E-01	1.566E-01	1.772E-01	NOT IDENT.
RB-83	-9.252E-03	1.898E-02	1.944E-02	NOT IDENT.
KR-85	2.592E+01	2.850E+00	1.203E+01	NOT IDENT.
SR-85	1.714E-01	1.886E-02	7.956E-02	NOT IDENT.
RB-86	3.414E-01	3.268E-01	3.612E-01	NOT IDENT.
Y-88	-2.626E-03	7.775E-03	7.864E-03	NOT IDENT.
Y-91	-8.216E-01	5.169E+00	5.182E+00	NOT IDENT.
NB-94	4.142E-03	6.944E-03	7.191E-03	NOT IDENT.
NB-95	2.274E-02	1.236E-02	1.605E-02	NOT IDENT.
NB-95M	2.071E-01	4.505E-02	1.037E-01	NOT IDENT.
ZR-95	1.138E-02	1.815E-02	1.886E-02	NOT IDENT.
NB-97	-1.000E+41	5.233E+41	0.000E+00	SHORT HLIF
ZR-97	3.543E+15	5.648E+14	1.694E+15	SHORT HLIF
MO-99	5.557E+01	5.210E+02	5.216E+02	SHORT HLIF
TC-99M	3.366E+40	2.829E+41	0.000E+00	SHORT HLIF
RH-101	8.682E-03	8.185E-03	9.073E-03	NOT IDENT.
RH-102	1.218E-03	1.084E-02	1.086E-02	NOT IDENT.
RU-103	-4.031E-03	1.109E-02	1.123E-02	FAIL ABUN
RH-106	-4.356E-02	6.453E-02	6.745E-02	NOT IDENT.
RU-106	-4.356E-02	6.453E-02	6.745E-02	NOT IDENT.
AG-108M	4.542E-03	5.828E-03	6.177E-03	NOT IDENT.
AG-110M	6.003E-03	1.045E-02	1.079E-02	FAIL ABUN
SN-113	-5.245E-04	9.923E-03	9.926E-03	NOT IDENT.
CD-115	3.343E+02	1.628E+03	1.635E+03	SHORT HLIF
SN-117M	-2.328E-02	4.075E-02	4.208E-02	NOT IDENT.
TE-123M	-3.147E-03	8.073E-03	8.196E-03	NOT IDENT.
SB-124	8.798E-03	1.973E-02	2.013E-02	NOT IDENT.
SB-125	-4.139E-03	1.804E-02	1.814E-02	FAIL ABUN
TE-125M	-1.752E+00	3.159E+00	3.257E+00	NOT IDENT.
I-126	1.449E-01	1.976E-01	2.081E-01	FAIL ABUN
SB-126	3.794E-02	1.090E-01	1.104E-01	FAIL ABUN
SB-127	-6.820E-01	1.153E+01	1.153E+01	NOT IDENT.
I-131	-8.073E-02	1.429E-01	1.475E-01	NOT IDENT.
I-132	1.000E+41	2.616E+41	0.000E+00	SHORT HLIF
TE-132	-3.959E+00	1.534E+01	1.544E+01	SHORT HLIF
BA-133	2.801E-02	1.008E-02	1.616E-02	FAIL ABUN
I-133	-9.146E+09	2.681E+10	2.713E+10	SHORT HLIF
CS-134	4.314E-02	1.745E-02	2.613E-02	FAIL ABUN
CS-135	7.434E-02	3.876E-02	5.124E-02	NOT IDENT.
I-135	-6.972E+35	2.150E+38	0.000E+00	SHORT HLIF
CS-136	1.553E-02	6.031E-02	6.072E-02	NOT IDENT.
BA-137M	1.134E-03	7.985E-03	8.002E-03	NOT IDENT.
CS-137	1.198E-03	8.436E-03	8.453E-03	NOT IDENT.
CE-139	1.109E-04	7.942E-03	7.942E-03	NOT IDENT.
BA-140	5.381E-02	1.645E-01	1.662E-01	FAIL ABUN
LA-140	7.587E-02	5.949E-02	6.862E-02	FAIL ABUN
CE-141	3.547E-02	3.722E-02	4.051E-02	FAIL ABUN
CE-143	1.118E+07	1.714E+06	5.325E+06	SHORT HLIF
CE-144	-1.011E-02	5.266E-02	5.285E-02	NOT IDENT.
PM-144	9.823E-03	7.449E-03	8.666E-03	NOT IDENT.
PR-144	7.457E-01	5.638E-01	6.564E-01	NOT IDENT.
PM-146	8.264E-03	8.462E-03	9.246E-03	NOT IDENT.
ND-147	-1.702E-01	4.218E-01	4.287E-01	FAIL ABUN
PM-147	-3.839E+01	1.618E+02	1.627E+02	NOT IDENT.
PM-149	-6.944E+03	1.527E+04	1.559E+04	SHORT HLIF
EU-150	2.719E-03	9.659E-03	9.737E-03	FAIL ABUN
EU-152	-1.411E-02	3.037E-02	3.103E-02	NOT IDENT.
GD-153	4.199E-02	2.893E-02	3.457E-02	NOT IDENT.
EU-154	-1.472E-02	2.353E-02	2.444E-02	NOT IDENT.
TB-160	-8.887E-03	3.313E-02	3.337E-02	FAIL ABUN
HO-166M	-6.085E-03	1.204E-02	1.235E-02	NOT IDENT.
TM-171	-4.577E+00	5.096E+00	5.498E+00	NOT IDENT.
HF-172	9.909E-03	4.847E-02	4.868E-02	FAIL ABUN

LU-172	1.095E-02	1.505E-02	1.584E-02	FAIL ABUN
LU-176	-3.089E-03	5.759E-03	5.925E-03	FAIL ABUN
HF-181	3.170E-03	1.206E-02	1.215E-02	NOT IDENT.
TA-182	-6.112E-03	3.962E-02	3.971E-02	FAIL ABUN
RE-183	4.917E-02	5.958E-02	6.357E-02	FAIL ABUN
RE-184	4.707E-03	4.516E-02	4.521E-02	NOT IDENT.
W-188	6.179E-01	2.160E+00	2.178E+00	FAIL ABUN
IR-192	-7.416E-03	8.877E-03	9.486E-03	FAIL ABUN
HG-203	2.518E-02	1.646E-02	2.000E-02	FAIL ABUN
BI-207	1.374E-02	1.020E-02	1.193E-02	FAIL ABUN
BI-211	1.487E+00	1.644E-01	6.901E-01	FAIL ABUN
PB-211	-1.207E-01	1.418E-01	1.519E-01	NOT IDENT.
BI-212	6.145E-01	2.237E-01	3.561E-01	FAIL ABUN
RN-219	-5.985E-02	7.990E-02	8.433E-02	FAIL ABUN
RA-223	-1.170E-01	1.575E-01	1.661E-01	FAIL ABUN
AC-227	-1.748E-02	6.041E-02	6.092E-02	FAIL ABUN
TH-227	-1.748E-02	6.041E-02	6.092E-02	FAIL ABUN
TH-231	-1.170E-01	1.575E-01	1.661E-01	FAIL ABUN
PA-233	1.232E-02	1.308E-02	1.421E-02	FAIL ABUN
PA-234	-3.725E-02	7.030E-02	7.227E-02	FAIL ABUN
PA-234M	8.569E-01	1.499E+00	1.548E+00	FAIL ABUN
NP-237	1.232E-02	1.308E-02	1.421E-02	FAIL ABUN
NP-238	-3.533E+03	3.954E+03	4.262E+03	SHORT HLIF
NP-239	-5.321E-02	5.906E-02	6.374E-02	FAIL ABUN
PU-239	1.458E+02	1.333E+02	1.486E+02	FAIL ABUN
AM-241	3.144E-02	3.846E-02	4.099E-02	NOT IDENT.
CM-243	5.251E-02	4.528E-02	5.110E-02	FAIL ABUN
BK-247	-1.290E-03	2.903E-02	2.903E-02	FAIL ABUN
CM-247	-6.331E-03	7.406E-03	7.937E-03	FAIL ABUN
CF-249	9.055E-03	9.282E-03	1.014E-02	NOT IDENT.
CF-251	-3.414E-03	2.797E-02	2.801E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1285.5530	87.09	1370.7515	136.47	1588.3268
45.60	1214.4902	87.57	1372.3091	140.51	0.0000
46.54	1282.7352	88.03	1373.7969	143.76	1580.7162
49.72	0.0000	88.34	1374.7959	144.24	1578.7025
51.35	1327.5507	88.47	1375.2148	145.44	1378.9030
51.87	1319.3164	89.96	1379.9897	152.43	1414.3353
52.39	1356.9727	1093.63	1382.1597	153.25	1465.8738
52.97	1378.2008	91.11	1383.6528	323.87	1535.5660
53.44	1359.9691	92.59	1388.3311	156.02	1414.5406
54.07	1380.5723	93.35	1390.7158	158.56	1504.0859
57.36	0.0000	94.56	1394.4971	159.00	1476.5630
57.53	1453.8206	94.65	1394.7764	162.33	1401.5956
57.98	1413.0332	94.67	1394.8408	162.66	1405.8837
59.27	1459.6732	94.87	1395.4639	163.33	1410.2123
59.32	1445.4437	97.43	1343.5674	165.86	1468.4824
59.54	1450.7657	98.43	1346.4985	176.31	1445.1638
60.96	1545.6997	98.44	1346.5293	176.60	1474.1182
61.17	1546.6835	99.53	1349.7073	177.52	1455.7767
62.93	1544.6367	100.11	1319.3082	181.07	0.0000
63.29	1678.6758	102.03	1296.5295	181.52	1420.4336
63.58	1680.1150	103.18	1299.6741	184.41	1503.1846
64.28	1778.2072	103.37	1300.1949	143.76	1434.5266
66.73	1857.3279	105.21	1525.6904	193.51	1460.8337
67.24	1938.4467	105.31	1526.0063	197.03	1398.9181
125.81	1909.7482	106.12	1572.4152	198.01	1394.1123
67.75	1910.1257	106.47	1573.5496	201.83	1570.4403
69.67	1869.7616	109.28	1610.3524	203.43	1533.9464
70.83	1818.9336	111.00	1589.9385	205.31	1442.0739
72.81	1896.3429	111.76	0.0000	210.85	1346.7821
72.87	1896.6433	114.06	1448.2660	215.65	1348.3118
74.66	1920.8022	116.30	0.0000	222.11	1319.0444
74.82	1921.6096	116.74	1580.2291	227.09	1321.9351
74.97	1922.3705	119.76	1434.9938	227.38	1339.9609
77.11	1933.1155	121.12	1425.0657	228.16	0.0000
78.74	1941.1974	121.22	1436.8391	228.18	1346.0964
79.69	1579.4906	121.78	1496.9603	116.74	1346.0964
80.12	1581.1984	122.06	1483.0773	235.69	1401.8307
80.19	1581.4757	122.92	1534.7480	235.96	1402.2559
80.57	1582.9818	123.07	1550.6179	238.63	1219.8452
81.00	1584.6833	265.00	1512.7405	238.98	0.0000
81.07	1584.9606	125.81	1493.3403	240.99	1223.0813
81.75	1587.6389	127.23	1488.7168	242.00	1224.4584
83.79	1359.9395	127.91	1524.4272	244.70	1069.0948
84.00	1360.6323	129.30	1561.1110	252.40	1069.7452
85.43	1365.3374	131.20	1461.8259	252.80	1091.9792
86.55	1368.9951	133.02	1531.4469	254.15	0.0000
86.79	1369.7686	133.52	1532.7813	256.23	1096.0051
86.94	1370.2627	136.00	1622.4874	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	976.8750	355.39	0.0000	584.27	510.3227
264.80	1063.5222	356.01	774.9475	595.83	599.1523
265.00	1063.7518	364.49	813.7736	427.87	552.2751
268.22	1084.3203	366.42	0.0000	602.52	0.0000
269.46	1066.9459	372.51	818.0872	604.72	656.9166
270.03	1094.8561	375.05	783.2057	607.14	705.0981
271.23	1088.5178	377.52	716.2051	609.32	661.1078
273.65	1052.6896	356.01	872.5698	610.33	661.4536
276.40	1055.6174	388.16	711.7394	614.28	539.0327
277.37	1055.3547	388.63	705.3718	618.01	528.6055
277.60	1055.5923	391.69	758.2795	620.36	579.6592
278.00	1056.7334	264.66	698.4670	621.93	568.7068
279.20	1001.7689	401.81	778.4438	630.19	0.0000
279.54	981.4502	402.40	788.3506	631.29	527.0854
279.70	981.6125	404.85	804.1697	633.25	530.4573
280.46	965.1205	410.95	716.3376	634.78	522.3611
283.69	1037.3657	413.71	816.1976	635.95	522.6788
284.31	1074.3306	414.70	801.3353	636.99	529.5897
285.41	1074.4537	423.72	698.7109	645.85	514.8670
285.90	0.0000	427.09	693.5814	657.76	498.6217
287.50	1027.3643	427.87	695.9147	657.90	0.0000
290.67	1020.0873	433.94	650.9429	661.66	513.6949
293.27	0.0000	439.40	679.9697	664.57	0.0000
351.93	1064.7588	453.88	637.1476	666.33	518.2555
295.96	929.0447	463.37	643.2205	666.50	494.7433
879.38	931.3566	468.07	642.3690	667.71	0.0000
299.98	976.4954	473.00	614.1636	677.62	484.4002
300.09	937.9548	475.06	622.0360	685.70	485.3341
300.13	1097.8444	476.78	643.8947	695.00	556.7409
301.36	907.4302	477.60	632.1408	696.49	550.3091
302.85	869.9474	482.18	596.6080	696.51	550.3091
256.23	911.8604	487.02	608.6121	697.00	568.9801
304.85	912.1549	492.35	0.0000	697.30	586.6310
306.78	929.2614	497.08	579.8448	697.49	586.6835
308.46	919.8184	505.52	540.1089	702.65	575.4082
311.90	835.3543	507.63	0.0000	706.68	550.0332
316.51	956.5648	511.00	567.3948	711.68	530.6868
319.41	882.8966	514.00	568.4402	720.70	493.9453
320.08	853.9695	514.00	568.4402	721.93	0.0000
321.04	876.3651	520.40	571.6982	722.78	513.4326
323.87	990.8979	520.69	0.0000	722.91	513.4689
325.23	992.0884	522.65	0.0000	723.31	527.3928
328.76	924.8654	527.90	0.0000	724.19	553.5547
333.37	879.7280	528.26	561.9287	727.33	499.9187
333.97	874.7496	529.59	575.9179	733.00	458.5356
334.37	880.4894	529.87	0.0000	735.93	459.1560
338.28	883.4557	531.02	578.4976	333.97	457.7298
338.32	883.4854	537.26	542.9797	739.50	0.0000
311.90	852.3442	546.56	0.0000	747.24	451.5192
340.48	852.3442	552.55	597.4713	748.06	452.6919
340.55	852.3918	563.25	600.0826	752.31	481.5872
344.28	898.9470	569.33	562.7188	753.82	439.8345
345.93	903.8677	946.00	573.4310	756.73	462.4712
351.06	807.6099	569.70	573.4967	756.80	462.4872
351.93	808.1911	583.19	571.3870	884.68	477.2935

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	470.6315	1274.44	349.9831	1620.50	130.8681
766.42	470.7619	1001.03	308.3644	1621.92	158.7758
766.84	474.3785	1002.74	299.1994	1678.03	0.0000
772.60	0.0000	1004.73	282.1997	1690.97	113.4234
776.52	388.1956	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	118.9667
778.90	460.9271	1028.54	0.0000	1063.66	117.8137
783.70	445.8988	1037.84	310.3636	1771.35	124.7759
785.37	404.6923	1038.76	0.0000	1791.20	0.0000
792.07	449.2980	631.29	340.7415	1808.65	99.9146
794.95	419.3423	1048.07	313.4023	1810.72	0.0000
795.86	419.5000	1049.04	318.4233	1836.06	120.7825
810.06	388.0657	1050.41	293.0073		
810.29	386.0452	1063.66	313.0723		
344.28	386.0714	1077.00	291.6493		
810.76	386.1239	1077.34	276.8033		
815.77	416.7805	1085.87	351.3431		
1048.07	391.5006	1093.63	331.5923		
832.01	470.3647	1099.45	316.2320		
834.85	539.3694	1112.07	346.0677		
835.71	512.5818	1112.84	346.1519		
836.80	0.0000	1115.54	333.9460		
846.75	0.0000	1120.29	372.0121		
846.77	480.5031	1120.55	372.0460		
856.80	428.5525	1221.41	349.2132		
860.56	414.5287	1129.67	340.8393		
871.09	376.5638	1131.51	0.0000		
873.19	383.4302	1147.95	0.0000		
875.33	0.0000	1173.23	327.3242		
879.38	416.0416	1177.95	334.9634		
880.51	390.8732	1189.05	334.0454		
883.24	369.0840	1204.77	376.9409		
884.68	368.2328	1221.41	354.9419		
889.28	429.3167	1231.02	355.2604		
894.76	343.1199	1235.36	372.3931		
898.04	372.2778	1238.28	373.4047		
900.72	436.3538	1260.41	0.0000		
903.28	401.0057	1271.87	317.0200		
911.20	439.6353	1274.44	308.8178		
912.08	439.7859	1274.54	308.8267		
923.98	0.0000	1291.59	279.6138		
926.50	263.4314	1298.22	0.0000		
929.11	305.1244	1312.11	251.8788		
937.49	351.0093	1332.49	238.0642		
944.13	354.8174	1362.66	0.0000		
946.00	362.0128	1365.19	226.7428		
949.00	329.2095	1368.63	0.0000		
667.71	0.0000	1384.29	201.6406		
962.31	320.3269	1408.01	232.6396		
964.08	338.6627	1457.56	0.0000		
966.17	338.9173	1460.82	192.0959		
911.20	339.2586	1489.16	196.4478		
968.97	339.2586	1505.03	199.0195		
983.53	350.6475	1584.12	138.8967		
984.45	0.0000	1596.21	128.2969		

VAX/VMS Nuclide Identification Report Generated 23-JUN-2016 03:20:21.79

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
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Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656004.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;135
Background date : 20-JUN-2016 14:17:28
Sample date     : 17-MAY-2016 10:35:00 Acquisition date : 22-JUN-2016 15:18:40
Sample ID      : G398656004 Sample quantity : 1.67820E+02 GRAM
Detector name  : GAM43 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.66 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit: 75.00000 Sensitivity : 3.00000
Batch ID       : 1572234 Detector SN# :
Matrix Spike ID: LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.31*	23	651	0.92	126.41	123	6	5.32E-04	224.6	
2	0	77.10	607	801	0.96	153.99	152	7	1.40E-02	8.8	
3	4	84.16	161	744	1.13	168.13	163	15	3.72E-03	28.9	1.85E+00
4	4	87.21	239	633	0.98	174.21	163	15	5.54E-03	17.8	
5	0	89.83	155	489	0.95	179.45	177	5	3.59E-03	22.9	
6	2	92.58*	272	456	1.20	184.97	182	11	6.30E-03	20.4	3.71E+00
7	2	94.57	87	679	1.33	188.95	182	11	2.02E-03	59.1	
8	0	129.19*	85	720	0.88	258.20	254	8	1.96E-03	64.5	
9	0	139.88	57	509	1.40	279.60	277	6	1.33E-03	63.7	
10	0	144.13*	67	729	1.60	288.09	284	9	1.55E-03	87.6	
11	0	185.86*	247	848	1.14	371.58	367	12	5.71E-03	29.3	
12	0	209.22	154	425	0.92	418.31	415	6	3.57E-03	22.6	
13	3	238.56*	1751	424	1.05	477.01	472	16	4.05E-02	3.7	6.08E-01
14	3	241.53	405	559	1.53	482.95	472	16	9.38E-03	13.3	
15	0	270.15	128	427	1.20	540.21	537	9	2.97E-03	30.4	
16	0	277.39	80	466	0.81	554.68	551	9	1.85E-03	49.8	
17	0	295.08*	414	443	1.16	590.08	586	10	9.58E-03	12.0	
18	0	299.51	78	434	0.78	598.94	596	9	1.81E-03	49.4	
19	0	327.54	109	362	1.48	655.01	651	9	2.51E-03	33.1	
20	0	338.38*	379	469	1.26	676.69	671	13	8.77E-03	13.8	
21	0	351.82*	807	373	1.31	703.60	698	12	1.87E-02	6.6	
22	0	409.00	40	180	1.48	817.98	815	7	9.30E-04	57.4	
23	0	443.86	32	179	1.51	887.72	885	8	7.46E-04	73.6	
24	0	462.95	125	225	1.14	925.91	920	10	2.89E-03	24.3	
25	0	494.42	40	121	1.14	988.85	986	7	9.19E-04	49.0	
26	0	510.53*	59	489	2.35	1021.08	1012	22	1.36E-03	129.2	
27	0	583.03*	484	267	1.50	1166.11	1160	15	1.12E-02	10.0	
28	0	609.08*	578	223	1.56	1218.23	1213	12	1.34E-02	7.5	
29	0	726.81	146	167	1.30	1453.73	1449	11	3.37E-03	19.2	
30	0	767.25	50	179	1.50	1534.62	1529	12	1.15E-03	56.0	
31	0	785.67*	46	140	1.80	1571.48	1566	14	1.06E-03	64.9	
32	0	794.66	77	151	1.54	1589.45	1584	14	1.79E-03	35.8	
33	0	835.46	43	110	1.70	1671.07	1664	11	9.95E-04	49.6	
34	0	859.55	69	169	1.31	1719.25	1713	14	1.60E-03	41.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	910.74*	368	165	1.59	1821.65	1813	17	8.52E-03	10.6	1.76E+00
36	5	964.21	41	125	2.25	1928.59	1924	19	9.61E-04	45.7	
37	5	968.52	236	100	1.93	1937.21	1924	19	5.47E-03	11.2	
38	0	1066.54	19	64	1.30	2133.29	2128	9	4.36E-04	83.0	
39	0	1119.80	141	124	2.27	2239.82	2234	19	3.27E-03	20.1	
40	0	1238.05	63	68	1.75	2476.34	2470	13	1.46E-03	30.2	9.19E-01
41	0	1383.55	31	118	10.71	2767.35	2750	27	7.11E-04	101.4	
42	0	1431.96	44	68	7.97	2864.16	2849	25	1.01E-03	53.5	
43	0	1460.02*	716	95	2.20	2920.29	2909	19	1.66E-02	5.5	
44	0	1478.28	16	42	4.63	2956.81	2948	14	3.70E-04	89.5	
45	0	1495.47	23	37	1.59	2991.19	2986	12	5.22E-04	59.0	5.34E+00
46	0	1575.91	21	24	2.93	3152.07	3143	14	4.75E-04	55.7	
47	3	1587.71	56	26	3.35	3175.67	3169	30	1.30E-03	24.2	
48	3	1591.38	28	26	2.52	3183.00	3169	30	6.58E-04	50.1	
49	0	1636.46	72	104	12.43	3273.17	3252	47	1.66E-03	52.4	
50	1	1691.38	40	14	2.58	3383.00	3378	27	9.16E-04	20.4	5.34E+00
51	1	1694.38	28	26	2.58	3389.00	3378	27	6.43E-04	44.0	
52	0	1714.64	20	33	5.89	3429.51	3420	15	4.73E-04	54.4	
53	0	1740.87	35	21	0.70	3481.97	3471	21	8.10E-04	36.8	
54	0	1763.89	117	15	2.50	3528.02	3520	16	2.71E-03	12.0	
55	0	1944.45	13	21	3.36	3889.12	3883	14	3.01E-04	79.8	5.34E+00
56	0	1963.58	17	22	2.69	3927.38	3917	18	3.92E-04	70.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 23-JUN-2016 03:20:23

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656004.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:35:00 Acquisition date : 22-JUN-2016 15:18:40
Sample ID        : G398656004 Sample quantity  : 167.82 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA43 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:05.66 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.017E+00	2.403E+00	2.403E+00	10.97	OK
MN-54	834.85	99.98*	1.729E+00	9.751E-03	1.057E-02	99.27	OK
NB-95	765.81	99.81*	1.869E+00	1.053E-02	1.562E-02	111.97	OK
CD-109	88.03	3.70*	4.665E+00	4.664E-01	4.926E-01	55.02	OK
SN-126	64.28	9.60	1.859E+00	6.746E-02	6.746E-02	449.14	OK
	86.94	8.90	4.665E+00	1.939E-01	1.939E-01	55.02	OK
	87.57	37.00*	4.665E+00	4.664E-02	4.664E-02	55.02	OK
CE-141	145.44	48.29*	6.010E+00	1.483E-03	3.226E-03	1355.30	OK
TL-208	277.37	6.60	4.073E+00	1.336E-01	1.336E-01	99.54	OK
	583.19	85.00*	2.356E+00	9.925E-02	9.925E-02	20.06	OK
	860.56	12.50	1.684E+00	1.279E-01	1.279E-01	83.38	OK
BI-211	72.87	1.23	3.101E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.431E+00	8.643E-02	8.643E-02	231.73	OK
BI-212	727.33	6.67*	1.961E+00	4.445E-01	4.445E-01	38.41	OK
	785.37	1.10	1.830E+00	8.997E-01	8.997E-01	129.87	OK
	1620.50	1.47	9.363E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.345E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	3.619E+00	5.036E-01	5.036E-01	17.65	OK
	238.63	43.60*	4.536E+00	4.037E-01	4.037E-01	7.34	OK
	300.09	3.30	3.853E+00	2.729E-01	2.729E-01	98.84	OK
BI-214	609.32	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94	OK
	1120.29	14.92	1.304E+00	2.738E-01	2.738E-01	40.20	OK
	1764.49	15.30	8.857E-01	3.054E-01	3.054E-01	23.95	OK
PB-214	74.82	5.80	3.345E+00	----- Line	Not Found	-----	Absent
	77.11	9.70	3.619E+00	8.878E-01	8.879E-01	17.65	OK
	87.09	3.41	4.655E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.490E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.895E+00	2.569E-01	2.569E-01	24.05	OK
	351.93	35.60*	3.430E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94	OK
	1120.29	14.92	1.304E+00	2.738E-01	2.738E-01	40.20	OK
	1764.49	15.30	8.857E-01	3.054E-01	3.054E-01	23.95	OK
RA-224	240.99	4.10*	4.497E+00	5.469E-01	5.469E-01	52.49	OK
RA-226	609.32	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94	OK
	1120.29	14.92	1.304E+00	2.738E-01	2.738E-01	40.20	OK
	1764.49	15.30	8.857E-01	3.054E-01	3.054E-01	23.95	OK
AC-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.529E+00	4.176E-01	4.176E-01	27.54	OK
	794.95	4.25	1.811E+00	3.968E-01	3.968E-01	71.58	OK
	835.71	1.61	1.729E+00	6.055E-01	6.055E-01	99.27	OK
	911.20	25.80*	1.595E+00	3.469E-01	3.469E-01	21.27	OK
	968.97	15.80	1.503E+00	3.823E-01	3.823E-01	22.32	OK
RA-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.529E+00	4.176E-01	4.176E-01	27.54	OK
	794.95	4.25	1.811E+00	3.968E-01	3.968E-01	71.58	OK
	835.71	1.61	1.729E+00	6.055E-01	6.055E-01	99.27	OK
	911.20	25.80*	1.595E+00	3.469E-01	3.469E-01	21.27	OK
	968.97	15.80	1.503E+00	3.823E-01	3.823E-01	22.32	OK
TH-228	74.82	10.28	3.345E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	77.11	17.10	3.619E+00	5.036E-01	5.036E-01	17.65	OK
	238.63	43.60*	4.536E+00	4.037E-01	4.037E-01	7.34	OK
	300.09	3.30	3.853E+00	2.729E-01	2.729E-01	98.84	OK
	85.43	14.70	4.383E+00	1.271E-01	1.271E-01	57.83	OK
	88.47	24.00	4.665E+00	7.190E-02	7.190E-02	55.02	OK
TH-230	193.51	4.41*	5.221E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.939E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94	OK
	1120.29	14.92	1.304E+00	2.738E-01	2.738E-01	40.20	OK
	1764.49	15.30	8.857E-01	3.054E-01	3.054E-01	23.95	OK
TH-232	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.529E+00	4.176E-01	4.176E-01	27.54	OK
	835.71	1.61	1.729E+00	6.055E-01	6.055E-01	99.27	OK
	911.20	25.80*	1.595E+00	3.469E-01	3.469E-01	21.27	OK
	968.97	15.80	1.503E+00	3.823E-01	3.823E-01	22.32	OK
TH-234	63.29	3.70*	1.859E+00	1.750E-01	1.750E-01	449.14	OK
	92.59	4.23	5.092E+00	6.377E-01	6.377E-01	40.71	OK
U-234	609.32	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94	OK
	1120.29	14.92	1.304E+00	2.738E-01	2.738E-01	40.20	OK
	1764.49	15.30	8.857E-01	3.054E-01	3.054E-01	23.95	OK
U-235	89.96	3.47	4.884E+00	4.627E-01	4.627E-01	45.77	OK
	93.35	5.60	5.092E+00	4.817E-01	4.817E-01	40.71	OK
	143.76	10.96*	6.014E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	5.735E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.351E+00	3.780E-02	3.780E-02	58.59	OK
U-238	205.31	5.01	5.027E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	1.859E+00	1.750E-01	1.750E-01	449.14	OK
	92.59	4.23	5.092E+00	6.377E-01	6.377E-01	40.71	OK
ANH-511	511.00	100.00*	2.612E+00	9.383E-03	9.383E-03	258.34	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656004.CNF;1  *
* Acquisition date   : 22-JUN-2016 15:18:40 Sensitivity      : 3.000          *
* Detector ID        : GAM43 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000        *
* Elapsed real time  : 0 12:00:05.66 Half life ratio : *****          *
* Sample date        : 17-MAY-2016 10:35:00 Analyst initials: MXR1       *
* Sample ID          : G398656004 Sample Quantity : 1.6782E+02 GRAM      *
* Batch Number       : 1572234 Wet Weight : 0.00000         *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000          *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-SEP-2015 10:32:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6          *
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	2.403E+00	2.584E-01	1.429E-01
MN-54	1.057E-02	1.029E-02	1.510E-02
NB-95	1.562E-02	1.714E-02	2.025E-02
CD-109	4.926E-01	2.656E-01	3.071E-01
SN-126	4.664E-02	2.515E-02	2.931E-02
CE-141	3.226E-03	4.285E-02	3.699E-02
TL-208	9.925E-02	1.951E-02	1.349E-02
BI-211	8.643E-02	1.963E-01	7.690E-02
BI-212	4.445E-01	1.673E-01	1.971E-01
PB-212	4.037E-01	2.902E-02	2.332E-02
BI-214	2.281E-01	3.340E-02	2.775E-02
PB-214	2.883E-01	3.752E-02	5.250E-02
RN-222	2.281E-01	3.340E-02	2.775E-02
RA-224	5.469E-01	2.813E-01	2.500E-01
RA-226	2.281E-01	3.340E-02	2.775E-02
AC-228	3.469E-01	7.230E-02	5.378E-02
RA-228	3.469E-01	7.230E-02	5.378E-02
TH-228	4.037E-01	2.902E-02	2.332E-02
TH-229	-9.331E-02	1.127E-01	2.032E-01
TH-230	2.281E-01	3.340E-02	2.775E-02
TH-232	3.469E-01	7.230E-02	5.378E-02
TH-234	1.750E-01	7.704E-01	7.698E-01
U-234	2.281E-01	3.340E-02	2.775E-02
U-235	4.894E-02	8.407E-02	8.089E-02
U-238	1.750E-01	7.704E-01	7.698E-01
ANH-511	9.383E-03	2.376E-02	1.095E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.875E-02	8.946E-02	1.655E-01	NOT IDENT.
NA-22	-2.525E-02	9.581E-03	1.443E-02	NOT IDENT.
NA-24	0.000E+00	3.039E+15	0.000E+00	SHORT HLIF
AL-26	-4.096E-04	7.491E-03	1.375E-02	NOT IDENT.

SC-46	-7.026E-03	1.014E-02	1.748E-02	FAIL ABUN
V-48	-1.478E-02	3.839E-02	6.669E-02	NOT IDENT.
CR-51	-6.268E-02	1.356E-01	2.502E-01	NOT IDENT.
CO-56	-1.155E-03	1.036E-02	1.857E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.351E-03	5.362E-03	1.048E-02	NOT IDENT.
CO-58	2.810E-03	9.792E-03	1.807E-02	NOT IDENT.
FE-59	2.585E-03	2.484E-02	4.583E-02	NOT IDENT.
CO-60	-2.027E-03	8.375E-03	1.488E-02	NOT IDENT.
ZN-65	-4.012E-03	2.263E-02	3.475E-02	NOT IDENT.
GE-68	3.117E-02	3.782E-01	5.284E-01	NOT IDENT.
AS-73	-8.591E-02	4.461E-01	8.411E-01	NOT IDENT.
AS-74	3.974E-02	4.918E-02	9.044E-02	NOT IDENT.
SE-75	6.268E-03	1.215E-02	2.061E-02	NOT IDENT.
BR-77	0.000E+00	2.262E+03	0.000E+00	SHORT HLIF
SR-82	6.148E-03	1.307E-01	2.379E-01	NOT IDENT.
RB-83	8.289E-03	1.984E-02	3.318E-02	NOT IDENT.
KR-85	0.000E+00	1.753E+00	3.650E+00	NOT IDENT.
SR-85	0.000E+00	1.162E-02	2.419E-02	NOT IDENT.
RB-86	4.103E-02	4.977E-01	6.955E-01	NOT IDENT.
Y-88	8.936E-03	9.857E-03	1.966E-02	NOT IDENT.
Y-91	6.494E+00	5.336E+00	1.036E+01	NOT IDENT.
NB-94	3.177E-04	7.496E-03	1.372E-02	NOT IDENT.
NB-95M	0.000E+00	3.877E-02	6.556E-02	NOT IDENT.
ZR-95	2.071E-03	2.017E-02	3.684E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	5.950E+14	0.000E+00	SHORT HLIF
MO-99	0.000E+00	5.443E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.248E+41	0.000E+00	SHORT HLIF
RH-101	7.355E-03	7.491E-03	1.300E-02	NOT IDENT.
RH-102	5.749E-03	1.152E-02	2.182E-02	FAIL ABUN
RU-103	6.084E-03	1.413E-02	2.272E-02	FAIL ABUN
RH-106	7.171E-03	6.912E-02	1.287E-01	NOT IDENT.
RU-106	7.171E-03	6.912E-02	1.287E-01	NOT IDENT.
AG-108M	5.145E-04	6.607E-03	1.211E-02	NOT IDENT.
AG-110M	4.118E-03	1.102E-02	2.028E-02	FAIL ABUN
SN-113	6.512E-04	1.059E-02	1.959E-02	NOT IDENT.
CD-115	0.000E+00	1.806E+03	0.000E+00	SHORT HLIF
SN-117M	6.716E-03	3.339E-02	6.297E-02	NOT IDENT.
TE-123M	3.427E-03	6.599E-03	1.254E-02	NOT IDENT.
SB-124	0.000E+00	1.987E-02	4.866E-02	FAIL ABUN
SB-125	-4.357E-02	2.352E-02	3.537E-02	FAIL ABUN
TE-125M	-8.084E-01	2.540E+00	4.868E+00	NOT IDENT.
I-126	8.891E-03	1.416E-01	2.617E-01	NOT IDENT.
SB-126	-1.281E-02	1.203E-01	1.876E-01	NOT IDENT.
SB-127	8.334E+00	1.247E+01	2.368E+01	NOT IDENT.
I-131	-4.055E-05	1.565E-01	2.904E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.626E+01	0.000E+00	SHORT HLIF
BA-133	-4.440E-03	1.011E-02	1.596E-02	FAIL ABUN
I-133	0.000E+00	3.065E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.431E-02	1.744E-02	FAIL ABUN
CS-135	3.516E-02	4.007E-02	6.526E-02	NOT IDENT.
I-135	0.000E+00	2.835E+38	0.000E+00	SHORT HLIF
CS-136	-4.096E-02	6.657E-02	1.180E-01	NOT IDENT.
BA-137M	1.437E-03	7.394E-03	1.375E-02	NOT IDENT.
CS-137	1.518E-03	7.811E-03	1.452E-02	NOT IDENT.
CE-139	-2.247E-03	6.779E-03	1.256E-02	NOT IDENT.
BA-140	-1.705E-02	1.858E-01	3.320E-01	NOT IDENT.
LA-140	4.699E-02	6.416E-02	1.118E-01	FAIL ABUN
CE-143	0.000E+00	1.766E+06	0.000E+00	SHORT HLIF
CE-144	-1.119E-02	4.641E-02	7.707E-02	NOT IDENT.
PM-144	4.729E-03	8.104E-03	1.518E-02	NOT IDENT.
PR-144	3.501E-01	6.130E-01	1.147E+00	NOT IDENT.
PM-146	-4.546E-03	9.172E-03	1.636E-02	NOT IDENT.
ND-147	-3.829E-01	4.639E-01	8.009E-01	FAIL ABUN
PM-147	1.058E+02	1.490E+02	2.908E+02	NOT IDENT.
PM-149	0.000E+00	1.620E+04	0.000E+00	SHORT HLIF
EU-150	1.432E-03	7.458E-03	1.074E-02	FAIL ABUN
EU-152	1.296E-02	2.456E-02	3.872E-02	FAIL ABUN
GD-153	-2.952E-03	2.075E-02	3.553E-02	NOT IDENT.
EU-154	-7.115E-02	2.683E-02	4.033E-02	NOT IDENT.
EU-155	-1.200E-02	2.144E-02	4.097E-02	FAIL ABUN
TB-160	9.973E-03	3.426E-02	6.273E-02	FAIL ABUN
HO-166M	-5.624E-03	1.305E-02	2.338E-02	FAIL ABUN
TM-171	-2.180E+00	8.394E+00	1.582E+01	NOT IDENT.
HF-172	-5.136E-03	4.450E-02	7.460E-02	FAIL ABUN
LU-172	1.184E-02	1.354E-02	2.604E-02	FAIL ABUN

LU-176	3.336E-04	5.849E-03	1.074E-02	FAIL ABUN
HF-181	-9.851E-03	1.344E-02	2.357E-02	NOT IDENT.
TA-182	-2.405E-03	4.134E-02	7.458E-02	FAIL ABUN
RE-183	-6.979E-02	9.160E-02	1.688E-01	NOT IDENT.
RE-184	-2.228E-02	4.985E-02	7.355E-02	NOT IDENT.
W-188	4.961E-01	2.306E+00	3.624E+00	FAIL ABUN
IR-192	-1.010E-03	9.033E-03	1.689E-02	FAIL ABUN
HG-203	0.000E+00	1.349E-02	2.272E-02	NOT IDENT.
BI-207	3.171E-03	1.276E-02	2.047E-02	NOT IDENT.
PB-210	5.843E-02	2.972E+00	4.524E+00	NOT IDENT.
PB-211	7.466E-02	1.674E-01	2.742E-01	NOT IDENT.
RN-219	-1.037E-01	1.117E-01	1.521E-01	FAIL ABUN
RA-223	5.410E-02	1.551E-01	2.569E-01	FAIL ABUN
AC-227	2.819E-02	5.623E-02	1.031E-01	FAIL ABUN
TH-227	2.819E-02	5.623E-02	1.031E-01	FAIL ABUN
PA-231	1.110E-01	1.221E-01	2.074E-01	NOT IDENT.
TH-231	5.410E-02	1.551E-01	2.569E-01	FAIL ABUN
PA-233	-1.581E-03	1.346E-02	2.521E-02	FAIL ABUN
PA-234	-7.329E-03	5.988E-02	1.065E-01	FAIL ABUN
PA-234M	-6.656E-01	1.417E+00	1.764E+00	FAIL ABUN
NP-237	-1.581E-03	1.346E-02	2.521E-02	FAIL ABUN
NP-238	0.000E+00	4.468E+03	0.000E+00	SHORT HLIF
NP-239	-2.517E-02	5.299E-02	1.007E-01	FAIL ABUN
PU-239	1.068E+02	1.351E+02	1.422E+02	FAIL ABUN
AM-241	2.605E-02	5.900E-02	1.005E-01	NOT IDENT.
AM-243	0.000E+00	1.867E-02	3.084E-02	NOT IDENT.
CM-243	2.670E-03	2.174E-02	4.229E-02	FAIL ABUN
BK-247	1.047E-02	1.933E-02	3.282E-02	FAIL ABUN
CM-247	-6.078E-03	1.039E-02	1.417E-02	FAIL ABUN
CF-249	-6.711E-03	8.458E-03	1.514E-02	NOT IDENT.
CF-251	-6.908E-03	2.708E-02	4.999E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	699	10.66*	1.017E+00	2.403E+00	2.403E+00	10.97
MN-54	834.85	45	99.98*	1.729E+00	9.751E-03	1.057E-02	99.27
NB-95	765.81	53	99.81*	1.869E+00	1.053E-02	1.562E-02	111.97
CD-109	88.03	326	3.70*	4.665E+00	7.032E-01	7.427E-01	35.58
SN-126	64.28	32	9.60	1.859E+00	6.746E-02	6.746E-02	449.14
	86.94	326	8.90	4.665E+00	2.923E-01	2.923E-01	35.58
	87.57	326	37.00*	4.665E+00	7.032E-02	7.032E-02	35.58
CE-141	145.44	86	48.29*	6.010E+00	1.111E-02	2.416E-02	175.29
TL-208	277.37	96	6.60	4.073E+00	1.336E-01	1.336E-01	99.54
	583.19	533	85.00*	2.356E+00	9.925E-02	9.925E-02	20.06
	860.56	72	12.50	1.684E+00	1.279E-01	1.279E-01	83.38
BI-211	72.87	-----	1.23	3.101E+00	-----	Line Not Found	-----
	351.06	945	12.92*	3.431E+00	7.944E-01	7.944E-01	13.28
BI-212	727.33	156	6.67*	1.961E+00	4.445E-01	4.445E-01	38.41
	785.37	49	1.10	1.830E+00	8.997E-01	8.997E-01	129.87
PB-212	1620.50	-----	1.47	9.363E-01	-----	Line Not Found	-----
	74.82	-----	10.28	3.345E+00	-----	Line Not Found	-----
	77.11	836	17.10	3.619E+00	5.036E-01	5.036E-01	17.65
	238.63	2142	43.60*	4.536E+00	4.037E-01	4.037E-01	7.34
	300.09	93	3.30	3.853E+00	2.729E-01	2.729E-01	98.84
BI-214	609.32	633	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94
	1120.29	143	14.92	1.304E+00	2.738E-01	2.738E-01	40.20
	1764.49	111	15.30	8.857E-01	3.054E-01	3.054E-01	23.95
PB-214	74.82	-----	5.80	3.345E+00	-----	Line Not Found	-----
	77.11	836	9.70	3.619E+00	8.878E-01	8.879E-01	17.65
	87.09	326	3.41	4.665E+00	7.630E-01	7.630E-01	35.58
	242.00	495	7.25	4.497E+00	5.662E-01	5.662E-01	26.51
	295.22	494	18.42	3.895E+00	2.569E-01	2.569E-01	24.05
RN-222	351.93	945	35.60*	3.431E+00	2.883E-01	2.883E-01	13.28
	609.32	633	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94
	1120.29	143	14.92	1.304E+00	2.738E-01	2.738E-01	40.20
	1764.49	111	15.30	8.857E-01	3.054E-01	3.054E-01	23.95
RA-224	240.99	495	4.10*	4.497E+00	1.001E+00	1.001E+00	26.51
RA-226	609.32	633	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94
	1120.29	143	14.92	1.304E+00	2.738E-01	2.738E-01	40.20
	1764.49	111	15.30	8.857E-01	3.054E-01	3.054E-01	23.95
AC-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	446	11.27	3.529E+00	4.176E-01	4.176E-01	27.54
	794.95	82	4.25	1.811E+00	3.968E-01	3.968E-01	71.58
	835.71	45	1.61	1.729E+00	6.055E-01	6.055E-01	99.27
	911.20	383	25.80*	1.595E+00	3.469E-01	3.469E-01	21.27
	968.97	244	15.80	1.503E+00	3.823E-01	3.823E-01	22.32
RA-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	446	11.27	3.529E+00	4.176E-01	4.176E-01	27.54
	794.95	82	4.25	1.811E+00	3.968E-01	3.968E-01	71.58
	835.71	45	1.61	1.729E+00	6.055E-01	6.055E-01	99.27
	911.20	383	25.80*	1.595E+00	3.469E-01	3.469E-01	21.27

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-228	968.97	244	15.80	1.503E+00	3.823E-01	3.823E-01	22.32
	74.82	-----	10.28	3.345E+00	-----	Line Not Found	-----
	77.11	836	17.10	3.619E+00	5.036E-01	5.036E-01	17.65
	238.63	2142	43.60*	4.536E+00	4.037E-01	4.037E-01	7.34
TH-229	300.09	93	3.30	3.853E+00	2.729E-01	2.729E-01	98.84
	85.43	220	14.70	4.383E+00	1.271E-01	1.271E-01	57.83
	88.47	326	24.00	4.665E+00	1.084E-01	1.084E-01	35.58
	193.51	-----	4.41*	5.221E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	4.939E+00	-----	Line Not Found	-----
	609.32	633	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94
	1120.29	143	14.92	1.304E+00	2.738E-01	2.738E-01	40.20
	1764.49	111	15.30	8.857E-01	3.054E-01	3.054E-01	23.95
TH-232	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	446	11.27	3.529E+00	4.176E-01	4.176E-01	27.54
	835.71	45	1.61	1.729E+00	6.055E-01	6.055E-01	99.27
	911.20	383	25.80*	1.595E+00	3.469E-01	3.469E-01	21.27
TH-234	968.97	244	15.80	1.503E+00	3.823E-01	3.823E-01	22.32
	63.29	32	3.70*	1.859E+00	1.750E-01	1.750E-01	449.14
	92.59	368	4.23	5.092E+00	6.377E-01	6.377E-01	40.71
	609.32	633	45.49*	2.275E+00	2.281E-01	2.281E-01	14.94
U-234	1120.29	143	14.92	1.304E+00	2.738E-01	2.738E-01	40.20
	1764.49	111	15.30	8.857E-01	3.054E-01	3.054E-01	23.95
	89.96	210	3.47	4.884E+00	4.627E-01	4.627E-01	45.77
	93.35	368	5.60	5.092E+00	4.817E-01	4.817E-01	40.71
U-235	143.76	86	10.96*	6.010E+00	4.894E-02	4.894E-02	175.29
	163.33	-----	5.08	5.735E+00	-----	Line Not Found	-----
	185.72	310	57.20	5.351E+00	3.780E-02	3.780E-02	58.59
	205.31	-----	5.01	5.027E+00	-----	Line Not Found	-----
U-238	63.29	32	3.70*	1.859E+00	1.750E-01	1.750E-01	449.14
	92.59	368	4.23	5.092E+00	6.377E-01	6.377E-01	40.71
ANH-511	511.00	66	100.00*	2.612E+00	9.383E-03	9.383E-03	258.34

Flag: "*" = Keyline

Total number of lines in spectrum 56
Number of unidentified lines 17
Number of lines tentatively identified by NID 39 69.64%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	2.403E+00	2.403E+00	0.264E+00	10.97	
MN-54	312.05D	1.08	9.751E-03	1.057E-02	1.050E-02	99.27	
NB-95	64.03D	1.48	1.053E-02	1.562E-02	1.749E-02	111.97	
CD-109	461.40D	1.06	7.032E-01	7.427E-01	2.643E-01	35.58	
SN-126	2.30E+05Y	1.00	7.032E-02	7.032E-02	2.502E-02	35.58	
CE-141	32.51D	2.18	1.111E-02	2.416E-02	4.235E-02	175.29	
TL-208	1.41E+10Y	1.00	9.925E-02	9.925E-02	1.991E-02	20.06	
BI-211	7.04E+08Y	1.00	7.944E-01	7.944E-01	1.055E-01	13.28	
BI-212	1.41E+10Y	1.00	4.445E-01	4.445E-01	1.707E-01	38.41	
PB-212	1.41E+10Y	1.00	4.037E-01	4.037E-01	0.296E-01	7.34	
BI-214	1600.00Y	1.00	2.281E-01	2.281E-01	0.341E-01	14.94	
PB-214	1600.00Y	1.00	2.883E-01	2.883E-01	0.383E-01	13.28	
RN-222	1600.00Y	1.00	2.281E-01	2.281E-01	0.341E-01	14.94	
RA-224	1.41E+10Y	1.00	1.001E+00	1.001E+00	0.265E+00	26.51	
RA-226	1600.00Y	1.00	2.281E-01	2.281E-01	0.341E-01	14.94	
AC-228	1.41E+10Y	1.00	3.469E-01	3.469E-01	0.738E-01	21.27	
RA-228	1.41E+10Y	1.00	3.469E-01	3.469E-01	0.738E-01	21.27	
TH-228	1.41E+10Y	1.00	4.037E-01	4.037E-01	0.296E-01	7.34	
TH-229	7340.00Y	1.00	1.084E-01	1.084E-01	0.386E-01	35.58	K
TH-230	7.54E+04Y	1.00	2.281E-01	2.281E-01	0.341E-01	14.94	
TH-232	1.41E+10Y	1.00	3.469E-01	3.469E-01	0.738E-01	21.27	
TH-234	4.47E+09Y	1.00	1.750E-01	1.750E-01	7.861E-01	449.14	
U-234	2.45E+05Y	1.00	2.281E-01	2.281E-01	0.341E-01	14.94	
U-235	7.04E+08Y	1.00	4.894E-02	4.894E-02	8.578E-02	175.29	
U-238	4.47E+09Y	1.00	1.750E-01	1.750E-01	7.861E-01	449.14	
ANH-511	1.00E+09Y	1.00	9.383E-03	9.383E-03	24.24E-03	258.34	
Total Activity :			9.341E+00	9.399E+00			

Grand Total Activity : 9.341E+00 9.399E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	94.57	118	916	1.33	188.95	182	11	2.02E-03	****	5.23E+00	T
0	129.19	111	941	0.88	258.20	254	8	1.96E-03	****	6.11E+00	T
0	139.88	74	659	1.40	279.60	277	6	1.33E-03	****	6.05E+00	T
0	209.22	192	527	0.92	418.31	415	6	3.57E-03	45.2	4.96E+00	
0	270.15	155	515	1.20	540.21	537	9	2.97E-03	60.8	4.15E+00	T
0	327.54	128	428	1.48	655.01	651	9	2.51E-03	66.1	3.61E+00	T
0	409.00	46	207	1.48	817.98	815	7	9.30E-04	****	3.08E+00	
0	443.86	37	203	1.51	887.72	885	8	7.46E-04	****	2.90E+00	
0	462.95	141	255	1.14	925.91	920	10	2.89E-03	48.5	2.81E+00	T
0	494.42	45	136	1.14	988.85	986	7	9.19E-04	98.0	2.68E+00	
5	964.21	43	129	2.25	1928.59	1924	19	9.61E-04	91.4	1.51E+00	T
0	1066.54	19	65	1.30	2133.29	2128	9	4.36E-04	****	1.37E+00	
0	1238.05	63	68	1.75	2476.34	2470	13	1.46E-03	60.4	1.18E+00	T
0	1383.55	30	116	10.71	2767.35	2750	27	7.11E-04	****	1.07E+00	T
0	1431.96	43	67	7.97	2864.16	2849	25	1.01E-03	****	1.03E+00	
0	1478.28	16	41	4.63	2956.81	2948	14	3.70E-04	****	1.01E+00	
0	1495.47	22	36	1.59	2991.19	2986	12	5.22E-04	****	9.97E-01	
0	1575.91	20	24	2.93	3152.07	3143	14	4.75E-04	****	9.56E-01	
3	1587.71	54	25	3.35	3175.67	3169	30	1.30E-03	48.4	9.51E-01	
3	1591.38	27	25	2.52	3183.00	3169	30	6.58E-04	****	9.49E-01	
0	1636.46	69	100	12.43	3273.17	3252	47	1.66E-03	****	9.30E-01	
1	1691.38	38	14	2.58	3383.00	3378	27	9.16E-04	40.9	9.09E-01	T
1	1694.38	27	25	2.58	3389.00	3378	27	6.43E-04	88.0	9.08E-01	
0	1714.64	19	31	5.89	3429.51	3420	15	4.73E-04	****	9.01E-01	
0	1740.87	33	20	0.70	3481.97	3471	21	8.10E-04	73.7	8.93E-01	
0	1944.45	12	20	3.36	3889.12	3883	14	3.01E-04	****	8.46E-01	
0	1963.58	16	21	2.69	3927.38	3917	18	3.92E-04	****	8.44E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656004.CNF;1  *
* Acquisition date   : 22-JUN-2016 15:18:40 Sensitivity      : 3.000          *
* Detector ID        : GAM43 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:05.66 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 10:35:00 Nuclide Library : SOLID         *
* Sample ID          : G398656004 Analyst initials: MXR1          *
* Batch Number       : 1572234 Sample Quantity : 1.6782E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000         *
*                                     Dry Weight    : 0.00000         *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-SEP-2015 10:32:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.675E-02
MN-54	7.229E-03
NB-95	9.715E-03
CD-109	1.503E-01
SN-126	1.434E-02
CE-141	1.809E-02
TL-208	6.484E-03
BI-211	3.727E-02
BI-212	9.459E-02
PB-212	1.139E-02
BI-214	1.338E-02
PB-214	2.583E-02
RN-222	1.338E-02
RA-224	1.221E-01
RA-226	1.338E-02
AC-228	2.564E-02
RA-228	2.564E-02
TH-228	1.139E-02
TH-229	9.927E-02
TH-230	1.338E-02
TH-232	2.564E-02
TH-234	3.769E-01
U-234	1.338E-02
U-235	3.963E-02
U-238	3.769E-01
ANH-511	5.273E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.984E-02	NOT IDENT.
NA-22	6.759E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.297E-03	NOT IDENT.
SC-46	8.315E-03	FAIL ABUN

V-48	3.166E-02	NOT IDENT.
CR-51	1.215E-01	NOT IDENT.
CO-56	8.867E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.128E-03	NOT IDENT.
CO-58	8.617E-03	NOT IDENT.
FE-59	2.171E-02	NOT IDENT.
CO-60	6.971E-03	NOT IDENT.
ZN-65	1.652E-02	NOT IDENT.
GE-68	2.514E-01	NOT IDENT.
AS-73	4.108E-01	NOT IDENT.
AS-74	4.365E-02	NOT IDENT.
SE-75	1.004E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.140E-01	NOT IDENT.
RB-83	1.599E-02	NOT IDENT.
KR-85	1.779E+00	NOT IDENT.
SR-85	1.179E-02	NOT IDENT.
RB-86	3.308E-01	NOT IDENT.
Y-88	9.088E-03	NOT IDENT.
Y-91	4.930E+00	NOT IDENT.
NB-94	6.602E-03	NOT IDENT.
NB-95M	3.209E-02	NOT IDENT.
ZR-95	1.768E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.370E-03	NOT IDENT.
RH-102	1.048E-02	FAIL ABUN
RU-103	1.095E-02	FAIL ABUN
RH-106	6.185E-02	NOT IDENT.
RU-106	6.185E-02	NOT IDENT.
AG-108M	5.858E-03	NOT IDENT.
AG-110M	9.662E-03	FAIL ABUN
SN-113	9.480E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.080E-02	NOT IDENT.
TE-123M	6.137E-03	NOT IDENT.
SB-124	2.255E-02	FAIL ABUN
SB-125	1.708E-02	FAIL ABUN
TE-125M	2.381E+00	NOT IDENT.
I-126	1.256E-01	NOT IDENT.
SB-126	9.003E-02	NOT IDENT.
SB-127	1.136E+01	NOT IDENT.
I-131	1.407E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	7.730E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	8.374E-03	FAIL ABUN
CS-135	3.184E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.588E-02	NOT IDENT.
BA-137M	6.603E-03	NOT IDENT.
CS-137	6.975E-03	NOT IDENT.
CE-139	6.140E-03	NOT IDENT.
BA-140	1.598E-01	NOT IDENT.
LA-140	5.185E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	3.767E-02	NOT IDENT.
PM-144	7.315E-03	NOT IDENT.
PR-144	5.530E-01	NOT IDENT.
PM-146	7.894E-03	NOT IDENT.
ND-147	3.848E-01	FAIL ABUN
PM-147	1.422E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.216E-03	FAIL ABUN
EU-152	1.879E-02	FAIL ABUN
GD-153	1.738E-02	NOT IDENT.
EU-154	1.889E-02	NOT IDENT.
EU-155	2.003E-02	FAIL ABUN
TB-160	2.990E-02	FAIL ABUN
HO-166M	1.121E-02	FAIL ABUN
TM-171	7.723E+00	NOT IDENT.
HF-172	3.649E-02	FAIL ABUN
LU-172	1.239E-02	FAIL ABUN
LU-176	5.220E-03	FAIL ABUN

HF-181	1.136E-02	NOT IDENT.
TA-182	3.533E-02	FAIL ABUN
RE-183	8.248E-02	NOT IDENT.
RE-184	3.506E-02	NOT IDENT.
W-188	1.764E+00	FAIL ABUN
IR-192	8.201E-03	FAIL ABUN
HG-203	1.108E-02	NOT IDENT.
BI-207	9.737E-03	NOT IDENT.
PB-210	2.213E+00	NOT IDENT.
PB-211	1.326E-01	NOT IDENT.
RN-219	7.350E-02	FAIL ABUN
RA-223	1.248E-01	FAIL ABUN
AC-227	5.027E-02	FAIL ABUN
TH-227	5.027E-02	FAIL ABUN
PA-231	1.012E-01	NOT IDENT.
TH-231	1.248E-01	FAIL ABUN
PA-233	1.224E-02	FAIL ABUN
PA-234	5.048E-02	FAIL ABUN
PA-234M	8.401E-01	FAIL ABUN
NP-237	1.224E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	4.921E-02	FAIL ABUN
PU-239	6.974E+01	FAIL ABUN
AM-241	4.916E-02	NOT IDENT.
AM-243	1.518E-02	NOT IDENT.
CM-243	2.069E-02	FAIL ABUN
BK-247	1.599E-02	FAIL ABUN
CM-247	6.850E-03	FAIL ABUN
CF-249	7.322E-03	NOT IDENT.
CF-251	2.444E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656004.CNF;1
Acquisition date : 22-JUN-2016 15:18:40 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance : 1.500
Elapsed live time : 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time : 0 12:00:05.66 Half life ratio : *****
Sample date : 17-MAY-2016 10:35:00 Nuclide Library : SOLID
Sample ID : G398656004 Analyst initials : MXR1
Batch Number : 1572234 Sample Quantity : 1.6782E+02 GRAM
Quantity Err(%) : 1.1918E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	2.403E+00	3.299E-01	3.299E-01
MN-54	1.057E-02	1.038E-02	1.038E-02
NB-95	1.562E-02	1.723E-02	1.723E-02
CD-109	4.926E-01	2.738E-01	2.738E-01
SN-126	4.664E-02	2.581E-02	2.581E-02
CE-141	3.293E-03	4.291E-02	4.291E-02
TL-208	9.925E-02	2.143E-02	2.143E-02
BI-211	8.643E-02	2.176E-01	2.176E-01
BI-212	4.445E-01	1.741E-01	1.741E-01
PB-212	4.037E-01	4.687E-02	4.687E-02
BI-214	2.281E-01	3.918E-02	3.918E-02
PB-214	2.883E-01	4.551E-02	4.551E-02
RN-222	2.281E-01	3.918E-02	3.918E-02
RA-224	5.469E-01	2.920E-01	2.920E-01
RA-226	2.281E-01	3.918E-02	3.918E-02
AC-228	3.469E-01	9.081E-02	9.081E-02
RA-228	3.469E-01	9.081E-02	9.081E-02
TH-228	4.037E-01	4.687E-02	4.687E-02
TH-229	-9.331E-02	1.129E-01	1.129E-01
TH-230	2.281E-01	3.917E-02	3.917E-02
TH-232	3.469E-01	9.081E-02	9.081E-02
TH-234	1.750E-01	7.716E-01	7.716E-01
U-234	2.281E-01	3.917E-02	3.917E-02
U-235	4.894E-02	8.416E-02	8.416E-02
U-238	1.750E-01	7.716E-01	7.716E-01
ANH-511	9.383E-03	2.377E-02	2.377E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.875E-02	8.953E-02	9.121E-02	NOT IDENT.
NA-22	-2.525E-02	9.796E-03	1.502E-02	NOT IDENT.
NA-24	8.199E+14	3.040E+15	3.062E+15	SHORT HLIF
AL-26	-4.096E-04	7.491E-03	7.493E-03	NOT IDENT.

SC-46	-7.026E-03	1.020E-02	1.068E-02	FAIL ABUN
V-48	-1.478E-02	3.847E-02	3.905E-02	NOT IDENT.
CR-51	-6.268E-02	1.357E-01	1.386E-01	NOT IDENT.
CO-56	-1.155E-03	1.036E-02	1.038E-02	FAIL ABUN
MN-56	-1.000E+41	8.878E+41	0.000E+00	SHORT HLIF
CO-57	4.351E-03	5.376E-03	5.722E-03	NOT IDENT.
CO-58	2.810E-03	9.799E-03	9.880E-03	NOT IDENT.
FE-59	2.585E-03	2.484E-02	2.487E-02	NOT IDENT.
CO-60	-2.027E-03	8.376E-03	8.426E-03	NOT IDENT.
ZN-65	-4.012E-03	2.265E-02	2.272E-02	NOT IDENT.
GE-68	3.117E-02	3.782E-01	3.785E-01	NOT IDENT.
AS-73	-8.591E-02	4.466E-01	4.483E-01	NOT IDENT.
AS-74	3.974E-02	4.938E-02	5.253E-02	NOT IDENT.
SE-75	6.268E-03	1.217E-02	1.249E-02	NOT IDENT.
BR-77	3.147E+04	3.330E+04	3.619E+04	SHORT HLIF
SR-82	6.148E-03	1.307E-01	1.308E-01	NOT IDENT.
RB-83	8.289E-03	1.989E-02	2.023E-02	NOT IDENT.
KR-85	8.367E+00	1.899E+00	4.223E+00	NOT IDENT.
SR-85	5.533E-02	1.258E-02	2.793E-02	NOT IDENT.
RB-86	4.103E-02	4.978E-01	4.981E-01	NOT IDENT.
Y-88	8.936E-03	9.880E-03	1.067E-02	NOT IDENT.
Y-91	6.494E+00	5.365E+00	6.111E+00	NOT IDENT.
NB-94	3.177E-04	7.496E-03	7.497E-03	NOT IDENT.
NB-95M	6.729E-02	3.944E-02	4.976E-02	NOT IDENT.
ZR-95	2.071E-03	2.017E-02	2.019E-02	NOT IDENT.
NB-97	-1.000E+41	5.511E+41	0.000E+00	SHORT HLIF
ZR-97	3.113E+15	6.536E+14	1.548E+15	SHORT HLIF
MO-99	-3.620E+02	5.459E+02	5.697E+02	SHORT HLIF
TC-99M	1.000E+41	1.253E+41	0.000E+00	SHORT HLIF
RH-101	7.355E-03	7.624E-03	8.314E-03	NOT IDENT.
RH-102	5.749E-03	1.154E-02	1.183E-02	FAIL ABUN
RU-103	6.084E-03	1.414E-02	1.441E-02	FAIL ABUN
RH-106	7.171E-03	6.912E-02	6.920E-02	NOT IDENT.
RU-106	7.171E-03	6.912E-02	6.920E-02	NOT IDENT.
AG-108M	5.145E-04	6.607E-03	6.612E-03	NOT IDENT.
AG-110M	4.118E-03	1.104E-02	1.120E-02	FAIL ABUN
SN-113	6.512E-04	1.059E-02	1.060E-02	NOT IDENT.
CD-115	2.290E+02	1.806E+03	1.809E+03	SHORT HLIF
SN-117M	6.716E-03	3.340E-02	3.353E-02	NOT IDENT.
TE-123M	3.427E-03	6.604E-03	6.782E-03	NOT IDENT.
SB-124	4.958E-02	2.025E-02	3.016E-02	FAIL ABUN
SB-125	-4.357E-02	2.379E-02	3.085E-02	FAIL ABUN
TE-125M	-8.084E-01	2.541E+00	2.567E+00	NOT IDENT.
I-126	8.891E-03	1.416E-01	1.417E-01	NOT IDENT.
SB-126	-1.281E-02	1.203E-01	1.205E-01	NOT IDENT.
SB-127	8.334E+00	1.257E+01	1.312E+01	NOT IDENT.
I-131	-4.055E-05	1.565E-01	1.565E-01	NOT IDENT.
I-132	1.000E+41	8.301E+41	0.000E+00	SHORT HLIF
TE-132	6.467E+00	1.628E+01	1.654E+01	SHORT HLIF
BA-133	-4.440E-03	1.012E-02	1.031E-02	FAIL ABUN
I-133	-2.696E+09	3.066E+10	3.068E+10	SHORT HLIF
CS-134	2.041E-02	1.453E-02	1.720E-02	FAIL ABUN
CS-135	3.516E-02	4.025E-02	4.326E-02	NOT IDENT.
I-135	2.046E+38	3.303E+38	0.000E+00	SHORT HLIF
CS-136	-4.096E-02	6.708E-02	6.957E-02	NOT IDENT.
BA-137M	1.437E-03	7.395E-03	7.424E-03	NOT IDENT.
CS-137	1.518E-03	7.812E-03	7.842E-03	NOT IDENT.
CE-139	-2.247E-03	6.795E-03	6.870E-03	NOT IDENT.
BA-140	-1.705E-02	1.858E-01	1.859E-01	NOT IDENT.
LA-140	4.699E-02	6.427E-02	6.767E-02	FAIL ABUN
CE-143	5.526E+06	1.850E+06	3.103E+06	SHORT HLIF
CE-144	-1.119E-02	4.642E-02	4.670E-02	NOT IDENT.
PM-144	4.729E-03	8.118E-03	8.393E-03	NOT IDENT.
PR-144	3.501E-01	6.139E-01	6.339E-01	NOT IDENT.
PM-146	-4.546E-03	9.184E-03	9.410E-03	NOT IDENT.
ND-147	-3.829E-01	4.651E-01	4.961E-01	FAIL ABUN
PM-147	1.058E+02	1.493E+02	1.567E+02	NOT IDENT.
PM-149	-7.630E+03	1.625E+04	1.661E+04	SHORT HLIF
EU-150	1.432E-03	7.459E-03	7.487E-03	FAIL ABUN
EU-152	1.296E-02	2.459E-02	2.528E-02	FAIL ABUN
GD-153	-2.952E-03	2.075E-02	2.079E-02	NOT IDENT.
EU-154	-7.115E-02	2.746E-02	4.223E-02	NOT IDENT.
EU-155	-1.200E-02	2.148E-02	2.215E-02	FAIL ABUN
TB-160	9.973E-03	3.429E-02	3.459E-02	FAIL ABUN
HO-166M	-5.624E-03	1.306E-02	1.331E-02	FAIL ABUN
TM-171	-2.180E+00	8.401E+00	8.459E+00	NOT IDENT.
HF-172	-5.136E-03	4.451E-02	4.457E-02	FAIL ABUN
LU-172	1.184E-02	1.379E-02	1.478E-02	FAIL ABUN

LU-176	3.336E-04	5.849E-03	5.851E-03	FAIL ABUN
HF-181	-9.851E-03	1.347E-02	1.418E-02	NOT IDENT.
TA-182	-2.405E-03	4.134E-02	4.136E-02	FAIL ABUN
RE-183	-6.979E-02	9.225E-02	9.747E-02	NOT IDENT.
RE-184	-2.228E-02	4.999E-02	5.099E-02	NOT IDENT.
W-188	4.961E-01	2.307E+00	2.318E+00	FAIL ABUN
IR-192	-1.010E-03	9.034E-03	9.045E-03	FAIL ABUN
HG-203	2.308E-02	1.368E-02	1.719E-02	NOT IDENT.
BI-207	3.171E-03	1.277E-02	1.285E-02	NOT IDENT.
PB-210	5.843E-02	2.972E+00	2.972E+00	NOT IDENT.
PB-211	7.466E-02	1.676E-01	1.709E-01	NOT IDENT.
RN-219	-1.037E-01	1.127E-01	1.220E-01	FAIL ABUN
RA-223	5.410E-02	1.552E-01	1.571E-01	FAIL ABUN
AC-227	2.819E-02	5.640E-02	5.782E-02	FAIL ABUN
TH-227	2.819E-02	5.640E-02	5.782E-02	FAIL ABUN
PA-231	1.110E-01	1.247E-01	1.344E-01	NOT IDENT.
TH-231	5.410E-02	1.552E-01	1.571E-01	FAIL ABUN
PA-233	-1.581E-03	1.346E-02	1.348E-02	FAIL ABUN
PA-234	-7.329E-03	6.048E-02	6.057E-02	FAIL ABUN
PA-234M	-6.656E-01	1.422E+00	1.453E+00	FAIL ABUN
NP-237	-1.581E-03	1.346E-02	1.348E-02	FAIL ABUN
NP-238	2.607E+03	4.491E+03	4.642E+03	SHORT HLIF
NP-239	-2.517E-02	5.306E-02	5.426E-02	FAIL ABUN
PU-239	1.068E+02	1.354E+02	1.437E+02	FAIL ABUN
AM-241	2.605E-02	5.911E-02	6.026E-02	NOT IDENT.
AM-243	5.682E-02	1.944E-02	3.216E-02	NOT IDENT.
CM-243	2.670E-03	2.174E-02	2.178E-02	FAIL ABUN
BK-247	1.047E-02	1.946E-02	2.003E-02	FAIL ABUN
CM-247	-6.078E-03	1.045E-02	1.080E-02	FAIL ABUN
CF-249	-6.711E-03	8.489E-03	9.012E-03	NOT IDENT.
CF-251	-6.908E-03	2.710E-02	2.727E-02	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	638.2332	87.09	780.0235	136.47	622.4442
45.60	614.6185	87.57	677.1564	140.51	0.0000
46.54	583.2542	88.03	677.8054	143.76	681.0966
49.72	0.0000	88.34	678.2421	144.24	681.5823
51.35	570.8619	88.47	678.4245	145.44	650.7056
51.87	581.2365	89.96	992.9833	152.43	657.6592
52.39	576.8439	1093.63	664.0643	153.25	677.7327
52.97	600.0475	91.11	664.6996	323.87	677.6765
53.44	579.6726	92.59	945.9238	156.02	668.7323
54.07	564.8022	93.35	644.9758	158.56	642.8804
57.36	0.0000	94.56	657.3901	159.00	624.7784
57.53	615.3622	94.65	679.9384	162.33	639.3455
57.98	663.3501	94.67	679.9650	162.66	625.9375
59.27	622.0620	94.87	680.2314	163.33	643.1454
59.32	622.1458	97.43	669.5459	165.86	635.5035
59.54	609.5804	98.43	652.4791	176.31	617.3227
60.96	658.9709	98.44	652.4904	176.60	610.5774
61.17	682.0754	99.53	685.2271	177.52	630.2401
62.93	683.0579	100.11	633.5270	181.07	0.0000
63.29	717.4470	102.03	684.3273	181.52	596.5305
63.58	732.1477	103.18	653.7327	184.41	679.1357
64.28	705.6362	103.37	653.9651	143.76	628.6512
66.73	714.9716	105.21	673.1770	193.51	653.9152
67.24	735.0129	105.31	673.3005	197.03	620.9001
125.81	740.8826	106.12	651.0148	198.01	597.0726
67.75	739.9082	106.47	629.9255	201.83	672.6403
69.67	787.6550	109.28	678.1579	203.43	612.5911
70.83	799.8483	111.00	663.0707	205.31	628.5198
72.81	991.1056	111.76	0.0000	210.85	544.4832
72.87	991.2458	114.06	639.3884	215.65	620.6072
74.66	879.8764	116.30	0.0000	222.11	586.1146
74.82	880.2042	116.74	649.6419	227.09	572.3395
74.97	880.5081	119.76	638.2983	227.38	545.0514
77.11	1485.9869	121.12	622.2835	228.16	0.0000
78.74	701.6636	121.22	593.8888	228.18	555.0247
79.69	703.1512	121.78	591.6815	116.74	555.0247
80.12	703.8209	122.06	604.8436	235.69	557.4648
80.19	703.9282	122.92	668.3926	235.96	572.9678
80.57	704.5189	123.07	660.7861	238.63	586.7178
81.00	705.1885	265.00	673.2278	238.98	0.0000
81.07	746.1826	125.81	665.4430	240.99	588.1293
81.75	706.3445	127.23	668.4508	242.00	538.7560
83.79	774.5921	127.91	654.3134	244.70	464.5206
84.00	774.9404	129.30	664.7044	252.40	462.6528
85.43	777.3026	131.20	602.4289	252.80	470.4227
86.55	779.1407	133.02	592.1528	254.15	0.0000
86.79	779.5303	133.52	625.6222	256.23	461.1168
86.94	779.7786	136.00	625.0076	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	439.9933	355.39	0.0000	584.27	205.9897
264.80	440.0545	356.01	336.2100	595.83	218.1615
265.00	438.6719	364.49	323.0970	427.87	265.9400
268.22	462.8826	366.42	0.0000	602.52	0.0000
269.46	475.7498	372.51	315.4175	604.72	283.1585
270.03	468.9484	375.05	288.1458	607.14	264.6035
271.23	463.2971	377.52	305.9779	609.32	234.5334
273.65	459.9131	356.01	296.7354	610.33	205.0746
276.40	469.9415	388.16	321.8803	614.28	205.4736
277.37	474.7929	388.63	332.6581	618.01	199.5161
277.60	478.2195	391.69	290.6052	620.36	199.7446
278.00	478.3971	264.66	290.4633	621.93	198.0475
279.20	410.6905	401.81	291.6740	630.19	0.0000
279.54	410.8145	402.40	279.6053	631.29	180.3515
279.70	414.4340	404.85	264.8188	633.25	184.2433
280.46	400.4791	410.95	303.6700	634.78	195.5505
283.69	459.0213	413.71	223.6535	635.95	195.6616
284.31	469.9633	414.70	262.3539	636.99	200.4208
285.41	448.0717	423.72	278.1201	645.85	188.1594
285.90	0.0000	427.09	292.6757	657.76	187.3277
287.50	413.0868	427.87	294.8148	657.90	0.0000
290.67	427.4877	433.94	288.9824	661.66	187.6678
293.27	0.0000	439.40	260.8982	664.57	0.0000
351.93	449.3334	453.88	273.4244	666.33	186.1825
295.96	437.5894	463.37	239.3804	666.50	188.0848
879.38	438.5840	468.07	238.3691	667.71	0.0000
299.98	421.0032	473.00	226.4441	677.62	178.5947
300.09	411.9883	475.06	264.6862	685.70	159.2228
300.13	411.9994	476.78	236.2048	695.00	197.2281
301.36	444.1642	477.60	226.0452	696.49	211.7287
302.85	426.5743	482.18	259.6351	696.51	211.7287
256.23	387.7917	487.02	228.3487	697.00	232.8552
304.85	368.2079	492.35	0.0000	697.30	231.9314
306.78	398.6599	497.08	214.8001	697.49	230.9927
308.46	395.7760	505.52	214.1089	702.65	217.1075
311.90	371.3126	507.63	0.0000	706.68	188.6229
316.51	380.0745	511.00	229.4474	711.68	197.7179
319.41	382.8246	514.00	229.8377	720.70	194.2016
320.08	395.9233	514.00	229.8377	721.93	0.0000
321.04	392.7775	520.40	212.1590	722.78	177.7636
323.87	366.3598	520.69	0.0000	722.91	177.7748
325.23	351.3516	522.65	0.0000	723.31	177.8047
328.76	426.5332	527.90	0.0000	724.19	166.2354
333.37	359.8521	528.26	212.6399	727.33	189.3466
333.97	360.7979	529.59	204.3274	733.00	131.8219
334.37	374.4214	529.87	0.0000	735.93	164.7055
338.28	364.3634	531.02	233.0947	333.97	171.6387
338.32	364.3729	537.26	225.3898	739.50	0.0000
311.90	338.4709	546.56	0.0000	747.24	182.1401
340.48	338.4709	552.55	221.8983	748.06	184.1598
340.55	338.4930	563.25	249.0356	752.31	177.6195
344.28	322.8905	569.33	223.8743	753.82	165.9468
345.93	333.6402	946.00	218.4865	756.73	182.8629
351.06	323.9454	569.70	213.0976	756.80	178.9341
351.93	314.4029	583.19	205.8743	884.68	179.1819

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	186.0854	1274.44	127.8199	1620.50	51.7819
766.42	179.3630	1001.03	111.8838	1621.92	50.7829
766.84	188.5635	1002.74	108.7180	1678.03	0.0000
772.60	0.0000	1004.73	141.1038	1690.97	48.1083
776.52	169.4866	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	31.4023
778.90	178.5791	1028.54	0.0000	1063.66	34.9327
783.70	143.1387	1037.84	110.1188	1771.35	38.4344
785.37	148.3509	1038.76	0.0000	1791.20	0.0000
792.07	155.5906	631.29	122.5932	1808.65	40.5946
794.95	142.5879	1048.07	123.5843	1810.72	0.0000
795.86	147.2636	1049.04	115.1967	1836.06	33.8475
810.06	146.6565	1050.41	108.6853		
810.29	131.6023	1063.66	116.9047		
344.28	131.6103	1077.00	104.8716		
810.76	132.6311	1077.34	104.8832		
815.77	134.9051	1085.87	126.0002		
1048.07	141.0966	1093.63	102.5608		
832.01	144.1500	1099.45	105.5994		
834.85	166.3289	1112.07	93.5874		
835.71	173.9223	1112.84	96.9546		
836.80	0.0000	1115.54	130.4919		
846.75	0.0000	1120.29	103.3933		
846.77	152.8229	1120.55	103.4008		
856.80	140.2511	1221.41	103.4272		
860.56	140.4492	1129.67	110.8835		
871.09	144.9673	1131.51	0.0000		
873.19	136.8478	1147.95	0.0000		
875.33	0.0000	1173.23	104.0444		
879.38	127.8775	1177.95	97.3703		
880.51	134.1207	1189.05	107.4487		
883.24	113.6009	1204.77	95.1765		
884.68	123.9941	1221.41	109.4205		
889.28	149.0420	1231.02	102.0544		
894.76	125.4853	1235.36	112.5677		
898.04	141.2074	1238.28	116.8682		
900.72	155.8960	1260.41	0.0000		
903.28	156.9311	1271.87	94.9536		
911.20	139.7905	1274.44	105.0220		
912.08	107.3354	1274.54	105.0256		
923.98	0.0000	1291.59	80.3850		
926.50	120.6199	1298.22	0.0000		
929.11	131.2281	1312.11	68.6996		
937.49	145.3026	1332.49	80.2399		
944.13	116.0872	1362.66	0.0000		
946.00	112.9931	1365.19	61.4544		
949.00	108.8822	1368.63	0.0000		
667.71	0.0000	1384.29	57.6348		
962.31	143.8185	1408.01	74.5413		
964.08	153.0117	1457.56	0.0000		
966.17	121.2201	1460.82	67.9048		
911.20	94.8793	1489.16	44.3438		
968.97	94.8793	1505.03	68.0003		
983.53	129.4192	1584.12	30.2148		
984.45	0.0000	1596.21	38.7127		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 00:01:38.92

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656005.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM22.CNF;465
Background date  : 20-JUN-2016 14:40:04
Sample date      : 17-MAY-2016 10:45:00 Acquisition date : 23-JUN-2016 12:00:15
Sample ID        : G398656005 Sample quantity : 1.59030E+02 GRAM
Detector name     : GAM22 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:05.29 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.50*	32	1080	1.33	93.27	90	7	7.45E-04	193.6	
2	0	63.22*	183	2095	1.32	126.72	121	11	4.23E-03	56.6	
3	6	70.23	168	1354	1.47	140.73	137	23	3.88E-03	37.2	2.09E+00
4	6	72.80	247	1547	1.31	145.88	137	23	5.72E-03	29.3	
5	6	74.93*	1146	1546	1.32	150.13	137	23	2.65E-02	7.6	
6	6	77.20*	1669	1738	1.43	154.67	137	23	3.86E-02	5.7	
7	3	84.29*	161	1860	1.67	168.85	163	30	3.73E-03	55.7	1.74E+00
8	3	87.31*	700	1254	1.21	174.90	163	30	1.62E-02	10.4	
9	3	90.08*	404	1376	1.36	180.42	163	30	9.36E-03	19.1	
10	3	92.82*	598	1627	1.67	185.91	163	30	1.38E-02	18.4	
11	0	105.61	108	1086	1.41	211.49	209	7	2.51E-03	51.4	
12	0	109.86	147	1211	1.53	219.99	216	8	3.41E-03	41.7	
13	0	129.43	163	1642	1.25	259.13	253	10	3.78E-03	47.0	
14	0	143.79*	68	1375	1.17	287.85	284	9	1.56E-03	112.9	
15	0	186.01*	426	1518	1.41	372.28	367	10	9.87E-03	22.1	
16	0	199.03*	72	1100	1.57	398.32	394	9	1.67E-03	99.6	
17	0	209.68	283	1160	1.18	419.62	415	9	6.55E-03	22.5	
18	0	227.18	62	1196	1.53	454.62	449	10	1.43E-03	105.7	
19	3	238.79*	3739	1136	1.46	477.85	472	19	8.66E-02	2.8	1.57E+00
20	3	241.83	727	1270	1.87	483.93	472	19	1.68E-02	12.5	
21	0	259.53	61	569	1.05	519.33	516	6	1.41E-03	63.5	
22	0	270.22	233	972	1.42	540.70	537	10	5.40E-03	25.8	
23	0	277.82	130	885	0.96	555.90	552	9	3.00E-03	42.3	
24	0	295.46*	1009	925	1.55	591.18	586	11	2.34E-02	7.4	
25	0	300.23	205	750	1.52	600.71	597	9	4.74E-03	25.1	
26	0	328.49	114	960	1.68	657.24	650	12	2.63E-03	55.4	
27	0	338.57*	723	1087	1.50	677.40	672	14	1.67E-02	11.7	
28	0	352.06*	1775	867	1.60	704.38	698	13	4.11E-02	4.5	
29	0	409.78	96	639	1.46	819.81	815	10	2.22E-03	50.4	
30	0	463.44	287	479	1.79	927.13	922	11	6.63E-03	16.0	
31	0	467.92	37	307	1.43	936.10	932	7	8.62E-04	79.8	
32	0	496.31	57	327	1.08	992.88	989	8	1.33E-03	56.2	
33	0	511.07*	370	815	2.96	1022.39	1012	20	8.57E-03	27.8	
34	0	583.26*	1340	753	2.30	1166.76	1157	23	3.10E-02	6.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	609.49*	1322	595	2.06	1219.23	1213	14	3.06E-02	5.3	
36	0	661.86	1701	569	2.13	1323.97	1315	17	3.94E-02	4.0	
37	0	695.47	62	310	2.34	1391.18	1387	9	1.43E-03	53.1	
38	0	727.12	386	499	2.91	1454.48	1446	19	8.93E-03	14.8	
39	0	767.44	103	436	3.02	1535.12	1529	14	2.37E-03	44.2	
40	0	795.24	186	386	1.70	1590.72	1582	15	4.30E-03	24.2	
41	0	804.34*	126	364	0.86	1608.93	1599	20	2.92E-03	43.9	
42	0	835.41	90	513	5.75	1671.06	1666	18	2.09E-03	59.6	
43	0	860.92	215	340	1.76	1722.09	1712	17	4.98E-03	20.8	
44	0	911.32*	1009	372	2.59	1822.88	1813	22	2.33E-02	6.4	
45	2	964.69	241	350	3.08	1929.63	1921	31	5.59E-03	17.7	1.34E+00
46	2	969.31	631	243	2.43	1938.87	1921	31	1.46E-02	7.0	
47	2	974.00	45	100	2.07	1948.25	1921	31	1.05E-03	46.4	
48	0	1098.10	57	195	1.00	2196.44	2192	13	1.32E-03	52.2	
49	0	1120.63	325	247	2.49	2241.51	2234	14	7.53E-03	11.7	
50	0	1147.78	4	206	1.21	2295.81	2294	11	9.36E-05	689.6	
51	2	1236.85	99	128	2.75	2473.94	2470	18	2.29E-03	23.6	3.09E+00
52	2	1239.87*	52	249	2.78	2480.00	2470	18	1.21E-03	81.7	
53	1	1377.37*	72	107	2.89	2755.00	2749	16	1.67E-03	37.9	3.51E+00
54	1	1379.87	45	90	2.89	2760.00	2749	16	1.03E-03	48.0	
55	0	1460.88*	3040	214	3.16	2922.02	2909	26	7.04E-02	2.4	
56	0	1589.74	86	216	1.15	3179.75	3167	24	1.99E-03	40.1	
57	0	1630.87	36	98	2.41	3262.00	3255	15	8.33E-04	54.0	
58	0	1764.69	323	133	4.07	3529.67	3517	25	7.47E-03	9.9	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 24-JUN-2016 00:01:41

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656005.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:45:00 Acquisition date : 23-JUN-2016 12:00:15
Sample ID        : G398656005 Sample quantity  : 159.03 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA22 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:05.29 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated : No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.908E+00	5.704E+00	5.704E+00	4.78	OK
MN-54	834.85	99.98*	3.002E+00	1.226E-02	1.332E-02	119.28	OK
RU-103	497.08	91.00*	4.457E+00	6.138E-03	1.186E-02	112.41	OK
	610.33	5.76	3.859E+00	2.517E+00	4.863E+00	10.52	OK
CD-109	88.03	3.70*	7.016E+00	1.010E+00	1.068E+00	29.26	OK
TE-125M	109.28	0.27*	8.215E+00	3.355E+00	5.263E+00	83.46	OK
SN-126	64.28	9.60	3.715E+00	2.721E-01	2.721E-01	113.24	OK
	86.94	8.90	7.016E+00	4.197E-01	4.197E-01	29.26	OK
	87.57	37.00*	7.016E+00	1.010E-01	1.010E-01	29.26	OK
BA-137M	661.66	89.90*	3.626E+00	2.188E-01	2.193E-01	8.05	OK
CS-137	661.66	85.10*	3.626E+00	2.311E-01	2.317E-01	8.05	OK
PR-144	696.51	1.34*	3.489E+00	5.508E-01	6.031E-01	106.22	OK
	1489.16	0.28	1.885E+00	----- Line	Not Found	-----	Absent
EU-155	86.55	30.70	7.016E+00	1.217E-01	1.235E-01	29.26	OK
	105.31	21.10*	8.093E+00	3.215E-02	3.263E-02	102.79	OK
TL-208	277.37	6.60	6.284E+00	1.438E-01	1.438E-01	84.65	OK
	583.19	85.00*	3.985E+00	1.682E-01	1.682E-01	12.81	OK
	860.56	12.50	2.926E+00	2.393E-01	2.393E-01	41.56	OK
PB-210	46.54	4.25*	9.600E-01	4.305E-01	4.319E-01	387.23	OK
PB-212	74.82	10.28	5.600E+00	8.089E-01	8.089E-01	20.04	OK
	77.11	17.10	5.907E+00	8.617E-01	8.617E-01	11.31	OK
	238.63	43.60*	6.804E+00	5.898E-01	5.898E-01	5.64	OK
	300.09	3.30	6.024E+00	4.710E-01	4.710E-01	50.11	OK
BI-214	609.32	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52	OK
	1120.29	14.92	2.334E+00	3.683E-01	3.683E-01	23.34	OK
	1764.49	15.30	1.744E+00	4.504E-01	4.504E-01	19.72	OK
PB-214	74.82	5.80	5.585E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.907E+00	1.519E+00	1.519E+00	11.31	OK
	87.09	3.41	6.996E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	6.758E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	6.078E+00	4.126E-01	4.127E-01	14.76	OK
	351.93	35.60*	5.508E+00	4.068E-01	4.068E-01	9.07	OK
RN-222	609.32	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52	OK
	1120.29	14.92	2.334E+00	3.683E-01	3.683E-01	23.34	OK
	1764.49	15.30	1.744E+00	4.504E-01	4.504E-01	19.72	OK
RA-224	240.99	4.10*	6.760E+00	4.954E-01	4.954E-01	65.59	OK
RA-226	609.32	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52	OK
	1120.29	14.92	2.334E+00	3.683E-01	3.683E-01	23.34	OK
	1764.49	15.30	1.744E+00	4.504E-01	4.504E-01	19.72	OK
AC-228	105.21	1.10	8.093E+00	6.166E-01	6.166E-01	102.79	OK
	338.32	11.27	5.632E+00	5.139E-01	5.139E-01	23.49	OK
	794.95	4.25	3.129E+00	5.740E-01	5.740E-01	48.35	OK
	835.71	1.61	3.002E+00	7.614E-01	7.614E-01	119.28	OK
	911.20	25.80*	2.787E+00	5.667E-01	5.667E-01	12.87	OK
	968.97	15.80	2.643E+00	6.058E-01	6.058E-01	14.08	OK
RA-228	105.21	1.10	8.093E+00	6.166E-01	6.166E-01	102.79	OK
	338.32	11.27	5.632E+00	5.139E-01	5.139E-01	23.49	OK
	794.95	4.25	3.129E+00	5.740E-01	5.740E-01	48.35	OK
	835.71	1.61	3.002E+00	7.614E-01	7.614E-01	119.28	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	911.20	25.80*	2.787E+00	5.667E-01	5.667E-01	12.87	OK
	968.97	15.80	2.643E+00	6.058E-01	6.058E-01	14.08	OK
	74.82	10.28	5.600E+00	8.089E-01	8.089E-01	20.04	OK
	77.11	17.10	5.907E+00	8.617E-01	8.617E-01	11.31	OK
	238.63	43.60*	6.804E+00	5.898E-01	5.898E-01	5.64	OK
TH-229	300.09	3.30	6.024E+00	4.710E-01	4.710E-01	50.11	OK
	85.43	14.70	6.729E+00	8.419E-02	8.419E-02	111.50	OK
	88.47	24.00	7.016E+00	1.556E-01	1.556E-01	29.26	OK
	193.51	4.41*	7.524E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	7.254E+00	6.609E-01	6.609E-01	45.09	OK
	609.32	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52	OK
	1120.29	14.92	2.334E+00	3.683E-01	3.683E-01	23.34	OK
	1764.49	15.30	1.744E+00	4.504E-01	4.504E-01	19.72	OK
PA-231	283.69	1.70	6.214E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	6.024E+00	2.905E-01	2.905E-01	50.11	OK
	105.21	1.10	8.093E+00	6.166E-01	6.166E-01	102.79	OK
	338.32	11.27	5.632E+00	5.139E-01	5.139E-01	23.49	OK
	835.71	1.61	3.002E+00	7.614E-01	7.614E-01	119.28	OK
	911.20	25.80*	2.787E+00	5.667E-01	5.667E-01	12.87	OK
TH-234	968.97	15.80	2.643E+00	6.058E-01	6.058E-01	14.08	OK
	63.29	3.70*	3.715E+00	7.061E-01	7.061E-01	113.24	OK
	92.59	4.23	7.452E+00	9.725E-01	9.725E-01	36.81	OK
U-234	609.32	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52	OK
	1120.29	14.92	2.334E+00	3.683E-01	3.683E-01	23.34	OK
	1764.49	15.30	1.744E+00	4.504E-01	4.504E-01	19.72	OK
U-235	89.96	3.47	7.249E+00	8.270E-01	8.270E-01	38.29	OK
	93.35	5.60	7.452E+00	7.346E-01	7.346E-01	36.81	OK
	143.76	10.96*	8.305E+00	3.654E-02	3.654E-02	225.84	OK
	163.33	5.08	8.034E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	7.653E+00	4.674E-02	4.674E-02	44.21	OK
U-238	205.31	5.01	7.326E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.715E+00	7.061E-01	7.061E-01	113.24	OK
	92.59	4.23	7.452E+00	9.725E-01	9.725E-01	36.81	OK
AM-243	43.53	5.90	6.275E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	5.600E+00	1.237E-01	1.238E-01	20.04	OK
	511.00	100.00*	4.370E+00	3.658E-02	3.658E-02	55.66	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656005.CNF;1
Acquisition date : 23-JUN-2016 12:00:15 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.29 Half life ratio : *****
Sample date : 17-MAY-2016 10:45:00 Analyst initials: MXR1
Sample ID : G398656005 Sample Quantity : 1.5903E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.704E+00	2.672E-01	1.221E-01
MN-54	1.332E-02	1.557E-02	1.366E-02
RU-103	1.186E-02	1.306E-02	2.202E-02
CD-109	1.068E+00	3.062E-01	3.032E-01
TE-125M	5.263E+00	4.305E+00	5.185E+00
SN-126	1.010E-01	2.895E-02	2.882E-02
BA-137M	2.193E-01	1.731E-02	1.313E-02
CS-137	2.317E-01	1.828E-02	1.387E-02
PR-144	6.031E-01	6.278E-01	9.797E-01
EU-155	3.263E-02	3.287E-02	4.176E-02
TL-208	1.682E-01	2.112E-02	1.258E-02
PB-210	4.319E-01	1.639E+00	1.741E+00
PB-212	5.898E-01	3.258E-02	2.192E-02
BI-214	3.187E-01	3.285E-02	2.811E-02
PB-214	4.068E-01	3.615E-02	2.789E-02
RN-222	3.187E-01	3.285E-02	2.811E-02
RA-224	4.954E-01	3.184E-01	2.345E-01
RA-226	3.187E-01	3.285E-02	2.811E-02
AC-228	5.667E-01	7.145E-02	4.815E-02
RA-228	5.667E-01	7.145E-02	4.815E-02
TH-228	5.898E-01	3.258E-02	2.192E-02
TH-229	-3.373E-02	1.305E-01	2.087E-01
TH-230	3.187E-01	3.285E-02	2.811E-02
PA-231	2.905E-01	1.427E-01	1.813E-01
TH-232	5.667E-01	7.145E-02	4.815E-02
TH-234	7.061E-01	7.835E-01	5.568E-01
U-234	3.187E-01	3.285E-02	2.811E-02
U-235	3.654E-02	8.088E-02	8.142E-02
U-238	7.061E-01	7.835E-01	5.568E-01
AM-243	1.238E-01	2.431E-02	2.111E-02
ANH-511	3.658E-02	1.995E-02	1.071E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	1.014E-02	9.220E-02	1.653E-01	NOT IDENT.
NA-22	-6.759E-03	8.682E-03	1.458E-02	NOT IDENT.
NA-24	0.000E+00	8.147E+15	0.000E+00	SHORT HLIF
AL-26	2.150E-04	5.917E-03	1.070E-02	NOT IDENT.
SC-46	9.144E-04	9.570E-03	1.679E-02	FAIL ABUN
V-48	-1.165E-03	3.686E-02	6.583E-02	NOT IDENT.
CR-51	-1.656E-01	1.498E-01	2.416E-01	NOT IDENT.
CO-56	-1.194E-02	1.489E-02	1.820E-02	FAIL ABUN
MN-56	0.000E+00	1.245E+41	0.000E+00	SHORT HLIF
CO-57	2.281E-03	6.245E-03	1.108E-02	NOT IDENT.
CO-58	4.079E-03	1.113E-02	1.707E-02	NOT IDENT.
FE-59	3.002E-02	3.073E-02	4.541E-02	FAIL ABUN
CO-60	-8.496E-04	7.929E-03	1.410E-02	NOT IDENT.
ZN-65	1.606E-02	2.222E-02	3.446E-02	NOT IDENT.
GE-68	1.627E-01	2.697E-01	4.881E-01	NOT IDENT.
AS-73	-2.771E-02	2.956E-01	4.813E-01	NOT IDENT.
AS-74	3.689E-02	4.955E-02	8.658E-02	NOT IDENT.
SE-75	-6.337E-03	1.649E-02	1.977E-02	NOT IDENT.
BR-77	0.000E+00	3.259E+03	0.000E+00	SHORT HLIF
SR-82	-1.037E-01	1.397E-01	2.182E-01	NOT IDENT.
RB-83	-1.399E-02	1.892E-02	3.017E-02	NOT IDENT.
KR-85	0.000E+00	2.108E+00	4.247E+00	NOT IDENT.
SR-85	0.000E+00	1.410E-02	2.840E-02	NOT IDENT.
RB-86	1.900E-01	3.644E-01	6.576E-01	NOT IDENT.
Y-88	-3.204E-03	7.750E-03	1.356E-02	NOT IDENT.
Y-91	-3.106E+00	5.278E+00	8.999E+00	NOT IDENT.
NB-94	-1.504E-03	7.695E-03	1.246E-02	NOT IDENT.
NB-95	0.000E+00	1.230E-02	2.069E-02	NOT IDENT.
NB-95M	0.000E+00	4.225E-02	7.563E-02	NOT IDENT.
ZR-95	1.230E-02	1.929E-02	3.491E-02	NOT IDENT.
NB-97	0.000E+00	2.163E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.401E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.633E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	9.444E-03	8.349E-03	1.365E-02	FAIL ABUN
RH-102	-6.062E-04	1.137E-02	2.052E-02	FAIL ABUN
RH-106	-5.919E-02	7.047E-02	1.244E-01	NOT IDENT.
RU-106	-5.919E-02	7.047E-02	1.244E-01	NOT IDENT.
AG-108M	-4.837E-03	6.194E-03	1.094E-02	NOT IDENT.
AG-110M	-3.095E-03	1.073E-02	1.855E-02	NOT IDENT.
SN-113	-3.072E-03	1.067E-02	1.929E-02	NOT IDENT.
CD-115	0.000E+00	2.330E+03	0.000E+00	SHORT HLIF
SN-117M	-2.190E-02	3.826E-02	6.736E-02	NOT IDENT.
TE-123M	-1.005E-03	7.270E-03	1.292E-02	NOT IDENT.
SB-124	-7.434E-03	2.143E-02	3.689E-02	NOT IDENT.
SB-125	1.308E-02	1.938E-02	3.562E-02	FAIL ABUN
I-126	0.000E+00	1.808E-01	3.130E-01	NOT IDENT.
SB-126	-2.030E-02	1.171E-01	1.768E-01	FAIL ABUN
SB-127	-1.118E+01	1.416E+01	2.476E+01	NOT IDENT.
I-131	-4.615E-02	1.655E-01	3.014E-01	NOT IDENT.
I-132	0.000E+00	1.474E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.166E+01	0.000E+00	SHORT HLIF
BA-133	6.336E-03	1.002E-02	1.623E-02	FAIL ABUN
I-133	0.000E+00	6.100E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.400E-02	1.742E-02	FAIL ABUN
CS-135	0.000E+00	3.896E-02	6.527E-02	NOT IDENT.
I-135	0.000E+00	2.627E+39	0.000E+00	SHORT HLIF
CS-136	-5.608E-03	7.065E-02	1.249E-01	FAIL ABUN
CE-139	-4.117E-03	7.207E-03	1.339E-02	NOT IDENT.
BA-140	9.470E-02	1.837E-01	3.300E-01	NOT IDENT.
LA-140	2.441E-02	6.346E-02	9.805E-02	FAIL ABUN
CE-141	1.630E-02	2.983E-02	4.200E-02	NOT IDENT.
CE-143	0.000E+00	2.458E+06	0.000E+00	SHORT HLIF
CE-144	-3.525E-02	5.464E-02	8.480E-02	NOT IDENT.
PM-144	7.966E-03	8.293E-03	1.407E-02	FAIL ABUN
PM-146	6.169E-03	9.175E-03	1.676E-02	NOT IDENT.
ND-147	-2.065E-01	4.756E-01	8.307E-01	FAIL ABUN
PM-147	1.057E+02	1.688E+02	3.118E+02	NOT IDENT.
PM-149	0.000E+00	2.092E+04	0.000E+00	SHORT HLIF
EU-150	-3.539E-03	1.056E-02	1.035E-02	FAIL ABUN
EU-152	-3.017E-03	2.935E-02	3.846E-02	FAIL ABUN
GD-153	-2.562E-03	2.248E-02	3.650E-02	FAIL ABUN
EU-154	-1.829E-02	2.435E-02	4.095E-02	NOT IDENT.
TB-160	2.105E-02	3.359E-02	6.015E-02	FAIL ABUN
HO-166M	-4.491E-04	1.263E-02	2.251E-02	FAIL ABUN
TM-171	-6.171E+00	5.315E+00	8.452E+00	NOT IDENT.
HF-172	-6.409E-03	5.037E-02	7.980E-02	FAIL ABUN

LU-172	6.746E-03	1.506E-02	2.320E-02	FAIL ABUN
LU-176	-2.109E-03	6.305E-03	1.046E-02	FAIL ABUN
HF-181	1.595E-03	1.352E-02	2.422E-02	NOT IDENT.
TA-182	-1.837E-02	4.427E-02	7.580E-02	FAIL ABUN
RE-183	1.161E-02	6.401E-02	1.095E-01	NOT IDENT.
RE-184	1.550E-02	4.688E-02	7.069E-02	NOT IDENT.
W-188	-2.574E-01	2.295E+00	3.530E+00	FAIL ABUN
IR-192	1.724E-03	9.369E-03	1.670E-02	FAIL ABUN
HG-203	2.028E-02	1.682E-02	2.257E-02	FAIL ABUN
BI-207	4.889E-03	1.080E-02	1.943E-02	FAIL ABUN
BI-211	0.000E+00	9.962E-02	1.393E-01	FAIL ABUN
PB-211	2.645E-02	1.790E-01	2.809E-01	NOT IDENT.
BI-212	0.000E+00	2.065E-01	2.343E-01	FAIL ABUN
RN-219	3.651E-03	9.110E-02	1.580E-01	FAIL ABUN
RA-223	5.487E-02	1.589E-01	2.456E-01	FAIL ABUN
AC-227	4.089E-03	6.355E-02	9.970E-02	FAIL ABUN
TH-227	4.089E-03	6.355E-02	9.970E-02	FAIL ABUN
TH-231	5.487E-02	1.589E-01	2.456E-01	FAIL ABUN
PA-233	-1.817E-03	1.446E-02	2.561E-02	FAIL ABUN
PA-234	1.856E-02	5.530E-02	1.008E-01	FAIL ABUN
PA-234M	3.763E-01	1.270E+00	1.751E+00	FAIL ABUN
NP-237	-1.817E-03	1.446E-02	2.561E-02	FAIL ABUN
NP-238	0.000E+00	5.719E+03	0.000E+00	SHORT HLIF
NP-239	-2.452E-03	6.021E-02	1.101E-01	FAIL ABUN
PU-239	0.000E+00	1.412E+02	1.504E+02	FAIL ABUN
AM-241	4.082E-02	3.898E-02	6.795E-02	NOT IDENT.
CM-243	-2.995E-02	2.744E-02	4.315E-02	FAIL ABUN
BK-247	-1.143E-02	2.353E-02	3.135E-02	FAIL ABUN
CM-247	1.321E-03	8.583E-03	1.452E-02	FAIL ABUN
CF-249	-6.069E-03	1.002E-02	1.524E-02	NOT IDENT.
CF-251	-2.241E-02	2.851E-02	5.245E-02	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	2949	10.66*	1.908E+00	5.704E+00	5.704E+00	4.78
MN-54	834.85	94	99.98*	3.002E+00	1.226E-02	1.332E-02	119.28
RU-103	497.08	63	91.00*	4.457E+00	6.138E-03	1.186E-02	112.41
	610.33	1422	5.76	3.859E+00	2.517E+00	4.863E+00	10.52
CD-109	88.03	917	3.70*	7.016E+00	1.390E+00	1.470E+00	20.87
TE-125M	109.28	189	0.27*	8.215E+00	3.355E+00	5.263E+00	83.46
SN-126	64.28	247	9.60	3.715E+00	2.721E-01	2.721E-01	113.24
	86.94	917	8.90	7.016E+00	5.778E-01	5.778E-01	20.87
	87.57	917	37.00*	7.016E+00	1.390E-01	1.390E-01	20.87
BA-137M	661.66	1813	89.90*	3.626E+00	2.188E-01	2.193E-01	8.05
CS-137	661.66	1813	85.10*	3.626E+00	2.311E-01	2.317E-01	8.05
PR-144	696.51	65	1.34*	3.489E+00	5.508E-01	6.031E-01	106.22
	1489.16	-----	0.28	1.885E+00	-----	Line Not Found	-----
EU-155	86.55	917	30.70	7.016E+00	1.675E-01	1.700E-01	20.87
	105.31	140	21.10*	8.093E+00	3.215E-02	3.263E-02	102.79
HG-203	70.83	224	3.69	4.897E+00	4.879E-01	8.499E-01	74.48
	72.87	329	6.19	5.293E+00	3.955E-01	6.889E-01	58.68
	279.20	152	81.56*	6.284E+00	1.164E-02	2.028E-02	84.65
TL-208	277.37	152	6.60	6.284E+00	1.438E-01	1.438E-01	84.65
	583.19	1448	85.00*	3.985E+00	1.682E-01	1.682E-01	12.81
	860.56	223	12.50	2.926E+00	2.393E-01	2.393E-01	41.56
PB-210	46.54	45	4.25*	9.600E-01	4.305E-01	4.319E-01	387.23
BI-211	72.87	329	1.23	5.293E+00	1.990E+00	1.990E+00	58.68
	351.06	2027	12.92*	5.508E+00	1.121E+00	1.121E+00	9.07
PB-212	74.82	1524	10.28	5.600E+00	1.042E+00	1.042E+00	15.21
	77.11	2213	17.10	5.907E+00	8.617E-01	8.617E-01	11.31
	238.63	4447	43.60*	6.804E+00	5.898E-01	5.898E-01	5.64
	300.09	238	3.30	6.024E+00	4.710E-01	4.710E-01	50.11
BI-214	609.32	1422	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52
	1120.29	326	14.92	2.334E+00	3.683E-01	3.683E-01	23.34
	1764.49	306	15.30	1.744E+00	4.504E-01	4.504E-01	19.72
PB-214	74.82	1524	5.80	5.600E+00	1.846E+00	1.847E+00	15.21
	77.11	2213	9.70	5.907E+00	1.519E+00	1.519E+00	11.31
	87.09	917	3.41	7.016E+00	1.508E+00	1.508E+00	20.87
	242.00	863	7.25	6.760E+00	6.928E-01	6.928E-01	25.02
	295.22	1174	18.42	6.078E+00	4.126E-01	4.127E-01	14.76
	351.93	2027	35.60*	5.508E+00	4.068E-01	4.068E-01	9.07
RN-222	609.32	1422	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52
	1120.29	326	14.92	2.334E+00	3.683E-01	3.683E-01	23.34
	1764.49	306	15.30	1.744E+00	4.504E-01	4.504E-01	19.72
RA-224	240.99	863	4.10*	6.760E+00	1.225E+00	1.225E+00	25.02
RA-226	609.32	1422	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52
	1120.29	326	14.92	2.334E+00	3.683E-01	3.683E-01	23.34
	1764.49	306	15.30	1.744E+00	4.504E-01	4.504E-01	19.72
AC-228	105.21	140	1.10	8.093E+00	6.166E-01	6.166E-01	102.79
	338.32	829	11.27	5.632E+00	5.139E-01	5.139E-01	23.49
	794.95	194	4.25	3.129E+00	5.740E-01	5.740E-01	48.35

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	835.71	94	1.61	3.002E+00	7.614E-01	7.614E-01	119.28
	911.20	1036	25.80*	2.787E+00	5.667E-01	5.667E-01	12.87
	968.97	643	15.80	2.643E+00	6.058E-01	6.058E-01	14.08
	105.21	140	1.10	8.093E+00	6.166E-01	6.166E-01	102.79
	338.32	829	11.27	5.632E+00	5.139E-01	5.139E-01	23.49
	794.95	194	4.25	3.129E+00	5.740E-01	5.740E-01	48.35
TH-228	835.71	94	1.61	3.002E+00	7.614E-01	7.614E-01	119.28
	911.20	1036	25.80*	2.787E+00	5.667E-01	5.667E-01	12.87
	968.97	643	15.80	2.643E+00	6.058E-01	6.058E-01	14.08
	74.82	1524	10.28	5.600E+00	1.042E+00	1.042E+00	15.21
	77.11	2213	17.10	5.907E+00	8.617E-01	8.617E-01	11.31
	238.63	4447	43.60*	6.804E+00	5.898E-01	5.898E-01	5.64
TH-229	300.09	238	3.30	6.024E+00	4.710E-01	4.710E-01	50.11
	85.43	212	14.70	6.729E+00	8.419E-02	8.419E-02	111.50
	88.47	917	24.00	7.016E+00	2.143E-01	2.143E-01	20.87
	193.51	-----	4.41*	7.524E+00	-----	Line Not Found	-----
TH-230	210.85	341	2.80	7.254E+00	6.609E-01	6.609E-01	45.09
	609.32	1422	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52
	1120.29	326	14.92	2.334E+00	3.683E-01	3.683E-01	23.34
	1764.49	306	15.30	1.744E+00	4.504E-01	4.504E-01	19.72
PA-231	283.69	-----	1.70	6.214E+00	-----	Line Not Found	-----
TH-232	301.36	238	5.35*	6.024E+00	2.905E-01	2.905E-01	50.11
	105.21	140	1.10	8.093E+00	6.166E-01	6.166E-01	102.79
	338.32	829	11.27	5.632E+00	5.139E-01	5.139E-01	23.49
	835.71	94	1.61	3.002E+00	7.614E-01	7.614E-01	119.28
TH-234	911.20	1036	25.80*	2.787E+00	5.667E-01	5.667E-01	12.87
	968.97	643	15.80	2.643E+00	6.058E-01	6.058E-01	14.08
	63.29	247	3.70*	3.715E+00	7.061E-01	7.061E-01	113.24
	92.59	779	4.23	7.452E+00	9.725E-01	9.725E-01	36.81
U-234	609.32	1422	45.49*	3.859E+00	3.187E-01	3.187E-01	10.52
	1120.29	326	14.92	2.334E+00	3.683E-01	3.683E-01	23.34
	1764.49	306	15.30	1.744E+00	4.504E-01	4.504E-01	19.72
	89.96	529	3.47	7.249E+00	8.270E-01	8.270E-01	38.29
U-235	93.35	779	5.60	7.452E+00	7.346E-01	7.346E-01	36.81
	143.76	85	10.96*	8.305E+00	3.654E-02	3.654E-02	225.84
	163.33	-----	5.08	8.034E+00	-----	Line Not Found	-----
	185.72	520	57.20	7.653E+00	4.674E-02	4.674E-02	44.21
U-238	205.31	-----	5.01	7.326E+00	-----	Line Not Found	-----
	63.29	247	3.70*	3.715E+00	7.061E-01	7.061E-01	113.24
	92.59	779	4.23	7.452E+00	9.725E-01	9.725E-01	36.81
	43.53	-----	5.90	6.275E-01	-----	Line Not Found	-----
AM-243	74.66	1524	67.20*	5.600E+00	1.594E-01	1.594E-01	15.21
ANH-511	511.00	406	100.00*	4.370E+00	3.658E-02	3.658E-02	55.66

Flag: "*" = Keyline

Total number of lines in spectrum 58
Number of unidentified lines 7
Number of lines tentatively identified by NID 51 87.93%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.704E+00	5.704E+00	0.273E+00	4.78	
MN-54	312.05D	1.09	1.226E-02	1.332E-02	1.589E-02	119.28	
RU-103	39.26D	1.93	6.138E-03	1.186E-02	1.333E-02	112.41	
CD-109	461.40D	1.06	1.390E+00	1.470E+00	0.307E+00	20.87	
TE-125M	57.40D	1.57	3.355E+00	5.263E+00	4.393E+00	83.46	
SN-126	2.30E+05Y	1.00	1.390E-01	1.390E-01	0.290E-01	20.87	
BA-137M	30.08Y	1.00	2.188E-01	2.193E-01	0.177E-01	8.05	
CS-137	30.08Y	1.00	2.311E-01	2.317E-01	0.187E-01	8.05	
PR-144	284.91D	1.09	5.508E-01	6.031E-01	6.406E-01	106.22	
EU-155	4.75Y	1.02	3.215E-02	3.263E-02	3.354E-02	102.79	
HG-203	46.59D	1.74	1.164E-02	2.028E-02	1.716E-02	84.65	
TL-208	1.41E+10Y	1.00	1.682E-01	1.682E-01	0.215E-01	12.81	
PB-210	22.20Y	1.00	4.305E-01	4.319E-01	16.72E-01	387.23	
BI-211	7.04E+08Y	1.00	1.121E+00	1.121E+00	0.102E+00	9.07	
PB-212	1.41E+10Y	1.00	5.898E-01	5.898E-01	0.332E-01	5.64	
BI-214	1600.00Y	1.00	3.187E-01	3.187E-01	0.335E-01	10.52	
PB-214	1600.00Y	1.00	4.068E-01	4.068E-01	0.369E-01	9.07	
RN-222	1600.00Y	1.00	3.187E-01	3.187E-01	0.335E-01	10.52	
RA-224	1.41E+10Y	1.00	1.225E+00	1.225E+00	0.307E+00	25.02	
RA-226	1600.00Y	1.00	3.187E-01	3.187E-01	0.335E-01	10.52	
AC-228	1.41E+10Y	1.00	5.667E-01	5.667E-01	0.729E-01	12.87	
RA-228	1.41E+10Y	1.00	5.667E-01	5.667E-01	0.729E-01	12.87	
TH-228	1.41E+10Y	1.00	5.898E-01	5.898E-01	0.332E-01	5.64	
TH-229	7340.00Y	1.00	2.143E-01	2.143E-01	0.447E-01	20.87	K
TH-230	7.54E+04Y	1.00	3.187E-01	3.187E-01	0.335E-01	10.52	
PA-231	7.04E+08Y	1.00	2.905E-01	2.905E-01	1.456E-01	50.11	
TH-232	1.41E+10Y	1.00	5.667E-01	5.667E-01	0.729E-01	12.87	
TH-234	4.47E+09Y	1.00	7.061E-01	7.061E-01	7.995E-01	113.24	
U-234	2.45E+05Y	1.00	3.187E-01	3.187E-01	0.335E-01	10.52	
U-235	7.04E+08Y	1.00	3.654E-02	3.654E-02	8.253E-02	225.84	
U-238	4.47E+09Y	1.00	7.061E-01	7.061E-01	7.995E-01	113.24	
AM-243	7370.00Y	1.00	1.594E-01	1.594E-01	0.242E-01	15.21	
ANH-511	1.00E+09Y	1.00	3.658E-02	3.658E-02	2.036E-02	55.66	

Total Activity : 2.162E+01 2.368E+01

Grand Total Activity : 2.162E+01 2.368E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.43	206	2074	1.25	259.13	253	10	3.78E-03	94.1	8.40E+00	T
0	199.03	87	1332	1.57	398.32	394	9	1.67E-03	****	7.43E+00	T
0	227.18	74	1430	1.53	454.62	449	10	1.43E-03	****	6.98E+00	T
0	259.53	72	671	1.05	519.33	516	6	1.41E-03	****	6.52E+00	T
0	270.22	274	1141	1.42	540.70	537	10	5.40E-03	51.6	6.38E+00	T
0	328.49	131	1105	1.68	657.24	650	12	2.63E-03	****	5.73E+00	T
0	409.78	108	718	1.46	819.81	815	10	2.22E-03	****	5.03E+00	T
0	463.44	318	532	1.79	927.13	922	11	6.63E-03	32.0	4.66E+00	T
0	467.92	41	340	1.43	936.10	932	7	8.62E-04	****	4.63E+00	T
0	727.12	407	526	2.91	1454.48	1446	19	8.93E-03	29.6	3.37E+00	T
0	767.44	108	457	3.02	1535.12	1529	14	2.37E-03	88.4	3.22E+00	T
0	804.34	132	379	0.86	1608.93	1599	20	2.92E-03	87.9	3.10E+00	
2	964.69	246	357	3.08	1929.63	1921	31	5.59E-03	35.5	2.65E+00	T
2	974.00	46	102	2.07	1948.25	1921	31	1.05E-03	92.7	2.63E+00	
0	1098.10	57	196	1.00	2196.44	2192	13	1.32E-03	****	2.37E+00	T
0	1147.78	4	206	1.21	2295.81	2294	11	9.36E-05	****	2.29E+00	T
2	1236.85	98	127	2.75	2473.94	2470	18	2.29E-03	47.3	2.15E+00	T
2	1239.87	52	247	2.78	2480.00	2470	18	1.21E-03	****	2.15E+00	
1	1377.37	70	105	2.89	2755.00	2749	16	1.67E-03	75.8	1.98E+00	
1	1379.87	44	87	2.89	2760.00	2749	16	1.03E-03	96.1	1.98E+00	
0	1589.74	82	208	1.15	3179.75	3167	24	1.99E-03	80.2	1.82E+00	
0	1630.87	34	94	2.41	3262.00	3255	15	8.33E-04	****	1.80E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656005.CNF;1
Acquisition date : 23-JUN-2016 12:00:15 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.29 Half life ratio : *****
Sample date : 17-MAY-2016 10:45:00 Nuclide Library : SOLID
Sample ID : G398656005 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5903E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	5.844E-02
MN-54	6.634E-03
RU-103	1.075E-02
CD-109	1.493E-01
TE-125M	2.553E+00
SN-126	1.419E-02
BA-137M	6.398E-03
CS-137	6.759E-03
PR-144	4.772E-01
EU-155	2.055E-02
TL-208	6.132E-03
PB-210	8.568E-01
PB-212	1.077E-02
BI-214	1.375E-02
PB-214	1.366E-02
RN-222	1.375E-02
RA-224	1.153E-01
RA-226	1.375E-02
AC-228	2.333E-02
RA-228	2.333E-02
TH-228	1.077E-02
TH-229	1.027E-01
TH-230	1.375E-02
PA-231	8.894E-02
TH-232	2.333E-02
TH-234	2.743E-01
U-234	1.375E-02
U-235	4.011E-02
U-238	2.743E-01
AM-243	1.041E-02
ANH-511	5.229E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)

BE-7	8.078E-02	NOT IDENT.
NA-22	7.030E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	5.044E-03	NOT IDENT.
SC-46	8.139E-03	FAIL ABUN
V-48	3.188E-02	NOT IDENT.
CR-51	1.184E-01	NOT IDENT.
CO-56	8.846E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.454E-03	NOT IDENT.
CO-58	8.285E-03	NOT IDENT.
FE-59	2.200E-02	FAIL ABUN
CO-60	6.786E-03	NOT IDENT.
ZN-65	1.673E-02	NOT IDENT.
GE-68	2.365E-01	NOT IDENT.
AS-73	2.368E-01	NOT IDENT.
AS-74	4.229E-02	NOT IDENT.
SE-75	9.704E-03	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.060E-01	NOT IDENT.
RB-83	1.471E-02	NOT IDENT.
KR-85	2.095E+00	NOT IDENT.
SR-85	1.401E-02	NOT IDENT.
RB-86	3.186E-01	NOT IDENT.
Y-88	6.384E-03	NOT IDENT.
Y-91	4.355E+00	NOT IDENT.
NB-94	6.073E-03	NOT IDENT.
NB-95	1.010E-02	NOT IDENT.
NB-95M	3.734E-02	NOT IDENT.
ZR-95	1.700E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.727E-03	FAIL ABUN
RH-102	9.999E-03	FAIL ABUN
RH-106	6.065E-02	NOT IDENT.
RU-106	6.065E-02	NOT IDENT.
AG-108M	5.348E-03	NOT IDENT.
AG-110M	8.990E-03	NOT IDENT.
SN-113	9.445E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.315E-02	NOT IDENT.
TE-123M	6.357E-03	NOT IDENT.
SB-124	1.748E-02	NOT IDENT.
SB-125	1.743E-02	FAIL ABUN
I-126	1.532E-01	NOT IDENT.
SB-126	8.600E-02	FAIL ABUN
SB-127	1.204E+01	NOT IDENT.
I-131	1.476E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	7.953E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	8.505E-03	FAIL ABUN
CS-135	3.210E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.054E-02	FAIL ABUN
CE-139	6.591E-03	NOT IDENT.
BA-140	1.610E-01	NOT IDENT.
LA-140	4.670E-02	FAIL ABUN
CE-141	2.069E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.175E-02	NOT IDENT.
PM-144	6.869E-03	FAIL ABUN
PM-146	8.202E-03	NOT IDENT.
ND-147	4.051E-01	FAIL ABUN
PM-147	1.535E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.076E-03	FAIL ABUN
EU-152	1.886E-02	FAIL ABUN
GD-153	1.797E-02	FAIL ABUN
EU-154	1.974E-02	NOT IDENT.
TB-160	2.919E-02	FAIL ABUN
HO-166M	1.097E-02	FAIL ABUN
TM-171	4.157E+00	NOT IDENT.
HF-172	3.929E-02	FAIL ABUN
LU-172	1.123E-02	FAIL ABUN

LU-176	5.131E-03	FAIL ABUN
HF-181	1.184E-02	NOT IDENT.
TA-182	3.677E-02	FAIL ABUN
RE-183	5.389E-02	NOT IDENT.
RE-184	3.431E-02	NOT IDENT.
W-188	1.733E+00	FAIL ABUN
IR-192	8.190E-03	FAIL ABUN
HG-203	1.110E-02	FAIL ABUN
BI-207	9.424E-03	FAIL ABUN
BI-211	6.892E-02	FAIL ABUN
PB-211	1.376E-01	NOT IDENT.
BI-212	1.148E-01	FAIL ABUN
RN-219	7.740E-02	FAIL ABUN
RA-223	1.204E-01	FAIL ABUN
AC-227	4.897E-02	FAIL ABUN
TH-227	4.897E-02	FAIL ABUN
TH-231	1.204E-01	FAIL ABUN
PA-233	1.256E-02	FAIL ABUN
PA-234	4.874E-02	FAIL ABUN
PA-234M	8.508E-01	FAIL ABUN
NP-237	1.256E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.419E-02	FAIL ABUN
PU-239	7.415E+01	FAIL ABUN
AM-241	3.346E-02	NOT IDENT.
CM-243	2.124E-02	FAIL ABUN
BK-247	1.539E-02	FAIL ABUN
CM-247	7.109E-03	FAIL ABUN
CF-249	7.460E-03	NOT IDENT.
CF-251	2.582E-02	FAIL ABUN

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656005.CNF;1
Acquisition date : 23-JUN-2016 12:00:15 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.29 Half life ratio : *****
Sample date : 17-MAY-2016 10:45:00 Nuclide Library : SOLID
Sample ID : G398656005 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5903E+02 GRAM
Quantity Err(%) : 1.2576E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.704E+00	5.553E-01	5.553E-01
MN-54	1.332E-02	1.563E-02	1.563E-02
RU-103	1.186E-02	1.310E-02	1.310E-02
CD-109	1.068E+00	3.285E-01	3.285E-01
TE-125M	5.263E+00	4.322E+00	4.322E+00
SN-126	1.010E-01	3.060E-02	3.060E-02
BA-137M	2.193E-01	2.568E-02	2.568E-02
CS-137	2.317E-01	2.712E-02	2.712E-02
PR-144	6.031E-01	6.301E-01	6.301E-01
EU-155	3.263E-02	3.298E-02	3.298E-02
TL-208	1.682E-01	2.554E-02	2.554E-02
PB-210	4.319E-01	1.639E+00	1.639E+00
PB-212	5.898E-01	5.638E-02	5.638E-02
BI-214	3.187E-01	4.278E-02	4.278E-02
PB-214	4.068E-01	4.807E-02	4.807E-02
RN-222	3.187E-01	4.278E-02	4.278E-02
RA-224	4.954E-01	3.302E-01	3.302E-01
RA-226	3.187E-01	4.278E-02	4.278E-02
AC-228	5.667E-01	9.306E-02	9.306E-02
RA-228	5.667E-01	9.306E-02	9.306E-02
TH-228	5.898E-01	5.638E-02	5.638E-02
TH-229	-3.373E-02	1.305E-01	1.305E-01
TH-230	3.187E-01	4.277E-02	4.277E-02
PA-231	2.905E-01	1.566E-01	1.566E-01
TH-232	5.667E-01	9.306E-02	9.306E-02
TH-234	7.061E-01	7.994E-01	7.994E-01
U-234	3.187E-01	4.277E-02	4.277E-02
U-235	3.654E-02	8.092E-02	8.092E-02
U-238	7.061E-01	7.994E-01	7.994E-01
AM-243	1.238E-01	2.653E-02	2.653E-02
ANH-511	3.658E-02	2.018E-02	2.018E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	1.014E-02	9.221E-02	9.232E-02	NOT IDENT.
NA-22	-6.759E-03	8.701E-03	9.219E-03	NOT IDENT.
NA-24	5.671E+13	8.147E+15	8.147E+15	SHORT HLIF
AL-26	2.150E-04	5.917E-03	5.918E-03	NOT IDENT.
SC-46	9.144E-04	9.570E-03	9.579E-03	FAIL ABUN
V-48	-1.165E-03	3.686E-02	3.687E-02	NOT IDENT.
CR-51	-1.656E-01	1.504E-01	1.679E-01	NOT IDENT.
CO-56	-1.194E-02	1.494E-02	1.588E-02	FAIL ABUN
MN-56	-1.000E+41	1.249E+41	0.000E+00	SHORT HLIF
CO-57	2.281E-03	6.247E-03	6.331E-03	NOT IDENT.
CO-58	4.079E-03	1.114E-02	1.129E-02	NOT IDENT.
FE-59	3.002E-02	3.092E-02	3.375E-02	FAIL ABUN
CO-60	-8.496E-04	7.929E-03	7.939E-03	NOT IDENT.
ZN-65	1.606E-02	2.227E-02	2.342E-02	NOT IDENT.
GE-68	1.627E-01	2.702E-01	2.800E-01	NOT IDENT.
AS-73	-2.771E-02	2.957E-01	2.959E-01	NOT IDENT.
AS-74	3.689E-02	4.971E-02	5.242E-02	NOT IDENT.
SE-75	-6.337E-03	1.650E-02	1.674E-02	NOT IDENT.
BR-77	5.901E+04	6.375E+04	6.908E+04	SHORT HLIF
SR-82	-1.037E-01	1.400E-01	1.476E-01	NOT IDENT.
RB-83	-1.399E-02	1.905E-02	2.006E-02	NOT IDENT.
KR-85	2.472E+01	2.944E+00	1.153E+01	NOT IDENT.
SR-85	1.651E-01	1.968E-02	7.699E-02	NOT IDENT.
RB-86	1.900E-01	3.649E-01	3.748E-01	NOT IDENT.
Y-88	-3.204E-03	7.753E-03	7.886E-03	NOT IDENT.
Y-91	-3.106E+00	5.285E+00	5.468E+00	NOT IDENT.
NB-94	-1.504E-03	7.697E-03	7.726E-03	NOT IDENT.
NB-95	3.025E-02	1.262E-02	1.858E-02	NOT IDENT.
NB-95M	2.415E-01	4.840E-02	1.191E-01	NOT IDENT.
ZR-95	1.230E-02	1.932E-02	2.010E-02	NOT IDENT.
NB-97	1.000E+41	2.329E+40	0.000E+00	SHORT HLIF
ZR-97	1.148E+16	1.694E+15	5.447E+15	SHORT HLIF
MO-99	3.783E+01	6.633E+02	6.635E+02	SHORT HLIF
TC-99M	-1.000E+41	6.156E+41	0.000E+00	SHORT HLIF
RH-101	9.444E-03	8.532E-03	9.535E-03	FAIL ABUN
RH-102	-6.062E-04	1.137E-02	1.138E-02	FAIL ABUN
RH-106	-5.919E-02	7.071E-02	7.557E-02	NOT IDENT.
RU-106	-5.919E-02	7.071E-02	7.557E-02	NOT IDENT.
AG-108M	-4.837E-03	6.206E-03	6.578E-03	NOT IDENT.
AG-110M	-3.095E-03	1.073E-02	1.082E-02	NOT IDENT.
SN-113	-3.072E-03	1.067E-02	1.076E-02	NOT IDENT.
CD-115	-2.545E+02	2.330E+03	2.332E+03	SHORT HLIF
SN-117M	-2.190E-02	3.829E-02	3.954E-02	NOT IDENT.
TE-123M	-1.005E-03	7.270E-03	7.284E-03	NOT IDENT.
SB-124	-7.434E-03	2.144E-02	2.170E-02	NOT IDENT.
SB-125	1.308E-02	1.941E-02	2.029E-02	FAIL ABUN
I-126	5.793E-01	1.894E-01	3.226E-01	NOT IDENT.
SB-126	-2.030E-02	1.171E-01	1.175E-01	FAIL ABUN
SB-127	-1.118E+01	1.433E+01	1.519E+01	NOT IDENT.
I-131	-4.615E-02	1.655E-01	1.668E-01	NOT IDENT.
I-132	1.000E+41	2.726E+41	0.000E+00	SHORT HLIF
TE-132	1.529E+01	3.171E+01	3.245E+01	SHORT HLIF
BA-133	6.336E-03	1.003E-02	1.043E-02	FAIL ABUN
I-133	-7.867E+10	6.399E+10	7.316E+10	SHORT HLIF
CS-134	2.954E-02	1.428E-02	1.952E-02	FAIL ABUN
CS-135	9.671E-02	3.993E-02	5.912E-02	NOT IDENT.
I-135	-8.871E+38	2.733E+39	0.000E+00	SHORT HLIF
CS-136	-5.608E-03	7.065E-02	7.070E-02	FAIL ABUN
CE-139	-4.117E-03	7.258E-03	7.491E-03	NOT IDENT.
BA-140	9.470E-02	1.839E-01	1.887E-01	NOT IDENT.
LA-140	2.441E-02	6.349E-02	6.444E-02	FAIL ABUN
CE-141	1.630E-02	2.985E-02	3.074E-02	NOT IDENT.
CE-143	1.558E+07	2.753E+06	7.545E+06	SHORT HLIF
CE-144	-3.525E-02	5.471E-02	5.697E-02	NOT IDENT.
PM-144	7.966E-03	8.323E-03	9.064E-03	FAIL ABUN
PM-146	6.169E-03	9.196E-03	9.608E-03	NOT IDENT.
ND-147	-2.065E-01	4.760E-01	4.850E-01	FAIL ABUN
PM-147	1.057E+02	1.690E+02	1.756E+02	NOT IDENT.
PM-149	-4.350E+01	2.092E+04	2.092E+04	SHORT HLIF
EU-150	-3.539E-03	1.056E-02	1.068E-02	FAIL ABUN
EU-152	-3.017E-03	2.935E-02	2.938E-02	FAIL ABUN
GD-153	-2.562E-03	2.248E-02	2.251E-02	FAIL ABUN
EU-154	-1.829E-02	2.440E-02	2.576E-02	NOT IDENT.
TB-160	2.105E-02	3.366E-02	3.498E-02	FAIL ABUN
HO-166M	-4.491E-04	1.263E-02	1.263E-02	FAIL ABUN
TM-171	-6.171E+00	5.346E+00	6.027E+00	NOT IDENT.
HF-172	-6.409E-03	5.039E-02	5.047E-02	FAIL ABUN

LU-172	6.746E-03	1.509E-02	1.539E-02	FAIL ABUN
LU-176	-2.109E-03	6.307E-03	6.378E-03	FAIL ABUN
HF-181	1.595E-03	1.352E-02	1.354E-02	NOT IDENT.
TA-182	-1.837E-02	4.430E-02	4.507E-02	FAIL ABUN
RE-183	1.161E-02	6.402E-02	6.424E-02	NOT IDENT.
RE-184	1.550E-02	4.692E-02	4.743E-02	NOT IDENT.
W-188	-2.574E-01	2.295E+00	2.298E+00	FAIL ABUN
IR-192	1.724E-03	9.370E-03	9.402E-03	FAIL ABUN
HG-203	2.028E-02	1.689E-02	1.920E-02	FAIL ABUN
BI-207	4.889E-03	1.081E-02	1.103E-02	FAIL ABUN
BI-211	1.121E+00	1.337E-01	5.227E-01	FAIL ABUN
PB-211	2.645E-02	1.790E-01	1.794E-01	NOT IDENT.
BI-212	7.128E-01	2.172E-01	3.879E-01	FAIL ABUN
RN-219	3.651E-03	9.110E-02	9.111E-02	FAIL ABUN
RA-223	5.487E-02	1.590E-01	1.609E-01	FAIL ABUN
AC-227	4.089E-03	6.355E-02	6.358E-02	FAIL ABUN
TH-227	4.089E-03	6.355E-02	6.358E-02	FAIL ABUN
TH-231	5.487E-02	1.590E-01	1.609E-01	FAIL ABUN
PA-233	-1.817E-03	1.446E-02	1.448E-02	FAIL ABUN
PA-234	1.856E-02	5.926E-02	5.984E-02	FAIL ABUN
PA-234M	3.763E-01	1.270E+00	1.282E+00	FAIL ABUN
NP-237	-1.817E-03	1.446E-02	1.448E-02	FAIL ABUN
NP-238	4.200E+02	5.719E+03	5.722E+03	SHORT HLIF
NP-239	-2.452E-03	6.021E-02	6.022E-02	FAIL ABUN
PU-239	1.531E+02	1.416E+02	1.575E+02	FAIL ABUN
AM-241	4.082E-02	3.912E-02	4.323E-02	NOT IDENT.
CM-243	-2.995E-02	2.762E-02	3.074E-02	FAIL ABUN
BK-247	-1.143E-02	2.365E-02	2.420E-02	FAIL ABUN
CM-247	1.321E-03	8.586E-03	8.607E-03	FAIL ABUN
CF-249	-6.069E-03	1.004E-02	1.040E-02	NOT IDENT.
CF-251	-2.241E-02	2.865E-02	3.038E-02	FAIL ABUN

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1117.7977	87.09	1368.5261	136.47	1356.2032
45.60	1124.7836	87.57	1370.0813	140.51	0.0000
46.54	1192.1417	88.03	1371.5667	143.76	1370.7518
49.72	0.0000	88.34	1372.5641	144.24	1354.4180
51.35	1208.9985	88.47	1372.9823	145.44	1279.4126
51.87	1179.2209	89.96	1377.7495	152.43	1246.6450
52.39	1168.7987	1093.63	1379.9159	153.25	1241.6293
52.97	1144.5173	91.11	1381.4066	323.87	1256.7745
53.44	1117.0542	92.59	1386.0773	156.02	1314.6908
54.07	1133.5973	93.35	1388.4581	158.56	1303.1550
57.36	0.0000	94.56	1291.4945	159.00	1268.3640
57.53	1253.4069	94.65	1329.7925	162.33	1253.5050
57.98	1217.7515	94.67	1329.8539	162.66	1269.8232
59.27	1198.0881	94.87	1330.4480	163.33	1259.8794
59.32	1198.2728	97.43	1334.7963	165.86	1319.8323
59.54	1212.1053	98.43	1211.4491	176.31	1305.2207
60.96	1320.5272	98.44	1211.4769	176.60	1270.0658
61.17	1321.3678	99.53	1206.8599	177.52	1338.6021
62.93	1410.1935	100.11	1257.8207	181.07	0.0000
63.29	1411.6968	102.03	1372.2275	181.52	1300.6565
63.58	1412.9072	103.18	1399.7732	184.41	1295.0513
64.28	1481.8394	103.37	1400.3341	143.76	1295.5221
66.73	1481.2819	105.21	1206.2845	193.51	1242.3330
67.24	1483.4296	105.31	1206.5343	197.03	1212.0194
125.81	1418.6066	106.12	1216.6725	198.01	1210.4286
67.75	1418.8871	106.47	1232.1803	201.83	1359.9755
69.67	1516.6672	109.28	1316.0748	203.43	1239.4432
70.83	1489.2667	111.00	1228.7505	205.31	1274.0959
72.81	1497.2823	111.76	0.0000	210.85	1182.4236
72.87	1497.5195	114.06	1267.5422	215.65	1173.7535
74.66	1504.6716	116.30	0.0000	222.11	1190.6018
74.82	1505.3042	116.74	1314.7838	227.09	1189.4812
74.97	1505.9001	119.76	1305.6775	227.38	1175.2330
77.11	1514.3173	121.12	1271.3718	228.16	0.0000
78.74	1445.9785	121.22	1237.1038	228.18	1166.5519
79.69	1468.5820	121.78	1252.0032	116.74	1166.5519
80.12	1470.1699	122.06	1255.6482	235.69	1198.0476
80.19	1470.4277	122.92	1282.6283	235.96	1198.4109
80.57	1471.8281	123.07	1287.7445	238.63	1080.3495
81.00	1473.4102	265.00	1327.8500	238.98	0.0000
81.07	1473.6680	125.81	1333.0382	240.99	1083.2155
81.75	1506.9115	127.23	1312.7775	242.00	1084.4352
83.79	1357.7317	127.91	1294.0693	244.70	1002.6913
84.00	1358.4235	129.30	1315.9603	252.40	946.1971
85.43	1363.1208	131.20	1293.1537	252.80	969.1595
86.55	1366.7727	133.02	1360.5265	254.15	0.0000
86.79	1367.5448	133.52	1365.1333	256.23	981.6979
86.94	1368.0382	136.00	1368.0006	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	987.0508	355.39	0.0000	584.27	479.3103
264.80	997.3701	356.01	722.7571	595.83	529.7394
265.00	997.5854	364.49	748.7460	427.87	597.3562
268.22	898.7773	366.42	0.0000	602.52	0.0000
269.46	935.7081	372.51	730.2014	604.72	585.1937
270.03	975.4792	375.05	715.7526	607.14	608.8000
271.23	1065.4668	377.52	713.3890	609.32	648.7354
273.65	1098.9052	356.01	683.9061	610.33	596.7563
276.40	1101.9615	388.16	744.8656	614.28	532.4791
277.37	987.0596	388.63	748.9250	618.01	581.7944
277.60	984.7039	391.69	718.4200	620.36	575.7458
278.00	993.6962	264.66	737.6423	621.93	561.1866
279.20	938.0826	401.81	733.3055	630.19	0.0000
279.54	940.1260	402.40	725.8439	631.29	478.9109
279.70	940.2815	404.85	744.3328	633.25	501.1450
280.46	908.2473	410.95	713.0366	634.78	494.9183
283.69	978.5817	413.71	640.0577	635.95	482.9098
284.31	988.6955	414.70	666.9979	636.99	490.7468
285.41	950.7980	423.72	661.7831	645.85	516.7704
285.90	0.0000	427.09	629.2888	657.76	499.2919
287.50	916.2979	427.87	624.7637	657.90	0.0000
290.67	940.0122	433.94	657.7949	661.66	484.4368
293.27	0.0000	439.40	596.4474	664.57	0.0000
351.93	867.1927	453.88	629.2081	666.33	440.8537
295.96	839.8145	463.37	616.3958	666.50	440.8937
879.38	841.9043	468.07	652.6744	667.71	0.0000
299.98	883.4122	473.00	606.5530	677.62	401.2496
300.09	887.0172	475.06	625.8791	685.70	446.5074
300.13	887.0583	476.78	637.8488	695.00	442.6627
301.36	875.7756	477.60	609.9604	696.49	464.4453
302.85	850.5760	482.18	599.6416	696.51	464.4453
256.23	873.0579	487.02	581.2245	697.00	485.0482
304.85	873.3398	492.35	0.0000	697.30	517.5726
306.78	905.4002	497.08	559.4279	697.49	517.6188
308.46	883.7054	505.52	589.3696	702.65	506.9072
311.90	883.3019	507.63	0.0000	706.68	476.4994
316.51	821.7469	511.00	575.6328	711.68	465.8250
319.41	842.1310	514.00	525.2581	720.70	431.7703
320.08	868.1327	514.00	525.2581	721.93	0.0000
321.04	859.4824	520.40	545.4609	722.78	385.5066
323.87	795.2315	520.69	0.0000	722.91	385.5338
325.23	812.3622	522.65	0.0000	723.31	395.9768
328.76	780.6368	527.90	0.0000	724.19	408.2466
333.37	901.4497	528.26	524.4668	727.33	419.7337
333.97	869.3164	529.59	548.8404	733.00	430.7456
334.37	840.6318	529.87	0.0000	735.93	400.0223
338.28	803.4720	531.02	535.7617	333.97	424.6619
338.32	803.4990	537.26	493.8081	739.50	0.0000
311.90	812.2768	546.56	0.0000	747.24	428.5436
340.48	812.2768	552.55	576.3593	748.06	434.7042
340.55	812.3221	563.25	607.5173	752.31	401.4895
344.28	846.8739	569.33	571.2448	753.82	388.7375
345.93	779.4486	946.00	559.5749	756.73	419.3340
351.06	869.4308	569.70	559.6390	756.80	419.3485
351.93	775.0911	583.19	479.0199	884.68	415.6504

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	366.6343	1274.44	369.6053	1620.50	137.5320
766.42	394.9463	1001.03	301.5978	1621.92	130.9132
766.84	393.2580	1002.74	287.2701	1678.03	0.0000
772.60	0.0000	1004.73	326.1859	1690.97	118.6263
776.52	427.8653	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	112.3045
778.90	464.9792	1028.54	0.0000	1063.66	129.9416
783.70	348.7385	1037.84	305.4683	1771.35	124.7759
785.37	354.1381	1038.76	0.0000	1791.20	0.0000
792.07	484.9565	631.29	319.1383	1808.65	89.3468
794.95	307.0416	1048.07	327.1566	1810.72	0.0000
795.86	307.1571	1049.04	321.3717	1836.06	98.5585
810.06	325.1847	1050.41	337.2533		
810.29	325.2123	1063.66	314.0599		
344.28	325.2344	1077.00	291.6493		
810.76	328.8728	1077.34	291.6852		
815.77	330.2580	1085.87	320.3589		
1048.07	346.1689	1093.63	278.3956		
832.01	340.8590	1099.45	304.7952		
834.85	381.1890	1112.07	303.2552		
835.71	383.1394	1112.84	296.1918		
836.80	0.0000	1115.54	323.2311		
846.75	0.0000	1120.29	277.6677		
846.77	439.3899	1120.55	277.6930		
856.80	421.2268	1221.41	259.4219		
860.56	331.9898	1129.67	255.6295		
871.09	330.9732	1131.51	0.0000		
873.19	341.2950	1147.95	0.0000		
875.33	0.0000	1173.23	267.9967		
879.38	322.0627	1177.95	279.6484		
880.51	327.4883	1189.05	308.3496		
883.24	322.5520	1204.77	325.3052		
884.68	337.5468	1221.41	365.3203		
889.28	324.3726	1231.02	321.9548		
894.76	349.4937	1235.36	326.0755		
898.04	349.9412	1238.28	281.8498		
900.72	314.5270	1260.41	0.0000		
903.28	335.7257	1271.87	264.3589		
911.20	320.7066	1274.44	275.0902		
912.08	320.8165	1274.54	275.0982		
923.98	0.0000	1291.59	252.0760		
926.50	333.0526	1298.22	0.0000		
929.11	359.7454	1312.11	239.5690		
937.49	293.8024	1332.49	219.9713		
944.13	303.9939	1362.66	0.0000		
946.00	269.1404	1365.19	203.6842		
949.00	277.9780	1368.63	0.0000		
667.71	0.0000	1384.29	175.5664		
962.31	310.1578	1408.01	190.4652		
964.08	322.4451	1457.56	0.0000		
966.17	322.6875	1460.82	165.4980		
911.20	323.0124	1489.16	183.5497		
968.97	323.0124	1505.03	194.2383		
983.53	312.2204	1584.12	129.7587		
984.45	0.0000	1596.21	119.1328		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 00:03:44.59

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656006.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;478
Background date : 20-JUN-2016 14:02:47
Sample date     : 17-MAY-2016 10:50:00 Acquisition date : 23-JUN-2016 12:03:15
Sample ID       : G398656006 Sample quantity : 1.56900E+02 GRAM
Detector name   : GAM02 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:03.67 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572234 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.05*	61	1024	0.85	93.73	92	6	1.41E-03	101.8	
2	0	63.16*	301	1975	1.17	125.94	121	10	6.96E-03	32.4	
3	3	72.96*	2	1456	1.40	145.52	142	19	4.83E-05	*****	1.01E+00
4	3	74.83*	904	1624	1.15	149.27	142	19	2.09E-02	9.6	
5	3	77.10	1635	1309	1.06	153.79	142	19	3.79E-02	4.4	
6	5	84.29*	153	1819	1.26	168.17	163	31	3.53E-03	55.8	1.91E+00
7	5	87.20	625	1502	1.09	173.99	163	31	1.45E-02	10.9	
8	5	89.89	426	1433	1.09	179.36	163	31	9.86E-03	15.6	
9	5	92.64*	531	1343	1.24	184.87	163	31	1.23E-02	16.9	
10	5	94.04*	210	2030	1.77	187.66	163	31	4.86E-03	51.1	
11	0	98.64*	90	1356	1.91	196.86	193	8	2.08E-03	80.5	
12	0	105.07	181	1319	1.57	209.70	206	8	4.20E-03	35.5	
13	0	129.30	198	1391	1.63	258.13	255	8	4.58E-03	33.4	
14	0	154.33	124	1065	0.89	308.17	305	7	2.87E-03	44.5	
15	0	185.72*	437	1846	1.45	370.91	364	13	1.01E-02	24.4	
16	0	198.67*	56	942	1.37	396.79	394	7	1.30E-03	106.3	
17	0	205.56*	152	1203	1.11	410.57	406	9	3.51E-03	47.0	
18	0	209.39	309	1177	0.91	418.21	415	9	7.15E-03	20.8	
19	3	238.60*	3640	770	1.24	476.60	471	17	8.43E-02	2.4	1.79E+00
20	3	241.62*	761	1039	1.75	482.64	471	17	1.76E-02	11.4	
21	0	269.84	372	997	1.28	539.04	534	12	8.62E-03	17.7	
22	0	277.34	176	825	1.82	554.04	549	10	4.09E-03	31.4	
23	2	295.19	1118	588	1.33	589.73	584	23	2.59E-02	4.8	1.43E+00
24	2	300.11	279	697	1.67	599.56	584	23	6.45E-03	19.0	
25	0	328.56	108	774	1.33	656.42	649	10	2.51E-03	49.1	
26	0	338.13*	756	733	1.35	675.56	671	11	1.75E-02	9.0	
27	0	346.97	99	386	0.77	693.22	690	7	2.29E-03	34.4	
28	0	351.80*	1834	703	1.40	702.88	697	12	4.25E-02	4.2	
29	0	356.58	64	513	1.36	712.43	709	9	1.47E-03	65.6	
30	0	368.96	46	456	1.14	737.19	736	8	1.06E-03	81.9	
31	0	409.63	100	635	1.31	818.48	814	11	2.30E-03	50.1	
32	0	462.53	255	449	1.60	924.22	919	10	5.91E-03	16.7	
33	0	499.99	55	331	2.35	999.10	994	9	1.27E-03	61.6	
34	0	502.75	23	323	1.42	1004.62	1004	8	5.38E-04	134.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	510.88*	410	812	1.96	1020.88	1011	21	9.50E-03	22.8	
36	0	557.55	29	360	3.25	1114.17	1112	10	6.67E-04	125.2	
37	0	562.40	65	214	1.91	1123.86	1121	7	1.49E-03	39.6	
38	0	583.15*	995	437	1.54	1165.35	1160	12	2.30E-02	5.9	
39	0	609.15*	1226	434	1.37	1217.32	1212	12	2.84E-02	4.9	
40	0	625.79	37	195	1.27	1250.58	1245	8	8.50E-04	68.0	
41	0	646.08	29	262	1.43	1291.14	1286	9	6.64E-04	103.9	
42	0	661.45*	1481	440	1.60	1321.87	1313	15	3.43E-02	4.4	
43	0	727.07	323	284	1.88	1453.07	1447	13	7.47E-03	12.1	
44	4	754.72	92	311	2.58	1508.34	1499	20	2.12E-03	43.1	1.51E+00
45	4	758.32	28	141	1.54	1515.54	1499	20	6.37E-04	73.3	
46	0	768.38	67	281	0.88	1535.65	1532	9	1.55E-03	47.4	
47	0	786.24	111	255	4.80	1571.35	1566	14	2.57E-03	32.1	
48	0	794.75	61	206	1.44	1588.37	1585	9	1.42E-03	44.4	
49	0	835.47	21	155	1.60	1669.77	1668	7	4.77E-04	102.1	
50	0	860.28	187	197	1.77	1719.36	1714	12	4.33E-03	16.8	
51	0	883.18	34	160	3.97	1765.15	1761	10	7.87E-04	71.7	
52	0	903.74	58	125	2.22	1806.25	1802	8	1.35E-03	35.9	
53	0	911.00*	745	274	1.85	1820.78	1813	15	1.72E-02	6.7	
54	2	964.59*	187	205	2.29	1927.91	1920	23	4.33E-03	20.8	1.07E+00
55	2	968.79*	448	178	1.95	1936.32	1920	23	1.04E-02	8.7	
56	0	985.48	39	246	4.24	1969.69	1963	18	8.99E-04	96.3	
57	0	1120.38*	247	222	2.07	2239.38	2231	16	5.72E-03	17.1	
58	1	1237.88*	115	130	2.25	2474.33	2465	36	2.65E-03	25.4	1.01E+00
59	1	1245.01	63	105	2.26	2488.59	2465	36	1.46E-03	40.2	
60	1	1249.02	45	58	2.09	2496.60	2465	36	1.05E-03	37.5	
61	0	1280.31	35	130	1.80	2559.17	2555	11	8.20E-04	64.4	
62	0	1377.68*	55	93	1.27	2753.86	2748	11	1.28E-03	44.7	
63	0	1385.55*	9	65	0.89	2769.60	2764	12	2.02E-04	230.0	
64	0	1408.50*	57	70	2.94	2815.49	2810	12	1.32E-03	32.5	
65	5	1460.45*	1753	84	2.35	2919.36	2912	29	4.06E-02	3.0	1.15E+00
66	5	1466.66	34	60	3.48	2931.78	2912	29	7.86E-04	87.8	
67	0	1473.76	36	35	3.53	2945.98	2940	11	8.25E-04	36.5	
68	0	1509.31	64	76	1.79	3017.07	3008	16	1.48E-03	32.9	
69	0	1515.77	41	42	2.59	3029.99	3024	14	9.52E-04	37.9	
70	0	1571.63	17	56	2.19	3141.68	3132	14	3.90E-04	97.3	
71	0	1582.12	34	73	3.18	3162.65	3155	15	7.86E-04	58.0	
72	0	1588.43	33	60	1.14	3175.28	3170	10	7.72E-04	46.1	
73	0	1592.18	33	42	2.23	3182.77	3179	7	7.74E-04	36.5	
74	0	1624.31	22	103	5.81	3247.02	3235	20	5.10E-04	115.6	
75	0	1659.17	61	50	5.36	3316.74	3308	18	1.41E-03	29.9	
76	0	1729.51*	48	67	2.30	3457.39	3448	17	1.10E-03	48.5	
77	0	1764.03*	216	58	2.39	3526.43	3517	18	5.01E-03	12.8	
78	0	1792.28	45	54	6.13	3582.93	3570	27	1.04E-03	47.8	
79	0	1802.23	27	24	0.77	3602.81	3597	12	6.25E-04	41.1	
80	0	1846.99	52	39	1.42	3692.34	3687	12	1.20E-03	27.9	
81	0	1996.19	13	36	4.71	3990.72	3978	16	3.04E-04	105.7	
82	0	2043.78	12	6	1.00	4085.89	4083	7	2.85E-04	46.9	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656006.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:50:00 Acquisition date : 23-JUN-2016 12:03:15
Sample ID        : G398656006 Sample quantity   : 156.90 GRAM
Sample type      : SOLID Sample geometry      :
Detector name    : GAMMA2 Detector geometry   : CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:03.67 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error      : 0.00 %
Efficiency type  : Empirical Efficiencies at  : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.046E+00	6.074E+00	6.074E+00	5.91	OK
MN-54	834.85	99.98*	1.748E+00	4.862E-03	5.282E-03	204.11	OK
CD-109	88.03	3.70*	5.102E+00	1.049E+00	1.110E+00	36.20	OK
SN-126	64.28	9.60	2.447E+00	6.825E-01	6.825E-01	64.85	OK
	86.94	8.90	5.102E+00	4.362E-01	4.362E-01	36.20	OK
	87.57	37.00*	5.102E+00	1.049E-01	1.049E-01	36.20	OK
BA-137M	661.66	89.90*	2.131E+00	3.271E-01	3.279E-01	8.70	OK
CS-137	661.66	85.10*	2.131E+00	3.456E-01	3.464E-01	8.70	OK
EU-155	86.55	30.70	5.102E+00	1.265E-01	1.284E-01	36.20	OK
	105.31	21.10*	5.961E+00	7.342E-02	7.452E-02	70.92	OK
TL-208	277.37	6.60	4.043E+00	3.069E-01	3.069E-01	62.78	OK
	583.19	85.00*	2.355E+00	2.135E-01	2.135E-01	11.82	OK
	860.56	12.50	1.704E+00	3.614E-01	3.614E-01	33.56	OK
PB-210	46.54	4.25*	5.545E-01	1.417E+00	1.422E+00	203.68	OK
BI-212	727.33	6.67*	1.971E+00	1.028E+00	1.028E+00	24.22	OK
	785.37	1.10	1.844E+00	2.275E+00	2.275E+00	64.19	OK
	1620.50	1.47	9.595E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.937E+00	7.646E-01	7.646E-01	29.76	OK
	77.11	17.10	4.188E+00	1.196E+00	1.196E+00	8.71	OK
	238.63	43.60*	4.497E+00	8.746E-01	8.746E-01	4.78	OK
	300.09	3.30	3.822E+00	1.017E+00	1.017E+00	38.03	OK
BI-214	609.32	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84	OK
	1120.29	14.92	1.335E+00	4.951E-01	4.952E-01	34.28	OK
	1764.49	15.30	9.019E-01	5.922E-01	5.922E-01	25.59	OK
PB-214	74.82	5.80	3.936E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.188E+00	2.109E+00	2.109E+00	8.71	OK
	87.09	3.41	5.094E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.453E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.867E+00	7.238E-01	7.238E-01	9.58	OK
	351.93	35.60*	3.411E+00	6.838E-01	6.838E-01	8.39	OK
RN-222	609.32	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84	OK
	1120.29	14.92	1.335E+00	4.951E-01	4.952E-01	34.28	OK
	1764.49	15.30	9.019E-01	5.922E-01	5.922E-01	25.59	OK
RA-224	240.99	4.10*	4.457E+00	6.786E-01	6.786E-01	68.32	OK
RA-226	609.32	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84	OK
	1120.29	14.92	1.335E+00	4.951E-01	4.952E-01	34.28	OK
	1764.49	15.30	9.019E-01	5.922E-01	5.922E-01	25.59	OK
AC-228	105.21	1.10	5.961E+00	1.408E+00	1.408E+00	70.92	OK
	338.32	11.27	3.509E+00	8.687E-01	8.687E-01	17.95	OK
	794.95	4.25	1.827E+00	3.270E-01	3.270E-01	88.75	OK
	835.71	1.61	1.748E+00	3.019E-01	3.019E-01	204.11	OK
	911.20	25.80*	1.618E+00	7.288E-01	7.288E-01	13.45	OK
	968.97	15.80	1.529E+00	7.512E-01	7.512E-01	17.37	OK
RA-228	105.21	1.10	5.961E+00	1.408E+00	1.408E+00	70.92	OK
	338.32	11.27	3.509E+00	8.687E-01	8.687E-01	17.95	OK
	794.95	4.25	1.827E+00	3.270E-01	3.270E-01	88.75	OK
	835.71	1.61	1.748E+00	3.019E-01	3.019E-01	204.11	OK
	911.20	25.80*	1.618E+00	7.288E-01	7.288E-01	13.45	OK
	968.97	15.80	1.529E+00	7.512E-01	7.512E-01	17.37	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	3.937E+00	7.646E-01	7.646E-01	29.76	OK
	77.11	17.10	4.188E+00	1.196E+00	1.196E+00	8.71	OK
	238.63	43.60*	4.497E+00	8.746E-01	8.746E-01	4.78	OK
	300.09	3.30	3.822E+00	1.017E+00	1.017E+00	38.03	OK
TH-229	85.43	14.70	4.873E+00	1.107E-01	1.107E-01	111.53	OK
	88.47	24.00	5.102E+00	1.618E-01	1.618E-01	36.20	OK
	193.51	4.41*	5.172E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.915E+00	1.071E+00	1.071E+00	41.62	OK
TH-230	609.32	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84	OK
	1120.29	14.92	1.335E+00	4.951E-01	4.951E-01	34.28	OK
	1764.49	15.30	9.019E-01	5.922E-01	5.922E-01	25.59	OK
PA-231	283.69	1.70	3.978E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.822E+00	6.275E-01	6.275E-01	38.03	OK
TH-232	105.21	1.10	5.961E+00	1.408E+00	1.408E+00	70.92	OK
	338.32	11.27	3.509E+00	8.687E-01	8.687E-01	17.95	OK
	835.71	1.61	1.748E+00	3.019E-01	3.019E-01	204.11	OK
	911.20	25.80*	1.618E+00	7.288E-01	7.288E-01	13.45	OK
	968.97	15.80	1.529E+00	7.512E-01	7.512E-01	17.37	OK
TH-234	63.29	3.70*	2.447E+00	1.771E+00	1.771E+00	64.85	OK
	92.59	4.23	5.457E+00	1.186E+00	1.186E+00	33.86	OK
U-234	609.32	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84	OK
	1120.29	14.92	1.335E+00	4.951E-01	4.951E-01	34.28	OK
	1764.49	15.30	9.019E-01	5.922E-01	5.922E-01	25.59	OK
U-235	89.96	3.47	5.289E+00	1.200E+00	1.200E+00	31.23	OK
	93.35	5.60	5.534E+00	3.483E-01	3.483E-01	102.29	OK
	143.76	10.96*	5.997E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.691E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.303E+00	6.959E-02	6.959E-02	48.87	OK
	205.31	5.01	4.975E+00	2.909E-01	2.909E-01	94.09	OK
U-238	63.29	3.70*	2.447E+00	1.771E+00	1.771E+00	64.85	OK
	92.59	4.23	5.457E+00	1.186E+00	1.186E+00	33.86	OK
AM-243	43.53	5.90	3.128E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.937E+00	1.170E-01	1.170E-01	29.76	OK
ANH-511	511.00	100.00*	2.603E+00	6.861E-02	6.861E-02	45.62	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656006.CNF;1
Acquisition date : 23-JUN-2016 12:03:15 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:03.67 Half life ratio : *****
Sample date : 17-MAY-2016 10:50:00 Analyst initials: MXR1
Sample ID : G398656006 Sample Quantity : 1.5690E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.074E+00	3.519E-01	1.866E-01
MN-54	5.282E-03	1.057E-02	2.034E-02
CD-109	1.110E+00	3.937E-01	4.235E-01
SN-126	1.049E-01	3.723E-02	4.029E-02
BA-137M	3.279E-01	2.796E-02	1.917E-02
CS-137	3.464E-01	2.954E-02	2.025E-02
EU-155	7.452E-02	5.179E-02	5.790E-02
TL-208	2.135E-01	2.473E-02	1.836E-02
PB-210	1.422E+00	2.838E+00	3.189E+00
BI-212	1.028E+00	2.439E-01	2.425E-01
PB-212	8.746E-01	4.099E-02	3.032E-02
BI-214	5.059E-01	4.878E-02	3.552E-02
PB-214	6.838E-01	5.620E-02	3.841E-02
RN-222	5.059E-01	4.878E-02	3.552E-02
RA-224	6.786E-01	4.544E-01	3.250E-01
RA-226	5.059E-01	4.878E-02	3.552E-02
AC-228	7.288E-01	9.607E-02	6.976E-02
RA-228	7.288E-01	9.607E-02	6.976E-02
TH-228	8.746E-01	4.099E-02	3.032E-02
TH-229	2.568E-02	1.612E-01	2.892E-01
TH-230	5.059E-01	4.878E-02	3.552E-02
PA-231	6.275E-01	2.339E-01	2.533E-01
TH-232	7.288E-01	9.607E-02	6.976E-02
TH-234	1.771E+00	1.125E+00	7.904E-01
U-234	5.059E-01	4.878E-02	3.552E-02
U-235	-4.337E-02	8.251E-02	1.133E-01
U-238	1.771E+00	1.125E+00	7.904E-01
AM-243	1.170E-01	3.412E-02	3.017E-02
ANH-511	6.861E-02	3.067E-02	1.425E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-4.135E-02	1.288E-01	2.331E-01	NOT IDENT.

NA-22	1.102E-02	1.324E-02	2.144E-02	NOT IDENT.
NA-24	0.000E+00	9.480E+15	0.000E+00	SHORT HLIF
AL-26	5.255E-03	1.046E-02	1.731E-02	NOT IDENT.
SC-46	-9.971E-03	1.520E-02	2.287E-02	FAIL ABUN
V-48	1.402E-02	5.514E-02	8.757E-02	NOT IDENT.
CR-51	-3.252E-02	2.066E-01	3.666E-01	NOT IDENT.
CO-56	1.165E-02	1.344E-02	2.446E-02	FAIL ABUN
MN-56	0.000E+00	1.134E+41	0.000E+00	SHORT HLIF
CO-57	7.195E-03	8.104E-03	1.468E-02	NOT IDENT.
CO-58	-1.312E-02	1.366E-02	2.286E-02	NOT IDENT.
FE-59	2.917E-02	3.397E-02	6.327E-02	NOT IDENT.
CO-60	-4.741E-03	1.095E-02	1.882E-02	NOT IDENT.
ZN-65	1.468E-02	2.925E-02	4.631E-02	NOT IDENT.
GE-68	1.821E-01	3.724E-01	6.817E-01	NOT IDENT.
AS-73	-6.582E-01	5.974E-01	7.829E-01	NOT IDENT.
AS-74	-5.775E-03	6.535E-02	1.170E-01	NOT IDENT.
SE-75	4.904E-04	1.763E-02	2.798E-02	NOT IDENT.
BR-77	0.000E+00	4.100E+03	0.000E+00	SHORT HLIF
SR-82	-8.424E-02	1.760E-01	3.029E-01	NOT IDENT.
RB-83	-8.517E-03	2.555E-02	4.327E-02	NOT IDENT.
KR-85	0.000E+00	2.432E+00	4.497E+00	NOT IDENT.
SR-85	0.000E+00	1.627E-02	3.007E-02	NOT IDENT.
RB-86	2.287E-01	5.039E-01	9.211E-01	NOT IDENT.
Y-88	-5.205E-03	1.147E-02	2.001E-02	NOT IDENT.
Y-91	3.560E+00	7.114E+00	1.291E+01	NOT IDENT.
NB-94	-1.357E-04	9.944E-03	1.758E-02	NOT IDENT.
NB-95	-5.887E-03	2.537E-02	3.115E-02	NOT IDENT.
NB-95M	5.537E-02	5.313E-02	8.754E-02	NOT IDENT.
ZR-95	3.052E-02	2.596E-02	4.804E-02	NOT IDENT.
NB-97	0.000E+00	4.831E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.464E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.256E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.116E+41	0.000E+00	SHORT HLIF
RH-101	6.479E-03	1.083E-02	1.733E-02	FAIL ABUN
RH-102	-5.475E-05	1.630E-02	2.839E-02	NOT IDENT.
RU-103	-1.327E-02	2.013E-02	3.092E-02	FAIL ABUN
RH-106	-8.094E-02	1.048E-01	1.556E-01	NOT IDENT.
RU-106	-8.094E-02	1.048E-01	1.556E-01	NOT IDENT.
AG-108M	-6.550E-03	8.790E-03	1.584E-02	NOT IDENT.
AG-110M	-4.381E-03	2.224E-02	2.623E-02	FAIL ABUN
SN-113	-5.557E-03	1.565E-02	2.716E-02	NOT IDENT.
CD-115	0.000E+00	3.182E+03	0.000E+00	SHORT HLIF
SN-117M	-3.097E-02	5.578E-02	9.090E-02	NOT IDENT.
TE-123M	-7.961E-03	1.019E-02	1.743E-02	NOT IDENT.
SB-124	-4.437E-03	2.968E-02	5.350E-02	FAIL ABUN
SB-125	3.047E-02	2.749E-02	5.224E-02	FAIL ABUN
TE-125M	1.687E+00	4.314E+00	6.942E+00	NOT IDENT.
I-126	1.597E-01	2.457E-01	3.910E-01	FAIL ABUN
SB-126	-8.873E-02	1.645E-01	2.432E-01	NOT IDENT.
SB-127	-8.714E+00	1.996E+01	3.485E+01	NOT IDENT.
I-131	6.513E-02	2.714E-01	4.461E-01	NOT IDENT.
I-132	0.000E+00	9.026E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.662E+01	0.000E+00	SHORT HLIF
BA-133	1.383E-02	1.779E-02	2.307E-02	FAIL ABUN
I-133	0.000E+00	8.260E+10	0.000E+00	SHORT HLIF
CS-134	1.683E-02	1.464E-02	2.275E-02	FAIL ABUN
CS-135	0.000E+00	5.330E-02	9.086E-02	NOT IDENT.
I-135	0.000E+00	3.201E+39	0.000E+00	SHORT HLIF
CS-136	-4.791E-02	9.197E-02	1.610E-01	FAIL ABUN
CE-139	-7.141E-03	9.863E-03	1.818E-02	NOT IDENT.
BA-140	1.122E-01	2.633E-01	4.838E-01	NOT IDENT.
LA-140	3.705E-02	9.122E-02	1.484E-01	FAIL ABUN
CE-141	-6.088E-02	4.146E-02	5.540E-02	NOT IDENT.
CE-143	0.000E+00	3.269E+06	0.000E+00	SHORT HLIF
CE-144	1.725E-02	7.159E-02	1.130E-01	NOT IDENT.
PM-144	-2.021E-03	1.063E-02	1.868E-02	NOT IDENT.
PR-144	-1.594E-01	8.044E-01	1.414E+00	NOT IDENT.
PM-146	4.436E-03	1.295E-02	2.398E-02	NOT IDENT.
ND-147	-5.026E-01	6.536E-01	1.155E+00	FAIL ABUN
PM-147	1.347E+02	2.285E+02	4.114E+02	NOT IDENT.
PM-149	0.000E+00	2.950E+04	0.000E+00	SHORT HLIF
EU-150	2.261E-03	9.871E-03	1.545E-02	FAIL ABUN
EU-152	9.820E-03	3.917E-02	5.172E-02	FAIL ABUN
GD-153	3.071E-02	4.845E-02	4.947E-02	FAIL ABUN
EU-154	3.067E-02	3.709E-02	6.003E-02	NOT IDENT.
TB-160	-3.184E-02	5.303E-02	8.020E-02	FAIL ABUN
HO-166M	-3.039E-03	1.748E-02	3.073E-02	FAIL ABUN
TM-171	-2.693E-01	1.089E+01	1.467E+01	NOT IDENT.

HF-172	-3.522E-02	6.594E-02	1.022E-01	FAIL ABUN
LU-172	-1.102E-02	1.745E-02	3.023E-02	FAIL ABUN
LU-176	8.239E-04	9.135E-03	1.514E-02	FAIL ABUN
HF-181	4.091E-03	1.861E-02	3.424E-02	FAIL ABUN
TA-182	9.063E-03	5.655E-02	1.007E-01	FAIL ABUN
RE-183	2.633E-02	9.922E-02	1.668E-01	NOT IDENT.
RE-184	7.976E-02	5.612E-02	1.015E-01	FAIL ABUN
W-188	-3.531E+00	3.150E+00	4.750E+00	FAIL ABUN
IR-192	5.699E-03	1.343E-02	2.425E-02	FAIL ABUN
HG-203	8.881E-03	1.823E-02	2.927E-02	FAIL ABUN
BI-207	2.888E-03	1.390E-02	2.521E-02	FAIL ABUN
BI-211	0.000E+00	1.549E-01	2.193E-01	FAIL ABUN
PB-211	-4.787E-03	2.600E-01	3.962E-01	NOT IDENT.
RN-219	-1.157E-02	1.287E-01	2.247E-01	FAIL ABUN
RA-223	-7.821E-02	2.338E-01	3.593E-01	FAIL ABUN
AC-227	-2.462E-02	7.708E-02	1.387E-01	FAIL ABUN
TH-227	-2.462E-02	7.708E-02	1.387E-01	FAIL ABUN
TH-231	-7.821E-02	2.338E-01	3.593E-01	FAIL ABUN
PA-233	-1.185E-02	2.051E-02	3.605E-02	FAIL ABUN
PA-234	3.353E-02	8.188E-02	1.511E-01	FAIL ABUN
PA-234M	-1.668E-01	1.661E+00	2.466E+00	NOT IDENT.
NP-237	-1.185E-02	2.051E-02	3.605E-02	FAIL ABUN
NP-238	0.000E+00	1.547E+04	0.000E+00	SHORT HLIF
NP-239	2.468E-02	8.011E-02	1.438E-01	FAIL ABUN
PU-239	0.000E+00	1.667E+02	1.970E+02	FAIL ABUN
AM-241	-3.945E-02	6.039E-02	9.873E-02	NOT IDENT.
CM-243	1.012E-02	3.875E-02	5.691E-02	FAIL ABUN
BK-247	-4.418E-03	2.781E-02	4.385E-02	FAIL ABUN
CM-247	7.254E-03	1.173E-02	2.093E-02	FAIL ABUN
CF-249	9.961E-03	1.265E-02	2.274E-02	NOT IDENT.
CF-251	-3.367E-02	3.791E-02	6.929E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1698	10.66*	1.046E+00	6.074E+00	6.074E+00	5.91
MN-54	834.85	21	99.98*	1.748E+00	4.862E-03	5.282E-03	204.11
CD-109	88.03	813	3.70*	5.102E+00	1.716E+00	1.815E+00	21.82
SN-126	64.28	402	9.60	2.447E+00	6.825E-01	6.825E-01	64.85
	86.94	813	8.90	5.102E+00	7.135E-01	7.135E-01	21.82
	87.57	813	37.00*	5.102E+00	1.716E-01	1.716E-01	21.82
BA-137M	661.66	1572	89.90*	2.131E+00	3.271E-01	3.279E-01	8.70
CS-137	661.66	1572	85.10*	2.131E+00	3.456E-01	3.464E-01	8.70
EU-155	86.55	813	30.70	5.102E+00	2.069E-01	2.100E-01	21.82
	105.31	232	21.10*	5.961E+00	7.342E-02	7.452E-02	70.92
TL-208	277.37	205	6.60	4.043E+00	3.069E-01	3.069E-01	62.78
	583.19	1071	85.00*	2.355E+00	2.135E-01	2.135E-01	11.82
	860.56	193	12.50	1.704E+00	3.614E-01	3.614E-01	33.56
PB-210	46.54	84	4.25*	5.545E-01	1.417E+00	1.422E+00	203.68
BI-211	72.87	3	1.23	3.718E+00	2.404E-02	2.404E-02	6893.08
	351.06	2083	12.92*	3.411E+00	1.884E+00	1.884E+00	8.39
BI-212	727.33	339	6.67*	1.971E+00	1.028E+00	1.028E+00	24.22
	785.37	116	1.10	1.844E+00	2.275E+00	2.275E+00	64.19
	1620.50	-----	1.47	9.595E-01	-----	Line Not Found	-----
PB-212	74.82	1191	10.28	3.937E+00	1.173E+00	1.173E+00	19.11
	77.11	2148	17.10	4.188E+00	1.196E+00	1.196E+00	8.71
	238.63	4300	43.60*	4.497E+00	8.746E-01	8.746E-01	4.78
	300.09	322	3.30	3.822E+00	1.017E+00	1.017E+00	38.03
BI-214	609.32	1313	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84
	1120.29	247	14.92	1.335E+00	4.951E-01	4.952E-01	34.28
	1764.49	205	15.30	9.019E-01	5.922E-01	5.922E-01	25.59
PB-214	74.82	1191	5.80	3.937E+00	2.079E+00	2.079E+00	19.11
	77.11	2148	9.70	4.188E+00	2.109E+00	2.109E+00	8.71
	87.09	813	3.41	5.102E+00	1.862E+00	1.862E+00	21.82
	242.00	898	7.25	4.457E+00	1.108E+00	1.108E+00	22.83
	295.22	1293	18.42	3.867E+00	7.238E-01	7.238E-01	9.58
	351.93	2083	35.60*	3.411E+00	6.838E-01	6.838E-01	8.39
RN-222	609.32	1313	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84
	1120.29	247	14.92	1.335E+00	4.951E-01	4.952E-01	34.28
	1764.49	205	15.30	9.019E-01	5.922E-01	5.922E-01	25.59
RA-224	240.99	898	4.10*	4.457E+00	1.958E+00	1.958E+00	22.83
RA-226	609.32	1313	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84
	1120.29	247	14.92	1.335E+00	4.951E-01	4.952E-01	34.28
	1764.49	205	15.30	9.019E-01	5.922E-01	5.922E-01	25.59
AC-228	105.21	232	1.10	5.961E+00	1.408E+00	1.408E+00	70.92
	338.32	862	11.27	3.509E+00	8.687E-01	8.687E-01	17.95
	794.95	64	4.25	1.827E+00	3.270E-01	3.270E-01	88.75
	835.71	21	1.61	1.748E+00	3.019E-01	3.019E-01	204.11
	911.20	763	25.80*	1.618E+00	7.288E-01	7.288E-01	13.45
	968.97	455	15.80	1.529E+00	7.512E-01	7.512E-01	17.37
RA-228	105.21	232	1.10	5.961E+00	1.408E+00	1.408E+00	70.92
	338.32	862	11.27	3.509E+00	8.687E-01	8.687E-01	17.95

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	794.95	64	4.25	1.827E+00	3.270E-01	3.270E-01	88.75
	835.71	21	1.61	1.748E+00	3.019E-01	3.019E-01	204.11
	911.20	763	25.80*	1.618E+00	7.288E-01	7.288E-01	13.45
	968.97	455	15.80	1.529E+00	7.512E-01	7.512E-01	17.37
TH-228	74.82	1191	10.28	3.937E+00	1.173E+00	1.173E+00	19.11
	77.11	2148	17.10	4.188E+00	1.196E+00	1.196E+00	8.71
	238.63	4300	43.60*	4.497E+00	8.746E-01	8.746E-01	4.78
	300.09	322	3.30	3.822E+00	1.017E+00	1.017E+00	38.03
TH-229	85.43	199	14.70	4.873E+00	1.107E-01	1.107E-01	111.53
	88.47	813	24.00	5.102E+00	2.646E-01	2.646E-01	21.82
	193.51	-----	4.41*	5.172E+00	-----	Line Not Found	-----
	210.85	370	2.80	4.915E+00	1.071E+00	1.071E+00	41.62
TH-230	609.32	1313	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84
	1120.29	247	14.92	1.335E+00	4.951E-01	4.951E-01	34.28
	1764.49	205	15.30	9.019E-01	5.922E-01	5.922E-01	25.59
PA-231	283.69	-----	1.70	3.978E+00	-----	Line Not Found	-----
	301.36	322	5.35*	3.822E+00	6.275E-01	6.275E-01	38.03
TH-232	105.21	232	1.10	5.961E+00	1.408E+00	1.408E+00	70.92
	338.32	862	11.27	3.509E+00	8.687E-01	8.687E-01	17.95
	835.71	21	1.61	1.748E+00	3.019E-01	3.019E-01	204.11
	911.20	763	25.80*	1.618E+00	7.288E-01	7.288E-01	13.45
	968.97	455	15.80	1.529E+00	7.512E-01	7.512E-01	17.37
TH-234	63.29	402	3.70*	2.447E+00	1.771E+00	1.771E+00	64.85
	92.59	686	4.23	5.457E+00	1.186E+00	1.186E+00	33.86
U-234	609.32	1313	45.49*	2.276E+00	5.059E-01	5.059E-01	9.84
	1120.29	247	14.92	1.335E+00	4.951E-01	4.951E-01	34.28
	1764.49	205	15.30	9.019E-01	5.922E-01	5.922E-01	25.59
U-235	89.96	552	3.47	5.289E+00	1.200E+00	1.200E+00	31.23
	93.35	271	5.60	5.534E+00	3.483E-01	3.483E-01	102.29
	143.76	-----	10.96*	5.997E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.691E+00	-----	Line Not Found	-----
	185.72	529	57.20	5.303E+00	6.959E-02	6.959E-02	48.87
	205.31	182	5.01	4.975E+00	2.909E-01	2.909E-01	94.09
U-238	63.29	402	3.70*	2.447E+00	1.771E+00	1.771E+00	64.85
	92.59	686	4.23	5.457E+00	1.186E+00	1.186E+00	33.86
AM-243	43.53	-----	5.90	3.128E-01	-----	Line Not Found	-----
	74.66	1191	67.20*	3.937E+00	1.794E-01	1.794E-01	19.11
ANH-511	511.00	448	100.00*	2.603E+00	6.861E-02	6.861E-02	45.62

Flag: "*" = Keyline

Total number of lines in spectrum 82
Number of unidentified lines 26
Number of lines tentatively identified by NID 56 68.29%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.074E+00	6.074E+00	0.359E+00	5.91	
MN-54	312.05D	1.09	4.862E-03	5.282E-03	10.78E-03	204.11	
CD-109	461.40D	1.06	1.716E+00	1.815E+00	0.396E+00	21.82	
SN-126	2.30E+05Y	1.00	1.716E-01	1.716E-01	0.374E-01	21.82	
BA-137M	30.08Y	1.00	3.271E-01	3.279E-01	0.285E-01	8.70	
CS-137	30.08Y	1.00	3.456E-01	3.464E-01	0.301E-01	8.70	
EU-155	4.75Y	1.02	7.342E-02	7.452E-02	5.285E-02	70.92	
TL-208	1.41E+10Y	1.00	2.135E-01	2.135E-01	0.252E-01	11.82	
PB-210	22.20Y	1.00	1.417E+00	1.422E+00	2.896E+00	203.68	
BI-211	7.04E+08Y	1.00	1.884E+00	1.884E+00	0.158E+00	8.39	
BI-212	1.41E+10Y	1.00	1.028E+00	1.028E+00	0.249E+00	24.22	
PB-212	1.41E+10Y	1.00	8.746E-01	8.746E-01	0.418E-01	4.78	
BI-214	1600.00Y	1.00	5.059E-01	5.059E-01	0.498E-01	9.84	
PB-214	1600.00Y	1.00	6.838E-01	6.838E-01	0.574E-01	8.39	
RN-222	1600.00Y	1.00	5.059E-01	5.059E-01	0.498E-01	9.84	
RA-224	1.41E+10Y	1.00	1.958E+00	1.958E+00	0.447E+00	22.83	
RA-226	1600.00Y	1.00	5.059E-01	5.059E-01	0.498E-01	9.84	
AC-228	1.41E+10Y	1.00	7.288E-01	7.288E-01	0.980E-01	13.45	
RA-228	1.41E+10Y	1.00	7.288E-01	7.288E-01	0.980E-01	13.45	
TH-228	1.41E+10Y	1.00	8.746E-01	8.746E-01	0.418E-01	4.78	
TH-229	7340.00Y	1.00	2.646E-01	2.646E-01	0.577E-01	21.82	K
TH-230	7.54E+04Y	1.00	5.059E-01	5.059E-01	0.498E-01	9.84	
PA-231	7.04E+08Y	1.00	6.275E-01	6.275E-01	2.386E-01	38.03	
TH-232	1.41E+10Y	1.00	7.288E-01	7.288E-01	0.980E-01	13.45	
TH-234	4.47E+09Y	1.00	1.771E+00	1.771E+00	1.148E+00	64.85	
U-234	2.45E+05Y	1.00	5.059E-01	5.059E-01	0.498E-01	9.84	
U-235	7.04E+08Y	1.00	6.959E-02	6.959E-02	3.401E-02	48.87	K
U-238	4.47E+09Y	1.00	1.771E+00	1.771E+00	1.148E+00	64.85	
AM-243	7370.00Y	1.00	1.794E-01	1.794E-01	0.343E-01	19.11	
ANH-511	1.00E+09Y	1.00	6.861E-02	6.861E-02	3.130E-02	45.62	
Total Activity :			2.711E+01	2.722E+01			

Grand Total Activity : 2.711E+01 2.722E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	98.64	115	1743	1.91	196.86	193	8	2.08E-03	****	5.75E+00	T
0	129.30	248	1743	1.63	258.13	255	8	4.58E-03	66.7	6.14E+00	T
0	154.33	153	1312	0.89	308.17	305	7	2.87E-03	89.1	5.84E+00	T
0	198.67	68	1133	1.37	396.79	394	7	1.30E-03	****	5.09E+00	T
0	269.84	434	1163	1.28	539.04	534	12	8.62E-03	35.5	4.12E+00	T
0	328.56	124	885	1.33	656.42	649	10	2.51E-03	98.2	3.58E+00	T
0	346.97	113	439	0.77	693.22	690	7	2.29E-03	68.9	3.45E+00	T
0	356.58	72	582	1.36	712.43	709	9	1.47E-03	****	3.38E+00	T
0	368.96	52	516	1.14	737.19	736	8	1.06E-03	****	3.30E+00	
0	409.63	111	710	1.31	818.48	814	11	2.30E-03	****	3.06E+00	T
0	462.53	282	495	1.60	924.22	919	10	5.91E-03	33.4	2.80E+00	T
0	499.99	60	363	2.35	999.10	994	9	1.27E-03	****	2.65E+00	
0	502.75	25	353	1.42	1004.62	1004	8	5.38E-04	****	2.63E+00	
0	557.55	31	390	3.25	1114.17	1112	10	6.67E-04	****	2.44E+00	
0	562.40	70	231	1.91	1123.86	1121	7	1.49E-03	79.2	2.42E+00	T
0	625.79	39	209	1.27	1250.58	1245	8	8.50E-04	****	2.23E+00	
0	646.08	31	279	1.43	1291.14	1286	9	6.64E-04	****	2.17E+00	T
4	754.72	96	326	2.58	1508.34	1499	20	2.12E-03	86.3	1.91E+00	T
4	758.32	29	148	1.54	1515.54	1499	20	6.37E-04	****	1.90E+00	
0	768.38	70	293	0.88	1535.65	1532	9	1.55E-03	94.8	1.88E+00	
0	883.18	35	164	3.97	1765.15	1761	10	7.87E-04	****	1.66E+00	T
0	903.74	60	128	2.22	1806.25	1802	8	1.35E-03	71.8	1.63E+00	T
2	964.59	190	208	2.29	1927.91	1920	23	4.33E-03	41.5	1.54E+00	T
0	985.48	39	250	4.24	1969.69	1963	18	8.99E-04	****	1.51E+00	T
1	1237.88	113	129	2.25	2474.33	2465	36	2.65E-03	50.8	1.22E+00	T
1	1245.01	62	104	2.26	2488.59	2465	36	1.46E-03	80.4	1.21E+00	
1	1249.02	45	57	2.09	2496.60	2465	36	1.05E-03	74.9	1.21E+00	
0	1280.31	35	128	1.80	2559.17	2555	11	8.20E-04	****	1.18E+00	
0	1377.68	54	90	1.27	2753.86	2748	11	1.28E-03	89.3	1.10E+00	
0	1385.55	9	63	0.89	2769.60	2764	12	2.02E-04	****	1.10E+00	T
0	1408.50	55	68	2.94	2815.49	2810	12	1.32E-03	65.1	1.08E+00	T
5	1466.66	33	58	3.48	2931.78	2912	29	7.86E-04	****	1.04E+00	
0	1473.76	34	34	3.53	2945.98	2940	11	8.25E-04	73.1	1.04E+00	
0	1509.31	62	73	1.79	3017.07	3008	16	1.48E-03	65.8	1.02E+00	
0	1515.77	40	40	2.59	3029.99	3024	14	9.52E-04	75.7	1.01E+00	
0	1571.63	16	54	2.19	3141.68	3132	14	3.90E-04	****	9.83E-01	
0	1582.12	33	70	3.18	3162.65	3155	15	7.86E-04	****	9.78E-01	
0	1588.43	32	57	1.14	3175.28	3170	10	7.72E-04	92.3	9.75E-01	
0	1592.18	32	40	2.23	3182.77	3179	7	7.74E-04	72.9	9.73E-01	
0	1624.31	21	98	5.81	3247.02	3235	20	5.10E-04	****	9.58E-01	
0	1659.17	58	48	5.36	3316.74	3308	18	1.41E-03	59.9	9.42E-01	
0	1729.51	45	64	2.30	3457.39	3448	17	1.10E-03	97.0	9.14E-01	
0	1792.28	43	51	6.13	3582.93	3570	27	1.04E-03	95.7	8.92E-01	T
0	1802.23	25	23	0.77	3602.81	3597	12	6.25E-04	82.2	8.89E-01	
0	1846.99	49	37	1.42	3692.34	3687	12	1.20E-03	55.9	8.76E-01	
0	1996.19	12	33	4.71	3990.72	3978	16	3.04E-04	****	8.40E-01	
0	2043.78	11	5	1.00	4085.89	4083	7	2.85E-04	93.8	8.32E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656006.CNF;1
Acquisition date : 23-JUN-2016 12:03:15 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:03.67 Half life ratio : *****
Sample date : 17-MAY-2016 10:50:00 Nuclide Library : SOLID
Sample ID : G398656006 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5690E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	8.847E-02
MN-54	9.832E-03
CD-109	2.086E-01
SN-126	1.985E-02
BA-137M	9.296E-03
CS-137	9.821E-03
EU-155	2.849E-02
TL-208	8.905E-03
PB-210	1.568E+00
BI-212	1.171E-01
PB-212	1.488E-02
BI-214	1.723E-02
PB-214	1.875E-02
RN-222	1.723E-02
RA-224	1.594E-01
RA-226	1.723E-02
AC-228	3.358E-02
RA-228	3.358E-02
TH-228	1.488E-02
TH-229	1.422E-01
TH-230	1.723E-02
PA-231	1.239E-01
TH-232	3.358E-02
TH-234	3.889E-01
U-234	1.723E-02
U-235	5.581E-02
U-238	3.889E-01
AM-243	1.487E-02
ANH-511	6.915E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.134E-01	NOT IDENT.
NA-22	1.025E-02	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	8.046E-03	NOT IDENT.
SC-46	1.099E-02	FAIL ABUN
V-48	4.196E-02	NOT IDENT.
CR-51	1.794E-01	NOT IDENT.
CO-56	1.179E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	7.224E-03	NOT IDENT.
CO-58	1.099E-02	NOT IDENT.
FE-59	3.037E-02	NOT IDENT.
CO-60	8.925E-03	NOT IDENT.
ZN-65	2.227E-02	NOT IDENT.
GE-68	3.275E-01	NOT IDENT.
AS-73	3.850E-01	NOT IDENT.
AS-74	5.676E-02	NOT IDENT.
SE-75	1.371E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.461E-01	NOT IDENT.
RB-83	2.099E-02	NOT IDENT.
KR-85	2.200E+00	NOT IDENT.
SR-85	1.471E-02	NOT IDENT.
RB-86	4.424E-01	NOT IDENT.
Y-88	9.217E-03	NOT IDENT.
Y-91	6.193E+00	NOT IDENT.
NB-94	8.522E-03	NOT IDENT.
NB-95	1.514E-02	NOT IDENT.
NB-95M	4.303E-02	NOT IDENT.
ZR-95	2.323E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	8.527E-03	FAIL ABUN
RH-102	1.374E-02	NOT IDENT.
RU-103	1.502E-02	FAIL ABUN
RH-106	7.514E-02	NOT IDENT.
RU-106	7.514E-02	NOT IDENT.
AG-108M	7.710E-03	NOT IDENT.
AG-110M	1.262E-02	FAIL ABUN
SN-113	1.324E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.470E-02	NOT IDENT.
TE-123M	8.570E-03	NOT IDENT.
SB-124	2.488E-02	FAIL ABUN
SB-125	2.548E-02	FAIL ABUN
TE-125M	3.417E+00	NOT IDENT.
I-126	1.897E-01	FAIL ABUN
SB-126	1.174E-01	NOT IDENT.
SB-127	1.683E+01	NOT IDENT.
I-131	2.179E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.127E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.101E-02	FAIL ABUN
CS-135	4.459E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.709E-02	FAIL ABUN
CE-139	8.940E-03	NOT IDENT.
BA-140	2.351E-01	NOT IDENT.
LA-140	6.976E-02	FAIL ABUN
CE-141	2.727E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	5.558E-02	NOT IDENT.
PM-144	9.052E-03	NOT IDENT.
PR-144	6.849E-01	NOT IDENT.
PM-146	1.169E-02	NOT IDENT.
ND-147	5.598E-01	FAIL ABUN
PM-147	2.024E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	7.562E-03	FAIL ABUN
EU-152	2.526E-02	FAIL ABUN
GD-153	2.435E-02	FAIL ABUN
EU-154	2.870E-02	NOT IDENT.
TB-160	3.855E-02	FAIL ABUN
HO-166M	1.486E-02	FAIL ABUN
TM-171	7.215E+00	NOT IDENT.
HF-172	5.025E-02	FAIL ABUN

LU-172	1.446E-02	FAIL ABUN
LU-176	7.414E-03	FAIL ABUN
HF-181	1.666E-02	FAIL ABUN
TA-182	4.831E-02	FAIL ABUN
RE-183	8.201E-02	NOT IDENT.
RE-184	4.892E-02	FAIL ABUN
W-188	2.324E+00	FAIL ABUN
IR-192	1.187E-02	FAIL ABUN
HG-203	1.434E-02	FAIL ABUN
BI-207	1.208E-02	FAIL ABUN
BI-211	1.084E-01	FAIL ABUN
PB-211	1.934E-01	NOT IDENT.
RN-219	1.097E-01	FAIL ABUN
RA-223	1.758E-01	FAIL ABUN
AC-227	6.797E-02	FAIL ABUN
TH-227	6.797E-02	FAIL ABUN
TH-231	1.758E-01	FAIL ABUN
PA-233	1.764E-02	FAIL ABUN
PA-234	7.263E-02	FAIL ABUN
PA-234M	1.189E+00	NOT IDENT.
NP-237	1.764E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	7.073E-02	FAIL ABUN
PU-239	9.704E+01	FAIL ABUN
AM-241	4.855E-02	NOT IDENT.
CM-243	2.800E-02	FAIL ABUN
BK-247	2.148E-02	FAIL ABUN
CM-247	1.022E-02	FAIL ABUN
CF-249	1.111E-02	NOT IDENT.
CF-251	3.405E-02	NOT IDENT.

GEL Laboratories LLC
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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656006.CNF;1
Acquisition date : 23-JUN-2016 12:03:15 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:03.67 Half life ratio : *****
Sample date : 17-MAY-2016 10:50:00 Nuclide Library : SOLID
Sample ID : G398656006 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5690E+02 GRAM
Quantity Err(%) : 1.2747E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.074E+00	6.275E-01	6.275E-01
MN-54	5.282E-03	1.059E-02	1.059E-02
CD-109	1.110E+00	4.284E-01	4.284E-01
SN-126	1.049E-01	4.012E-02	4.012E-02
BA-137M	3.279E-01	3.983E-02	3.983E-02
CS-137	3.464E-01	4.206E-02	4.206E-02
EU-155	7.452E-02	5.226E-02	5.226E-02
TL-208	2.135E-01	3.082E-02	3.082E-02
PB-210	1.422E+00	2.843E+00	2.843E+00
BI-212	1.028E+00	2.656E-01	2.656E-01
PB-212	8.746E-01	9.320E-02	9.320E-02
BI-214	5.059E-01	6.554E-02	6.554E-02
PB-214	6.838E-01	8.411E-02	8.411E-02
RN-222	5.059E-01	6.554E-02	6.554E-02
RA-224	6.786E-01	4.933E-01	4.933E-01
RA-226	5.059E-01	6.554E-02	6.554E-02
AC-228	7.288E-01	1.415E-01	1.415E-01
RA-228	7.288E-01	1.415E-01	1.415E-01
TH-228	8.746E-01	9.320E-02	9.320E-02
TH-229	2.568E-02	1.612E-01	1.612E-01
TH-230	5.059E-01	6.554E-02	6.554E-02
PA-231	6.275E-01	2.759E-01	2.759E-01
TH-232	7.288E-01	1.415E-01	1.415E-01
TH-234	1.771E+00	1.202E+00	1.202E+00
U-234	5.059E-01	6.554E-02	6.554E-02
U-235	-4.337E-02	8.258E-02	8.258E-02
U-238	1.771E+00	1.202E+00	1.202E+00
AM-243	1.170E-01	3.743E-02	3.743E-02
ANH-511	6.861E-02	3.121E-02	3.121E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	-4.135E-02	1.289E-01	1.302E-01 NOT IDENT.

NA-22	1.102E-02	1.328E-02	1.417E-02	NOT IDENT.
NA-24	3.063E+14	9.480E+15	9.481E+15	SHORT HLIF
AL-26	5.255E-03	1.047E-02	1.073E-02	NOT IDENT.
SC-46	-9.971E-03	1.526E-02	1.591E-02	FAIL ABUN
V-48	1.402E-02	5.519E-02	5.555E-02	NOT IDENT.
CR-51	-3.252E-02	2.067E-01	2.072E-01	NOT IDENT.
CO-56	1.165E-02	1.352E-02	1.450E-02	FAIL ABUN
MN-56	1.000E+41	1.141E+41	0.000E+00	SHORT HLIF
CO-57	7.195E-03	8.124E-03	8.748E-03	NOT IDENT.
CO-58	-1.312E-02	1.375E-02	1.496E-02	NOT IDENT.
FE-59	2.917E-02	3.447E-02	3.690E-02	NOT IDENT.
CO-60	-4.741E-03	1.096E-02	1.116E-02	NOT IDENT.
ZN-65	1.468E-02	2.939E-02	3.013E-02	NOT IDENT.
GE-68	1.821E-01	3.739E-01	3.828E-01	NOT IDENT.
AS-73	-6.582E-01	6.162E-01	6.839E-01	NOT IDENT.
AS-74	-5.775E-03	6.535E-02	6.540E-02	NOT IDENT.
SE-75	4.904E-04	1.763E-02	1.763E-02	NOT IDENT.
BR-77	8.746E+04	9.459E+04	1.025E+05	SHORT HLIF
SR-82	-8.424E-02	1.762E-01	1.803E-01	NOT IDENT.
RB-83	-8.517E-03	2.558E-02	2.587E-02	NOT IDENT.
KR-85	1.057E+01	2.590E+00	5.424E+00	NOT IDENT.
SR-85	7.050E-02	1.732E-02	3.619E-02	NOT IDENT.
RB-86	2.287E-01	5.057E-01	5.161E-01	NOT IDENT.
Y-88	-5.205E-03	1.148E-02	1.172E-02	NOT IDENT.
Y-91	3.560E+00	7.122E+00	7.301E+00	NOT IDENT.
NB-94	-1.357E-04	9.944E-03	9.945E-03	NOT IDENT.
NB-95	-5.887E-03	2.538E-02	2.552E-02	NOT IDENT.
NB-95M	5.537E-02	5.349E-02	5.902E-02	NOT IDENT.
ZR-95	3.052E-02	2.616E-02	2.956E-02	NOT IDENT.
NB-97	1.000E+41	4.908E+40	0.000E+00	SHORT HLIF
ZR-97	7.117E+15	2.536E+15	4.089E+15	SHORT HLIF
MO-99	-2.742E+01	9.256E+02	9.257E+02	SHORT HLIF
TC-99M	-1.000E+41	1.122E+41	0.000E+00	SHORT HLIF
RH-101	6.479E-03	1.090E-02	1.128E-02	FAIL ABUN
RH-102	-5.475E-05	1.630E-02	1.630E-02	NOT IDENT.
RU-103	-1.327E-02	2.016E-02	2.103E-02	FAIL ABUN
RH-106	-8.094E-02	1.051E-01	1.113E-01	NOT IDENT.
RU-106	-8.094E-02	1.051E-01	1.113E-01	NOT IDENT.
AG-108M	-6.550E-03	8.806E-03	9.288E-03	NOT IDENT.
AG-110M	-4.381E-03	2.225E-02	2.234E-02	FAIL ABUN
SN-113	-5.557E-03	1.565E-02	1.585E-02	NOT IDENT.
CD-115	-2.252E+03	3.189E+03	3.347E+03	SHORT HLIF
SN-117M	-3.097E-02	5.582E-02	5.754E-02	NOT IDENT.
TE-123M	-7.961E-03	1.021E-02	1.082E-02	NOT IDENT.
SB-124	-4.437E-03	2.968E-02	2.975E-02	FAIL ABUN
SB-125	3.047E-02	2.760E-02	3.083E-02	FAIL ABUN
TE-125M	1.687E+00	4.316E+00	4.382E+00	NOT IDENT.
I-126	1.597E-01	2.461E-01	2.565E-01	FAIL ABUN
SB-126	-8.873E-02	1.649E-01	1.697E-01	NOT IDENT.
SB-127	-8.714E+00	2.003E+01	2.041E+01	NOT IDENT.
I-131	6.513E-02	2.715E-01	2.731E-01	NOT IDENT.
I-132	1.000E+41	2.464E+41	0.000E+00	SHORT HLIF
TE-132	-1.509E+01	2.668E+01	2.754E+01	SHORT HLIF
BA-133	1.383E-02	1.783E-02	1.889E-02	FAIL ABUN
I-133	-4.869E+10	8.346E+10	8.630E+10	SHORT HLIF
CS-134	1.683E-02	1.476E-02	1.659E-02	FAIL ABUN
CS-135	1.234E-01	5.513E-02	7.831E-02	NOT IDENT.
I-135	1.270E+39	3.377E+39	0.000E+00	SHORT HLIF
CS-136	-4.791E-02	9.243E-02	9.492E-02	FAIL ABUN
CE-139	-7.141E-03	9.974E-03	1.048E-02	NOT IDENT.
BA-140	1.122E-01	2.634E-01	2.682E-01	NOT IDENT.
LA-140	3.705E-02	9.127E-02	9.278E-02	FAIL ABUN
CE-141	-6.088E-02	4.170E-02	4.992E-02	NOT IDENT.
CE-143	2.248E+07	4.061E+06	1.092E+07	SHORT HLIF
CE-144	1.725E-02	7.161E-02	7.203E-02	NOT IDENT.
PM-144	-2.021E-03	1.063E-02	1.067E-02	NOT IDENT.
PR-144	-1.594E-01	8.045E-01	8.077E-01	NOT IDENT.
PM-146	4.436E-03	1.296E-02	1.311E-02	NOT IDENT.
ND-147	-5.026E-01	6.550E-01	6.931E-01	FAIL ABUN
PM-147	1.347E+02	2.287E+02	2.366E+02	NOT IDENT.
PM-149	1.211E+04	2.957E+04	3.007E+04	SHORT HLIF
EU-150	2.261E-03	9.873E-03	9.925E-03	FAIL ABUN
EU-152	9.820E-03	3.918E-02	3.943E-02	FAIL ABUN
GD-153	3.071E-02	4.852E-02	5.045E-02	FAIL ABUN
EU-154	3.067E-02	3.719E-02	3.967E-02	NOT IDENT.
TB-160	-3.184E-02	5.321E-02	5.511E-02	FAIL ABUN
HO-166M	-3.039E-03	1.749E-02	1.754E-02	FAIL ABUN
TM-171	-2.693E-01	1.089E+01	1.089E+01	NOT IDENT.

HF-172	-3.522E-02	6.623E-02	6.811E-02	FAIL	ABUN
LU-172	-1.102E-02	1.760E-02	1.829E-02	FAIL	ABUN
LU-176	8.239E-04	9.135E-03	9.143E-03	FAIL	ABUN
HF-181	4.091E-03	1.861E-02	1.870E-02	FAIL	ABUN
TA-182	9.063E-03	5.655E-02	5.670E-02	FAIL	ABUN
RE-183	2.633E-02	9.929E-02	1.000E-01	NOT	IDENT.
RE-184	7.976E-02	5.743E-02	6.776E-02	FAIL	ABUN
W-188	-3.531E+00	3.193E+00	3.568E+00	FAIL	ABUN
IR-192	5.699E-03	1.345E-02	1.369E-02	FAIL	ABUN
HG-203	8.881E-03	1.825E-02	1.869E-02	FAIL	ABUN
BI-207	2.888E-03	1.391E-02	1.397E-02	FAIL	ABUN
BI-211	1.884E+00	2.338E-01	8.810E-01	FAIL	ABUN
PB-211	-4.787E-03	2.600E-01	2.601E-01	NOT	IDENT.
RN-219	-1.157E-02	1.287E-01	1.289E-01	FAIL	ABUN
RA-223	-7.821E-02	2.340E-01	2.366E-01	FAIL	ABUN
AC-227	-2.462E-02	7.718E-02	7.797E-02	FAIL	ABUN
TH-227	-2.462E-02	7.718E-02	7.797E-02	FAIL	ABUN
TH-231	-7.821E-02	2.340E-01	2.366E-01	FAIL	ABUN
PA-233	-1.185E-02	2.054E-02	2.123E-02	FAIL	ABUN
PA-234	3.353E-02	9.055E-02	9.180E-02	FAIL	ABUN
PA-234M	-1.668E-01	1.662E+00	1.663E+00	NOT	IDENT.
NP-237	-1.185E-02	2.054E-02	2.123E-02	FAIL	ABUN
NP-238	8.198E+03	1.553E+04	1.596E+04	SHORT	HLIF
NP-239	2.468E-02	8.015E-02	8.092E-02	FAIL	ABUN
PU-239	2.549E+02	1.679E+02	2.034E+02	FAIL	ABUN
AM-241	-3.945E-02	6.059E-02	6.314E-02	NOT	IDENT.
CM-243	1.012E-02	3.877E-02	3.904E-02	FAIL	ABUN
BK-247	-4.418E-03	2.782E-02	2.789E-02	FAIL	ABUN
CM-247	7.254E-03	1.180E-02	1.225E-02	FAIL	ABUN
CF-249	9.961E-03	1.269E-02	1.346E-02	NOT	IDENT.
CF-251	-3.367E-02	3.814E-02	4.105E-02	NOT	IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1183.7719	87.09	1391.0066	136.47	1153.8152
45.60	1162.5931	87.57	1392.2344	140.51	0.0000
46.54	1112.1711	88.03	1393.4033	143.76	1209.4427
49.72	0.0000	88.34	1394.1936	144.24	1184.4723
51.35	1108.4998	88.47	1394.5266	145.44	1252.9844
51.87	1077.1571	89.96	1398.2949	152.43	1176.3877
52.39	1023.4989	1093.63	1400.0060	153.25	1177.5989
52.97	1102.5438	91.11	1401.1815	323.87	1177.2130
53.44	1114.9443	92.59	1404.8713	156.02	1079.3573
54.07	1148.0139	93.35	1406.7522	158.56	1179.6041
57.36	0.0000	94.56	1409.7368	159.00	1206.5173
57.53	1075.3359	94.65	1409.9589	162.33	1126.3889
57.98	1088.7290	94.67	1410.0111	162.66	1126.8434
59.27	1154.9645	94.87	1410.5009	163.33	1120.4823
59.32	1155.0995	97.43	1092.3445	165.86	1203.1687
59.54	1191.0000	98.43	1203.6284	176.31	1068.4236
60.96	1144.1456	98.44	1203.6450	176.60	1087.2360
61.17	1081.5359	99.53	1126.1394	177.52	1126.2581
62.93	1213.7917	100.11	1086.2255	181.07	0.0000
63.29	1214.7841	102.03	1097.4933	181.52	1057.2748
63.58	1215.5802	103.18	1147.4813	184.41	1078.1772
64.28	1337.4902	103.37	1147.8428	143.76	1079.7322
66.73	1390.0122	105.21	1178.1215	193.51	1059.5924
67.24	1393.1239	105.31	1237.5656	197.03	1087.2773
125.81	1439.7933	106.12	1255.9783	198.01	1114.1007
67.75	1440.0111	106.47	1239.8853	201.83	1013.0649
69.67	1411.4366	109.28	1213.3948	203.43	1069.2178
70.83	1377.1277	111.00	1251.0940	205.31	1032.6920
72.81	1486.8246	111.76	0.0000	210.85	929.7578
72.87	1487.0112	114.06	1145.9625	215.65	961.9141
74.66	1492.4806	116.30	0.0000	222.11	946.7137
74.82	1492.9688	116.74	1155.2100	227.09	907.4811
74.97	1493.4209	119.76	1151.3086	227.38	931.0803
77.11	1499.8666	121.12	1161.6481	228.16	0.0000
78.74	1504.7186	121.22	1136.6162	228.18	964.8928
79.69	1422.9125	121.78	1111.1750	116.74	964.8928
80.12	1472.2164	122.06	1111.6334	235.69	974.2620
80.19	1472.4196	122.92	1125.6705	235.96	974.5045
80.57	1473.5051	123.07	1125.9174	238.63	878.9809
81.00	1474.7308	265.00	1148.7677	238.98	0.0000
81.07	1474.9340	125.81	1192.1090	240.99	880.8839
81.75	1476.8600	127.23	1152.9205	242.00	881.6955
83.79	1382.4774	127.91	1154.0417	244.70	787.7604
84.00	1383.0260	129.30	1214.8523	252.40	799.3609
85.43	1386.7355	131.20	1189.0460	252.80	800.6385
86.55	1389.6221	133.02	1223.5260	254.15	0.0000
86.79	1390.2294	133.52	1159.6531	256.23	816.0370
86.94	1390.6212	136.00	1129.3849	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	766.2542	355.39	0.0000	584.27	296.0472
264.80	766.3414	356.01	539.3372	595.83	360.1434
265.00	766.4808	364.49	571.3887	427.87	367.8586
268.22	702.3721	366.42	0.0000	602.52	0.0000
269.46	741.2042	372.51	485.1629	604.72	384.7401
270.03	741.5624	375.05	562.9025	607.14	383.5137
271.23	755.4167	377.52	564.6899	609.32	345.5021
273.65	746.1299	356.01	575.8195	610.33	339.3728
276.40	758.6638	388.16	523.4234	614.28	335.0063
277.37	706.5943	388.63	510.3555	618.01	283.5139
277.60	667.2009	391.69	522.4031	620.36	347.5679
278.00	667.4211	264.66	556.4772	621.93	306.2025
279.20	718.5953	401.81	541.3134	630.19	0.0000
279.54	744.8788	402.40	511.4917	631.29	304.1406
279.70	744.9680	404.85	541.6781	633.25	297.0479
280.46	732.3875	410.95	466.8179	634.78	312.3136
283.69	733.9078	413.71	535.6962	635.95	327.5440
284.31	731.2014	414.70	525.2612	636.99	290.5028
285.41	748.2332	423.72	505.6122	645.85	274.4770
285.90	0.0000	427.09	466.8967	657.76	299.2205
287.50	686.9504	427.87	447.2402	657.90	0.0000
290.67	759.8298	433.94	490.5652	661.66	344.4293
293.27	0.0000	439.40	443.9299	664.57	0.0000
351.93	664.3608	453.88	465.0945	666.33	312.1995
295.96	664.7441	463.37	507.2595	666.50	312.2220
879.38	666.1100	468.07	483.4992	667.71	0.0000
299.98	666.8372	473.00	436.7386	677.62	280.2747
300.09	666.8961	475.06	463.2318	685.70	284.2970
300.13	666.9158	476.78	463.6704	695.00	332.7862
301.36	667.5545	477.60	444.3556	696.49	330.9294
302.85	682.4346	482.18	408.1976	696.51	330.9294
256.23	709.9084	487.02	426.0917	697.00	328.9376
304.85	675.1732	492.35	0.0000	697.30	330.0078
306.78	706.4301	497.08	421.1936	697.49	328.9999
308.46	699.3508	505.52	386.9075	702.65	326.5925
311.90	710.5780	507.63	0.0000	706.68	308.4984
316.51	648.0344	511.00	348.5903	711.68	293.5641
319.41	658.8973	514.00	353.8737	720.70	291.5049
320.08	694.9698	514.00	353.8737	721.93	0.0000
321.04	691.6062	520.40	366.1448	722.78	267.4321
323.87	705.1505	520.69	0.0000	722.91	267.4509
325.23	685.5908	522.65	0.0000	723.31	267.4885
328.76	744.9170	527.90	0.0000	724.19	260.6323
333.37	664.5997	528.26	368.5753	727.33	259.9181
333.97	672.9583	529.59	356.3990	733.00	238.8804
334.37	727.5477	529.87	0.0000	735.93	284.8895
338.28	612.6046	531.02	373.8651	333.97	278.7740
338.32	612.6221	537.26	363.5384	739.50	0.0000
311.90	599.2622	546.56	0.0000	747.24	298.0742
340.48	599.2622	552.55	357.6064	748.06	275.3697
340.55	599.2965	563.25	327.0993	752.31	209.0635
344.28	542.0984	569.33	370.2773	753.82	230.9819
345.93	512.4463	946.00	370.3145	756.73	231.2385
351.06	546.1062	569.70	363.5293	756.80	231.2439
351.93	546.4318	583.19	344.2902	884.68	324.7028

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	303.7435	1274.44	255.3425	1620.50	60.3237
766.42	312.6453	1001.03	166.4774	1621.92	90.9909
766.84	328.5955	1002.74	176.1387	1678.03	0.0000
772.60	0.0000	1004.73	242.3348	1690.97	62.1652
776.52	262.7752	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	54.1982
778.90	256.8877	1028.54	0.0000	1063.66	48.3403
783.70	247.1300	1037.84	192.5302	1771.35	50.0774
785.37	247.2827	1038.76	0.0000	1791.20	0.0000
792.07	246.1157	631.29	194.0023	1808.65	46.9550
794.95	239.6845	1048.07	188.2690	1810.72	0.0000
795.86	256.1081	1049.04	181.5215	1836.06	54.9386
810.06	242.3639	1050.41	171.8865		
810.29	252.0756	1063.66	170.6065		
344.28	252.0927	1077.00	179.1056		
810.76	245.6566	1077.34	179.1205		
815.77	210.4819	1085.87	166.8042		
1048.07	209.6109	1093.63	183.8955		
832.01	237.0484	1099.45	159.5742		
834.85	277.1382	1112.07	171.1632		
835.71	257.6565	1112.84	135.6027		
836.80	0.0000	1115.54	184.9031		
846.75	0.0000	1120.29	189.2513		
846.77	198.6359	1120.55	189.2669		
856.80	211.7463	1221.41	166.5098		
860.56	211.6592	1129.67	184.2396		
871.09	229.3091	1131.51	0.0000		
873.19	189.0848	1147.95	0.0000		
875.33	0.0000	1173.23	163.8821		
879.38	231.7998	1177.95	178.1812		
880.51	206.6476	1189.05	158.5204		
883.24	204.4711	1204.77	169.3240		
884.68	192.7227	1221.41	179.2298		
889.28	227.8326	1231.02	166.2632		
894.76	202.4966	1235.36	152.4321		
898.04	249.1346	1238.28	144.2186		
900.72	201.7108	1260.41	0.0000		
903.28	224.1385	1271.87	138.2420		
911.20	218.1762	1274.44	125.6466		
912.08	235.9524	1274.54	125.6516		
923.98	0.0000	1291.59	156.5544		
926.50	197.1643	1298.22	0.0000		
929.11	253.4450	1312.11	139.6379		
937.49	230.6951	1332.49	126.7211		
944.13	218.0334	1362.66	0.0000		
946.00	190.8907	1365.19	90.7801		
949.00	189.1940	1368.63	0.0000		
667.71	0.0000	1384.29	67.8620		
962.31	171.7694	1408.01	98.0981		
964.08	186.3228	1457.56	0.0000		
966.17	186.4470	1460.82	111.0059		
911.20	186.6113	1489.16	81.9230		
968.97	186.6113	1505.03	86.6490		
983.53	164.7626	1584.12	53.2148		
984.45	0.0000	1596.21	71.6885		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 01:05:19.69

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656007.CNF:1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF:501
Background date : 20-JUN-2016 14:03:14
Sample date     : 17-MAY-2016 10:55:00 Acquisition date : 23-JUN-2016 13:04:57
Sample ID      : G398656007 Sample quantity : 1.79870E+02 GRAM
Detector name   : GAM11 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.36 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572234 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.47*	54	959	0.66	92.81	90	7	1.25E-03	116.9	
2	0	63.22*	315	1540	1.08	126.35	122	9	7.29E-03	25.5	
3	0	66.65*	31	1080	0.85	133.22	131	6	7.16E-04	191.8	
4	0	69.61	98	1462	1.45	139.13	137	7	2.27E-03	65.3	
5	3	72.85	88	1070	1.10	145.62	143	16	2.03E-03	56.8	2.84E+00
6	3	74.90	1136	1264	1.01	149.71	143	16	2.63E-02	5.8	
7	3	77.14*	1582	1034	0.90	154.20	143	16	3.66E-02	4.3	
8	3	84.26*	226	1216	1.15	168.45	165	27	5.23E-03	33.6	3.70E+00
9	3	87.32	676	1361	1.25	174.57	165	27	1.56E-02	10.2	
10	3	89.94	448	1003	0.97	179.83	165	27	1.04E-02	12.2	
11	3	92.77*	548	1303	1.26	185.49	165	27	1.27E-02	15.9	
12	0	105.14	157	1263	0.73	210.25	206	9	3.62E-03	41.7	
13	0	109.06	88	1049	1.28	218.09	215	7	2.05E-03	61.5	
14	0	129.00	178	1330	0.97	257.99	254	9	4.12E-03	37.6	
15	0	143.91*	60	978	0.98	287.83	285	7	1.39E-03	99.7	
16	0	153.85*	95	1079	1.47	307.72	304	8	2.21E-03	68.0	
17	0	162.95	117	905	1.82	325.93	323	7	2.71E-03	43.7	
18	0	185.82*	359	1231	1.00	371.71	367	9	8.30E-03	22.0	
19	0	198.11*	26	947	0.98	396.32	392	8	6.09E-04	243.4	
20	0	209.29	314	1146	1.08	418.67	414	10	7.27E-03	20.9	
21	5	238.68*	3104	539	1.01	477.51	470	20	7.19E-02	2.4	1.50E+00
22	5	241.63	765	773	1.63	483.41	470	20	1.77E-02	8.4	
23	0	270.16	271	901	1.43	540.49	535	12	6.27E-03	23.0	
24	0	277.87*	92	776	1.22	555.93	550	10	2.12E-03	62.7	
25	5	295.26	970	467	1.14	590.74	584	23	2.24E-02	4.9	2.11E+00
26	5	300.09	256	524	1.39	600.39	584	23	5.93E-03	16.6	
27	5	302.11	34	261	0.73	604.43	584	23	7.76E-04	71.5	
28	0	328.27	202	539	1.24	656.79	653	9	4.68E-03	21.9	
29	0	338.42*	550	599	1.11	677.09	673	9	1.27E-02	10.6	
30	0	351.98*	1577	698	1.24	704.23	698	13	3.65E-02	4.6	
31	0	372.09	27	377	1.62	744.47	743	8	6.25E-04	125.5	
32	0	409.53	93	518	1.02	819.40	814	11	2.16E-03	48.7	
33	0	423.21	32	338	1.08	846.78	845	8	7.45E-04	100.3	
34	0	462.71	162	449	1.22	925.81	920	11	3.74E-03	26.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	511.02*	329	572	2.03	1022.49	1014	18	7.60E-03	24.8	
36	0	583.34*	915	369	1.35	1167.19	1160	14	2.12E-02	6.5	
37	0	609.42*	1127	298	1.29	1219.37	1214	10	2.61E-02	4.8	
38	0	661.80*	26	357	1.61	1324.18	1315	14	6.13E-04	178.5	
39	0	671.40	76	218	3.19	1343.39	1338	11	1.75E-03	39.7	
40	0	727.36	233	219	1.24	1455.34	1451	10	5.40E-03	13.6	
41	1	768.51	113	250	1.77	1537.68	1531	19	2.61E-03	28.7	2.60E+00
42	1	772.51	48	206	1.77	1545.68	1531	19	1.10E-03	54.3	
43	1	782.08	52	185	1.78	1564.83	1559	20	1.20E-03	50.8	3.19E+00
44	1	785.83	85	180	1.78	1572.32	1559	20	1.96E-03	33.1	
45	2	792.48	44	62	1.45	1585.62	1583	16	1.02E-03	29.6	2.07E+00
46	2	795.14	190	126	1.97	1590.94	1583	16	4.40E-03	14.4	
47	0	860.93	118	232	1.17	1722.58	1716	14	2.74E-03	28.8	
48	0	882.47	48	156	1.67	1765.65	1759	12	1.11E-03	54.2	
49	0	911.36*	711	165	1.68	1823.45	1817	13	1.65E-02	6.1	
50	1	964.49	167	143	1.90	1929.74	1921	27	3.86E-03	16.1	2.51E+00
51	1	969.05*	444	141	1.65	1938.87	1921	27	1.03E-02	7.9	
52	0	1000.72	115	150	3.10	2002.23	1996	14	2.66E-03	24.5	
53	0	1048.07	36	66	1.17	2096.94	2094	6	8.22E-04	40.6	
54	0	1120.10	335	265	1.96	2241.02	2231	20	7.76E-03	13.1	
55	0	1141.57	42	83	2.56	2283.97	2280	8	9.73E-04	40.7	
56	0	1152.90	84	276	6.78	2306.64	2295	23	1.96E-03	52.2	
57	0	1238.29	141	179	2.03	2477.43	2471	14	3.26E-03	21.8	
58	0	1287.93	31	180	7.71	2576.72	2565	19	7.18E-04	106.5	
59	1	1332.38	51	58	2.12	2665.61	2660	21	1.18E-03	32.1	4.30E+00
60	1	1338.37	37	41	2.12	2677.61	2660	21	8.51E-04	29.7	
61	0	1378.00	58	95	1.60	2756.86	2752	11	1.34E-03	35.3	
62	0	1407.96	41	82	2.46	2816.78	2811	12	9.57E-04	46.3	
63	0	1438.11*	2	88	3.02	2877.09	2867	14	4.65E-05	*****	
64	0	1461.05*	2353	118	1.83	2922.96	2914	16	5.45E-02	2.4	
65	0	1509.34	38	62	2.17	3019.55	3015	10	8.86E-04	41.3	
66	0	1534.28	25	58	4.69	3069.41	3062	13	5.80E-04	65.9	
67	3	1588.75	57	76	2.73	3178.36	3170	23	1.33E-03	35.7	6.53E-01
68	3	1593.58	36	30	2.24	3188.00	3170	23	8.31E-04	39.8	
69	0	1603.25	25	50	4.80	3207.35	3199	14	5.81E-04	64.1	
70	1	1620.79	51	60	2.27	3242.41	3233	23	1.19E-03	34.8	2.79E+00
71	1	1623.58	30	50	2.06	3248.00	3233	23	6.95E-04	52.3	
72	0	1730.80	41	75	2.88	3462.40	3454	15	9.60E-04	48.0	
73	0	1764.77*	202	68	1.99	3530.33	3522	16	4.68E-03	13.9	
74	0	1798.78	40	48	8.09	3598.35	3584	25	9.33E-04	49.7	
75	0	1839.81*	4	21	3.38	3680.37	3674	11	1.00E-04	338.3	
76	0	1847.69	56	29	1.63	3696.13	3689	13	1.31E-03	23.8	
77	0	1951.87	14	36	5.22	3904.44	3892	15	3.26E-04	97.9	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656007.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:55:00 Acquisition date : 23-JUN-2016 13:04:57
Sample ID        : G398656007 Sample quantity  : 179.87 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA11 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.36 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.256E+00	6.006E+00	6.006E+00	4.81	OK
CD-109	88.03	3.70*	6.504E+00	9.320E-01	9.858E-01	30.84	OK
TE-125M	109.28	0.27*	7.223E+00	2.199E+00	3.452E+00	122.93	OK
SN-126	64.28	9.60	3.901E+00	4.328E-01	4.328E-01	51.02	OK
	86.94	8.90	6.504E+00	3.875E-01	3.875E-01	30.84	OK
	87.57	37.00*	6.504E+00	9.320E-02	9.320E-02	30.84	OK
BA-137M	661.66	89.90*	2.461E+00	4.614E-03	4.625E-03	357.10	OK
CS-137	661.66	85.10*	2.461E+00	4.874E-03	4.886E-03	357.10	OK
EU-155	86.55	30.70	6.504E+00	1.123E-01	1.140E-01	30.84	OK
	105.31	21.10*	7.170E+00	5.036E-02	5.112E-02	83.50	OK
TL-208	277.37	6.60	4.695E+00	1.280E-01	1.280E-01	125.32	OK
	583.19	85.00*	2.717E+00	1.555E-01	1.555E-01	12.92	OK
	860.56	12.50	1.984E+00	1.769E-01	1.769E-01	57.56	OK
PB-210	46.54	4.25*	1.277E+00	5.287E-01	5.303E-01	233.87	OK
BI-212	727.33	6.67*	2.281E+00	5.828E-01	5.828E-01	27.14	OK
	785.37	1.10	2.141E+00	1.353E+00	1.353E+00	66.22	OK
	1620.50	1.47	1.155E+00	1.018E+00	1.018E+00	69.57	OK
PB-212	74.82	10.28	5.444E+00	7.416E-01	7.416E-01	16.36	OK
	77.11	17.10	5.679E+00	8.209E-01	8.209E-01	8.62	OK
	238.63	43.60*	5.225E+00	6.018E-01	6.018E-01	4.90	OK
	300.09	3.30	4.443E+00	7.495E-01	7.495E-01	33.29	OK
BI-214	609.32	45.49*	2.626E+00	3.679E-01	3.680E-01	9.52	OK
	1120.29	14.92	1.580E+00	5.067E-01	5.067E-01	26.18	OK
	1764.49	15.30	1.084E+00	4.044E-01	4.044E-01	27.79	OK
PB-214	74.82	5.80	5.435E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.679E+00	1.447E+00	1.447E+00	8.62	OK
	87.09	3.41	6.489E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.176E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.495E+00	5.035E-01	5.035E-01	9.77	OK
	351.93	35.60*	3.958E+00	4.703E-01	4.704E-01	9.21	OK
RN-222	609.32	45.49*	2.626E+00	3.679E-01	3.680E-01	9.52	OK
	1120.29	14.92	1.580E+00	5.067E-01	5.067E-01	26.18	OK
	1764.49	15.30	1.084E+00	4.044E-01	4.044E-01	27.79	OK
RA-224	240.99	4.10*	5.181E+00	6.976E-01	6.976E-01	40.04	OK
RA-226	609.32	45.49*	2.626E+00	3.679E-01	3.680E-01	9.52	OK
	1120.29	14.92	1.580E+00	5.067E-01	5.067E-01	26.18	OK
	1764.49	15.30	1.084E+00	4.044E-01	4.044E-01	27.79	OK
AC-228	105.21	1.10	7.170E+00	9.660E-01	9.660E-01	83.50	OK
	338.32	11.27	4.073E+00	5.057E-01	5.057E-01	21.19	OK
	794.95	4.25	2.120E+00	7.910E-01	7.910E-01	28.74	OK
	835.71	1.61	2.034E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.890E+00	5.361E-01	5.361E-01	12.13	OK
	968.97	15.80	1.793E+00	5.710E-01	5.710E-01	15.71	OK
RA-228	105.21	1.10	7.170E+00	9.660E-01	9.660E-01	83.50	OK
	338.32	11.27	4.073E+00	5.057E-01	5.057E-01	21.19	OK
	794.95	4.25	2.120E+00	7.910E-01	7.910E-01	28.74	OK
	835.71	1.61	2.034E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.890E+00	5.361E-01	5.361E-01	12.13	OK
	968.97	15.80	1.793E+00	5.710E-01	5.710E-01	15.71	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	5.444E+00	7.416E-01	7.416E-01	16.36	OK
	77.11	17.10	5.679E+00	8.209E-01	8.209E-01	8.62	OK
	238.63	43.60*	5.225E+00	6.018E-01	6.018E-01	4.90	OK
	300.09	3.30	4.443E+00	7.495E-01	7.495E-01	33.29	OK
TH-229	85.43	14.70	6.296E+00	1.218E-01	1.218E-01	67.15	OK
	88.47	24.00	6.504E+00	1.437E-01	1.437E-01	30.84	OK
	193.51	4.41*	5.998E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.680E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.626E+00	3.679E-01	3.679E-01	9.52	OK
	1120.29	14.92	1.580E+00	5.067E-01	5.067E-01	26.18	OK
	1764.49	15.30	1.084E+00	4.044E-01	4.044E-01	27.79	OK
	283.69	1.70	4.626E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	4.422E+00	6.073E-02	6.073E-02	143.09	OK
	105.21	1.10	7.170E+00	9.660E-01	9.660E-01	83.50	OK
	338.32	11.27	4.073E+00	5.057E-01	5.057E-01	21.19	OK
	835.71	1.61	2.034E+00	----- Line	Not Found	-----	Absent
TH-234	911.20	25.80*	1.890E+00	5.361E-01	5.361E-01	12.13	OK
	968.97	15.80	1.793E+00	5.710E-01	5.710E-01	15.71	OK
	63.29	3.70*	3.901E+00	1.123E+00	1.123E+00	51.02	OK
	92.59	4.23	6.798E+00	9.400E-01	9.400E-01	31.82	OK
U-234	609.32	45.49*	2.626E+00	3.679E-01	3.679E-01	9.52	OK
	1120.29	14.92	1.580E+00	5.067E-01	5.067E-01	26.18	OK
	1764.49	15.30	1.084E+00	4.044E-01	4.044E-01	27.79	OK
	89.96	3.47	6.657E+00	9.608E-01	9.608E-01	24.32	OK
U-235	93.35	5.60	6.798E+00	7.101E-01	7.101E-01	31.82	OK
	143.76	10.96*	6.966E+00	3.685E-02	3.685E-02	199.35	OK
	163.33	5.08	6.604E+00	1.612E-01	1.612E-01	87.48	OK
	185.72	57.20	6.147E+00	4.646E-02	4.646E-02	43.94	OK
U-238	205.31	5.01	5.779E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.901E+00	1.123E+00	1.123E+00	51.02	OK
	92.59	4.23	6.798E+00	9.400E-01	9.400E-01	31.82	OK
	43.53	5.90	9.036E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	5.444E+00	1.135E-01	1.135E-01	16.36	OK
	511.00	100.00*	3.005E+00	4.369E-02	4.369E-02	49.55	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656007.CNF;1
* Acquisition date   : 23-JUN-2016 13:04:57 Sensitivity      : 3.000
* Detector ID        : GAM11 Energy tolerance: 1.500
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 12:00:05.36 Half life ratio : *****
* Sample date        : 17-MAY-2016 10:55:00 Analyst initials: MXR1
* Sample ID          : G398656007 Sample Quantity : 1.7987E+02 GRAM
* Batch Number       : 1572234 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 16-JUL-2015 08:37:24 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.006E+00	2.830E-01	1.153E-01
CD-109	9.858E-01	2.979E-01	2.541E-01
TE-125M	3.452E+00	4.158E+00	4.506E+00
SN-126	9.320E-02	2.817E-02	2.412E-02
BA-137M	4.625E-03	1.619E-02	1.313E-02
CS-137	4.886E-03	1.710E-02	1.387E-02
EU-155	5.112E-02	4.183E-02	3.620E-02
TL-208	1.555E-01	1.970E-02	1.229E-02
PB-210	5.303E-01	1.216E+00	9.391E-01
BI-212	5.828E-01	1.550E-01	1.710E-01
PB-212	6.018E-01	2.889E-02	2.018E-02
BI-214	3.680E-01	3.434E-02	2.410E-02
PB-214	4.704E-01	4.244E-02	2.522E-02
RN-222	3.680E-01	3.434E-02	2.410E-02
RA-224	6.976E-01	2.737E-01	2.162E-01
RA-226	3.680E-01	3.434E-02	2.410E-02
AC-228	5.361E-01	6.371E-02	4.635E-02
RA-228	5.361E-01	6.371E-02	4.635E-02
TH-228	6.018E-01	2.889E-02	2.018E-02
TH-229	-6.527E-02	1.209E-01	1.926E-01
TH-230	3.679E-01	3.434E-02	2.409E-02
PA-231	6.073E-02	8.516E-02	1.736E-01
TH-232	5.361E-01	6.371E-02	4.635E-02
TH-234	1.123E+00	5.615E-01	3.970E-01
U-234	3.679E-01	3.434E-02	2.409E-02
U-235	3.685E-02	7.200E-02	7.174E-02
U-238	1.123E+00	5.615E-01	3.970E-01
AM-243	1.135E-01	1.819E-02	1.680E-02
ANH-511	4.369E-02	2.122E-02	9.731E-03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-6.282E-02	8.886E-02	1.567E-01	NOT IDENT.

NA-22	-7.843E-04	7.802E-03	1.416E-02	NOT IDENT.
NA-24	0.000E+00	6.944E+15	0.000E+00	SHORT HLIF
AL-26	-2.208E-03	5.992E-03	9.556E-03	NOT IDENT.
SC-46	-2.471E-03	9.188E-03	1.543E-02	FAIL ABUN
V-48	-1.250E-02	3.680E-02	6.460E-02	NOT IDENT.
CR-51	-4.186E-02	1.285E-01	2.391E-01	NOT IDENT.
MN-54	3.929E-03	7.258E-03	1.352E-02	NOT IDENT.
CO-56	-5.865E-03	9.490E-03	1.671E-02	FAIL ABUN
MN-56	0.000E+00	1.604E+41	0.000E+00	SHORT HLIF
CO-57	-1.219E-03	5.082E-03	9.591E-03	NOT IDENT.
CO-58	-5.546E-03	9.033E-03	1.600E-02	NOT IDENT.
FE-59	-2.784E-02	2.432E-02	4.012E-02	NOT IDENT.
CO-60	1.321E-02	8.314E-03	1.338E-02	FAIL ABUN
ZN-65	-9.064E-03	2.052E-02	3.003E-02	NOT IDENT.
GE-68	2.375E-01	2.535E-01	4.725E-01	NOT IDENT.
AS-73	7.817E-02	1.551E-01	3.164E-01	NOT IDENT.
AS-74	-2.513E-02	4.586E-02	7.938E-02	NOT IDENT.
SE-75	-5.271E-03	1.094E-02	1.812E-02	NOT IDENT.
BR-77	0.000E+00	2.922E+03	0.000E+00	SHORT HLIF
SR-82	-1.794E-01	2.179E-01	2.065E-01	NOT IDENT.
RB-83	1.323E-02	1.620E-02	3.022E-02	NOT IDENT.
KR-85	0.000E+00	1.666E+00	3.140E+00	NOT IDENT.
SR-85	0.000E+00	1.114E-02	2.100E-02	NOT IDENT.
RB-86	2.251E-01	3.448E-01	6.333E-01	NOT IDENT.
Y-88	-1.897E-03	9.759E-03	1.454E-02	NOT IDENT.
Y-91	5.368E+00	4.703E+00	9.095E+00	NOT IDENT.
NB-94	3.200E-03	6.743E-03	1.265E-02	NOT IDENT.
NB-95	1.522E-02	1.146E-02	1.964E-02	NOT IDENT.
NB-95M	2.216E-02	3.425E-02	5.582E-02	NOT IDENT.
ZR-95	2.744E-03	1.794E-02	3.310E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.235E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.353E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	9.051E+40	0.000E+00	SHORT HLIF
RH-101	1.263E-03	6.717E-03	1.142E-02	FAIL ABUN
RH-102	6.651E-03	1.057E-02	2.023E-02	FAIL ABUN
RU-103	-4.104E-03	1.164E-02	2.075E-02	FAIL ABUN
RH-106	-2.868E-02	6.479E-02	1.190E-01	NOT IDENT.
RU-106	-2.868E-02	6.479E-02	1.190E-01	NOT IDENT.
AG-108M	-2.536E-03	5.902E-03	1.063E-02	NOT IDENT.
AG-110M	5.555E-04	1.072E-02	1.692E-02	NOT IDENT.
SN-113	-7.427E-03	1.016E-02	1.830E-02	NOT IDENT.
CD-115	0.000E+00	2.251E+03	0.000E+00	SHORT HLIF
SN-117M	-1.230E-02	3.751E-02	6.143E-02	NOT IDENT.
TE-123M	-4.341E-03	7.205E-03	1.169E-02	NOT IDENT.
SB-124	1.286E-02	1.978E-02	3.801E-02	NOT IDENT.
SB-125	1.312E-02	2.112E-02	3.495E-02	FAIL ABUN
I-126	1.727E-01	2.166E-01	2.586E-01	NOT IDENT.
SB-126	1.856E-02	1.041E-01	1.826E-01	NOT IDENT.
SB-127	6.963E+00	1.393E+01	2.632E+01	NOT IDENT.
I-131	1.024E-01	1.567E-01	2.974E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.867E+01	0.000E+00	SHORT HLIF
BA-133	-6.235E-03	9.243E-03	1.467E-02	FAIL ABUN
I-133	0.000E+00	6.082E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.147E-02	1.727E-02	FAIL ABUN
CS-135	5.690E-02	3.225E-02	5.783E-02	NOT IDENT.
I-135	0.000E+00	3.307E+39	0.000E+00	SHORT HLIF
CS-136	6.823E-02	5.427E-02	1.203E-01	FAIL ABUN
CE-139	-5.195E-03	7.309E-03	1.176E-02	NOT IDENT.
BA-140	-1.565E-03	1.841E-01	3.298E-01	FAIL ABUN
LA-140	3.298E-02	9.434E-02	9.961E-02	FAIL ABUN
CE-141	1.938E-03	2.205E-02	3.688E-02	NOT IDENT.
CE-143	0.000E+00	2.063E+06	0.000E+00	SHORT HLIF
CE-144	-2.835E-02	4.576E-02	7.552E-02	NOT IDENT.
PM-144	-1.482E-03	7.236E-03	1.324E-02	NOT IDENT.
PR-144	-1.195E-01	5.476E-01	1.001E+00	NOT IDENT.
PM-146	7.469E-03	8.449E-03	1.590E-02	NOT IDENT.
ND-147	-2.553E-01	4.600E-01	8.068E-01	FAIL ABUN
PM-147	3.538E+01	1.423E+02	2.718E+02	NOT IDENT.
PM-149	0.000E+00	1.800E+04	0.000E+00	SHORT HLIF
EU-150	4.421E-03	6.930E-03	1.001E-02	FAIL ABUN
EU-152	-2.694E-03	1.977E-02	3.553E-02	FAIL ABUN
GD-153	-1.397E-02	2.201E-02	3.136E-02	FAIL ABUN
EU-154	-1.276E-03	2.175E-02	3.959E-02	NOT IDENT.
TB-160	-8.950E-03	3.590E-02	5.526E-02	FAIL ABUN
HO-166M	-1.292E-03	1.212E-02	2.223E-02	FAIL ABUN
TM-171	5.675E-01	2.723E+00	5.531E+00	FAIL ABUN

HF-172	1.196E-02	3.997E-02	6.831E-02	FAIL ABUN
LU-172	1.113E-02	1.250E-02	2.319E-02	FAIL ABUN
LU-176	-1.257E-03	5.379E-03	9.743E-03	FAIL ABUN
HF-181	4.495E-04	1.297E-02	2.352E-02	NOT IDENT.
TA-182	-2.155E-02	4.033E-02	7.155E-02	FAIL ABUN
RE-183	-5.085E-03	3.862E-02	7.728E-02	FAIL ABUN
RE-184	1.163E-02	3.920E-02	6.984E-02	FAIL ABUN
W-188	-1.102E+00	1.932E+00	3.156E+00	FAIL ABUN
IR-192	2.061E-03	8.505E-03	1.611E-02	FAIL ABUN
HG-203	1.805E-02	2.216E-02	2.082E-02	FAIL ABUN
BI-207	7.785E-03	1.049E-02	1.929E-02	FAIL ABUN
BI-211	0.000E+00	1.169E-01	1.532E-01	FAIL ABUN
PB-211	7.218E-02	1.661E-01	2.733E-01	NOT IDENT.
RN-219	5.421E-02	8.170E-02	1.537E-01	FAIL ABUN
RA-223	7.831E-02	1.421E-01	2.400E-01	FAIL ABUN
AC-227	-3.431E-02	4.767E-02	8.962E-02	FAIL ABUN
TH-227	-3.431E-02	4.767E-02	8.962E-02	FAIL ABUN
TH-231	7.831E-02	1.421E-01	2.400E-01	FAIL ABUN
PA-233	3.486E-04	1.269E-02	2.393E-02	FAIL ABUN
PA-234	3.339E-02	5.841E-02	1.079E-01	FAIL ABUN
PA-234M	0.000E+00	1.366E+00	1.765E+00	FAIL ABUN
NP-237	3.486E-04	1.269E-02	2.393E-02	FAIL ABUN
NP-238	0.000E+00	6.586E+03	0.000E+00	SHORT HLIF
NP-239	-7.180E-03	5.088E-02	9.657E-02	FAIL ABUN
PU-239	0.000E+00	1.377E+02	1.324E+02	FAIL ABUN
AM-241	6.605E-03	2.658E-02	4.823E-02	NOT IDENT.
CM-243	3.750E-03	2.140E-02	3.706E-02	FAIL ABUN
BK-247	-4.962E-03	1.713E-02	2.857E-02	FAIL ABUN
CM-247	8.958E-03	7.507E-03	1.436E-02	FAIL ABUN
CF-249	4.486E-03	7.934E-03	1.494E-02	NOT IDENT.
CF-251	2.287E-04	2.590E-02	4.761E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	2312	10.66*	1.256E+00	6.006E+00	6.006E+00	4.81
CD-109	88.03	966	3.70*	6.504E+00	1.396E+00	1.477E+00	20.33
TE-125M	109.28	123	0.27*	7.223E+00	2.199E+00	3.452E+00	122.93
SN-126	64.28	466	9.60	3.901E+00	4.328E-01	4.328E-01	51.02
	86.94	966	8.90	6.504E+00	5.804E-01	5.804E-01	20.33
	87.57	966	37.00*	6.504E+00	1.396E-01	1.396E-01	20.33
BA-137M	661.66	29	89.90*	2.461E+00	4.614E-03	4.625E-03	357.10
CS-137	661.66	29	85.10*	2.461E+00	4.874E-03	4.886E-03	357.10
EU-155	86.55	966	30.70	6.504E+00	1.682E-01	1.708E-01	20.33
	105.31	219	21.10*	7.170E+00	5.036E-02	5.112E-02	83.50
HG-203	70.83	143	3.69	4.807E+00	2.812E-01	4.901E-01	130.68
	72.87	128	6.19	5.211E+00	1.376E-01	2.399E-01	113.56
	279.20	114	81.56*	4.695E+00	1.035E-02	1.805E-02	125.32
TL-208	277.37	114	6.60	4.695E+00	1.280E-01	1.280E-01	125.32
	583.19	1033	85.00*	2.717E+00	1.555E-01	1.555E-01	12.92
	860.56	126	12.50	1.984E+00	1.769E-01	1.769E-01	57.56
PB-210	46.54	82	4.25*	1.277E+00	5.287E-01	5.303E-01	233.87
BI-211	72.87	128	1.23	5.211E+00	6.927E-01	6.927E-01	113.56
	351.06	1906	12.92*	3.958E+00	1.296E+00	1.296E+00	9.21
BI-212	727.33	255	6.67*	2.281E+00	5.828E-01	5.828E-01	27.14
	785.37	92	1.10	2.141E+00	1.353E+00	1.353E+00	66.22
	1620.50	50	1.47	1.155E+00	1.018E+00	1.018E+00	69.57
PB-212	74.82	1650	10.28	5.444E+00	1.026E+00	1.026E+00	11.52
	77.11	2292	17.10	5.679E+00	8.209E-01	8.209E-01	8.62
	238.63	3941	43.60*	5.225E+00	6.018E-01	6.018E-01	4.90
	300.09	316	3.30	4.443E+00	7.495E-01	7.495E-01	33.29
BI-214	609.32	1264	45.49*	2.626E+00	3.679E-01	3.680E-01	9.52
	1120.29	343	14.92	1.580E+00	5.067E-01	5.067E-01	26.18
	1764.49	193	15.30	1.084E+00	4.044E-01	4.044E-01	27.79
PB-214	74.82	1650	5.80	5.444E+00	1.818E+00	1.818E+00	11.52
	77.11	2292	9.70	5.679E+00	1.447E+00	1.447E+00	8.62
	87.09	966	3.41	6.504E+00	1.515E+00	1.515E+00	20.33
	242.00	970	7.25	5.181E+00	8.979E-01	8.980E-01	16.71
	295.22	1199	18.42	4.495E+00	5.035E-01	5.035E-01	9.77
	351.93	1906	35.60*	3.958E+00	4.703E-01	4.704E-01	9.21
RN-222	609.32	1264	45.49*	2.626E+00	3.679E-01	3.680E-01	9.52
	1120.29	343	14.92	1.580E+00	5.067E-01	5.067E-01	26.18
	1764.49	193	15.30	1.084E+00	4.044E-01	4.044E-01	27.79
RA-224	240.99	970	4.10*	5.181E+00	1.588E+00	1.588E+00	16.71
RA-226	609.32	1264	45.49*	2.626E+00	3.679E-01	3.680E-01	9.52
	1120.29	343	14.92	1.580E+00	5.067E-01	5.067E-01	26.18
	1764.49	193	15.30	1.084E+00	4.044E-01	4.044E-01	27.79
AC-228	105.21	219	1.10	7.170E+00	9.660E-01	9.660E-01	83.50
	338.32	667	11.27	4.073E+00	5.057E-01	5.057E-01	21.19
	794.95	205	4.25	2.120E+00	7.910E-01	7.910E-01	28.74
	835.71	-----	1.61	2.034E+00	-----	Line Not Found	-----
	911.20	752	25.80*	1.890E+00	5.361E-01	5.361E-01	12.13

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	968.97	465	15.80	1.793E+00	5.710E-01	5.710E-01	15.71
	105.21	219	1.10	7.170E+00	9.660E-01	9.660E-01	83.50
	338.32	667	11.27	4.073E+00	5.057E-01	5.057E-01	21.19
	794.95	205	4.25	2.120E+00	7.910E-01	7.910E-01	28.74
	835.71	-----	1.61	2.034E+00	-----	Line Not Found	-----
TH-228	911.20	752	25.80*	1.890E+00	5.361E-01	5.361E-01	12.13
	968.97	465	15.80	1.793E+00	5.710E-01	5.710E-01	15.71
	74.82	1650	10.28	5.444E+00	1.026E+00	1.026E+00	11.52
	77.11	2292	17.10	5.679E+00	8.209E-01	8.209E-01	8.62
	238.63	3941	43.60*	5.225E+00	6.018E-01	6.018E-01	4.90
TH-229	300.09	316	3.30	4.443E+00	7.495E-01	7.495E-01	33.29
	85.43	324	14.70	6.296E+00	1.218E-01	1.218E-01	67.15
	88.47	966	24.00	6.504E+00	2.152E-01	2.152E-01	20.33
	193.51	-----	4.41*	5.998E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.680E+00	-----	Line Not Found	-----
TH-230	609.32	1264	45.49*	2.626E+00	3.679E-01	3.679E-01	9.52
	1120.29	343	14.92	1.580E+00	5.067E-01	5.067E-01	26.18
	1764.49	193	15.30	1.084E+00	4.044E-01	4.044E-01	27.79
	283.69	-----	1.70	4.626E+00	-----	Line Not Found	-----
	301.36	41	5.35*	4.422E+00	6.073E-02	6.073E-02	143.09
TH-232	105.21	219	1.10	7.170E+00	9.660E-01	9.660E-01	83.50
	338.32	667	11.27	4.073E+00	5.057E-01	5.057E-01	21.19
	835.71	-----	1.61	2.034E+00	-----	Line Not Found	-----
	911.20	752	25.80*	1.890E+00	5.361E-01	5.361E-01	12.13
	968.97	465	15.80	1.793E+00	5.710E-01	5.710E-01	15.71
TH-234	63.29	466	3.70*	3.901E+00	1.123E+00	1.123E+00	51.02
	92.59	777	4.23	6.798E+00	9.400E-01	9.400E-01	31.82
	609.32	1264	45.49*	2.626E+00	3.679E-01	3.679E-01	9.52
	1120.29	343	14.92	1.580E+00	5.067E-01	5.067E-01	26.18
	1764.49	193	15.30	1.084E+00	4.044E-01	4.044E-01	27.79
U-235	89.96	638	3.47	6.657E+00	9.608E-01	9.608E-01	24.32
	93.35	777	5.60	6.798E+00	7.101E-01	7.101E-01	31.82
	143.76	81	10.96*	6.966E+00	3.685E-02	3.685E-02	199.35
	163.33	155	5.08	6.604E+00	1.612E-01	1.612E-01	87.48
	185.72	470	57.20	6.147E+00	4.646E-02	4.646E-02	43.94
U-238	205.31	-----	5.01	5.779E+00	-----	Line Not Found	-----
	63.29	466	3.70*	3.901E+00	1.123E+00	1.123E+00	51.02
	92.59	777	4.23	6.798E+00	9.400E-01	9.400E-01	31.82
	43.53	-----	5.90	9.036E-01	-----	Line Not Found	-----
	74.66	1650	67.20*	5.444E+00	1.569E-01	1.569E-01	11.52
ANH-511	511.00	377	100.00*	3.005E+00	4.369E-02	4.369E-02	49.55

Flag: "*" = Keyline

Total number of lines in spectrum 77
Number of unidentified lines 21
Number of lines tentatively identified by NID 56 72.73%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.006E+00	6.006E+00	0.289E+00	4.81	
CD-109	461.40D	1.06	1.396E+00	1.477E+00	0.300E+00	20.33	
TE-125M	57.40D	1.57	2.199E+00	3.452E+00	4.243E+00	122.93	
SN-126	2.30E+05Y	1.00	1.396E-01	1.396E-01	0.284E-01	20.33	
BA-137M	30.08Y	1.00	4.614E-03	4.625E-03	16.52E-03	357.10	
CS-137	30.08Y	1.00	4.874E-03	4.886E-03	17.45E-03	357.10	
EU-155	4.75Y	1.02	5.036E-02	5.112E-02	4.268E-02	83.50	
HG-203	46.59D	1.74	1.035E-02	1.805E-02	2.262E-02	125.32	
TL-208	1.41E+10Y	1.00	1.555E-01	1.555E-01	0.201E-01	12.92	
PB-210	22.20Y	1.00	5.287E-01	5.303E-01	12.40E-01	233.87	
BI-211	7.04E+08Y	1.00	1.296E+00	1.296E+00	0.119E+00	9.21	
BI-212	1.41E+10Y	1.00	5.828E-01	5.828E-01	1.582E-01	27.14	
PB-212	1.41E+10Y	1.00	6.018E-01	6.018E-01	0.295E-01	4.90	
BI-214	1600.00Y	1.00	3.679E-01	3.680E-01	0.350E-01	9.52	
PB-214	1600.00Y	1.00	4.703E-01	4.704E-01	0.433E-01	9.21	
RN-222	1600.00Y	1.00	3.679E-01	3.680E-01	0.350E-01	9.52	
RA-224	1.41E+10Y	1.00	1.588E+00	1.588E+00	0.265E+00	16.71	
RA-226	1600.00Y	1.00	3.679E-01	3.680E-01	0.350E-01	9.52	
AC-228	1.41E+10Y	1.00	5.361E-01	5.361E-01	0.650E-01	12.13	
RA-228	1.41E+10Y	1.00	5.361E-01	5.361E-01	0.650E-01	12.13	
TH-228	1.41E+10Y	1.00	6.018E-01	6.018E-01	0.295E-01	4.90	
TH-229	7340.00Y	1.00	2.152E-01	2.152E-01	0.438E-01	20.33	K
TH-230	7.54E+04Y	1.00	3.679E-01	3.679E-01	0.350E-01	9.52	
PA-231	7.04E+08Y	1.00	6.073E-02	6.073E-02	8.690E-02	143.09	
TH-232	1.41E+10Y	1.00	5.361E-01	5.361E-01	0.650E-01	12.13	
TH-234	4.47E+09Y	1.00	1.123E+00	1.123E+00	0.573E+00	51.02	
U-234	2.45E+05Y	1.00	3.679E-01	3.679E-01	0.350E-01	9.52	
U-235	7.04E+08Y	1.00	3.685E-02	3.685E-02	7.347E-02	199.35	
U-238	4.47E+09Y	1.00	1.123E+00	1.123E+00	0.573E+00	51.02	
AM-243	7370.00Y	1.00	1.569E-01	1.569E-01	0.181E-01	11.52	
ANH-511	1.00E+09Y	1.00	4.369E-02	4.369E-02	2.165E-02	49.55	
Total Activity :			2.184E+01	2.319E+01			

Grand Total Activity : 2.184E+01 2.319E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.65	46	1589	0.85	133.22	131	6	7.16E-04	****	4.41E+00	T
0	129.00	244	1818	0.97	257.99	254	9	4.12E-03	75.2	7.18E+00	T
0	153.85	128	1445	1.47	307.72	304	8	2.21E-03	****	6.78E+00	T
0	198.11	34	1230	0.98	396.32	392	8	6.09E-04	****	5.91E+00	T
0	209.29	405	1479	1.08	418.67	414	10	7.27E-03	41.9	5.71E+00	
0	270.16	338	1127	1.43	540.49	535	12	6.27E-03	45.9	4.79E+00	T
0	328.27	246	657	1.24	656.79	653	9	4.68E-03	43.8	4.16E+00	T
0	372.09	32	452	1.62	744.47	743	8	6.25E-04	****	3.80E+00	T
0	409.53	110	613	1.02	819.40	814	11	2.16E-03	97.4	3.54E+00	T
0	423.21	38	398	1.08	846.78	845	8	7.45E-04	****	3.46E+00	T
0	462.71	188	523	1.22	925.81	920	11	3.74E-03	53.1	3.24E+00	T
0	671.40	84	242	3.19	1343.39	1338	11	1.75E-03	79.4	2.43E+00	
1	768.51	122	271	1.77	1537.68	1531	19	2.61E-03	57.4	2.18E+00	
1	772.51	51	223	1.77	1545.68	1531	19	1.10E-03	****	2.17E+00	T
1	782.08	56	200	1.78	1564.83	1559	20	1.20E-03	****	2.15E+00	
2	792.48	48	67	1.45	1585.62	1583	16	1.02E-03	59.1	2.13E+00	T
0	882.47	51	166	1.67	1765.65	1759	12	1.11E-03	****	1.94E+00	T
1	964.49	175	150	1.90	1929.74	1921	27	3.86E-03	32.3	1.80E+00	T
0	1000.72	120	157	3.10	2002.23	1996	14	2.66E-03	49.0	1.74E+00	T
0	1048.07	37	69	1.17	2096.94	2094	6	8.22E-04	81.2	1.67E+00	T
0	1141.57	43	85	2.56	2283.97	2280	8	9.73E-04	81.4	1.55E+00	
0	1152.90	86	281	6.78	2306.64	2295	23	1.96E-03	****	1.54E+00	
0	1238.29	142	181	2.03	2477.43	2471	14	3.26E-03	43.6	1.45E+00	T
0	1287.93	31	180	7.71	2576.72	2565	19	7.18E-04	****	1.40E+00	
1	1332.38	51	58	2.12	2665.61	2660	21	1.18E-03	64.2	1.36E+00	T
1	1338.37	37	41	2.12	2677.61	2660	21	8.51E-04	59.5	1.35E+00	
0	1378.00	57	94	1.60	2756.86	2752	11	1.34E-03	70.5	1.32E+00	
0	1407.96	41	81	2.46	2816.78	2811	12	9.57E-04	92.5	1.30E+00	T
0	1438.11	2	87	3.02	2877.09	2867	14	4.65E-05	****	1.27E+00	
0	1509.34	37	60	2.17	3019.55	3015	10	8.86E-04	82.7	1.22E+00	
0	1534.28	24	56	4.69	3069.41	3062	13	5.80E-04	****	1.21E+00	
3	1588.75	56	74	2.73	3178.36	3170	23	1.33E-03	71.3	1.17E+00	
3	1593.58	35	29	2.24	3188.00	3170	23	8.31E-04	79.7	1.17E+00	
0	1603.25	24	48	4.80	3207.35	3199	14	5.81E-04	****	1.16E+00	
1	1623.58	29	48	2.06	3248.00	3233	23	6.95E-04	****	1.15E+00	
0	1730.80	40	71	2.88	3462.40	3454	15	9.60E-04	96.1	1.10E+00	
0	1798.78	38	45	8.09	3598.35	3584	25	9.33E-04	99.3	1.07E+00	
0	1839.81	4	20	3.38	3680.37	3674	11	1.00E-04	****	1.05E+00	
0	1847.69	53	27	1.63	3696.13	3689	13	1.31E-03	47.6	1.05E+00	
0	1951.87	13	34	5.22	3904.44	3892	15	3.26E-04	****	1.01E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                           *
*****
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656007.CNF;1      *
* Acquisition date   : 23-JUN-2016 13:04:57 Sensitivity      : 3.000                *
* Detector ID        : GAM11 Energy tolerance: 1.500          *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:05.36 Half life ratio  : *****      *
* Sample date        : 17-MAY-2016 10:55:00 Nuclide Library : SOLID        *
* Sample ID          : G398656007 Analyst initials: MXR1          *
* Batch Number       : 1572234 Sample Quantity : 1.7987E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000          *
*                                     Dry Weight    : 0.00000          *
*****
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 16-JUL-2015 08:37:24 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	5.409E-02
CD-109	1.248E-01
TE-125M	2.212E+00
SN-126	1.185E-02
BA-137M	6.345E-03
CS-137	6.702E-03
EU-155	1.776E-02
TL-208	5.936E-03
PB-210	4.599E-01
BI-212	8.231E-02
PB-212	9.870E-03
BI-214	1.164E-02
PB-214	1.226E-02
RN-222	1.164E-02
RA-224	1.058E-01
RA-226	1.164E-02
AC-228	2.219E-02
RA-228	2.219E-02
TH-228	9.870E-03
TH-229	9.440E-02
TH-230	1.164E-02
PA-231	8.470E-02
TH-232	2.219E-02
TH-234	1.949E-01
U-234	1.164E-02
U-235	3.521E-02
U-238	1.949E-01
AM-243	8.260E-03
ANH-511	4.703E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.595E-02	NOT IDENT.
NA-22	6.734E-03	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	4.334E-03	NOT IDENT.
SC-46	7.374E-03	FAIL ABUN
V-48	3.093E-02	NOT IDENT.
CR-51	1.165E-01	NOT IDENT.
MN-54	6.503E-03	NOT IDENT.
CO-56	8.020E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.705E-03	NOT IDENT.
CO-58	7.666E-03	NOT IDENT.
FE-59	1.911E-02	NOT IDENT.
CO-60	6.333E-03	FAIL ABUN
ZN-65	1.435E-02	NOT IDENT.
GE-68	2.263E-01	NOT IDENT.
AS-73	1.552E-01	NOT IDENT.
AS-74	3.836E-02	NOT IDENT.
SE-75	8.842E-03	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	9.913E-02	NOT IDENT.
RB-83	1.461E-02	NOT IDENT.
KR-85	1.532E+00	NOT IDENT.
SR-85	1.025E-02	NOT IDENT.
RB-86	3.031E-01	NOT IDENT.
Y-88	6.698E-03	NOT IDENT.
Y-91	4.355E+00	NOT IDENT.
NB-94	6.118E-03	NOT IDENT.
NB-95	9.491E-03	NOT IDENT.
NB-95M	2.734E-02	NOT IDENT.
ZR-95	1.595E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	5.605E-03	FAIL ABUN
RH-102	9.771E-03	FAIL ABUN
RU-103	1.004E-02	FAIL ABUN
RH-106	5.746E-02	NOT IDENT.
RU-106	5.746E-02	NOT IDENT.
AG-108M	5.157E-03	NOT IDENT.
AG-110M	8.080E-03	NOT IDENT.
SN-113	8.891E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.013E-02	NOT IDENT.
TE-123M	5.733E-03	NOT IDENT.
SB-124	1.764E-02	NOT IDENT.
SB-125	1.698E-02	FAIL ABUN
I-126	1.248E-01	NOT IDENT.
SB-126	8.810E-02	NOT IDENT.
SB-127	1.270E+01	NOT IDENT.
I-131	1.448E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	7.131E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	8.362E-03	FAIL ABUN
CS-135	2.827E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.757E-02	FAIL ABUN
CE-139	5.766E-03	NOT IDENT.
BA-140	1.597E-01	FAIL ABUN
LA-140	4.658E-02	FAIL ABUN
CE-141	1.811E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.706E-02	NOT IDENT.
PM-144	6.398E-03	NOT IDENT.
PR-144	4.839E-01	NOT IDENT.
PM-146	7.720E-03	NOT IDENT.
ND-147	3.899E-01	FAIL ABUN
PM-147	1.334E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	4.879E-03	FAIL ABUN
EU-152	1.730E-02	FAIL ABUN
GD-153	1.540E-02	FAIL ABUN
EU-154	1.882E-02	NOT IDENT.
TB-160	2.645E-02	FAIL ABUN
HO-166M	1.073E-02	FAIL ABUN
TM-171	2.712E+00	FAIL ABUN
HF-172	3.351E-02	FAIL ABUN

LU-172	1.110E-02	FAIL ABUN
LU-176	4.750E-03	FAIL ABUN
HF-181	1.140E-02	NOT IDENT.
TA-182	3.426E-02	FAIL ABUN
RE-183	3.793E-02	FAIL ABUN
RE-184	3.354E-02	FAIL ABUN
W-188	1.538E+00	FAIL ABUN
IR-192	7.856E-03	FAIL ABUN
HG-203	1.018E-02	FAIL ABUN
BI-207	9.255E-03	FAIL ABUN
BI-211	7.566E-02	FAIL ABUN
PB-211	1.330E-01	NOT IDENT.
RN-219	7.480E-02	FAIL ABUN
RA-223	1.171E-01	FAIL ABUN
AC-227	4.376E-02	FAIL ABUN
TH-227	4.376E-02	FAIL ABUN
TH-231	1.171E-01	FAIL ABUN
PA-233	1.167E-02	FAIL ABUN
PA-234	5.178E-02	FAIL ABUN
PA-234M	8.498E-01	FAIL ABUN
NP-237	1.167E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	4.740E-02	FAIL ABUN
PU-239	6.509E+01	FAIL ABUN
AM-241	2.368E-02	NOT IDENT.
CM-243	1.819E-02	FAIL ABUN
BK-247	1.394E-02	FAIL ABUN
CM-247	6.990E-03	FAIL ABUN
CF-249	7.266E-03	NOT IDENT.
CF-251	2.335E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656007.CNF;1
Acquisition date : 23-JUN-2016 13:04:57 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.36 Half life ratio : *****
Sample date : 17-MAY-2016 10:55:00 Nuclide Library : SOLID
Sample ID : G398656007 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.7987E+02 GRAM
Quantity Err(%) : 1.1119E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.006E+00	5.911E-01	5.911E-01
CD-109	9.858E-01	3.216E-01	3.216E-01
TE-125M	3.452E+00	4.167E+00	4.167E+00
SN-126	9.320E-02	3.000E-02	3.000E-02
BA-137M	4.625E-03	1.619E-02	1.619E-02
CS-137	4.886E-03	1.710E-02	1.710E-02
EU-155	5.112E-02	4.207E-02	4.207E-02
TL-208	1.555E-01	2.344E-02	2.344E-02
PB-210	5.303E-01	1.216E+00	1.216E+00
BI-212	5.828E-01	1.652E-01	1.652E-01
PB-212	6.018E-01	5.835E-02	5.835E-02
BI-214	3.680E-01	4.554E-02	4.554E-02
PB-214	4.704E-01	5.741E-02	5.741E-02
RN-222	3.680E-01	4.554E-02	4.554E-02
RA-224	6.976E-01	2.992E-01	2.992E-01
RA-226	3.680E-01	4.554E-02	4.554E-02
AC-228	5.361E-01	1.006E-01	1.006E-01
RA-228	5.361E-01	1.006E-01	1.006E-01
TH-228	6.018E-01	5.835E-02	5.835E-02
TH-229	-6.527E-02	1.210E-01	1.210E-01
TH-230	3.679E-01	4.554E-02	4.554E-02
PA-231	6.073E-02	8.625E-02	8.625E-02
TH-232	5.361E-01	1.006E-01	1.006E-01
TH-234	1.123E+00	6.158E-01	6.158E-01
U-234	3.679E-01	4.554E-02	4.554E-02
U-235	3.685E-02	7.205E-02	7.205E-02
U-238	1.123E+00	6.158E-01	6.158E-01
AM-243	1.135E-01	2.113E-02	2.113E-02
ANH-511	4.369E-02	2.151E-02	2.151E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	-6.282E-02	8.901E-02	9.341E-02 NOT IDENT.

NA-22	-7.843E-04	7.802E-03	7.810E-03	NOT IDENT.
NA-24	-2.050E+15	6.946E+15	7.008E+15	SHORT HLIF
AL-26	-2.208E-03	5.994E-03	6.076E-03	NOT IDENT.
SC-46	-2.471E-03	9.194E-03	9.262E-03	FAIL ABUN
V-48	-1.250E-02	3.686E-02	3.728E-02	NOT IDENT.
CR-51	-4.186E-02	1.285E-01	1.299E-01	NOT IDENT.
MN-54	3.929E-03	7.274E-03	7.487E-03	NOT IDENT.
CO-56	-5.865E-03	9.518E-03	9.878E-03	FAIL ABUN
MN-56	-1.000E+41	1.609E+41	0.000E+00	SHORT HLIF
CO-57	-1.219E-03	5.083E-03	5.112E-03	NOT IDENT.
CO-58	-5.546E-03	9.056E-03	9.395E-03	NOT IDENT.
FE-59	-2.784E-02	2.498E-02	2.795E-02	NOT IDENT.
CO-60	1.321E-02	8.380E-03	1.028E-02	FAIL ABUN
ZN-65	-9.064E-03	2.060E-02	2.100E-02	NOT IDENT.
GE-68	2.375E-01	2.574E-01	2.788E-01	NOT IDENT.
AS-73	7.817E-02	1.559E-01	1.599E-01	NOT IDENT.
AS-74	-2.513E-02	4.594E-02	4.731E-02	NOT IDENT.
SE-75	-5.271E-03	1.095E-02	1.120E-02	NOT IDENT.
BR-77	6.088E+04	6.585E+04	7.134E+04	SHORT HLIF
SR-82	-1.794E-01	2.187E-01	2.332E-01	NOT IDENT.
RB-83	1.323E-02	1.633E-02	1.738E-02	NOT IDENT.
KR-85	7.173E+00	1.765E+00	3.684E+00	NOT IDENT.
SR-85	4.783E-02	1.181E-02	2.458E-02	NOT IDENT.
RB-86	2.251E-01	3.474E-01	3.619E-01	NOT IDENT.
Y-88	-1.897E-03	9.760E-03	9.797E-03	NOT IDENT.
Y-91	5.368E+00	4.730E+00	5.313E+00	NOT IDENT.
NB-94	3.200E-03	6.749E-03	6.902E-03	NOT IDENT.
NB-95	1.522E-02	1.157E-02	1.345E-02	NOT IDENT.
NB-95M	2.216E-02	3.432E-02	3.575E-02	NOT IDENT.
ZR-95	2.744E-03	1.794E-02	1.798E-02	NOT IDENT.
NB-97	-1.000E+41	1.746E+42	0.000E+00	SHORT HLIF
ZR-97	2.259E+15	1.248E+15	1.611E+15	SHORT HLIF
MO-99	1.949E+02	6.357E+02	6.417E+02	SHORT HLIF
TC-99M	1.000E+41	9.122E+40	0.000E+00	SHORT HLIF
RH-101	1.263E-03	6.721E-03	6.745E-03	FAIL ABUN
RH-102	6.651E-03	1.060E-02	1.101E-02	FAIL ABUN
RU-103	-4.104E-03	1.165E-02	1.179E-02	FAIL ABUN
RH-106	-2.868E-02	6.484E-02	6.612E-02	NOT IDENT.
RU-106	-2.868E-02	6.484E-02	6.612E-02	NOT IDENT.
AG-108M	-2.536E-03	5.906E-03	6.015E-03	NOT IDENT.
AG-110M	5.555E-04	1.072E-02	1.072E-02	NOT IDENT.
SN-113	-7.427E-03	1.018E-02	1.071E-02	NOT IDENT.
CD-115	9.259E+02	2.253E+03	2.291E+03	SHORT HLIF
SN-117M	-1.230E-02	3.752E-02	3.793E-02	NOT IDENT.
TE-123M	-4.341E-03	7.211E-03	7.472E-03	NOT IDENT.
SB-124	1.286E-02	1.980E-02	2.063E-02	NOT IDENT.
SB-125	1.312E-02	2.115E-02	2.196E-02	FAIL ABUN
I-126	1.727E-01	2.172E-01	2.307E-01	NOT IDENT.
SB-126	1.856E-02	1.042E-01	1.045E-01	NOT IDENT.
SB-127	6.963E+00	1.400E+01	1.435E+01	NOT IDENT.
I-131	1.024E-01	1.570E-01	1.636E-01	NOT IDENT.
I-132	1.000E+41	4.674E+41	0.000E+00	SHORT HLIF
TE-132	-2.340E+00	1.867E+01	1.870E+01	SHORT HLIF
BA-133	-6.235E-03	9.257E-03	9.674E-03	FAIL ABUN
I-133	7.634E+09	6.085E+10	6.095E+10	SHORT HLIF
CS-134	4.071E-02	1.232E-02	2.210E-02	FAIL ABUN
CS-135	5.690E-02	3.273E-02	4.158E-02	NOT IDENT.
I-135	7.140E+38	3.362E+39	0.000E+00	SHORT HLIF
CS-136	6.823E-02	5.586E-02	6.377E-02	FAIL ABUN
CE-139	-5.195E-03	7.389E-03	7.751E-03	NOT IDENT.
BA-140	-1.565E-03	1.841E-01	1.841E-01	FAIL ABUN
LA-140	3.298E-02	9.438E-02	9.554E-02	FAIL ABUN
CE-141	1.938E-03	2.205E-02	2.206E-02	NOT IDENT.
CE-143	9.607E+06	2.229E+06	4.871E+06	SHORT HLIF
CE-144	-2.835E-02	4.582E-02	4.757E-02	NOT IDENT.
PM-144	-1.482E-03	7.237E-03	7.268E-03	NOT IDENT.
PR-144	-1.195E-01	5.477E-01	5.503E-01	NOT IDENT.
PM-146	7.469E-03	8.482E-03	9.126E-03	NOT IDENT.
ND-147	-2.553E-01	4.604E-01	4.746E-01	FAIL ABUN
PM-147	3.538E+01	1.424E+02	1.432E+02	NOT IDENT.
PM-149	3.205E+03	1.801E+04	1.807E+04	SHORT HLIF
EU-150	4.421E-03	6.940E-03	7.220E-03	FAIL ABUN
EU-152	-2.694E-03	1.977E-02	1.981E-02	FAIL ABUN
GD-153	-1.397E-02	2.203E-02	2.292E-02	FAIL ABUN
EU-154	-1.276E-03	2.175E-02	2.176E-02	NOT IDENT.
TB-160	-8.950E-03	3.592E-02	3.615E-02	FAIL ABUN
HO-166M	-1.292E-03	1.212E-02	1.213E-02	FAIL ABUN
TM-171	5.675E-01	2.724E+00	2.736E+00	FAIL ABUN

HF-172	1.196E-02	4.002E-02	4.038E-02	FAIL	ABUN
LU-172	1.113E-02	1.272E-02	1.368E-02	FAIL	ABUN
LU-176	-1.257E-03	5.380E-03	5.410E-03	FAIL	ABUN
HF-181	4.495E-04	1.297E-02	1.297E-02	NOT	IDENT.
TA-182	-2.155E-02	4.038E-02	4.153E-02	FAIL	ABUN
RE-183	-5.085E-03	3.862E-02	3.869E-02	FAIL	ABUN
RE-184	1.163E-02	3.925E-02	3.960E-02	FAIL	ABUN
W-188	-1.102E+00	1.938E+00	2.000E+00	FAIL	ABUN
IR-192	2.061E-03	8.507E-03	8.558E-03	FAIL	ABUN
HG-203	1.805E-02	2.222E-02	2.366E-02	FAIL	ABUN
BI-207	7.785E-03	1.059E-02	1.115E-02	FAIL	ABUN
BI-211	1.296E+00	1.596E-01	6.056E-01	FAIL	ABUN
PB-211	7.218E-02	1.662E-01	1.694E-01	NOT	IDENT.
RN-219	5.421E-02	8.206E-02	8.562E-02	FAIL	ABUN
RA-223	7.831E-02	1.423E-01	1.466E-01	FAIL	ABUN
AC-227	-3.431E-02	4.795E-02	5.038E-02	FAIL	ABUN
TH-227	-3.431E-02	4.795E-02	5.038E-02	FAIL	ABUN
TH-231	7.831E-02	1.423E-01	1.466E-01	FAIL	ABUN
PA-233	3.486E-04	1.269E-02	1.270E-02	FAIL	ABUN
PA-234	3.339E-02	6.996E-02	7.157E-02	FAIL	ABUN
PA-234M	2.843E+00	1.446E+00	1.932E+00	FAIL	ABUN
NP-237	3.486E-04	1.269E-02	1.270E-02	FAIL	ABUN
NP-238	9.308E+02	6.587E+03	6.601E+03	SHORT	HLIF
NP-239	-7.180E-03	5.089E-02	5.099E-02	FAIL	ABUN
PU-239	1.869E+02	1.384E+02	1.620E+02	FAIL	ABUN
AM-241	6.605E-03	2.658E-02	2.675E-02	NOT	IDENT.
CM-243	3.750E-03	2.140E-02	2.147E-02	FAIL	ABUN
BK-247	-4.962E-03	1.716E-02	1.730E-02	FAIL	ABUN
CM-247	8.958E-03	7.680E-03	8.677E-03	FAIL	ABUN
CF-249	4.486E-03	7.948E-03	8.202E-03	NOT	IDENT.
CF-251	2.287E-04	2.590E-02	2.590E-02	NOT	IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	696.0540	87.09	989.8547	136.47	869.5743
45.60	722.3004	87.57	990.8402	140.51	0.0000
46.54	732.5106	88.03	991.7775	143.76	906.0247
49.72	0.0000	88.34	992.4094	144.24	921.1790
51.35	802.7270	88.47	992.6772	145.44	930.5807
51.87	832.4185	89.96	995.6926	152.43	876.9333
52.39	813.8123	1093.63	997.0637	153.25	866.9030
52.97	848.0643	91.11	998.0063	323.87	874.3743
53.44	818.8818	92.59	1000.9627	156.02	871.8253
54.07	821.2255	93.35	1002.4731	158.56	881.2200
57.36	0.0000	94.56	930.4276	159.00	902.3986
57.53	924.7375	94.65	930.5912	162.33	849.0196
57.98	910.9479	94.67	930.6259	162.66	832.3625
59.27	900.9162	94.87	955.3369	163.33	814.9993
59.32	901.0372	97.43	971.6000	165.86	856.2203
59.54	921.3958	98.43	880.2955	176.31	810.4323
60.96	930.1813	98.44	880.3141	176.60	833.4902
61.17	939.9884	99.53	917.2045	177.52	824.6863
62.93	944.3016	100.11	957.1777	181.07	0.0000
63.29	945.1753	102.03	965.5569	181.52	830.9880
63.58	945.8775	103.18	921.0548	184.41	896.3311
64.28	883.3251	103.37	882.0779	143.76	887.8986
66.73	956.1047	105.21	860.2271	193.51	846.4385
67.24	1030.1165	105.31	860.3798	197.03	788.2780
125.81	1031.2356	106.12	804.5941	198.01	804.1963
67.75	1031.4105	106.47	805.1018	201.83	802.7139
69.67	1177.3019	109.28	929.7978	203.43	782.3575
70.83	1115.2819	111.00	973.9371	205.31	775.6162
72.81	1100.0087	111.76	0.0000	210.85	736.4255
72.87	1081.0289	114.06	949.4580	215.65	747.6966
74.66	1085.5249	116.30	0.0000	222.11	735.7876
74.82	1085.9232	116.74	933.9424	227.09	725.8961
74.97	1086.2974	119.76	880.7664	227.38	726.1211
77.11	1091.5898	121.12	869.7425	228.16	0.0000
78.74	1109.4233	121.22	869.8840	228.18	745.1235
79.69	1058.5469	121.78	890.7273	116.74	745.1235
80.12	1078.0712	122.06	891.1343	235.69	681.4003
80.19	1078.2369	122.92	892.3913	235.96	714.6280
80.57	1093.0372	123.07	892.6083	238.63	655.5444
81.00	1010.5464	265.00	871.3878	238.98	0.0000
81.07	1010.7015	125.81	832.0328	240.99	657.1107
81.75	1026.1335	127.23	879.4055	242.00	657.7762
83.79	983.0260	127.91	862.1512	244.70	550.0920
84.00	983.4652	129.30	908.6624	252.40	570.8785
85.43	986.4377	131.20	891.0375	252.80	595.8538
86.55	988.7460	133.02	904.2654	254.15	0.0000
86.79	989.2388	133.52	950.9063	256.23	603.1555
86.94	989.5494	136.00	856.6567	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	577.9489	355.39	0.0000	584.27	259.6366
264.80	578.0278	356.01	440.0314	595.83	301.3358
265.00	559.5328	364.49	402.0227	427.87	308.7649
268.22	493.7526	366.42	0.0000	602.52	0.0000
269.46	514.2361	372.51	376.6390	604.72	349.7527
270.03	514.5070	375.05	410.2130	607.14	337.6013
271.23	515.0749	377.52	370.1616	609.32	267.8508
273.65	569.7991	356.01	395.8537	610.33	293.1612
276.40	563.9956	388.16	387.1790	614.28	280.8196
277.37	573.7955	388.63	388.2986	618.01	284.3383
277.60	573.9116	391.69	422.7910	620.36	272.9133
278.00	561.9180	264.66	415.4538	621.93	282.1635
279.20	549.4760	401.81	385.8662	630.19	0.0000
279.54	516.2869	402.40	372.0552	631.29	234.3794
279.70	516.3651	404.85	406.0465	633.25	250.0580
280.46	509.4556	410.95	425.3781	634.78	284.8178
283.69	561.3311	413.71	432.5935	635.95	276.7840
284.31	547.9875	414.70	374.9502	636.99	265.9866
285.41	543.0533	423.72	387.5058	645.85	249.7190
285.90	0.0000	427.09	373.1492	657.76	233.0221
287.50	492.0300	427.87	348.9918	657.90	0.0000
290.67	534.5878	433.94	361.5652	661.66	273.3737
293.27	0.0000	439.40	343.4136	664.57	0.0000
351.93	529.3564	453.88	313.5464	666.33	203.1616
295.96	529.6904	463.37	363.5154	666.50	203.1724
879.38	530.8857	468.07	321.2771	667.71	0.0000
299.98	531.5186	473.00	318.2684	677.62	212.1596
300.09	531.5713	475.06	311.3503	685.70	231.9603
300.13	531.5889	476.78	353.5034	695.00	262.8544
301.36	530.6644	477.60	359.9570	696.49	283.6260
302.85	475.0972	482.18	331.5551	696.51	283.6260
256.23	495.0229	487.02	285.1546	697.00	294.9203
304.85	511.4777	492.35	0.0000	697.30	291.2132
306.78	513.3723	497.08	303.7639	697.49	291.2360
308.46	517.6744	505.52	311.4083	702.65	265.6234
311.90	495.8601	507.63	0.0000	706.68	261.3852
316.51	491.1942	511.00	273.1152	711.68	259.1284
319.41	492.3557	514.00	268.4485	720.70	243.5877
320.08	509.5182	514.00	268.4485	721.93	0.0000
321.04	519.3066	520.40	247.7498	722.78	241.4344
323.87	472.8705	520.69	0.0000	722.91	247.7656
325.23	485.4449	522.65	0.0000	723.31	244.6472
328.76	455.0641	527.90	0.0000	724.19	246.3208
333.37	546.2578	528.26	281.1437	727.33	220.0885
333.97	440.2463	529.59	289.9746	733.00	225.0587
334.37	506.8258	529.87	0.0000	735.93	210.4194
338.28	520.7501	531.02	299.9139	333.97	194.3578
338.32	520.7668	537.26	300.9319	739.50	0.0000
311.90	454.6974	546.56	0.0000	747.24	236.2902
340.48	454.6974	552.55	293.5948	748.06	227.7618
340.55	454.7192	563.25	257.9349	752.31	234.8734
344.28	459.0894	569.33	278.5718	753.82	214.8781
345.93	502.5783	946.00	278.5949	756.73	223.7790
351.06	397.0562	569.70	278.6258	756.80	223.7847
351.93	397.3146	583.19	259.4938	884.68	211.9219

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	205.6563	1274.44	150.3355	1620.50	79.4658
766.42	221.7793	1001.03	128.1596	1621.92	79.4877
766.84	215.3891	1002.74	117.3727	1678.03	0.0000
772.60	0.0000	1004.73	122.7079	1690.97	42.9569
776.52	251.7354	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	38.2969
778.90	219.0258	1028.54	0.0000	1063.66	47.4714
783.70	174.7837	1037.84	139.2643	1771.35	45.6560
785.37	174.9023	1038.76	0.0000	1791.20	0.0000
792.07	170.4968	631.29	157.7703	1808.65	38.6396
794.95	160.3976	1048.07	184.5052	1810.72	0.0000
795.86	160.4538	1049.04	174.9627	1836.06	49.9489
810.06	200.1650	1050.41	131.6378		
810.29	200.1850	1063.66	159.6948		
344.28	193.3255	1077.00	142.0611		
810.76	195.3125	1077.34	136.6924		
815.77	162.2607	1085.87	141.3687		
1048.07	187.0405	1093.63	139.5379		
832.01	194.9415	1099.45	176.6337		
834.85	189.2094	1112.07	146.8455		
835.71	192.2428	1112.84	152.3252		
836.80	0.0000	1115.54	174.2266		
846.75	0.0000	1120.29	148.2984		
846.77	212.9551	1120.55	148.3117		
856.80	198.1058	1221.41	148.3449		
860.56	151.0406	1129.67	162.8109		
871.09	155.6433	1131.51	0.0000		
873.19	162.7989	1147.95	0.0000		
875.33	0.0000	1173.23	137.5110		
879.38	177.9434	1177.95	139.5472		
880.51	166.2609	1189.05	156.6771		
883.24	132.8046	1204.77	131.3040		
884.68	148.0094	1221.41	189.9160		
889.28	165.5250	1231.02	181.7175		
894.76	171.1703	1235.36	165.8303		
898.04	177.4567	1238.28	155.0903		
900.72	184.7327	1260.41	0.0000		
903.28	183.9984	1271.87	141.3366		
911.20	167.0870	1274.44	126.2461		
912.08	166.4596	1274.54	128.1445		
923.98	0.0000	1291.59	119.3328		
926.50	161.8420	1298.22	0.0000		
929.11	178.3925	1312.11	95.8740		
937.49	183.0280	1332.49	105.0571		
944.13	165.9251	1362.66	0.0000		
946.00	163.9726	1365.19	108.8555		
949.00	162.0749	1368.63	0.0000		
667.71	0.0000	1384.29	97.1023		
962.31	150.3667	1408.01	82.5166		
964.08	156.6846	1457.56	0.0000		
966.17	156.7952	1460.82	77.6128		
911.20	156.9427	1489.16	81.1417		
968.97	156.9427	1505.03	77.5635		
983.53	180.6870	1584.12	64.9358		
984.45	0.0000	1596.21	55.4304		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 01:06:10.27

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656008.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM15.CNF;476
Background date  : 22-JUN-2016 09:28:24
Sample date      : 17-MAY-2016 11:00:00 Acquisition date : 23-JUN-2016 13:05:23
Sample ID        : G398656008 Sample quantity   : 1.73770E+02 GRAM
Detector name     : GAM15 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:06.47 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity       : 3.00000
Batch ID          : 1572234 Detector SN#      :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.52*	10	688	1.37	93.01	92	6	2.28E-04	531.8	
2	0	63.54*	55	804	1.43	127.03	124	6	1.26E-03	105.8	
3	2	73.04	108	805	1.20	146.02	143	16	2.50E-03	39.9	1.09E+00
4	2	75.06	613	1098	1.21	150.05	143	16	1.42E-02	9.9	
5	2	77.33*	951	1046	1.14	154.58	143	16	2.20E-02	8.2	
6	8	84.12*	237	1119	1.70	168.17	164	29	5.49E-03	29.1	3.19E+00
7	8	87.34	630	1201	1.53	174.58	164	29	1.46E-02	10.6	
8	8	90.17	425	1143	1.46	180.25	164	29	9.84E-03	15.7	
9	8	92.96*	476	1085	1.51	185.83	164	29	1.10E-02	18.4	
10	0	99.77*	42	959	1.06	199.43	195	8	9.80E-04	144.7	
11	4	127.67	59	252	1.07	255.18	254	9	1.38E-03	34.6	2.74E+00
12	4	129.44	199	897	1.18	258.72	254	9	4.60E-03	26.1	
13	0	134.15	113	789	1.92	268.15	265	7	2.62E-03	42.3	
14	0	144.02*	85	991	1.24	287.87	284	8	1.97E-03	76.8	
15	0	154.56	139	969	1.60	308.94	305	8	3.22E-03	39.7	
16	0	186.20*	243	1211	1.32	372.17	367	10	5.62E-03	34.0	
17	0	209.63	203	821	1.48	419.00	416	8	4.69E-03	25.4	
18	0	216.29	86	542	1.80	432.32	430	6	2.00E-03	44.0	
19	5	236.94	81	638	1.79	473.59	470	19	1.88E-03	55.0	1.71E+00
20	5	239.05*	2718	604	1.25	477.81	470	19	6.29E-02	2.8	
21	5	242.08	640	708	1.78	483.87	470	19	1.48E-02	8.8	
22	0	270.81	240	704	1.66	541.30	537	10	5.56E-03	21.7	
23	0	278.14	118	674	1.28	555.94	551	9	2.72E-03	41.0	
24	0	295.74*	761	712	1.23	591.12	586	11	1.76E-02	8.7	
25	0	300.76	251	598	1.41	601.15	597	10	5.81E-03	19.3	
26	0	328.61	47	573	0.87	656.82	653	8	1.09E-03	89.0	
27	0	338.74*	425	606	1.14	677.08	672	10	9.85E-03	13.9	
28	0	352.42*	1134	769	1.37	704.43	698	13	2.63E-02	6.8	
29	1	410.13	117	376	1.52	819.78	815	15	2.70E-03	31.6	9.15E-01
30	1	413.38	48	291	1.24	826.28	815	15	1.12E-03	59.7	
31	0	463.45	93	373	1.44	926.38	923	9	2.16E-03	38.8	
32	0	501.16	67	238	1.11	1001.77	998	9	1.55E-03	43.1	
33	0	511.64*	296	628	2.17	1022.74	1014	20	6.86E-03	28.6	
34	0	583.77*	825	406	1.58	1166.94	1159	17	1.91E-02	7.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	610.11*	837	432	1.36	1219.61	1214	13	1.94E-02	7.1	
36	0	692.83	47	200	1.02	1385.03	1381	9	1.08E-03	56.8	
37	0	727.88	269	258	1.75	1455.12	1447	15	6.23E-03	14.4	
38	0	768.80	104	270	2.03	1536.94	1530	13	2.41E-03	34.0	
39	0	795.58	157	212	1.16	1590.49	1584	13	3.64E-03	20.7	
40	0	806.70	30	156	3.70	1612.75	1611	10	6.95E-04	80.2	
41	0	861.30	105	130	1.80	1721.95	1719	9	2.43E-03	21.6	
42	0	912.06*	546	221	1.61	1823.47	1816	16	1.26E-02	8.3	
43	0	935.12	81	180	2.53	1869.58	1863	14	1.88E-03	37.0	
44	0	969.07*	274	312	1.79	1937.49	1927	18	6.34E-03	17.0	
45	0	986.81	24	109	2.21	1972.98	1969	9	5.55E-04	80.9	
46	0	1001.46*	17	192	1.76	2002.28	1997	16	3.96E-04	216.6	
47	0	1121.60*	199	192	1.75	2242.63	2235	16	4.62E-03	20.0	
48	1	1179.95	39	65	2.03	2359.37	2356	34	9.05E-04	34.7	1.46E+00
49	1	1191.44*	7	123	2.03	2382.34	2356	34	1.72E-04	410.3	
50	0	1239.84	107	168	1.27	2479.18	2472	14	2.48E-03	28.0	
51	0	1258.51	33	94	4.23	2516.54	2510	11	7.69E-04	59.0	
52	0	1369.76	18	30	1.76	2739.15	2735	7	4.10E-04	57.3	
53	0	1379.01	75	131	2.61	2757.66	2748	20	1.74E-03	38.9	
54	0	1403.20	52	35	1.88	2806.06	2800	10	1.20E-03	25.4	
55	0	1411.16	45	129	2.31	2822.00	2812	23	1.04E-03	66.7	
56	0	1441.25	21	31	2.09	2882.21	2877	10	4.94E-04	52.8	
57	0	1462.10*	1892	142	2.11	2923.93	2915	21	4.38E-02	2.9	
58	0	1510.94	22	72	1.44	3021.68	3016	11	5.07E-04	77.8	
59	0	1582.82	67	22	4.35	3165.55	3158	15	1.55E-03	19.6	
60	0	1589.85	25	53	1.50	3179.61	3175	8	5.82E-04	54.2	
61	0	1594.09	48	56	2.60	3188.09	3183	12	1.12E-03	34.3	
62	0	1632.45	31	50	2.41	3264.88	3256	14	7.07E-04	53.3	
63	0	1731.33	48	64	1.60	3462.80	3454	17	1.12E-03	40.4	
64	0	1766.33	203	46	2.17	3532.86	3524	21	4.69E-03	11.3	
65	0	1849.67	34	32	1.63	3699.71	3690	14	7.88E-04	39.0	
66	0	1998.13	29	36	5.80	3996.95	3986	18	6.74E-04	51.7	
67	0	2018.92	36	10	1.69	4038.59	4032	13	8.41E-04	24.3	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656008.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:00:00 Acquisition date : 23-JUN-2016 13:05:23
Sample ID        : G398656008 Sample quantity   : 173.77 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA15 Detector geometry   : CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:06.47 0.0%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated : No Systematic Error      : 0.00 %
Efficiency type   : Empirical Efficiencies at  : Peak Energy
Abundance limit   : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.008E+00	6.206E+00	6.206E+00	5.89	OK
NB-95M	235.69	24.80*	4.247E+00	3.456E-02	5.178E-02	110.03	OK
CD-109	88.03	3.70*	4.347E+00	1.508E+00	1.595E+00	28.16	OK
SN-126	64.28	9.60	1.773E+00	1.665E-01	1.665E-01	211.70	OK
	86.94	8.90	4.347E+00	6.270E-01	6.270E-01	28.16	OK
	87.57	37.00*	4.347E+00	1.508E-01	1.508E-01	28.16	OK
CE-141	145.44	48.29*	5.584E+00	4.894E-03	1.085E-02	488.33	OK
CE-144	80.12	1.36	3.690E+00	----- Line	Not Found	-----	Absent
	133.52	11.09*	5.661E+00	8.635E-02	9.457E-02	84.60	OK
HG-203	70.83	3.69	2.653E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	2.915E+00	3.065E-01	5.341E-01	79.89	OK
	279.20	81.56*	3.794E+00	2.543E-03	4.432E-03	545.03	OK
TL-208	277.37	6.60	3.801E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	2.242E+00	1.735E-01	1.735E-01	14.78	OK
	860.56	12.50	1.634E+00	1.956E-01	1.956E-01	43.16	OK
PB-210	46.54	4.25*	2.548E-01	4.878E-01	4.893E-01	1063.68	OK
PB-212	74.82	10.28	3.146E+00	6.867E-01	6.867E-01	28.72	OK
	77.11	17.10	3.397E+00	8.326E-01	8.326E-01	16.35	OK
	238.63	43.60*	4.221E+00	6.624E-01	6.624E-01	5.61	OK
	300.09	3.30	3.590E+00	9.243E-01	9.243E-01	38.63	OK
BI-214	609.32	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20	OK
	1120.29	14.92	1.283E+00	3.818E-01	3.818E-01	40.08	OK
	1764.49	15.30	8.750E-01	----- Line	Not Found	-----	Absent
PB-214	74.82	5.80	3.119E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.397E+00	1.468E+00	1.468E+00	16.35	OK
	87.09	3.41	4.327E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.185E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.633E+00	4.975E-01	4.975E-01	17.41	OK
	351.93	35.60*	3.211E+00	4.247E-01	4.247E-01	13.52	OK
RN-222	609.32	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20	OK
	1120.29	14.92	1.283E+00	3.818E-01	3.818E-01	40.08	OK
	1764.49	15.30	8.750E-01	----- Line	Not Found	-----	Absent
RA-224	240.99	4.10*	4.184E+00	7.922E-01	7.922E-01	41.87	OK
RA-226	609.32	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20	OK
	1120.29	14.92	1.283E+00	3.818E-01	3.818E-01	40.08	OK
	1764.49	15.30	8.750E-01	----- Line	Not Found	-----	Absent
AC-228	105.21	1.10	5.346E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.301E+00	4.917E-01	4.917E-01	27.84	OK
	794.95	4.25	1.751E+00	8.134E-01	8.134E-01	41.30	OK
	835.71	1.61	1.678E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.553E+00	5.140E-01	5.140E-01	16.67	OK
	968.97	15.80	1.470E+00	4.415E-01	4.415E-01	33.97	OK
RA-228	105.21	1.10	5.346E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.301E+00	4.917E-01	4.917E-01	27.84	OK
	794.95	4.25	1.751E+00	8.134E-01	8.134E-01	41.30	OK
	835.71	1.61	1.678E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.553E+00	5.140E-01	5.140E-01	16.67	OK
	968.97	15.80	1.470E+00	4.415E-01	4.415E-01	33.97	OK
TH-228	74.82	10.28	3.146E+00	6.867E-01	6.867E-01	28.72	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	77.11	17.10	3.397E+00	8.326E-01	8.326E-01	16.35	OK
	238.63	43.60*	4.221E+00	6.624E-01	6.624E-01	5.61	OK
	300.09	3.30	3.590E+00	9.243E-01	9.243E-01	38.63	OK
	85.43	14.70	4.073E+00	1.998E-01	1.998E-01	58.16	OK
	88.47	24.00	4.347E+00	2.325E-01	2.325E-01	28.16	OK
TH-230	193.51	4.41*	4.858E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.615E+00	7.140E-01	7.140E-01	50.88	OK
	609.32	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20	OK
	1120.29	14.92	1.283E+00	3.818E-01	3.818E-01	40.08	OK
PA-231	1764.49	15.30	8.750E-01	----- Line	Not Found	-----	Absent
	283.69	1.70	3.741E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.590E+00	5.701E-01	5.701E-01	38.63	OK
TH-232	105.21	1.10	5.346E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.301E+00	4.917E-01	4.917E-01	27.84	OK
	835.71	1.61	1.678E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.553E+00	5.140E-01	5.140E-01	16.67	OK
TH-234	968.97	15.80	1.470E+00	4.415E-01	4.415E-01	33.97	OK
	63.29	3.70*	1.773E+00	4.320E-01	4.320E-01	211.70	OK
	92.59	4.23	4.755E+00	1.180E+00	1.180E+00	36.85	OK
	609.32	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20	OK
U-234	1120.29	14.92	1.283E+00	3.818E-01	3.818E-01	40.08	OK
	1764.49	15.30	8.750E-01	----- Line	Not Found	-----	Absent
	89.96	3.47	4.564E+00	1.344E+00	1.344E+00	31.35	OK
	93.35	5.60	4.755E+00	8.914E-01	8.914E-01	36.85	OK
U-235	143.76	10.96*	5.587E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	5.331E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	4.972E+00	3.945E-02	3.945E-02	67.94	OK
	205.31	5.01	4.679E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	1.773E+00	4.320E-01	4.320E-01	211.70	OK
	92.59	4.23	4.755E+00	1.180E+00	1.180E+00	36.85	OK
	129.30	0.01*	5.676E+00	2.669E+02	2.669E+02	52.22	OK
PU-239	375.05	0.00	3.074E+00	----- Line	Not Found	-----	Absent
	413.71	0.00	2.872E+00	4.821E+02	4.821E+02	119.30	OK
	43.53	5.90	1.396E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	3.146E+00	1.051E-01	1.051E-01	28.72	OK
	511.00	100.00*	2.470E+00	4.898E-02	4.898E-02	57.17	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656008.CNF;1  *
* Acquisition date   : 23-JUN-2016 13:05:23 Sensitivity      : 3.000          *
* Detector ID        : GAM15 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:06.47 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 11:00:00 Analyst initials: MXR1      *
* Sample ID          : G398656008 Sample Quantity : 1.7377E+02 GRAM    *
* Batch Number       : 1572234 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 18-JUN-2015 05:21:57 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM15_CAN.CNF;10          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.206E+00	3.580E-01	1.501E-01
NB-95M	5.178E-02	5.583E-02	6.937E-02
CD-109	1.595E+00	4.403E-01	3.643E-01
SN-126	1.508E-01	4.163E-02	3.472E-02
CE-141	1.085E-02	5.192E-02	4.455E-02
CE-144	9.457E-02	7.840E-02	9.623E-02
HG-203	4.432E-03	2.367E-02	2.455E-02
TL-208	1.735E-01	2.514E-02	1.457E-02
PB-210	4.893E-01	5.101E+00	4.686E+00
PB-212	6.624E-01	3.640E-02	2.553E-02
BI-214	3.383E-01	4.707E-02	3.252E-02
PB-214	4.247E-01	5.627E-02	3.429E-02
RN-222	3.383E-01	4.707E-02	3.252E-02
RA-224	7.922E-01	3.250E-01	2.735E-01
RA-226	3.383E-01	4.707E-02	3.252E-02
AC-228	5.140E-01	8.399E-02	5.808E-02
RA-228	5.140E-01	8.399E-02	5.808E-02
TH-228	6.624E-01	3.640E-02	2.553E-02
TH-229	2.119E-03	1.281E-01	2.459E-01
TH-230	3.383E-01	4.707E-02	3.251E-02
PA-231	5.701E-01	2.159E-01	2.084E-01
TH-232	5.140E-01	8.399E-02	5.808E-02
TH-234	4.320E-01	8.962E-01	8.529E-01
U-234	3.383E-01	4.707E-02	3.251E-02
U-235	6.628E-02	9.981E-02	9.712E-02
U-238	4.320E-01	8.962E-01	8.529E-01
PU-239	2.669E+02	1.366E+02	1.560E+02
AM-243	1.051E-01	2.957E-02	2.869E-02
ANH-511	4.898E-02	2.744E-02	1.230E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	5.685E-02	1.060E-01	1.946E-01	NOT IDENT.

NA-22	-9.352E-05	1.000E-02	1.825E-02	NOT IDENT.
NA-24	0.000E+00	6.309E+15	0.000E+00	SHORT HLIF
AL-26	-8.488E-03	1.417E-02	1.326E-02	NOT IDENT.
SC-46	-4.488E-03	1.118E-02	1.973E-02	FAIL ABUN
V-48	3.258E-02	4.763E-02	7.781E-02	NOT IDENT.
CR-51	-5.092E-04	1.645E-01	3.046E-01	NOT IDENT.
MN-54	4.272E-03	9.112E-03	1.684E-02	NOT IDENT.
CO-56	5.877E-04	1.139E-02	2.066E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-8.572E-04	6.643E-03	1.226E-02	NOT IDENT.
CO-58	-7.662E-03	1.259E-02	1.896E-02	NOT IDENT.
FE-59	-3.475E-02	3.034E-02	4.994E-02	NOT IDENT.
CO-60	1.991E-03	9.080E-03	1.683E-02	NOT IDENT.
ZN-65	4.865E-04	2.515E-02	3.823E-02	NOT IDENT.
GE-68	-8.276E-02	3.043E-01	5.308E-01	NOT IDENT.
AS-73	2.526E-01	4.913E-01	9.750E-01	NOT IDENT.
AS-74	-3.238E-02	5.239E-02	9.522E-02	NOT IDENT.
SE-75	4.701E-03	1.328E-02	2.437E-02	FAIL ABUN
BR-77	0.000E+00	3.679E+03	0.000E+00	SHORT HLIF
SR-82	-1.881E-03	1.394E-01	2.543E-01	NOT IDENT.
RB-83	-1.195E-02	2.211E-02	3.533E-02	NOT IDENT.
KR-85	0.000E+00	2.183E+00	4.713E+00	NOT IDENT.
SR-85	0.000E+00	1.460E-02	3.152E-02	NOT IDENT.
RB-86	-1.547E-01	4.122E-01	7.145E-01	NOT IDENT.
Y-88	-1.147E-02	1.122E-02	1.815E-02	NOT IDENT.
Y-91	2.595E+00	6.165E+00	1.149E+01	NOT IDENT.
NB-94	7.675E-03	8.026E-03	1.528E-02	NOT IDENT.
NB-95	1.602E-02	1.380E-02	2.340E-02	NOT IDENT.
ZR-95	4.407E-03	2.107E-02	3.887E-02	NOT IDENT.
NB-97	0.000E+00	1.510E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.534E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.873E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	7.585E-03	5.140E-03	1.514E-02	FAIL ABUN
RH-102	8.208E-03	1.262E-02	2.406E-02	NOT IDENT.
RU-103	5.254E-03	1.551E-02	2.481E-02	FAIL ABUN
RH-106	-9.096E-03	7.663E-02	1.417E-01	NOT IDENT.
RU-106	-9.096E-03	7.663E-02	1.417E-01	NOT IDENT.
AG-108M	4.975E-03	7.418E-03	1.376E-02	NOT IDENT.
AG-110M	4.332E-03	1.242E-02	2.280E-02	NOT IDENT.
SN-113	-4.287E-03	1.302E-02	2.346E-02	NOT IDENT.
CD-115	0.000E+00	2.744E+03	0.000E+00	SHORT HLIF
SN-117M	2.142E-02	4.718E-02	7.733E-02	FAIL ABUN
TE-123M	2.604E-03	9.032E-03	1.471E-02	NOT IDENT.
SB-124	-5.356E-03	2.432E-02	4.343E-02	NOT IDENT.
SB-125	1.409E-02	2.327E-02	4.307E-02	FAIL ABUN
TE-125M	-1.939E+00	3.217E+00	5.914E+00	NOT IDENT.
I-126	6.503E-02	1.678E-01	3.145E-01	NOT IDENT.
SB-126	1.829E-02	1.262E-01	2.033E-01	FAIL ABUN
SB-127	4.308E+00	1.643E+01	3.063E+01	NOT IDENT.
I-131	1.069E-01	1.952E-01	3.649E-01	NOT IDENT.
I-132	0.000E+00	1.700E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.189E+01	0.000E+00	SHORT HLIF
BA-133	9.267E-03	1.167E-02	1.951E-02	NOT IDENT.
I-133	0.000E+00	7.151E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.694E-02	2.179E-02	FAIL ABUN
CS-135	5.056E-03	4.370E-02	7.247E-02	NOT IDENT.
I-135	0.000E+00	3.681E+39	0.000E+00	SHORT HLIF
CS-136	-4.708E-02	8.230E-02	1.413E-01	FAIL ABUN
BA-137M	2.043E-03	8.156E-03	1.523E-02	NOT IDENT.
CS-137	2.158E-03	8.617E-03	1.608E-02	NOT IDENT.
CE-139	-6.609E-03	8.562E-03	1.516E-02	NOT IDENT.
BA-140	5.146E-02	2.181E-01	3.921E-01	NOT IDENT.
LA-140	4.862E-02	8.601E-02	1.412E-01	FAIL ABUN
CE-143	0.000E+00	2.599E+06	0.000E+00	SHORT HLIF
PM-144	-2.061E-03	9.833E-03	1.549E-02	NOT IDENT.
PR-144	-1.566E-01	7.445E-01	1.173E+00	NOT IDENT.
PM-146	9.633E-05	1.070E-02	1.929E-02	NOT IDENT.
ND-147	1.494E-02	5.489E-01	9.794E-01	FAIL ABUN
PM-147	2.188E+01	1.849E+02	3.436E+02	NOT IDENT.
PM-149	0.000E+00	2.485E+04	0.000E+00	SHORT HLIF
EU-150	-4.135E-03	8.658E-03	1.274E-02	FAIL ABUN
EU-152	-3.113E-02	3.274E-02	4.678E-02	NOT IDENT.
GD-153	-2.403E-02	3.358E-02	3.961E-02	NOT IDENT.
EU-154	-7.970E-05	2.804E-02	5.116E-02	NOT IDENT.
EU-155	2.311E-02	2.647E-02	5.056E-02	FAIL ABUN
TB-160	-1.060E-02	3.640E-02	6.482E-02	FAIL ABUN
HO-166M	6.782E-03	1.400E-02	2.624E-02	FAIL ABUN

TM-171	-8.476E+00	9.256E+00	1.775E+01	NOT IDENT.
HF-172	5.350E-02	5.338E-02	9.073E-02	FAIL ABUN
LU-172	1.072E-02	1.503E-02	2.771E-02	FAIL ABUN
LU-176	-2.701E-03	7.133E-03	1.212E-02	FAIL ABUN
HF-181	-1.124E-03	1.524E-02	2.729E-02	FAIL ABUN
TA-182	2.863E-03	4.789E-02	8.765E-02	FAIL ABUN
RE-183	-9.725E-03	9.996E-02	1.943E-01	NOT IDENT.
RE-184	-3.773E-02	4.652E-02	7.768E-02	NOT IDENT.
W-188	-5.250E-01	2.643E+00	4.298E+00	FAIL ABUN
IR-192	4.665E-03	1.088E-02	2.042E-02	FAIL ABUN
BI-207	-4.029E-03	1.251E-02	2.175E-02	FAIL ABUN
BI-211	0.000E+00	1.550E-01	1.738E-01	FAIL ABUN
PB-211	2.401E-01	1.966E-01	3.323E-01	NOT IDENT.
BI-212	0.000E+00	2.348E-01	2.911E-01	FAIL ABUN
RN-219	1.220E-02	9.945E-02	1.819E-01	FAIL ABUN
RA-223	3.808E-02	1.885E-01	3.085E-01	FAIL ABUN
AC-227	7.428E-02	6.483E-02	1.254E-01	FAIL ABUN
TH-227	7.428E-02	6.483E-02	1.254E-01	FAIL ABUN
TH-231	3.808E-02	1.885E-01	3.085E-01	FAIL ABUN
PA-233	-1.076E-02	1.632E-02	2.968E-02	FAIL ABUN
PA-234	-6.723E-02	6.565E-02	1.109E-01	FAIL ABUN
PA-234M	5.326E-01	2.261E+00	2.074E+00	FAIL ABUN
NP-237	-1.076E-02	1.632E-02	2.968E-02	FAIL ABUN
NP-238	0.000E+00	7.846E+03	0.000E+00	SHORT HLIF
NP-239	4.539E-02	6.643E-02	1.254E-01	FAIL ABUN
AM-241	4.419E-02	6.451E-02	1.149E-01	NOT IDENT.
CM-243	-3.638E-02	2.986E-02	4.791E-02	FAIL ABUN
BK-247	-1.276E-03	2.108E-02	3.820E-02	FAIL ABUN
CM-247	-1.757E-03	9.267E-03	1.675E-02	FAIL ABUN
CF-249	9.795E-03	9.983E-03	1.883E-02	NOT IDENT.
CF-251	-1.379E-02	3.468E-02	6.167E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1852	10.66*	1.008E+00	6.206E+00	6.206E+00	5.89
NB-95M	235.69	101	24.80*	4.247E+00	3.456E-02	5.178E-02	110.03
CD-109	88.03	879	3.70*	4.347E+00	1.967E+00	2.080E+00	21.21
SN-126	64.28	79	9.60	1.773E+00	1.665E-01	1.665E-01	211.70
	86.94	879	8.90	4.347E+00	8.176E-01	8.176E-01	21.21
	87.57	879	37.00*	4.347E+00	1.967E-01	1.967E-01	21.21
CE-141	145.44	113	48.29*	5.584E+00	1.504E-02	3.335E-02	153.68
CE-144	80.12	-----	1.36	3.690E+00	-----	Line Not Found	-----
	133.52	151	11.09*	5.661E+00	8.635E-02	9.457E-02	84.60
HG-203	70.83	-----	3.69	2.653E+00	-----	Line Not Found	-----
	72.87	154	6.19	2.915E+00	3.065E-01	5.341E-01	79.89
	279.20	144	81.56*	3.794E+00	1.674E-02	2.917E-02	81.96
TL-208	277.37	144	6.60	3.794E+00	2.068E-01	2.068E-01	81.96
	583.19	919	85.00*	2.242E+00	1.735E-01	1.735E-01	14.78
	860.56	111	12.50	1.634E+00	1.956E-01	1.956E-01	43.16
PB-210	46.54	15	4.25*	2.548E-01	4.878E-01	4.893E-01	1063.68
BI-211	72.87	154	1.23	2.915E+00	1.542E+00	1.542E+00	79.89
	351.06	1348	12.92*	3.211E+00	1.170E+00	1.170E+00	13.52
PB-212	74.82	869	10.28	3.146E+00	9.674E-01	9.674E-01	19.75
	77.11	1343	17.10	3.397E+00	8.326E-01	8.326E-01	16.35
	238.63	3386	43.60*	4.221E+00	6.624E-01	6.624E-01	5.61
	300.09	304	3.30	3.590E+00	9.243E-01	9.243E-01	38.63
BI-214	609.32	927	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20
	1120.29	203	14.92	1.283E+00	3.818E-01	3.818E-01	40.08
	1764.49	-----	15.30	8.750E-01	-----	Line Not Found	-----
PB-214	74.82	869	5.80	3.146E+00	1.715E+00	1.715E+00	19.75
	77.11	1343	9.70	3.397E+00	1.468E+00	1.468E+00	16.35
	87.09	879	3.41	4.347E+00	2.134E+00	2.134E+00	21.21
	242.00	797	7.25	4.184E+00	9.455E-01	9.455E-01	17.60
	295.22	925	18.42	3.633E+00	4.975E-01	4.975E-01	17.41
	351.93	1348	35.60*	3.211E+00	4.247E-01	4.247E-01	13.52
RN-222	609.32	927	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20
	1120.29	203	14.92	1.283E+00	3.818E-01	3.818E-01	40.08
	1764.49	-----	15.30	8.750E-01	-----	Line Not Found	-----
RA-224	240.99	797	4.10*	4.184E+00	1.672E+00	1.672E+00	17.60
RA-226	609.32	927	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20
	1120.29	203	14.92	1.283E+00	3.818E-01	3.818E-01	40.08
	1764.49	-----	15.30	8.750E-01	-----	Line Not Found	-----
AC-228	105.21	-----	1.10	5.346E+00	-----	Line Not Found	-----
	338.32	508	11.27	3.301E+00	4.917E-01	4.917E-01	27.84
	794.95	168	4.25	1.751E+00	8.134E-01	8.134E-01	41.30
	835.71	-----	1.61	1.678E+00	-----	Line Not Found	-----
	911.20	572	25.80*	1.553E+00	5.140E-01	5.140E-01	16.67
	968.97	285	15.80	1.470E+00	4.415E-01	4.415E-01	33.97
RA-228	105.21	-----	1.10	5.346E+00	-----	Line Not Found	-----
	338.32	508	11.27	3.301E+00	4.917E-01	4.917E-01	27.84
	794.95	168	4.25	1.751E+00	8.134E-01	8.134E-01	41.30

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	-----	1.61	1.678E+00	-----	Line Not Found	-----
	911.20	572	25.80*	1.553E+00	5.140E-01	5.140E-01	16.67
	968.97	285	15.80	1.470E+00	4.415E-01	4.415E-01	33.97
TH-228	74.82	869	10.28	3.146E+00	9.674E-01	9.674E-01	19.75
	77.11	1343	17.10	3.397E+00	8.326E-01	8.326E-01	16.35
	238.63	3386	43.60*	4.221E+00	6.624E-01	6.624E-01	5.61
	300.09	304	3.30	3.590E+00	9.243E-01	9.243E-01	38.63
TH-229	85.43	332	14.70	4.073E+00	1.998E-01	1.998E-01	58.16
	88.47	879	24.00	4.347E+00	3.032E-01	3.032E-01	21.21
	193.51	-----	4.41*	4.858E+00	-----	Line Not Found	-----
	210.85	256	2.80	4.615E+00	7.140E-01	7.140E-01	50.88
TH-230	609.32	927	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20
	1120.29	203	14.92	1.283E+00	3.818E-01	3.818E-01	40.08
	1764.49	-----	15.30	8.750E-01	-----	Line Not Found	-----
PA-231	283.69	-----	1.70	3.741E+00	-----	Line Not Found	-----
	301.36	304	5.35*	3.590E+00	5.701E-01	5.701E-01	38.63
TH-232	105.21	-----	1.10	5.346E+00	-----	Line Not Found	-----
	338.32	508	11.27	3.301E+00	4.917E-01	4.917E-01	27.84
	835.71	-----	1.61	1.678E+00	-----	Line Not Found	-----
	911.20	572	25.80*	1.553E+00	5.140E-01	5.140E-01	16.67
	968.97	285	15.80	1.470E+00	4.415E-01	4.415E-01	33.97
TH-234	63.29	79	3.70*	1.773E+00	4.320E-01	4.320E-01	211.70
	92.59	659	4.23	4.755E+00	1.180E+00	1.180E+00	36.85
U-234	609.32	927	45.49*	2.169E+00	3.383E-01	3.383E-01	14.20
	1120.29	203	14.92	1.283E+00	3.818E-01	3.818E-01	40.08
	1764.49	-----	15.30	8.750E-01	-----	Line Not Found	-----
U-235	89.96	591	3.47	4.564E+00	1.344E+00	1.344E+00	31.35
	93.35	659	5.60	4.755E+00	8.914E-01	8.914E-01	36.85
	143.76	113	10.96*	5.584E+00	6.628E-02	6.628E-02	153.68
	163.33	-----	5.08	5.331E+00	-----	Line Not Found	-----
	185.72	312	57.20	4.972E+00	3.945E-02	3.945E-02	67.94
	205.31	-----	5.01	4.679E+00	-----	Line Not Found	-----
U-238	63.29	79	3.70*	1.773E+00	4.320E-01	4.320E-01	211.70
	92.59	659	4.23	4.755E+00	1.180E+00	1.180E+00	36.85
PU-239	129.30	265	0.01*	5.676E+00	2.669E+02	2.669E+02	52.22
	375.05	-----	0.00	3.074E+00	-----	Line Not Found	-----
	413.71	56	0.00	2.872E+00	4.821E+02	4.821E+02	119.30
AM-243	43.53	-----	5.90	1.396E-01	-----	Line Not Found	-----
	74.66	869	67.20*	3.146E+00	1.480E-01	1.480E-01	19.75
ANH-511	511.00	336	100.00*	2.470E+00	4.898E-02	4.898E-02	57.17

Flag: "*" = Keyline

Total number of lines in spectrum 67
Number of unidentified lines 23
Number of lines tentatively identified by NID 44 65.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.206E+00	6.206E+00	0.365E+00	5.89	
NB-95M	64.03D	1.50	3.456E-02	5.178E-02	5.697E-02	110.03	
CD-109	461.40D	1.06	1.967E+00	2.080E+00	0.441E+00	21.21	
SN-126	2.30E+05Y	1.00	1.967E-01	1.967E-01	0.417E-01	21.21	
CE-141	32.51D	2.22	1.504E-02	3.335E-02	5.124E-02	153.68	
CE-144	284.91D	1.10	8.635E-02	9.457E-02	8.000E-02	84.60	
HG-203	46.59D	1.74	1.674E-02	2.917E-02	2.391E-02	81.96	
TL-208	1.41E+10Y	1.00	1.735E-01	1.735E-01	0.257E-01	14.78	
PB-210	22.20Y	1.00	4.878E-01	4.893E-01	52.05E-01	1063.68	
BI-211	7.04E+08Y	1.00	1.170E+00	1.170E+00	0.158E+00	13.52	
PB-212	1.41E+10Y	1.00	6.624E-01	6.624E-01	0.371E-01	5.61	
BI-214	1600.00Y	1.00	3.383E-01	3.383E-01	0.480E-01	14.20	
PB-214	1600.00Y	1.00	4.247E-01	4.247E-01	0.574E-01	13.52	
RN-222	1600.00Y	1.00	3.383E-01	3.383E-01	0.480E-01	14.20	
RA-224	1.41E+10Y	1.00	1.672E+00	1.672E+00	0.294E+00	17.60	
RA-226	1600.00Y	1.00	3.383E-01	3.383E-01	0.480E-01	14.20	
AC-228	1.41E+10Y	1.00	5.140E-01	5.140E-01	0.857E-01	16.67	
RA-228	1.41E+10Y	1.00	5.140E-01	5.140E-01	0.857E-01	16.67	
TH-228	1.41E+10Y	1.00	6.624E-01	6.624E-01	0.371E-01	5.61	
TH-229	7340.00Y	1.00	3.032E-01	3.032E-01	0.643E-01	21.21	K
TH-230	7.54E+04Y	1.00	3.383E-01	3.383E-01	0.480E-01	14.20	
PA-231	7.04E+08Y	1.00	5.701E-01	5.701E-01	2.203E-01	38.63	
TH-232	1.41E+10Y	1.00	5.140E-01	5.140E-01	0.857E-01	16.67	
TH-234	4.47E+09Y	1.00	4.320E-01	4.320E-01	9.145E-01	211.70	
U-234	2.45E+05Y	1.00	3.383E-01	3.383E-01	0.480E-01	14.20	
U-235	7.04E+08Y	1.00	6.628E-02	6.628E-02	10.19E-02	153.68	
U-238	4.47E+09Y	1.00	4.320E-01	4.320E-01	9.145E-01	211.70	
PU-239	24110.00Y	1.00	2.669E+02	2.669E+02	1.394E+02	52.22	
AM-243	7370.00Y	1.00	1.480E-01	1.480E-01	0.292E-01	19.75	
ANH-511	1.00E+09Y	1.00	4.898E-02	4.898E-02	2.800E-02	57.17	
Total Activity :			2.859E+02	2.861E+02			

Grand Total Activity : 2.859E+02 2.861E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	99.77	58	1318	1.06	199.43	195	8	9.80E-04	****	5.13E+00	T
4	127.67	80	337	1.07	255.18	254	9	1.38E-03	69.1	5.68E+00	T
0	154.56	182	1269	1.60	308.94	305	8	3.22E-03	79.4	5.46E+00	T
0	216.29	109	683	1.80	432.32	430	6	2.00E-03	88.0	4.52E+00	T
0	270.81	295	864	1.66	541.30	537	10	5.56E-03	43.3	3.87E+00	T
0	328.61	57	687	0.87	656.82	653	8	1.09E-03	****	3.37E+00	T
1	410.13	136	439	1.52	819.78	815	15	2.70E-03	63.1	2.89E+00	T
0	463.45	107	428	1.44	926.38	923	9	2.16E-03	77.6	2.65E+00	T
0	501.16	76	270	1.11	1001.77	998	9	1.55E-03	86.2	2.51E+00	
0	692.83	51	218	1.02	1385.03	1381	9	1.08E-03	****	1.96E+00	
0	727.88	291	279	1.75	1455.12	1447	15	6.23E-03	28.8	1.89E+00	T
0	768.80	112	290	2.03	1536.94	1530	13	2.41E-03	68.1	1.80E+00	
0	806.70	32	166	3.70	1612.75	1611	10	6.95E-04	****	1.73E+00	
0	935.12	85	188	2.53	1869.58	1863	14	1.88E-03	73.9	1.52E+00	
0	986.81	25	113	2.21	1972.98	1969	9	5.55E-04	****	1.45E+00	
0	1001.46	18	199	1.76	2002.28	1997	16	3.96E-04	****	1.43E+00	T
1	1179.95	40	66	2.03	2359.37	2356	34	9.05E-04	69.5	1.22E+00	
1	1191.44	8	124	2.03	2382.34	2356	34	1.72E-04	****	1.21E+00	
0	1239.84	107	168	1.27	2479.18	2472	14	2.48E-03	56.0	1.17E+00	
0	1258.51	33	94	4.23	2516.54	2510	11	7.69E-04	****	1.15E+00	
0	1369.76	18	30	1.76	2739.15	2735	7	4.10E-04	****	1.07E+00	T
0	1379.01	74	129	2.61	2757.66	2748	20	1.74E-03	77.8	1.06E+00	
0	1403.20	51	34	1.88	2806.06	2800	10	1.20E-03	50.8	1.04E+00	
0	1411.16	44	127	2.31	2822.00	2812	23	1.04E-03	****	1.04E+00	
0	1441.25	21	30	2.09	2882.21	2877	10	4.94E-04	****	1.02E+00	
0	1510.94	21	70	1.44	3021.68	3016	11	5.07E-04	****	9.80E-01	
0	1582.82	65	21	4.35	3165.55	3158	15	1.55E-03	39.2	9.45E-01	T
0	1589.85	24	51	1.50	3179.61	3175	8	5.82E-04	****	9.41E-01	
0	1594.09	47	54	2.60	3188.09	3183	12	1.12E-03	68.6	9.40E-01	
0	1632.45	29	49	2.41	3264.88	3256	14	7.07E-04	****	9.23E-01	
0	1731.33	46	61	1.60	3462.80	3454	17	1.12E-03	80.8	8.86E-01	
0	1766.33	193	44	2.17	3532.86	3524	21	4.69E-03	22.6	8.74E-01	
0	1849.67	32	30	1.63	3699.71	3690	14	7.88E-04	78.0	8.51E-01	
0	1998.13	27	33	5.80	3996.95	3986	18	6.74E-04	****	8.22E-01	
0	2018.92	34	9	1.69	4038.59	4032	13	8.41E-04	48.5	8.19E-01	

Flags: "T" = Tentatively associated


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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656008.CNF;1      *
* Acquisition date   : 23-JUN-2016 13:05:23 Sensitivity      : 3.000                *
* Detector ID        : GAM15 Energy tolerance: 1.500          *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:06.47 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 11:00:00 Nuclide Library : SOLID          *
* Sample ID          : G398656008 Analyst initials: MXR1          *
* Batch Number       : 1572234 Sample Quantity : 1.7377E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date     : 18-JUN-2015 05:21:57 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM15_CAN.CNF;10          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	7.051E-02
NB-95M	3.396E-02
CD-109	1.787E-01
SN-126	1.703E-02
CE-141	2.185E-02
CE-144	4.721E-02
HG-203	1.199E-02
TL-208	7.021E-03
PB-210	2.293E+00
PB-212	1.249E-02
BI-214	1.575E-02
PB-214	1.670E-02
RN-222	1.575E-02
RA-224	1.338E-01
RA-226	1.575E-02
AC-228	2.780E-02
RA-228	2.780E-02
TH-228	1.249E-02
TH-229	1.206E-01
TH-230	1.575E-02
PA-231	1.015E-01
TH-232	2.780E-02
TH-234	4.182E-01
U-234	1.575E-02
U-235	4.771E-02
U-238	4.182E-01
PU-239	7.655E+01
AM-243	1.409E-02
ANH-511	5.945E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.424E-02	NOT IDENT.
NA-22	8.680E-03	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	6.064E-03	NOT IDENT.
SC-46	9.437E-03	FAIL ABUN
V-48	3.718E-02	NOT IDENT.
CR-51	1.485E-01	NOT IDENT.
MN-54	8.099E-03	NOT IDENT.
CO-56	9.908E-03	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	6.011E-03	NOT IDENT.
CO-58	9.060E-03	NOT IDENT.
FE-59	2.377E-02	NOT IDENT.
CO-60	7.958E-03	NOT IDENT.
ZN-65	1.827E-02	NOT IDENT.
GE-68	2.527E-01	NOT IDENT.
AS-73	4.774E-01	NOT IDENT.
AS-74	4.596E-02	NOT IDENT.
SE-75	1.191E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.220E-01	NOT IDENT.
RB-83	1.705E-02	NOT IDENT.
KR-85	2.309E+00	NOT IDENT.
SR-85	1.544E-02	NOT IDENT.
RB-86	3.400E-01	NOT IDENT.
Y-88	8.344E-03	NOT IDENT.
Y-91	5.502E+00	NOT IDENT.
NB-94	7.382E-03	NOT IDENT.
NB-95	1.129E-02	NOT IDENT.
ZR-95	1.868E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.431E-03	FAIL ABUN
RH-102	1.160E-02	NOT IDENT.
RU-103	1.198E-02	FAIL ABUN
RH-106	6.829E-02	NOT IDENT.
RU-106	6.829E-02	NOT IDENT.
AG-108M	6.678E-03	NOT IDENT.
AG-110M	1.093E-02	NOT IDENT.
SN-113	1.140E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.792E-02	FAIL ABUN
TE-123M	7.215E-03	NOT IDENT.
SB-124	1.996E-02	NOT IDENT.
SB-125	2.091E-02	FAIL ABUN
TE-125M	2.901E+00	NOT IDENT.
I-126	1.517E-01	NOT IDENT.
SB-126	9.769E-02	FAIL ABUN
SB-127	1.474E+01	NOT IDENT.
I-131	1.775E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	9.495E-03	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	1.055E-02	FAIL ABUN
CS-135	3.541E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.740E-02	FAIL ABUN
BA-137M	7.339E-03	NOT IDENT.
CS-137	7.753E-03	NOT IDENT.
CE-139	7.435E-03	NOT IDENT.
BA-140	1.895E-01	NOT IDENT.
LA-140	6.646E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
PM-144	7.469E-03	NOT IDENT.
PR-144	5.654E-01	NOT IDENT.
PM-146	9.354E-03	NOT IDENT.
ND-147	4.728E-01	FAIL ABUN
PM-147	1.685E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	6.213E-03	FAIL ABUN
EU-152	2.280E-02	NOT IDENT.
GD-153	1.940E-02	NOT IDENT.
EU-154	2.434E-02	NOT IDENT.
EU-155	2.481E-02	FAIL ABUN
TB-160	3.094E-02	FAIL ABUN
HO-166M	1.264E-02	FAIL ABUN
TM-171	8.684E+00	NOT IDENT.

HF-172	4.452E-02	FAIL ABUN
LU-172	1.323E-02	FAIL ABUN
LU-176	5.904E-03	FAIL ABUN
HF-181	1.320E-02	FAIL ABUN
TA-182	4.190E-02	FAIL ABUN
RE-183	9.519E-02	NOT IDENT.
RE-184	3.711E-02	NOT IDENT.
W-188	2.099E+00	FAIL ABUN
IR-192	9.955E-03	FAIL ABUN
BI-207	1.038E-02	FAIL ABUN
BI-211	8.568E-02	FAIL ABUN
PB-211	1.615E-01	NOT IDENT.
BI-212	1.416E-01	FAIL ABUN
RN-219	8.832E-02	FAIL ABUN
RA-223	1.505E-01	FAIL ABUN
AC-227	6.139E-02	FAIL ABUN
TH-227	6.139E-02	FAIL ABUN
TH-231	1.505E-01	FAIL ABUN
PA-233	1.446E-02	FAIL ABUN
PA-234	5.270E-02	FAIL ABUN
PA-234M	9.959E-01	FAIL ABUN
NP-237	1.446E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	6.153E-02	FAIL ABUN
AM-241	5.631E-02	NOT IDENT.
CM-243	2.348E-02	FAIL ABUN
BK-247	1.867E-02	FAIL ABUN
CM-247	8.135E-03	FAIL ABUN
CF-249	9.159E-03	NOT IDENT.
CF-251	3.025E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656008.CNF;1
Acquisition date : 23-JUN-2016 13:05:23 Sensitivity : 3.000
Detector ID : GAM15 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.47 Half life ratio : *****
Sample date : 17-MAY-2016 11:00:00 Nuclide Library : SOLID
Sample ID : G398656008 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.7377E+02 GRAM
Quantity Err(%) : 1.1509E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-JUN-2015 05:21:57 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM15_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.206E+00	6.365E-01	6.365E-01
NB-95M	5.178E-02	5.611E-02	5.611E-02
CD-109	1.595E+00	4.728E-01	4.728E-01
SN-126	1.508E-01	4.398E-02	4.398E-02
CE-141	1.103E-02	5.199E-02	5.199E-02
CE-144	9.457E-02	7.886E-02	7.886E-02
HG-203	4.371E-03	2.399E-02	2.399E-02
TL-208	1.735E-01	2.950E-02	2.950E-02
PB-210	4.893E-01	5.101E+00	5.101E+00
PB-212	6.624E-01	6.980E-02	6.980E-02
BI-214	3.383E-01	5.602E-02	5.602E-02
PB-214	4.247E-01	6.742E-02	6.742E-02
RN-222	3.383E-01	5.602E-02	5.602E-02
RA-224	7.922E-01	3.521E-01	3.521E-01
RA-226	3.383E-01	5.602E-02	5.602E-02
AC-228	5.140E-01	1.110E-01	1.110E-01
RA-228	5.140E-01	1.110E-01	1.110E-01
TH-228	6.624E-01	6.980E-02	6.980E-02
TH-229	2.119E-03	1.281E-01	1.281E-01
TH-230	3.383E-01	5.602E-02	5.602E-02
PA-231	5.701E-01	2.525E-01	2.525E-01
TH-232	5.140E-01	1.110E-01	1.110E-01
TH-234	4.320E-01	9.019E-01	9.019E-01
U-234	3.383E-01	5.602E-02	5.602E-02
U-235	6.628E-02	9.996E-02	9.996E-02
U-238	4.320E-01	9.019E-01	9.019E-01
PU-239	2.669E+02	1.385E+02	1.385E+02
AM-243	1.051E-01	3.157E-02	3.157E-02
ANH-511	4.898E-02	2.776E-02	2.776E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	5.685E-02	1.061E-01	1.092E-01 NOT IDENT.

NA-22	-9.352E-05	1.000E-02	1.000E-02	NOT IDENT.
NA-24	5.613E+15	6.331E+15	6.818E+15	SHORT HLIF
AL-26	-8.488E-03	1.419E-02	1.470E-02	NOT IDENT.
SC-46	-4.488E-03	1.119E-02	1.137E-02	FAIL ABUN
V-48	3.258E-02	4.789E-02	5.009E-02	NOT IDENT.
CR-51	-5.092E-04	1.645E-01	1.645E-01	NOT IDENT.
MN-54	4.272E-03	9.127E-03	9.328E-03	NOT IDENT.
CO-56	5.877E-04	1.139E-02	1.139E-02	NOT IDENT.
MN-56	1.000E+41	1.663E+42	0.000E+00	SHORT HLIF
CO-57	-8.572E-04	6.644E-03	6.655E-03	NOT IDENT.
CO-58	-7.662E-03	1.262E-02	1.308E-02	NOT IDENT.
FE-59	-3.475E-02	3.105E-02	3.477E-02	NOT IDENT.
CO-60	1.991E-03	9.081E-03	9.125E-03	NOT IDENT.
ZN-65	4.865E-04	2.515E-02	2.515E-02	NOT IDENT.
GE-68	-8.276E-02	3.046E-01	3.069E-01	NOT IDENT.
AS-73	2.526E-01	4.946E-01	5.075E-01	NOT IDENT.
AS-74	-3.238E-02	5.252E-02	5.451E-02	NOT IDENT.
SE-75	4.701E-03	1.329E-02	1.346E-02	FAIL ABUN
BR-77	6.695E+04	7.247E+04	7.850E+04	SHORT HLIF
SR-82	-1.881E-03	1.394E-01	1.394E-01	NOT IDENT.
RB-83	-1.195E-02	2.219E-02	2.283E-02	NOT IDENT.
KR-85	1.680E+01	2.616E+00	8.012E+00	NOT IDENT.
SR-85	1.121E-01	1.749E-02	5.349E-02	NOT IDENT.
RB-86	-1.547E-01	4.130E-01	4.189E-01	NOT IDENT.
Y-88	-1.147E-02	1.125E-02	1.238E-02	NOT IDENT.
Y-91	2.595E+00	6.169E+00	6.279E+00	NOT IDENT.
NB-94	7.675E-03	8.061E-03	8.772E-03	NOT IDENT.
NB-95	1.602E-02	1.391E-02	1.567E-02	NOT IDENT.
ZR-95	4.407E-03	2.107E-02	2.117E-02	NOT IDENT.
NB-97	-1.000E+41	1.512E+41	0.000E+00	SHORT HLIF
ZR-97	2.926E+15	1.554E+15	2.038E+15	SHORT HLIF
MO-99	-2.873E+02	7.879E+02	7.985E+02	SHORT HLIF
TC-99M	1.000E+41	3.145E+41	0.000E+00	SHORT HLIF
RH-101	7.585E-03	5.346E-03	6.346E-03	FAIL ABUN
RH-102	8.208E-03	1.265E-02	1.318E-02	NOT IDENT.
RU-103	5.254E-03	1.552E-02	1.570E-02	FAIL ABUN
RH-106	-9.096E-03	7.664E-02	7.675E-02	NOT IDENT.
RU-106	-9.096E-03	7.664E-02	7.675E-02	NOT IDENT.
AG-108M	4.975E-03	7.429E-03	7.760E-03	NOT IDENT.
AG-110M	4.332E-03	1.243E-02	1.259E-02	NOT IDENT.
SN-113	-4.287E-03	1.302E-02	1.317E-02	NOT IDENT.
CD-115	7.174E+02	2.745E+03	2.764E+03	SHORT HLIF
SN-117M	2.142E-02	4.721E-02	4.818E-02	FAIL ABUN
TE-123M	2.604E-03	9.034E-03	9.110E-03	NOT IDENT.
SB-124	-5.356E-03	2.433E-02	2.445E-02	NOT IDENT.
SB-125	1.409E-02	2.330E-02	2.415E-02	FAIL ABUN
TE-125M	-1.939E+00	3.222E+00	3.338E+00	NOT IDENT.
I-126	6.503E-02	1.679E-01	1.705E-01	NOT IDENT.
SB-126	1.829E-02	1.262E-01	1.265E-01	FAIL ABUN
SB-127	4.308E+00	1.645E+01	1.657E+01	NOT IDENT.
I-131	1.069E-01	1.954E-01	2.013E-01	NOT IDENT.
I-132	1.000E+41	2.856E+41	0.000E+00	SHORT HLIF
TE-132	-2.292E+00	2.190E+01	2.192E+01	SHORT HLIF
BA-133	9.267E-03	1.170E-02	1.242E-02	NOT IDENT.
I-133	3.324E+10	7.198E+10	7.352E+10	SHORT HLIF
CS-134	4.186E-02	1.761E-02	2.581E-02	FAIL ABUN
CS-135	5.056E-03	4.371E-02	4.376E-02	NOT IDENT.
I-135	-2.947E+38	3.689E+39	0.000E+00	SHORT HLIF
CS-136	-4.708E-02	8.275E-02	8.543E-02	FAIL ABUN
BA-137M	2.043E-03	8.159E-03	8.210E-03	NOT IDENT.
CS-137	2.158E-03	8.619E-03	8.674E-03	NOT IDENT.
CE-139	-6.609E-03	8.671E-03	9.169E-03	NOT IDENT.
BA-140	5.146E-02	2.182E-01	2.194E-01	NOT IDENT.
LA-140	4.862E-02	8.609E-02	8.884E-02	FAIL ABUN
CE-143	4.188E+06	2.632E+06	3.239E+06	SHORT HLIF
PM-144	-2.061E-03	9.835E-03	9.879E-03	NOT IDENT.
PR-144	-1.566E-01	7.446E-01	7.480E-01	NOT IDENT.
PM-146	9.633E-05	1.070E-02	1.070E-02	NOT IDENT.
ND-147	1.494E-02	5.489E-01	5.489E-01	FAIL ABUN
PM-147	2.188E+01	1.849E+02	1.852E+02	NOT IDENT.
PM-149	-3.536E+03	2.486E+04	2.491E+04	SHORT HLIF
EU-150	-4.135E-03	8.666E-03	8.864E-03	FAIL ABUN
EU-152	-3.113E-02	3.287E-02	3.574E-02	NOT IDENT.
GD-153	-2.403E-02	3.363E-02	3.533E-02	NOT IDENT.
EU-154	-7.970E-05	2.804E-02	2.804E-02	NOT IDENT.
EU-155	2.311E-02	2.656E-02	2.853E-02	FAIL ABUN
TB-160	-1.060E-02	3.643E-02	3.674E-02	FAIL ABUN
HO-166M	6.782E-03	1.402E-02	1.435E-02	FAIL ABUN

TM-171	-8.476E+00	9.323E+00	1.008E+01	NOT IDENT.
HF-172	5.350E-02	5.424E-02	5.936E-02	FAIL ABUN
LU-172	1.072E-02	1.519E-02	1.594E-02	FAIL ABUN
LU-176	-2.701E-03	7.138E-03	7.241E-03	FAIL ABUN
HF-181	-1.124E-03	1.524E-02	1.525E-02	FAIL ABUN
TA-182	2.863E-03	4.789E-02	4.791E-02	FAIL ABUN
RE-183	-9.725E-03	9.996E-02	1.001E-01	NOT IDENT.
RE-184	-3.773E-02	4.687E-02	4.986E-02	NOT IDENT.
W-188	-5.250E-01	2.644E+00	2.654E+00	FAIL ABUN
IR-192	4.665E-03	1.089E-02	1.109E-02	FAIL ABUN
BI-207	-4.029E-03	1.252E-02	1.265E-02	FAIL ABUN
BI-211	1.170E+00	1.867E-01	5.596E-01	FAIL ABUN
PB-211	2.401E-01	1.976E-01	2.253E-01	NOT IDENT.
BI-212	8.327E-01	2.507E-01	4.514E-01	FAIL ABUN
RN-219	1.220E-02	9.947E-02	9.962E-02	FAIL ABUN
RA-223	3.808E-02	1.885E-01	1.893E-01	FAIL ABUN
AC-227	7.428E-02	6.583E-02	7.385E-02	FAIL ABUN
TH-227	7.428E-02	6.583E-02	7.385E-02	FAIL ABUN
TH-231	3.808E-02	1.885E-01	1.893E-01	FAIL ABUN
PA-233	-1.076E-02	1.635E-02	1.705E-02	FAIL ABUN
PA-234	-6.723E-02	1.016E-01	1.060E-01	FAIL ABUN
PA-234M	5.326E-01	2.263E+00	2.275E+00	FAIL ABUN
NP-237	-1.076E-02	1.635E-02	1.705E-02	FAIL ABUN
NP-238	1.032E+03	7.848E+03	7.862E+03	SHORT HLIF
NP-239	4.539E-02	6.662E-02	6.969E-02	FAIL ABUN
AM-241	4.419E-02	6.469E-02	6.769E-02	NOT IDENT.
CM-243	-3.638E-02	3.013E-02	3.430E-02	FAIL ABUN
BK-247	-1.276E-03	2.108E-02	2.108E-02	FAIL ABUN
CM-247	-1.757E-03	9.273E-03	9.307E-03	FAIL ABUN
CF-249	9.795E-03	1.004E-02	1.097E-02	NOT IDENT.
CF-251	-1.379E-02	3.472E-02	3.527E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	724.2805	87.09	870.2199	136.47	888.5165
45.60	738.0582	87.57	870.9359	140.51	0.0000
46.54	684.9924	88.03	871.6216	143.76	885.6201
49.72	0.0000	88.34	872.0859	144.24	837.4109
51.35	752.7226	88.47	872.2769	145.44	833.6495
51.87	730.6689	89.96	874.4814	152.43	886.0129
52.39	742.0410	1093.63	875.4838	153.25	928.8672
52.97	698.2883	91.11	876.1716	323.87	864.3319
53.44	680.9417	92.59	878.3306	156.02	815.6127
54.07	661.8885	93.35	879.4329	158.56	789.2953
57.36	0.0000	94.56	881.1774	159.00	799.8403
57.53	774.0107	94.65	881.3076	162.33	828.3550
57.98	756.4780	94.67	881.3336	162.66	854.6974
59.27	742.2148	94.87	753.2830	163.33	846.2869
59.32	742.2969	97.43	756.4013	165.86	878.2432
59.54	733.9532	98.43	757.6100	176.31	869.9678
60.96	797.3369	98.44	757.6212	176.60	881.7332
61.17	797.7006	99.53	749.5605	177.52	892.9636
62.93	818.2425	100.11	739.3043	181.07	0.0000
63.29	820.8159	102.03	829.3150	181.52	873.6482
63.58	835.9496	103.18	901.4601	184.41	921.4993
64.28	877.7191	103.37	887.5887	143.76	825.2545
66.73	820.3206	105.21	793.9907	193.51	804.6418
67.24	838.8618	105.31	814.0717	197.03	860.3126
125.81	897.1609	106.12	824.5343	198.01	840.8785
67.75	897.2861	106.47	859.6976	201.83	878.5496
69.67	924.4552	109.28	918.2649	203.43	832.0701
70.83	870.1478	111.00	904.7079	205.31	799.6772
72.81	978.8528	111.76	0.0000	210.85	758.2307
72.87	978.9630	114.06	851.2817	215.65	741.7894
74.66	982.3297	116.30	0.0000	222.11	701.6495
74.82	982.6253	116.74	822.5074	227.09	675.8348
74.97	982.9059	119.76	845.3180	227.38	706.8215
77.11	986.8688	121.12	809.3004	228.16	0.0000
78.74	948.1405	121.22	809.4153	228.18	706.4205
79.69	966.4014	121.78	812.1910	116.74	706.4205
80.12	873.4648	122.06	832.9531	235.69	702.5582
80.19	873.5750	122.92	866.2604	235.96	724.6431
80.57	967.9492	123.07	878.2946	238.63	647.9881
81.00	868.8039	265.00	858.5357	238.98	0.0000
81.07	868.9133	125.81	796.6613	240.99	649.3115
81.75	970.0098	127.23	853.4495	242.00	649.8787
83.79	865.2294	127.91	850.9783	244.70	634.4570
84.00	865.5505	129.30	885.4767	252.40	632.4805
85.43	867.7203	131.20	862.8662	252.80	617.8727
86.55	869.4084	133.02	743.7007	254.15	0.0000
86.79	869.7642	133.52	865.4766	256.23	597.3378
86.94	869.9942	136.00	878.1186	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	583.6956	355.39	0.0000	584.27	233.1511
264.80	599.7997	356.01	386.9282	595.83	280.6876
265.00	599.8877	364.49	380.8101	427.87	286.7377
268.22	591.3655	366.42	0.0000	602.52	0.0000
269.46	585.9426	372.51	384.7788	604.72	338.9371
270.03	602.7433	375.05	403.6027	607.14	316.4688
271.23	589.5920	377.52	383.9619	609.32	315.2505
273.65	618.0430	356.01	383.4371	610.33	281.5688
276.40	601.7498	388.16	362.0203	614.28	245.7255
277.37	556.5374	388.63	376.4041	618.01	247.6472
277.60	556.6363	391.69	411.8550	620.36	246.9796
278.00	556.8160	264.66	381.2068	621.93	243.4752
279.20	557.1480	401.81	362.9594	630.19	0.0000
279.54	575.4644	402.40	382.6317	631.29	210.3155
279.70	575.5386	404.85	327.9759	633.25	218.8026
280.46	550.1098	410.95	389.7362	634.78	214.3225
283.69	550.1813	413.71	377.7363	635.95	228.2941
284.31	558.5892	414.70	368.0073	636.99	221.9180
285.41	565.7112	423.72	355.1372	645.85	214.3912
285.90	0.0000	427.09	339.1285	657.76	233.1726
287.50	579.9514	427.87	337.1894	657.90	0.0000
290.67	583.4453	433.94	323.6871	661.66	225.1373
293.27	0.0000	439.40	335.1846	664.57	0.0000
351.93	537.9315	453.88	332.5757	666.33	228.3747
295.96	538.2314	463.37	325.3435	666.50	231.2007
879.38	472.4434	468.07	319.3290	667.71	0.0000
299.98	472.9314	473.00	321.0205	677.62	210.6125
300.09	472.9689	475.06	309.5849	685.70	209.4095
300.13	472.9839	476.78	286.2786	695.00	254.0519
301.36	471.1025	477.60	289.6188	696.49	251.0383
302.85	463.9118	482.18	287.0853	696.51	251.0448
256.23	492.2460	487.02	288.8843	697.00	252.6693
304.85	481.5739	492.35	0.0000	697.30	257.4400
306.78	501.0496	497.08	242.7065	697.49	246.4033
308.46	453.6281	505.52	261.1523	702.65	227.9063
311.90	512.9288	507.63	0.0000	706.68	272.0142
316.51	476.6763	511.00	278.2350	711.68	207.7440
319.41	503.0008	514.00	278.6494	720.70	192.8438
320.08	492.5091	514.00	278.6514	721.93	0.0000
321.04	486.9925	520.40	274.7863	722.78	205.7617
323.87	508.4869	520.69	0.0000	722.91	205.7722
325.23	541.8583	522.65	0.0000	723.31	201.0176
328.76	527.8781	527.90	0.0000	724.19	191.5088
333.37	543.3329	528.26	244.2962	727.33	192.6970
333.97	529.7744	529.59	245.5532	733.00	224.1732
334.37	541.7419	529.87	0.0000	735.93	208.3936
338.28	514.5368	531.02	255.6404	333.97	204.9813
338.32	514.5527	537.26	259.7278	739.50	0.0000
311.90	528.5534	546.56	0.0000	747.24	192.2128
340.48	528.5534	552.55	266.0669	748.06	188.4064
340.55	528.5779	563.25	258.4510	752.31	196.4431
344.28	514.3060	569.33	283.8606	753.82	194.6206
345.93	505.6029	946.00	283.8838	756.73	194.8267
351.06	458.1891	569.70	283.9070	756.80	194.8316
351.93	458.4488	583.19	233.0377	884.68	200.8491

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	191.2650	1274.44	131.1249	1620.50	57.9440
766.42	202.6571	1001.03	126.0586	1621.92	53.2457
766.84	212.4166	1002.74	134.5313	1678.03	0.0000
772.60	0.0000	1004.73	138.4654	1690.97	47.4150
776.52	186.4768	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	62.7148
778.90	194.4525	1028.54	0.0000	1063.66	34.0810
783.70	160.5286	1037.84	134.8507	1771.35	35.8831
785.37	176.2954	1038.76	0.0000	1791.20	0.0000
792.07	166.9038	631.29	158.6108	1808.65	44.2593
794.95	168.0568	1048.07	164.0010	1810.72	0.0000
795.86	168.1110	1049.04	170.4375	1836.06	64.6015
810.06	171.2555	1050.41	170.5000		
810.29	179.5067	1063.66	158.3051		
344.28	179.5156	1077.00	141.7260		
810.76	179.5333	1077.34	140.6651		
815.77	158.3984	1085.87	135.6161		
1048.07	171.4330	1093.63	127.2764		
832.01	193.1380	1099.45	170.6986		
834.85	190.3332	1112.07	158.2760		
835.71	181.4179	1112.84	150.4503		
836.80	0.0000	1115.54	155.5321		
846.75	0.0000	1120.29	157.5388		
846.77	182.1022	1120.55	157.5530		
856.80	150.5896	1221.41	157.5884		
860.56	192.6634	1129.67	164.9448		
871.09	132.1418	1131.51	0.0000		
873.19	163.5267	1147.95	0.0000		
875.33	0.0000	1173.23	139.9356		
879.38	155.7671	1177.95	173.3636		
880.51	155.8235	1189.05	161.3495		
883.24	168.1155	1204.77	151.8148		
884.68	162.1172	1221.41	154.3146		
889.28	176.5658	1231.02	172.2123		
894.76	158.5822	1235.36	191.9113		
898.04	162.8203	1238.28	180.8426		
900.72	173.1460	1260.41	0.0000		
903.28	182.3479	1271.87	116.7243		
911.20	166.5736	1274.44	127.1613		
912.08	166.6213	1274.54	127.1613		
923.98	0.0000	1291.59	106.8801		
926.50	147.8707	1298.22	0.0000		
929.11	150.7344	1312.11	96.9531		
937.49	152.8456	1332.49	95.5078		
944.13	144.5562	1362.66	0.0000		
946.00	154.9731	1365.19	69.2930		
949.00	129.2633	1368.63	0.0000		
667.71	0.0000	1384.29	96.1070		
962.31	145.3662	1408.01	23.3232		
964.08	159.2967	1457.56	0.0000		
966.17	160.0946	1460.82	79.6421		
911.20	160.2299	1489.16	58.3662		
968.97	160.2299	1505.03	66.3647		
983.53	127.1440	1584.12	60.5469		
984.45	0.0000	1596.21	69.3666		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 01:06:59.36

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656009.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM18.CNF;496
Background date    : 20-JUN-2016 14:41:07
Sample date       : 17-MAY-2016 11:10:00 Acquisition date : 23-JUN-2016 13:05:49
Sample ID        : G398656009 Sample quantity : 1.44050E+02 GRAM
Detector name    : GAM18 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:10.06 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572234 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	42.84	102	1169	0.92	86.31	84	6	2.35E-03	54.2	
2	0	46.42*	90	1337	2.13	93.45	90	7	2.08E-03	82.1	
3	0	63.39*	121	1606	0.95	127.36	124	7	2.80E-03	64.8	
4	0	66.13*	13	1389	1.53	132.84	131	6	2.98E-04	547.6	
5	3	75.00	1084	1518	1.06	150.56	146	16	2.51E-02	6.4	1.44E+00
6	3	77.24	1792	1360	1.07	155.03	146	16	4.15E-02	4.1	
7	5	81.39	152	784	1.04	163.32	161	33	3.53E-03	26.7	1.90E+00
8	5	84.55*	393	1739	1.55	169.65	161	33	9.09E-03	21.9	
9	5	87.33	899	1521	1.36	175.20	161	33	2.08E-02	8.3	
10	5	90.06	539	1308	1.13	180.66	161	33	1.25E-02	12.1	
11	5	92.86*	774	1648	1.42	186.26	161	33	1.79E-02	11.9	
12	0	99.25	138	1440	2.13	199.01	195	8	3.19E-03	48.6	
13	0	105.69	153	1164	1.56	211.88	209	7	3.54E-03	38.0	
14	0	108.62	95	1013	1.06	217.74	216	6	2.20E-03	53.8	
15	0	120.26	123	1310	1.48	241.00	238	8	2.84E-03	51.8	
16	0	129.24	196	1498	1.40	258.95	255	8	4.53E-03	35.0	
17	0	154.11	82	1181	1.05	308.63	305	7	1.91E-03	70.0	
18	0	163.49	115	1101	1.22	327.38	325	7	2.66E-03	48.8	
19	0	186.02*	698	1212	1.43	372.40	368	8	1.62E-02	11.6	
20	0	209.33*	330	1223	1.19	418.98	415	8	7.63E-03	21.2	
21	0	227.38	54	932	1.45	455.05	451	7	1.26E-03	94.3	
22	3	238.82*	4610	935	1.26	477.91	471	19	1.07E-01	2.2	3.35E+00
23	3	241.84	1125	1261	1.80	483.94	471	19	2.60E-02	7.6	
24	0	270.39	431	1018	1.56	540.99	536	10	9.98E-03	14.7	
25	0	277.44	230	1071	1.92	555.07	550	11	5.33E-03	28.3	
26	0	283.47	52	528	1.35	567.12	565	6	1.20E-03	71.2	
27	2	295.45*	1333	809	1.43	591.06	583	24	3.09E-02	5.5	2.00E+00
28	2	300.36*	360	928	1.77	600.88	583	24	8.34E-03	19.4	
29	0	328.35	221	804	1.62	656.82	653	9	5.11E-03	24.1	
30	0	338.56*	827	1054	1.35	677.20	671	12	1.91E-02	9.5	
31	0	352.13*	2310	927	1.33	704.34	699	12	5.35E-02	3.6	
32	0	409.58	107	699	0.81	819.13	815	10	2.47E-03	47.4	
33	0	447.62	53	610	2.91	895.15	888	11	1.22E-03	92.4	
34	0	462.84	338	665	1.19	925.57	919	12	7.82E-03	16.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	511.21*	279	1108	2.54	1022.24	1014	22	6.45E-03	41.4	
36	0	583.31*	1552	758	1.71	1166.33	1157	17	3.59E-02	5.2	
37	0	609.56*	1617	676	1.47	1218.79	1211	13	3.74E-02	4.7	
38	0	653.79	50	227	1.50	1307.19	1304	7	1.16E-03	52.0	
39	0	661.77	1967	700	1.67	1323.12	1315	17	4.55E-02	3.8	
40	5	693.43	71	203	1.65	1386.41	1383	13	1.64E-03	34.0	8.31E-01
41	5	696.46	43	297	1.41	1392.46	1383	13	9.92E-04	70.6	
42	0	727.58	441	451	1.99	1454.65	1448	15	1.02E-02	11.6	
43	0	755.31	91	290	0.96	1510.08	1505	11	2.10E-03	38.0	
44	0	768.46	176	464	2.17	1536.36	1530	13	4.07E-03	26.4	
45	0	787.92	30	490	1.13	1575.25	1565	14	6.97E-04	157.8	
46	0	795.13	271	393	1.55	1589.67	1582	17	6.28E-03	17.8	
47	0	804.66*	92	441	4.31	1608.71	1599	18	2.12E-03	59.6	
48	0	821.47	33	280	0.87	1642.32	1638	11	7.66E-04	99.5	
49	2	836.07*	21	444	2.63	1671.49	1660	24	4.81E-04	248.4	1.60E+00
50	2	840.43	96	175	1.82	1680.20	1660	24	2.22E-03	25.4	
51	0	860.81*	148	538	2.09	1720.95	1715	19	3.43E-03	40.6	
52	0	911.32*	1128	400	2.08	1821.89	1813	17	2.61E-02	5.7	
53	0	934.92	164	381	3.88	1869.07	1861	18	3.79E-03	29.2	
54	2	965.15*	242	409	2.79	1929.49	1921	23	5.60E-03	23.9	1.75E+00
55	2	969.25*	637	260	1.98	1937.70	1921	23	1.47E-02	7.5	
56	0	1001.19*	33	281	1.87	2001.54	1995	13	7.58E-04	136.7	
57	0	1021.79	31	369	8.56	2042.71	2035	20	7.11E-04	154.4	
58	0	1065.38	11	212	1.52	2129.84	2126	9	2.59E-04	238.1	
59	0	1120.64*	405	312	1.94	2240.31	2232	15	9.37E-03	12.1	
60	0	1155.28	119	435	5.30	2309.55	2294	22	2.75E-03	45.7	
61	0	1237.87	176	323	1.94	2474.63	2468	16	4.07E-03	24.0	
62	0	1327.77	25	142	1.76	2654.35	2646	11	5.90E-04	92.9	
63	0	1376.85	49	207	3.66	2752.47	2749	13	1.12E-03	62.5	
64	7	1403.85	78	244	5.26	2806.44	2793	36	1.82E-03	57.2	1.97E+00
65	7	1409.10	88	146	3.27	2816.93	2793	36	2.05E-03	37.7	
66	0	1460.90*	3897	231	2.68	2920.50	2908	22	9.02E-02	2.0	
67	0	1588.56	63	168	2.49	3175.73	3168	16	1.45E-03	47.8	
68	0	1630.85	102	107	3.75	3260.28	3250	20	2.35E-03	27.1	
69	0	1731.23	120	120	2.73	3460.96	3450	26	2.78E-03	26.9	
70	0	1764.69*	381	116	3.06	3527.86	3517	23	8.83E-03	10.6	
71	0	1848.22	48	111	4.57	3694.88	3684	17	1.12E-03	44.8	
72	0	1974.12	40	51	6.00	3946.63	3938	17	9.18E-04	38.7	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656009.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:10:00 Acquisition date : 23-JUN-2016 13:05:49
Sample ID        : G398656009 Sample quantity   : 144.05 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA18 Detector geometry   : CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:10.06 0.0%
Energy tolerance  : 1.50 keV Half life ratio    : 10.00
Errors propagated : No Systematic Error       : 0.00 %
Efficiency type   : Empirical Efficiencies at    : Peak Energy
Abundance limit   : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.929E+00	7.908E+00	7.908E+00	3.95	OK
MN-54	834.85	99.98*	3.015E+00	3.036E-03	3.298E-03	496.85	OK
CD-109	88.03	3.70*	6.352E+00	1.489E+00	1.575E+00	23.12	OK
TE-125M	109.28	0.27*	7.717E+00	2.391E+00	3.753E+00	107.52	OK
SN-126	64.28	9.60	3.076E+00	2.239E-01	2.239E-01	129.69	OK
	86.94	8.90	6.352E+00	6.189E-01	6.189E-01	23.12	OK
	87.57	37.00*	6.352E+00	1.489E-01	1.489E-01	23.12	OK
BA-137M	661.66	89.90*	3.572E+00	2.755E-01	2.761E-01	7.63	OK
CS-137	661.66	85.10*	3.572E+00	2.910E-01	2.917E-01	7.63	OK
PR-144	696.51	1.34*	3.447E+00	4.152E-01	4.547E-01	141.28	OK
	1489.16	0.28	1.901E+00	----- Line	Not Found	-----	Absent
PM-147	121.22	0.00*	8.001E+00	2.800E+02	2.877E+02	103.56	OK
EU-155	86.55	30.70	6.352E+00	1.794E-01	1.821E-01	23.12	OK
	105.31	21.10*	7.603E+00	5.003E-02	5.078E-02	75.92	OK
TL-208	277.37	6.60	6.072E+00	2.786E-01	2.786E-01	56.62	OK
	583.19	85.00*	3.889E+00	2.136E-01	2.136E-01	10.36	OK
	860.56	12.50	2.949E+00	1.764E-01	1.764E-01	81.19	OK
PB-210	46.54	4.25*	6.822E-01	1.728E+00	1.734E+00	164.27	OK
PB-212	74.82	10.28	4.876E+00	8.290E-01	8.290E-01	18.41	OK
	77.11	17.10	5.184E+00	1.087E+00	1.087E+00	8.20	OK
	238.63	43.60*	6.596E+00	7.878E-01	7.878E-01	4.35	OK
	300.09	3.30	5.805E+00	9.066E-01	9.066E-01	38.74	OK
BI-214	609.32	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41	OK
	1120.29	14.92	2.389E+00	4.865E-01	4.866E-01	24.27	OK
	1764.49	15.30	1.690E+00	6.041E-01	6.042E-01	21.17	OK
PB-214	74.82	5.80	4.851E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.184E+00	1.917E+00	1.917E+00	8.20	OK
	87.09	3.41	6.329E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	6.549E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	5.860E+00	5.963E-01	5.964E-01	11.09	OK
	351.93	35.60*	5.295E+00	5.829E-01	5.830E-01	7.28	OK
RN-222	609.32	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41	OK
	1120.29	14.92	2.389E+00	4.865E-01	4.866E-01	24.27	OK
	1764.49	15.30	1.690E+00	6.041E-01	6.042E-01	21.17	OK
RA-223	81.07	15.00	5.708E+00	9.536E-02	9.536E-02	53.33	OK
	83.79	24.70	6.068E+00	1.399E-01	1.399E-01	43.87	OK
	94.56	8.67	6.969E+00	----- Line	Not Found	-----	Absent
	144.24	3.27	8.039E+00	----- Line	Not Found	-----	Absent
	154.21	5.70	7.939E+00	9.276E-02	9.276E-02	139.93	OK
	269.46	13.90	6.161E+00	2.448E-01	2.448E-01	29.37	OK
	323.87	3.99*	5.558E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	5.417E+00	2.564E+00	2.564E+00	19.08	OK
RA-224	240.99	4.10*	6.552E+00	1.002E+00	1.002E+00	33.20	OK
RA-226	609.32	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41	OK
	1120.29	14.92	2.389E+00	4.865E-01	4.866E-01	24.27	OK
	1764.49	15.30	1.690E+00	6.041E-01	6.042E-01	21.17	OK
AC-228	105.21	1.10	7.603E+00	9.596E-01	9.596E-01	75.92	OK
	338.32	11.27	5.417E+00	6.461E-01	6.461E-01	19.08	OK
	794.95	4.25	3.131E+00	9.009E-01	9.009E-01	35.58	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RA-228	835.71	1.61	3.015E+00	1.885E-01	1.885E-01	496.85	OK
	911.20	25.80*	2.821E+00	6.767E-01	6.767E-01	11.35	OK
	968.97	15.80	2.687E+00	6.512E-01	6.512E-01	15.09	OK
	105.21	1.10	7.603E+00	9.596E-01	9.596E-01	75.92	OK
	338.32	11.27	5.417E+00	6.461E-01	6.461E-01	19.08	OK
	794.95	4.25	3.131E+00	9.009E-01	9.009E-01	35.58	OK
TH-228	835.71	1.61	3.015E+00	1.885E-01	1.885E-01	496.85	OK
	911.20	25.80*	2.821E+00	6.767E-01	6.767E-01	11.35	OK
	968.97	15.80	2.687E+00	6.512E-01	6.512E-01	15.09	OK
	74.82	10.28	4.876E+00	8.290E-01	8.290E-01	18.41	OK
	77.11	17.10	5.184E+00	1.087E+00	1.087E+00	8.20	OK
	238.63	43.60*	6.596E+00	7.878E-01	7.878E-01	4.35	OK
TH-229	300.09	3.30	5.805E+00	9.066E-01	9.066E-01	38.74	OK
	85.43	14.70	6.068E+00	2.350E-01	2.350E-01	43.87	OK
	88.47	24.00	6.352E+00	2.295E-01	2.295E-01	23.12	OK
	193.51	4.41*	7.325E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	7.034E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41	OK
	1120.29	14.92	2.389E+00	4.865E-01	4.865E-01	24.27	OK
	1764.49	15.30	1.690E+00	6.041E-01	6.041E-01	21.17	OK
PA-231	283.69	1.70	5.999E+00	2.465E-01	2.465E-01	142.39	OK
	301.36	5.35*	5.805E+00	5.592E-01	5.592E-01	38.74	OK
TH-231	81.07	15.00	5.708E+00	9.536E-02	9.536E-02	53.33	OK
	83.79	24.70	6.068E+00	1.399E-01	1.399E-01	43.87	OK
	94.87	5.69	6.991E+00	----- Line	Not Found	-----	Absent
	144.24	3.27	8.039E+00	----- Line	Not Found	-----	Absent
	154.21	5.70	7.939E+00	9.276E-02	9.276E-02	139.93	OK
	269.46	13.90	6.161E+00	2.448E-01	2.448E-01	29.37	OK
TH-232	323.87	3.99*	5.558E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	5.417E+00	2.564E+00	2.564E+00	19.08	OK
	105.21	1.10	7.603E+00	9.596E-01	9.596E-01	75.92	OK
	338.32	11.27	5.417E+00	6.461E-01	6.461E-01	19.08	OK
	835.71	1.61	3.015E+00	1.885E-01	1.885E-01	496.85	OK
	911.20	25.80*	2.821E+00	6.767E-01	6.767E-01	11.35	OK
TH-234	968.97	15.80	2.687E+00	6.512E-01	6.512E-01	15.09	OK
	63.29	3.70*	3.076E+00	5.809E-01	5.809E-01	129.69	OK
	92.59	4.23	6.840E+00	1.419E+00	1.419E+00	23.86	OK
U-234	609.32	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41	OK
	1120.29	14.92	2.389E+00	4.865E-01	4.865E-01	24.27	OK
	1764.49	15.30	1.690E+00	6.041E-01	6.041E-01	21.17	OK
U-235	89.96	3.47	6.606E+00	1.250E+00	1.250E+00	24.28	OK
	93.35	5.60	6.840E+00	1.072E+00	1.072E+00	23.86	OK
	143.76	10.96*	8.043E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	7.813E+00	1.468E-01	1.468E-01	97.65	OK
U-238	185.72	57.20	7.451E+00	8.215E-02	8.215E-02	23.14	OK
	205.31	5.01	7.126E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.076E+00	5.809E-01	5.809E-01	129.69	OK
	92.59	4.23	6.840E+00	1.419E+00	1.419E+00	23.86	OK
AM-243	43.53	5.90	3.876E-01	2.496E+00	2.496E+00	108.40	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	74.66	67.20*	4.876E+00	1.268E-01	1.268E-01	18.41	OK
ANH-511	511.00	100.00*	4.232E+00	3.031E-02	3.031E-02	82.78	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656009.CNF;1
Acquisition date : 23-JUN-2016 13:05:49 Sensitivity : 3.000
Detector ID : GAM18 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.06 Half life ratio : *****
Sample date : 17-MAY-2016 11:10:00 Analyst initials: MXR1
Sample ID : G398656009 Sample Quantity : 1.4405E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 22-JUN-2015 09:18:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	7.908E+00	3.059E-01	1.355E-01
MN-54	3.298E-03	1.606E-02	1.479E-02
CD-109	1.575E+00	3.567E-01	3.390E-01
TE-125M	3.753E+00	3.955E+00	5.456E+00
SN-126	1.489E-01	3.373E-02	3.225E-02
BA-137M	2.761E-01	2.064E-02	1.462E-02
CS-137	2.917E-01	2.181E-02	1.545E-02
PR-144	4.547E-01	6.296E-01	1.182E+00
PM-147	2.877E+02	2.919E+02	3.345E+02
EU-155	5.078E-02	3.778E-02	4.647E-02
TL-208	2.136E-01	2.168E-02	1.464E-02
PB-210	1.734E+00	2.791E+00	2.323E+00
PB-212	7.878E-01	3.361E-02	2.372E-02
BI-214	4.264E-01	3.934E-02	2.941E-02
PB-214	5.830E-01	4.160E-02	3.100E-02
RN-222	4.264E-01	3.934E-02	2.941E-02
RA-223	2.203E-01	1.722E-01	2.850E-01
RA-224	1.002E+00	3.261E-01	2.540E-01
RA-226	4.264E-01	3.934E-02	2.941E-02
AC-228	6.767E-01	7.528E-02	5.462E-02
RA-228	6.767E-01	7.528E-02	5.462E-02
TH-228	7.878E-01	3.361E-02	2.372E-02
TH-229	-4.851E-02	1.273E-01	2.300E-01
TH-230	4.264E-01	3.934E-02	2.941E-02
PA-231	5.592E-01	2.123E-01	1.947E-01
TH-231	2.203E-01	1.722E-01	2.850E-01
TH-232	6.767E-01	7.528E-02	5.462E-02
TH-234	5.809E-01	7.383E-01	6.832E-01
U-234	4.264E-01	3.934E-02	2.941E-02
U-235	-3.139E-02	6.500E-02	8.889E-02
U-238	5.809E-01	7.383E-01	6.832E-01
AM-243	1.268E-01	2.289E-02	2.587E-02
ANH-511	3.031E-02	2.459E-02	1.186E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.041E-01	1.028E-01	1.748E-01	NOT IDENT.
NA-22	-3.871E-03	9.682E-03	1.679E-02	NOT IDENT.
NA-24	0.000E+00	8.770E+15	0.000E+00	SHORT HLIF
AL-26	-4.669E-04	7.270E-03	1.284E-02	NOT IDENT.
SC-46	1.360E-03	1.035E-02	1.850E-02	FAIL ABUN
V-48	9.462E-03	4.112E-02	7.291E-02	NOT IDENT.
CR-51	2.061E-02	1.605E-01	2.783E-01	NOT IDENT.
CO-56	1.107E-03	1.227E-02	1.954E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-5.989E-03	7.570E-03	1.172E-02	NOT IDENT.
CO-58	-4.617E-04	1.258E-02	1.856E-02	NOT IDENT.
FE-59	6.888E-03	2.803E-02	4.908E-02	NOT IDENT.
CO-60	3.938E-03	9.912E-03	1.524E-02	NOT IDENT.
ZN-65	1.062E-02	2.488E-02	3.737E-02	NOT IDENT.
GE-68	2.525E-01	2.888E-01	5.199E-01	NOT IDENT.
AS-73	2.131E-01	3.280E-01	6.367E-01	NOT IDENT.
AS-74	-1.262E-02	5.219E-02	9.264E-02	NOT IDENT.
SE-75	-6.212E-03	1.400E-02	2.129E-02	FAIL ABUN
BR-77	0.000E+00	3.390E+03	0.000E+00	SHORT HLIF
SR-82	-2.883E-01	1.629E-01	2.310E-01	NOT IDENT.
RB-83	2.498E-02	2.344E-02	3.670E-02	NOT IDENT.
KR-85	0.000E+00	2.085E+00	4.322E+00	NOT IDENT.
SR-85	0.000E+00	1.395E-02	2.890E-02	NOT IDENT.
RB-86	7.265E-02	3.996E-01	7.000E-01	NOT IDENT.
Y-88	-2.088E-03	1.093E-02	1.697E-02	NOT IDENT.
Y-91	4.567E-03	5.904E+00	1.045E+01	NOT IDENT.
NB-94	-2.508E-03	8.782E-03	1.409E-02	NOT IDENT.
NB-95	0.000E+00	1.428E-02	2.371E-02	NOT IDENT.
NB-95M	6.645E-02	4.148E-02	6.783E-02	NOT IDENT.
ZR-95	3.409E-02	2.537E-02	3.726E-02	FAIL ABUN
NB-97	0.000E+00	4.511E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.502E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.429E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.063E+41	0.000E+00	SHORT HLIF
RH-101	5.912E-04	9.208E-03	1.452E-02	NOT IDENT.
RH-102	-5.103E-03	1.233E-02	2.165E-02	FAIL ABUN
RU-103	-7.334E-03	1.412E-02	2.424E-02	FAIL ABUN
RH-106	-3.036E-02	7.611E-02	1.339E-01	NOT IDENT.
RU-106	-3.036E-02	7.611E-02	1.339E-01	NOT IDENT.
AG-108M	1.325E-03	7.036E-03	1.252E-02	NOT IDENT.
AG-110M	2.934E-03	1.145E-02	2.058E-02	NOT IDENT.
SN-113	-4.573E-03	1.237E-02	2.193E-02	NOT IDENT.
CD-115	0.000E+00	2.661E+03	0.000E+00	SHORT HLIF
SN-117M	-1.411E-02	4.503E-02	7.334E-02	NOT IDENT.
TE-123M	-2.613E-03	8.569E-03	1.395E-02	NOT IDENT.
SB-124	-3.451E-03	2.302E-02	4.074E-02	NOT IDENT.
SB-125	-7.715E-03	2.213E-02	3.887E-02	FAIL ABUN
I-126	1.150E-01	1.965E-01	3.055E-01	FAIL ABUN
SB-126	-1.985E-02	1.618E-01	1.991E-01	FAIL ABUN
SB-127	5.662E+00	1.658E+01	2.891E+01	NOT IDENT.
I-131	1.987E-02	1.806E-01	3.270E-01	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.699E+01	0.000E+00	SHORT HLIF
BA-133	7.299E-03	1.092E-02	1.759E-02	FAIL ABUN
I-133	0.000E+00	6.885E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.616E-02	1.916E-02	FAIL ABUN
CS-135	0.000E+00	4.305E-02	7.201E-02	NOT IDENT.
I-135	0.000E+00	2.924E+39	0.000E+00	SHORT HLIF
CS-136	3.411E-03	7.693E-02	1.344E-01	FAIL ABUN
CE-139	1.167E-04	8.697E-03	1.421E-02	NOT IDENT.
BA-140	-9.255E-02	2.186E-01	3.727E-01	FAIL ABUN
LA-140	-1.642E-02	7.939E-02	1.180E-01	FAIL ABUN
CE-141	-4.750E-02	3.274E-02	4.353E-02	NOT IDENT.
CE-143	0.000E+00	2.714E+06	0.000E+00	SHORT HLIF
CE-144	-1.054E-02	5.818E-02	9.067E-02	FAIL ABUN
PM-144	6.006E-03	8.315E-03	1.559E-02	FAIL ABUN
PM-146	6.370E-03	1.071E-02	1.867E-02	NOT IDENT.
ND-147	-2.906E-01	5.355E-01	9.113E-01	FAIL ABUN
PM-149	0.000E+00	2.684E+04	0.000E+00	SHORT HLIF
EU-150	1.632E-04	1.106E-02	1.180E-02	FAIL ABUN
EU-152	-1.626E-02	2.663E-02	4.117E-02	FAIL ABUN
GD-153	-6.168E-03	3.115E-02	3.967E-02	NOT IDENT.
EU-154	-1.108E-02	2.712E-02	4.702E-02	FAIL ABUN
TB-160	5.672E-03	3.541E-02	6.346E-02	FAIL ABUN
HO-166M	-5.743E-03	1.394E-02	2.411E-02	FAIL ABUN

TM-171	1.400E+00	5.980E+00	1.154E+01	FAIL ABUN
HF-172	3.957E-02	5.429E-02	8.738E-02	FAIL ABUN
LU-172	-4.153E-03	1.403E-02	2.409E-02	FAIL ABUN
LU-176	5.383E-04	7.016E-03	1.127E-02	FAIL ABUN
HF-181	6.011E-03	1.480E-02	2.623E-02	NOT IDENT.
TA-182	2.233E-03	4.754E-02	8.403E-02	FAIL ABUN
RE-183	-6.002E-02	9.024E-02	1.384E-01	FAIL ABUN
RE-184	-9.843E-04	4.907E-02	7.443E-02	NOT IDENT.
W-188	-3.428E-01	2.509E+00	3.807E+00	FAIL ABUN
IR-192	8.895E-03	1.026E-02	1.818E-02	FAIL ABUN
HG-203	0.000E+00	1.970E-02	2.407E-02	NOT IDENT.
BI-207	1.659E-03	1.232E-02	2.152E-02	FAIL ABUN
BI-211	0.000E+00	1.146E-01	1.733E-01	FAIL ABUN
PB-211	5.562E-02	1.999E-01	3.120E-01	NOT IDENT.
BI-212	0.000E+00	1.997E-01	2.679E-01	FAIL ABUN
RN-219	1.358E-02	9.824E-02	1.758E-01	FAIL ABUN
AC-227	2.465E-03	6.097E-02	1.081E-01	FAIL ABUN
TH-227	2.465E-03	6.097E-02	1.081E-01	FAIL ABUN
PA-233	-4.115E-03	1.564E-02	2.693E-02	FAIL ABUN
PA-234	-2.665E-02	6.770E-02	1.131E-01	FAIL ABUN
PA-234M	6.441E-01	1.726E+00	1.889E+00	FAIL ABUN
NP-237	-4.115E-03	1.564E-02	2.693E-02	FAIL ABUN
NP-238	0.000E+00	6.372E+03	0.000E+00	SHORT HLIF
NP-239	-5.481E-02	7.355E-02	1.146E-01	FAIL ABUN
PU-239	0.000E+00	1.359E+02	1.620E+02	FAIL ABUN
AM-241	3.112E-02	5.795E-02	8.555E-02	NOT IDENT.
CM-243	-3.324E-03	3.674E-02	4.665E-02	FAIL ABUN
BK-247	-2.349E-03	2.207E-02	3.394E-02	FAIL ABUN
CM-247	-7.929E-04	9.339E-03	1.618E-02	FAIL ABUN
CF-249	6.439E-03	9.695E-03	1.764E-02	NOT IDENT.
CF-251	-2.345E-03	3.030E-02	5.559E-02	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	3745	10.66*	1.929E+00	7.908E+00	7.908E+00	3.95
MN-54	834.85	21	99.98*	3.015E+00	3.036E-03	3.298E-03	496.85
CD-109	88.03	1103	3.70*	6.352E+00	2.038E+00	2.156E+00	16.62
TE-125M	109.28	115	0.27*	7.717E+00	2.391E+00	3.753E+00	107.52
SN-126	64.28	152	9.60	3.076E+00	2.239E-01	2.239E-01	129.69
	86.94	1103	8.90	6.352E+00	8.474E-01	8.474E-01	16.62
	87.57	1103	37.00*	6.352E+00	2.038E-01	2.038E-01	16.62
BA-137M	661.66	2037	89.90*	3.572E+00	2.755E-01	2.761E-01	7.63
CS-137	661.66	2037	85.10*	3.572E+00	2.910E-01	2.917E-01	7.63
PR-144	696.51	44	1.34*	3.447E+00	4.152E-01	4.547E-01	141.28
	1489.16	-----	0.28	1.901E+00	-----	Line Not Found	-----
PM-147	121.22	147	0.00*	8.001E+00	2.800E+02	2.877E+02	103.56
EU-155	86.55	1103	30.70	6.352E+00	2.457E-01	2.494E-01	16.62
	105.31	185	21.10*	7.603E+00	5.003E-02	5.078E-02	75.92
TL-208	277.37	257	6.60	6.072E+00	2.786E-01	2.786E-01	56.62
	583.19	1625	85.00*	3.889E+00	2.136E-01	2.136E-01	10.36
	860.56	150	12.50	2.949E+00	1.764E-01	1.764E-01	81.19
PB-210	46.54	115	4.25*	6.822E-01	1.728E+00	1.734E+00	164.27
BI-211	72.87	-----	1.23	4.569E+00	-----	Line Not Found	-----
	351.06	2530	12.92*	5.295E+00	1.606E+00	1.606E+00	7.28
PB-212	74.82	1345	10.28	4.876E+00	1.165E+00	1.165E+00	12.70
	77.11	2219	17.10	5.184E+00	1.087E+00	1.087E+00	8.20
	238.63	5216	43.60*	6.596E+00	7.878E-01	7.878E-01	4.35
	300.09	400	3.30	5.805E+00	9.066E-01	9.066E-01	38.74
BI-214	609.32	1687	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41
	1120.29	399	14.92	2.389E+00	4.865E-01	4.866E-01	24.27
	1764.49	360	15.30	1.690E+00	6.041E-01	6.042E-01	21.17
PB-214	74.82	1345	5.80	4.876E+00	2.066E+00	2.066E+00	12.70
	77.11	2219	9.70	5.184E+00	1.917E+00	1.917E+00	8.20
	87.09	1103	3.41	6.352E+00	2.212E+00	2.212E+00	16.62
	242.00	1272	7.25	6.552E+00	1.163E+00	1.163E+00	15.15
	295.22	1482	18.42	5.860E+00	5.963E-01	5.964E-01	11.09
	351.93	2530	35.60*	5.295E+00	5.829E-01	5.830E-01	7.28
RN-222	609.32	1687	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41
	1120.29	399	14.92	2.389E+00	4.865E-01	4.866E-01	24.27
	1764.49	360	15.30	1.690E+00	6.041E-01	6.042E-01	21.17
RA-223	81.07	188	15.00	5.708E+00	9.536E-02	9.536E-02	53.33
	83.79	483	24.70	6.068E+00	1.399E-01	1.399E-01	43.87
	94.56	-----	8.67	6.969E+00	-----	Line Not Found	-----
	144.24	-----	3.27	8.039E+00	-----	Line Not Found	-----
	154.21	97	5.70	7.939E+00	9.276E-02	9.276E-02	139.93
	269.46	483	13.90	6.161E+00	2.448E-01	2.448E-01	29.37
	323.87	-----	3.99*	5.558E+00	-----	Line Not Found	-----
	338.28	908	2.84	5.417E+00	2.564E+00	2.564E+00	19.08
RA-224	240.99	1272	4.10*	6.552E+00	2.057E+00	2.057E+00	15.15
RA-226	609.32	1687	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41
	1120.29	399	14.92	2.389E+00	4.865E-01	4.866E-01	24.27

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AC-228	1764.49	360	15.30	1.690E+00	6.041E-01	6.042E-01	21.17
	105.21	185	1.10	7.603E+00	9.596E-01	9.596E-01	75.92
	338.32	908	11.27	5.417E+00	6.461E-01	6.461E-01	19.08
	794.95	276	4.25	3.131E+00	9.009E-01	9.009E-01	35.58
	835.71	21	1.61	3.015E+00	1.885E-01	1.885E-01	496.85
RA-228	911.20	1134	25.80*	2.821E+00	6.767E-01	6.767E-01	11.35
	968.97	637	15.80	2.687E+00	6.512E-01	6.512E-01	15.09
	105.21	185	1.10	7.603E+00	9.596E-01	9.596E-01	75.92
	338.32	908	11.27	5.417E+00	6.461E-01	6.461E-01	19.08
	794.95	276	4.25	3.131E+00	9.009E-01	9.009E-01	35.58
TH-228	835.71	21	1.61	3.015E+00	1.885E-01	1.885E-01	496.85
	911.20	1134	25.80*	2.821E+00	6.767E-01	6.767E-01	11.35
	968.97	637	15.80	2.687E+00	6.512E-01	6.512E-01	15.09
	74.82	1345	10.28	4.876E+00	1.165E+00	1.165E+00	12.70
	77.11	2219	17.10	5.184E+00	1.087E+00	1.087E+00	8.20
TH-229	238.63	5216	43.60*	6.596E+00	7.878E-01	7.878E-01	4.35
	300.09	400	3.30	5.805E+00	9.066E-01	9.066E-01	38.74
	85.43	483	14.70	6.068E+00	2.350E-01	2.350E-01	43.87
	88.47	1103	24.00	6.352E+00	3.142E-01	3.143E-01	16.62
	193.51	-----	4.41*	7.325E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	7.034E+00	-----	Line Not Found	-----
	609.32	1687	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41
	1120.29	399	14.92	2.389E+00	4.865E-01	4.865E-01	24.27
	1764.49	360	15.30	1.690E+00	6.041E-01	6.041E-01	21.17
	283.69	58	1.70	5.999E+00	2.465E-01	2.465E-01	142.39
TH-231	301.36	400	5.35*	5.805E+00	5.592E-01	5.592E-01	38.74
	81.07	188	15.00	5.708E+00	9.536E-02	9.536E-02	53.33
	83.79	483	24.70	6.068E+00	1.399E-01	1.399E-01	43.87
	94.87	-----	5.69	6.991E+00	-----	Line Not Found	-----
	144.24	-----	3.27	8.039E+00	-----	Line Not Found	-----
TH-232	154.21	97	5.70	7.939E+00	9.276E-02	9.276E-02	139.93
	269.46	483	13.90	6.161E+00	2.448E-01	2.448E-01	29.37
	323.87	-----	3.99*	5.558E+00	-----	Line Not Found	-----
	338.28	908	2.84	5.417E+00	2.564E+00	2.564E+00	19.08
	105.21	185	1.10	7.603E+00	9.596E-01	9.596E-01	75.92
TH-234	338.32	908	11.27	5.417E+00	6.461E-01	6.461E-01	19.08
	835.71	21	1.61	3.015E+00	1.885E-01	1.885E-01	496.85
	911.20	1134	25.80*	2.821E+00	6.767E-01	6.767E-01	11.35
	968.97	637	15.80	2.687E+00	6.512E-01	6.512E-01	15.09
	63.29	152	3.70*	3.076E+00	5.809E-01	5.809E-01	129.69
U-234	92.59	945	4.23	6.840E+00	1.419E+00	1.419E+00	23.86
	609.32	1687	45.49*	3.777E+00	4.264E-01	4.264E-01	9.41
	1120.29	399	14.92	2.389E+00	4.865E-01	4.865E-01	24.27
	1764.49	360	15.30	1.690E+00	6.041E-01	6.041E-01	21.17
	89.96	660	3.47	6.606E+00	1.250E+00	1.250E+00	24.28
U-235	93.35	945	5.60	6.840E+00	1.072E+00	1.072E+00	23.86
	143.76	-----	10.96*	8.043E+00	-----	Line Not Found	-----
	163.33	134	5.08	7.813E+00	1.468E-01	1.468E-01	97.65
	185.72	806	57.20	7.451E+00	8.215E-02	8.215E-02	23.14

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	205.31	-----	5.01	7.126E+00	-----	Line Not Found	-----
U-238	63.29	152	3.70*	3.076E+00	5.809E-01	5.809E-01	129.69
	92.59	945	4.23	6.840E+00	1.419E+00	1.419E+00	23.86
AM-243	43.53	131	5.90	3.876E-01	2.496E+00	2.496E+00	108.40
	74.66	1345	67.20*	4.876E+00	1.783E-01	1.783E-01	12.70
ANH-511	511.00	295	100.00*	4.232E+00	3.031E-02	3.031E-02	82.78

Flag: "*" = Keyline

Total number of lines in spectrum 72
Number of unidentified lines 20
Number of lines tentatively identified by NID 52 72.22%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	7.908E+00	7.908E+00	0.312E+00	3.95	
MN-54	312.05D	1.09	3.036E-03	3.298E-03	16.39E-03	496.85	
CD-109	461.40D	1.06	2.038E+00	2.156E+00	0.358E+00	16.62	
TE-125M	57.40D	1.57	2.391E+00	3.753E+00	4.035E+00	107.52	
SN-126	2.30E+05Y	1.00	2.038E-01	2.038E-01	0.339E-01	16.62	
BA-137M	30.08Y	1.00	2.755E-01	2.761E-01	0.211E-01	7.63	
CS-137	30.08Y	1.00	2.910E-01	2.917E-01	0.223E-01	7.63	
PR-144	284.91D	1.10	4.152E-01	4.547E-01	6.424E-01	141.28	
PM-147	2.62Y	1.03	2.800E+02	2.877E+02	2.979E+02	103.56	
EU-155	4.75Y	1.02	5.003E-02	5.078E-02	3.855E-02	75.92	
TL-208	1.41E+10Y	1.00	2.136E-01	2.136E-01	0.221E-01	10.36	
PB-210	22.20Y	1.00	1.728E+00	1.734E+00	2.848E+00	164.27	
BI-211	7.04E+08Y	1.00	1.606E+00	1.606E+00	0.117E+00	7.28	
PB-212	1.41E+10Y	1.00	7.878E-01	7.878E-01	0.343E-01	4.35	
BI-214	1600.00Y	1.00	4.264E-01	4.264E-01	0.401E-01	9.41	
PB-214	1600.00Y	1.00	5.829E-01	5.830E-01	0.424E-01	7.28	
RN-222	1600.00Y	1.00	4.264E-01	4.264E-01	0.401E-01	9.41	
RA-223	7.04E+08Y	1.00	1.399E-01	1.399E-01	0.614E-01	43.87	K
RA-224	1.41E+10Y	1.00	2.057E+00	2.057E+00	0.312E+00	15.15	
RA-226	1600.00Y	1.00	4.264E-01	4.264E-01	0.401E-01	9.41	
AC-228	1.41E+10Y	1.00	6.767E-01	6.767E-01	0.768E-01	11.35	
RA-228	1.41E+10Y	1.00	6.767E-01	6.767E-01	0.768E-01	11.35	
TH-228	1.41E+10Y	1.00	7.878E-01	7.878E-01	0.343E-01	4.35	
TH-229	7340.00Y	1.00	3.142E-01	3.143E-01	0.522E-01	16.62	K
TH-230	7.54E+04Y	1.00	4.264E-01	4.264E-01	0.401E-01	9.41	
PA-231	7.04E+08Y	1.00	5.592E-01	5.592E-01	2.167E-01	38.74	
TH-231	7.04E+08Y	1.00	1.399E-01	1.399E-01	0.614E-01	43.87	K
TH-232	1.41E+10Y	1.00	6.767E-01	6.767E-01	0.768E-01	11.35	
TH-234	4.47E+09Y	1.00	5.809E-01	5.809E-01	7.534E-01	129.69	
U-234	2.45E+05Y	1.00	4.264E-01	4.264E-01	0.401E-01	9.41	
U-235	7.04E+08Y	1.00	8.215E-02	8.215E-02	1.901E-02	23.14	K
U-238	4.47E+09Y	1.00	5.809E-01	5.809E-01	7.534E-01	129.69	
AM-243	7370.00Y	1.00	1.783E-01	1.783E-01	0.226E-01	12.70	
ANH-511	1.00E+09Y	1.00	3.031E-02	3.031E-02	2.509E-02	82.78	
Total Activity :			3.081E+02	3.173E+02			

Grand Total Activity : 3.081E+02 3.173E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.13	16	1740	1.53	132.84	131	6	2.98E-04	****	3.52E+00	T
0	99.25	167	1749	2.13	199.01	195	8	3.19E-03	97.1	7.28E+00	T
0	129.24	233	1782	1.40	258.95	255	8	4.53E-03	69.9	8.08E+00	T
0	209.33	377	1399	1.19	418.98	415	8	7.63E-03	42.5	7.06E+00	
0	227.38	62	1059	1.45	455.05	451	7	1.26E-03	****	6.77E+00	T
0	328.35	243	886	1.62	656.82	653	9	5.11E-03	48.3	5.51E+00	T
0	409.58	115	756	0.81	819.13	815	10	2.47E-03	94.9	4.84E+00	T
0	447.62	56	655	2.91	895.15	888	11	1.22E-03	****	4.59E+00	
0	462.84	361	711	1.19	925.57	919	12	7.82E-03	32.4	4.50E+00	T
0	653.79	52	235	1.50	1307.19	1304	7	1.16E-03	****	3.60E+00	
5	693.43	73	209	1.65	1386.41	1383	13	1.64E-03	68.1	3.46E+00	
0	727.58	453	463	1.99	1454.65	1448	15	1.02E-02	23.1	3.34E+00	T
0	755.31	93	297	0.96	1510.08	1505	11	2.10E-03	75.9	3.25E+00	T
0	768.46	180	474	2.17	1536.36	1530	13	4.07E-03	52.7	3.21E+00	
0	787.92	31	499	1.13	1575.25	1565	14	6.97E-04	****	3.15E+00	
0	804.66	93	448	4.31	1608.71	1599	18	2.12E-03	****	3.10E+00	
0	821.47	34	284	0.87	1642.32	1638	11	7.66E-04	****	3.06E+00	
2	840.43	97	177	1.82	1680.20	1660	24	2.22E-03	50.8	3.00E+00	
0	934.92	164	382	3.88	1869.07	1861	18	3.79E-03	58.4	2.76E+00	
2	965.15	242	409	2.79	1929.49	1921	23	5.60E-03	47.7	2.70E+00	T
0	1001.19	33	280	1.87	2001.54	1995	13	7.58E-04	****	2.62E+00	T
0	1021.79	31	367	8.56	2042.71	2035	20	7.11E-04	****	2.58E+00	T
0	1065.38	11	210	1.52	2129.84	2126	9	2.59E-04	****	2.49E+00	
0	1155.28	117	428	5.30	2309.55	2294	22	2.75E-03	91.5	2.33E+00	
0	1237.87	172	316	1.94	2474.63	2468	16	4.07E-03	48.0	2.20E+00	T
0	1327.77	25	137	1.76	2654.35	2646	11	5.90E-04	****	2.08E+00	
0	1376.85	47	201	3.66	2752.47	2749	13	1.12E-03	****	2.02E+00	
7	1403.85	76	235	5.26	2806.44	2793	36	1.82E-03	****	1.99E+00	
7	1409.10	85	141	3.27	2816.93	2793	36	2.05E-03	75.3	1.98E+00	T
0	1588.56	60	160	2.49	3175.73	3168	16	1.45E-03	95.7	1.81E+00	
0	1630.85	96	101	3.75	3260.28	3250	20	2.35E-03	54.2	1.78E+00	
0	1731.23	113	113	2.73	3460.96	3450	26	2.78E-03	53.9	1.71E+00	
0	1848.22	45	104	4.57	3694.88	3684	17	1.12E-03	89.7	1.64E+00	
0	1974.12	37	48	6.00	3946.63	3938	17	9.18E-04	77.4	1.59E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656009.CNF;1
Acquisition date : 23-JUN-2016 13:05:49 Sensitivity : 3.000
Detector ID : GAM18 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.06 Half life ratio : *****
Sample date : 17-MAY-2016 11:10:00 Nuclide Library : SOLID
Sample ID : G398656009 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.4405E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 22-JUN-2015 09:18:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;9

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.494E-02
MN-54	7.182E-03
CD-109	1.668E-01
TE-125M	2.683E+00
SN-126	1.587E-02
BA-137M	7.127E-03
CS-137	7.529E-03
PR-144	5.771E-01
PM-147	1.645E+02
EU-155	2.285E-02
TL-208	7.141E-03
PB-210	1.141E+00
PB-212	1.166E-02
BI-214	1.436E-02
PB-214	1.519E-02
RN-222	1.436E-02
RA-223	1.398E-01
RA-224	1.248E-01
RA-226	1.436E-02
AC-228	2.651E-02
RA-228	2.651E-02
TH-228	1.166E-02
TH-229	1.132E-01
TH-230	1.436E-02
PA-231	9.543E-02
TH-231	1.398E-01
TH-232	2.651E-02
TH-234	3.362E-01
U-234	1.436E-02
U-235	4.376E-02
U-238	3.362E-01
AM-243	1.275E-02
ANH-511	5.789E-03

---- Non-Identified Nuclides ----

Lc

Nuclide	(pCi/GRAM)	
BE-7	8.530E-02	NOT IDENT.
NA-22	8.118E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.070E-03	NOT IDENT.
SC-46	8.972E-03	FAIL ABUN
V-48	3.534E-02	NOT IDENT.
CR-51	1.364E-01	NOT IDENT.
CO-56	9.495E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.762E-03	NOT IDENT.
CO-58	9.005E-03	NOT IDENT.
FE-59	2.378E-02	NOT IDENT.
CO-60	7.334E-03	NOT IDENT.
ZN-65	1.815E-02	NOT IDENT.
GE-68	2.518E-01	NOT IDENT.
AS-73	3.129E-01	NOT IDENT.
AS-74	4.520E-02	NOT IDENT.
SE-75	1.044E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.121E-01	NOT IDENT.
RB-83	1.793E-02	NOT IDENT.
KR-85	2.129E+00	NOT IDENT.
SR-85	1.424E-02	NOT IDENT.
RB-86	3.390E-01	NOT IDENT.
Y-88	8.034E-03	NOT IDENT.
Y-91	5.068E+00	NOT IDENT.
NB-94	6.873E-03	NOT IDENT.
NB-95	1.158E-02	NOT IDENT.
NB-95M	3.337E-02	NOT IDENT.
ZR-95	1.813E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.150E-03	NOT IDENT.
RH-102	1.053E-02	FAIL ABUN
RU-103	1.183E-02	FAIL ABUN
RH-106	6.523E-02	NOT IDENT.
RU-106	6.523E-02	NOT IDENT.
AG-108M	6.122E-03	NOT IDENT.
AG-110M	9.979E-03	NOT IDENT.
SN-113	1.073E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.608E-02	NOT IDENT.
TE-123M	6.864E-03	NOT IDENT.
SB-124	1.929E-02	NOT IDENT.
SB-125	1.900E-02	FAIL ABUN
I-126	1.490E-01	FAIL ABUN
SB-126	9.693E-02	FAIL ABUN
SB-127	1.407E+01	NOT IDENT.
I-131	1.600E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.613E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.353E-03	FAIL ABUN
CS-135	3.540E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.513E-02	FAIL ABUN
CE-139	6.990E-03	NOT IDENT.
BA-140	1.818E-01	FAIL ABUN
LA-140	5.644E-02	FAIL ABUN
CE-141	2.142E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.460E-02	FAIL ABUN
PM-144	7.612E-03	FAIL ABUN
PM-146	9.131E-03	NOT IDENT.
ND-147	4.441E-01	FAIL ABUN
PM-149	0.000E+00	SHORT HLIF
EU-150	5.787E-03	FAIL ABUN
EU-152	2.017E-02	FAIL ABUN
GD-153	1.951E-02	NOT IDENT.
EU-154	2.273E-02	FAIL ABUN
TB-160	3.077E-02	FAIL ABUN
HO-166M	1.174E-02	FAIL ABUN
TM-171	5.671E+00	FAIL ABUN

HF-172	4.301E-02	FAIL ABUN
LU-172	1.165E-02	FAIL ABUN
LU-176	5.524E-03	FAIL ABUN
HF-181	1.281E-02	NOT IDENT.
TA-182	4.080E-02	FAIL ABUN
RE-183	6.801E-02	FAIL ABUN
RE-184	3.609E-02	NOT IDENT.
W-188	1.867E+00	FAIL ABUN
IR-192	8.908E-03	FAIL ABUN
HG-203	1.183E-02	NOT IDENT.
BI-207	1.045E-02	FAIL ABUN
BI-211	8.583E-02	FAIL ABUN
PB-211	1.528E-01	NOT IDENT.
BI-212	1.313E-01	FAIL ABUN
RN-219	8.609E-02	FAIL ABUN
AC-227	5.304E-02	FAIL ABUN
TH-227	5.304E-02	FAIL ABUN
PA-233	1.319E-02	FAIL ABUN
PA-234	5.477E-02	FAIL ABUN
PA-234M	9.181E-01	FAIL ABUN
NP-237	1.319E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.635E-02	FAIL ABUN
PU-239	7.984E+01	FAIL ABUN
AM-241	4.208E-02	NOT IDENT.
CM-243	2.294E-02	FAIL ABUN
BK-247	1.665E-02	FAIL ABUN
CM-247	7.920E-03	FAIL ABUN
CF-249	8.640E-03	NOT IDENT.
CF-251	2.734E-02	FAIL ABUN

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656009.CNF;1
Acquisition date : 23-JUN-2016 13:05:49 Sensitivity : 3.000
Detector ID : GAM18 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.06 Half life ratio : *****
Sample date : 17-MAY-2016 11:10:00 Nuclide Library : SOLID
Sample ID : G398656009 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.4405E+02 GRAM
Quantity Err(%) : 1.3884E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 22-JUN-2015 09:18:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM18_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	7.908E+00	7.495E-01	7.495E-01
MN-54	3.298E-03	1.607E-02	1.607E-02
CD-109	1.575E+00	3.974E-01	3.974E-01
TE-125M	3.753E+00	3.965E+00	3.965E+00
SN-126	1.489E-01	3.673E-02	3.673E-02
BA-137M	2.761E-01	3.041E-02	3.041E-02
CS-137	2.917E-01	3.211E-02	3.211E-02
PR-144	4.547E-01	6.309E-01	6.309E-01
PM-147	2.877E+02	2.927E+02	2.927E+02
EU-155	5.078E-02	3.804E-02	3.804E-02
TL-208	2.136E-01	2.803E-02	2.803E-02
PB-210	1.734E+00	2.796E+00	2.796E+00
PB-212	7.878E-01	7.147E-02	7.147E-02
BI-214	4.264E-01	5.283E-02	5.283E-02
PB-214	5.830E-01	6.336E-02	6.336E-02
RN-222	4.264E-01	5.283E-02	5.283E-02
RA-223	2.203E-01	1.734E-01	1.734E-01
RA-224	1.002E+00	3.561E-01	3.561E-01
RA-226	4.264E-01	5.283E-02	5.283E-02
AC-228	6.767E-01	1.322E-01	1.322E-01
RA-228	6.767E-01	1.322E-01	1.322E-01
TH-228	7.878E-01	7.147E-02	7.147E-02
TH-229	-4.851E-02	1.273E-01	1.273E-01
TH-230	4.264E-01	5.283E-02	5.283E-02
PA-231	5.592E-01	2.465E-01	2.465E-01
TH-231	2.203E-01	1.734E-01	1.734E-01
TH-232	6.767E-01	1.322E-01	1.322E-01
TH-234	5.809E-01	7.500E-01	7.500E-01
U-234	4.264E-01	5.283E-02	5.283E-02
U-235	-3.139E-02	6.504E-02	6.504E-02
U-238	5.809E-01	7.500E-01	7.500E-01
AM-243	1.268E-01	2.607E-02	2.607E-02
ANH-511	3.031E-02	2.472E-02	2.472E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.041E-01	1.032E-01	1.134E-01	NOT IDENT.
NA-22	-3.871E-03	9.688E-03	9.844E-03	NOT IDENT.
NA-24	-7.097E+15	8.797E+15	9.361E+15	SHORT HLIF
AL-26	-4.669E-04	7.270E-03	7.273E-03	NOT IDENT.
SC-46	1.360E-03	1.035E-02	1.037E-02	FAIL ABUN
V-48	9.462E-03	4.115E-02	4.138E-02	NOT IDENT.
CR-51	2.061E-02	1.605E-01	1.608E-01	NOT IDENT.
CO-56	1.107E-03	1.227E-02	1.228E-02	FAIL ABUN
MN-56	1.000E+41	1.093E+42	0.000E+00	SHORT HLIF
CO-57	-5.989E-03	7.584E-03	8.050E-03	NOT IDENT.
CO-58	-4.617E-04	1.258E-02	1.258E-02	NOT IDENT.
FE-59	6.888E-03	2.808E-02	2.825E-02	NOT IDENT.
CO-60	3.938E-03	9.917E-03	1.007E-02	NOT IDENT.
ZN-65	1.062E-02	2.500E-02	2.545E-02	NOT IDENT.
GE-68	2.525E-01	2.939E-01	3.151E-01	NOT IDENT.
AS-73	2.131E-01	3.311E-01	3.447E-01	NOT IDENT.
AS-74	-1.262E-02	5.221E-02	5.252E-02	NOT IDENT.
SE-75	-6.212E-03	1.401E-02	1.428E-02	FAIL ABUN
BR-77	7.947E+04	8.589E+04	9.306E+04	SHORT HLIF
SR-82	-2.883E-01	1.662E-01	2.110E-01	NOT IDENT.
RB-83	2.498E-02	2.376E-02	2.629E-02	NOT IDENT.
KR-85	1.981E+01	2.663E+00	9.319E+00	NOT IDENT.
SR-85	1.322E-01	1.780E-02	6.222E-02	NOT IDENT.
RB-86	7.265E-02	3.999E-01	4.012E-01	NOT IDENT.
Y-88	-2.088E-03	1.093E-02	1.097E-02	NOT IDENT.
Y-91	4.567E-03	5.904E+00	5.904E+00	NOT IDENT.
NB-94	-2.508E-03	8.785E-03	8.858E-03	NOT IDENT.
NB-95	3.722E-02	1.486E-02	2.241E-02	NOT IDENT.
NB-95M	6.645E-02	4.200E-02	5.159E-02	NOT IDENT.
ZR-95	3.409E-02	2.563E-02	2.988E-02	FAIL ABUN
NB-97	1.000E+41	4.583E+40	0.000E+00	SHORT HLIF
ZR-97	7.590E+15	1.630E+15	3.790E+15	SHORT HLIF
MO-99	-5.844E+02	7.456E+02	7.908E+02	SHORT HLIF
TC-99M	-1.000E+41	1.070E+41	0.000E+00	SHORT HLIF
RH-101	5.912E-04	9.208E-03	9.212E-03	NOT IDENT.
RH-102	-5.103E-03	1.234E-02	1.255E-02	FAIL ABUN
RU-103	-7.334E-03	1.413E-02	1.451E-02	FAIL ABUN
RH-106	-3.036E-02	7.616E-02	7.738E-02	NOT IDENT.
RU-106	-3.036E-02	7.616E-02	7.738E-02	NOT IDENT.
AG-108M	1.325E-03	7.037E-03	7.062E-03	NOT IDENT.
AG-110M	2.934E-03	1.146E-02	1.154E-02	NOT IDENT.
SN-113	-4.573E-03	1.238E-02	1.255E-02	NOT IDENT.
CD-115	-2.083E+03	2.668E+03	2.829E+03	SHORT HLIF
SN-117M	-1.411E-02	4.504E-02	4.549E-02	NOT IDENT.
TE-123M	-2.613E-03	8.571E-03	8.652E-03	NOT IDENT.
SB-124	-3.451E-03	2.303E-02	2.308E-02	NOT IDENT.
SB-125	-7.715E-03	2.214E-02	2.241E-02	FAIL ABUN
I-126	1.150E-01	1.968E-01	2.035E-01	FAIL ABUN
SB-126	-1.985E-02	1.618E-01	1.621E-01	FAIL ABUN
SB-127	5.662E+00	1.662E+01	1.681E+01	NOT IDENT.
I-131	1.987E-02	1.807E-01	1.809E-01	FAIL ABUN
I-132	1.000E+41	3.825E+41	0.000E+00	SHORT HLIF
TE-132	1.461E+01	2.704E+01	2.783E+01	SHORT HLIF
BA-133	7.299E-03	1.094E-02	1.142E-02	FAIL ABUN
I-133	1.939E+10	6.902E+10	6.957E+10	SHORT HLIF
CS-134	4.636E-02	1.708E-02	2.699E-02	FAIL ABUN
CS-135	1.197E-01	4.447E-02	6.992E-02	NOT IDENT.
I-135	1.637E+39	3.238E+39	0.000E+00	SHORT HLIF
CS-136	3.411E-03	7.693E-02	7.695E-02	FAIL ABUN
CE-139	1.167E-04	8.697E-03	8.697E-03	NOT IDENT.
BA-140	-9.255E-02	2.187E-01	2.226E-01	FAIL ABUN
LA-140	-1.642E-02	7.940E-02	7.974E-02	FAIL ABUN
CE-141	-4.750E-02	3.291E-02	3.926E-02	NOT IDENT.
CE-143	1.718E+07	3.070E+06	8.329E+06	SHORT HLIF
CE-144	-1.054E-02	5.819E-02	5.838E-02	FAIL ABUN
PM-144	6.006E-03	8.333E-03	8.762E-03	FAIL ABUN
PM-146	6.370E-03	1.073E-02	1.111E-02	NOT IDENT.
ND-147	-2.906E-01	5.360E-01	5.518E-01	FAIL ABUN
PM-149	-1.149E+04	2.690E+04	2.739E+04	SHORT HLIF
EU-150	1.632E-04	1.106E-02	1.106E-02	FAIL ABUN
EU-152	-1.626E-02	2.667E-02	2.766E-02	FAIL ABUN
GD-153	-6.168E-03	3.116E-02	3.128E-02	NOT IDENT.
EU-154	-1.108E-02	2.713E-02	2.759E-02	FAIL ABUN
TB-160	5.672E-03	3.542E-02	3.551E-02	FAIL ABUN
HO-166M	-5.743E-03	1.395E-02	1.419E-02	FAIL ABUN

TM-171	1.400E+00	5.982E+00	6.015E+00	FAIL ABUN
HF-172	3.957E-02	5.472E-02	5.755E-02	FAIL ABUN
LU-172	-4.153E-03	1.407E-02	1.419E-02	FAIL ABUN
LU-176	5.383E-04	7.016E-03	7.021E-03	FAIL ABUN
HF-181	6.011E-03	1.481E-02	1.505E-02	NOT IDENT.
TA-182	2.233E-03	4.754E-02	4.755E-02	FAIL ABUN
RE-183	-6.002E-02	9.050E-02	9.446E-02	FAIL ABUN
RE-184	-9.843E-04	4.907E-02	4.907E-02	NOT IDENT.
W-188	-3.428E-01	2.509E+00	2.514E+00	FAIL ABUN
IR-192	8.895E-03	1.028E-02	1.104E-02	FAIL ABUN
HG-203	3.700E-02	1.993E-02	2.598E-02	NOT IDENT.
BI-207	1.659E-03	1.233E-02	1.235E-02	FAIL ABUN
BI-211	1.606E+00	1.765E-01	7.453E-01	FAIL ABUN
PB-211	5.562E-02	2.000E-01	2.015E-01	NOT IDENT.
BI-212	8.820E-01	2.191E-01	4.540E-01	FAIL ABUN
RN-219	1.358E-02	9.826E-02	9.845E-02	FAIL ABUN
AC-227	2.465E-03	6.097E-02	6.098E-02	FAIL ABUN
TH-227	2.465E-03	6.097E-02	6.098E-02	FAIL ABUN
PA-233	-4.115E-03	1.564E-02	1.575E-02	FAIL ABUN
PA-234	-2.665E-02	7.438E-02	7.534E-02	FAIL ABUN
PA-234M	6.441E-01	1.730E+00	1.754E+00	FAIL ABUN
NP-237	-4.115E-03	1.564E-02	1.575E-02	FAIL ABUN
NP-238	3.787E+03	6.409E+03	6.633E+03	SHORT HLIF
NP-239	-5.481E-02	7.375E-02	7.778E-02	FAIL ABUN
PU-239	1.982E+02	1.367E+02	1.633E+02	FAIL ABUN
AM-241	3.112E-02	5.801E-02	5.968E-02	NOT IDENT.
CM-243	-3.324E-03	3.675E-02	3.678E-02	FAIL ABUN
BK-247	-2.349E-03	2.207E-02	2.210E-02	FAIL ABUN
CM-247	-7.929E-04	9.340E-03	9.347E-03	FAIL ABUN
CF-249	6.439E-03	9.720E-03	1.014E-02	NOT IDENT.
CF-251	-2.345E-03	3.030E-02	3.032E-02	FAIL ABUN

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	920.3941	87.09	1200.3171	136.47	1151.1948
45.60	931.3115	87.57	1202.2660	140.51	0.0000
46.54	941.0889	88.03	1204.1332	143.76	1222.9045
49.72	0.0000	88.34	1205.3842	144.24	1200.3719
51.35	1034.1454	88.47	1205.9122	145.44	1277.6241
51.87	1025.1244	89.96	1211.9034	152.43	1236.6638
52.39	1035.4060	1093.63	1214.6193	153.25	1219.7272
52.97	993.6407	91.11	1216.4863	323.87	1190.8944
53.44	1010.3680	92.59	1222.3518	156.02	1235.6749
54.07	995.6751	93.35	1225.3442	158.56	1214.5149
57.36	0.0000	94.56	1230.0844	159.00	1207.1805
57.53	1068.5081	94.65	1230.4364	162.33	1170.1532
57.98	1093.2535	94.67	1230.5118	162.66	1170.9497
59.27	1050.1556	94.87	1231.2914	163.33	1153.3790
59.32	1050.3979	97.43	1168.9021	165.86	1142.8818
59.54	1051.4530	98.43	1084.8772	176.31	1136.7947
60.96	1147.7333	98.44	1084.9155	176.60	1146.5303
61.17	1148.8143	99.53	1097.6329	177.52	1146.7133
62.93	1225.5055	100.11	1117.7966	181.07	0.0000
63.29	1227.4315	102.03	1093.7202	181.52	1119.1493
63.58	1228.9807	103.18	1121.9863	184.41	1166.5392
64.28	1260.7505	103.37	1122.6230	143.76	1193.0548
66.73	1192.9468	105.21	1122.5315	193.51	1221.1106
67.24	1261.7552	105.31	1122.8591	197.03	1159.6644
125.81	1293.8606	106.12	989.4531	198.01	1175.8312
67.75	1294.2322	106.47	990.4541	201.83	1285.5289
69.67	1398.6875	109.28	1104.5161	203.43	1199.0610
70.83	1337.5045	111.00	1174.1298	205.31	1144.1520
72.81	1355.3730	111.76	0.0000	210.85	1043.2603
72.87	1406.8790	114.06	1121.3811	215.65	1065.6650
74.66	1458.4366	116.30	0.0000	222.11	1059.9099
74.82	1459.3234	116.74	1175.1797	227.09	1033.4072
74.97	1460.1621	119.76	1054.6075	227.38	1060.6830
77.11	1472.0002	121.12	1163.0649	228.16	0.0000
78.74	1480.9069	121.22	1163.3679	228.18	1062.7822
79.69	999.2222	121.78	1205.4004	116.74	1062.7822
80.12	1000.7852	122.06	1212.7316	235.69	1036.3038
80.19	1001.0376	122.92	1183.0508	235.96	1036.7206
80.57	1002.4126	123.07	1183.5082	238.63	1006.0913
81.00	1003.9648	265.00	1204.8185	238.98	0.0000
81.07	1004.2173	125.81	1159.1721	240.99	1009.5868
81.75	1178.2511	127.23	1277.8304	242.00	1011.0762
83.79	1186.7632	127.91	1245.5878	244.70	883.7869
84.00	1187.6307	129.30	1249.8669	252.40	896.4308
85.43	1193.5339	131.20	1156.5765	252.80	908.2758
86.55	1198.1168	133.02	1229.7235	254.15	0.0000
86.79	1199.0913	133.52	1184.6814	256.23	914.7065
86.94	1199.7074	136.00	1135.4287	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	900.3928	355.39	0.0000	584.27	519.6563
264.80	880.4388	356.01	655.4913	595.83	544.5596
265.00	880.6824	364.49	654.9815	427.87	586.2477
268.22	832.2622	366.42	0.0000	602.52	0.0000
269.46	896.0884	372.51	691.6889	604.72	651.0948
270.03	915.1285	375.05	672.5012	607.14	675.0610
271.23	882.4012	377.52	687.5244	609.32	567.7286
273.65	844.2196	356.01	712.9703	610.33	556.6093
276.40	930.2787	388.16	693.7753	614.28	477.3692
277.37	860.0480	388.63	700.8488	618.01	528.4371
277.60	860.3066	391.69	728.0961	620.36	493.5625
278.00	860.7499	264.66	714.8080	621.93	496.9574
279.20	769.1528	401.81	698.9666	630.19	0.0000
279.54	842.1558	402.40	719.4563	631.29	449.4355
279.70	842.3361	404.85	702.5992	633.25	405.2838
280.46	770.3943	410.95	649.0756	634.78	411.5110
283.69	855.2482	413.71	627.6594	635.95	442.9659
284.31	845.1635	414.70	605.1409	636.99	419.8725
285.41	875.2086	423.72	635.3749	645.85	428.0648
285.90	0.0000	427.09	649.3011	657.76	420.3405
287.50	807.5560	427.87	646.7491	657.90	0.0000
290.67	860.2015	433.94	603.9331	661.66	487.8016
293.27	0.0000	439.40	589.1200	664.57	0.0000
351.93	819.7117	453.88	612.1238	666.33	477.7843
295.96	820.4575	463.37	641.6629	666.50	467.6208
879.38	823.0852	468.07	626.8825	667.71	0.0000
299.98	824.4966	473.00	590.9294	677.62	431.3584
300.09	824.5999	475.06	554.3983	685.70	423.5647
300.13	824.6458	476.78	604.2182	695.00	514.4409
301.36	790.7300	477.60	606.7095	696.49	555.5588
302.85	792.1472	482.18	530.3426	696.51	555.5588
256.23	774.3163	487.02	508.1936	697.00	548.7908
304.85	774.6378	492.35	0.0000	697.30	548.8903
306.78	788.5132	497.08	565.2585	697.49	543.7505
308.46	804.1212	505.52	583.5493	702.65	537.6520
311.90	774.0207	507.63	0.0000	706.68	503.6794
316.51	706.6315	511.00	555.2660	711.68	460.3040
319.41	795.3856	514.00	556.5338	720.70	419.3586
320.08	790.3779	514.00	556.5338	721.93	0.0000
321.04	832.8336	520.40	498.3994	722.78	425.1205
323.87	759.2261	520.69	0.0000	722.91	425.1543
325.23	810.0867	522.65	0.0000	723.31	434.0332
328.76	892.5308	527.90	0.0000	724.19	413.1433
333.37	797.7432	528.26	506.0241	727.33	408.8747
333.97	830.2084	529.59	484.7854	733.00	360.4009
334.37	845.7869	529.87	0.0000	735.93	371.5942
338.28	791.0693	531.02	514.6762	333.97	370.7822
338.32	791.1009	537.26	557.4763	739.50	0.0000
311.90	754.9865	546.56	0.0000	747.24	381.3719
340.48	754.9865	552.55	504.6858	748.06	388.0898
340.55	755.0466	563.25	497.3638	752.31	389.2021
344.28	798.0765	569.33	494.8092	753.82	396.6609
345.93	798.5672	946.00	494.8740	756.73	374.0161
351.06	771.3468	569.70	485.6180	756.80	374.0307
351.93	746.0107	583.19	518.3337	884.68	400.3104

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	397.4100	1274.44	271.6663	1620.50	117.1340
766.42	395.7345	1001.03	346.2153	1621.92	130.9627
766.84	408.4211	1002.74	354.9980	1678.03	0.0000
772.60	0.0000	1004.73	378.1593	1690.97	109.1684
776.52	469.9539	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	107.2236
778.90	420.0630	1028.54	0.0000	1063.66	87.6904
783.70	359.3998	1037.84	309.6830	1771.35	85.9242
785.37	396.0450	1038.76	0.0000	1791.20	0.0000
792.07	357.3076	631.29	310.7751	1808.65	101.3562
794.95	354.6390	1048.07	321.1841	1810.72	0.0000
795.86	354.8084	1049.04	308.0022	1836.06	110.6050
810.06	342.1915	1050.41	323.5275		
810.29	342.2304	1063.66	351.9838		
344.28	349.6167	1077.00	302.0925		
810.76	349.6697	1077.34	274.1963		
815.77	343.1710	1085.87	278.2164		
1048.07	367.6558	1093.63	297.7903		
832.01	331.9918	1099.45	305.7534		
834.85	376.2208	1112.07	324.7773		
835.71	376.3828	1112.84	334.0518		
836.80	0.0000	1115.54	349.0833		
846.75	0.0000	1120.29	321.8379		
846.77	383.1992	1120.55	309.2476		
856.80	390.3542	1221.41	301.9646		
860.56	359.7053	1129.67	341.1998		
871.09	288.5380	1131.51	0.0000		
873.19	306.5305	1147.95	0.0000		
875.33	0.0000	1173.23	316.2049		
879.38	326.2878	1177.95	310.1605		
880.51	309.3292	1189.05	310.4456		
883.24	305.9084	1204.77	349.1665		
884.68	325.1881	1221.41	365.5144		
889.28	333.5231	1231.02	355.7603		
894.76	320.9560	1235.36	342.6553		
898.04	365.5724	1238.28	357.0714		
900.72	341.8467	1260.41	0.0000		
903.28	336.6333	1271.87	264.0562		
911.20	353.2924	1274.44	296.3437		
912.08	366.7107	1274.54	296.3530		
923.98	0.0000	1291.59	239.3999		
926.50	335.0707	1298.22	0.0000		
929.11	325.2386	1312.11	222.3170		
937.49	307.6447	1332.49	198.9087		
944.13	336.7336	1362.66	0.0000		
946.00	328.2411	1365.19	205.0813		
949.00	300.3650	1368.63	0.0000		
667.71	0.0000	1384.29	164.5938		
962.31	305.8014	1408.01	190.5646		
964.08	338.8848	1457.56	0.0000		
966.17	328.3120	1460.82	172.9937		
911.20	303.2112	1489.16	167.1515		
968.97	303.2112	1505.03	209.6306		
983.53	316.7966	1584.12	136.4648		
984.45	0.0000	1596.21	167.7150		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 01:09:37.69

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                             *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656010.CNF:1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM20.CNF:500
Background date  : 20-JUN-2016 14:03:44
Sample date      : 17-MAY-2016 11:15:00 Acquisition date : 23-JUN-2016 13:06:10
Sample ID        : G398656010 Sample quantity : 1.59870E+02 GRAM
Detector name     : GAM20 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:02:55.99 0.4%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	26.55*	85	65	0.77	53.31	51	21	1.96E-03	47.4	3.38E+00
2	10	27.65*	195	223	1.23	55.50	51	21	4.51E-03	27.4	
3	10	29.35*	435	942	2.41	58.91	51	21	1.01E-02	21.8	
4	10	31.93*	227	1864	2.71	64.07	51	21	5.26E-03	46.1	
5	0	63.38*	248	2122	0.98	126.91	123	8	5.74E-03	36.1	
6	5	72.82	176	1446	1.17	145.78	143	17	4.07E-03	32.5	4.09E+00
7	5	74.93*	2050	1941	1.23	150.01	143	17	4.74E-02	4.4	
8	5	77.20	3054	1512	0.99	154.54	143	17	7.07E-02	2.8	
9	0	81.35	128	1402	0.88	162.84	160	6	2.97E-03	47.1	
10	2	84.35*	388	1857	1.25	168.83	165	27	8.99E-03	23.0	3.69E+00
11	2	87.26	1304	1783	1.31	174.64	165	27	3.02E-02	6.2	
12	2	90.00*	685	1497	1.14	180.12	165	27	1.58E-02	10.6	
13	2	92.86*	1030	1630	1.41	185.84	165	27	2.38E-02	8.9	
14	0	99.17*	42	1499	1.89	198.44	195	8	9.80E-04	187.5	
15	0	105.20	133	1529	1.26	210.50	208	8	3.08E-03	51.6	
16	0	108.88	107	1271	1.28	217.85	215	7	2.48E-03	56.1	
17	0	128.96	265	1420	0.90	257.99	255	8	6.14E-03	25.4	
18	0	154.13	132	1308	1.00	308.29	305	8	3.06E-03	48.0	
19	0	163.43*	38	849	1.11	326.89	325	6	8.75E-04	150.1	
20	0	185.82*	812	1858	1.26	371.65	365	13	1.88E-02	12.7	
21	0	209.20	555	1192	1.13	418.38	414	9	1.28E-02	12.0	
22	0	217.66	30	1156	0.68	435.29	429	9	7.00E-04	204.4	
23	2	238.59*	5438	827	1.12	477.13	470	20	1.26E-01	1.7	1.55E+00
24	2	241.54	1132	1077	1.61	483.04	470	20	2.62E-02	7.4	
25	0	270.16	550	968	1.20	540.24	535	12	1.27E-02	12.1	
26	0	277.15	345	988	1.02	554.22	548	12	7.99E-03	19.0	
27	0	288.84	62	616	1.32	577.59	574	8	1.44E-03	70.6	
28	0	295.17	1537	819	1.12	590.25	585	11	3.56E-02	4.4	
29	0	299.96	290	900	1.14	599.82	596	11	6.71E-03	20.8	
30	0	327.77	309	613	1.55	655.43	651	9	7.16E-03	15.5	
31	0	338.29*	1034	784	1.25	676.47	671	12	2.39E-02	7.2	
32	0	347.62	84	476	1.33	695.12	691	8	1.94E-03	46.5	
33	0	351.85*	2666	666	1.25	703.58	699	11	6.17E-02	2.8	
34	0	409.66	114	571	1.31	819.17	815	10	2.63E-03	40.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	442.66	14	388	0.75	885.17	879	8	3.27E-04	243.9	
36	0	462.83	375	545	1.47	925.50	920	12	8.69E-03	13.4	
37	0	511.01*	378	708	1.90	1021.84	1013	19	8.74E-03	23.5	
38	0	562.42	36	366	1.03	1124.68	1122	9	8.41E-04	96.2	
39	0	583.16*	1591	531	1.49	1166.15	1158	14	3.68E-02	4.3	
40	0	609.29*	1742	489	1.54	1218.42	1213	12	4.03E-02	3.7	
41	0	665.52	54	255	1.88	1330.90	1327	9	1.26E-03	54.5	
42	0	692.16*	23	349	4.04	1384.19	1378	13	5.41E-04	192.7	
43	0	702.21	37	250	1.52	1404.29	1402	8	8.61E-04	75.2	
44	0	708.57	11	386	1.36	1417.02	1412	11	2.62E-04	338.0	
45	0	727.43*	318	504	1.62	1454.76	1446	16	7.36E-03	17.5	
46	0	755.63	81	275	3.67	1511.18	1506	12	1.88E-03	42.5	
47	0	767.99	151	361	1.77	1535.90	1531	12	3.50E-03	26.3	
48	0	773.75	132	301	1.67	1547.42	1542	14	3.05E-03	29.9	
49	0	785.13	80	279	2.96	1570.20	1565	12	1.86E-03	43.1	
50	0	794.90	250	304	1.24	1589.74	1583	14	5.79E-03	16.1	
51	0	807.19	41	306	0.58	1614.34	1607	13	9.55E-04	89.8	
52	0	831.96	20	266	2.01	1663.90	1653	13	4.56E-04	172.2	
53	0	835.52	70	239	1.40	1671.01	1666	10	1.63E-03	42.8	
54	0	838.96	19	293	1.77	1677.91	1676	11	4.36E-04	177.6	
55	0	860.42	255	252	1.42	1720.85	1714	14	5.91E-03	14.6	
56	0	911.20*	1155	248	1.66	1822.46	1814	15	2.67E-02	4.4	
57	0	934.04	80	213	1.41	1868.16	1864	12	1.85E-03	38.1	
58	1	964.78	247	218	1.85	1929.69	1923	22	5.71E-03	13.4	3.51E-01
59	1	969.01	633	205	1.62	1938.16	1923	22	1.47E-02	5.8	
60	0	1000.66	73	190	1.67	2001.50	1996	11	1.68E-03	38.6	
61	0	1024.50	16	158	1.78	2049.23	2043	10	3.74E-04	148.2	
62	0	1120.41*	350	253	1.41	2241.20	2236	13	8.10E-03	11.4	
63	0	1139.11	14	117	1.46	2278.64	2276	8	3.24E-04	137.0	
64	0	1155.82	51	264	0.52	2312.09	2302	16	1.19E-03	72.0	
65	0	1166.77	11	187	4.81	2334.01	2324	12	2.51E-04	256.6	
66	0	1238.03	149	203	2.17	2476.68	2471	13	3.46E-03	21.2	
67	0	1254.34	22	129	1.30	2509.35	2507	9	5.20E-04	92.8	
68	0	1314.18	50	157	5.20	2629.16	2619	19	1.15E-03	62.1	
69	0	1371.00	54	134	5.55	2742.94	2734	17	1.26E-03	50.8	
70	0	1378.19	194	67	1.74	2757.35	2751	15	4.50E-03	11.8	
71	0	1401.66	40	55	1.51	2804.36	2801	9	9.34E-04	36.9	
72	0	1407.75	83	99	1.48	2816.55	2810	15	1.93E-03	28.1	
73	0	1447.08	27	55	2.01	2895.31	2890	9	6.36E-04	52.6	
74	0	1460.98*	2629	76	1.89	2923.16	2915	17	6.08E-02	2.2	
75	0	1496.10	55	75	2.18	2993.50	2984	15	1.28E-03	36.6	
76	0	1512.78	105	143	4.70	3026.92	3015	31	2.43E-03	35.5	
77	2	1588.28*	55	92	2.19	3178.16	3172	19	1.27E-03	44.5	1.84E+00
78	2	1592.33	28	76	1.85	3186.28	3172	19	6.55E-04	56.9	
79	2	1621.01	55	60	2.48	3243.73	3234	22	1.28E-03	33.1	3.38E+00
80	2	1625.21	33	17	2.48	3252.14	3234	22	7.72E-04	29.2	
81	0	1630.70	63	52	1.13	3263.15	3257	13	1.45E-03	26.9	
82	0	1729.74	74	50	2.79	3461.58	3456	12	1.71E-03	22.5	
83	0	1764.83*	310	82	1.95	3531.89	3523	20	7.18E-03	10.0	
84	0	1847.37	68	63	1.14	3697.31	3687	18	1.57E-03	29.9	
85	0	1899.06	55	113	13.63	3800.90	3777	36	1.27E-03	63.7	
86	0	1948.52	16	47	5.54	3900.03	3888	15	3.77E-04	96.2	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656010.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:15:00 Acquisition date : 23-JUN-2016 13:06:10
Sample ID        : G398656010 Sample quantity  : 159.87 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA20 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:02:55.99 0.4%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.318E+00	7.105E+00	7.105E+00	4.33	OK
MN-54	834.85	99.98*	2.166E+00	1.319E-02	1.433E-02	85.52	OK
CD-109	88.03	3.70*	7.465E+00	1.683E+00	1.780E+00	18.34	OK
TE-125M	109.28	0.27*	7.906E+00	2.528E+00	3.968E+00	112.18	OK
SN-126	64.28	9.60	4.941E+00	2.771E-01	2.771E-01	72.14	OK
	86.94	8.90	7.465E+00	6.995E-01	6.995E-01	18.34	OK
	87.57	37.00*	7.465E+00	1.683E-01	1.683E-01	18.34	OK
EU-155	86.55	30.70	7.465E+00	2.028E-01	2.058E-01	18.34	OK
	105.31	21.10*	7.902E+00	4.041E-02	4.102E-02	103.29	OK
TL-208	277.37	6.60	4.889E+00	4.917E-01	4.917E-01	38.00	OK
	583.19	85.00*	2.901E+00	2.735E-01	2.735E-01	8.62	OK
	860.56	12.50	2.112E+00	3.920E-01	3.920E-01	29.19	OK
BI-212	727.33	6.67*	2.435E+00	8.085E-01	8.085E-01	34.99	OK
	785.37	1.10	2.285E+00	1.308E+00	1.308E+00	86.14	OK
	1620.50	1.47	1.214E+00	1.165E+00	1.165E+00	66.18	OK
PB-212	74.82	10.28	6.518E+00	1.139E+00	1.139E+00	12.92	OK
	77.11	17.10	6.745E+00	1.379E+00	1.379E+00	5.52	OK
	238.63	43.60*	5.411E+00	1.076E+00	1.076E+00	3.48	OK
	300.09	3.30	4.633E+00	8.642E-01	8.642E-01	41.58	OK
BI-214	609.32	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46	OK
	1120.29	14.92	1.666E+00	5.524E-01	5.524E-01	22.73	OK
	1764.49	15.30	1.145E+00	6.565E-01	6.566E-01	20.09	OK
PB-214	74.82	5.80	6.506E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.745E+00	2.431E+00	2.431E+00	5.52	OK
	87.09	3.41	7.457E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.359E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.684E+00	8.131E-01	8.131E-01	8.84	OK
	351.93	35.60*	4.155E+00	8.074E-01	8.075E-01	5.64	OK
RN-222	609.32	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46	OK
	1120.29	14.92	1.666E+00	5.524E-01	5.524E-01	22.73	OK
	1764.49	15.30	1.145E+00	6.565E-01	6.566E-01	20.09	OK
RA-223	81.07	15.00	7.096E+00	6.240E-02	6.240E-02	94.14	OK
	83.79	24.70	7.301E+00	1.112E-01	1.112E-01	46.01	OK
	94.56	8.67	7.747E+00	----- Line	Not Found	-----	Absent
	144.24	3.27	7.330E+00	----- Line	Not Found	-----	Absent
	154.21	5.70	7.097E+00	1.595E-01	1.595E-01	96.05	OK
	269.46	13.90	4.974E+00	3.666E-01	3.666E-01	24.13	OK
	323.87	3.99*	4.397E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	4.268E+00	3.837E+00	3.837E+00	14.50	OK
RA-224	240.99	4.10*	5.366E+00	9.602E-01	9.602E-01	39.30	OK
RA-226	609.32	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46	OK
	1120.29	14.92	1.666E+00	5.524E-01	5.524E-01	22.73	OK
	1764.49	15.30	1.145E+00	6.565E-01	6.566E-01	20.09	OK
AC-228	105.21	1.10	7.902E+00	7.752E-01	7.752E-01	103.29	OK
	338.32	11.27	4.268E+00	9.668E-01	9.668E-01	14.50	OK
	794.95	4.25	2.261E+00	1.065E+00	1.065E+00	32.18	OK
	835.71	1.61	2.166E+00	8.191E-01	8.191E-01	85.52	OK
	911.20	25.80*	2.008E+00	8.976E-01	8.976E-01	8.87	OK
	968.97	15.80	1.901E+00	8.426E-01	8.426E-01	11.61	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RA-228	105.21	1.10	7.902E+00	7.752E-01	7.752E-01	103.29	OK
	338.32	11.27	4.268E+00	9.668E-01	9.668E-01	14.50	OK
	794.95	4.25	2.261E+00	1.065E+00	1.065E+00	32.18	OK
	835.71	1.61	2.166E+00	8.191E-01	8.191E-01	85.52	OK
	911.20	25.80*	2.008E+00	8.976E-01	8.976E-01	8.87	OK
TH-228	968.97	15.80	1.901E+00	8.426E-01	8.426E-01	11.61	OK
	74.82	10.28	6.518E+00	1.139E+00	1.139E+00	12.92	OK
	77.11	17.10	6.745E+00	1.379E+00	1.379E+00	5.52	OK
	238.63	43.60*	5.411E+00	1.076E+00	1.076E+00	3.48	OK
	300.09	3.30	4.633E+00	8.642E-01	8.642E-01	41.58	OK
TH-229	85.43	14.70	7.301E+00	1.869E-01	1.869E-01	46.01	OK
	88.47	24.00	7.465E+00	2.594E-01	2.594E-01	18.34	OK
	193.51	4.41*	6.212E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.876E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46	OK
	1120.29	14.92	1.666E+00	5.524E-01	5.524E-01	22.73	OK
	1764.49	15.30	1.145E+00	6.565E-01	6.565E-01	20.09	OK
	283.69	1.70	4.812E+00	----- Line	Not Found	-----	Absent
PA-231	301.36	5.35*	4.633E+00	5.331E-01	5.331E-01	41.58	OK
	81.07	15.00	7.096E+00	6.240E-02	6.240E-02	94.14	OK
	83.79	24.70	7.301E+00	1.112E-01	1.112E-01	46.01	OK
	94.87	5.69	7.755E+00	----- Line	Not Found	-----	Absent
TH-231	144.24	3.27	7.330E+00	----- Line	Not Found	-----	Absent
	154.21	5.70	7.097E+00	1.595E-01	1.595E-01	96.05	OK
	269.46	13.90	4.974E+00	3.666E-01	3.666E-01	24.13	OK
	323.87	3.99*	4.397E+00	----- Line	Not Found	-----	Absent
TH-232	338.28	2.84	4.268E+00	3.837E+00	3.837E+00	14.50	OK
	105.21	1.10	7.902E+00	7.752E-01	7.752E-01	103.29	OK
	338.32	11.27	4.268E+00	9.668E-01	9.668E-01	14.50	OK
	835.71	1.61	2.166E+00	8.191E-01	8.191E-01	85.52	OK
TH-234	911.20	25.80*	2.008E+00	8.976E-01	8.976E-01	8.87	OK
	968.97	15.80	1.901E+00	8.426E-01	8.426E-01	11.61	OK
	63.29	3.70*	4.941E+00	7.189E-01	7.189E-01	72.14	OK
	92.59	4.23	7.696E+00	1.620E+00	1.620E+00	17.73	OK
U-234	609.32	45.49*	2.805E+00	5.757E-01	5.757E-01	7.46	OK
	1120.29	14.92	1.666E+00	5.524E-01	5.524E-01	22.73	OK
	1764.49	15.30	1.145E+00	6.565E-01	6.565E-01	20.09	OK
	89.96	3.47	7.591E+00	1.334E+00	1.334E+00	21.21	OK
U-235	93.35	5.60	7.696E+00	1.223E+00	1.223E+00	17.73	OK
	143.76	10.96*	7.341E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.876E+00	5.247E-02	5.247E-02	300.26	OK
	185.72	57.20	6.372E+00	1.067E-01	1.067E-01	25.47	OK
U-238	205.31	5.01	5.979E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	4.941E+00	7.189E-01	7.189E-01	72.14	OK
	92.59	4.23	7.696E+00	1.620E+00	1.620E+00	17.73	OK
	43.53	5.90	1.288E+00	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	6.518E+00	1.742E-01	1.742E-01	12.92	OK
ANH-511	511.00	100.00*	3.200E+00	5.078E-02	5.078E-02	47.06	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656010.CNF;1  *
* Acquisition date   : 23-JUN-2016 13:06:10 Sensitivity      : 3.000          *
* Detector ID        : GAM20 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:02:55.99 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 11:15:00 Analyst initials: MXR1      *
* Sample ID          : G398656010 Sample Quantity : 1.5987E+02 GRAM  *
* Batch Number       : 1572234 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 3-JUN-2015 05:30:57 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;13          *
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	7.105E+00	3.015E-01	1.374E-01
MN-54	1.433E-02	1.201E-02	1.543E-02
CD-109	1.780E+00	3.199E-01	2.901E-01
TE-125M	3.968E+00	4.362E+00	5.578E+00
SN-126	1.683E-01	3.024E-02	2.751E-02
EU-155	4.102E-02	4.152E-02	4.489E-02
TL-208	2.735E-01	2.310E-02	1.460E-02
BI-212	8.085E-01	2.773E-01	1.984E-01
PB-212	1.076E+00	3.668E-02	2.471E-02
BI-214	5.758E-01	4.212E-02	2.932E-02
PB-214	8.075E-01	4.464E-02	3.199E-02
RN-222	5.758E-01	4.212E-02	2.932E-02
RA-223	-2.090E-02	1.802E-01	2.804E-01
RA-224	9.602E-01	3.698E-01	2.646E-01
RA-226	5.758E-01	4.212E-02	2.932E-02
AC-228	8.976E-01	7.798E-02	5.523E-02
RA-228	8.976E-01	7.798E-02	5.523E-02
TH-228	1.076E+00	3.668E-02	2.471E-02
TH-229	2.025E-02	1.309E-01	2.420E-01
TH-230	5.758E-01	4.212E-02	2.932E-02
PA-231	5.331E-01	2.172E-01	2.068E-01
TH-231	-2.090E-02	1.802E-01	2.804E-01
TH-232	8.976E-01	7.798E-02	5.523E-02
TH-234	7.189E-01	5.082E-01	4.667E-01
U-234	5.757E-01	4.212E-02	2.932E-02
U-235	-1.709E-02	5.436E-02	9.168E-02
U-238	7.189E-01	5.082E-01	4.667E-01
AM-243	1.742E-01	2.206E-02	2.037E-02
ANH-511	5.078E-02	2.342E-02	1.137E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	9.577E-03	1.018E-01	1.880E-01	NOT IDENT.

NA-22	-6.155E-03	9.034E-03	1.568E-02	NOT IDENT.
NA-24	0.000E+00	8.894E+15	0.000E+00	SHORT HLIF
AL-26	4.189E-03	7.693E-03	1.434E-02	NOT IDENT.
SC-46	2.442E-04	1.087E-02	1.921E-02	FAIL ABUN
V-48	-1.085E-02	4.016E-02	6.953E-02	NOT IDENT.
CR-51	-1.475E-02	1.629E-01	2.906E-01	NOT IDENT.
CO-56	2.162E-03	1.270E-02	1.966E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-3.728E-03	7.138E-03	1.190E-02	NOT IDENT.
CO-58	-7.320E-03	1.233E-02	1.824E-02	NOT IDENT.
FE-59	-1.900E-02	2.704E-02	4.754E-02	NOT IDENT.
CO-60	6.497E-03	8.730E-03	1.635E-02	NOT IDENT.
ZN-65	-1.405E-02	2.467E-02	3.711E-02	NOT IDENT.
GE-68	2.820E-01	3.013E-01	5.492E-01	NOT IDENT.
AS-73	-1.373E-01	2.021E-01	3.271E-01	NOT IDENT.
AS-74	2.809E-02	5.233E-02	9.662E-02	NOT IDENT.
SE-75	3.067E-03	1.364E-02	2.184E-02	NOT IDENT.
BR-77	0.000E+00	3.698E+03	0.000E+00	SHORT HLIF
SR-82	1.888E-02	1.540E-01	2.398E-01	NOT IDENT.
RB-83	1.461E-02	1.935E-02	3.555E-02	NOT IDENT.
KR-85	0.000E+00	1.891E+00	3.616E+00	NOT IDENT.
SR-85	0.000E+00	1.265E-02	2.418E-02	NOT IDENT.
RB-86	3.326E-01	4.064E-01	7.369E-01	NOT IDENT.
Y-88	-3.864E-03	1.021E-02	1.713E-02	NOT IDENT.
Y-91	3.844E+00	5.705E+00	1.059E+01	NOT IDENT.
NB-94	6.169E-03	9.095E-03	1.444E-02	FAIL ABUN
NB-95	0.000E+00	1.506E-02	2.373E-02	NOT IDENT.
NB-95M	0.000E+00	4.440E-02	7.518E-02	NOT IDENT.
ZR-95	3.901E-02	3.251E-02	3.948E-02	FAIL ABUN
NB-97	0.000E+00	9.199E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.446E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.428E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.178E+41	0.000E+00	SHORT HLIF
RH-101	1.202E-02	8.667E-03	1.491E-02	NOT IDENT.
RH-102	-6.115E-04	1.311E-02	2.365E-02	FAIL ABUN
RU-103	3.179E-03	1.315E-02	2.440E-02	FAIL ABUN
RH-106	-4.928E-02	7.635E-02	1.350E-01	NOT IDENT.
RU-106	-4.928E-02	7.635E-02	1.350E-01	NOT IDENT.
AG-108M	2.437E-03	7.206E-03	1.279E-02	NOT IDENT.
AG-110M	-3.128E-03	1.215E-02	2.121E-02	NOT IDENT.
SN-113	-2.081E-03	1.259E-02	2.212E-02	NOT IDENT.
CD-115	0.000E+00	2.583E+03	0.000E+00	SHORT HLIF
SN-117M	-1.278E-02	5.023E-02	7.631E-02	NOT IDENT.
TE-123M	-2.777E-03	1.059E-02	1.456E-02	NOT IDENT.
SB-124	-5.102E-03	2.199E-02	3.884E-02	NOT IDENT.
SB-125	-3.075E-03	2.268E-02	3.963E-02	FAIL ABUN
I-126	1.954E-01	2.086E-01	3.098E-01	FAIL ABUN
SB-126	-8.894E-02	1.398E-01	2.090E-01	FAIL ABUN
SB-127	1.395E-01	1.935E+01	3.015E+01	FAIL ABUN
I-131	1.588E-01	1.922E-01	3.498E-01	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.235E+01	0.000E+00	SHORT HLIF
BA-133	-1.208E-02	1.405E-02	1.812E-02	FAIL ABUN
I-133	0.000E+00	6.747E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.728E-02	2.174E-02	FAIL ABUN
CS-135	0.000E+00	4.349E-02	7.653E-02	NOT IDENT.
I-135	0.000E+00	3.116E+39	0.000E+00	SHORT HLIF
CS-136	-3.080E-03	7.892E-02	1.372E-01	FAIL ABUN
BA-137M	-1.328E-04	8.890E-03	1.391E-02	NOT IDENT.
CS-137	-1.403E-04	9.391E-03	1.469E-02	NOT IDENT.
CE-139	3.188E-03	8.998E-03	1.488E-02	NOT IDENT.
BA-140	9.977E-02	1.989E-01	3.705E-01	FAIL ABUN
LA-140	1.196E-01	6.884E-02	1.256E-01	FAIL ABUN
CE-141	3.018E-02	2.385E-02	4.571E-02	NOT IDENT.
CE-143	0.000E+00	3.592E+06	0.000E+00	SHORT HLIF
CE-144	3.634E-02	5.611E-02	9.470E-02	FAIL ABUN
PM-144	-4.388E-03	1.320E-02	1.514E-02	NOT IDENT.
PR-144	-3.327E-01	9.993E-01	1.146E+00	NOT IDENT.
PM-146	6.776E-03	1.052E-02	1.879E-02	NOT IDENT.
ND-147	-6.081E-01	5.203E-01	9.147E-01	FAIL ABUN
PM-147	-7.747E+01	1.999E+02	3.341E+02	NOT IDENT.
PM-149	0.000E+00	2.709E+04	0.000E+00	SHORT HLIF
EU-150	-6.091E-03	7.690E-03	1.161E-02	FAIL ABUN
EU-152	1.703E-02	3.625E-02	4.193E-02	FAIL ABUN
GD-153	-1.943E-03	3.034E-02	3.742E-02	NOT IDENT.
EU-154	-1.084E-02	2.502E-02	4.405E-02	FAIL ABUN
TB-160	-3.154E-02	4.385E-02	6.408E-02	FAIL ABUN
HO-166M	-1.350E-03	1.652E-02	2.551E-02	FAIL ABUN

TM-171	-1.785E+00	3.526E+00	5.719E+00	NOT IDENT.
HF-172	-1.623E-02	5.155E-02	8.661E-02	FAIL ABUN
LU-172	-2.584E-03	1.378E-02	2.486E-02	FAIL ABUN
LU-176	2.304E-03	6.940E-03	1.165E-02	FAIL ABUN
HF-181	-2.436E-03	1.460E-02	2.675E-02	NOT IDENT.
TA-182	4.646E-03	4.813E-02	8.669E-02	FAIL ABUN
RE-183	1.229E-02	4.579E-02	8.437E-02	FAIL ABUN
RE-184	-1.725E-02	5.127E-02	7.626E-02	NOT IDENT.
W-188	2.047E+00	3.239E+00	3.838E+00	FAIL ABUN
IR-192	-4.712E-03	1.075E-02	1.901E-02	FAIL ABUN
HG-203	0.000E+00	1.467E-02	2.488E-02	FAIL ABUN
BI-207	1.244E-02	1.183E-02	2.167E-02	FAIL ABUN
PB-210	-4.159E-01	6.732E-01	1.023E+00	NOT IDENT.
BI-211	0.000E+00	1.230E-01	2.032E-01	FAIL ABUN
PB-211	-5.280E-02	2.078E-01	3.155E-01	FAIL ABUN
RN-219	1.114E-02	1.012E-01	1.789E-01	FAIL ABUN
AC-227	-1.585E-02	6.414E-02	1.156E-01	FAIL ABUN
TH-227	-1.585E-02	6.414E-02	1.156E-01	FAIL ABUN
PA-233	3.725E-03	1.591E-02	2.870E-02	FAIL ABUN
PA-234	2.087E-02	6.536E-02	1.169E-01	FAIL ABUN
PA-234M	1.860E+00	1.409E+00	2.032E+00	FAIL ABUN
NP-237	3.725E-03	1.591E-02	2.870E-02	FAIL ABUN
NP-238	0.000E+00	6.445E+03	0.000E+00	SHORT HLIF
NP-239	-1.694E-02	6.156E-02	1.163E-01	FAIL ABUN
PU-239	0.000E+00	1.352E+02	1.635E+02	FAIL ABUN
AM-241	2.775E-02	3.196E-02	5.319E-02	NOT IDENT.
CM-243	1.657E-02	3.646E-02	4.578E-02	FAIL ABUN
BK-247	-1.184E-02	2.201E-02	3.425E-02	FAIL ABUN
CM-247	1.013E-03	9.327E-03	1.648E-02	FAIL ABUN
CF-249	4.885E-03	1.010E-02	1.809E-02	NOT IDENT.
CF-251	-6.847E-03	3.233E-02	5.965E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	2551	10.66*	1.318E+00	7.105E+00	7.105E+00	4.33
MN-54	834.85	73	99.98*	2.166E+00	1.319E-02	1.433E-02	85.52
CD-109	88.03	1717	3.70*	7.465E+00	2.432E+00	2.572E+00	12.39
TE-125M	109.28	138	0.27*	7.906E+00	2.528E+00	3.968E+00	112.18
SN-126	64.28	336	9.60	4.941E+00	2.771E-01	2.771E-01	72.14
	86.94	1717	8.90	7.465E+00	1.011E+00	1.011E+00	12.39
	87.57	1717	37.00*	7.465E+00	2.432E-01	2.432E-01	12.39
EU-155	86.55	1717	30.70	7.465E+00	2.931E-01	2.975E-01	12.39
	105.31	172	21.10*	7.902E+00	4.041E-02	4.102E-02	103.29
TL-208	277.37	405	6.60	4.889E+00	4.917E-01	4.917E-01	38.00
	583.19	1723	85.00*	2.901E+00	2.735E-01	2.735E-01	8.62
	860.56	264	12.50	2.112E+00	3.920E-01	3.920E-01	29.19
BI-211	72.87	235	1.23	6.282E+00	1.192E+00	1.192E+00	65.09
	351.06	3052	12.92*	4.155E+00	2.225E+00	2.225E+00	5.64
BI-212	727.33	336	6.67*	2.435E+00	8.085E-01	8.085E-01	34.99
	785.37	84	1.10	2.285E+00	1.308E+00	1.308E+00	86.14
	1620.50	53	1.47	1.214E+00	1.165E+00	1.165E+00	66.18
PB-212	74.82	2736	10.28	6.518E+00	1.598E+00	1.598E+00	8.85
	77.11	4064	17.10	6.745E+00	1.379E+00	1.379E+00	5.52
	238.63	6486	43.60*	5.411E+00	1.076E+00	1.076E+00	3.48
	300.09	338	3.30	4.633E+00	8.642E-01	8.642E-01	41.58
BI-214	609.32	1877	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46
	1120.29	351	14.92	1.666E+00	5.524E-01	5.524E-01	22.73
	1764.49	294	15.30	1.145E+00	6.565E-01	6.566E-01	20.09
PB-214	74.82	2736	5.80	6.518E+00	2.832E+00	2.832E+00	8.85
	77.11	4064	9.70	6.745E+00	2.431E+00	2.431E+00	5.52
	87.09	1717	3.41	7.465E+00	2.639E+00	2.639E+00	12.39
	242.00	1348	7.25	5.366E+00	1.356E+00	1.356E+00	14.82
	295.22	1793	18.42	4.684E+00	8.131E-01	8.131E-01	8.84
	351.93	3052	35.60*	4.155E+00	8.074E-01	8.075E-01	5.64
RN-222	609.32	1877	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46
	1120.29	351	14.92	1.666E+00	5.524E-01	5.524E-01	22.73
	1764.49	294	15.30	1.145E+00	6.565E-01	6.566E-01	20.09
RA-223	81.07	170	15.00	7.096E+00	6.240E-02	6.240E-02	94.14
	83.79	513	24.70	7.301E+00	1.112E-01	1.112E-01	46.01
	94.56	-----	8.67	7.747E+00	-----	Line Not Found	-----
	144.24	-----	3.27	7.330E+00	-----	Line Not Found	-----
	154.21	165	5.70	7.097E+00	1.595E-01	1.595E-01	96.05
	269.46	648	13.90	4.974E+00	3.666E-01	3.666E-01	24.13
	323.87	-----	3.99*	4.397E+00	-----	Line Not Found	-----
	338.28	1188	2.84	4.268E+00	3.837E+00	3.837E+00	14.50
RA-224	240.99	1348	4.10*	5.366E+00	2.398E+00	2.398E+00	14.82
RA-226	609.32	1877	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46
	1120.29	351	14.92	1.666E+00	5.524E-01	5.524E-01	22.73
	1764.49	294	15.30	1.145E+00	6.565E-01	6.566E-01	20.09
AC-228	105.21	172	1.10	7.902E+00	7.752E-01	7.752E-01	103.29
	338.32	1188	11.27	4.268E+00	9.668E-01	9.668E-01	14.50

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	794.95	261	4.25	2.261E+00	1.065E+00	1.065E+00	32.18
	835.71	73	1.61	2.166E+00	8.191E-01	8.191E-01	85.52
	911.20	1188	25.80*	2.008E+00	8.976E-01	8.976E-01	8.87
	968.97	647	15.80	1.901E+00	8.426E-01	8.426E-01	11.61
	105.21	172	1.10	7.902E+00	7.752E-01	7.752E-01	103.29
	338.32	1188	11.27	4.268E+00	9.668E-01	9.668E-01	14.50
	794.95	261	4.25	2.261E+00	1.065E+00	1.065E+00	32.18
	835.71	73	1.61	2.166E+00	8.191E-01	8.191E-01	85.52
	911.20	1188	25.80*	2.008E+00	8.976E-01	8.976E-01	8.87
	968.97	647	15.80	1.901E+00	8.426E-01	8.426E-01	11.61
TH-228	74.82	2736	10.28	6.518E+00	1.598E+00	1.598E+00	8.85
	77.11	4064	17.10	6.745E+00	1.379E+00	1.379E+00	5.52
	238.63	6486	43.60*	5.411E+00	1.076E+00	1.076E+00	3.48
	300.09	338	3.30	4.633E+00	8.642E-01	8.642E-01	41.58
TH-229	85.43	513	14.70	7.301E+00	1.869E-01	1.869E-01	46.01
	88.47	1717	24.00	7.465E+00	3.749E-01	3.749E-01	12.39
	193.51	-----	4.41*	6.212E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.876E+00	-----	Line Not Found	-----
TH-230	609.32	1877	45.49*	2.805E+00	5.757E-01	5.758E-01	7.46
	1120.29	351	14.92	1.666E+00	5.524E-01	5.524E-01	22.73
	1764.49	294	15.30	1.145E+00	6.565E-01	6.565E-01	20.09
PA-231	283.69	-----	1.70	4.812E+00	-----	Line Not Found	-----
TH-231	301.36	338	5.35*	4.633E+00	5.331E-01	5.331E-01	41.58
	81.07	170	15.00	7.096E+00	6.240E-02	6.240E-02	94.14
	83.79	513	24.70	7.301E+00	1.112E-01	1.112E-01	46.01
	94.87	-----	5.69	7.755E+00	-----	Line Not Found	-----
TH-232	144.24	-----	3.27	7.330E+00	-----	Line Not Found	-----
	154.21	165	5.70	7.097E+00	1.595E-01	1.595E-01	96.05
	269.46	648	13.90	4.974E+00	3.666E-01	3.666E-01	24.13
	323.87	-----	3.99*	4.397E+00	-----	Line Not Found	-----
	338.28	1188	2.84	4.268E+00	3.837E+00	3.837E+00	14.50
	105.21	172	1.10	7.902E+00	7.752E-01	7.752E-01	103.29
	338.32	1188	11.27	4.268E+00	9.668E-01	9.668E-01	14.50
	835.71	73	1.61	2.166E+00	8.191E-01	8.191E-01	85.52
	911.20	1188	25.80*	2.008E+00	8.976E-01	8.976E-01	8.87
	968.97	647	15.80	1.901E+00	8.426E-01	8.426E-01	11.61
TH-234	63.29	336	3.70*	4.941E+00	7.189E-01	7.189E-01	72.14
U-234	92.59	1347	4.23	7.696E+00	1.620E+00	1.620E+00	17.73
	609.32	1877	45.49*	2.805E+00	5.757E-01	5.757E-01	7.46
	1120.29	351	14.92	1.666E+00	5.524E-01	5.524E-01	22.73
U-235	1764.49	294	15.30	1.145E+00	6.565E-01	6.565E-01	20.09
	89.96	898	3.47	7.591E+00	1.334E+00	1.334E+00	21.21
	93.35	1347	5.60	7.696E+00	1.223E+00	1.223E+00	17.73
	143.76	-----	10.96*	7.341E+00	-----	Line Not Found	-----
U-238	163.33	47	5.08	6.876E+00	5.247E-02	5.247E-02	300.26
	185.72	994	57.20	6.372E+00	1.067E-01	1.067E-01	25.47
	205.31	-----	5.01	5.979E+00	-----	Line Not Found	-----
	63.29	336	3.70*	4.941E+00	7.189E-01	7.189E-01	72.14
	92.59	1347	4.23	7.696E+00	1.620E+00	1.620E+00	17.73

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AM-243	43.53	-----	5.90	1.288E+00	-----	Line Not Found	-----
	74.66	2736	67.20*	6.518E+00	2.444E-01	2.444E-01	8.85
ANH-511	511.00	415	100.00*	3.200E+00	5.078E-02	5.078E-02	47.06

Flag: "*" = Keyline

Total number of lines in spectrum 86
Number of unidentified lines 32
Number of lines tentatively identified by NID 54 62.79%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	7.105E+00	7.105E+00	0.308E+00	4.33	
MN-54	312.05D	1.09	1.319E-02	1.433E-02	1.226E-02	85.52	
CD-109	461.40D	1.06	2.432E+00	2.572E+00	0.319E+00	12.39	
TE-125M	57.40D	1.57	2.528E+00	3.968E+00	4.451E+00	112.18	
SN-126	2.30E+05Y	1.00	2.432E-01	2.432E-01	0.301E-01	12.39	
EU-155	4.75Y	1.02	4.041E-02	4.102E-02	4.237E-02	103.29	
TL-208	1.41E+10Y	1.00	2.735E-01	2.735E-01	0.236E-01	8.62	
BI-211	7.04E+08Y	1.00	2.225E+00	2.225E+00	0.126E+00	5.64	
BI-212	1.41E+10Y	1.00	8.085E-01	8.085E-01	2.829E-01	34.99	
PB-212	1.41E+10Y	1.00	1.076E+00	1.076E+00	0.037E+00	3.48	
BI-214	1600.00Y	1.00	5.757E-01	5.758E-01	0.430E-01	7.46	
PB-214	1600.00Y	1.00	8.074E-01	8.075E-01	0.456E-01	5.64	
RN-222	1600.00Y	1.00	5.757E-01	5.758E-01	0.430E-01	7.46	
RA-223	7.04E+08Y	1.00	1.112E-01	1.112E-01	0.512E-01	46.01	K
RA-224	1.41E+10Y	1.00	2.398E+00	2.398E+00	0.355E+00	14.82	
RA-226	1600.00Y	1.00	5.757E-01	5.758E-01	0.430E-01	7.46	
AC-228	1.41E+10Y	1.00	8.976E-01	8.976E-01	0.796E-01	8.87	
RA-228	1.41E+10Y	1.00	8.976E-01	8.976E-01	0.796E-01	8.87	
TH-228	1.41E+10Y	1.00	1.076E+00	1.076E+00	0.037E+00	3.48	
TH-229	7340.00Y	1.00	3.749E-01	3.749E-01	0.465E-01	12.39	K
TH-230	7.54E+04Y	1.00	5.757E-01	5.758E-01	0.430E-01	7.46	
PA-231	7.04E+08Y	1.00	5.331E-01	5.331E-01	2.217E-01	41.58	
TH-231	7.04E+08Y	1.00	1.112E-01	1.112E-01	0.512E-01	46.01	K
TH-232	1.41E+10Y	1.00	8.976E-01	8.976E-01	0.796E-01	8.87	
TH-234	4.47E+09Y	1.00	7.189E-01	7.189E-01	5.186E-01	72.14	
U-234	2.45E+05Y	1.00	5.757E-01	5.757E-01	0.430E-01	7.46	
U-235	7.04E+08Y	1.00	1.067E-01	1.067E-01	0.272E-01	25.47	K
U-238	4.47E+09Y	1.00	7.189E-01	7.189E-01	5.186E-01	72.14	
AM-243	7370.00Y	1.00	2.444E-01	2.444E-01	0.216E-01	8.85	
ANH-511	1.00E+09Y	1.00	5.078E-02	5.078E-02	2.390E-02	47.06	
Total Activity :			2.957E+01	3.115E+01			

Grand Total Activity : 2.957E+01 3.115E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
10	26.55	124	96	0.77	53.31	51	21	1.96E-03	94.8	1.75E-02	
10	27.65	284	325	1.23	55.50	51	21	4.51E-03	54.8	2.89E-02	
10	29.35	631	1366	2.41	58.91	51	21	1.01E-02	43.6	5.74E-02	
10	31.93	327	2683	2.71	64.07	51	21	5.26E-03	92.2	1.36E-01	
0	99.17	55	1949	1.89	198.44	195	8	9.80E-04	****	7.85E+00	T
0	128.96	336	1801	0.90	257.99	255	8	6.14E-03	50.7	7.66E+00	T
0	209.20	671	1441	1.13	418.38	414	9	1.28E-02	24.0	5.91E+00	
0	217.66	36	1391	0.68	435.29	429	9	7.00E-04	****	5.75E+00	
0	288.84	73	720	1.32	577.59	574	8	1.44E-03	****	4.75E+00	T
0	327.77	357	707	1.55	655.43	651	9	7.16E-03	31.0	4.36E+00	T
0	347.62	96	546	1.33	695.12	691	8	1.94E-03	93.0	4.19E+00	
0	409.66	128	644	1.31	819.17	815	10	2.63E-03	81.4	3.74E+00	T
0	442.66	16	433	0.75	885.17	879	8	3.27E-04	****	3.55E+00	
0	462.83	417	605	1.47	925.50	920	12	8.69E-03	26.9	3.44E+00	T
0	562.42	40	398	1.03	1124.68	1122	9	8.41E-04	****	2.98E+00	T
0	665.52	58	272	1.88	1330.90	1327	9	1.26E-03	****	2.62E+00	T
0	692.16	25	370	4.04	1384.19	1378	13	5.41E-04	****	2.54E+00	
0	702.21	39	265	1.52	1404.29	1402	8	8.61E-04	****	2.51E+00	T
0	708.57	12	409	1.36	1417.02	1412	11	2.62E-04	****	2.49E+00	
0	755.63	85	289	3.67	1511.18	1506	12	1.88E-03	85.0	2.36E+00	T
0	767.99	159	378	1.77	1535.90	1531	12	3.50E-03	52.6	2.33E+00	T
0	773.75	138	316	1.67	1547.42	1542	14	3.05E-03	59.9	2.31E+00	T
0	807.19	43	319	0.58	1614.34	1607	13	9.55E-04	****	2.23E+00	
0	831.96	20	277	2.01	1663.90	1653	13	4.56E-04	****	2.17E+00	T
0	838.96	20	304	1.77	1677.91	1676	11	4.36E-04	****	2.16E+00	
0	934.04	82	219	1.41	1868.16	1864	12	1.85E-03	76.2	1.96E+00	
1	964.78	252	222	1.85	1929.69	1923	22	5.71E-03	26.7	1.91E+00	T
0	1000.66	74	194	1.67	2001.50	1996	11	1.68E-03	77.3	1.85E+00	T
0	1024.50	16	160	1.78	2049.23	2043	10	3.74E-04	****	1.81E+00	T
0	1139.11	14	117	1.46	2278.64	2276	8	3.24E-04	****	1.64E+00	
0	1155.82	51	263	0.52	2312.09	2302	16	1.19E-03	****	1.62E+00	
0	1166.77	11	187	4.81	2334.01	2324	12	2.51E-04	****	1.61E+00	
0	1238.03	148	201	2.17	2476.68	2471	13	3.46E-03	42.5	1.52E+00	T
0	1254.34	22	127	1.30	2509.35	2507	9	5.20E-04	****	1.50E+00	
0	1314.18	49	155	5.20	2629.16	2619	19	1.15E-03	****	1.44E+00	
0	1371.00	53	131	5.55	2742.94	2734	17	1.26E-03	****	1.39E+00	
0	1378.19	190	65	1.74	2757.35	2751	15	4.50E-03	23.7	1.38E+00	
0	1401.66	39	53	1.51	2804.36	2801	9	9.34E-04	73.8	1.36E+00	
0	1407.75	81	96	1.48	2816.55	2810	15	1.93E-03	56.1	1.36E+00	T
0	1447.08	27	53	2.01	2895.31	2890	9	6.36E-04	****	1.33E+00	
0	1496.10	54	72	2.18	2993.50	2984	15	1.28E-03	73.2	1.29E+00	
0	1512.78	101	138	4.70	3026.92	3015	31	2.43E-03	71.0	1.28E+00	
2	1588.28	53	88	2.19	3178.16	3172	19	1.27E-03	89.0	1.23E+00	
2	1592.33	27	73	1.85	3186.28	3172	19	6.55E-04	****	1.23E+00	
2	1625.21	32	16	2.48	3252.14	3234	22	7.72E-04	58.4	1.21E+00	
0	1630.70	60	50	1.13	3263.15	3257	13	1.45E-03	53.8	1.21E+00	
0	1729.74	70	47	2.79	3461.58	3456	12	1.71E-03	45.0	1.16E+00	
0	1847.37	64	59	1.14	3697.31	3687	18	1.57E-03	59.9	1.11E+00	
0	1899.06	51	106	13.63	3800.90	3777	36	1.27E-03	****	1.10E+00	
0	1948.52	15	44	5.54	3900.03	3888	15	3.77E-04	****	1.08E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656010.CNF;1
Acquisition date : 23-JUN-2016 13:06:10 Sensitivity : 3.000
Detector ID : GAM20 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:02:55.99 Half life ratio : *****
Sample date : 17-MAY-2016 11:15:00 Nuclide Library : SOLID
Sample ID : G398656010 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5987E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2015 05:30:57 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;13

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.492E-02
MN-54	7.449E-03
CD-109	1.429E-01
TE-125M	2.748E+00
SN-126	1.355E-02
EU-155	2.211E-02
TL-208	7.081E-03
BI-212	9.588E-02
PB-212	1.212E-02
BI-214	1.424E-02
PB-214	1.563E-02
RN-222	1.424E-02
RA-223	1.371E-01
RA-224	1.298E-01
RA-226	1.424E-02
AC-228	2.658E-02
RA-228	2.658E-02
TH-228	1.212E-02
TH-229	1.190E-01
TH-230	1.424E-02
PA-231	1.012E-01
TH-231	1.371E-01
TH-232	2.658E-02
TH-234	2.303E-01
U-234	1.424E-02
U-235	4.516E-02
U-238	2.303E-01
AM-243	1.006E-02
ANH-511	5.518E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.150E-02	NOT IDENT.
NA-22	7.473E-03	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	6.700E-03	NOT IDENT.
SC-46	9.251E-03	FAIL ABUN
V-48	3.333E-02	NOT IDENT.
CR-51	1.421E-01	NOT IDENT.
CO-56	9.482E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.857E-03	NOT IDENT.
CO-58	8.768E-03	NOT IDENT.
FE-59	2.277E-02	NOT IDENT.
CO-60	7.800E-03	NOT IDENT.
ZN-65	1.786E-02	NOT IDENT.
GE-68	2.640E-01	NOT IDENT.
AS-73	1.611E-01	NOT IDENT.
AS-74	4.694E-02	NOT IDENT.
SE-75	1.069E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.156E-01	NOT IDENT.
RB-83	1.726E-02	NOT IDENT.
KR-85	1.769E+00	NOT IDENT.
SR-85	1.183E-02	NOT IDENT.
RB-86	3.541E-01	NOT IDENT.
Y-88	7.957E-03	NOT IDENT.
Y-91	5.090E+00	NOT IDENT.
NB-94	7.006E-03	FAIL ABUN
NB-95	1.152E-02	NOT IDENT.
NB-95M	3.698E-02	NOT IDENT.
ZR-95	1.911E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.348E-03	NOT IDENT.
RH-102	1.147E-02	FAIL ABUN
RU-103	1.185E-02	FAIL ABUN
RH-106	6.537E-02	NOT IDENT.
RU-106	6.537E-02	NOT IDENT.
AG-108M	6.229E-03	NOT IDENT.
AG-110M	1.021E-02	NOT IDENT.
SN-113	1.079E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.755E-02	NOT IDENT.
TE-123M	7.162E-03	NOT IDENT.
SB-124	1.797E-02	NOT IDENT.
SB-125	1.930E-02	FAIL ABUN
I-126	1.503E-01	FAIL ABUN
SB-126	1.012E-01	FAIL ABUN
SB-127	1.460E+01	FAIL ABUN
I-131	1.708E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.848E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.058E-02	FAIL ABUN
CS-135	3.758E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.593E-02	FAIL ABUN
BA-137M	6.724E-03	NOT IDENT.
CS-137	7.104E-03	NOT IDENT.
CE-139	7.318E-03	NOT IDENT.
BA-140	1.798E-01	FAIL ABUN
LA-140	5.938E-02	FAIL ABUN
CE-141	2.251E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.663E-02	FAIL ABUN
PM-144	7.342E-03	NOT IDENT.
PR-144	5.558E-01	NOT IDENT.
PM-146	9.154E-03	NOT IDENT.
ND-147	4.433E-01	FAIL ABUN
PM-147	1.645E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.672E-03	FAIL ABUN
EU-152	2.048E-02	FAIL ABUN
GD-153	1.844E-02	NOT IDENT.
EU-154	2.099E-02	FAIL ABUN
TB-160	3.081E-02	FAIL ABUN
HO-166M	1.236E-02	FAIL ABUN
TM-171	2.816E+00	NOT IDENT.

HF-172	4.265E-02	FAIL ABUN
LU-172	1.192E-02	FAIL ABUN
LU-176	5.695E-03	FAIL ABUN
HF-181	1.300E-02	NOT IDENT.
TA-182	4.175E-02	FAIL ABUN
RE-183	4.159E-02	FAIL ABUN
RE-184	3.669E-02	NOT IDENT.
W-188	1.877E+00	FAIL ABUN
IR-192	9.294E-03	FAIL ABUN
HG-203	1.220E-02	FAIL ABUN
BI-207	1.043E-02	FAIL ABUN
PB-210	5.042E-01	NOT IDENT.
BI-211	1.006E-01	FAIL ABUN
PB-211	1.540E-01	FAIL ABUN
RN-219	8.728E-02	FAIL ABUN
AC-227	5.668E-02	FAIL ABUN
TH-227	5.668E-02	FAIL ABUN
PA-233	1.403E-02	FAIL ABUN
PA-234	5.617E-02	FAIL ABUN
PA-234M	9.816E-01	FAIL ABUN
NP-237	1.403E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.725E-02	FAIL ABUN
PU-239	8.060E+01	FAIL ABUN
AM-241	2.623E-02	NOT IDENT.
CM-243	2.255E-02	FAIL ABUN
BK-247	1.676E-02	FAIL ABUN
CM-247	8.043E-03	FAIL ABUN
CF-249	8.834E-03	NOT IDENT.
CF-251	2.934E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656010.CNF;1
Acquisition date : 23-JUN-2016 13:06:10 Sensitivity : 3.000
Detector ID : GAM20 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:02:55.99 Half life ratio : *****
Sample date : 17-MAY-2016 11:15:00 Nuclide Library : SOLID
Sample ID : G398656010 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5987E+02 GRAM
Quantity Err(%) : 1.2510E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2015 05:30:57 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	7.105E+00	7.011E-01	7.011E-01
MN-54	1.433E-02	1.214E-02	1.214E-02
CD-109	1.780E+00	3.858E-01	3.858E-01
TE-125M	3.968E+00	4.373E+00	4.373E+00
SN-126	1.683E-01	3.537E-02	3.537E-02
EU-155	4.102E-02	4.168E-02	4.168E-02
TL-208	2.735E-01	3.257E-02	3.257E-02
BI-212	8.085E-01	2.892E-01	2.892E-01
PB-212	1.076E+00	1.101E-01	1.101E-01
BI-214	5.758E-01	6.420E-02	6.420E-02
PB-214	8.075E-01	8.433E-02	8.433E-02
RN-222	5.758E-01	6.420E-02	6.420E-02
RA-223	-2.090E-02	1.803E-01	1.803E-01
RA-224	9.602E-01	4.298E-01	4.298E-01
RA-226	5.758E-01	6.420E-02	6.420E-02
AC-228	8.976E-01	1.540E-01	1.540E-01
RA-228	8.976E-01	1.540E-01	1.540E-01
TH-228	1.076E+00	1.101E-01	1.101E-01
TH-229	2.025E-02	1.309E-01	1.309E-01
TH-230	5.758E-01	6.420E-02	6.420E-02
PA-231	5.331E-01	2.498E-01	2.498E-01
TH-231	-2.090E-02	1.803E-01	1.803E-01
TH-232	8.976E-01	1.540E-01	1.540E-01
TH-234	7.189E-01	5.334E-01	5.334E-01
U-234	5.757E-01	6.420E-02	6.420E-02
U-235	-1.709E-02	5.438E-02	5.438E-02
U-238	7.189E-01	5.334E-01	5.334E-01
AM-243	1.742E-01	2.805E-02	2.805E-02
ANH-511	5.078E-02	2.379E-02	2.379E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	9.577E-03	1.018E-01	1.019E-01 NOT IDENT.

NA-22	-6.155E-03	9.050E-03	9.466E-03	NOT IDENT.
NA-24	9.300E+15	8.942E+15	9.876E+15	SHORT HLIF
AL-26	4.189E-03	7.700E-03	7.928E-03	NOT IDENT.
SC-46	2.442E-04	1.087E-02	1.087E-02	FAIL ABUN
V-48	-1.085E-02	4.020E-02	4.050E-02	NOT IDENT.
CR-51	-1.475E-02	1.629E-01	1.630E-01	NOT IDENT.
CO-56	2.162E-03	1.271E-02	1.274E-02	FAIL ABUN
MN-56	1.000E+41	5.823E+41	0.000E+00	SHORT HLIF
CO-57	-3.728E-03	7.143E-03	7.338E-03	NOT IDENT.
CO-58	-7.320E-03	1.236E-02	1.279E-02	NOT IDENT.
FE-59	-1.900E-02	2.736E-02	2.866E-02	NOT IDENT.
CO-60	6.497E-03	8.746E-03	9.224E-03	NOT IDENT.
ZN-65	-1.405E-02	2.486E-02	2.565E-02	NOT IDENT.
GE-68	2.820E-01	3.067E-01	3.320E-01	NOT IDENT.
AS-73	-1.373E-01	2.040E-01	2.132E-01	NOT IDENT.
AS-74	2.809E-02	5.242E-02	5.392E-02	NOT IDENT.
SE-75	3.067E-03	1.365E-02	1.372E-02	NOT IDENT.
BR-77	1.085E+05	1.173E+05	1.271E+05	SHORT HLIF
SR-82	1.888E-02	1.540E-01	1.542E-01	NOT IDENT.
RB-83	1.461E-02	1.948E-02	2.056E-02	NOT IDENT.
KR-85	9.643E+00	2.051E+00	4.807E+00	NOT IDENT.
SR-85	6.432E-02	1.371E-02	3.207E-02	NOT IDENT.
RB-86	3.326E-01	4.119E-01	4.384E-01	NOT IDENT.
Y-88	-3.864E-03	1.021E-02	1.036E-02	NOT IDENT.
Y-91	3.844E+00	5.716E+00	5.973E+00	NOT IDENT.
NB-94	6.169E-03	9.113E-03	9.528E-03	FAIL ABUN
NB-95	3.038E-02	1.540E-02	2.061E-02	NOT IDENT.
NB-95M	9.495E-02	4.566E-02	6.259E-02	NOT IDENT.
ZR-95	3.901E-02	3.277E-02	3.719E-02	FAIL ABUN
NB-97	-1.000E+41	9.237E+40	0.000E+00	SHORT HLIF
ZR-97	4.982E+15	1.503E+15	2.703E+15	SHORT HLIF
MO-99	-2.446E+00	7.428E+02	7.428E+02	SHORT HLIF
TC-99M	-1.000E+41	1.184E+41	0.000E+00	SHORT HLIF
RH-101	1.202E-02	8.958E-03	1.047E-02	NOT IDENT.
RH-102	-6.115E-04	1.311E-02	1.311E-02	FAIL ABUN
RU-103	3.179E-03	1.315E-02	1.323E-02	FAIL ABUN
RH-106	-4.928E-02	7.649E-02	7.965E-02	NOT IDENT.
RU-106	-4.928E-02	7.649E-02	7.965E-02	NOT IDENT.
AG-108M	2.437E-03	7.209E-03	7.292E-03	NOT IDENT.
AG-110M	-3.128E-03	1.216E-02	1.224E-02	NOT IDENT.
SN-113	-2.081E-03	1.260E-02	1.263E-02	NOT IDENT.
CD-115	2.490E+03	2.594E+03	2.827E+03	SHORT HLIF
SN-117M	-1.278E-02	5.024E-02	5.057E-02	NOT IDENT.
TE-123M	-2.777E-03	1.060E-02	1.067E-02	NOT IDENT.
SB-124	-5.102E-03	2.199E-02	2.211E-02	NOT IDENT.
SB-125	-3.075E-03	2.268E-02	2.272E-02	FAIL ABUN
I-126	1.954E-01	2.095E-01	2.272E-01	FAIL ABUN
SB-126	-8.894E-02	1.403E-01	1.459E-01	FAIL ABUN
SB-127	1.395E-01	1.935E+01	1.935E+01	FAIL ABUN
I-131	1.588E-01	1.927E-01	2.055E-01	FAIL ABUN
I-132	-1.000E+41	4.521E+42	0.000E+00	SHORT HLIF
TE-132	3.963E-02	2.235E+01	2.235E+01	SHORT HLIF
BA-133	-1.208E-02	1.409E-02	1.511E-02	FAIL ABUN
I-133	-1.209E+09	6.747E+10	6.747E+10	SHORT HLIF
CS-134	5.479E-02	1.837E-02	3.078E-02	FAIL ABUN
CS-135	1.478E-01	4.650E-02	8.124E-02	NOT IDENT.
I-135	1.827E+39	3.481E+39	0.000E+00	SHORT HLIF
CS-136	-3.080E-03	7.892E-02	7.894E-02	FAIL ABUN
BA-137M	-1.328E-04	8.890E-03	8.890E-03	NOT IDENT.
CS-137	-1.403E-04	9.391E-03	9.391E-03	NOT IDENT.
CE-139	3.188E-03	9.023E-03	9.137E-03	NOT IDENT.
BA-140	9.977E-02	1.991E-01	2.041E-01	FAIL ABUN
LA-140	1.196E-01	6.952E-02	8.797E-02	FAIL ABUN
CE-141	3.018E-02	2.396E-02	2.755E-02	NOT IDENT.
CE-143	2.830E+07	4.619E+06	1.357E+07	SHORT HLIF
CE-144	3.634E-02	5.619E-02	5.853E-02	FAIL ABUN
PM-144	-4.388E-03	1.321E-02	1.335E-02	NOT IDENT.
PR-144	-3.327E-01	9.998E-01	1.011E+00	NOT IDENT.
PM-146	6.776E-03	1.054E-02	1.097E-02	NOT IDENT.
ND-147	-6.081E-01	5.228E-01	5.904E-01	FAIL ABUN
PM-147	-7.747E+01	1.999E+02	2.030E+02	NOT IDENT.
PM-149	6.253E+03	2.711E+04	2.726E+04	SHORT HLIF
EU-150	-6.091E-03	7.711E-03	8.185E-03	FAIL ABUN
EU-152	1.703E-02	3.629E-02	3.709E-02	FAIL ABUN
GD-153	-1.943E-03	3.034E-02	3.036E-02	NOT IDENT.
EU-154	-1.084E-02	2.504E-02	2.551E-02	FAIL ABUN
TB-160	-3.154E-02	4.408E-02	4.632E-02	FAIL ABUN
HO-166M	-1.350E-03	1.652E-02	1.653E-02	FAIL ABUN

TM-171	-1.785E+00	3.530E+00	3.620E+00	NOT IDENT.
HF-172	1.623E-02	5.163E-02	5.214E-02	FAIL ABUN
LU-172	-2.584E-03	1.379E-02	1.384E-02	FAIL ABUN
LU-176	2.304E-03	6.944E-03	7.021E-03	FAIL ABUN
HF-181	-2.436E-03	1.460E-02	1.464E-02	NOT IDENT.
TA-182	4.646E-03	4.813E-02	4.818E-02	FAIL ABUN
RE-183	1.229E-02	4.581E-02	4.614E-02	FAIL ABUN
RE-184	-1.725E-02	5.134E-02	5.192E-02	NOT IDENT.
W-188	2.047E+00	3.252E+00	3.381E+00	FAIL ABUN
IR-192	-4.712E-03	1.076E-02	1.097E-02	FAIL ABUN
HG-203	3.074E-02	1.501E-02	2.043E-02	FAIL ABUN
BI-207	1.244E-02	1.208E-02	1.332E-02	FAIL ABUN
PB-210	-4.159E-01	6.742E-01	6.998E-01	NOT IDENT.
BI-211	2.225E+00	2.351E-01	1.030E+00	FAIL ABUN
PB-211	-5.280E-02	2.079E-01	2.092E-01	FAIL ABUN
RN-219	1.114E-02	1.012E-01	1.013E-01	FAIL ABUN
AC-227	-1.585E-02	6.419E-02	6.459E-02	FAIL ABUN
TH-227	-1.585E-02	6.419E-02	6.459E-02	FAIL ABUN
PA-233	3.725E-03	1.591E-02	1.600E-02	FAIL ABUN
PA-234	2.087E-02	6.966E-02	7.029E-02	FAIL ABUN
PA-234M	1.860E+00	1.446E+00	1.672E+00	FAIL ABUN
NP-237	3.725E-03	1.591E-02	1.600E-02	FAIL ABUN
NP-238	-6.089E+02	6.446E+03	6.452E+03	SHORT HLIF
NP-239	-1.694E-02	6.158E-02	6.205E-02	FAIL ABUN
PU-239	2.722E+02	1.367E+02	1.837E+02	FAIL ABUN
AM-241	2.775E-02	3.204E-02	3.440E-02	NOT IDENT.
CM-243	1.657E-02	3.650E-02	3.726E-02	FAIL ABUN
BK-247	-1.184E-02	2.216E-02	2.279E-02	FAIL ABUN
CM-247	1.013E-03	9.328E-03	9.340E-03	FAIL ABUN
CF-249	4.885E-03	1.011E-02	1.035E-02	NOT IDENT.
CF-251	-6.847E-03	3.235E-02	3.249E-02	NOT IDENT.

* GEL Laboratories LLC *
* 2040 Savage Road *
* Charleston, SC 29407 *
* GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1296.0142	87.09	1421.4858	136.47	1362.4750
45.60	1231.3436	87.57	1422.4014	140.51	0.0000
46.54	1274.6813	88.03	1423.2794	143.76	1280.1873
49.72	0.0000	88.34	1423.8689	144.24	1266.0267
51.35	1350.7418	88.47	1424.1135	145.44	1208.3872
51.87	1353.1312	89.96	1426.9293	152.43	1233.6233
52.39	1334.7632	1093.63	1428.2024	153.25	1240.5416
52.97	1365.6968	91.11	1429.0804	323.87	1251.1626
53.44	1382.1836	92.59	1431.8398	156.02	1236.2994
54.07	1355.2684	93.35	1433.2446	158.56	1223.4957
57.36	0.0000	94.56	1435.4709	159.00	1225.2324
57.53	1467.1782	94.65	1435.6340	162.33	1202.9374
57.98	1494.7915	94.67	1435.6716	162.66	1186.7744
59.27	1490.9064	94.87	1436.0354	163.33	1189.3669
59.32	1491.0332	97.43	1440.6949	165.86	1107.3361
59.54	1493.2480	98.43	1442.5011	176.31	1143.1859
60.96	1591.6207	98.44	1442.5137	176.60	1156.7777
61.17	1592.1792	99.53	1336.9258	177.52	1180.5179
62.93	1750.8857	100.11	1366.3716	181.07	0.0000
63.29	1751.9144	102.03	1279.6947	181.52	1197.3323
63.58	1912.5410	103.18	1334.4376	184.41	1150.1040
64.28	2001.6727	103.37	1334.7433	143.76	1151.3604
66.73	1974.2808	105.21	1346.1956	193.51	1105.7131
67.24	1984.2695	105.31	1346.3580	197.03	1177.4935
125.81	2017.5934	106.12	1176.1897	198.01	1110.6886
67.75	2017.8086	106.47	1176.6760	201.83	1182.9523
69.67	2062.6367	109.28	1428.0712	203.43	1173.7522
70.83	2025.7549	111.00	1395.2961	205.31	1071.1620
72.81	2080.9819	111.76	0.0000	210.85	1065.8447
72.87	2081.1692	114.06	1301.5100	215.65	1015.3366
74.66	1928.6912	116.30	0.0000	222.11	1015.7734
74.82	1929.1415	116.74	1334.1448	227.09	972.3354
74.97	1929.5745	119.76	1263.0612	227.38	961.6624
77.11	1935.6187	121.12	1307.2943	228.16	0.0000
78.74	1627.3453	121.22	1307.4354	228.18	975.0878
79.69	1629.5533	121.78	1309.1396	116.74	975.0878
80.12	1630.5411	122.06	1315.8517	235.69	969.8058
80.19	1630.7083	122.92	1315.2762	235.96	985.9193
80.57	1573.3091	123.07	1324.5161	238.63	871.6929
81.00	1807.4855	265.00	1333.0098	238.98	0.0000
81.07	1807.6625	125.81	1286.5919	240.99	873.1365
81.75	1720.1234	127.23	1301.5944	242.00	873.7533
83.79	1556.2813	127.91	1321.4135	244.70	770.8271
84.00	1391.4193	129.30	1332.4324	252.40	827.6693
85.43	1418.2999	131.20	1350.7472	252.80	845.0138
86.55	1420.4510	133.02	1261.3219	254.15	0.0000
86.79	1420.9088	133.52	1248.8302	256.23	844.9535
86.94	1421.1973	136.00	1327.0500	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	683.8167	355.39	0.0000	584.27	376.5719
264.80	692.0004	356.01	562.3646	595.83	352.7827
265.00	734.3345	364.49	499.4641	427.87	385.8812
268.22	667.5012	366.42	0.0000	602.52	0.0000
269.46	725.0697	372.51	488.5953	604.72	425.6942
270.03	725.3413	375.05	540.1163	607.14	373.4136
271.23	725.9008	377.52	520.2100	609.32	370.8435
273.65	735.2051	356.01	562.1318	610.33	346.6914
276.40	649.7580	388.16	529.5825	614.28	351.9946
277.37	650.1553	388.63	543.8777	618.01	305.6868
277.60	650.2523	391.69	521.7914	620.36	349.2457
278.00	619.2888	264.66	541.6769	621.93	346.5527
279.20	650.9114	401.81	516.7446	630.19	0.0000
279.54	677.2958	402.40	521.2853	631.29	335.1651
279.70	677.3563	404.85	548.5060	633.25	292.8729
280.46	680.9708	410.95	446.1101	634.78	320.1067
283.69	659.3297	413.71	497.9063	635.95	333.7892
284.31	638.2108	414.70	445.1528	636.99	334.8834
285.41	683.0884	423.72	466.8156	645.85	314.5711
285.90	0.0000	427.09	476.4456	657.76	323.6838
287.50	756.4984	427.87	464.4012	657.90	0.0000
290.67	586.2354	433.94	432.3024	661.66	284.7453
293.27	0.0000	439.40	486.1270	664.57	0.0000
351.93	616.8531	453.88	423.9179	666.33	304.7576
295.96	588.1421	463.37	415.5667	666.50	309.6700
879.38	589.0781	468.07	431.5253	667.71	0.0000
299.98	665.9772	473.00	411.9030	677.62	301.3562
300.09	666.0164	475.06	417.7229	685.70	310.0551
300.13	666.0359	476.78	429.8514	695.00	325.8347
301.36	674.8362	477.60	426.3709	696.49	325.9958
302.85	678.7681	482.18	408.0891	696.51	325.9958
256.23	641.1340	487.02	383.3884	697.00	319.4653
304.85	654.6002	492.35	0.0000	697.30	319.4969
306.78	614.2156	497.08	355.7030	697.49	296.4624
308.46	659.3395	505.52	389.4801	702.65	358.0112
311.90	626.1824	507.63	0.0000	706.68	346.9238
316.51	664.5604	511.00	346.7283	711.68	316.0562
319.41	656.2328	514.00	318.5354	720.70	343.5344
320.08	658.5815	514.00	318.5354	721.93	0.0000
321.04	605.3555	520.40	328.1207	722.78	328.8237
323.87	636.6568	520.69	0.0000	722.91	345.4479
325.23	611.8624	522.65	0.0000	723.31	350.4733
328.76	699.2314	527.90	0.0000	724.19	323.9923
333.37	637.8320	528.26	327.8350	727.33	275.4205
333.97	658.9448	529.59	341.0251	733.00	278.2586
334.37	659.0872	529.87	0.0000	735.93	251.1655
338.28	557.1636	531.02	386.7805	333.97	283.3247
338.32	557.1716	537.26	327.1687	739.50	0.0000
311.90	562.7323	546.56	0.0000	747.24	275.1707
340.48	562.7323	552.55	349.7968	748.06	263.4066
340.55	562.7485	563.25	371.0391	752.31	274.9416
344.28	519.6169	569.33	417.6958	753.82	281.7773
345.93	562.7161	946.00	400.0175	756.73	251.8188
351.06	512.9883	569.70	396.5083	756.80	231.6790
351.93	581.6606	583.19	341.6221	884.68	257.4342

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	232.3303	1274.44	177.8141	1620.50	61.4282
766.42	232.3752	1001.03	187.0231	1621.92	61.4429
766.84	257.6646	1002.74	187.1035	1678.03	0.0000
772.60	0.0000	1004.73	190.7965	1690.97	55.9622
776.52	233.0996	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	52.4556
778.90	212.9839	1028.54	0.0000	1063.66	39.6034
783.70	218.3751	1037.84	187.3020	1771.35	46.8131
785.37	233.7341	1038.76	0.0000	1791.20	0.0000
792.07	244.3887	631.29	188.8048	1808.65	56.0041
794.95	224.2217	1048.07	199.7899	1810.72	0.0000
795.86	220.8826	1049.04	187.8227	1836.06	65.9948
810.06	184.2847	1050.41	170.4117		
810.29	209.8948	1063.66	172.0560		
344.28	209.9048	1077.00	170.4092		
810.76	235.5254	1077.34	170.4243		
815.77	219.4702	1085.87	168.0181		
1048.07	204.2519	1093.63	183.0483		
832.01	206.0938	1099.45	198.9580		
834.85	252.6742	1112.07	198.5478		
835.71	237.2605	1112.84	193.4306		
836.80	0.0000	1115.54	242.5097		
846.75	0.0000	1120.29	234.8530		
846.77	232.8497	1120.55	222.1680		
856.80	226.6008	1221.41	193.6376		
860.56	240.0065	1129.67	201.3850		
871.09	223.0072	1131.51	0.0000		
873.19	212.7108	1147.95	0.0000		
875.33	0.0000	1173.23	174.7877		
879.38	219.3516	1177.95	194.1552		
880.51	195.3867	1189.05	188.0534		
883.24	214.3591	1204.77	180.2205		
884.68	229.0892	1221.41	220.6560		
889.28	222.0514	1231.02	202.1403		
894.76	223.4368	1235.36	195.4102		
898.04	221.5397	1238.28	193.9063		
900.72	219.6031	1260.41	0.0000		
903.28	229.5698	1271.87	144.5609		
911.20	218.1283	1274.44	151.3459		
912.08	228.3675	1274.54	159.0090		
923.98	0.0000	1291.59	150.9311		
926.50	193.6378	1298.22	0.0000		
929.11	204.7181	1312.11	132.2672		
937.49	187.4884	1332.49	118.2818		
944.13	184.9854	1362.66	0.0000		
946.00	185.0789	1365.19	120.4604		
949.00	199.0619	1368.63	0.0000		
667.71	0.0000	1384.29	90.6918		
962.31	201.1847	1408.01	84.3680		
964.08	224.4375	1457.56	0.0000		
966.17	224.5605	1460.82	98.4401		
911.20	224.7246	1489.16	89.1175		
968.97	224.7246	1505.03	87.6634		
983.53	186.9013	1584.12	94.1648		
984.45	0.0000	1596.21	52.4268		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 03:00:06.85

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656011.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;320
Background date  : 20-JUN-2016 14:03:09
Sample date      : 17-MAY-2016 11:20:00 Acquisition date : 23-JUN-2016 14:59:37
Sample ID        : G398656011 Sample quantity : 1.73960E+02 GRAM
Detector name     : GAM09 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:04.78 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.30*	115	1068	0.98	126.28	123	7	2.65E-03	57.7	
2	0	66.58*	12	1015	1.00	132.83	131	6	2.86E-04	456.6	
3	3	74.88	790	1187	1.00	149.44	145	21	1.83E-02	7.5	2.32E+00
4	3	77.13*	1172	889	0.85	153.95	145	21	2.71E-02	5.3	
5	3	81.44	101	1068	1.09	162.57	145	21	2.34E-03	57.1	
6	5	84.18*	230	914	1.40	168.06	165	28	5.32E-03	25.5	4.43E+00
7	5	87.33*	506	1039	1.16	174.35	165	28	1.17E-02	12.5	
8	5	89.87	354	1018	1.10	179.43	165	28	8.19E-03	15.9	
9	5	92.67*	401	988	1.13	185.04	165	28	9.28E-03	19.6	
10	0	99.46	121	1085	1.62	198.63	195	8	2.79E-03	48.1	
11	0	120.13	66	733	1.39	239.99	238	6	1.53E-03	65.9	
12	0	128.86	202	1167	0.98	257.45	253	9	4.68E-03	31.2	
13	0	143.70*	22	946	0.96	287.14	284	7	5.00E-04	289.7	
14	0	154.06	67	760	0.88	307.86	306	6	1.55E-03	66.0	
15	0	185.90*	373	1170	1.13	371.57	367	10	8.63E-03	21.6	
16	0	205.35*	13	614	0.82	410.50	408	6	2.94E-04	380.8	
17	0	209.04*	239	1027	1.07	417.87	414	10	5.53E-03	28.3	
18	0	214.87	148	912	1.76	429.54	424	10	3.43E-03	39.2	
19	0	228.21	88	489	1.43	456.23	454	6	2.03E-03	41.3	
20	7	238.61*	3036	584	0.96	477.03	473	15	7.03E-02	2.4	1.68E+00
21	7	241.48	735	834	1.76	482.78	473	15	1.70E-02	11.1	
22	0	245.09	64	500	1.07	490.01	488	7	1.47E-03	59.5	
23	0	270.33	174	757	1.42	540.52	536	10	4.03E-03	30.5	
24	0	277.62	118	569	0.97	555.10	551	8	2.73E-03	36.3	
25	0	295.08	930	730	1.04	590.03	584	12	2.15E-02	6.7	
26	0	299.90	205	586	1.02	599.66	596	9	4.76E-03	22.3	
27	2	325.80	68	138	1.44	651.50	650	12	1.57E-03	25.0	7.81E-01
28	2	327.90	219	406	1.29	655.69	650	12	5.07E-03	17.4	
29	6	336.33	94	200	1.74	672.56	670	12	2.18E-03	23.7	2.06E+00
30	6	338.25*	581	350	1.04	676.40	670	12	1.34E-02	7.6	
31	0	351.84*	1574	534	1.14	703.59	697	12	3.64E-02	4.3	
32	0	409.50	94	374	1.21	818.97	814	9	2.16E-03	38.7	
33	0	462.32*	183	331	1.75	924.66	919	11	4.23E-03	23.7	
34	0	510.83*	340	584	2.01	1021.72	1015	17	7.88E-03	22.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	582.91*	985	360	1.36	1165.93	1158	16	2.28E-02	5.7	
36	0	609.08*	1155	351	1.45	1218.31	1214	12	2.67E-02	4.9	
37	0	660.62	49	185	1.03	1321.44	1318	9	1.14E-03	51.5	
38	0	727.20	201	376	1.34	1454.65	1447	16	4.66E-03	22.6	
39	0	743.24	36	173	0.82	1486.76	1482	9	8.42E-04	67.3	
40	0	768.13	53	181	1.09	1536.55	1534	8	1.23E-03	46.1	
41	0	785.13	27	144	0.88	1570.58	1568	7	6.17E-04	77.4	
42	2	794.51	136	166	1.88	1589.35	1583	33	3.15E-03	20.4	9.96E-01
43	2	803.18*	17	169	1.89	1606.69	1583	33	3.86E-04	179.9	
44	1	830.17	35	122	1.73	1660.68	1656	20	8.10E-04	57.7	8.82E-01
45	1	834.98	63	160	1.74	1670.32	1656	20	1.45E-03	39.9	
46	0	860.25	177	146	1.59	1720.88	1714	13	4.11E-03	15.9	
47	0	864.90	38	59	1.43	1730.20	1727	6	8.89E-04	35.4	
48	0	910.63*	658	203	1.61	1821.69	1817	14	1.52E-02	6.4	
49	0	933.86	85	143	2.80	1868.17	1862	14	1.97E-03	31.9	
50	0	950.34	30	177	0.68	1901.15	1896	13	7.00E-04	92.8	
51	6	963.52	130	158	2.93	1927.53	1921	24	3.01E-03	22.7	1.26E+00
52	6	968.54*	420	120	1.60	1937.57	1921	24	9.73E-03	7.6	
53	0	1000.56*	33	111	2.69	2001.63	1997	10	7.59E-04	78.3	
54	0	1038.64	56	140	1.34	2077.83	2071	15	1.30E-03	47.6	
55	0	1119.89	247	165	1.72	2240.41	2234	12	5.72E-03	12.2	
56	0	1155.08	42	95	1.54	2310.83	2306	9	9.82E-04	44.4	
57	0	1176.04	37	72	1.26	2352.78	2349	7	8.46E-04	42.4	
58	0	1237.20	94	196	1.94	2475.15	2468	14	2.17E-03	33.3	
59	0	1355.09	14	51	0.57	2711.06	2704	9	3.29E-04	94.7	
60	0	1377.18	65	92	2.39	2755.26	2749	12	1.50E-03	32.2	
61	0	1412.20	107	134	7.16	2825.34	2808	35	2.47E-03	35.9	
62	0	1460.00*	2009	85	2.08	2921.00	2912	18	4.65E-02	2.6	
63	0	1479.23	16	65	1.54	2959.47	2951	13	3.62E-04	109.3	
64	3	1587.39	64	53	2.63	3175.92	3170	19	1.49E-03	25.8	4.68E-01
65	3	1591.77	23	30	1.92	3184.67	3170	19	5.24E-04	48.6	
66	0	1630.78	40	74	1.02	3262.74	3255	17	9.22E-04	51.5	
67	0	1639.86	24	59	5.17	3280.92	3274	16	5.45E-04	76.3	
68	0	1661.65	31	44	2.23	3324.52	3316	12	7.12E-04	47.1	
69	0	1711.04	12	18	0.84	3423.34	3418	9	2.89E-04	67.4	
70	0	1729.00	45	45	2.08	3459.29	3453	13	1.05E-03	34.0	
71	1	1757.28	23	36	2.25	3515.89	3508	32	5.41E-04	58.7	1.70E+00
72	1	1763.78	169	39	2.26	3528.89	3508	32	3.92E-03	11.7	
73	0	1823.14	18	46	6.31	3647.66	3633	18	4.10E-04	95.5	
74	0	1837.62	20	37	0.82	3676.66	3667	14	4.57E-04	70.2	
75	0	1847.77	42	42	1.21	3696.97	3690	16	9.69E-04	38.5	
76	0	1995.23	19	28	4.25	3992.05	3984	14	4.40E-04	63.4	
77	0	2013.77	23	29	4.79	4029.16	4016	17	5.24E-04	59.0	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656011.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:20:00 Acquisition date : 23-JUN-2016 14:59:37
Sample ID        : G398656011 Sample quantity  : 173.96 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA9 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:04.78 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.146E+00	5.789E+00	5.789E+00	5.23	OK
MN-54	834.85	99.98*	1.800E+00	1.332E-02	1.447E-02	79.70	OK
CD-109	88.03	3.70*	4.868E+00	9.192E-01	9.723E-01	38.98	OK
SN-126	64.28	9.60	2.267E+00	2.731E-01	2.731E-01	115.33	OK
	86.94	8.90	4.868E+00	3.821E-01	3.821E-01	38.98	OK
	87.57	37.00*	4.868E+00	9.192E-02	9.192E-02	38.98	OK
BA-137M	661.66	89.90*	2.159E+00	1.001E-02	1.003E-02	102.99	OK
CS-137	661.66	85.10*	2.159E+00	1.057E-02	1.060E-02	102.99	OK
PM-147	121.22	0.00*	6.265E+00	1.797E+02	1.847E+02	131.85	OK
TL-208	277.37	6.60	4.349E+00	1.812E-01	1.812E-01	72.55	OK
	583.19	85.00*	2.383E+00	1.950E-01	1.950E-01	11.42	OK
	860.56	12.50	1.759E+00	3.069E-01	3.069E-01	31.85	OK
BI-212	727.33	6.67*	2.004E+00	5.868E-01	5.868E-01	45.28	OK
	785.37	1.10	1.888E+00	4.944E-01	4.944E-01	154.70	OK
	1620.50	1.47	1.045E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.676E+00	7.654E-01	7.654E-01	21.67	OK
	77.11	17.10	3.921E+00	8.887E-01	8.887E-01	10.62	OK
	238.63	43.60*	4.883E+00	6.395E-01	6.395E-01	4.72	OK
	300.09	3.30	4.089E+00	6.642E-01	6.642E-01	44.69	OK
BI-214	609.32	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78	OK
	1120.29	14.92	1.429E+00	4.242E-01	4.242E-01	24.39	OK
	1764.49	15.30	9.660E-01	3.921E-01	3.921E-01	23.34	OK
PB-214	74.82	5.80	3.669E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.921E+00	1.567E+00	1.567E+00	10.62	OK
	87.09	3.41	4.849E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.832E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.142E+00	5.328E-01	5.328E-01	13.34	OK
	351.93	35.60*	3.589E+00	5.269E-01	5.269E-01	8.58	OK
RN-222	609.32	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78	OK
	1120.29	14.92	1.429E+00	4.242E-01	4.242E-01	24.39	OK
	1764.49	15.30	9.660E-01	3.921E-01	3.921E-01	23.34	OK
RA-223	81.07	15.00	4.354E+00	7.831E-02	7.831E-02	114.22	OK
	83.79	24.70	4.605E+00	1.019E-01	1.019E-01	51.06	OK
	94.56	8.67	5.375E+00	----- Line	Not Found	-----	Absent
	144.24	3.27	6.311E+00	4.972E-02	4.972E-02	579.32	OK
	154.21	5.70	6.214E+00	8.934E-02	8.934E-02	132.09	OK
	269.46	13.90	4.441E+00	1.247E-01	1.247E-01	60.96	OK
	323.87	3.99*	3.841E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	3.707E+00	2.372E+00	2.372E+00	15.17	OK
RA-224	240.99	4.10*	4.840E+00	7.166E-01	7.166E-01	54.40	OK
RA-226	609.32	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78	OK
	1120.29	14.92	1.429E+00	4.242E-01	4.242E-01	24.39	OK
	1764.49	15.30	9.660E-01	3.921E-01	3.921E-01	23.34	OK
AC-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.707E+00	5.978E-01	5.978E-01	15.17	OK
	794.95	4.25	1.871E+00	6.583E-01	6.583E-01	40.81	OK
	835.71	1.61	1.800E+00	8.272E-01	8.272E-01	79.70	OK
	911.20	25.80*	1.683E+00	5.722E-01	5.722E-01	12.88	OK
	968.97	15.80	1.603E+00	6.205E-01	6.205E-01	15.10	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RA-228	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.707E+00	5.978E-01	5.978E-01	15.17	OK
	794.95	4.25	1.871E+00	6.583E-01	6.583E-01	40.81	OK
	835.71	1.61	1.800E+00	8.272E-01	8.272E-01	79.70	OK
	911.20	25.80*	1.683E+00	5.722E-01	5.722E-01	12.88	OK
TH-228	968.97	15.80	1.603E+00	6.205E-01	6.205E-01	15.10	OK
	74.82	10.28	3.676E+00	7.654E-01	7.654E-01	21.67	OK
	77.11	17.10	3.921E+00	8.887E-01	8.887E-01	10.62	OK
	238.63	43.60*	4.883E+00	6.395E-01	6.395E-01	4.72	OK
	300.09	3.30	4.089E+00	6.642E-01	6.642E-01	44.69	OK
TH-229	85.43	14.70	4.605E+00	1.712E-01	1.712E-01	51.06	OK
	88.47	24.00	4.868E+00	1.417E-01	1.417E-01	38.98	OK
	193.51	4.41*	5.613E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	5.322E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78	OK
	1120.29	14.92	1.429E+00	4.242E-01	4.242E-01	24.39	OK
	1764.49	15.30	9.660E-01	3.921E-01	3.921E-01	23.34	OK
PA-231	283.69	1.70	4.275E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.089E+00	4.097E-01	4.097E-01	44.69	OK
TH-231	81.07	15.00	4.354E+00	7.831E-02	7.831E-02	114.22	OK
	83.79	24.70	4.605E+00	1.019E-01	1.019E-01	51.06	OK
	94.87	5.69	5.394E+00	----- Line	Not Found	-----	Absent
	144.24	3.27	6.311E+00	4.972E-02	4.972E-02	579.32	OK
	154.21	5.70	6.214E+00	8.934E-02	8.934E-02	132.09	OK
TH-232	269.46	13.90	4.441E+00	1.247E-01	1.247E-01	60.96	OK
	323.87	3.99*	3.841E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	3.707E+00	2.372E+00	2.372E+00	15.17	OK
	105.21	1.10	5.896E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.707E+00	5.978E-01	5.978E-01	15.17	OK
TH-234	835.71	1.61	1.800E+00	8.272E-01	8.272E-01	79.70	OK
	911.20	25.80*	1.683E+00	5.722E-01	5.722E-01	12.88	OK
	968.97	15.80	1.603E+00	6.205E-01	6.205E-01	15.10	OK
	63.29	3.70*	2.267E+00	7.085E-01	7.085E-01	115.33	OK
U-234	92.59	4.23	5.255E+00	8.995E-01	8.995E-01	39.29	OK
	609.32	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78	OK
	1120.29	14.92	1.429E+00	4.242E-01	4.242E-01	24.39	OK
U-235	1764.49	15.30	9.660E-01	3.921E-01	3.921E-01	23.34	OK
	89.96	3.47	5.061E+00	1.008E+00	1.008E+00	31.78	OK
	93.35	5.60	5.255E+00	6.795E-01	6.795E-01	39.29	OK
	143.76	10.96*	6.311E+00	1.483E-02	1.483E-02	579.32	OK
U-238	163.33	5.08	6.096E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.741E+00	5.240E-02	5.240E-02	43.17	OK
	205.31	5.01	5.414E+00	2.140E-02	2.140E-02	761.64	OK
	63.29	3.70*	2.267E+00	7.085E-01	7.085E-01	115.33	OK
AM-243	92.59	4.23	5.255E+00	8.995E-01	8.995E-01	39.29	OK
	43.53	5.90	1.969E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.676E+00	1.171E-01	1.171E-01	21.67	OK
	511.00	100.00*	2.647E+00	5.246E-02	5.246E-02	45.76	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656011.CNF;1
Acquisition date : 23-JUN-2016 14:59:37 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:04.78 Half life ratio : *****
Sample date : 17-MAY-2016 11:20:00 Analyst initials: MXR1
Sample ID : G398656011 Sample Quantity : 1.7396E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.789E+00	2.966E-01	1.201E-01
MN-54	1.447E-02	1.131E-02	1.414E-02
CD-109	9.723E-01	3.715E-01	3.120E-01
SN-126	9.192E-02	3.512E-02	2.970E-02
BA-137M	1.003E-02	1.013E-02	1.532E-02
CS-137	1.060E-02	1.070E-02	1.618E-02
PM-147	1.847E+02	2.386E+02	2.912E+02
TL-208	1.950E-01	2.182E-02	1.244E-02
BI-212	5.868E-01	2.604E-01	1.917E-01
PB-212	6.395E-01	2.957E-02	2.255E-02
BI-214	4.396E-01	4.215E-02	2.794E-02
PB-214	5.269E-01	4.429E-02	2.780E-02
RN-222	4.396E-01	4.215E-02	2.794E-02
RA-223	5.344E-02	1.467E-01	2.494E-01
RA-224	7.166E-01	3.820E-01	2.417E-01
RA-226	4.396E-01	4.215E-02	2.794E-02
AC-228	5.722E-01	7.221E-02	4.878E-02
RA-228	5.722E-01	7.221E-02	4.878E-02
TH-228	6.395E-01	2.957E-02	2.255E-02
TH-229	-3.382E-02	1.072E-01	1.962E-01
TH-230	4.396E-01	4.214E-02	2.794E-02
PA-231	4.097E-01	1.794E-01	1.875E-01
TH-231	5.344E-02	1.467E-01	2.494E-01
TH-232	5.722E-01	7.221E-02	4.878E-02
TH-234	7.085E-01	8.007E-01	6.324E-01
U-234	4.396E-01	4.214E-02	2.794E-02
U-235	1.483E-02	8.422E-02	7.598E-02
U-238	7.085E-01	8.007E-01	6.324E-01
AM-243	1.171E-01	2.487E-02	2.424E-02
ANH-511	5.246E-02	2.353E-02	1.150E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	-2.813E-02	9.014E-02	1.633E-01	NOT IDENT.
NA-22	-4.730E-03	9.104E-03	1.547E-02	NOT IDENT.
NA-24	0.000E+00	8.222E+15	0.000E+00	SHORT HLIF
AL-26	-5.396E-05	6.959E-03	1.268E-02	NOT IDENT.
SC-46	-9.791E-03	9.996E-03	1.732E-02	FAIL ABUN
V-48	-2.448E-02	3.811E-02	6.645E-02	NOT IDENT.
CR-51	-5.481E-02	1.351E-01	2.532E-01	NOT IDENT.
CO-56	-3.787E-03	1.021E-02	1.839E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-5.875E-03	6.079E-03	1.014E-02	NOT IDENT.
CO-58	3.315E-05	1.182E-02	1.893E-02	NOT IDENT.
FE-59	-5.674E-03	2.474E-02	4.367E-02	NOT IDENT.
CO-60	-1.014E-03	7.352E-03	1.347E-02	NOT IDENT.
ZN-65	-1.496E-02	2.219E-02	3.221E-02	NOT IDENT.
GE-68	3.086E-01	2.653E-01	5.077E-01	NOT IDENT.
AS-73	-9.571E-02	3.379E-01	6.191E-01	NOT IDENT.
AS-74	1.481E-02	5.005E-02	9.087E-02	NOT IDENT.
SE-75	-2.412E-04	1.089E-02	1.861E-02	FAIL ABUN
BR-77	0.000E+00	3.047E+03	0.000E+00	SHORT HLIF
SR-82	-1.330E-01	1.558E-01	2.361E-01	NOT IDENT.
RB-83	7.634E-03	1.860E-02	3.441E-02	NOT IDENT.
KR-85	0.000E+00	1.786E+00	3.337E+00	NOT IDENT.
SR-85	0.000E+00	1.196E-02	2.234E-02	NOT IDENT.
RB-86	4.351E-01	3.648E-01	6.982E-01	NOT IDENT.
Y-88	7.276E-03	9.415E-03	1.831E-02	NOT IDENT.
Y-91	3.064E+00	5.584E+00	1.014E+01	NOT IDENT.
NB-94	1.518E-04	7.689E-03	1.355E-02	NOT IDENT.
NB-95	1.102E-02	1.303E-02	2.199E-02	NOT IDENT.
NB-95M	8.497E-03	3.645E-02	5.929E-02	NOT IDENT.
ZR-95	1.692E-02	1.959E-02	3.763E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.457E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.384E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-3.080E-04	7.194E-03	1.232E-02	FAIL ABUN
RH-102	-4.933E-03	1.188E-02	2.080E-02	FAIL ABUN
RU-103	5.512E-03	1.276E-02	2.373E-02	FAIL ABUN
RH-106	-5.010E-02	7.495E-02	1.297E-01	NOT IDENT.
RU-106	-5.010E-02	7.495E-02	1.297E-01	NOT IDENT.
AG-108M	-8.823E-03	6.196E-03	1.083E-02	NOT IDENT.
AG-110M	-1.989E-03	1.089E-02	1.972E-02	NOT IDENT.
SN-113	-6.393E-03	1.092E-02	1.995E-02	NOT IDENT.
CD-115	0.000E+00	2.552E+03	0.000E+00	SHORT HLIF
SN-117M	2.222E-03	3.671E-02	6.580E-02	NOT IDENT.
TE-123M	-2.860E-03	6.676E-03	1.239E-02	NOT IDENT.
SB-124	2.315E-02	2.188E-02	4.392E-02	NOT IDENT.
SB-125	-6.914E-03	1.974E-02	3.608E-02	FAIL ABUN
TE-125M	1.750E+00	2.562E+00	5.041E+00	NOT IDENT.
I-126	-7.957E-02	1.962E-01	2.949E-01	NOT IDENT.
SB-126	2.717E-02	1.158E-01	1.910E-01	NOT IDENT.
SB-127	7.888E+00	1.614E+01	2.925E+01	FAIL ABUN
I-131	-1.471E-01	1.624E-01	2.957E-01	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.384E+01	0.000E+00	SHORT HLIF
BA-133	1.891E-03	9.382E-03	1.573E-02	FAIL ABUN
I-133	0.000E+00	6.981E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.355E-02	1.906E-02	FAIL ABUN
CS-135	2.099E-02	3.653E-02	5.969E-02	NOT IDENT.
I-135	0.000E+00	3.379E+39	0.000E+00	SHORT HLIF
CS-136	2.112E-02	7.105E-02	1.297E-01	FAIL ABUN
CE-139	-6.580E-03	6.694E-03	1.220E-02	NOT IDENT.
BA-140	-2.373E-02	2.011E-01	3.626E-01	NOT IDENT.
LA-140	1.925E-02	6.597E-02	1.075E-01	FAIL ABUN
CE-141	9.665E-03	2.263E-02	3.884E-02	NOT IDENT.
CE-143	0.000E+00	2.378E+06	0.000E+00	SHORT HLIF
CE-144	-1.194E-02	4.340E-02	7.833E-02	FAIL ABUN
PM-144	1.325E-02	8.581E-03	1.612E-02	NOT IDENT.
PR-144	9.928E-01	6.493E-01	1.219E+00	NOT IDENT.
PM-146	-4.031E-03	1.122E-02	1.701E-02	NOT IDENT.
ND-147	3.025E-01	5.099E-01	9.483E-01	FAIL ABUN
PM-149	0.000E+00	2.439E+04	0.000E+00	SHORT HLIF
EU-150	5.423E-03	7.161E-03	1.060E-02	FAIL ABUN
EU-152	-1.311E-02	2.111E-02	3.769E-02	FAIL ABUN
GD-153	6.271E-03	2.568E-02	3.641E-02	NOT IDENT.
EU-154	-1.245E-02	2.555E-02	4.352E-02	NOT IDENT.
EU-155	2.582E-02	2.186E-02	4.359E-02	FAIL ABUN
TB-160	-5.911E-04	3.350E-02	6.129E-02	FAIL ABUN
HO-166M	9.147E-03	1.376E-02	2.500E-02	FAIL ABUN

TM-171	4.059E+00	6.166E+00	1.165E+01	FAIL ABUN
HF-172	2.626E-02	4.324E-02	7.570E-02	FAIL ABUN
LU-172	5.428E-03	1.330E-02	2.433E-02	FAIL ABUN
LU-176	-3.204E-03	6.750E-03	9.986E-03	FAIL ABUN
HF-181	5.543E-03	1.341E-02	2.499E-02	NOT IDENT.
TA-182	-7.859E-03	4.373E-02	7.614E-02	FAIL ABUN
RE-183	1.996E-03	7.326E-02	1.346E-01	FAIL ABUN
RE-184	-2.090E-02	4.018E-02	6.927E-02	NOT IDENT.
W-188	-1.156E+00	2.192E+00	3.382E+00	FAIL ABUN
IR-192	2.949E-03	8.816E-03	1.691E-02	FAIL ABUN
HG-203	2.736E-03	1.435E-02	2.041E-02	NOT IDENT.
BI-207	1.702E-03	1.108E-02	2.000E-02	FAIL ABUN
PB-210	-5.535E-01	2.072E+00	3.117E+00	NOT IDENT.
BI-211	0.000E+00	1.220E-01	1.709E-01	FAIL ABUN
PB-211	4.504E-02	1.720E-01	2.849E-01	NOT IDENT.
RN-219	1.038E-04	8.718E-02	1.622E-01	FAIL ABUN
AC-227	-2.951E-02	5.414E-02	9.579E-02	FAIL ABUN
TH-227	-2.951E-02	5.414E-02	9.579E-02	FAIL ABUN
PA-233	3.409E-03	1.316E-02	2.522E-02	FAIL ABUN
PA-234	-1.229E-02	7.374E-02	1.144E-01	FAIL ABUN
PA-234M	9.295E-01	1.426E+00	1.858E+00	FAIL ABUN
NP-237	3.409E-03	1.316E-02	2.522E-02	FAIL ABUN
NP-238	0.000E+00	6.107E+03	0.000E+00	SHORT HLIF
NP-239	-3.401E-02	6.031E-02	1.024E-01	FAIL ABUN
PU-239	0.000E+00	1.488E+02	1.428E+02	FAIL ABUN
AM-241	-2.761E-02	4.780E-02	7.875E-02	NOT IDENT.
CM-243	5.666E-05	2.484E-02	4.341E-02	FAIL ABUN
BK-247	1.604E-03	1.731E-02	2.969E-02	FAIL ABUN
CM-247	4.852E-04	8.021E-03	1.495E-02	FAIL ABUN
CF-249	3.913E-03	8.570E-03	1.624E-02	NOT IDENT.
CF-251	-7.067E-03	2.573E-02	4.750E-02	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1967	10.66*	1.146E+00	5.789E+00	5.789E+00	5.23
MN-54	834.85	67	99.98*	1.800E+00	1.332E-02	1.447E-02	79.70
CD-109	88.03	706	3.70*	4.868E+00	1.410E+00	1.492E+00	24.98
SN-126	64.28	165	9.60	2.267E+00	2.731E-01	2.731E-01	115.33
	86.94	706	8.90	4.868E+00	5.863E-01	5.863E-01	24.98
	87.57	706	37.00*	4.868E+00	1.410E-01	1.410E-01	24.98
BA-137M	661.66	54	89.90*	2.159E+00	1.001E-02	1.003E-02	102.99
CS-137	661.66	54	85.10*	2.159E+00	1.057E-02	1.060E-02	102.99
PM-147	121.22	89	0.00*	6.265E+00	1.797E+02	1.847E+02	131.85
TL-208	277.37	145	6.60	4.349E+00	1.812E-01	1.812E-01	72.55
	583.19	1098	85.00*	2.383E+00	1.950E-01	1.950E-01	11.42
	860.56	188	12.50	1.759E+00	3.069E-01	3.069E-01	31.85
BI-211	72.87	-----	1.23	3.448E+00	-----	Line Not Found	-----
	351.06	1872	12.92*	3.589E+00	1.452E+00	1.452E+00	8.58
BI-212	727.33	218	6.67*	2.004E+00	5.868E-01	5.868E-01	45.28
	785.37	29	1.10	1.888E+00	4.944E-01	4.944E-01	154.70
	1620.50	-----	1.47	1.045E+00	-----	Line Not Found	-----
PB-212	74.82	1120	10.28	3.676E+00	1.066E+00	1.066E+00	15.10
	77.11	1657	17.10	3.921E+00	8.887E-01	8.887E-01	10.62
	238.63	3786	43.60*	4.883E+00	6.395E-01	6.395E-01	4.72
	300.09	249	3.30	4.089E+00	6.642E-01	6.642E-01	44.69
BI-214	609.32	1280	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78
	1120.29	252	14.92	1.429E+00	4.242E-01	4.242E-01	24.39
	1764.49	161	15.30	9.660E-01	3.921E-01	3.921E-01	23.34
PB-214	74.82	1120	5.80	3.676E+00	1.889E+00	1.889E+00	15.10
	77.11	1657	9.70	3.921E+00	1.567E+00	1.567E+00	10.62
	87.09	706	3.41	4.868E+00	1.530E+00	1.530E+00	24.98
	242.00	915	7.25	4.840E+00	9.381E-01	9.381E-01	22.25
	295.22	1130	18.42	4.142E+00	5.328E-01	5.328E-01	13.34
	351.93	1872	35.60*	3.589E+00	5.269E-01	5.269E-01	8.58
RN-222	609.32	1280	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78
	1120.29	252	14.92	1.429E+00	4.242E-01	4.242E-01	24.39
	1764.49	161	15.30	9.660E-01	3.921E-01	3.921E-01	23.34
RA-223	81.07	142	15.00	4.354E+00	7.831E-02	7.831E-02	114.22
	83.79	322	24.70	4.605E+00	1.019E-01	1.019E-01	51.06
	94.56	-----	8.67	5.375E+00	-----	Line Not Found	-----
	144.24	29	3.27	6.311E+00	4.972E-02	4.972E-02	579.32
	154.21	88	5.70	6.214E+00	8.934E-02	8.934E-02	132.09
	269.46	214	13.90	4.441E+00	1.247E-01	1.247E-01	60.96
	323.87	-----	3.99*	3.841E+00	-----	Line Not Found	-----
	338.28	694	2.84	3.707E+00	2.372E+00	2.372E+00	15.17
RA-224	240.99	915	4.10*	4.840E+00	1.659E+00	1.659E+00	22.25
RA-226	609.32	1280	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78
	1120.29	252	14.92	1.429E+00	4.242E-01	4.242E-01	24.39
	1764.49	161	15.30	9.660E-01	3.921E-01	3.921E-01	23.34
AC-228	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	694	11.27	3.707E+00	5.978E-01	5.978E-01	15.17

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	794.95	146	4.25	1.871E+00	6.583E-01	6.583E-01	40.81
	835.71	67	1.61	1.800E+00	8.272E-01	8.272E-01	79.70
	911.20	691	25.80*	1.683E+00	5.722E-01	5.722E-01	12.88
	968.97	437	15.80	1.603E+00	6.205E-01	6.205E-01	15.10
	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	694	11.27	3.707E+00	5.978E-01	5.978E-01	15.17
	794.95	146	4.25	1.871E+00	6.583E-01	6.583E-01	40.81
	835.71	67	1.61	1.800E+00	8.272E-01	8.272E-01	79.70
	911.20	691	25.80*	1.683E+00	5.722E-01	5.722E-01	12.88
	968.97	437	15.80	1.603E+00	6.205E-01	6.205E-01	15.10
TH-228	74.82	1120	10.28	3.676E+00	1.066E+00	1.066E+00	15.10
	77.11	1657	17.10	3.921E+00	8.887E-01	8.887E-01	10.62
	238.63	3786	43.60*	4.883E+00	6.395E-01	6.395E-01	4.72
	300.09	249	3.30	4.089E+00	6.642E-01	6.642E-01	44.69
TH-229	85.43	322	14.70	4.605E+00	1.712E-01	1.712E-01	51.06
	88.47	706	24.00	4.868E+00	2.174E-01	2.174E-01	24.98
	193.51	-----	4.41*	5.613E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.322E+00	-----	Line Not Found	-----
TH-230	609.32	1280	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78
	1120.29	252	14.92	1.429E+00	4.242E-01	4.242E-01	24.39
	1764.49	161	15.30	9.660E-01	3.921E-01	3.921E-01	23.34
PA-231	283.69	-----	1.70	4.275E+00	-----	Line Not Found	-----
	301.36	249	5.35*	4.089E+00	4.097E-01	4.097E-01	44.69
TH-231	81.07	142	15.00	4.354E+00	7.831E-02	7.831E-02	114.22
	83.79	322	24.70	4.605E+00	1.019E-01	1.019E-01	51.06
	94.87	-----	5.69	5.394E+00	-----	Line Not Found	-----
	144.24	29	3.27	6.311E+00	4.972E-02	4.972E-02	579.32
TH-232	154.21	88	5.70	6.214E+00	8.934E-02	8.934E-02	132.09
	269.46	214	13.90	4.441E+00	1.247E-01	1.247E-01	60.96
	323.87	-----	3.99*	3.841E+00	-----	Line Not Found	-----
	338.28	694	2.84	3.707E+00	2.372E+00	2.372E+00	15.17
	105.21	-----	1.10	5.896E+00	-----	Line Not Found	-----
	338.32	694	11.27	3.707E+00	5.978E-01	5.978E-01	15.17
	835.71	67	1.61	1.800E+00	8.272E-01	8.272E-01	79.70
	911.20	691	25.80*	1.683E+00	5.722E-01	5.722E-01	12.88
	968.97	437	15.80	1.603E+00	6.205E-01	6.205E-01	15.10
	63.29	165	3.70*	2.267E+00	7.085E-01	7.085E-01	115.33
U-234	92.59	556	4.23	5.255E+00	8.995E-01	8.995E-01	39.29
	609.32	1280	45.49*	2.301E+00	4.396E-01	4.396E-01	9.78
	1120.29	252	14.92	1.429E+00	4.242E-01	4.242E-01	24.39
U-235	1764.49	161	15.30	9.660E-01	3.921E-01	3.921E-01	23.34
	89.96	492	3.47	5.061E+00	1.008E+00	1.008E+00	31.78
	93.35	556	5.60	5.255E+00	6.795E-01	6.795E-01	39.29
	143.76	29	10.96*	6.311E+00	1.483E-02	1.483E-02	579.32
U-238	163.33	-----	5.08	6.096E+00	-----	Line Not Found	-----
	185.72	478	57.20	5.741E+00	5.240E-02	5.240E-02	43.17
	205.31	16	5.01	5.414E+00	2.140E-02	2.140E-02	761.64
	63.29	165	3.70*	2.267E+00	7.085E-01	7.085E-01	115.33
	92.59	556	4.23	5.255E+00	8.995E-01	8.995E-01	39.29

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AM-243	43.53	-----	5.90	1.969E-01	-----	Line Not Found	-----
	74.66	1120	67.20*	3.676E+00	1.631E-01	1.631E-01	15.10
ANH-511	511.00	386	100.00*	2.647E+00	5.246E-02	5.246E-02	45.76

Flag: "*" = Keyline

Total number of lines in spectrum 77
Number of unidentified lines 25
Number of lines tentatively identified by NID 52 67.53%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.789E+00	5.789E+00	0.303E+00	5.23	
MN-54	312.05D	1.09	1.332E-02	1.447E-02	1.154E-02	79.70	
CD-109	461.40D	1.06	1.410E+00	1.492E+00	0.373E+00	24.98	
SN-126	2.30E+05Y	1.00	1.410E-01	1.410E-01	0.352E-01	24.98	
BA-137M	30.08Y	1.00	1.001E-02	1.003E-02	1.033E-02	102.99	
CS-137	30.08Y	1.00	1.057E-02	1.060E-02	1.092E-02	102.99	
PM-147	2.62Y	1.03	1.797E+02	1.847E+02	2.435E+02	131.85	
TL-208	1.41E+10Y	1.00	1.950E-01	1.950E-01	0.223E-01	11.42	
BI-211	7.04E+08Y	1.00	1.452E+00	1.452E+00	0.125E+00	8.58	
BI-212	1.41E+10Y	1.00	5.868E-01	5.868E-01	2.657E-01	45.28	
PB-212	1.41E+10Y	1.00	6.395E-01	6.395E-01	0.302E-01	4.72	
BI-214	1600.00Y	1.00	4.396E-01	4.396E-01	0.430E-01	9.78	
PB-214	1600.00Y	1.00	5.269E-01	5.269E-01	0.452E-01	8.58	
RN-222	1600.00Y	1.00	4.396E-01	4.396E-01	0.430E-01	9.78	
RA-223	7.04E+08Y	1.00	1.019E-01	1.019E-01	0.520E-01	51.06	K
RA-224	1.41E+10Y	1.00	1.659E+00	1.659E+00	0.369E+00	22.25	
RA-226	1600.00Y	1.00	4.396E-01	4.396E-01	0.430E-01	9.78	
AC-228	1.41E+10Y	1.00	5.722E-01	5.722E-01	0.737E-01	12.88	
RA-228	1.41E+10Y	1.00	5.722E-01	5.722E-01	0.737E-01	12.88	
TH-228	1.41E+10Y	1.00	6.395E-01	6.395E-01	0.302E-01	4.72	
TH-229	7340.00Y	1.00	2.174E-01	2.174E-01	0.543E-01	24.98	K
TH-230	7.54E+04Y	1.00	4.396E-01	4.396E-01	0.430E-01	9.78	
PA-231	7.04E+08Y	1.00	4.097E-01	4.097E-01	1.831E-01	44.69	
TH-231	7.04E+08Y	1.00	1.019E-01	1.019E-01	0.520E-01	51.06	K
TH-232	1.41E+10Y	1.00	5.722E-01	5.722E-01	0.737E-01	12.88	
TH-234	4.47E+09Y	1.00	7.085E-01	7.085E-01	8.171E-01	115.33	
U-234	2.45E+05Y	1.00	4.396E-01	4.396E-01	0.430E-01	9.78	
U-235	7.04E+08Y	1.00	1.483E-02	1.483E-02	8.594E-02	579.32	
U-238	4.47E+09Y	1.00	7.085E-01	7.085E-01	8.171E-01	115.33	
AM-243	7370.00Y	1.00	1.631E-01	1.631E-01	0.246E-01	15.10	
ANH-511	1.00E+09Y	1.00	5.246E-02	5.246E-02	2.401E-02	45.76	
Total Activity :			1.992E+02	2.042E+02			

Grand Total Activity : 1.992E+02 2.042E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.58	18	1457	1.00	132.83	131	6	2.86E-04	****	2.68E+00	T
0	99.46	166	1494	1.62	198.63	195	8	2.79E-03	96.3	5.65E+00	T
0	128.86	271	1561	0.98	257.45	253	9	4.68E-03	62.4	6.34E+00	T
0	209.04	302	1301	1.07	417.87	414	10	5.53E-03	56.6	5.35E+00	
0	214.87	187	1151	1.76	429.54	424	10	3.43E-03	78.3	5.26E+00	T
0	228.21	110	613	1.43	456.23	454	6	2.03E-03	82.6	5.04E+00	T
0	245.09	79	622	1.07	490.01	488	7	1.47E-03	****	4.79E+00	T
2	325.80	82	166	1.44	651.50	650	12	1.57E-03	50.1	3.82E+00	T
2	327.90	263	488	1.29	655.69	650	12	5.07E-03	34.9	3.80E+00	T
6	336.33	112	239	1.74	672.56	670	12	2.18E-03	47.3	3.72E+00	
0	409.50	109	436	1.21	818.97	814	9	2.16E-03	77.3	3.17E+00	T
0	462.32	210	380	1.75	924.66	919	11	4.23E-03	47.4	2.87E+00	T
0	743.24	39	186	0.82	1486.76	1482	9	8.42E-04	****	1.97E+00	
0	768.13	57	194	1.09	1536.55	1534	8	1.23E-03	92.2	1.92E+00	T
2	803.18	18	180	1.89	1606.69	1583	33	3.86E-04	****	1.85E+00	T
1	830.17	37	130	1.73	1660.68	1656	20	8.10E-04	****	1.81E+00	
0	864.90	41	62	1.43	1730.20	1727	6	8.89E-04	70.8	1.75E+00	
0	933.86	89	149	2.80	1868.17	1862	14	1.97E-03	63.9	1.65E+00	
0	950.34	32	184	0.68	1901.15	1896	13	7.00E-04	****	1.63E+00	T
6	963.52	135	164	2.93	1927.53	1921	24	3.01E-03	45.5	1.61E+00	T
0	1000.56	34	115	2.69	2001.63	1997	10	7.59E-04	****	1.56E+00	T
0	1038.64	58	144	1.34	2077.83	2071	15	1.30E-03	95.2	1.52E+00	T
0	1155.08	43	96	1.54	2310.83	2306	9	9.82E-04	88.8	1.39E+00	
0	1176.04	37	73	1.26	2352.78	2349	7	8.46E-04	84.9	1.37E+00	
0	1237.20	94	197	1.94	2475.15	2468	14	2.17E-03	66.6	1.32E+00	T
0	1355.09	14	50	0.57	2711.06	2704	9	3.29E-04	****	1.22E+00	
0	1377.18	64	91	2.39	2755.26	2749	12	1.50E-03	64.4	1.21E+00	
0	1412.20	105	132	7.16	2825.34	2808	35	2.47E-03	71.8	1.18E+00	
0	1479.23	15	64	1.54	2959.47	2951	13	3.62E-04	****	1.13E+00	
3	1587.39	62	51	2.63	3175.92	3170	19	1.49E-03	51.6	1.06E+00	
3	1591.77	22	29	1.92	3184.67	3170	19	5.24E-04	97.2	1.06E+00	
0	1630.78	38	71	1.02	3262.74	3255	17	9.22E-04	****	1.04E+00	
0	1639.86	23	57	5.17	3280.92	3274	16	5.45E-04	****	1.03E+00	
0	1661.65	30	42	2.23	3324.52	3316	12	7.12E-04	94.3	1.02E+00	
0	1711.04	12	17	0.84	3423.34	3418	9	2.89E-04	****	9.94E-01	
0	1729.00	43	43	2.08	3459.29	3453	13	1.05E-03	68.1	9.84E-01	
1	1757.28	22	34	2.25	3515.89	3508	32	5.41E-04	****	9.69E-01	
0	1823.14	17	44	6.31	3647.66	3633	18	4.10E-04	****	9.36E-01	
0	1837.62	19	35	0.82	3676.66	3667	14	4.57E-04	****	9.29E-01	
0	1847.77	40	40	1.21	3696.97	3690	16	9.69E-04	77.1	9.24E-01	
0	1995.23	18	26	4.25	3992.05	3984	14	4.40E-04	****	8.56E-01	
0	2013.77	21	27	4.79	4029.16	4016	17	5.24E-04	****	8.48E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656011.CNF;1
Acquisition date : 23-JUN-2016 14:59:37 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:04.78 Half life ratio : *****
Sample date : 17-MAY-2016 11:20:00 Nuclide Library : SOLID
Sample ID : G398656011 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.7396E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	5.606E-02
MN-54	6.770E-03
CD-109	1.529E-01
SN-126	1.456E-02
BA-137M	7.400E-03
CS-137	7.818E-03
PM-147	1.426E+02
TL-208	5.970E-03
BI-212	9.212E-02
PB-212	1.103E-02
BI-214	1.349E-02
PB-214	1.350E-02
RN-222	1.349E-02
RA-223	1.214E-01
RA-224	1.183E-01
RA-226	1.349E-02
AC-228	2.325E-02
RA-228	2.325E-02
TH-228	1.103E-02
TH-229	9.601E-02
TH-230	1.349E-02
PA-231	9.141E-02
TH-231	1.214E-01
TH-232	2.325E-02
TH-234	3.099E-01
U-234	1.349E-02
U-235	3.724E-02
U-238	3.099E-01
AM-243	1.190E-02
ANH-511	5.558E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	7.884E-02 NOT IDENT.

NA-22	7.342E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	5.821E-03	NOT IDENT.
SC-46	8.265E-03	FAIL ABUN
V-48	3.164E-02	NOT IDENT.
CR-51	1.232E-01	NOT IDENT.
CO-56	8.805E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.965E-03	NOT IDENT.
CO-58	9.074E-03	NOT IDENT.
FE-59	2.075E-02	NOT IDENT.
CO-60	6.334E-03	NOT IDENT.
ZN-65	1.535E-02	NOT IDENT.
GE-68	2.424E-01	NOT IDENT.
AS-73	3.027E-01	NOT IDENT.
AS-74	4.387E-02	NOT IDENT.
SE-75	9.065E-03	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.132E-01	NOT IDENT.
RB-83	1.663E-02	NOT IDENT.
KR-85	1.624E+00	NOT IDENT.
SR-85	1.087E-02	NOT IDENT.
RB-86	3.335E-01	NOT IDENT.
Y-88	8.485E-03	NOT IDENT.
Y-91	4.851E+00	NOT IDENT.
NB-94	6.531E-03	NOT IDENT.
NB-95	1.061E-02	NOT IDENT.
NB-95M	2.902E-02	NOT IDENT.
ZR-95	1.811E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.037E-03	FAIL ABUN
RH-102	9.992E-03	FAIL ABUN
RU-103	1.147E-02	FAIL ABUN
RH-106	6.244E-02	NOT IDENT.
RU-106	6.244E-02	NOT IDENT.
AG-108M	5.229E-03	NOT IDENT.
AG-110M	9.421E-03	NOT IDENT.
SN-113	9.676E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.224E-02	NOT IDENT.
TE-123M	6.071E-03	NOT IDENT.
SB-124	2.039E-02	NOT IDENT.
SB-125	1.747E-02	FAIL ABUN
TE-125M	2.470E+00	NOT IDENT.
I-126	1.422E-01	NOT IDENT.
SB-126	9.175E-02	NOT IDENT.
SB-127	1.408E+01	FAIL ABUN
I-131	1.433E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	7.634E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.209E-03	FAIL ABUN
CS-135	2.913E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.192E-02	FAIL ABUN
CE-139	5.973E-03	NOT IDENT.
BA-140	1.751E-01	NOT IDENT.
LA-140	5.007E-02	FAIL ABUN
CE-141	1.904E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.835E-02	FAIL ABUN
PM-144	7.798E-03	NOT IDENT.
PR-144	5.897E-01	NOT IDENT.
PM-146	8.237E-03	NOT IDENT.
ND-147	4.583E-01	FAIL ABUN
PM-149	0.000E+00	SHORT HLIF
EU-150	5.159E-03	FAIL ABUN
EU-152	1.832E-02	FAIL ABUN
GD-153	1.784E-02	NOT IDENT.
EU-154	2.066E-02	NOT IDENT.
EU-155	2.137E-02	FAIL ABUN
TB-160	2.928E-02	FAIL ABUN
HO-166M	1.205E-02	FAIL ABUN
TM-171	5.697E+00	FAIL ABUN

HF-172	3.709E-02	FAIL ABUN
LU-172	1.161E-02	FAIL ABUN
LU-176	4.857E-03	FAIL ABUN
HF-181	1.208E-02	NOT IDENT.
TA-182	3.636E-02	FAIL ABUN
RE-183	6.586E-02	FAIL ABUN
RE-184	3.304E-02	NOT IDENT.
W-188	1.647E+00	FAIL ABUN
IR-192	8.233E-03	FAIL ABUN
HG-203	9.950E-03	NOT IDENT.
BI-207	9.554E-03	FAIL ABUN
PB-210	1.526E+00	NOT IDENT.
BI-211	8.441E-02	FAIL ABUN
PB-211	1.383E-01	NOT IDENT.
RN-219	7.871E-02	FAIL ABUN
AC-227	4.673E-02	FAIL ABUN
TH-227	4.673E-02	FAIL ABUN
PA-233	1.228E-02	FAIL ABUN
PA-234	5.469E-02	FAIL ABUN
PA-234M	8.914E-01	FAIL ABUN
NP-237	1.228E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.015E-02	FAIL ABUN
PU-239	7.012E+01	FAIL ABUN
AM-241	3.854E-02	NOT IDENT.
CM-243	2.127E-02	FAIL ABUN
BK-247	1.447E-02	FAIL ABUN
CM-247	7.256E-03	FAIL ABUN
CF-249	7.886E-03	NOT IDENT.
CF-251	2.324E-02	FAIL ABUN

GEL Laboratories LLC
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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656011.CNF;1
Acquisition date : 23-JUN-2016 14:59:37 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance : 1.500
Elapsed live time : 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time : 0 12:00:04.78 Half life ratio : *****
Sample date : 17-MAY-2016 11:20:00 Nuclide Library : SOLID
Sample ID : G398656011 Analyst initials : MXR1
Batch Number : 1572234 Sample Quantity : 1.7396E+02 GRAM
Quantity Err(%) : 1.1497E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.789E+00	4.230E-01	4.230E-01
MN-54	1.447E-02	1.132E-02	1.132E-02
CD-109	9.723E-01	3.853E-01	3.853E-01
SN-126	9.192E-02	3.610E-02	3.610E-02
BA-137M	1.003E-02	1.014E-02	1.014E-02
CS-137	1.060E-02	1.071E-02	1.071E-02
PM-147	1.847E+02	2.388E+02	2.388E+02
TL-208	1.950E-01	2.334E-02	2.334E-02
BI-212	5.868E-01	2.621E-01	2.621E-01
PB-212	6.395E-01	4.486E-02	4.486E-02
BI-214	4.396E-01	4.616E-02	4.616E-02
PB-214	5.269E-01	4.937E-02	4.937E-02
RN-222	4.396E-01	4.616E-02	4.616E-02
RA-223	5.344E-02	1.467E-01	1.467E-01
RA-224	7.166E-01	3.888E-01	3.888E-01
RA-226	4.396E-01	4.616E-02	4.616E-02
AC-228	5.722E-01	7.791E-02	7.791E-02
RA-228	5.722E-01	7.791E-02	7.791E-02
TH-228	6.395E-01	4.486E-02	4.486E-02
TH-229	-3.382E-02	1.073E-01	1.073E-01
TH-230	4.396E-01	4.615E-02	4.615E-02
PA-231	4.097E-01	1.996E-01	1.996E-01
TH-231	5.344E-02	1.467E-01	1.467E-01
TH-232	5.722E-01	7.791E-02	7.791E-02
TH-234	7.085E-01	8.160E-01	8.160E-01
U-234	4.396E-01	4.615E-02	4.615E-02
U-235	1.483E-02	8.422E-02	8.422E-02
U-238	7.085E-01	8.160E-01	8.160E-01
AM-243	1.171E-01	2.654E-02	2.654E-02
ANH-511	5.246E-02	2.362E-02	2.362E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	-2.813E-02	9.015E-02	9.103E-02	NOT IDENT.
NA-22	-4.730E-03	9.105E-03	9.352E-03	NOT IDENT.
NA-24	3.112E+15	8.224E+15	8.343E+15	SHORT HLIF
AL-26	-5.396E-05	6.959E-03	6.959E-03	NOT IDENT.
SC-46	-9.791E-03	1.000E-02	1.093E-02	FAIL ABUN
V-48	-2.448E-02	3.812E-02	3.968E-02	NOT IDENT.
CR-51	-5.481E-02	1.351E-01	1.373E-01	NOT IDENT.
CO-56	-3.787E-03	1.022E-02	1.036E-02	FAIL ABUN
MN-56	-1.000E+41	2.690E+41	0.000E+00	SHORT HLIF
CO-57	-5.875E-03	6.085E-03	6.637E-03	NOT IDENT.
CO-58	3.315E-05	1.182E-02	1.182E-02	NOT IDENT.
FE-59	-5.674E-03	2.474E-02	2.487E-02	NOT IDENT.
CO-60	-1.014E-03	7.352E-03	7.366E-03	NOT IDENT.
ZN-65	-1.496E-02	2.220E-02	2.320E-02	NOT IDENT.
GE-68	3.086E-01	2.656E-01	2.998E-01	NOT IDENT.
AS-73	-9.571E-02	3.385E-01	3.413E-01	NOT IDENT.
AS-74	1.481E-02	5.006E-02	5.050E-02	NOT IDENT.
SE-75	-2.412E-04	1.089E-02	1.089E-02	FAIL ABUN
BR-77	6.588E+04	7.124E+04	7.718E+04	SHORT HLIF
SR-82	-1.330E-01	1.559E-01	1.670E-01	NOT IDENT.
RB-83	7.634E-03	1.863E-02	1.894E-02	NOT IDENT.
KR-85	6.334E+00	1.805E+00	3.378E+00	NOT IDENT.
SR-85	4.231E-02	1.208E-02	2.258E-02	NOT IDENT.
RB-86	4.351E-01	3.651E-01	4.145E-01	NOT IDENT.
Y-88	7.276E-03	9.427E-03	9.981E-03	NOT IDENT.
Y-91	3.064E+00	5.585E+00	5.753E+00	NOT IDENT.
NB-94	1.518E-04	7.689E-03	7.689E-03	NOT IDENT.
NB-95	1.102E-02	1.304E-02	1.395E-02	NOT IDENT.
NB-95M	8.497E-03	3.646E-02	3.666E-02	NOT IDENT.
ZR-95	1.692E-02	1.960E-02	2.103E-02	NOT IDENT.
NB-97	-1.000E+41	2.294E+41	0.000E+00	SHORT HLIF
ZR-97	4.097E+15	1.466E+15	2.358E+15	SHORT HLIF
MO-99	8.122E+02	7.398E+02	8.254E+02	SHORT HLIF
TC-99M	1.000E+41	5.846E+41	0.000E+00	SHORT HLIF
RH-101	-3.080E-04	7.194E-03	7.195E-03	FAIL ABUN
RH-102	-4.933E-03	1.189E-02	1.210E-02	FAIL ABUN
RU-103	5.512E-03	1.276E-02	1.300E-02	FAIL ABUN
RH-106	-5.010E-02	7.501E-02	7.834E-02	NOT IDENT.
RU-106	-5.010E-02	7.501E-02	7.834E-02	NOT IDENT.
AG-108M	-8.823E-03	6.206E-03	7.371E-03	NOT IDENT.
AG-110M	-1.989E-03	1.089E-02	1.092E-02	NOT IDENT.
SN-113	-6.393E-03	1.092E-02	1.129E-02	NOT IDENT.
CD-115	-2.228E+03	2.555E+03	2.746E+03	SHORT HLIF
SN-117M	2.222E-03	3.671E-02	3.673E-02	NOT IDENT.
TE-123M	-2.860E-03	6.677E-03	6.800E-03	NOT IDENT.
SB-124	2.315E-02	2.192E-02	2.428E-02	NOT IDENT.
SB-125	-6.914E-03	1.974E-02	1.999E-02	FAIL ABUN
TE-125M	1.750E+00	2.564E+00	2.683E+00	NOT IDENT.
I-126	-7.957E-02	1.962E-01	1.995E-01	NOT IDENT.
SB-126	2.717E-02	1.159E-01	1.165E-01	NOT IDENT.
SB-127	7.888E+00	1.620E+01	1.659E+01	FAIL ABUN
I-131	-1.471E-01	1.625E-01	1.755E-01	FAIL ABUN
I-132	1.000E+41	3.004E+42	0.000E+00	SHORT HLIF
TE-132	2.944E+01	2.401E+01	2.743E+01	SHORT HLIF
BA-133	1.891E-03	9.382E-03	9.421E-03	FAIL ABUN
I-133	3.495E+10	7.029E+10	7.203E+10	SHORT HLIF
CS-134	3.388E-02	1.363E-02	2.047E-02	FAIL ABUN
CS-135	2.099E-02	3.656E-02	3.776E-02	NOT IDENT.
I-135	-1.912E+39	3.747E+39	0.000E+00	SHORT HLIF
CS-136	2.112E-02	7.107E-02	7.171E-02	FAIL ABUN
CE-139	-6.580E-03	6.824E-03	7.440E-03	NOT IDENT.
BA-140	-2.373E-02	2.011E-01	2.014E-01	NOT IDENT.
LA-140	1.925E-02	6.598E-02	6.655E-02	FAIL ABUN
CE-141	9.665E-03	2.264E-02	2.305E-02	NOT IDENT.
CE-143	9.173E+06	2.421E+06	4.791E+06	SHORT HLIF
CE-144	-1.194E-02	4.341E-02	4.374E-02	FAIL ABUN
PM-144	1.325E-02	8.600E-03	1.047E-02	NOT IDENT.
PR-144	9.928E-01	6.507E-01	7.898E-01	NOT IDENT.
PM-146	-4.031E-03	1.122E-02	1.137E-02	NOT IDENT.
ND-147	3.025E-01	5.101E-01	5.280E-01	FAIL ABUN
PM-149	-9.643E+03	2.442E+04	2.480E+04	SHORT HLIF
EU-150	5.423E-03	7.165E-03	7.570E-03	FAIL ABUN
EU-152	-1.311E-02	2.112E-02	2.193E-02	FAIL ABUN
GD-153	6.271E-03	2.568E-02	2.583E-02	NOT IDENT.
EU-154	-1.245E-02	2.556E-02	2.617E-02	NOT IDENT.
EU-155	2.582E-02	2.194E-02	2.483E-02	FAIL ABUN
TB-160	-5.911E-04	3.350E-02	3.350E-02	FAIL ABUN
HO-166M	9.147E-03	1.377E-02	1.437E-02	FAIL ABUN

TM-171	4.059E+00	6.177E+00	6.442E+00	FAIL ABUN
HF-172	2.626E-02	4.345E-02	4.503E-02	FAIL ABUN
LU-172	5.428E-03	1.331E-02	1.353E-02	FAIL ABUN
LU-176	-3.204E-03	6.751E-03	6.904E-03	FAIL ABUN
HF-181	5.543E-03	1.341E-02	1.364E-02	NOT IDENT.
TA-182	-7.859E-03	4.373E-02	4.387E-02	FAIL ABUN
RE-183	1.996E-03	7.326E-02	7.327E-02	FAIL ABUN
RE-184	-2.090E-02	4.022E-02	4.131E-02	NOT IDENT.
W-188	-1.156E+00	2.196E+00	2.257E+00	FAIL ABUN
IR-192	2.949E-03	8.817E-03	8.917E-03	FAIL ABUN
HG-203	2.736E-03	1.435E-02	1.441E-02	NOT IDENT.
BI-207	1.702E-03	1.108E-02	1.110E-02	FAIL ABUN
PB-210	-5.535E-01	2.072E+00	2.087E+00	NOT IDENT.
BI-211	1.452E+00	1.381E-01	6.689E-01	FAIL ABUN
PB-211	4.504E-02	1.720E-01	1.732E-01	NOT IDENT.
RN-219	1.038E-04	8.718E-02	8.718E-02	FAIL ABUN
AC-227	-2.951E-02	5.428E-02	5.589E-02	FAIL ABUN
TH-227	-2.951E-02	5.428E-02	5.589E-02	FAIL ABUN
PA-233	3.409E-03	1.316E-02	1.325E-02	FAIL ABUN
PA-234	-1.229E-02	7.507E-02	7.527E-02	FAIL ABUN
PA-234M	9.295E-01	1.426E+00	1.487E+00	FAIL ABUN
NP-237	3.409E-03	1.316E-02	1.325E-02	FAIL ABUN
NP-238	-5.708E+03	6.111E+03	6.631E+03	SHORT HLIF
NP-239	-3.401E-02	6.037E-02	6.229E-02	FAIL ABUN
PU-239	2.434E+02	1.491E+02	1.852E+02	FAIL ABUN
AM-241	-2.761E-02	4.785E-02	4.944E-02	NOT IDENT.
CM-243	5.666E-05	2.484E-02	2.484E-02	FAIL ABUN
BK-247	1.604E-03	1.731E-02	1.732E-02	FAIL ABUN
CM-247	4.852E-04	8.022E-03	8.025E-03	FAIL ABUN
CF-249	3.913E-03	8.576E-03	8.756E-03	NOT IDENT.
CF-251	-7.067E-03	2.574E-02	2.594E-02	FAIL ABUN

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	655.4080	87.09	797.6521	136.47	721.3857
45.60	609.7083	87.57	798.4963	140.51	0.0000
46.54	639.8844	88.03	799.3035	143.76	787.9548
49.72	0.0000	88.34	799.8462	144.24	745.8125
51.35	678.6710	88.47	800.0735	145.44	771.9965
51.87	654.6497	89.96	802.6665	152.43	780.1895
52.39	595.7766	1093.63	803.8401	153.25	744.2183
52.97	607.6578	91.11	804.6519	323.87	779.7751
53.44	644.6194	92.59	807.1892	156.02	757.6345
54.07	645.8646	93.35	808.4834	158.56	772.6364
57.36	0.0000	94.56	810.5337	159.00	795.1578
57.53	674.4922	94.65	810.6868	162.33	761.0518
57.98	688.7856	94.67	810.7192	162.66	715.4975
59.27	735.8157	94.87	811.0579	163.33	701.1931
59.32	735.9213	97.43	742.9328	165.86	762.8347
59.54	736.3870	98.43	744.4460	176.31	689.3938
60.96	698.3754	98.44	744.4586	176.60	707.9653
61.17	726.6730	99.53	736.9428	177.52	692.5411
62.93	761.5593	100.11	715.9579	181.07	0.0000
63.29	762.3124	102.03	789.0818	181.52	761.7251
63.58	762.9187	103.18	797.6482	184.41	721.4238
64.28	823.9399	103.37	776.2358	143.76	711.3215
66.73	855.6020	105.21	694.5809	193.51	706.9291
67.24	901.7836	105.31	711.9714	197.03	693.3080
125.81	831.4489	106.12	788.5763	198.01	651.2779
67.75	831.6008	106.47	811.8594	201.83	737.2842
69.67	970.0245	109.28	715.5526	203.43	621.9015
70.83	981.3157	111.00	800.4821	205.31	711.8935
72.81	936.3229	111.76	0.0000	210.85	652.8682
72.87	936.4636	114.06	752.3934	215.65	618.0795
74.66	973.7573	116.30	0.0000	222.11	619.4063
74.82	974.1362	116.74	763.9390	227.09	653.6759
74.97	974.4976	119.76	714.8979	227.38	653.8849
77.11	979.5628	121.12	725.0236	228.16	0.0000
78.74	983.3749	121.22	725.1498	228.18	605.2023
79.69	985.5782	121.78	760.9594	116.74	605.2023
80.12	986.5750	122.06	773.9736	235.69	666.3806
80.19	986.7323	122.92	779.3499	235.96	666.5731
80.57	987.6066	123.07	738.7459	238.63	676.6919
81.00	988.5975	265.00	681.7734	238.98	0.0000
81.07	988.7549	125.81	716.7827	240.99	678.3893
81.75	668.8489	127.23	766.6939	242.00	679.1122
83.79	767.4795	127.91	773.7253	244.70	449.6201
84.00	767.8437	129.30	775.5289	252.40	499.8642
85.43	794.7158	131.20	713.3102	252.80	495.6229
86.55	796.7012	133.02	695.4214	254.15	0.0000
86.79	797.1233	133.52	740.0927	256.23	556.4512
86.94	797.3877	136.00	723.7183	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	466.9142	355.39	0.0000	584.27	190.2557
264.80	466.9733	356.01	340.6146	595.83	245.6490
265.00	467.0662	364.49	374.3213	427.87	304.8962
268.22	494.2738	366.42	0.0000	602.52	0.0000
269.46	486.3970	372.51	345.1570	604.72	278.6201
270.03	505.3214	375.05	332.8375	607.14	268.6938
271.23	516.0894	377.52	347.3893	609.32	260.2194
273.65	561.5378	356.01	335.0287	610.33	260.3529
276.40	530.6020	388.16	352.0066	614.28	242.1923
277.37	467.9022	388.63	340.8945	618.01	224.7987
277.60	468.0109	391.69	374.5070	620.36	222.9129
278.00	427.1774	264.66	349.5398	621.93	253.2661
279.20	461.8790	401.81	354.5551	630.19	0.0000
279.54	462.0273	402.40	354.7039	631.29	214.3872
279.70	460.3817	404.85	339.5930	633.25	216.7664
280.46	457.2848	410.95	318.2148	634.78	200.6613
283.69	454.6696	413.71	346.2914	635.95	218.1385
284.31	483.5760	414.70	330.3917	636.99	197.6184
285.41	501.2804	423.72	312.0171	645.85	212.6564
285.90	0.0000	427.09	306.9577	657.76	210.5977
287.50	467.7701	427.87	323.4902	657.90	0.0000
290.67	492.7661	433.94	327.7183	661.66	269.0125
293.27	0.0000	439.40	306.5975	664.57	0.0000
351.93	482.6653	453.88	294.8318	666.33	260.7994
295.96	482.9877	463.37	258.5923	666.50	279.0316
879.38	449.2954	468.07	292.5764	667.71	0.0000
299.98	432.4258	473.00	251.8412	677.62	214.8043
300.09	432.4712	475.06	275.0008	685.70	200.0555
300.13	432.4863	476.78	289.2106	695.00	234.4043
301.36	494.0668	477.60	270.4644	696.49	224.5117
302.85	440.5232	482.18	256.2745	696.51	224.5117
256.23	408.9568	487.02	249.0380	697.00	239.0847
304.85	437.1047	492.35	0.0000	697.30	239.1173
306.78	428.0276	497.08	254.5905	697.49	242.4959
308.46	452.3774	505.52	249.2048	702.65	236.3447
311.90	422.9004	507.63	0.0000	706.68	252.4864
316.51	421.0468	511.00	279.0325	711.68	204.6945
319.41	446.0349	514.00	239.0688	720.70	186.7064
320.08	454.2734	514.00	239.0688	721.93	0.0000
321.04	421.1587	520.40	250.9849	722.78	207.9771
323.87	410.1609	520.69	0.0000	722.91	195.9310
325.23	416.3353	522.65	0.0000	723.31	195.9680
328.76	444.2029	527.90	0.0000	724.19	205.0902
333.37	383.9957	528.26	264.4248	727.33	200.2435
333.97	375.8073	529.59	232.8260	733.00	157.4473
334.37	395.0909	529.87	0.0000	735.93	195.0366
338.28	435.9885	531.02	246.3647	333.97	171.4036
338.32	436.0032	537.26	266.8092	739.50	0.0000
311.90	425.9423	546.56	0.0000	747.24	220.8807
340.48	425.9423	552.55	237.9313	748.06	217.9156
340.55	414.4193	563.25	249.7874	752.31	230.8298
344.28	429.3221	569.33	228.5913	753.82	208.0686
345.93	398.8171	946.00	228.6113	756.73	182.6320
351.06	374.0554	569.70	223.3939	756.80	182.6369
351.93	374.3125	583.19	190.1514	884.68	168.7687

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	205.7546	1274.44	145.7823	1620.50	53.6990
766.42	213.4885	1001.03	135.9492	1621.92	55.7061
766.84	213.5281	1002.74	110.8379	1678.03	0.0000
772.60	0.0000	1004.73	110.9131	1690.97	36.3604
776.52	208.2294	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	46.1682
778.90	198.6595	1028.54	0.0000	1063.66	51.0656
783.70	145.4254	1037.84	129.4743	1771.35	52.8390
785.37	170.9143	1038.76	0.0000	1791.20	0.0000
792.07	173.8743	631.29	131.6356	1808.65	42.4497
794.95	173.4577	1048.07	137.0686	1810.72	0.0000
795.86	173.5213	1049.04	127.9053	1836.06	38.5236
810.06	151.6967	1050.41	121.8181		
810.29	157.9687	1063.66	147.0219		
344.28	162.6693	1077.00	113.5771		
810.76	176.7694	1077.34	111.5227		
815.77	175.8741	1085.87	136.6793		
1048.07	160.0598	1093.63	129.7485		
832.01	167.5493	1099.45	129.9866		
834.85	167.7395	1112.07	148.7692		
835.71	208.5596	1112.84	134.0106		
836.80	0.0000	1115.54	163.7350		
846.75	0.0000	1120.29	158.7390		
846.77	180.9036	1120.55	165.7320		
856.80	154.5266	1221.41	157.0459		
860.56	143.5840	1129.67	150.1011		
871.09	156.6567	1131.51	0.0000		
873.19	143.3179	1147.95	0.0000		
875.33	0.0000	1173.23	140.0309		
879.38	152.3335	1177.95	136.6800		
880.51	140.8208	1189.05	123.9467		
883.24	166.0707	1204.77	143.8406		
884.68	157.4685	1221.41	155.3133		
889.28	179.0291	1231.02	162.2314		
894.76	150.3038	1235.36	155.2171		
898.04	168.9363	1238.28	155.3431		
900.72	141.8902	1260.41	0.0000		
903.28	158.8871	1271.87	114.8745		
911.20	136.5854	1274.44	132.4737		
912.08	136.6299	1274.54	132.4737		
923.98	0.0000	1291.59	118.2500		
926.50	160.6517	1298.22	0.0000		
929.11	157.1211	1312.11	106.9281		
937.49	157.5938	1332.49	86.1960		
944.13	143.1592	1362.66	0.0000		
946.00	161.3674	1365.19	90.6809		
949.00	145.0553	1368.63	0.0000		
667.71	0.0000	1384.29	66.3909		
962.31	145.7393	1408.01	74.6700		
964.08	136.2173	1457.56	0.0000		
966.17	136.3177	1460.82	65.1279		
911.20	136.4515	1489.16	75.2261		
968.97	136.4515	1505.03	85.1927		
983.53	153.1569	1584.12	62.5562		
984.45	0.0000	1596.21	54.2522		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 01:07:49.98

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656012.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;260
Background date    : 20-JUN-2016 14:04:24
Sample date       : 17-MAY-2016 11:25:00 Acquisition date : 23-JUN-2016 13:07:08
Sample ID        : G398656012 Sample quantity : 1.64910E+02 GRAM
Detector name    : GAM32 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.44 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572234 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.89	76	751	0.87	94.86	93	6	1.77E-03	58.0	
2	1	74.97	712	1212	1.27	151.04	143	17	1.65E-02	9.5	3.60E+00
3	1	77.33	1063	1083	1.11	155.77	143	17	2.46E-02	6.1	
4	4	84.50*	181	1110	1.71	170.11	166	26	4.18E-03	38.7	9.13E-01
5	4	87.39*	510	1120	1.35	175.89	166	26	1.18E-02	13.2	
6	4	90.10	298	988	1.15	181.30	166	26	6.89E-03	18.5	
7	4	92.93*	209	1140	1.41	186.97	166	26	4.83E-03	41.0	
8	0	105.49	104	857	1.29	212.10	209	7	2.41E-03	47.5	
9	0	112.73*	19	574	1.38	226.57	225	5	4.51E-04	240.9	
10	0	128.30	96	1253	1.12	257.73	255	9	2.22E-03	67.1	
11	0	131.67	81	724	1.28	264.48	263	6	1.87E-03	54.2	
12	0	144.40*	154	1113	2.44	289.94	286	10	3.57E-03	45.9	
13	0	153.80	163	920	2.41	308.73	305	8	3.78E-03	33.1	
14	0	163.89	95	815	1.28	328.93	326	7	2.21E-03	50.8	
15	0	186.16*	346	1006	1.39	373.48	369	9	8.01E-03	20.5	
16	0	209.88	236	915	1.31	420.92	416	9	5.45E-03	24.1	
17	2	238.88*	2708	588	1.16	478.93	472	19	6.27E-02	2.7	1.78E+00
18	2	241.91	530	802	1.63	485.00	472	19	1.23E-02	12.3	
19	0	270.34*	148	701	1.63	541.89	537	10	3.42E-03	40.2	
20	0	278.49	159	889	2.30	558.18	552	13	3.67E-03	39.8	
21	1	295.53	806	484	1.35	592.27	587	21	1.86E-02	5.9	1.24E+00
22	1	300.45	150	538	1.45	602.12	587	21	3.47E-03	29.2	
23	0	328.28	220	423	1.43	657.79	654	8	5.09E-03	17.6	
24	0	338.47*	556	475	1.27	678.18	674	9	1.29E-02	9.4	
25	0	352.15*	1279	678	1.19	705.54	699	13	2.96E-02	5.4	
26	0	405.26	28	334	1.36	811.80	809	8	6.43E-04	115.7	
27	0	409.81	53	299	0.92	820.89	818	7	1.23E-03	55.7	
28	0	463.25	158	282	2.05	927.81	924	9	3.65E-03	20.8	
29	0	511.34*	235	521	2.17	1024.01	1017	19	5.44E-03	34.6	
30	0	583.60	831	388	1.41	1168.56	1163	13	1.92E-02	6.0	
31	0	609.69*	926	429	1.40	1220.76	1214	14	2.14E-02	6.2	
32	0	727.59	212	292	2.03	1456.63	1451	16	4.90E-03	19.2	
33	0	750.60	37	88	1.45	1502.67	1500	6	8.50E-04	43.7	
34	0	769.43	162	298	2.26	1540.33	1533	17	3.74E-03	25.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	786.19	44	232	2.18	1573.87	1569	12	1.02E-03	70.7	
36	0	795.37	109	165	1.19	1592.23	1587	11	2.52E-03	24.7	
37	0	803.10*	21	129	1.93	1607.69	1605	7	4.78E-04	144.6	
38	0	835.92	41	153	1.40	1673.36	1669	8	9.60E-04	54.0	
39	0	860.73	119	188	1.19	1722.99	1716	13	2.75E-03	25.6	
40	0	876.26	29	190	5.86	1754.05	1747	14	6.82E-04	100.8	
41	0	911.61*	537	205	1.50	1824.78	1818	13	1.24E-02	7.7	
42	0	926.26	15	132	3.36	1854.10	1848	10	3.50E-04	144.5	
43	0	934.97	58	273	5.93	1871.50	1863	20	1.35E-03	70.8	
44	2	965.25	155	153	1.82	1932.09	1925	38	3.59E-03	16.7	1.12E+00
45	2	969.41*	372	129	1.78	1940.42	1925	38	8.60E-03	9.3	
46	0	1102.04	16	102	0.65	2205.75	2198	9	3.73E-04	116.4	
47	0	1120.88*	198	176	1.79	2243.45	2237	16	4.59E-03	18.5	
48	1	1151.46	49	76	2.04	2304.63	2301	20	1.14E-03	28.7	2.18E+00
49	1	1155.29	53	139	2.04	2312.29	2301	20	1.22E-03	47.1	
50	0	1200.12	12	141	3.71	2401.98	2398	11	2.78E-04	192.9	
51	0	1230.88	48	116	2.54	2463.51	2458	10	1.11E-03	44.7	
52	0	1238.85	92	128	2.01	2479.46	2474	11	2.14E-03	25.9	
53	0	1319.01	18	72	1.14	2639.84	2633	10	4.07E-04	94.8	
54	0	1378.96	48	74	1.89	2759.79	2752	12	1.10E-03	39.2	
55	0	1402.44	49	49	4.50	2806.75	2801	13	1.14E-03	33.1	
56	0	1461.45*	2102	86	1.97	2924.82	2916	19	4.87E-02	2.6	
57	0	1497.31	31	34	1.11	2996.56	2991	12	7.20E-04	42.3	
58	1	1588.69	63	55	2.22	3179.38	3169	25	1.45E-03	27.3	1.25E+00
59	1	1593.20	41	49	2.23	3188.40	3169	25	9.42E-04	35.3	
60	0	1631.86	38	49	1.49	3265.76	3259	15	8.69E-04	43.8	
61	0	1731.26	52	40	0.79	3464.63	3454	18	1.20E-03	32.1	
62	0	1765.04	204	58	2.07	3532.21	3521	19	4.73E-03	11.3	
63	0	1833.42	8	22	1.37	3669.03	3662	9	1.92E-04	108.2	
64	0	1848.71	17	25	0.51	3699.61	3694	9	3.87E-04	60.6	
65	0	1866.28	26	56	6.56	3734.77	3718	25	6.06E-04	79.6	
66	0	2018.05	36	48	7.71	4038.42	4023	25	8.32E-04	55.4	

Flag: "*" = Peak area was modified by background subtraction


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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656012.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:25:00 Acquisition date : 23-JUN-2016 13:07:08
Sample ID        : G398656012 Sample quantity  : 164.91 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA32 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.44 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.119E+00	6.507E+00	6.507E+00	5.12	OK
MN-54	834.85	99.98*	1.867E+00	8.822E-03	9.585E-03	108.08	OK
CD-109	88.03	3.70*	4.981E+00	9.606E-01	1.016E+00	39.25	OK
SN-126	64.28	9.60	2.258E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.981E+00	3.994E-01	3.994E-01	39.25	OK
	87.57	37.00*	4.981E+00	9.606E-02	9.606E-02	39.25	OK
CE-141	145.44	48.29*	6.134E+00	1.173E-02	2.599E-02	201.75	OK
EU-155	86.55	30.70	4.981E+00	1.158E-01	1.175E-01	39.25	OK
	105.31	21.10*	5.997E+00	4.123E-02	4.185E-02	95.09	OK
HG-203	70.83	3.69	3.149E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	3.416E+00	----- Line	Not Found	-----	Absent
	279.20	81.56*	4.180E+00	7.786E-03	1.357E-02	215.93	OK
TL-208	277.37	6.60	4.192E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	2.503E+00	1.622E-01	1.622E-01	12.05	OK
	860.56	12.50	1.819E+00	2.064E-01	2.064E-01	51.13	OK
PB-210	46.54	4.25*	3.637E-01	2.674E+00	2.683E+00	116.00	OK
BI-212	727.33	6.67*	2.103E+00	6.097E-01	6.097E-01	38.46	OK
	785.37	1.10	1.970E+00	8.169E-01	8.169E-01	141.45	OK
	1620.50	1.47	1.033E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.681E+00	6.974E-01	6.974E-01	26.84	OK
	77.11	17.10	3.966E+00	8.087E-01	8.087E-01	12.27	OK
	238.63	43.60*	4.642E+00	6.153E-01	6.153E-01	5.49	OK
	300.09	3.30	3.969E+00	5.128E-01	5.128E-01	58.41	OK
BI-214	609.32	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50	OK
	1120.29	14.92	1.424E+00	3.570E-01	3.570E-01	36.99	OK
	1764.49	15.30	9.782E-01	4.910E-01	4.910E-01	22.61	OK
PB-214	74.82	5.80	3.663E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.966E+00	1.426E+00	1.426E+00	12.27	OK
	87.09	3.41	4.955E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.601E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.014E+00	4.893E-01	4.894E-01	11.75	OK
	351.93	35.60*	3.562E+00	4.442E-01	4.442E-01	10.83	OK
RN-222	609.32	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50	OK
	1120.29	14.92	1.424E+00	3.570E-01	3.570E-01	36.99	OK
	1764.49	15.30	9.782E-01	4.910E-01	4.910E-01	22.61	OK
RA-224	240.99	4.10*	4.602E+00	4.252E-01	4.252E-01	78.23	OK
RA-226	609.32	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50	OK
	1120.29	14.92	1.424E+00	3.570E-01	3.570E-01	36.99	OK
	1764.49	15.30	9.782E-01	4.910E-01	4.910E-01	22.61	OK
AC-228	105.21	1.10	5.997E+00	7.909E-01	7.909E-01	95.09	OK
	338.32	11.27	3.660E+00	5.964E-01	5.964E-01	18.78	OK
	794.95	4.25	1.950E+00	5.257E-01	5.257E-01	49.50	OK
	835.71	1.61	1.867E+00	5.479E-01	5.479E-01	108.08	OK
	911.20	25.80*	1.727E+00	4.732E-01	4.732E-01	15.49	OK
	968.97	15.80	1.632E+00	5.618E-01	5.618E-01	18.50	OK
RA-228	105.21	1.10	5.997E+00	7.909E-01	7.909E-01	95.09	OK
	338.32	11.27	3.660E+00	5.964E-01	5.964E-01	18.78	OK
	794.95	4.25	1.950E+00	5.257E-01	5.257E-01	49.50	OK
	835.71	1.61	1.867E+00	5.479E-01	5.479E-01	108.08	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	911.20	25.80*	1.727E+00	4.732E-01	4.732E-01	15.49	OK
	968.97	15.80	1.632E+00	5.618E-01	5.618E-01	18.50	OK
	74.82	10.28	3.681E+00	6.974E-01	6.974E-01	26.84	OK
	77.11	17.10	3.966E+00	8.087E-01	8.087E-01	12.27	OK
	238.63	43.60*	4.642E+00	6.153E-01	6.153E-01	5.49	OK
TH-229	300.09	3.30	3.969E+00	5.128E-01	5.128E-01	58.41	OK
	85.43	14.70	4.724E+00	1.331E-01	1.331E-01	77.36	OK
	88.47	24.00	4.981E+00	1.481E-01	1.481E-01	39.25	OK
	193.51	4.41*	5.324E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	5.058E+00	7.756E-01	7.756E-01	48.21	OK
	609.32	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50	OK
	1120.29	14.92	1.424E+00	3.570E-01	3.570E-01	36.99	OK
	1764.49	15.30	9.782E-01	4.910E-01	4.910E-01	22.61	OK
PA-231	283.69	1.70	4.128E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	3.969E+00	3.163E-01	3.163E-01	58.41	OK
	105.21	1.10	5.997E+00	7.909E-01	7.909E-01	95.09	OK
	338.32	11.27	3.660E+00	5.964E-01	5.964E-01	18.78	OK
	835.71	1.61	1.867E+00	5.479E-01	5.479E-01	108.08	OK
U-234	911.20	25.80*	1.727E+00	4.732E-01	4.732E-01	15.49	OK
	968.97	15.80	1.632E+00	5.618E-01	5.618E-01	18.50	OK
	609.32	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50	OK
	1120.29	14.92	1.424E+00	3.570E-01	3.570E-01	36.99	OK
U-235	1764.49	15.30	9.782E-01	4.910E-01	4.910E-01	22.61	OK
	89.96	3.47	5.196E+00	8.399E-01	8.399E-01	36.94	OK
	93.35	5.60	5.395E+00	3.498E-01	3.498E-01	82.03	OK
	143.76	10.96*	6.142E+00	----- Line	Not Found	-----	<<INT Reject
AM-243	163.33	5.08	5.835E+00	1.539E-01	1.539E-01	101.53	OK
	185.72	57.20	5.449E+00	5.242E-02	5.242E-02	41.08	OK
	205.31	5.01	5.130E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	1.916E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.681E+00	1.067E-01	1.067E-01	26.84	OK
	511.00	100.00*	2.756E+00	3.599E-02	3.599E-02	69.20	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656012.CNF;1
Acquisition date : 23-JUN-2016 13:07:08 Sensitivity : 3.000
Detector ID : GAM32 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.44 Half life ratio : *****
Sample date : 17-MAY-2016 11:25:00 Analyst initials: MXR1
Sample ID : G398656012 Sample Quantity : 1.6491E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 6-AUG-2015 09:24:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.507E+00	3.262E-01	1.366E-01
MN-54	9.585E-03	1.015E-02	1.558E-02
CD-109	1.016E+00	3.908E-01	3.601E-01
SN-126	9.606E-02	3.695E-02	3.431E-02
CE-141	2.599E-02	5.139E-02	4.430E-02
EU-155	4.185E-02	3.900E-02	4.714E-02
HG-203	1.357E-02	2.871E-02	2.364E-02
TL-208	1.622E-01	1.916E-02	1.420E-02
PB-210	2.683E+00	3.050E+00	4.125E+00
BI-212	6.097E-01	2.298E-01	1.985E-01
PB-212	6.153E-01	3.307E-02	2.481E-02
BI-214	3.470E-01	4.250E-02	2.936E-02
PB-214	4.442E-01	4.716E-02	3.120E-02
RN-222	3.470E-01	4.250E-02	2.936E-02
RA-224	4.252E-01	3.260E-01	2.657E-01
RA-226	3.470E-01	4.250E-02	2.936E-02
AC-228	4.732E-01	7.184E-02	5.358E-02
RA-228	4.732E-01	7.184E-02	5.358E-02
TH-228	6.153E-01	3.307E-02	2.481E-02
TH-229	-1.504E-01	1.287E-01	2.320E-01
TH-230	3.470E-01	4.250E-02	2.936E-02
PA-231	3.163E-01	1.811E-01	2.073E-01
TH-232	4.732E-01	7.184E-02	5.358E-02
U-234	3.470E-01	4.250E-02	2.936E-02
U-235	1.113E-01	1.000E-01	9.306E-02
AM-243	1.067E-01	2.807E-02	2.671E-02
ANH-511	3.599E-02	2.441E-02	1.207E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.154E-02	9.878E-02	1.826E-01	NOT IDENT.
NA-22	4.888E-03	8.995E-03	1.688E-02	NOT IDENT.
NA-24	0.000E+00	7.513E+15	0.000E+00	SHORT HLIF

AL-26	-3.188E-03	6.812E-03	1.178E-02	NOT IDENT.
SC-46	-1.148E-02	1.029E-02	1.720E-02	FAIL ABUN
V-48	2.527E-02	4.806E-02	7.634E-02	NOT IDENT.
CR-51	-1.907E-01	2.188E-01	2.853E-01	NOT IDENT.
CO-56	1.095E-03	1.137E-02	2.037E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	4.619E-03	6.441E-03	1.245E-02	NOT IDENT.
CO-58	-7.182E-03	1.075E-02	1.862E-02	NOT IDENT.
FE-59	-4.307E-03	2.699E-02	4.908E-02	NOT IDENT.
CO-60	3.685E-03	8.605E-03	1.607E-02	NOT IDENT.
ZN-65	-4.511E-03	2.558E-02	3.625E-02	NOT IDENT.
GE-68	-3.661E-02	2.879E-01	5.023E-01	NOT IDENT.
AS-73	-2.953E-01	4.659E-01	8.503E-01	NOT IDENT.
AS-74	-3.066E-02	5.142E-02	9.175E-02	NOT IDENT.
SE-75	2.973E-03	1.431E-02	2.301E-02	FAIL ABUN
BR-77	0.000E+00	3.327E+03	0.000E+00	SHORT HLIF
SR-82	1.001E-01	1.531E-01	2.492E-01	NOT IDENT.
RB-83	-1.451E-02	2.512E-02	3.387E-02	NOT IDENT.
KR-85	0.000E+00	1.878E+00	3.940E+00	NOT IDENT.
SR-85	0.000E+00	1.256E-02	2.635E-02	NOT IDENT.
RB-86	-2.684E-01	3.970E-01	6.684E-01	NOT IDENT.
Y-88	-1.377E-02	1.340E-02	1.766E-02	NOT IDENT.
Y-91	6.869E+00	6.706E+00	1.127E+01	NOT IDENT.
NB-94	3.823E-04	7.794E-03	1.409E-02	NOT IDENT.
NB-95	1.859E-02	1.276E-02	2.177E-02	NOT IDENT.
NB-95M	3.978E-02	4.143E-02	6.877E-02	NOT IDENT.
ZR-95	1.563E-02	2.101E-02	3.816E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.383E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.437E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.178E+41	0.000E+00	SHORT HLIF
RH-101	1.131E-02	1.487E-02	1.534E-02	FAIL ABUN
RH-102	2.235E-03	1.235E-02	2.269E-02	NOT IDENT.
RU-103	-4.771E-03	1.274E-02	2.330E-02	FAIL ABUN
RH-106	9.497E-04	7.417E-02	1.354E-01	NOT IDENT.
RU-106	9.497E-04	7.417E-02	1.354E-01	NOT IDENT.
AG-108M	-2.961E-03	7.102E-03	1.234E-02	NOT IDENT.
AG-110M	2.914E-03	1.164E-02	2.103E-02	NOT IDENT.
SN-113	7.391E-03	1.209E-02	2.199E-02	NOT IDENT.
CD-115	0.000E+00	2.384E+03	0.000E+00	SHORT HLIF
SN-117M	-1.330E-02	5.187E-02	7.903E-02	NOT IDENT.
TE-123M	-2.225E-03	9.857E-03	1.503E-02	NOT IDENT.
SB-124	-4.156E-03	2.085E-02	3.748E-02	NOT IDENT.
SB-125	2.288E-02	2.155E-02	3.973E-02	FAIL ABUN
TE-125M	3.515E+00	4.603E+00	5.895E+00	NOT IDENT.
I-126	6.103E-02	1.593E-01	2.938E-01	NOT IDENT.
SB-126	-4.939E-02	1.285E-01	2.056E-01	NOT IDENT.
SB-127	6.678E+00	1.585E+01	2.927E+01	NOT IDENT.
I-131	-3.598E-02	2.732E-01	3.494E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.186E+01	0.000E+00	SHORT HLIF
BA-133	-1.949E-03	1.164E-02	1.803E-02	NOT IDENT.
I-133	0.000E+00	6.202E+10	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.312E-02	1.900E-02	FAIL ABUN
CS-135	3.243E-02	4.465E-02	7.300E-02	NOT IDENT.
I-135	0.000E+00	2.764E+39	0.000E+00	SHORT HLIF
CS-136	-3.749E-02	8.013E-02	1.369E-01	FAIL ABUN
BA-137M	-6.653E-04	7.779E-03	1.408E-02	NOT IDENT.
CS-137	-7.028E-04	8.218E-03	1.488E-02	NOT IDENT.
CE-139	5.084E-03	9.068E-03	1.518E-02	NOT IDENT.
BA-140	2.958E-01	2.023E-01	3.929E-01	FAIL ABUN
LA-140	7.422E-02	6.819E-02	1.207E-01	FAIL ABUN
CE-143	0.000E+00	2.565E+06	0.000E+00	SHORT HLIF
CE-144	-2.588E-02	5.782E-02	9.521E-02	NOT IDENT.
PM-144	6.449E-03	8.249E-03	1.538E-02	NOT IDENT.
PR-144	3.209E-01	6.319E-01	1.164E+00	NOT IDENT.
PM-146	-4.746E-04	9.800E-03	1.821E-02	NOT IDENT.
ND-147	-3.919E-01	4.876E-01	8.715E-01	FAIL ABUN
PM-147	-4.116E+01	1.791E+02	3.397E+02	NOT IDENT.
PM-149	0.000E+00	2.413E+04	0.000E+00	SHORT HLIF
EU-150	4.310E-03	8.181E-03	1.224E-02	FAIL ABUN
EU-152	-1.748E-02	2.466E-02	4.150E-02	FAIL ABUN
GD-153	1.996E-03	2.810E-02	4.210E-02	NOT IDENT.
EU-154	1.869E-02	2.489E-02	4.731E-02	NOT IDENT.
TB-160	-3.638E-03	4.238E-02	6.484E-02	FAIL ABUN
HO-166M	-1.534E-02	1.397E-02	2.398E-02	FAIL ABUN
TM-171	-2.057E+00	8.613E+00	1.590E+01	NOT IDENT.
HF-172	-4.132E-04	5.367E-02	8.986E-02	FAIL ABUN

LU-172	2.182E-03	1.447E-02	2.493E-02	FAIL ABUN
LU-176	-1.952E-03	6.840E-03	1.179E-02	FAIL ABUN
HF-181	9.519E-04	1.431E-02	2.661E-02	FAIL ABUN
TA-182	-4.176E-03	4.533E-02	8.179E-02	FAIL ABUN
RE-183	-1.820E-02	9.635E-02	1.770E-01	NOT IDENT.
RE-184	-2.441E-02	4.691E-02	7.865E-02	NOT IDENT.
W-188	-9.110E-01	2.544E+00	3.968E+00	NOT IDENT.
IR-192	-8.132E-04	1.040E-02	1.869E-02	FAIL ABUN
BI-207	9.547E-03	1.200E-02	2.198E-02	FAIL ABUN
BI-211	0.000E+00	1.299E-01	1.729E-01	FAIL ABUN
PB-211	9.841E-02	2.231E-01	3.135E-01	FAIL ABUN
RN-219	-5.516E-02	1.140E-01	1.719E-01	FAIL ABUN
RA-223	1.526E-01	1.807E-01	2.943E-01	FAIL ABUN
AC-227	-3.893E-02	6.289E-02	1.127E-01	FAIL ABUN
TH-227	-3.893E-02	6.289E-02	1.127E-01	FAIL ABUN
TH-231	1.526E-01	1.807E-01	2.943E-01	FAIL ABUN
PA-233	3.724E-04	1.596E-02	2.879E-02	FAIL ABUN
PA-234	1.019E-02	6.437E-02	1.154E-01	FAIL ABUN
PA-234M	2.776E-01	1.031E+00	1.844E+00	NOT IDENT.
TH-234	-1.735E-01	5.531E-01	8.463E-01	FAIL ABUN
NP-237	3.724E-04	1.596E-02	2.879E-02	FAIL ABUN
NP-238	0.000E+00	7.123E+03	0.000E+00	SHORT HLIF
U-238	-1.735E-01	5.531E-01	8.463E-01	FAIL ABUN
NP-239	2.963E-02	7.008E-02	1.195E-01	FAIL ABUN
PU-239	1.193E+02	1.568E+02	1.652E+02	FAIL ABUN
AM-241	-8.030E-02	5.709E-02	1.016E-01	NOT IDENT.
CM-243	-2.867E-02	2.884E-02	4.751E-02	FAIL ABUN
BK-247	-6.874E-03	2.303E-02	3.628E-02	FAIL ABUN
CM-247	-4.089E-03	1.039E-02	1.575E-02	FAIL ABUN
CF-249	5.545E-03	9.688E-03	1.758E-02	NOT IDENT.
CF-251	2.689E-02	3.216E-02	6.098E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	2047	10.66*	1.119E+00	6.507E+00	6.507E+00	5.12
MN-54	834.85	43	99.98*	1.867E+00	8.822E-03	9.585E-03	108.08
CD-109	88.03	686	3.70*	4.981E+00	1.412E+00	1.493E+00	26.44
SN-126	64.28	-----	9.60	2.258E+00	-----	Line Not Found	-----
	86.94	686	8.90	4.981E+00	5.868E-01	5.868E-01	26.44
	87.57	686	37.00*	4.981E+00	1.412E-01	1.412E-01	26.44
CE-141	145.44	197	48.29*	6.134E+00	2.526E-02	5.597E-02	91.73
EU-155	86.55	686	30.70	4.981E+00	1.701E-01	1.727E-01	26.44
	105.31	138	21.10*	5.997E+00	4.123E-02	4.185E-02	95.09
HG-203	70.83	-----	3.69	3.149E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.416E+00	-----	Line Not Found	-----
	279.20	189	81.56*	4.180E+00	2.103E-02	3.664E-02	79.61
TL-208	277.37	189	6.60	4.180E+00	2.598E-01	2.598E-01	79.61
	583.19	909	85.00*	2.503E+00	1.622E-01	1.622E-01	12.05
	860.56	124	12.50	1.819E+00	2.064E-01	2.064E-01	51.13
PB-210	46.54	109	4.25*	3.637E-01	2.674E+00	2.683E+00	116.00
BI-211	72.87	-----	1.23	3.416E+00	-----	Line Not Found	-----
	351.06	1485	12.92*	3.562E+00	1.224E+00	1.224E+00	10.83
BI-212	727.33	225	6.67*	2.103E+00	6.097E-01	6.097E-01	38.46
	785.37	47	1.10	1.970E+00	8.169E-01	8.169E-01	141.45
	1620.50	-----	1.47	1.033E+00	-----	Line Not Found	-----
PB-212	74.82	971	10.28	3.681E+00	9.735E-01	9.735E-01	18.94
	77.11	1446	17.10	3.966E+00	8.087E-01	8.087E-01	12.27
	238.63	3282	43.60*	4.642E+00	6.153E-01	6.153E-01	5.49
	300.09	177	3.30	3.969E+00	5.128E-01	5.128E-01	58.41
BI-214	609.32	1007	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50
	1120.29	200	14.92	1.424E+00	3.570E-01	3.570E-01	36.99
	1764.49	194	15.30	9.782E-01	4.910E-01	4.910E-01	22.61
PB-214	74.82	971	5.80	3.681E+00	1.725E+00	1.726E+00	18.94
	77.11	1446	9.70	3.966E+00	1.426E+00	1.426E+00	12.27
	87.09	686	3.41	4.981E+00	1.532E+00	1.532E+00	26.44
	242.00	642	7.25	4.602E+00	7.298E-01	7.298E-01	24.54
	295.22	954	18.42	4.014E+00	4.893E-01	4.894E-01	11.75
	351.93	1485	35.60*	3.562E+00	4.442E-01	4.442E-01	10.83
RN-222	609.32	1007	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50
	1120.29	200	14.92	1.424E+00	3.570E-01	3.570E-01	36.99
	1764.49	194	15.30	9.782E-01	4.910E-01	4.910E-01	22.61
RA-224	240.99	642	4.10*	4.602E+00	1.291E+00	1.291E+00	24.54
RA-226	609.32	1007	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50
	1120.29	200	14.92	1.424E+00	3.570E-01	3.570E-01	36.99
	1764.49	194	15.30	9.782E-01	4.910E-01	4.910E-01	22.61
AC-228	105.21	138	1.10	5.997E+00	7.909E-01	7.909E-01	95.09
	338.32	648	11.27	3.660E+00	5.964E-01	5.964E-01	18.78
	794.95	115	4.25	1.950E+00	5.257E-01	5.257E-01	49.50
	835.71	43	1.61	1.867E+00	5.479E-01	5.479E-01	108.08
	911.20	556	25.80*	1.727E+00	4.732E-01	4.732E-01	15.49
	968.97	382	15.80	1.632E+00	5.618E-01	5.618E-01	18.50

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	105.21	138	1.10	5.997E+00	7.909E-01	7.909E-01	95.09
	338.32	648	11.27	3.660E+00	5.964E-01	5.964E-01	18.78
	794.95	115	4.25	1.950E+00	5.257E-01	5.257E-01	49.50
	835.71	43	1.61	1.867E+00	5.479E-01	5.479E-01	108.08
	911.20	556	25.80*	1.727E+00	4.732E-01	4.732E-01	15.49
TH-228	968.97	382	15.80	1.632E+00	5.618E-01	5.618E-01	18.50
	74.82	971	10.28	3.681E+00	9.735E-01	9.735E-01	18.94
	77.11	1446	17.10	3.966E+00	8.087E-01	8.087E-01	12.27
	238.63	3282	43.60*	4.642E+00	6.153E-01	6.153E-01	5.49
	300.09	177	3.30	3.969E+00	5.128E-01	5.128E-01	58.41
TH-229	85.43	244	14.70	4.724E+00	1.331E-01	1.331E-01	77.36
	88.47	686	24.00	4.981E+00	2.176E-01	2.176E-01	26.44
	193.51	-----	4.41*	5.324E+00	-----	Line Not Found	-----
	210.85	290	2.80	5.058E+00	7.756E-01	7.756E-01	48.21
TH-230	609.32	1007	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50
	1120.29	200	14.92	1.424E+00	3.570E-01	3.570E-01	36.99
	1764.49	194	15.30	9.782E-01	4.910E-01	4.910E-01	22.61
	283.69	-----	1.70	4.128E+00	-----	Line Not Found	-----
TH-232	301.36	177	5.35*	3.969E+00	3.163E-01	3.163E-01	58.41
	105.21	138	1.10	5.997E+00	7.909E-01	7.909E-01	95.09
	338.32	648	11.27	3.660E+00	5.964E-01	5.964E-01	18.78
	835.71	43	1.61	1.867E+00	5.479E-01	5.479E-01	108.08
	911.20	556	25.80*	1.727E+00	4.732E-01	4.732E-01	15.49
U-234	968.97	382	15.80	1.632E+00	5.618E-01	5.618E-01	18.50
	609.32	1007	45.49*	2.421E+00	3.470E-01	3.470E-01	12.50
	1120.29	200	14.92	1.424E+00	3.570E-01	3.570E-01	36.99
	1764.49	194	15.30	9.782E-01	4.910E-01	4.910E-01	22.61
U-235	89.96	399	3.47	5.196E+00	8.399E-01	8.399E-01	36.94
	93.35	279	5.60	5.395E+00	3.498E-01	3.498E-01	82.03
	143.76	197	10.96*	6.134E+00	1.113E-01	1.113E-01	91.73
	163.33	120	5.08	5.835E+00	1.539E-01	1.539E-01	101.53
	185.72	431	57.20	5.449E+00	5.242E-02	5.242E-02	41.08
	205.31	-----	5.01	5.130E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	1.916E-01	-----	Line Not Found	-----
	74.66	971	67.20*	3.681E+00	1.489E-01	1.489E-01	18.94
ANH-511	511.00	261	100.00*	2.756E+00	3.599E-02	3.599E-02	69.20

Flag: "*" = Keyline

Total number of lines in spectrum 66
Number of unidentified lines 19
Number of lines tentatively identified by NID 47 71.21%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.507E+00	6.507E+00	0.333E+00	5.12	
MN-54	312.05D	1.09	8.822E-03	9.585E-03	10.36E-03	108.08	
CD-109	461.40D	1.06	1.412E+00	1.493E+00	0.395E+00	26.44	
SN-126	2.30E+05Y	1.00	1.412E-01	1.412E-01	0.373E-01	26.44	
CE-141	32.51D	2.22	2.526E-02	5.597E-02	5.134E-02	91.73	
EU-155	4.75Y	1.02	4.123E-02	4.185E-02	3.980E-02	95.09	
HG-203	46.59D	1.74	2.103E-02	3.664E-02	2.917E-02	79.61	
TL-208	1.41E+10Y	1.00	1.622E-01	1.622E-01	0.195E-01	12.05	
PB-210	22.20Y	1.00	2.674E+00	2.683E+00	3.112E+00	116.00	
BI-211	7.04E+08Y	1.00	1.224E+00	1.224E+00	0.133E+00	10.83	
BI-212	1.41E+10Y	1.00	6.097E-01	6.097E-01	2.345E-01	38.46	
PB-212	1.41E+10Y	1.00	6.153E-01	6.153E-01	0.337E-01	5.49	
BI-214	1600.00Y	1.00	3.470E-01	3.470E-01	0.434E-01	12.50	
PB-214	1600.00Y	1.00	4.442E-01	4.442E-01	0.481E-01	10.83	
RN-222	1600.00Y	1.00	3.470E-01	3.470E-01	0.434E-01	12.50	
RA-224	1.41E+10Y	1.00	1.291E+00	1.291E+00	0.317E+00	24.54	
RA-226	1600.00Y	1.00	3.470E-01	3.470E-01	0.434E-01	12.50	
AC-228	1.41E+10Y	1.00	4.732E-01	4.732E-01	0.733E-01	15.49	
RA-228	1.41E+10Y	1.00	4.732E-01	4.732E-01	0.733E-01	15.49	
TH-228	1.41E+10Y	1.00	6.153E-01	6.153E-01	0.337E-01	5.49	
TH-229	7340.00Y	1.00	2.176E-01	2.176E-01	0.576E-01	26.44	K
TH-230	7.54E+04Y	1.00	3.470E-01	3.470E-01	0.434E-01	12.50	
PA-231	7.04E+08Y	1.00	3.163E-01	3.163E-01	1.848E-01	58.41	
TH-232	1.41E+10Y	1.00	4.732E-01	4.732E-01	0.733E-01	15.49	
U-234	2.45E+05Y	1.00	3.470E-01	3.470E-01	0.434E-01	12.50	
U-235	7.04E+08Y	1.00	1.113E-01	1.113E-01	1.021E-01	91.73	
AM-243	7370.00Y	1.00	1.489E-01	1.489E-01	0.282E-01	18.94	
ANH-511	1.00E+09Y	1.00	3.599E-02	3.599E-02	2.491E-02	69.20	
Total Activity :			1.978E+01	1.991E+01			

Grand Total Activity : 1.978E+01 1.991E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	112.73	26	753	1.38	226.57	225	5	4.51E-04	****	6.17E+00	T
0	128.30	124	1621	1.12	257.73	255	9	2.22E-03	****	6.27E+00	T
0	131.67	104	935	1.28	264.48	263	6	1.87E-03	****	6.25E+00	T
0	153.80	207	1168	2.41	308.73	305	8	3.78E-03	66.2	6.00E+00	T
0	270.34	177	838	1.63	541.89	537	10	3.42E-03	80.4	4.27E+00	T
0	328.28	257	495	1.43	657.79	654	8	5.09E-03	35.1	3.74E+00	T
0	405.26	32	382	1.36	811.80	809	8	6.43E-04	****	3.24E+00	T
0	409.81	61	341	0.92	820.89	818	7	1.23E-03	****	3.21E+00	T
0	463.25	177	318	2.05	927.81	924	9	3.65E-03	41.6	2.95E+00	T
0	750.60	39	94	1.45	1502.67	1500	6	8.50E-04	87.4	2.05E+00	
0	769.43	171	315	2.26	1540.33	1533	17	3.74E-03	51.4	2.01E+00	
0	803.10	22	136	1.93	1607.69	1605	7	4.78E-04	****	1.93E+00	T
0	876.26	31	197	5.86	1754.05	1747	14	6.82E-04	****	1.79E+00	T
0	926.26	16	136	3.36	1854.10	1848	10	3.50E-04	****	1.70E+00	T
0	934.97	60	281	5.93	1871.50	1863	20	1.35E-03	****	1.69E+00	
2	965.25	159	157	1.82	1932.09	1925	38	3.59E-03	33.4	1.64E+00	T
0	1102.04	16	103	0.65	2205.75	2198	9	3.73E-04	****	1.45E+00	
1	1151.46	49	76	2.04	2304.63	2301	20	1.14E-03	57.4	1.39E+00	
1	1155.29	53	139	2.04	2312.29	2301	20	1.22E-03	94.2	1.38E+00	
0	1200.12	12	141	3.71	2401.98	2398	11	2.78E-04	****	1.34E+00	
0	1230.88	48	115	2.54	2463.51	2458	10	1.11E-03	89.5	1.30E+00	T
0	1238.85	92	127	2.01	2479.46	2474	11	2.14E-03	51.9	1.30E+00	T
0	1319.01	17	71	1.14	2639.84	2633	10	4.07E-04	****	1.22E+00	
0	1378.96	47	73	1.89	2759.79	2752	12	1.10E-03	78.3	1.18E+00	
0	1402.44	48	48	4.50	2806.75	2801	13	1.14E-03	66.3	1.16E+00	
0	1497.31	30	33	1.11	2996.56	2991	12	7.20E-04	84.6	1.10E+00	
1	1588.69	60	53	2.22	3179.38	3169	25	1.45E-03	54.7	1.05E+00	
1	1593.20	39	47	2.23	3188.40	3169	25	9.42E-04	70.6	1.05E+00	
0	1631.86	36	47	1.49	3265.76	3259	15	8.69E-04	87.5	1.03E+00	
0	1731.26	49	38	0.79	3464.63	3454	18	1.20E-03	64.2	9.89E-01	
0	1833.42	8	20	1.37	3669.03	3662	9	1.92E-04	****	9.59E-01	
0	1848.71	16	24	0.51	3699.61	3694	9	3.87E-04	****	9.55E-01	
0	1866.28	25	53	6.56	3734.77	3718	25	6.06E-04	****	9.51E-01	
0	2018.05	33	45	7.71	4038.42	4023	25	8.32E-04	****	9.25E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656012.CNF;1  *
* Acquisition date   : 23-JUN-2016 13:07:08 Sensitivity      : 3.000          *
* Detector ID        : GAM32 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:05.44 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 11:25:00 Nuclide Library : SOLID      *
* Sample ID          : G398656012 Analyst initials: MXR1        *
* Batch Number       : 1572234 Sample Quantity : 1.6491E+02 GRAM  *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 6-AUG-2015 09:24:00 Eff. Geometry    : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.396E-02
MN-54	7.488E-03
CD-109	1.770E-01
SN-126	1.686E-02
CE-141	2.175E-02
EU-155	2.313E-02
HG-203	1.155E-02
TL-208	6.854E-03
PB-210	2.024E+00
BI-212	9.550E-02
PB-212	1.214E-02
BI-214	1.420E-02
PB-214	1.518E-02
RN-222	1.420E-02
RA-224	1.300E-01
RA-226	1.420E-02
AC-228	2.562E-02
RA-228	2.562E-02
TH-228	1.214E-02
TH-229	1.137E-01
TH-230	1.420E-02
PA-231	1.011E-01
TH-232	2.562E-02
U-234	1.420E-02
U-235	4.573E-02
AM-243	1.313E-02
ANH-511	5.846E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.843E-02	NOT IDENT.
NA-22	8.021E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	5.356E-03	NOT IDENT.

SC-46	8.199E-03	FAIL ABUN
V-48	3.654E-02	NOT IDENT.
CR-51	1.390E-01	NOT IDENT.
CO-56	9.789E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	6.113E-03	NOT IDENT.
CO-58	8.913E-03	NOT IDENT.
FE-59	2.341E-02	NOT IDENT.
CO-60	7.606E-03	NOT IDENT.
ZN-65	1.733E-02	NOT IDENT.
GE-68	2.391E-01	NOT IDENT.
AS-73	4.170E-01	NOT IDENT.
AS-74	4.432E-02	NOT IDENT.
SE-75	1.124E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.198E-01	NOT IDENT.
RB-83	1.635E-02	NOT IDENT.
KR-85	1.926E+00	NOT IDENT.
SR-85	1.288E-02	NOT IDENT.
RB-86	3.179E-01	NOT IDENT.
Y-88	8.142E-03	NOT IDENT.
Y-91	5.403E+00	NOT IDENT.
NB-94	6.802E-03	NOT IDENT.
NB-95	1.050E-02	NOT IDENT.
NB-95M	3.370E-02	NOT IDENT.
ZR-95	1.837E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.538E-03	FAIL ABUN
RH-102	1.094E-02	NOT IDENT.
RU-103	1.125E-02	FAIL ABUN
RH-106	6.531E-02	NOT IDENT.
RU-106	6.531E-02	NOT IDENT.
AG-108M	5.978E-03	NOT IDENT.
AG-110M	1.007E-02	NOT IDENT.
SN-113	1.069E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.881E-02	NOT IDENT.
TE-123M	7.381E-03	NOT IDENT.
SB-124	1.708E-02	NOT IDENT.
SB-125	1.928E-02	FAIL ABUN
TE-125M	2.896E+00	NOT IDENT.
I-126	1.417E-01	NOT IDENT.
SB-126	9.907E-02	NOT IDENT.
SB-127	1.410E+01	NOT IDENT.
I-131	1.700E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.772E-03	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	9.178E-03	FAIL ABUN
CS-135	3.572E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.542E-02	FAIL ABUN
BA-137M	6.784E-03	NOT IDENT.
CS-137	7.167E-03	NOT IDENT.
CE-139	7.449E-03	NOT IDENT.
BA-140	1.903E-01	FAIL ABUN
LA-140	5.645E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	4.675E-02	NOT IDENT.
PM-144	7.429E-03	NOT IDENT.
PR-144	5.626E-01	NOT IDENT.
PM-146	8.831E-03	NOT IDENT.
ND-147	4.199E-01	FAIL ABUN
PM-147	1.667E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.972E-03	FAIL ABUN
EU-152	2.019E-02	FAIL ABUN
GD-153	2.068E-02	NOT IDENT.
EU-154	2.248E-02	NOT IDENT.
TB-160	3.103E-02	FAIL ABUN
HO-166M	1.154E-02	FAIL ABUN
TM-171	7.796E+00	NOT IDENT.
HF-172	4.414E-02	FAIL ABUN
LU-172	1.188E-02	FAIL ABUN

LU-176	5.752E-03	FAIL ABUN
HF-181	1.288E-02	FAIL ABUN
TA-182	3.907E-02	FAIL ABUN
RE-183	8.688E-02	NOT IDENT.
RE-184	3.769E-02	NOT IDENT.
W-188	1.937E+00	NOT IDENT.
IR-192	9.106E-03	FAIL ABUN
BI-207	1.053E-02	FAIL ABUN
BI-211	8.535E-02	FAIL ABUN
PB-211	1.524E-01	FAIL ABUN
RN-219	8.347E-02	FAIL ABUN
RA-223	1.436E-01	FAIL ABUN
AC-227	5.508E-02	FAIL ABUN
TH-227	5.508E-02	FAIL ABUN
TH-231	1.436E-01	FAIL ABUN
PA-233	1.404E-02	FAIL ABUN
PA-234	5.509E-02	FAIL ABUN
PA-234M	8.829E-01	NOT IDENT.
TH-234	4.162E-01	FAIL ABUN
NP-237	1.404E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	4.162E-01	FAIL ABUN
NP-239	5.867E-02	FAIL ABUN
PU-239	8.122E+01	FAIL ABUN
AM-241	4.983E-02	NOT IDENT.
CM-243	2.331E-02	FAIL ABUN
BK-247	1.773E-02	FAIL ABUN
CM-247	7.649E-03	FAIL ABUN
CF-249	8.551E-03	NOT IDENT.
CF-251	2.994E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656012.CNF;1
Acquisition date : 23-JUN-2016 13:07:08 Sensitivity : 3.000
Detector ID : GAM32 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.44 Half life ratio : *****
Sample date : 17-MAY-2016 11:25:00 Nuclide Library : SOLID
Sample ID : G398656012 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6491E+02 GRAM
Quantity Err(%) : 1.2128E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 6-AUG-2015 09:24:00 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.507E+00	6.436E-01	6.436E-01
MN-54	9.585E-03	1.023E-02	1.023E-02
CD-109	1.016E+00	4.109E-01	4.109E-01
SN-126	9.606E-02	3.851E-02	3.851E-02
CE-141	2.599E-02	5.154E-02	5.154E-02
EU-155	4.185E-02	3.920E-02	3.920E-02
HG-203	1.348E-02	2.898E-02	2.898E-02
TL-208	1.622E-01	2.404E-02	2.404E-02
PB-210	2.683E+00	3.067E+00	3.067E+00
BI-212	6.097E-01	2.393E-01	2.393E-01
PB-212	6.153E-01	6.633E-02	6.633E-02
BI-214	3.470E-01	5.284E-02	5.284E-02
PB-214	4.442E-01	6.185E-02	6.185E-02
RN-222	3.470E-01	5.284E-02	5.284E-02
RA-224	4.252E-01	3.492E-01	3.492E-01
RA-226	3.470E-01	5.284E-02	5.284E-02
AC-228	4.732E-01	1.032E-01	1.032E-01
RA-228	4.732E-01	1.032E-01	1.032E-01
TH-228	6.153E-01	6.633E-02	6.633E-02
TH-229	-1.504E-01	1.293E-01	1.293E-01
TH-230	3.470E-01	5.284E-02	5.284E-02
PA-231	3.163E-01	1.953E-01	1.953E-01
TH-232	4.732E-01	1.032E-01	1.032E-01
U-234	3.470E-01	5.284E-02	5.284E-02
U-235	1.113E-01	1.005E-01	1.005E-01
AM-243	1.067E-01	3.035E-02	3.035E-02
ANH-511	3.599E-02	2.460E-02	2.460E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.154E-02	9.878E-02	9.892E-02	NOT IDENT.
NA-22	4.888E-03	9.004E-03	9.270E-03	NOT IDENT.
NA-24	3.327E+15	7.520E+15	7.668E+15	SHORT HLIF

AL-26	-3.188E-03	6.817E-03	6.966E-03	NOT IDENT.
SC-46	-1.148E-02	1.043E-02	1.164E-02	FAIL ABUN
V-48	2.527E-02	4.826E-02	4.958E-02	NOT IDENT.
CR-51	-1.907E-01	2.196E-01	2.358E-01	NOT IDENT.
CO-56	1.095E-03	1.137E-02	1.138E-02	FAIL ABUN
MN-56	1.000E+41	1.146E+42	0.000E+00	SHORT HLIF
CO-57	4.619E-03	6.455E-03	6.782E-03	NOT IDENT.
CO-58	-7.182E-03	1.079E-02	1.126E-02	NOT IDENT.
FE-59	-4.307E-03	2.701E-02	2.708E-02	NOT IDENT.
CO-60	3.685E-03	8.610E-03	8.769E-03	NOT IDENT.
ZN-65	-4.511E-03	2.560E-02	2.568E-02	NOT IDENT.
GE-68	-3.661E-02	2.880E-01	2.885E-01	NOT IDENT.
AS-73	-2.953E-01	4.710E-01	4.894E-01	NOT IDENT.
AS-74	-3.066E-02	5.154E-02	5.336E-02	NOT IDENT.
SE-75	2.973E-03	1.432E-02	1.438E-02	FAIL ABUN
BR-77	6.189E+04	6.698E+04	7.256E+04	SHORT HLIF
SR-82	1.001E-01	1.535E-01	1.600E-01	NOT IDENT.
RB-83	-1.451E-02	2.522E-02	2.606E-02	NOT IDENT.
KR-85	9.782E+00	2.059E+00	4.867E+00	NOT IDENT.
SR-85	6.525E-02	1.377E-02	3.248E-02	NOT IDENT.
RB-86	-2.684E-01	4.005E-01	4.183E-01	NOT IDENT.
Y-88	-1.377E-02	1.344E-02	1.480E-02	NOT IDENT.
Y-91	6.869E+00	6.732E+00	7.410E+00	NOT IDENT.
NB-94	3.823E-04	7.794E-03	7.796E-03	NOT IDENT.
NB-95	1.859E-02	1.294E-02	1.542E-02	NOT IDENT.
NB-95M	3.978E-02	4.166E-02	4.535E-02	NOT IDENT.
ZR-95	1.563E-02	2.109E-02	2.223E-02	NOT IDENT.
NB-97	1.000E+41	3.590E+41	0.000E+00	SHORT HLIF
ZR-97	1.964E+15	1.393E+15	1.651E+15	SHORT HLIF
MO-99	3.682E+02	7.449E+02	7.632E+02	SHORT HLIF
TC-99M	-1.000E+41	1.184E+41	0.000E+00	SHORT HLIF
RH-101	1.131E-02	1.503E-02	1.587E-02	FAIL ABUN
RH-102	2.235E-03	1.235E-02	1.239E-02	NOT IDENT.
RU-103	-4.771E-03	1.275E-02	1.293E-02	FAIL ABUN
RH-106	9.497E-04	7.417E-02	7.417E-02	NOT IDENT.
RU-106	9.497E-04	7.417E-02	7.417E-02	NOT IDENT.
AG-108M	-2.961E-03	7.106E-03	7.230E-03	NOT IDENT.
AG-110M	2.914E-03	1.164E-02	1.172E-02	NOT IDENT.
SN-113	7.391E-03	1.211E-02	1.256E-02	NOT IDENT.
CD-115	-1.017E+03	2.386E+03	2.429E+03	SHORT HLIF
SN-117M	-1.330E-02	5.188E-02	5.223E-02	NOT IDENT.
TE-123M	-2.225E-03	9.858E-03	9.909E-03	NOT IDENT.
SB-124	-4.156E-03	2.085E-02	2.094E-02	NOT IDENT.
SB-125	2.288E-02	2.163E-02	2.396E-02	FAIL ABUN
TE-125M	3.515E+00	4.613E+00	4.878E+00	NOT IDENT.
I-126	6.103E-02	1.594E-01	1.617E-01	NOT IDENT.
SB-126	-4.939E-02	1.286E-01	1.306E-01	NOT IDENT.
SB-127	6.678E+00	1.590E+01	1.619E+01	NOT IDENT.
I-131	-3.598E-02	2.732E-01	2.737E-01	NOT IDENT.
I-132	1.000E+41	3.213E+41	0.000E+00	SHORT HLIF
TE-132	2.974E+01	2.216E+01	2.590E+01	SHORT HLIF
BA-133	-1.949E-03	1.164E-02	1.168E-02	NOT IDENT.
I-133	-1.458E+10	6.213E+10	6.248E+10	SHORT HLIF
CS-134	2.705E-02	1.354E-02	1.822E-02	FAIL ABUN
CS-135	3.243E-02	4.480E-02	4.712E-02	NOT IDENT.
I-135	-4.740E+38	2.793E+39	0.000E+00	SHORT HLIF
CS-136	-3.749E-02	8.049E-02	8.225E-02	FAIL ABUN
BA-137M	-6.653E-04	7.779E-03	7.785E-03	NOT IDENT.
CS-137	-7.028E-04	8.218E-03	8.224E-03	NOT IDENT.
CE-139	5.084E-03	9.130E-03	9.413E-03	NOT IDENT.
BA-140	2.958E-01	2.039E-01	2.437E-01	FAIL ABUN
LA-140	7.422E-02	6.844E-02	7.618E-02	FAIL ABUN
CE-143	8.544E+06	2.714E+06	4.712E+06	SHORT HLIF
CE-144	-2.588E-02	5.787E-02	5.904E-02	NOT IDENT.
PM-144	6.449E-03	8.274E-03	8.770E-03	NOT IDENT.
PR-144	3.209E-01	6.327E-01	6.490E-01	NOT IDENT.
PM-146	-4.746E-04	9.800E-03	9.802E-03	NOT IDENT.
ND-147	-3.919E-01	4.889E-01	5.198E-01	FAIL ABUN
PM-147	-4.116E+01	1.791E+02	1.801E+02	NOT IDENT.
PM-149	1.084E+03	2.413E+04	2.414E+04	SHORT HLIF
EU-150	4.310E-03	8.191E-03	8.418E-03	FAIL ABUN
EU-152	-1.748E-02	2.472E-02	2.595E-02	FAIL ABUN
GD-153	1.996E-03	2.810E-02	2.812E-02	NOT IDENT.
EU-154	1.869E-02	2.494E-02	2.632E-02	NOT IDENT.
TB-160	-3.638E-03	4.238E-02	4.241E-02	FAIL ABUN
HO-166M	-1.534E-02	1.407E-02	1.567E-02	FAIL ABUN
TM-171	-2.057E+00	8.618E+00	8.668E+00	NOT IDENT.
HF-172	-4.132E-04	5.367E-02	5.367E-02	FAIL ABUN

LU-172	2.182E-03	1.447E-02	1.451E-02	FAIL	ABUN
LU-176	-1.952E-03	6.842E-03	6.899E-03	FAIL	ABUN
HF-181	9.519E-04	1.431E-02	1.431E-02	FAIL	ABUN
TA-182	-4.176E-03	4.533E-02	4.537E-02	FAIL	ABUN
RE-183	-1.820E-02	9.639E-02	9.674E-02	NOT	IDENT.
RE-184	-2.441E-02	4.709E-02	4.836E-02	NOT	IDENT.
W-188	-9.110E-01	2.547E+00	2.580E+00	NOT	IDENT.
IR-192	-8.132E-04	1.040E-02	1.041E-02	FAIL	ABUN
BI-207	9.547E-03	1.214E-02	1.288E-02	FAIL	ABUN
BI-211	1.224E+00	1.716E-01	5.778E-01	FAIL	ABUN
PB-211	9.841E-02	2.233E-01	2.276E-01	FAIL	ABUN
RN-219	-5.516E-02	1.142E-01	1.169E-01	FAIL	ABUN
RA-223	1.526E-01	1.814E-01	1.940E-01	FAIL	ABUN
AC-227	-3.893E-02	6.319E-02	6.558E-02	FAIL	ABUN
TH-227	-3.893E-02	6.319E-02	6.558E-02	FAIL	ABUN
TH-231	1.526E-01	1.814E-01	1.940E-01	FAIL	ABUN
PA-233	3.724E-04	1.596E-02	1.596E-02	FAIL	ABUN
PA-234	1.019E-02	6.544E-02	6.560E-02	FAIL	ABUN
PA-234M	2.776E-01	1.032E+00	1.040E+00	NOT	IDENT.
TH-234	-1.735E-01	5.546E-01	5.601E-01	FAIL	ABUN
NP-237	3.724E-04	1.596E-02	1.596E-02	FAIL	ABUN
NP-238	5.903E+03	7.195E+03	7.671E+03	SHORT	HLIF
U-238	-1.735E-01	5.546E-01	5.601E-01	FAIL	ABUN
NP-239	2.963E-02	7.015E-02	7.141E-02	FAIL	ABUN
PU-239	1.193E+02	1.572E+02	1.661E+02	FAIL	ABUN
AM-241	-8.030E-02	5.792E-02	6.830E-02	NOT	IDENT.
CM-243	-2.867E-02	2.901E-02	3.176E-02	FAIL	ABUN
BK-247	-6.874E-03	2.308E-02	2.329E-02	FAIL	ABUN
CM-247	-4.089E-03	1.042E-02	1.058E-02	FAIL	ABUN
CF-249	5.545E-03	9.706E-03	1.002E-02	NOT	IDENT.
CF-251	2.689E-02	3.234E-02	3.453E-02	NOT	IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	867.7586	87.09	1029.2037	136.47	938.4336
45.60	876.1326	87.57	1029.8335	140.51	0.0000
46.54	884.2815	88.03	1030.4321	143.76	980.8289
49.72	0.0000	88.34	1030.8386	144.24	940.5001
51.35	835.2873	88.47	1031.0083	145.44	917.9660
51.87	825.0322	89.96	1032.9381	152.43	911.7834
52.39	850.7179	1093.63	1033.8136	153.25	876.2589
52.97	852.6835	91.11	1034.4167	323.87	975.1272
53.44	879.0271	92.59	1036.3063	156.02	947.9702
54.07	896.7217	93.35	1037.2711	158.56	990.6324
57.36	0.0000	94.56	994.9759	159.00	979.6383
57.53	891.8022	94.65	995.0871	162.33	953.2130
57.98	912.6863	94.67	995.1085	162.66	947.4056
59.27	955.1408	94.87	995.3524	163.33	899.6426
59.32	955.2184	97.43	940.0166	165.86	850.8887
59.54	1000.6282	98.43	910.2367	176.31	866.2309
60.96	1096.6322	98.44	910.2484	176.60	849.1276
61.17	1046.1560	99.53	914.6893	177.52	859.3844
62.93	949.3481	100.11	920.5413	181.07	0.0000
63.29	996.3513	102.03	1002.3792	181.52	911.4103
63.58	1022.8796	103.18	980.7660	184.41	898.0371
64.28	1054.6307	103.37	980.9831	143.76	923.1897
66.73	1132.6134	105.21	889.2681	193.51	883.9915
67.24	1017.1653	105.31	889.3663	197.03	837.5156
125.81	987.2516	106.12	986.9330	198.01	845.9673
67.75	987.3528	106.47	994.5187	201.83	886.6610
69.67	1117.5255	109.28	895.1401	203.43	866.3998
70.83	1024.8297	111.00	940.2347	205.31	907.8453
72.81	1084.0702	111.76	0.0000	210.85	788.3250
72.87	1084.1661	114.06	886.7667	215.65	747.0797
74.66	1086.9048	116.30	0.0000	222.11	781.3766
74.82	1087.1447	116.74	868.9404	227.09	734.1589
74.97	1087.3749	119.76	929.0244	227.38	741.3037
77.11	1090.5980	121.12	924.8575	228.16	0.0000
78.74	1060.5703	121.22	924.9540	228.18	720.7195
79.69	1068.8975	121.78	894.4008	116.74	720.7195
80.12	1062.5482	122.06	901.0617	235.69	684.8501
80.19	1062.6460	122.92	909.3177	235.96	684.9749
80.57	1070.1575	123.07	926.2028	238.63	678.5612
81.00	994.0384	265.00	934.6395	238.98	0.0000
81.07	994.1341	125.81	982.9531	240.99	679.6307
81.75	1071.8392	127.23	988.7759	242.00	680.0884
83.79	1069.8192	127.91	948.2314	244.70	635.6218
84.00	1025.1163	129.30	977.5609	252.40	644.1143
85.43	1027.0149	131.20	982.3687	252.80	658.5057
86.55	1028.4934	133.02	987.0899	254.15	0.0000
86.79	1028.8062	133.52	992.0122	256.23	647.7426
86.94	1029.0071	136.00	957.3038	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	586.5047	355.39	0.0000	584.27	252.0994
264.80	620.9641	356.01	431.3110	595.83	295.1870
265.00	621.0381	364.49	431.0128	427.87	278.4677
268.22	620.6453	366.42	0.0000	602.52	0.0000
269.46	593.1910	372.51	390.3446	604.72	354.5894
270.03	579.4305	375.05	416.9660	607.14	292.5424
271.23	637.4356	377.52	374.9666	609.32	290.8460
273.65	663.0932	356.01	402.3765	610.33	290.9495
276.40	589.9536	388.16	376.9219	614.28	201.9302
277.37	575.8547	388.63	368.2383	618.01	265.7444
277.60	575.9313	391.69	356.7135	620.36	250.5420
278.00	576.0761	264.66	386.2388	621.93	246.8250
279.20	576.4933	401.81	404.0989	630.19	0.0000
279.54	576.6125	402.40	397.1503	631.29	231.1812
279.70	565.5024	404.85	374.6334	633.25	232.3008
280.46	598.8466	410.95	407.6042	634.78	240.1713
283.69	588.4108	413.71	404.5775	635.95	234.4552
284.31	615.1571	414.70	385.2386	636.99	228.7229
285.41	606.7947	423.72	383.2679	645.85	244.9679
285.90	0.0000	427.09	312.4408	657.76	209.8402
287.50	554.4520	427.87	300.2731	657.90	0.0000
290.67	567.5535	433.94	346.9904	661.66	231.6131
293.27	0.0000	439.40	348.9591	664.57	0.0000
351.93	504.8264	453.88	338.7634	666.33	226.0992
295.96	505.0406	463.37	303.8718	666.50	222.1951
879.38	505.8087	468.07	296.9070	667.71	0.0000
299.98	506.2222	473.00	306.9366	677.62	223.9922
300.09	506.2518	475.06	325.4357	685.70	211.7771
300.13	506.2665	476.78	323.8465	695.00	229.2076
301.36	522.5314	477.60	321.2215	696.49	235.2516
302.85	524.6570	482.18	303.5498	696.51	247.1130
256.23	511.7313	487.02	296.8326	697.00	232.3207
304.85	520.2188	492.35	0.0000	697.30	241.2419
306.78	524.3939	497.08	276.9038	697.49	241.2598
308.46	500.2736	505.52	298.4676	702.65	256.5086
311.90	497.0275	507.63	0.0000	706.68	234.0295
316.51	476.1458	511.00	305.2903	711.68	261.2214
319.41	497.0012	514.00	305.6528	720.70	250.4341
320.08	517.2867	514.00	305.6609	721.93	0.0000
321.04	520.7305	520.40	269.2908	722.78	245.8537
323.87	473.2033	520.69	0.0000	722.91	245.8597
325.23	493.9256	522.65	0.0000	723.31	220.9685
328.76	541.0067	527.90	0.0000	724.19	209.4001
333.37	426.2085	528.26	259.8800	727.33	215.5939
333.97	471.1155	529.59	246.0305	733.00	186.6393
334.37	477.6133	529.87	0.0000	735.93	230.1797
338.28	496.7729	531.02	264.8217	333.97	225.8364
338.32	496.7800	537.26	243.9611	739.50	0.0000
311.90	443.2340	546.56	0.0000	747.24	220.9346
340.48	443.2340	552.55	268.8931	748.06	200.8984
340.55	450.0921	563.25	275.6463	752.31	216.2440
344.28	472.7834	569.33	280.9971	753.82	186.1563
345.93	432.4913	946.00	276.2879	756.73	191.3545
351.06	425.9103	569.70	276.3022	756.80	191.3591
351.93	426.0976	583.19	252.0023	884.68	200.1830

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	173.3640	1274.44	185.9665	1620.50	47.7956
766.42	171.7141	1001.03	159.2807	1621.92	40.6868
766.84	175.1022	1002.74	136.7358	1678.03	0.0000
772.60	0.0000	1004.73	174.5060	1690.97	39.1025
776.52	173.9173	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	46.8604
778.90	239.5146	1028.54	0.0000	1063.66	55.3896
783.70	155.6730	1037.84	146.5884	1771.35	57.1875
785.37	184.5318	1038.76	0.0000	1791.20	0.0000
792.07	127.2186	631.29	151.2507	1808.65	41.9450
794.95	193.5347	1048.07	168.7214	1810.72	0.0000
795.86	171.5101	1049.04	157.8716	1836.06	74.0179
810.06	206.6604	1050.41	150.2974		
810.29	206.6752	1063.66	140.9363		
344.28	199.5227	1077.00	149.0488		
810.76	193.3997	1077.34	135.9035		
815.77	161.9114	1085.87	136.1760		
1048.07	176.3966	1093.63	130.7952		
832.01	173.2937	1099.45	146.8815		
834.85	200.9081	1112.07	143.6221		
835.71	195.8030	1112.84	139.9642		
836.80	0.0000	1115.54	148.4749		
846.75	0.0000	1120.29	137.4321		
846.77	198.4781	1120.55	137.4443		
856.80	176.2256	1221.41	137.4685		
860.56	157.7297	1129.67	152.5122		
871.09	168.2423	1131.51	0.0000		
873.19	189.1666	1147.95	0.0000		
875.33	0.0000	1173.23	153.0560		
879.38	168.6212	1177.95	161.6244		
880.51	186.0614	1189.05	147.9643		
883.24	137.2267	1204.77	138.5322		
884.68	157.7205	1221.41	154.6509		
889.28	176.7403	1231.02	154.2086		
894.76	160.2428	1235.36	119.1658		
898.04	186.5914	1238.28	153.8216		
900.72	158.3988	1260.41	0.0000		
903.28	197.1117	1271.87	110.5389		
911.20	158.8412	1274.44	99.1589		
912.08	147.3008	1274.54	104.8796		
923.98	0.0000	1291.59	92.8083		
926.50	165.4601	1298.22	0.0000		
929.11	153.2448	1312.11	110.3472		
937.49	132.3944	1332.49	91.6408		
944.13	143.9877	1362.66	0.0000		
946.00	143.2991	1365.19	81.5527		
949.00	150.8438	1368.63	0.0000		
667.71	0.0000	1384.29	88.5354		
962.31	158.1075	1408.01	90.6165		
964.08	175.9490	1457.56	0.0000		
966.17	156.8371	1460.82	73.1539		
911.20	156.9483	1489.16	42.9293		
968.97	156.9483	1505.03	77.0690		
983.53	144.6636	1584.12	53.7072		
984.45	0.0000	1596.21	43.4030		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 01:08:40.72

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656013.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;460
Background date  : 20-JUN-2016 14:02:57
Sample date     : 17-MAY-2016 11:35:00 Acquisition date : 23-JUN-2016 13:08:07
Sample ID      : G398656013 Sample quantity   : 1.58740E+02 GRAM
Detector name   : GAM05 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:10.01 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity      : 3.00000
Batch ID       : 1572234 Detector SN#     :
Matrix Spike ID: LCS ID       : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.36	4484	3911	1.01	66.22	62	10	1.04E-01	3.0	
2	0	36.97	1524	2970	0.89	75.44	71	9	3.53E-02	7.0	
3	0	46.82*	528	2913	0.83	95.14	91	9	1.22E-02	21.0	
4	0	63.54*	411	2904	0.91	128.60	125	7	9.52E-03	24.2	
5	2	75.11*	2165	2534	0.94	151.74	145	23	5.01E-02	4.5	2.77E+00
6	2	77.36*	3171	1986	0.87	156.24	145	23	7.34E-02	2.9	
7	2	81.41	110	1863	0.88	164.33	145	23	2.55E-03	60.7	
8	4	84.54	629	2866	1.35	170.59	167	26	1.46E-02	15.2	1.18E+00
9	4	87.47*	1093	2132	1.02	176.46	167	26	2.53E-02	7.8	
10	4	90.08	627	1760	0.83	181.67	167	26	1.45E-02	10.8	
11	4	93.06*	872	2785	1.35	187.64	167	26	2.02E-02	12.4	
12	0	105.52	173	2504	1.88	212.56	209	8	4.01E-03	50.6	
13	3	115.30	137	1520	0.87	232.13	230	8	3.18E-03	43.7	1.70E+00
14	3	116.42	116	2105	1.17	234.37	230	8	2.69E-03	67.0	
15	0	129.03	273	2655	1.06	259.58	256	8	6.33E-03	33.2	
16	0	143.98*	59	1829	0.98	289.50	287	6	1.37E-03	124.8	
17	0	186.13*	688	3780	1.23	373.79	369	11	1.59E-02	18.3	
18	0	201.97	194	1832	1.83	405.48	403	6	4.49E-03	35.6	
19	0	209.30	326	2527	0.95	420.15	417	8	7.55E-03	27.3	
20	0	224.92*	47	1642	1.34	451.37	449	6	1.09E-03	145.1	
21	4	236.33	149	1006	1.00	474.19	472	20	3.45E-03	30.8	5.08E+00
22	4	238.72*	4297	1449	1.05	478.98	472	20	9.95E-02	2.3	
23	4	241.46	982	2070	1.58	484.47	472	20	2.27E-02	9.8	
24	0	255.32	98	1133	0.59	512.17	511	5	2.27E-03	52.6	
25	0	270.31	270	1846	1.07	542.16	539	8	6.24E-03	28.3	
26	0	277.31	130	1315	0.92	556.16	553	6	3.01E-03	44.9	
27	0	295.26	1192	2176	1.07	592.07	587	10	2.76E-02	7.9	
28	0	300.20	284	1999	0.99	601.94	598	9	6.57E-03	29.0	
29	0	327.83	241	1610	1.18	657.21	654	8	5.57E-03	29.5	
30	0	338.37	880	1986	1.05	678.28	674	10	2.04E-02	10.1	
31	0	351.90*	2133	2276	1.21	705.36	700	12	4.94E-02	5.1	
32	0	368.93	10	1611	0.45	739.42	739	8	2.31E-04	697.2	
33	0	409.31	155	1604	1.35	820.18	817	8	3.60E-03	45.3	
34	0	463.37	239	2747	2.09	928.29	923	11	5.52E-03	43.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	499.57	109	1149	1.48	1000.70	997	9	2.53E-03	56.9	
36	0	510.57*	242	1908	1.65	1022.69	1015	15	5.60E-03	46.4	
37	0	534.79	45	679	0.59	1071.13	1070	8	1.05E-03	100.4	
38	0	582.99*	1137	862	1.28	1167.53	1162	12	2.63E-02	6.3	
39	0	609.02*	1265	721	1.38	1219.59	1213	12	2.93E-02	5.5	
40	0	641.07	49	322	1.34	1283.69	1281	8	1.14E-03	64.5	
41	0	661.27*	55878	700	1.45	1324.08	1317	15	1.29E+00	0.4	
42	0	670.45	19	214	2.87	1342.44	1339	8	4.45E-04	134.6	
43	0	726.85	231	294	1.36	1455.23	1450	11	5.34E-03	15.8	
44	0	767.83	99	234	1.43	1537.19	1533	9	2.30E-03	29.6	
45	0	771.81	60	159	1.79	1545.16	1542	8	1.40E-03	38.7	
46	0	794.27	121	209	1.43	1590.07	1586	9	2.80E-03	23.3	
47	0	834.70	38	315	4.80	1670.92	1662	15	8.80E-04	103.1	
48	0	860.21	198	195	1.33	1721.93	1717	13	4.58E-03	16.2	
49	0	875.91	69	196	4.09	1753.33	1746	14	1.60E-03	44.9	
50	0	897.07	29	185	1.47	1795.64	1788	12	6.65E-04	97.3	
51	0	910.58*	788	233	1.41	1822.65	1815	14	1.82E-02	6.1	
52	0	933.33	90	124	1.86	1868.15	1864	10	2.09E-03	25.6	
53	1	964.10	177	154	1.74	1929.68	1921	23	4.09E-03	15.2	1.13E+00
54	1	968.34	550	152	1.61	1938.17	1921	23	1.27E-02	6.0	
55	0	1028.27	24	164	0.87	2058.00	2050	12	5.52E-04	109.5	
56	0	1119.63	308	180	1.45	2240.68	2235	13	7.14E-03	10.7	
57	0	1237.24	117	202	2.19	2475.86	2470	13	2.70E-03	26.8	
58	0	1268.65	49	87	2.98	2538.66	2534	11	1.13E-03	39.5	
59	0	1281.06	15	109	1.98	2563.48	2556	9	3.48E-04	129.2	
60	0	1377.19	97	93	1.82	2755.69	2748	14	2.24E-03	23.6	
61	0	1406.37	101	86	3.52	2814.02	2805	20	2.34E-03	24.5	
62	0	1459.72*	1981	136	1.93	2920.70	2910	21	4.58E-02	2.8	
63	0	1508.00	43	66	1.41	3017.24	3013	10	9.88E-04	38.6	
64	0	1586.99	79	72	3.08	3175.16	3168	13	1.82E-03	24.9	
65	0	1591.49	36	48	1.99	3184.16	3180	9	8.29E-04	39.0	
66	0	1620.34	34	67	1.94	3241.82	3233	14	7.98E-04	53.0	
67	0	1632.11	108	52	9.25	3265.37	3254	26	2.50E-03	20.7	
68	0	1659.65	48	65	7.27	3320.42	3313	18	1.12E-03	41.1	
69	0	1720.32	18	34	2.01	3441.71	3433	12	4.07E-04	67.8	
70	0	1728.63	43	38	1.36	3458.34	3453	11	9.92E-04	32.6	
71	0	1748.03	15	36	0.58	3497.11	3488	13	3.52E-04	84.9	
72	0	1763.11	275	28	2.04	3527.27	3519	16	6.37E-03	7.4	
73	0	1787.53	14	57	6.22	3576.09	3563	18	3.25E-04	130.2	
74	0	1846.68	16	57	1.32	3694.34	3688	11	3.65E-04	94.9	
75	0	1903.11	39	21	5.08	3807.16	3800	16	9.08E-04	31.8	
76	0	1915.90	10	33	2.94	3832.73	3822	12	2.38E-04	115.8	
77	0	2000.83	29	26	6.71	4002.51	3993	17	6.60E-04	44.7	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656013.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:35:00 Acquisition date : 23-JUN-2016 13:08:07
Sample ID        : G398656013 Sample quantity  : 158.74 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA5 Detector geometry   : CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:10.01 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated : No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	TH-231	144.24
U-235	143.76	RA-223	144.24
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.289E+00	5.509E+00	5.509E+00	5.65	OK
MN-54	834.85	99.98*	2.096E+00	7.415E-03	8.056E-03	206.16	OK
NB-95M	235.69	24.80*	5.684E+00	4.960E-02	7.428E-02	61.51	OK
CD-109	88.03	3.70*	9.355E+00	1.063E+00	1.125E+00	25.26	OK
SN-126	64.28	9.60	9.502E+00	2.396E-01	2.396E-01	48.48	OK
	86.94	8.90	9.355E+00	4.421E-01	4.421E-01	25.26	OK
	87.57	37.00*	9.355E+00	1.063E-01	1.063E-01	25.26	OK
BA-137M	661.66	89.90*	2.543E+00	1.026E+01	1.029E+01	0.87	OK
CS-137	661.66	85.10*	2.543E+00	1.084E+01	1.087E+01	0.87	OK
EU-155	86.55	30.70	9.355E+00	1.282E-01	1.301E-01	25.26	OK
	105.31	21.10*	8.889E+00	4.682E-02	4.752E-02	101.20	OK
TL-208	277.37	6.60	5.062E+00	1.796E-01	1.796E-01	89.83	OK
	583.19	85.00*	2.821E+00	2.019E-01	2.019E-01	12.64	OK
	860.56	12.50	2.043E+00	3.158E-01	3.158E-01	32.37	OK
PB-210	46.54	4.25*	8.666E+00	7.828E-01	7.853E-01	42.01	OK
BI-211	72.87	1.23	9.556E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	4.224E+00	6.766E-02	6.766E-02	475.32	OK
BI-212	727.33	6.67*	2.352E+00	6.105E-01	6.105E-01	31.69	OK
	785.37	1.10	2.205E+00	----- Line	Not Found	-----	Absent
	1620.50	1.47	1.171E+00	7.560E-01	7.560E-01	105.95	OK
PB-212	74.82	10.28	9.543E+00	8.085E-01	8.085E-01	14.48	OK
	77.11	17.10	9.522E+00	1.016E+00	1.016E+00	5.87	OK
	238.63	43.60*	5.643E+00	8.179E-01	8.179E-01	4.63	OK
	300.09	3.30	4.771E+00	8.249E-01	8.249E-01	58.06	OK
BI-214	609.32	45.49*	2.721E+00	4.331E-01	4.332E-01	10.93	OK
	1120.29	14.92	1.632E+00	5.003E-01	5.003E-01	21.30	OK
	1764.49	15.30	1.081E+00	6.210E-01	6.210E-01	14.81	OK
PB-214	74.82	5.80	9.545E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	9.522E+00	1.791E+00	1.792E+00	5.87	OK
	87.09	3.41	9.363E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.589E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.831E+00	6.137E-01	6.138E-01	15.75	OK
	351.93	35.60*	4.224E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.721E+00	4.331E-01	4.332E-01	10.93	OK
	1120.29	14.92	1.632E+00	5.003E-01	5.003E-01	21.30	OK
	1764.49	15.30	1.081E+00	6.210E-01	6.210E-01	14.81	OK
RA-223	81.07	15.00	9.468E+00	4.030E-02	4.030E-02	121.42	OK
	83.79	24.70	9.414E+00	1.400E-01	1.400E-01	30.42	OK
	94.56	8.67	9.227E+00	5.596E-01	5.596E-01	24.84	OK
	144.24	3.27	7.746E+00	----- Line	Not Found	-----	<<INT Reject
	154.21	5.70	7.470E+00	----- Line	Not Found	-----	Absent
	269.46	13.90	5.159E+00	1.739E-01	1.739E-01	56.58	OK
	323.87	3.99*	4.503E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	4.354E+00	3.214E+00	3.214E+00	20.12	OK
RA-224	240.99	4.10*	5.598E+00	9.163E-01	9.163E-01	46.74	OK
RA-226	609.32	45.49*	2.721E+00	4.331E-01	4.332E-01	10.93	OK
	1120.29	14.92	1.632E+00	5.003E-01	5.003E-01	21.30	OK
	1764.49	15.30	1.081E+00	6.210E-01	6.210E-01	14.81	OK
AC-227	79.69	2.64	9.494E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-227	235.96	17.50	5.684E+00	7.029E-02	7.029E-02	61.51	OK
	256.23	9.50*	5.378E+00	8.913E-02	8.913E-02	105.18	OK
	299.98	3.00	4.771E+00	9.074E-01	9.074E-01	58.06	OK
	304.50	1.56	4.720E+00	-----	Line Not Found	-----	Absent
	334.37	1.54	4.394E+00	-----	Line Not Found	-----	Absent
	79.69	2.64	9.494E+00	-----	Line Not Found	-----	Absent
	235.96	17.50	5.684E+00	7.029E-02	7.029E-02	61.51	OK
	256.23	9.50*	5.378E+00	8.913E-02	8.913E-02	105.18	OK
	299.98	3.00	4.771E+00	9.074E-01	9.074E-01	58.06	OK
	304.50	1.56	4.720E+00	-----	Line Not Found	-----	Absent
AC-228	334.37	1.54	4.394E+00	-----	Line Not Found	-----	Absent
	105.21	1.10	8.889E+00	8.980E-01	8.980E-01	101.20	OK
	338.32	11.27	4.354E+00	8.100E-01	8.100E-01	20.12	OK
	794.95	4.25	2.185E+00	5.359E-01	5.359E-01	46.63	OK
	835.71	1.61	2.096E+00	4.605E-01	4.605E-01	206.16	OK
	911.20	25.80*	1.947E+00	6.346E-01	6.346E-01	12.23	OK
	968.97	15.80	1.848E+00	7.561E-01	7.561E-01	11.94	OK
	105.21	1.10	8.889E+00	8.980E-01	8.980E-01	101.20	OK
	338.32	11.27	4.354E+00	8.100E-01	8.100E-01	20.12	OK
	794.95	4.25	2.185E+00	5.359E-01	5.359E-01	46.63	OK
RA-228	835.71	1.61	2.096E+00	4.605E-01	4.605E-01	206.16	OK
	911.20	25.80*	1.947E+00	6.346E-01	6.346E-01	12.23	OK
	968.97	15.80	1.848E+00	7.561E-01	7.561E-01	11.94	OK
	105.21	1.10	8.889E+00	8.980E-01	8.980E-01	101.20	OK
	338.32	11.27	4.354E+00	8.100E-01	8.100E-01	20.12	OK
	794.95	4.25	2.185E+00	5.359E-01	5.359E-01	46.63	OK
	835.71	1.61	2.096E+00	4.605E-01	4.605E-01	206.16	OK
	911.20	25.80*	1.947E+00	6.346E-01	6.346E-01	12.23	OK
	968.97	15.80	1.848E+00	7.561E-01	7.561E-01	11.94	OK
	74.82	10.28	9.543E+00	8.085E-01	8.085E-01	14.48	OK
TH-228	77.11	17.10	9.522E+00	1.016E+00	1.016E+00	5.87	OK
	238.63	43.60*	5.643E+00	8.179E-01	8.179E-01	4.63	OK
	300.09	3.30	4.771E+00	8.249E-01	8.249E-01	58.06	OK
	85.43	14.70	9.414E+00	2.353E-01	2.353E-01	30.42	OK
	88.47	24.00	9.355E+00	1.639E-01	1.639E-01	25.26	OK
	193.51	4.41*	6.509E+00	-----	Line Not Found	-----	Absent
	210.85	2.80	6.150E+00	-----	Line Not Found	-----	Absent
	609.32	45.49*	2.721E+00	4.331E-01	4.331E-01	10.93	OK
	1120.29	14.92	1.632E+00	5.003E-01	5.003E-01	21.30	OK
	1764.49	15.30	1.081E+00	6.210E-01	6.210E-01	14.81	OK
PA-231	283.69	1.70	4.978E+00	-----	Line Not Found	-----	Absent
	301.36	5.35*	4.771E+00	5.088E-01	5.088E-01	58.06	OK
	81.07	15.00	9.468E+00	4.030E-02	4.030E-02	121.42	OK
	83.79	24.70	9.414E+00	1.400E-01	1.400E-01	30.42	OK
	94.87	5.69	9.181E+00	-----	Line Not Found	-----	Absent
	144.24	3.27	7.746E+00	-----	Line Not Found	-----	<<INT Reject
	154.21	5.70	7.470E+00	-----	Line Not Found	-----	Absent
	269.46	13.90	5.159E+00	1.739E-01	1.739E-01	56.58	OK
	323.87	3.99*	4.503E+00	-----	Line Not Found	-----	Absent
	338.28	2.84	4.354E+00	3.214E+00	3.214E+00	20.12	OK
TH-232	105.21	1.10	8.889E+00	8.980E-01	8.980E-01	101.20	OK
	338.32	11.27	4.354E+00	8.100E-01	8.100E-01	20.12	OK
	835.71	1.61	2.096E+00	4.605E-01	4.605E-01	206.16	OK
	911.20	25.80*	1.947E+00	6.346E-01	6.346E-01	12.23	OK
	968.97	15.80	1.848E+00	7.561E-01	7.561E-01	11.94	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-234	63.29	3.70*	9.502E+00	6.216E-01	6.216E-01	48.48	OK
	92.59	4.23	9.227E+00	1.147E+00	1.147E+00	24.84	OK
U-234	609.32	45.49*	2.721E+00	4.331E-01	4.331E-01	10.93	OK
	1120.29	14.92	1.632E+00	5.003E-01	5.003E-01	21.30	OK
	1764.49	15.30	1.081E+00	6.210E-01	6.210E-01	14.81	OK
U-235	89.96	3.47	9.298E+00	9.997E-01	9.997E-01	21.63	OK
	93.35	5.60	9.227E+00	8.664E-01	8.664E-01	24.84	OK
	143.76	10.96*	7.753E+00	3.437E-02	3.437E-02	249.65	OK
	163.33	5.08	7.228E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.674E+00	8.656E-02	8.656E-02	36.59	OK
	205.31	5.01	6.261E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	9.502E+00	6.216E-01	6.216E-01	48.48	OK
	92.59	4.23	9.227E+00	1.147E+00	1.147E+00	24.84	OK
AM-243	43.53	5.90	8.322E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	9.543E+00	1.237E-01	1.237E-01	14.48	OK
ANH-511	511.00	100.00*	3.142E+00	3.329E-02	3.329E-02	92.88	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656013.CNF;1
Acquisition date : 23-JUN-2016 13:08:07 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.01 Half life ratio : *****
Sample date : 17-MAY-2016 11:35:00 Analyst initials: MXR1
Sample ID : G398656013 Sample Quantity : 1.5874E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.509E+00	3.052E-01	1.383E-01
MN-54	8.056E-03	1.627E-02	1.536E-02
NB-95M	7.428E-02	4.478E-02	8.982E-02
CD-109	1.125E+00	2.784E-01	2.705E-01
SN-126	1.063E-01	2.632E-02	2.554E-02
BA-137M	1.029E+01	8.809E-02	1.742E-02
CS-137	1.087E+01	9.306E-02	1.841E-02
EU-155	4.752E-02	4.713E-02	4.728E-02
TL-208	2.019E-01	2.502E-02	1.966E-02
PB-210	7.853E-01	3.233E-01	2.262E-01
BI-211	6.766E-02	3.152E-01	1.396E-01
BI-212	6.105E-01	1.896E-01	2.064E-01
PB-212	8.179E-01	3.712E-02	3.391E-02
BI-214	4.332E-01	4.641E-02	3.646E-02
PB-214	6.383E-01	6.413E-02	7.791E-02
RN-222	4.332E-01	4.641E-02	3.646E-02
RA-223	-1.773E-04	2.741E-01	4.375E-01
RA-224	9.163E-01	4.197E-01	3.635E-01
RA-226	4.332E-01	4.641E-02	3.646E-02
AC-227	8.913E-02	9.187E-02	1.643E-01
TH-227	8.913E-02	9.187E-02	1.643E-01
AC-228	6.346E-01	7.605E-02	4.954E-02
RA-228	6.346E-01	7.605E-02	4.954E-02
TH-228	8.179E-01	3.712E-02	3.391E-02
TH-229	1.045E-01	1.897E-01	3.378E-01
TH-230	4.331E-01	4.641E-02	3.646E-02
PA-231	5.088E-01	2.895E-01	3.094E-01
TH-231	-1.773E-04	2.741E-01	4.375E-01
TH-232	6.346E-01	7.605E-02	4.954E-02
TH-234	6.216E-01	2.953E-01	2.706E-01
U-234	4.331E-01	4.641E-02	3.646E-02
U-235	3.437E-02	8.408E-02	1.046E-01
U-238	6.216E-01	2.953E-01	2.706E-01
AM-243	1.237E-01	1.755E-02	1.519E-02
ANH-511	3.329E-02	3.030E-02	2.052E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.645E-01	2.187E-01	3.767E-01	NOT IDENT.
NA-22	4.203E-03	1.606E-02	1.622E-02	NOT IDENT.
NA-24	0.000E+00	8.749E+15	0.000E+00	SHORT HLIF
AL-26	5.686E-03	8.406E-03	1.609E-02	NOT IDENT.
SC-46	-2.925E-03	1.110E-02	1.755E-02	FAIL ABUN
V-48	-2.956E-03	4.117E-02	7.199E-02	NOT IDENT.
CR-51	2.290E-02	2.439E-01	4.438E-01	NOT IDENT.
CO-56	3.808E-03	1.067E-02	1.931E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.955E-03	7.347E-03	1.346E-02	NOT IDENT.
CO-58	5.214E-04	1.038E-02	1.863E-02	NOT IDENT.
FE-59	-2.051E-02	2.502E-02	4.360E-02	NOT IDENT.
CO-60	8.881E-03	8.671E-03	1.644E-02	NOT IDENT.
ZN-65	6.389E-03	2.233E-02	3.555E-02	NOT IDENT.
GE-68	2.312E-02	2.814E-01	5.142E-01	NOT IDENT.
AS-73	-7.095E-03	7.665E-02	1.297E-01	NOT IDENT.
AS-74	3.357E-02	6.705E-02	1.237E-01	NOT IDENT.
SE-75	-2.445E-03	1.761E-02	3.248E-02	NOT IDENT.
BR-77	0.000E+00	3.727E+03	0.000E+00	SHORT HLIF
SR-82	-9.338E-02	1.530E-01	2.284E-01	NOT IDENT.
RB-83	2.564E-02	3.368E-02	5.954E-02	NOT IDENT.
KR-85	4.618E+00	3.161E+00	5.001E+00	NOT IDENT.
SR-85	3.077E-02	2.115E-02	3.346E-02	NOT IDENT.
RB-86	2.667E-02	3.835E-01	7.003E-01	NOT IDENT.
Y-88	-4.875E-03	9.606E-03	1.685E-02	FAIL ABUN
Y-91	-2.829E-01	5.569E+00	9.975E+00	NOT IDENT.
NB-94	-3.897E-03	7.953E-03	1.409E-02	NOT IDENT.
NB-95	1.924E-02	1.442E-02	2.397E-02	NOT IDENT.
ZR-95	-9.764E-04	2.006E-02	3.601E-02	NOT IDENT.
NB-97	0.000E+00	4.143E+39	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.362E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.076E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.080E+41	0.000E+00	SHORT HLIF
RH-101	6.909E-03	1.003E-02	1.666E-02	NOT IDENT.
RH-102	7.749E-03	1.559E-02	2.873E-02	FAIL ABUN
RU-103	-1.295E-02	2.959E-02	4.444E-02	FAIL ABUN
RH-106	-3.726E-02	9.551E-02	1.715E-01	NOT IDENT.
RU-106	-3.726E-02	9.551E-02	1.715E-01	NOT IDENT.
AG-108M	-2.609E-04	1.480E-02	2.605E-02	NOT IDENT.
AG-110M	-1.511E-03	1.099E-02	1.940E-02	NOT IDENT.
SN-113	-3.762E-03	2.241E-02	3.980E-02	NOT IDENT.
CD-115	0.000E+00	4.450E+03	0.000E+00	SHORT HLIF
SN-117M	1.040E-02	5.108E-02	9.224E-02	NOT IDENT.
TE-123M	5.765E-04	9.730E-03	1.753E-02	NOT IDENT.
SB-124	-7.617E-03	2.496E-02	4.483E-02	NOT IDENT.
SB-125	-2.804E-02	4.457E-02	7.783E-02	FAIL ABUN
TE-125M	5.515E-01	3.514E+00	5.858E+00	NOT IDENT.
I-126	-4.452E-02	2.980E-01	3.100E-01	NOT IDENT.
SB-126	-5.874E-03	1.270E-01	1.985E-01	NOT IDENT.
SB-127	-6.015E+00	1.552E+01	2.773E+01	NOT IDENT.
I-131	4.823E-02	3.285E-01	5.909E-01	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.574E+01	0.000E+00	SHORT HLIF
BA-133	9.390E-03	1.818E-02	2.911E-02	FAIL ABUN
I-133	0.000E+00	1.158E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.125E-02	2.073E-02	NOT IDENT.
CS-135	2.063E-02	6.028E-02	9.890E-02	NOT IDENT.
I-135	0.000E+00	2.786E+39	0.000E+00	SHORT HLIF
CS-136	-6.106E-02	7.451E-02	1.240E-01	NOT IDENT.
CE-139	3.868E-03	1.029E-02	1.855E-02	NOT IDENT.
BA-140	-5.873E-02	3.802E-01	5.717E-01	NOT IDENT.
LA-140	9.067E-03	6.305E-02	9.869E-02	FAIL ABUN
CE-141	1.728E-02	4.228E-02	5.327E-02	FAIL ABUN
CE-143	0.000E+00	3.568E+06	0.000E+00	SHORT HLIF
CE-144	3.615E-02	6.216E-02	1.093E-01	FAIL ABUN
PM-144	1.357E-03	8.766E-03	1.590E-02	NOT IDENT.
PR-144	1.075E-01	6.639E-01	1.205E+00	NOT IDENT.
PM-146	-1.810E-02	2.303E-02	3.985E-02	NOT IDENT.
ND-147	6.449E-01	9.776E-01	1.514E+00	FAIL ABUN
PM-147	8.079E+01	2.040E+02	3.778E+02	NOT IDENT.
PM-149	0.000E+00	3.378E+04	0.000E+00	SHORT HLIF
EU-150	-6.456E-03	1.168E-02	1.834E-02	FAIL ABUN
EU-152	5.428E-03	4.014E-02	6.736E-02	FAIL ABUN

GD-153	-2.125E-02	2.235E-02	3.677E-02	NOT IDENT.
EU-154	-2.622E-02	5.166E-02	4.517E-02	NOT IDENT.
TB-160	1.116E-02	3.881E-02	6.102E-02	FAIL ABUN
HO-166M	3.311E-03	1.385E-02	2.524E-02	FAIL ABUN
TM-171	1.582E-01	1.261E+00	2.138E+00	NOT IDENT.
HF-172	4.696E-02	5.976E-02	9.964E-02	FAIL ABUN
LU-172	1.200E-02	1.309E-02	2.492E-02	FAIL ABUN
LU-176	4.555E-03	9.751E-03	1.793E-02	FAIL ABUN
HF-181	-7.181E-03	2.932E-02	5.095E-02	NOT IDENT.
TA-182	-2.726E-02	4.558E-02	7.923E-02	NOT IDENT.
RE-183	3.988E-03	2.138E-02	4.159E-02	NOT IDENT.
RE-184	6.453E-02	5.410E-02	8.010E-02	NOT IDENT.
W-188	-2.274E+00	3.631E+00	5.782E+00	FAIL ABUN
IR-192	-1.424E-03	1.605E-02	2.916E-02	FAIL ABUN
HG-203	1.752E-02	2.108E-02	3.481E-02	NOT IDENT.
BI-207	-3.558E-03	1.400E-02	2.140E-02	FAIL ABUN
PB-211	2.663E-02	3.644E-01	5.678E-01	NOT IDENT.
RN-219	-7.547E-02	1.827E-01	3.224E-01	FAIL ABUN
PA-233	-2.837E-03	2.563E-02	4.342E-02	FAIL ABUN
PA-234	-8.733E-02	1.114E-01	1.170E-01	NOT IDENT.
PA-234M	-2.519E-01	1.562E+00	1.869E+00	FAIL ABUN
NP-237	-2.837E-03	2.563E-02	4.342E-02	FAIL ABUN
NP-238	0.000E+00	6.524E+03	0.000E+00	SHORT HLIF
NP-239	8.578E-02	1.126E-01	1.306E-01	FAIL ABUN
PU-239	0.000E+00	1.711E+02	1.854E+02	FAIL ABUN
AM-241	2.490E-02	1.574E-02	2.825E-02	NOT IDENT.
CM-243	-2.196E-02	3.037E-02	4.627E-02	FAIL ABUN
BK-247	-1.035E-02	2.889E-02	5.136E-02	FAIL ABUN
CM-247	8.594E-03	1.662E-02	2.977E-02	FAIL ABUN
CF-249	1.089E-02	1.728E-02	3.114E-02	NOT IDENT.
CF-251	-4.841E-02	4.133E-02	7.221E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1921	10.66*	1.289E+00	5.509E+00	5.509E+00	5.65
MN-54	834.85	39	99.98*	2.096E+00	7.415E-03	8.056E-03	206.16
NB-95M	235.69	177	24.80*	5.684E+00	4.960E-02	7.428E-02	61.51
CD-109	88.03	1431	3.70*	9.355E+00	1.629E+00	1.723E+00	15.55
SN-126	64.28	554	9.60	9.502E+00	2.396E-01	2.396E-01	48.48
	86.94	1431	8.90	9.355E+00	6.772E-01	6.772E-01	15.55
	87.57	1431	37.00*	9.355E+00	1.629E-01	1.629E-01	15.55
BA-137M	661.66	59532	89.90*	2.543E+00	1.026E+01	1.029E+01	0.87
CS-137	661.66	59532	85.10*	2.543E+00	1.084E+01	1.087E+01	0.87
CE-141	145.44	74	48.29*	7.753E+00	7.800E-03	1.728E-02	249.65
EU-155	86.55	1431	30.70	9.355E+00	1.963E-01	1.993E-01	15.55
	105.31	223	21.10*	8.889E+00	4.682E-02	4.752E-02	101.20
TL-208	277.37	152	6.60	5.062E+00	1.796E-01	1.796E-01	89.83
	583.19	1228	85.00*	2.821E+00	2.019E-01	2.019E-01	12.64
	860.56	205	12.50	2.043E+00	3.158E-01	3.158E-01	32.37
PB-210	46.54	731	4.25*	8.666E+00	7.828E-01	7.853E-01	42.01
BI-211	72.87	-----	1.23	9.556E+00	-----	Line Not Found	-----
	351.06	2435	12.92*	4.224E+00	1.759E+00	1.759E+00	10.25
BI-212	727.33	243	6.67*	2.352E+00	6.105E-01	6.105E-01	31.69
	785.37	-----	1.10	2.205E+00	-----	Line Not Found	-----
	1620.50	33	1.47	1.171E+00	7.560E-01	7.560E-01	105.95
PB-212	74.82	2875	10.28	9.543E+00	1.155E+00	1.155E+00	8.97
	77.11	4199	17.10	9.522E+00	1.016E+00	1.016E+00	5.87
	238.63	5106	43.60*	5.643E+00	8.179E-01	8.179E-01	4.63
	300.09	330	3.30	4.771E+00	8.249E-01	8.249E-01	58.06
BI-214	609.32	1361	45.49*	2.721E+00	4.331E-01	4.332E-01	10.93
	1120.29	309	14.92	1.632E+00	5.003E-01	5.003E-01	21.30
	1764.49	261	15.30	1.081E+00	6.210E-01	6.210E-01	14.81
PB-214	74.82	2875	5.80	9.543E+00	2.047E+00	2.047E+00	8.97
	77.11	4199	9.70	9.522E+00	1.791E+00	1.792E+00	5.87
	87.09	1431	3.41	9.355E+00	1.767E+00	1.768E+00	15.55
	242.00	1166	7.25	5.598E+00	1.132E+00	1.132E+00	19.62
	295.22	1386	18.42	4.831E+00	6.137E-01	6.138E-01	15.75
	351.93	2435	35.60*	4.224E+00	6.383E-01	6.383E-01	10.25
RN-222	609.32	1361	45.49*	2.721E+00	4.331E-01	4.332E-01	10.93
	1120.29	309	14.92	1.632E+00	5.003E-01	5.003E-01	21.30
	1764.49	261	15.30	1.081E+00	6.210E-01	6.210E-01	14.81
RA-223	81.07	145	15.00	9.468E+00	4.030E-02	4.030E-02	121.42
	83.79	826	24.70	9.414E+00	1.400E-01	1.400E-01	30.42
	94.56	1136	8.67	9.227E+00	5.596E-01	5.596E-01	24.84
	144.24	74	3.27	7.753E+00	1.152E-01	1.152E-01	249.65
	154.21	-----	5.70	7.470E+00	-----	Line Not Found	-----
	269.46	316	13.90	5.159E+00	1.739E-01	1.739E-01	56.58
	323.87	-----	3.99*	4.503E+00	-----	Line Not Found	-----
	338.28	1009	2.84	4.354E+00	3.214E+00	3.214E+00	20.12
RA-224	240.99	1166	4.10*	5.598E+00	2.002E+00	2.002E+00	19.62
RA-226	609.32	1361	45.49*	2.721E+00	4.331E-01	4.332E-01	10.93

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AC-227	1120.29	309	14.92	1.632E+00	5.003E-01	5.003E-01	21.30
	1764.49	261	15.30	1.081E+00	6.210E-01	6.210E-01	14.81
	79.69	-----	2.64	9.494E+00	-----	Line Not Found	-----
	235.96	177	17.50	5.684E+00	7.029E-02	7.029E-02	61.51
	256.23	116	9.50*	5.378E+00	8.913E-02	8.913E-02	105.18
TH-227	299.98	330	3.00	4.771E+00	9.074E-01	9.074E-01	58.06
	304.50	-----	1.56	4.720E+00	-----	Line Not Found	-----
	334.37	-----	1.54	4.394E+00	-----	Line Not Found	-----
	79.69	-----	2.64	9.494E+00	-----	Line Not Found	-----
	235.96	177	17.50	5.684E+00	7.029E-02	7.029E-02	61.51
AC-228	256.23	116	9.50*	5.378E+00	8.913E-02	8.913E-02	105.18
	299.98	330	3.00	4.771E+00	9.074E-01	9.074E-01	58.06
	304.50	-----	1.56	4.720E+00	-----	Line Not Found	-----
	334.37	-----	1.54	4.394E+00	-----	Line Not Found	-----
	105.21	223	1.10	8.889E+00	8.980E-01	8.980E-01	101.20
RA-228	338.32	1009	11.27	4.354E+00	8.100E-01	8.100E-01	20.12
	794.95	126	4.25	2.185E+00	5.359E-01	5.359E-01	46.63
	835.71	39	1.61	2.096E+00	4.605E-01	4.605E-01	206.16
	911.20	809	25.80*	1.947E+00	6.346E-01	6.346E-01	12.23
	968.97	560	15.80	1.848E+00	7.561E-01	7.561E-01	11.94
TH-228	105.21	223	1.10	8.889E+00	8.980E-01	8.980E-01	101.20
	338.32	1009	11.27	4.354E+00	8.100E-01	8.100E-01	20.12
	794.95	126	4.25	2.185E+00	5.359E-01	5.359E-01	46.63
	835.71	39	1.61	2.096E+00	4.605E-01	4.605E-01	206.16
	911.20	809	25.80*	1.947E+00	6.346E-01	6.346E-01	12.23
TH-229	968.97	560	15.80	1.848E+00	7.561E-01	7.561E-01	11.94
	74.82	2875	10.28	9.543E+00	1.155E+00	1.155E+00	8.97
	77.11	4199	17.10	9.522E+00	1.016E+00	1.016E+00	5.87
	238.63	5106	43.60*	5.643E+00	8.179E-01	8.179E-01	4.63
	300.09	330	3.30	4.771E+00	8.249E-01	8.249E-01	58.06
TH-230	85.43	826	14.70	9.414E+00	2.353E-01	2.353E-01	30.42
	88.47	1431	24.00	9.355E+00	2.511E-01	2.511E-01	15.55
	193.51	-----	4.41*	6.509E+00	-----	Line Not Found	-----
	210.85	-----	2.80	6.150E+00	-----	Line Not Found	-----
	609.32	1361	45.49*	2.721E+00	4.331E-01	4.331E-01	10.93
PA-231	1120.29	309	14.92	1.632E+00	5.003E-01	5.003E-01	21.30
	1764.49	261	15.30	1.081E+00	6.210E-01	6.210E-01	14.81
	283.69	-----	1.70	4.978E+00	-----	Line Not Found	-----
	301.36	330	5.35*	4.771E+00	5.088E-01	5.088E-01	58.06
	81.07	145	15.00	9.468E+00	4.030E-02	4.030E-02	121.42
TH-231	83.79	826	24.70	9.414E+00	1.400E-01	1.400E-01	30.42
	94.87	-----	5.69	9.181E+00	-----	Line Not Found	-----
	144.24	74	3.27	7.753E+00	1.152E-01	1.152E-01	249.65
	154.21	-----	5.70	7.470E+00	-----	Line Not Found	-----
	269.46	316	13.90	5.159E+00	1.739E-01	1.739E-01	56.58
TH-232	323.87	-----	3.99*	4.503E+00	-----	Line Not Found	-----
	338.28	1009	2.84	4.354E+00	3.214E+00	3.214E+00	20.12
	105.21	223	1.10	8.889E+00	8.980E-01	8.980E-01	101.20
	338.32	1009	11.27	4.354E+00	8.100E-01	8.100E-01	20.12

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	835.71	39	1.61	2.096E+00	4.605E-01	4.605E-01	206.16
	911.20	809	25.80*	1.947E+00	6.346E-01	6.346E-01	12.23
TH-234	968.97	560	15.80	1.848E+00	7.561E-01	7.561E-01	11.94
	63.29	554	3.70*	9.502E+00	6.216E-01	6.216E-01	48.48
	92.59	1136	4.23	9.227E+00	1.147E+00	1.147E+00	24.84
U-234	609.32	1361	45.49*	2.721E+00	4.331E-01	4.331E-01	10.93
	1120.29	309	14.92	1.632E+00	5.003E-01	5.003E-01	21.30
	1764.49	261	15.30	1.081E+00	6.210E-01	6.210E-01	14.81
U-235	89.96	818	3.47	9.298E+00	9.997E-01	9.997E-01	21.63
	93.35	1136	5.60	9.227E+00	8.664E-01	8.664E-01	24.84
	143.76	74	10.96*	7.753E+00	3.437E-02	3.437E-02	249.65
	163.33	-----	5.08	7.228E+00	-----	Line Not Found	-----
	185.72	838	57.20	6.674E+00	8.656E-02	8.656E-02	36.59
	205.31	-----	5.01	6.261E+00	-----	Line Not Found	-----
U-238	63.29	554	3.70*	9.502E+00	6.216E-01	6.216E-01	48.48
	92.59	1136	4.23	9.227E+00	1.147E+00	1.147E+00	24.84
AM-243	43.53	-----	5.90	8.322E+00	-----	Line Not Found	-----
	74.66	2875	67.20*	9.543E+00	1.767E-01	1.767E-01	8.97
ANH-511	511.00	265	100.00*	3.142E+00	3.329E-02	3.329E-02	92.88

Flag: "*" = Keyline

Total number of lines in spectrum 77
Number of unidentified lines 28
Number of lines tentatively identified by NID 49 63.64%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.509E+00	5.509E+00	0.311E+00	5.65	
MN-54	312.05D	1.09	7.415E-03	8.056E-03	16.61E-03	206.16	
NB-95M	64.03D	1.50	4.960E-02	7.428E-02	4.569E-02	61.51	
CD-109	461.40D	1.06	1.629E+00	1.723E+00	0.268E+00	15.55	
SN-126	2.30E+05Y	1.00	1.629E-01	1.629E-01	0.253E-01	15.55	
BA-137M	30.08Y	1.00	1.026E+01	1.029E+01	0.009E+01	0.87	
CS-137	30.08Y	1.00	1.084E+01	1.087E+01	0.009E+01	0.87	
CE-141	32.51D	2.22	7.800E-03	1.728E-02	4.315E-02	249.65	
EU-155	4.75Y	1.02	4.682E-02	4.752E-02	4.809E-02	101.20	
TL-208	1.41E+10Y	1.00	2.019E-01	2.019E-01	0.255E-01	12.64	
PB-210	22.20Y	1.00	7.828E-01	7.853E-01	3.299E-01	42.01	
BI-211	7.04E+08Y	1.00	1.759E+00	1.759E+00	0.180E+00	10.25	
BI-212	1.41E+10Y	1.00	6.105E-01	6.105E-01	1.934E-01	31.69	
PB-212	1.41E+10Y	1.00	8.179E-01	8.179E-01	0.379E-01	4.63	
BI-214	1600.00Y	1.00	4.331E-01	4.332E-01	0.474E-01	10.93	
PB-214	1600.00Y	1.00	6.383E-01	6.383E-01	0.654E-01	10.25	
RN-222	1600.00Y	1.00	4.331E-01	4.332E-01	0.474E-01	10.93	
RA-223	7.04E+08Y	1.00	1.400E-01	1.400E-01	0.426E-01	30.42	K
RA-224	1.41E+10Y	1.00	2.002E+00	2.002E+00	0.393E+00	19.62	
RA-226	1600.00Y	1.00	4.331E-01	4.332E-01	0.474E-01	10.93	
AC-227	7.04E+08Y	1.00	8.913E-02	8.913E-02	9.375E-02	105.18	
TH-227	7.04E+08Y	1.00	8.913E-02	8.913E-02	9.375E-02	105.18	
AC-228	1.41E+10Y	1.00	6.346E-01	6.346E-01	0.776E-01	12.23	
RA-228	1.41E+10Y	1.00	6.346E-01	6.346E-01	0.776E-01	12.23	
TH-228	1.41E+10Y	1.00	8.179E-01	8.179E-01	0.379E-01	4.63	
TH-229	7340.00Y	1.00	2.511E-01	2.511E-01	0.391E-01	15.55	K
TH-230	7.54E+04Y	1.00	4.331E-01	4.331E-01	0.474E-01	10.93	
PA-231	7.04E+08Y	1.00	5.088E-01	5.088E-01	2.954E-01	58.06	
TH-231	7.04E+08Y	1.00	1.400E-01	1.400E-01	0.426E-01	30.42	K
TH-232	1.41E+10Y	1.00	6.346E-01	6.346E-01	0.776E-01	12.23	
TH-234	4.47E+09Y	1.00	6.216E-01	6.216E-01	3.014E-01	48.48	
U-234	2.45E+05Y	1.00	4.331E-01	4.331E-01	0.474E-01	10.93	
U-235	7.04E+08Y	1.00	3.437E-02	3.437E-02	8.580E-02	249.65	
U-238	4.47E+09Y	1.00	6.216E-01	6.216E-01	3.014E-01	48.48	
AM-243	7370.00Y	1.00	1.767E-01	1.767E-01	0.158E-01	8.97	
ANH-511	1.00E+09Y	1.00	3.329E-02	3.329E-02	3.092E-02	92.88	
Total Activity :			4.292E+01	4.310E+01			

Grand Total Activity : 4.292E+01 4.310E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	32.36	6409	5589	1.01	66.22	62	10	1.04E-01	6.0	6.47E+00	
0	36.97	2154	4197	0.89	75.44	71	9	3.53E-02	13.9	7.38E+00	
3	115.30	175	1940	0.87	232.13	230	8	3.18E-03	87.4	8.60E+00	T
3	116.42	148	2684	1.17	234.37	230	8	2.69E-03	****	8.57E+00	T
0	129.03	345	3351	1.06	259.58	256	8	6.33E-03	66.3	8.19E+00	T
0	201.97	234	2214	1.83	405.48	403	6	4.49E-03	71.2	6.33E+00	T
0	209.30	393	3043	0.95	420.15	417	8	7.55E-03	54.6	6.18E+00	
0	224.92	56	1962	1.34	451.37	449	6	1.09E-03	****	5.88E+00	
0	327.83	277	1852	1.18	657.21	654	8	5.57E-03	59.1	4.46E+00	T
0	368.93	11	1830	0.45	739.42	739	8	2.31E-04	****	4.07E+00	
0	409.31	175	1801	1.35	820.18	817	8	3.60E-03	90.6	3.75E+00	
0	463.37	264	3045	2.09	928.29	923	11	5.52E-03	86.1	3.40E+00	T
0	499.57	120	1263	1.48	1000.70	997	9	2.53E-03	****	3.20E+00	
0	534.79	49	740	0.59	1071.13	1070	8	1.05E-03	****	3.03E+00	
0	641.07	53	344	1.34	1283.69	1281	8	1.14E-03	****	2.61E+00	
0	670.45	20	227	2.87	1342.44	1339	8	4.45E-04	****	2.51E+00	
0	767.83	104	245	1.43	1537.19	1533	9	2.30E-03	59.3	2.25E+00	T
0	771.81	63	166	1.79	1545.16	1542	8	1.40E-03	77.4	2.24E+00	T
0	875.91	71	202	4.09	1753.33	1746	14	1.60E-03	89.9	2.01E+00	T
0	897.07	30	191	1.47	1795.64	1788	12	6.65E-04	****	1.97E+00	T
0	933.33	92	127	1.86	1868.15	1864	10	2.09E-03	51.1	1.91E+00	
1	964.10	180	157	1.74	1929.68	1921	23	4.09E-03	30.4	1.86E+00	T
0	1028.27	24	166	0.87	2058.00	2050	12	5.52E-04	****	1.76E+00	T
0	1237.24	115	200	2.19	2475.86	2470	13	2.70E-03	53.5	1.50E+00	T
0	1268.65	48	86	2.98	2538.66	2534	11	1.13E-03	79.0	1.46E+00	
0	1281.06	15	107	1.98	2563.48	2556	9	3.48E-04	****	1.45E+00	
0	1377.19	94	91	1.82	2755.69	2748	14	2.24E-03	47.2	1.36E+00	
0	1406.37	98	84	3.52	2814.02	2805	20	2.34E-03	49.0	1.33E+00	
0	1508.00	41	64	1.41	3017.24	3013	10	9.88E-04	77.2	1.25E+00	
0	1586.99	75	69	3.08	3175.16	3168	13	1.82E-03	49.8	1.19E+00	
0	1591.49	34	46	1.99	3184.16	3180	9	8.29E-04	78.0	1.19E+00	
0	1632.11	103	50	9.25	3265.37	3254	26	2.50E-03	41.3	1.16E+00	
0	1659.65	46	62	7.27	3320.42	3313	18	1.12E-03	82.2	1.14E+00	
0	1720.32	17	33	2.01	3441.71	3433	12	4.07E-04	****	1.11E+00	
0	1728.63	41	36	1.36	3458.34	3453	11	9.92E-04	65.1	1.10E+00	
0	1748.03	14	34	0.58	3497.11	3488	13	3.52E-04	****	1.09E+00	
0	1787.53	13	54	6.22	3576.09	3563	18	3.25E-04	****	1.07E+00	
0	1846.68	15	54	1.32	3694.34	3688	11	3.65E-04	****	1.03E+00	
0	1903.11	37	19	5.08	3807.16	3800	16	9.08E-04	63.7	1.00E+00	
0	1915.90	10	31	2.94	3832.73	3822	12	2.38E-04	****	9.97E-01	
0	2000.83	27	24	6.71	4002.51	3993	17	6.60E-04	89.4	9.55E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656013.CNF;1
Acquisition date : 23-JUN-2016 13:08:07 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.01 Half life ratio : *****
Sample date : 17-MAY-2016 11:35:00 Nuclide Library : SOLID
Sample ID : G398656013 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5874E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.528E-02
MN-54	7.402E-03
NB-95M	4.433E-02
CD-109	1.335E-01
SN-126	1.261E-02
BA-137M	8.475E-03
CS-137	8.953E-03
EU-155	2.334E-02
TL-208	9.606E-03
PB-210	1.115E-01
BI-211	6.880E-02
BI-212	9.973E-02
PB-212	1.674E-02
BI-214	1.779E-02
PB-214	3.861E-02
RN-222	1.779E-02
RA-223	2.158E-01
RA-224	1.794E-01
RA-226	1.779E-02
AC-227	8.107E-02
TH-227	8.107E-02
AC-228	2.370E-02
RA-228	2.370E-02
TH-228	1.674E-02
TH-229	1.670E-01
TH-230	1.779E-02
PA-231	1.526E-01
TH-231	2.158E-01
TH-232	2.370E-02
TH-234	1.337E-01
U-234	1.779E-02
U-235	5.163E-02
U-238	1.337E-01
AM-243	7.510E-03
ANH-511	1.009E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.859E-01	NOT IDENT.
NA-22	7.730E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	7.542E-03	NOT IDENT.
SC-46	8.404E-03	FAIL ABUN
V-48	3.450E-02	NOT IDENT.
CR-51	2.189E-01	NOT IDENT.
CO-56	9.289E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	6.644E-03	NOT IDENT.
CO-58	8.951E-03	NOT IDENT.
FE-59	2.077E-02	NOT IDENT.
CO-60	7.834E-03	NOT IDENT.
ZN-65	1.706E-02	NOT IDENT.
GE-68	2.463E-01	NOT IDENT.
AS-73	6.403E-02	NOT IDENT.
AS-74	6.043E-02	NOT IDENT.
SE-75	1.602E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.097E-01	NOT IDENT.
RB-83	2.925E-02	NOT IDENT.
KR-85	2.461E+00	NOT IDENT.
SR-85	1.646E-02	NOT IDENT.
RB-86	3.354E-01	NOT IDENT.
Y-88	7.765E-03	FAIL ABUN
Y-91	4.778E+00	NOT IDENT.
NB-94	6.820E-03	NOT IDENT.
NB-95	1.162E-02	NOT IDENT.
ZR-95	1.735E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	8.230E-03	NOT IDENT.
RH-102	1.399E-02	FAIL ABUN
RU-103	2.186E-02	FAIL ABUN
RH-106	8.357E-02	NOT IDENT.
RU-106	8.357E-02	NOT IDENT.
AG-108M	1.286E-02	NOT IDENT.
AG-110M	9.289E-03	NOT IDENT.
SN-113	1.963E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.554E-02	NOT IDENT.
TE-123M	8.652E-03	NOT IDENT.
SB-124	2.089E-02	NOT IDENT.
SB-125	3.841E-02	FAIL ABUN
TE-125M	2.892E+00	NOT IDENT.
I-126	1.502E-01	NOT IDENT.
SB-126	9.578E-02	NOT IDENT.
SB-127	1.337E+01	NOT IDENT.
I-131	2.914E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.435E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.006E-02	NOT IDENT.
CS-135	4.880E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.920E-02	NOT IDENT.
CE-139	9.161E-03	NOT IDENT.
BA-140	2.803E-01	NOT IDENT.
LA-140	4.576E-02	FAIL ABUN
CE-141	2.631E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	5.397E-02	FAIL ABUN
PM-144	7.711E-03	NOT IDENT.
PR-144	5.841E-01	NOT IDENT.
PM-146	1.968E-02	NOT IDENT.
ND-147	7.429E-01	FAIL ABUN
PM-147	1.865E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	9.041E-03	FAIL ABUN
EU-152	3.321E-02	FAIL ABUN
GD-153	1.815E-02	NOT IDENT.

EU-154	2.153E-02	NOT IDENT.
TB-160	2.923E-02	FAIL ABUN
HO-166M	1.220E-02	FAIL ABUN
TM-171	1.055E+00	NOT IDENT.
HF-172	4.921E-02	FAIL ABUN
LU-172	1.193E-02	FAIL ABUN
LU-176	8.841E-03	FAIL ABUN
HF-181	2.510E-02	NOT IDENT.
TA-182	3.798E-02	NOT IDENT.
RE-183	2.054E-02	NOT IDENT.
RE-184	3.855E-02	NOT IDENT.
W-188	2.851E+00	FAIL ABUN
IR-192	1.438E-02	FAIL ABUN
HG-203	1.718E-02	NOT IDENT.
BI-207	1.028E-02	FAIL ABUN
PB-211	2.802E-01	NOT IDENT.
RN-219	1.591E-01	FAIL ABUN
PA-233	2.141E-02	FAIL ABUN
PA-234	5.614E-02	NOT IDENT.
PA-234M	8.988E-01	FAIL ABUN
NP-237	2.141E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	6.450E-02	FAIL ABUN
PU-239	9.161E+01	FAIL ABUN
AM-241	1.396E-02	NOT IDENT.
CM-243	2.284E-02	FAIL ABUN
BK-247	2.534E-02	FAIL ABUN
CM-247	1.469E-02	FAIL ABUN
CF-249	1.536E-02	NOT IDENT.
CF-251	3.565E-02	NOT IDENT.

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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656013.CNF;1
Acquisition date : 23-JUN-2016 13:08:07 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.01 Half life ratio : *****
Sample date : 17-MAY-2016 11:35:00 Nuclide Library : SOLID
Sample ID : G398656013 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5874E+02 GRAM
Quantity Err(%) : 1.2599E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.509E+00	5.768E-01	5.768E-01
MN-54	8.056E-03	1.631E-02	1.631E-02
NB-95M	7.428E-02	4.612E-02	4.612E-02
CD-109	1.125E+00	3.161E-01	3.161E-01
SN-126	1.063E-01	2.935E-02	2.935E-02
BA-137M	1.029E+01	8.233E-01	8.233E-01
CS-137	1.087E+01	8.691E-01	8.691E-01
EU-155	4.752E-02	4.740E-02	4.740E-02
TL-208	2.019E-01	3.034E-02	3.034E-02
PB-210	7.853E-01	3.300E-01	3.300E-01
BI-211	6.766E-02	3.988E-01	3.988E-01
BI-212	6.105E-01	1.992E-01	1.992E-01
PB-212	8.179E-01	1.168E-01	1.168E-01
BI-214	4.332E-01	5.887E-02	5.887E-02
PB-214	6.383E-01	8.891E-02	8.891E-02
RN-222	4.332E-01	5.887E-02	5.887E-02
RA-223	-1.773E-04	2.741E-01	2.741E-01
RA-224	9.163E-01	4.749E-01	4.749E-01
RA-226	4.332E-01	5.887E-02	5.887E-02
AC-227	8.913E-02	9.320E-02	9.320E-02
TH-227	8.913E-02	9.320E-02	9.320E-02
AC-228	6.346E-01	1.243E-01	1.243E-01
RA-228	6.346E-01	1.243E-01	1.243E-01
TH-228	8.179E-01	1.168E-01	1.168E-01
TH-229	1.045E-01	1.904E-01	1.904E-01
TH-230	4.331E-01	5.887E-02	5.887E-02
PA-231	5.088E-01	3.131E-01	3.131E-01
TH-231	-1.773E-04	2.741E-01	2.741E-01
TH-232	6.346E-01	1.243E-01	1.243E-01
TH-234	6.216E-01	3.265E-01	3.265E-01
U-234	4.331E-01	5.887E-02	5.887E-02
U-235	3.437E-02	8.421E-02	8.421E-02
U-238	6.216E-01	3.265E-01	3.265E-01
AM-243	1.237E-01	2.184E-02	2.184E-02
ANH-511	3.329E-02	3.044E-02	3.044E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.645E-01	2.192E-01	2.314E-01	NOT IDENT.
NA-22	4.203E-03	1.607E-02	1.618E-02	NOT IDENT.
NA-24	-7.552E+15	8.781E+15	9.418E+15	SHORT HLIF
AL-26	5.686E-03	8.417E-03	8.798E-03	NOT IDENT.
SC-46	-2.925E-03	1.111E-02	1.119E-02	FAIL ABUN
V-48	-2.956E-03	4.118E-02	4.120E-02	NOT IDENT.
CR-51	2.290E-02	2.439E-01	2.441E-01	NOT IDENT.
CO-56	3.808E-03	1.068E-02	1.082E-02	FAIL ABUN
MN-56	1.000E+41	2.766E+41	0.000E+00	SHORT HLIF
CO-57	-1.955E-03	7.351E-03	7.403E-03	NOT IDENT.
CO-58	5.214E-04	1.038E-02	1.038E-02	NOT IDENT.
FE-59	-2.051E-02	2.537E-02	2.700E-02	NOT IDENT.
CO-60	8.881E-03	8.703E-03	9.579E-03	NOT IDENT.
ZN-65	6.389E-03	2.237E-02	2.255E-02	NOT IDENT.
GE-68	2.312E-02	2.815E-01	2.817E-01	NOT IDENT.
AS-73	-7.095E-03	7.666E-02	7.673E-02	NOT IDENT.
AS-74	3.357E-02	6.715E-02	6.884E-02	NOT IDENT.
SE-75	-2.445E-03	1.761E-02	1.764E-02	NOT IDENT.
BR-77	8.213E+04	8.919E+04	9.657E+04	SHORT HLIF
SR-82	-9.338E-02	1.533E-01	1.590E-01	NOT IDENT.
RB-83	2.564E-02	3.392E-02	3.583E-02	NOT IDENT.
KR-85	4.618E+00	3.186E+00	3.806E+00	NOT IDENT.
SR-85	3.077E-02	2.132E-02	2.543E-02	NOT IDENT.
RB-86	2.667E-02	3.836E-01	3.838E-01	NOT IDENT.
Y-88	-4.875E-03	9.613E-03	9.861E-03	FAIL ABUN
Y-91	-2.829E-01	5.569E+00	5.570E+00	NOT IDENT.
NB-94	-3.897E-03	7.961E-03	8.153E-03	NOT IDENT.
NB-95	1.924E-02	1.457E-02	1.696E-02	NOT IDENT.
ZR-95	-9.764E-04	2.006E-02	2.006E-02	NOT IDENT.
NB-97	1.000E+41	8.992E+39	0.000E+00	SHORT HLIF
ZR-97	5.286E+15	2.406E+15	3.386E+15	SHORT HLIF
MO-99	3.842E+02	7.087E+02	7.296E+02	SHORT HLIF
TC-99M	1.000E+41	1.091E+41	0.000E+00	SHORT HLIF
RH-101	6.909E-03	1.013E-02	1.060E-02	NOT IDENT.
RH-102	7.749E-03	1.562E-02	1.600E-02	FAIL ABUN
RU-103	-1.295E-02	2.961E-02	3.018E-02	FAIL ABUN
RH-106	-3.726E-02	9.557E-02	9.704E-02	NOT IDENT.
RU-106	-3.726E-02	9.557E-02	9.704E-02	NOT IDENT.
AG-108M	-2.609E-04	1.480E-02	1.480E-02	NOT IDENT.
AG-110M	-1.511E-03	1.099E-02	1.101E-02	NOT IDENT.
SN-113	-3.762E-03	2.241E-02	2.247E-02	NOT IDENT.
CD-115	1.229E+03	4.451E+03	4.486E+03	SHORT HLIF
SN-117M	1.040E-02	5.110E-02	5.132E-02	NOT IDENT.
TE-123M	5.765E-04	9.730E-03	9.734E-03	NOT IDENT.
SB-124	-7.617E-03	2.497E-02	2.520E-02	NOT IDENT.
SB-125	-2.804E-02	4.464E-02	4.639E-02	FAIL ABUN
TE-125M	5.515E-01	3.515E+00	3.523E+00	NOT IDENT.
I-126	-4.452E-02	2.980E-01	2.987E-01	NOT IDENT.
SB-126	-5.874E-03	1.270E-01	1.271E-01	NOT IDENT.
SB-127	-6.015E+00	1.556E+01	1.580E+01	NOT IDENT.
I-131	4.823E-02	3.285E-01	3.292E-01	FAIL ABUN
I-132	-1.000E+41	3.930E+41	0.000E+00	SHORT HLIF
TE-132	2.765E+01	3.602E+01	3.812E+01	SHORT HLIF
BA-133	9.390E-03	1.820E-02	1.869E-02	FAIL ABUN
I-133	5.614E+10	1.166E+11	1.193E+11	SHORT HLIF
CS-134	3.932E-02	1.215E-02	2.149E-02	NOT IDENT.
CS-135	2.063E-02	6.034E-02	6.105E-02	NOT IDENT.
I-135	3.858E+38	2.805E+39	0.000E+00	SHORT HLIF
CS-136	-6.106E-02	7.547E-02	8.033E-02	NOT IDENT.
CE-139	3.868E-03	1.033E-02	1.048E-02	NOT IDENT.
BA-140	-5.873E-02	3.802E-01	3.812E-01	NOT IDENT.
LA-140	9.067E-03	6.305E-02	6.318E-02	FAIL ABUN
CE-141	1.728E-02	4.235E-02	4.306E-02	FAIL ABUN
CE-143	1.177E+07	3.795E+06	6.525E+06	SHORT HLIF
CE-144	3.615E-02	6.233E-02	6.442E-02	FAIL ABUN
PM-144	1.357E-03	8.767E-03	8.788E-03	NOT IDENT.
PR-144	1.075E-01	6.639E-01	6.657E-01	NOT IDENT.
PM-146	-1.810E-02	2.310E-02	2.450E-02	NOT IDENT.
ND-147	6.449E-01	9.792E-01	1.021E+00	FAIL ABUN
PM-147	8.079E+01	2.042E+02	2.074E+02	NOT IDENT.
PM-149	-1.449E+04	3.386E+04	3.449E+04	SHORT HLIF
EU-150	-6.456E-03	1.170E-02	1.205E-02	FAIL ABUN
EU-152	5.428E-03	4.015E-02	4.022E-02	FAIL ABUN

GD-153	-2.125E-02	2.243E-02	2.439E-02	NOT IDENT.
EU-154	-2.622E-02	5.171E-02	5.305E-02	NOT IDENT.
TB-160	1.116E-02	3.884E-02	3.917E-02	FAIL ABUN
HO-166M	3.311E-03	1.385E-02	1.393E-02	FAIL ABUN
TM-171	1.582E-01	1.261E+00	1.263E+00	NOT IDENT.
HF-172	4.696E-02	6.044E-02	6.404E-02	FAIL ABUN
LU-172	1.200E-02	1.334E-02	1.439E-02	FAIL ABUN
LU-176	4.555E-03	9.763E-03	9.977E-03	FAIL ABUN
HF-181	-7.181E-03	2.933E-02	2.951E-02	NOT IDENT.
TA-182	-2.726E-02	4.565E-02	4.727E-02	NOT IDENT.
RE-183	3.988E-03	2.138E-02	2.146E-02	NOT IDENT.
RE-184	6.453E-02	5.514E-02	6.234E-02	NOT IDENT.
W-188	-2.274E+00	3.647E+00	3.788E+00	FAIL ABUN
IR-192	-1.424E-03	1.605E-02	1.607E-02	FAIL ABUN
HG-203	1.752E-02	2.117E-02	2.259E-02	NOT IDENT.
BI-207	-3.558E-03	1.401E-02	1.411E-02	FAIL ABUN
PB-211	2.663E-02	3.644E-01	3.646E-01	NOT IDENT.
RN-219	-7.547E-02	1.831E-01	1.862E-01	FAIL ABUN
PA-233	-2.837E-03	2.564E-02	2.567E-02	FAIL ABUN
PA-234	-8.733E-02	1.502E-01	1.553E-01	NOT IDENT.
PA-234M	-2.519E-01	1.563E+00	1.567E+00	FAIL ABUN
NP-237	-2.837E-03	2.564E-02	2.567E-02	FAIL ABUN
NP-238	5.701E+02	6.525E+03	6.530E+03	SHORT HLIF
NP-239	8.578E-02	1.132E-01	1.196E-01	FAIL ABUN
PU-239	2.633E+02	1.739E+02	2.105E+02	FAIL ABUN
AM-241	2.490E-02	1.585E-02	1.942E-02	NOT IDENT.
CM-243	-2.196E-02	3.048E-02	3.205E-02	FAIL ABUN
BK-247	-1.035E-02	2.899E-02	2.936E-02	FAIL ABUN
CM-247	8.594E-03	1.669E-02	1.714E-02	FAIL ABUN
CF-249	1.089E-02	1.733E-02	1.801E-02	NOT IDENT.
CF-251	-4.841E-02	4.229E-02	4.759E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1655.1282	87.09	1901.2175	136.47	1984.0902
45.60	1552.7263	87.57	1903.2734	140.51	0.0000
46.54	1614.4431	88.03	1905.2360	143.76	1977.4205
49.72	0.0000	88.34	1906.5547	144.24	1939.5454
51.35	1844.6965	88.47	1907.1050	145.44	1935.4164
51.87	1773.8448	89.96	1913.4078	152.43	1975.7288
52.39	1723.2898	1093.63	1916.2633	153.25	1914.0970
52.97	1734.9670	91.11	1918.2362	323.87	1915.7882
53.44	1776.7380	92.59	1924.4041	156.02	2001.1473
54.07	1794.7581	93.35	1927.5503	158.56	1898.5511
57.36	0.0000	94.56	1858.6978	159.00	1894.4753
57.53	1999.3505	94.65	1809.3499	162.33	1885.5608
57.98	2009.7993	94.67	1809.4276	162.66	1892.8528
59.27	1913.8196	94.87	1810.1954	163.33	1896.8110
59.32	1963.5466	97.43	1994.2355	165.86	1909.0201
59.54	1964.8102	98.43	1885.7671	176.31	1908.6847
60.96	2137.6484	98.44	1885.8073	176.60	1914.8666
61.17	2138.9395	99.53	1824.0499	177.52	2009.6887
62.93	2168.5093	100.11	1831.9587	181.07	0.0000
63.29	2170.7019	102.03	1948.2263	181.52	1987.6978
63.58	2172.4636	103.18	1897.7955	184.41	2102.3071
64.28	2218.4963	103.37	1898.5167	143.76	2195.5137
66.73	2241.4092	105.21	1879.8304	193.51	2318.6689
67.24	2273.7554	105.31	1880.1960	197.03	2270.9692
125.81	2297.4875	106.12	1927.7745	198.01	2249.7341
67.75	2297.9219	106.47	1929.0997	201.83	2236.2659
69.67	2324.6575	109.28	1908.9130	203.43	2082.6868
70.83	2366.6255	111.00	1966.5507	205.31	2187.1792
72.81	2385.4607	111.76	0.0000	210.85	2135.4111
72.87	2291.3098	114.06	1932.1412	215.65	2089.9045
74.66	2301.6936	116.30	0.0000	222.11	2032.5769
74.82	2302.6128	116.74	1837.8928	227.09	1978.1907
74.97	2303.4673	119.76	1821.1412	227.38	1912.9315
77.11	2315.7021	121.12	1882.8990	228.16	0.0000
78.74	2324.8948	121.22	1883.2352	228.18	1923.3275
79.69	2330.2158	121.78	1919.0486	116.74	1923.3275
80.12	2332.6111	122.06	1949.9504	235.69	1839.9528
80.19	2332.9995	122.92	1957.9204	235.96	1853.1045
80.57	2335.1099	123.07	2035.4553	238.63	1787.5425
81.00	2337.4922	265.00	1996.5863	238.98	0.0000
81.07	2337.8806	125.81	1896.4922	240.99	1792.0939
81.75	1920.7756	127.23	1981.2382	242.00	1794.0355
83.79	1929.9408	127.91	1994.1548	244.70	1708.0106
84.00	1904.5200	129.30	2033.2571	252.40	1693.3641
85.43	1894.0736	131.20	1979.4711	252.80	1731.1356
86.55	1898.9020	133.02	1918.3750	254.15	0.0000
86.79	1899.9247	133.52	1906.2202	256.23	1804.8870
86.94	1900.5737	136.00	1917.1143	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	1696.7633	355.39	0.0000	584.27	547.3600
264.80	1717.7720	356.01	1413.5610	595.83	555.9058
265.00	1718.0916	364.49	1620.2006	427.87	625.0217
268.22	1696.0917	366.42	0.0000	602.52	0.0000
269.46	1595.2148	372.51	1655.4639	604.72	594.5800
270.03	1649.7881	375.05	1680.9441	607.14	607.5670
271.23	1673.5219	377.52	1632.5616	609.32	537.7687
273.65	1660.0137	356.01	1638.3748	610.33	530.3898
276.40	1704.6184	388.16	1629.6119	614.28	529.9377
277.37	1669.6790	388.63	1665.2939	618.01	515.2509
277.60	1670.0416	391.69	1712.3029	620.36	497.3873
278.00	1661.1781	264.66	1756.9530	621.93	499.6318
279.20	1638.2040	401.81	1778.6949	630.19	0.0000
279.54	1638.7504	402.40	1693.3103	631.29	430.4227
279.70	1658.0372	404.85	1731.4171	633.25	454.1045
280.46	1569.8412	410.95	1779.7737	634.78	437.6875
283.69	1680.7230	413.71	1814.3188	635.95	464.5746
284.31	1666.0690	414.70	1788.3047	636.99	464.5961
285.41	1670.5721	423.72	1787.9633	645.85	468.2007
285.90	0.0000	427.09	1841.6217	657.76	505.4703
287.50	1567.8101	427.87	1849.8247	657.90	0.0000
290.67	1670.8704	433.94	1892.7638	661.66	416.1507
293.27	0.0000	439.40	1962.1506	664.57	0.0000
351.93	1588.7543	453.88	2179.5530	666.33	331.0217
295.96	1695.4160	463.37	2057.8306	666.50	331.0474
879.38	1632.3948	468.07	2132.7339	667.71	0.0000
299.98	1588.2070	473.00	2049.2944	677.62	235.8240
300.09	1588.3629	475.06	1866.7832	685.70	257.7261
300.13	1588.4149	476.78	1817.6752	695.00	326.9138
301.36	1608.1418	477.60	1802.6221	696.49	330.9760
302.85	1632.7444	482.18	1455.0132	696.51	330.9760
256.23	1615.6841	487.02	1335.0277	697.00	334.8900
304.85	1563.7361	492.35	0.0000	697.30	324.3843
306.78	1560.0524	497.08	1248.1459	697.49	315.7709
308.46	1588.7073	505.52	1153.9114	702.65	327.1089
311.90	1525.6642	507.63	0.0000	706.68	284.3408
316.51	1586.7477	511.00	1102.2109	711.68	268.5659
319.41	1618.2618	514.00	1049.8845	720.70	255.4385
320.08	1596.4063	514.00	1049.8845	721.93	0.0000
321.04	1625.3037	520.40	933.3072	722.78	254.0645
323.87	1609.8070	520.69	0.0000	722.91	249.2223
325.23	1546.0616	522.65	0.0000	723.31	249.2662
328.76	1625.7207	527.90	0.0000	724.19	241.2701
333.37	1713.4686	528.26	829.8825	727.33	274.0405
333.97	1626.7009	529.59	831.6277	733.00	222.9464
334.37	1697.9930	529.87	0.0000	735.93	246.1184
338.28	1540.1488	531.02	806.7777	333.97	233.5793
338.32	1540.1975	537.26	823.8052	739.50	0.0000
311.90	1518.0243	546.56	0.0000	747.24	227.7123
340.48	1518.0243	552.55	664.2432	748.06	233.6886
340.55	1477.9255	563.25	613.2717	752.31	226.2546
344.28	1515.7932	569.33	575.9531	753.82	227.3850
345.93	1574.7562	946.00	593.1161	756.73	232.6006
351.06	1522.1730	569.70	593.1805	756.80	232.6064
351.93	1523.2456	583.19	586.6439	884.68	199.3822

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	268.8014	1274.44	203.1924	1620.50	61.6758
766.42	282.0707	1001.03	176.4626	1621.92	55.6975
766.84	282.1194	1002.74	176.5661	1678.03	0.0000
772.60	0.0000	1004.73	205.9524	1690.97	68.9904
776.52	226.9620	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	67.9588
778.90	229.9544	1028.54	0.0000	1063.66	31.5314
783.70	213.3574	1037.84	157.8445	1771.35	45.7398
785.37	226.4791	1038.76	0.0000	1791.20	0.0000
792.07	205.1051	631.29	158.3016	1808.65	59.2667
794.95	192.3281	1048.07	180.3760	1810.72	0.0000
795.86	190.3943	1049.04	175.1144	1836.06	56.7159
810.06	190.5042	1050.41	151.3440		
810.29	190.5227	1063.66	181.4811		
344.28	190.5365	1077.00	168.3885		
810.76	196.6091	1077.34	166.5601		
815.77	187.9209	1085.87	162.3749		
1048.07	175.9923	1093.63	135.7997		
832.01	196.6138	1099.45	163.0798		
834.85	230.0940	1112.07	158.4262		
835.71	283.4706	1112.84	166.8454		
836.80	0.0000	1115.54	173.4057		
846.75	0.0000	1120.29	172.0538		
846.77	199.4751	1120.55	172.0688		
856.80	183.1443	1221.41	181.7569		
860.56	183.0714	1129.67	162.7436		
871.09	199.6535	1131.51	0.0000		
873.19	172.2534	1147.95	0.0000		
875.33	0.0000	1173.23	173.4984		
879.38	160.5779	1177.95	170.8789		
880.51	164.1007	1189.05	174.3204		
883.24	173.7813	1204.77	174.1654		
884.68	172.3182	1221.41	199.1853		
889.28	181.2384	1231.02	184.5019		
894.76	164.9898	1235.36	199.7126		
898.04	208.6670	1238.28	188.2204		
900.72	203.6550	1260.41	0.0000		
903.28	159.4213	1271.87	145.9603		
911.20	160.7642	1274.44	170.7998		
912.08	153.8246	1274.54	123.6877		
923.98	0.0000	1291.59	100.6013		
926.50	164.7491	1298.22	0.0000		
929.11	153.0323	1312.11	125.9665		
937.49	174.6720	1332.49	104.7223		
944.13	181.4579	1362.66	0.0000		
946.00	193.2595	1365.19	93.5638		
949.00	159.4519	1368.63	0.0000		
667.71	0.0000	1384.29	95.5497		
962.31	185.8436	1408.01	90.5391		
964.08	185.9625	1457.56	0.0000		
966.17	186.0984	1460.82	93.8141		
911.20	180.2145	1489.16	94.4732		
968.97	180.2145	1505.03	100.0508		
983.53	179.7003	1584.12	80.0938		
984.45	0.0000	1596.21	51.1113		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 03:01:47.00

```
*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656014.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM12.CNF;448
Background date    : 20-JUN-2016 14:03:19
Sample date       : 17-MAY-2016 11:40:00 Acquisition date : 23-JUN-2016 14:59:59
Sample ID        : G398656014 Sample quantity : 1.56460E+02 GRAM
Detector name    : GAM12 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:30.95 0.1%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572234 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	29.25	17	7	1.56	58.41	55	7	3.94E-04	35.4	
2	3	36.48*	3325	1221	1.78	72.89	68	31	7.70E-02	4.4	1.40E+02
3	3	39.41*	1903	2321	1.48	78.73	68	31	4.41E-02	7.0	
4	3	46.41*	426	5992	1.49	92.73	68	31	9.86E-03	30.5	
5	0	49.94	71	4128	1.00	99.79	98	5	1.64E-03	136.2	
6	0	63.22*	187	6625	1.82	126.35	123	8	4.34E-03	79.1	
7	2	74.61	1026	8498	1.65	149.13	142	17	2.37E-02	17.1	3.60E+00
8	2	77.28	1202	6769	1.27	154.47	142	17	2.78E-02	12.2	
9	2	84.32*	155	5071	1.25	168.53	166	12	3.59E-03	75.9	8.47E-01
10	2	87.34	481	5072	1.32	174.57	166	12	1.11E-02	23.8	
11	0	93.00*	338	7593	1.69	185.90	182	9	7.83E-03	49.2	
12	0	128.80	297	5908	0.77	257.49	255	7	6.88E-03	43.3	
13	10	186.07*	2051	17250	3.08	372.03	363	41	4.75E-02	15.9	2.48E+00
14	10	190.95	1503	21533	3.91	381.78	363	41	3.48E-02	25.7	
15	0	209.11	365	7426	1.40	418.10	415	8	8.46E-03	41.2	
16	0	238.60*	2525	9021	1.29	477.08	473	10	5.85E-02	7.4	
17	0	242.26	305	5806	0.91	484.41	482	7	7.05E-03	42.1	
18	0	277.78	202	5652	1.25	555.45	552	8	4.68E-03	64.8	
19	0	295.15	1376	7242	1.58	590.19	585	11	3.19E-02	12.3	
20	0	299.50	263	5976	2.01	598.89	596	9	6.09E-03	53.3	
21	0	305.79	398	5106	2.59	611.46	608	8	9.21E-03	31.5	
22	0	338.37	888	7001	1.60	676.64	672	11	2.06E-02	18.6	
23	0	351.69	1537	6874	1.47	703.28	699	10	3.56E-02	10.4	
24	0	433.02	381	6677	3.32	865.95	862	9	8.81E-03	39.1	
25	0	503.66	93	3333	0.57	1007.27	1006	8	2.14E-03	108.5	
26	0	510.74*	2	4861	2.34	1021.44	1016	12	3.87E-05	*****	
27	0	569.31*	308	2230	1.92	1138.60	1133	11	7.12E-03	31.2	
28	0	583.15*	832	1992	1.67	1166.29	1162	10	1.92E-02	11.1	
29	0	609.34*	1130	2070	1.50	1218.69	1213	12	2.62E-02	8.8	
30	0	646.82	112	888	1.67	1293.67	1291	6	2.58E-03	43.2	
31	0	661.69	214609	2431	1.58	1323.42	1314	18	4.97E+00	0.2	
32	3	693.11	55	272	2.14	1386.29	1380	16	1.28E-03	63.9	1.78E+00
33	3	696.27	35	167	1.42	1392.60	1380	16	8.13E-04	61.6	
34	0	727.43	254	309	1.77	1454.95	1449	13	5.89E-03	15.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	768.26	148	220	1.99	1536.65	1521	33	3.42E-03	21.7	1.66E+00
36	1	772.62	71	204	1.96	1545.36	1521	33	1.65E-03	43.5	
37	0	784.98	66	394	4.71	1570.10	1562	21	1.53E-03	76.3	
38	1	795.40	128	185	2.00	1590.94	1584	20	2.97E-03	22.8	9.47E-01
39	1	798.43	44	139	1.82	1597.00	1584	20	1.01E-03	59.4	
40	4	803.32*	4	57	1.44	1606.79	1604	13	9.51E-05	670.5	1.10E+00
41	4	806.10	53	123	1.95	1612.35	1604	13	1.23E-03	42.5	
42	0	825.90	37	116	0.89	1651.98	1648	8	8.66E-04	52.4	
43	0	860.61	190	132	1.99	1721.43	1715	12	4.40E-03	14.1	
44	0	911.61*	606	232	1.72	1823.49	1817	14	1.40E-02	7.5	
45	0	926.91	28	217	4.21	1854.11	1843	18	6.41E-04	127.0	
46	0	933.63	91	131	3.55	1867.56	1862	13	2.10E-03	28.0	
47	2	964.89	171	178	2.28	1930.10	1923	27	3.97E-03	18.2	1.12E+00
48	2	969.23*	357	120	1.69	1938.80	1923	27	8.25E-03	9.3	
49	0	1120.45*	263	146	1.74	2241.45	2235	14	6.09E-03	12.5	
50	0	1181.88	29	122	3.73	2364.39	2360	11	6.63E-04	72.4	
51	0	1195.35	20	159	4.18	2391.36	2386	13	4.64E-04	131.6	
52	0	1238.69	100	167	1.76	2478.10	2474	14	2.33E-03	29.1	
53	0	1378.50	44	78	1.19	2757.97	2753	9	1.02E-03	39.8	
54	0	1384.84	24	63	1.40	2770.67	2766	10	5.46E-04	66.1	
55	0	1402.23	32	70	1.10	2805.49	2800	12	7.51E-04	54.2	
56	0	1461.13*	1521	134	1.83	2923.39	2915	18	3.52E-02	3.4	
57	0	1497.93	41	57	4.38	2997.08	2990	13	9.56E-04	41.8	
58	0	1588.52	35	74	1.89	3178.45	3172	11	8.07E-04	50.7	
59	0	1608.38	32	17	2.20	3218.22	3214	9	7.32E-04	29.9	
60	0	1620.85	34	59	0.75	3243.19	3235	14	7.92E-04	50.7	
61	0	1631.86	42	85	2.27	3265.24	3255	18	9.68E-04	54.1	
62	0	1661.45	35	37	3.12	3324.49	3317	14	8.21E-04	40.5	
63	0	1683.41	37	41	1.46	3368.46	3361	15	8.59E-04	41.1	
64	0	1730.00	71	48	2.25	3461.74	3455	15	1.64E-03	24.6	
65	0	1764.69	220	66	1.92	3531.21	3524	19	5.10E-03	10.9	
66	0	1848.33	29	43	1.87	3698.71	3690	12	6.74E-04	44.9	
67	0	1872.31	28	29	1.11	3746.75	3741	12	6.40E-04	43.8	
68	0	1927.71	30	42	4.45	3857.70	3850	17	7.00E-04	52.5	
69	0	1969.11	30	51	3.02	3940.62	3927	19	6.88E-04	61.0	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656014.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:40:00 Acquisition date : 23-JUN-2016 14:59:59
Sample ID         : G398656014 Sample quantity   : 156.46 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA12 Detector geometry   : CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:30.95 0.1%
Energy tolerance  : 1.50 keV Half life ratio   : 10.00
Errors propagated : No Systematic Error    : 0.00 %
Efficiency type   : Empirical Efficiencies at  : Peak Energy
Abundance limit   : 75.00

```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.102E+00	5.013E+00	5.013E+00	6.75	OK
CD-109	88.03	3.70*	4.383E+00	8.425E-01	8.912E-01	89.38	OK
SN-126	64.28	9.60	1.945E+00	5.352E-01	5.352E-01	158.18	OK
	86.94	8.90	4.383E+00	3.502E-01	3.502E-01	89.38	OK
	87.57	37.00*	4.383E+00	8.425E-02	8.425E-02	89.38	OK
BA-137M	661.66	89.90*	2.123E+00	4.770E+01	4.781E+01	0.44	OK
CS-137	661.66	85.10*	2.123E+00	5.039E+01	5.051E+01	0.44	OK
PR-144	696.51	1.34*	2.039E+00	5.422E-01	5.938E-01	123.12	OK
	1489.16	0.28	1.084E+00	----- Line	Not Found	-----	Absent
HG-203	70.83	3.69	2.799E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	3.022E+00	----- Line	Not Found	-----	Absent
	279.20	81.56*	4.162E+00	1.118E-02	1.950E-02	321.84	OK
TL-208	277.37	6.60	4.166E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	2.344E+00	1.795E-01	1.795E-01	22.17	OK
	860.56	12.50	1.720E+00	3.639E-01	3.639E-01	28.21	OK
PB-210	46.54	4.25*	4.062E-01	1.352E+01	1.357E+01	60.96	OK
BI-212	727.33	6.67*	1.969E+00	8.128E-01	8.128E-01	31.23	OK
	785.37	1.10	1.853E+00	1.345E+00	1.345E+00	152.60	OK
	1620.50	1.47	1.009E+00	8.816E-01	8.816E-01	101.47	OK
PB-212	74.82	10.28	3.208E+00	1.210E+00	1.210E+00	47.13	OK
	77.11	17.10	3.482E+00	1.058E+00	1.058E+00	24.45	OK
	238.63	43.60*	4.642E+00	5.884E-01	5.884E-01	14.89	OK
	300.09	3.30	3.933E+00	9.340E-01	9.340E-01	106.58	OK
BI-214	609.32	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63	OK
	1120.29	14.92	1.382E+00	5.102E-01	5.103E-01	24.93	OK
	1764.49	15.30	9.411E-01	5.788E-01	5.788E-01	21.86	OK
PB-214	74.82	5.80	3.229E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.482E+00	1.865E+00	1.865E+00	24.45	OK
	87.09	3.41	4.364E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.594E+00	4.310E-01	4.310E-01	84.13	OK
	295.22	18.42	3.977E+00	8.673E-01	8.674E-01	24.58	OK
	351.93	35.60*	3.476E+00	5.632E-01	5.633E-01	20.81	OK
RN-222	609.32	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63	OK
	1120.29	14.92	1.382E+00	5.102E-01	5.103E-01	24.93	OK
	1764.49	15.30	9.411E-01	5.788E-01	5.788E-01	21.86	OK
RA-226	609.32	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63	OK
	1120.29	14.92	1.382E+00	5.102E-01	5.103E-01	24.93	OK
	1764.49	15.30	9.411E-01	5.788E-01	5.788E-01	21.86	OK
AC-228	105.21	1.10	5.409E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.582E+00	1.002E+00	1.002E+00	37.11	OK
	794.95	4.25	1.833E+00	6.839E-01	6.839E-01	45.55	OK
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	5.856E-01	5.856E-01	14.91	OK
	968.97	15.80	1.560E+00	5.878E-01	5.878E-01	18.57	OK
RA-228	105.21	1.10	5.409E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.582E+00	1.002E+00	1.002E+00	37.11	OK
	794.95	4.25	1.833E+00	6.839E-01	6.839E-01	45.55	OK
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	5.856E-01	5.856E-01	14.91	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	1.560E+00	5.878E-01	5.878E-01	18.57	OK
	74.82	10.28	3.208E+00	1.210E+00	1.210E+00	47.13	OK
	77.11	17.10	3.482E+00	1.058E+00	1.058E+00	24.45	OK
	238.63	43.60*	4.642E+00	5.884E-01	5.884E-01	14.89	OK
TH-229	300.09	3.30	3.933E+00	9.340E-01	9.340E-01	106.58	OK
	85.43	14.70	4.137E+00	1.327E-01	1.327E-01	151.73	OK
	88.47	24.00	4.383E+00	1.299E-01	1.299E-01	89.38	OK
	193.51	4.41*	5.291E+00	-----	Line Not Found	-----	Absent
TH-230	210.85	2.80	5.034E+00	-----	Line Not Found	-----	Absent
	609.32	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63	OK
	1120.29	14.92	1.382E+00	5.102E-01	5.102E-01	24.93	OK
	1764.49	15.30	9.411E-01	5.788E-01	5.788E-01	21.86	OK
TH-232	105.21	1.10	5.409E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.582E+00	1.002E+00	1.002E+00	37.11	OK
	835.71	1.61	1.762E+00	-----	Line Not Found	-----	Absent
	911.20	25.80*	1.641E+00	5.856E-01	5.856E-01	14.91	OK
TH-234	968.97	15.80	1.560E+00	5.878E-01	5.878E-01	18.57	OK
	63.29	3.70*	1.945E+00	1.389E+00	1.389E+00	158.18	OK
	92.59	4.23	4.786E+00	8.610E-01	8.610E-01	98.41	OK
	609.32	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63	OK
U-234	1120.29	14.92	1.382E+00	5.102E-01	5.102E-01	24.93	OK
	1764.49	15.30	9.411E-01	5.788E-01	5.788E-01	21.86	OK
	63.29	3.70*	1.945E+00	1.389E+00	1.389E+00	158.18	OK
	92.59	4.23	4.786E+00	8.610E-01	8.610E-01	98.41	OK
AM-243	43.53	5.90	2.582E-01	-----	Line Not Found	-----	Absent
	74.66	67.20*	3.208E+00	1.850E-01	1.850E-01	47.13	OK
ANH-511	511.00	100.00*	2.599E+00	2.803E-04	2.803E-04	*****	OK

Flag: "*" = Keyline

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656014.CNF;1  *
* Acquisition date   : 23-JUN-2016 14:59:59 Sensitivity      : 3.000          *
* Detector ID        : GAM12 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:30.95 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 11:40:00 Analyst initials: MXR1      *
* Sample ID          : G398656014 Sample Quantity : 1.5646E+02 GRAM    *
* Batch Number       : 1572234 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 29-SEP-2015 06:02:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.013E+00	3.314E-01	1.596E-01
CD-109	8.912E-01	7.805E-01	1.110E+00
SN-126	8.425E-02	7.379E-02	1.083E-01
BA-137M	4.781E+01	2.083E-01	3.628E-02
CS-137	5.051E+01	2.201E-01	3.832E-02
PR-144	5.938E-01	7.164E-01	1.337E+00
HG-203	1.950E-02	6.151E-02	8.322E-02
TL-208	1.795E-01	3.899E-02	4.361E-02
PB-210	1.357E+01	8.106E+00	4.463E+00
BI-212	8.128E-01	2.487E-01	2.406E-01
PB-212	5.884E-01	8.589E-02	8.791E-02
BI-214	4.694E-01	8.109E-02	7.942E-02
PB-214	5.633E-01	1.149E-01	1.272E-01
RN-222	4.694E-01	8.109E-02	7.942E-02
RA-226	4.694E-01	8.109E-02	7.942E-02
AC-228	5.856E-01	8.555E-02	6.389E-02
RA-228	5.856E-01	8.555E-02	6.389E-02
TH-228	5.884E-01	8.589E-02	8.791E-02
TH-229	2.102E+00	4.426E-01	8.412E-01
TH-230	4.694E-01	8.109E-02	7.942E-02
TH-232	5.856E-01	8.555E-02	6.389E-02
TH-234	1.389E+00	2.152E+00	2.375E+00
U-234	4.694E-01	8.109E-02	7.942E-02
U-238	1.389E+00	2.152E+00	2.375E+00
AM-243	1.850E-01	8.548E-02	7.992E-02
ANH-511	2.803E-04	4.884E-02	4.734E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-5.128E-01	5.437E-01	9.462E-01	NOT IDENT.
NA-22	-8.353E-03	1.036E-02	1.766E-02	NOT IDENT.
NA-24	0.000E+00	9.536E+15	0.000E+00	SHORT HLIF
AL-26	-4.494E-03	9.731E-03	1.659E-02	NOT IDENT.

SC-46	8.986E-03	1.165E-02	2.203E-02	FAIL ABUN
V-48	9.953E-03	4.502E-02	8.268E-02	NOT IDENT.
CR-51	1.347E-01	6.075E-01	1.093E+00	NOT IDENT.
MN-54	5.089E-03	1.089E-02	2.016E-02	NOT IDENT.
CO-56	4.486E-03	1.306E-02	2.414E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.060E-03	2.153E-02	3.842E-02	NOT IDENT.
CO-58	-1.263E-02	2.542E-02	2.184E-02	NOT IDENT.
FE-59	-1.222E-02	3.009E-02	5.311E-02	NOT IDENT.
CO-60	3.369E-03	1.020E-02	1.859E-02	NOT IDENT.
ZN-65	-1.249E-02	2.560E-02	3.814E-02	NOT IDENT.
GE-68	3.499E-01	3.249E-01	6.185E-01	NOT IDENT.
AS-73	-6.624E-01	1.523E+00	2.452E+00	NOT IDENT.
AS-74	4.684E-03	1.537E-01	2.676E-01	NOT IDENT.
SE-75	2.332E-02	4.464E-02	8.135E-02	NOT IDENT.
BR-77	0.000E+00	8.813E+03	0.000E+00	SHORT HLIF
SR-82	-1.502E-01	2.527E-01	2.781E-01	NOT IDENT.
RB-83	3.802E-02	7.837E-02	1.379E-01	NOT IDENT.
KR-85	0.000E+00	7.334E+00	1.139E+01	NOT IDENT.
SR-85	0.000E+00	4.911E-02	7.625E-02	NOT IDENT.
RB-86	4.436E-01	4.455E-01	8.442E-01	NOT IDENT.
Y-88	-1.186E-02	1.247E-02	2.023E-02	NOT IDENT.
Y-91	-5.801E-01	6.555E+00	1.141E+01	NOT IDENT.
NB-94	9.228E-03	9.653E-03	1.719E-02	NOT IDENT.
NB-95	2.400E-02	1.465E-02	2.737E-02	NOT IDENT.
NB-95M	1.544E-01	1.456E-01	2.338E-01	NOT IDENT.
ZR-95	2.816E-02	2.844E-02	4.581E-02	NOT IDENT.
NB-97	0.000E+00	2.397E+39	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	8.685E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.206E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	3.262E-02	2.881E-02	4.535E-02	NOT IDENT.
RH-102	-1.481E-02	3.793E-02	6.536E-02	FAIL ABUN
RU-103	3.667E-02	6.108E-02	1.077E-01	FAIL ABUN
RH-106	1.130E-01	2.265E-01	3.966E-01	NOT IDENT.
RU-106	1.130E-01	2.265E-01	3.966E-01	NOT IDENT.
AG-108M	6.314E-02	4.836E-02	6.460E-02	FAIL ABUN
AG-110M	-9.079E-03	1.317E-02	2.324E-02	FAIL ABUN
SN-113	8.844E-03	5.542E-02	9.852E-02	NOT IDENT.
CD-115	0.000E+00	1.027E+04	0.000E+00	SHORT HLIF
SN-117M	-4.218E-02	1.325E-01	2.327E-01	NOT IDENT.
TE-123M	-1.073E-02	2.527E-02	4.433E-02	NOT IDENT.
SB-124	-3.703E-03	3.060E-02	4.638E-02	FAIL ABUN
SB-125	-2.110E-02	1.279E-01	1.952E-01	NOT IDENT.
TE-125M	2.147E+00	1.008E+01	1.810E+01	NOT IDENT.
I-126	0.000E+00	2.951E-01	5.470E-01	NOT IDENT.
SB-126	-1.434E-02	1.595E-01	2.403E-01	FAIL ABUN
SB-127	2.218E+00	2.232E+01	3.578E+01	FAIL ABUN
I-131	2.573E-01	8.254E-01	1.450E+00	NOT IDENT.
I-132	0.000E+00	9.685E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.605E+01	0.000E+00	SHORT HLIF
BA-133	-5.575E-03	4.806E-02	7.435E-02	FAIL ABUN
I-133	0.000E+00	2.759E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.571E-02	2.279E-02	FAIL ABUN
CS-135	4.251E-02	1.341E-01	2.438E-01	NOT IDENT.
I-135	0.000E+00	3.758E+39	0.000E+00	SHORT HLIF
CS-136	4.307E-02	8.545E-02	1.583E-01	NOT IDENT.
CE-139	2.102E-03	2.602E-02	4.575E-02	NOT IDENT.
BA-140	-5.839E-01	7.564E-01	1.309E+00	FAIL ABUN
LA-140	-4.229E-02	8.859E-02	1.479E-01	NOT IDENT.
CE-141	-1.980E-02	7.966E-02	1.365E-01	NOT IDENT.
CE-143	0.000E+00	9.153E+06	0.000E+00	SHORT HLIF
CE-144	1.878E-01	1.863E-01	2.922E-01	NOT IDENT.
PM-144	7.843E-03	9.462E-03	1.805E-02	FAIL ABUN
PM-146	4.822E-02	5.648E-02	9.994E-02	NOT IDENT.
ND-147	1.257E+00	2.015E+00	3.549E+00	NOT IDENT.
PM-147	1.025E+02	6.030E+02	1.077E+03	NOT IDENT.
PM-149	0.000E+00	8.610E+04	0.000E+00	SHORT HLIF
EU-150	-4.119E-03	2.910E-02	4.520E-02	FAIL ABUN
EU-152	2.465E-02	1.086E-01	1.691E-01	FAIL ABUN
GD-153	-2.798E-02	8.428E-02	1.295E-01	NOT IDENT.
EU-154	-2.415E-02	2.897E-02	4.930E-02	NOT IDENT.
EU-155	-5.528E-02	8.447E-02	1.508E-01	FAIL ABUN
TB-160	2.302E-02	4.074E-02	7.635E-02	FAIL ABUN
HO-166M	-2.558E-03	1.690E-02	2.951E-02	NOT IDENT.
TM-171	-8.467E+00	2.776E+01	4.480E+01	FAIL ABUN
HF-172	1.486E-02	1.764E-01	2.745E-01	FAIL ABUN
LU-172	1.425E-02	1.549E-02	2.930E-02	FAIL ABUN

LU-176	0.000E+00	3.122E-02	4.400E-02	FAIL ABUN
HF-181	-3.598E-02	7.309E-02	1.276E-01	NOT IDENT.
TA-182	-8.484E-03	4.882E-02	8.655E-02	FAIL ABUN
RE-183	3.941E-01	3.073E-01	5.304E-01	NOT IDENT.
RE-184	-3.535E-03	5.421E-02	9.377E-02	NOT IDENT.
W-188	2.865E+00	9.105E+00	1.434E+01	FAIL ABUN
IR-192	4.859E-03	4.029E-02	7.250E-02	FAIL ABUN
BI-207	8.989E-03	1.247E-02	2.339E-02	FAIL ABUN
BI-211	0.000E+00	3.165E-01	3.954E-01	FAIL ABUN
PB-211	-6.141E-03	7.958E-01	1.410E+00	NOT IDENT.
RN-219	1.331E-04	4.488E-01	7.956E-01	NOT IDENT.
RA-223	-8.488E-01	5.978E-01	1.061E+00	FAIL ABUN
RA-224	7.620E-01	6.283E-01	1.024E+00	FAIL ABUN
AC-227	4.546E-02	2.173E-01	3.958E-01	FAIL ABUN
TH-227	4.546E-02	2.173E-01	3.958E-01	FAIL ABUN
PA-231	4.845E-01	7.196E-01	7.674E-01	NOT IDENT.
TH-231	-8.488E-01	5.978E-01	1.061E+00	FAIL ABUN
PA-233	7.839E-04	6.332E-02	1.076E-01	FAIL ABUN
PA-234	1.861E-02	7.399E-02	1.362E-01	FAIL ABUN
PA-234M	-1.401E-01	1.541E+00	2.123E+00	NOT IDENT.
U-235	-1.864E-02	1.583E-01	2.718E-01	FAIL ABUN
NP-237	7.839E-04	6.332E-02	1.076E-01	FAIL ABUN
NP-238	0.000E+00	7.190E+03	0.000E+00	SHORT HLIF
NP-239	1.527E-01	2.129E-01	3.829E-01	FAIL ABUN
PU-239	4.004E+02	3.401E+02	4.754E+02	FAIL ABUN
AM-241	-5.367E-02	1.924E-01	3.089E-01	NOT IDENT.
CM-243	-1.011E-01	8.492E-02	1.511E-01	FAIL ABUN
BK-247	3.107E-02	7.063E-02	1.286E-01	FAIL ABUN
CM-247	7.880E-03	4.131E-02	7.333E-02	FAIL ABUN
CF-249	1.645E-02	4.283E-02	7.631E-02	NOT IDENT.
CF-251	-3.348E-03	1.085E-01	1.831E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1473	10.66*	1.102E+00	5.013E+00	5.013E+00	6.75
CD-109	88.03	624	3.70*	4.383E+00	1.538E+00	1.627E+00	47.69
SN-126	64.28	250	9.60	1.945E+00	5.352E-01	5.352E-01	158.18
	86.94	624	8.90	4.383E+00	6.396E-01	6.396E-01	47.69
	87.57	624	37.00*	4.383E+00	1.538E-01	1.538E-01	47.69
BA-137M	661.66	227634	89.90*	2.123E+00	4.770E+01	4.781E+01	0.44
CS-137	661.66	227634	85.10*	2.123E+00	5.039E+01	5.051E+01	0.44
PR-144	696.51	37	1.34*	2.039E+00	5.422E-01	5.938E-01	123.12
	1489.16	-----	0.28	1.084E+00	-----	Line Not Found	-----
HG-203	70.83	-----	3.69	2.799E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.022E+00	-----	Line Not Found	-----
	279.20	235	81.56*	4.162E+00	2.766E-02	4.824E-02	129.68
TL-208	277.37	235	6.60	4.162E+00	3.418E-01	3.418E-01	129.68
	583.19	894	85.00*	2.344E+00	1.795E-01	1.795E-01	22.17
	860.56	196	12.50	1.720E+00	3.639E-01	3.639E-01	28.21
PB-210	46.54	584	4.25*	4.062E-01	1.352E+01	1.357E+01	60.96
BI-211	72.87	-----	1.23	3.022E+00	-----	Line Not Found	-----
	351.06	1743	12.92*	3.476E+00	1.552E+00	1.552E+00	20.81
BI-212	727.33	267	6.67*	1.969E+00	8.128E-01	8.128E-01	31.23
	785.37	69	1.10	1.853E+00	1.345E+00	1.345E+00	152.60
	1620.50	33	1.47	1.009E+00	8.816E-01	8.816E-01	101.47
PB-212	74.82	1349	10.28	3.208E+00	1.636E+00	1.636E+00	34.27
	77.11	1576	17.10	3.482E+00	1.058E+00	1.058E+00	24.45
	238.63	2979	43.60*	4.642E+00	5.884E-01	5.884E-01	14.89
	300.09	303	3.30	3.933E+00	9.340E-01	9.340E-01	106.58
BI-214	609.32	1209	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63
	1120.29	263	14.92	1.382E+00	5.102E-01	5.103E-01	24.93
	1764.49	208	15.30	9.411E-01	5.788E-01	5.788E-01	21.86
PB-214	74.82	1349	5.80	3.208E+00	2.899E+00	2.899E+00	34.27
	77.11	1576	9.70	3.482E+00	1.865E+00	1.865E+00	24.45
	87.09	624	3.41	4.383E+00	1.669E+00	1.669E+00	47.69
	242.00	359	7.25	4.594E+00	4.310E-01	4.310E-01	84.13
	295.22	1589	18.42	3.977E+00	8.673E-01	8.674E-01	24.58
	351.93	1743	35.60*	3.476E+00	5.632E-01	5.633E-01	20.81
RN-222	609.32	1209	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63
	1120.29	263	14.92	1.382E+00	5.102E-01	5.103E-01	24.93
	1764.49	208	15.30	9.411E-01	5.788E-01	5.788E-01	21.86
RA-224	240.99	359	4.10*	4.594E+00	7.620E-01	7.620E-01	84.13
RA-226	609.32	1209	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63
	1120.29	263	14.92	1.382E+00	5.102E-01	5.103E-01	24.93
	1764.49	208	15.30	9.411E-01	5.788E-01	5.788E-01	21.86
AC-228	105.21	-----	1.10	5.409E+00	-----	Line Not Found	-----
	338.32	1012	11.27	3.582E+00	1.002E+00	1.002E+00	37.11
	794.95	133	4.25	1.833E+00	6.839E-01	6.839E-01	45.55
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	620	25.80*	1.641E+00	5.856E-01	5.856E-01	14.91
	968.97	362	15.80	1.560E+00	5.878E-01	5.878E-01	18.57

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	105.21	-----	1.10	5.409E+00	-----	Line Not Found	-----
	338.32	1012	11.27	3.582E+00	1.002E+00	1.002E+00	37.11
	794.95	133	4.25	1.833E+00	6.839E-01	6.839E-01	45.55
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	620	25.80*	1.641E+00	5.856E-01	5.856E-01	14.91
TH-228	968.97	362	15.80	1.560E+00	5.878E-01	5.878E-01	18.57
	74.82	1349	10.28	3.208E+00	1.636E+00	1.636E+00	34.27
	77.11	1576	17.10	3.482E+00	1.058E+00	1.058E+00	24.45
	238.63	2979	43.60*	4.642E+00	5.884E-01	5.884E-01	14.89
	300.09	303	3.30	3.933E+00	9.340E-01	9.340E-01	106.58
TH-229	85.43	202	14.70	4.137E+00	1.327E-01	1.327E-01	151.73
	88.47	624	24.00	4.383E+00	2.372E-01	2.372E-01	47.69
	193.51	-----	4.41*	5.291E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	5.034E+00	-----	Line Not Found	-----
	609.32	1209	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63
	1120.29	263	14.92	1.382E+00	5.102E-01	5.102E-01	24.93
	1764.49	208	15.30	9.411E-01	5.788E-01	5.788E-01	21.86
	105.21	-----	1.10	5.409E+00	-----	Line Not Found	-----
TH-232	338.32	1012	11.27	3.582E+00	1.002E+00	1.002E+00	37.11
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	620	25.80*	1.641E+00	5.856E-01	5.856E-01	14.91
	968.97	362	15.80	1.560E+00	5.878E-01	5.878E-01	18.57
	63.29	250	3.70*	1.945E+00	1.389E+00	1.389E+00	158.18
TH-234	92.59	436	4.23	4.786E+00	8.610E-01	8.610E-01	98.41
	609.32	1209	45.49*	2.265E+00	4.694E-01	4.694E-01	17.63
	1120.29	263	14.92	1.382E+00	5.102E-01	5.102E-01	24.93
U-234	1764.49	208	15.30	9.411E-01	5.788E-01	5.788E-01	21.86
	63.29	250	3.70*	1.945E+00	1.389E+00	1.389E+00	158.18
	92.59	436	4.23	4.786E+00	8.610E-01	8.610E-01	98.41
U-238	43.53	-----	5.90	2.582E-01	-----	Line Not Found	-----
	74.66	1349	67.20*	3.208E+00	2.502E-01	2.502E-01	34.27
ANH-511	511.00	2	100.00*	2.599E+00	2.803E-04	2.803E-04	17779.04

Flag: "*" = Keyline

Total number of lines in spectrum 69
Number of unidentified lines 26
Number of lines tentatively identified by NID 43 62.32%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.013E+00	5.013E+00	0.338E+00	6.75	
CD-109	461.40D	1.06	1.538E+00	1.627E+00	0.776E+00	47.69	
SN-126	2.30E+05Y	1.00	1.538E-01	1.538E-01	0.734E-01	47.69	
BA-137M	30.08Y	1.00	4.770E+01	4.781E+01	0.021E+01	0.44	
CS-137	30.08Y	1.00	5.039E+01	5.051E+01	0.022E+01	0.44	
PR-144	284.91D	1.10	5.422E-01	5.938E-01	7.311E-01	123.12	
HG-203	46.59D	1.74	2.766E-02	4.824E-02	6.255E-02	129.68	
TL-208	1.41E+10Y	1.00	1.795E-01	1.795E-01	0.398E-01	22.17	
PB-210	22.20Y	1.00	1.352E+01	1.357E+01	0.827E+01	60.96	
BI-211	7.04E+08Y	1.00	1.552E+00	1.552E+00	0.323E+00	20.81	
BI-212	1.41E+10Y	1.00	8.128E-01	8.128E-01	2.538E-01	31.23	
PB-212	1.41E+10Y	1.00	5.884E-01	5.884E-01	0.876E-01	14.89	
BI-214	1600.00Y	1.00	4.694E-01	4.694E-01	0.827E-01	17.63	
PB-214	1600.00Y	1.00	5.632E-01	5.633E-01	1.172E-01	20.81	
RN-222	1600.00Y	1.00	4.694E-01	4.694E-01	0.827E-01	17.63	
RA-224	1.41E+10Y	1.00	7.620E-01	7.620E-01	6.411E-01	84.13	
RA-226	1600.00Y	1.00	4.694E-01	4.694E-01	0.827E-01	17.63	
AC-228	1.41E+10Y	1.00	5.856E-01	5.856E-01	0.873E-01	14.91	
RA-228	1.41E+10Y	1.00	5.856E-01	5.856E-01	0.873E-01	14.91	
TH-228	1.41E+10Y	1.00	5.884E-01	5.884E-01	0.876E-01	14.89	
TH-229	7340.00Y	1.00	2.372E-01	2.372E-01	1.131E-01	47.69	K
TH-230	7.54E+04Y	1.00	4.694E-01	4.694E-01	0.827E-01	17.63	
TH-232	1.41E+10Y	1.00	5.856E-01	5.856E-01	0.873E-01	14.91	
TH-234	4.47E+09Y	1.00	1.389E+00	1.389E+00	2.196E+00	158.18	
U-234	2.45E+05Y	1.00	4.694E-01	4.694E-01	0.827E-01	17.63	
U-238	4.47E+09Y	1.00	1.389E+00	1.389E+00	2.196E+00	158.18	
AM-243	7370.00Y	1.00	2.502E-01	2.502E-01	0.858E-01	34.27	
ANH-511	1.00E+09Y	1.00	2.803E-04	2.803E-04	498.4E-04	17779.04	
Total Activity :			1.313E+02	1.317E+02			

Grand Total Activity : 1.313E+02 1.317E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	29.25	24	10	1.56	58.41	55	7	3.94E-04	70.8	4.07E-03	
3	36.48	4650	1707	1.78	72.89	68	31	7.70E-02	8.8	5.57E-02	
3	39.41	2644	3224	1.48	78.73	68	31	4.41E-02	14.0	1.15E-01	
0	49.94	97	5621	1.00	99.79	98	5	1.64E-03	****	6.43E-01	T
0	128.80	372	7393	0.77	257.49	255	7	6.88E-03	86.7	5.89E+00	T
10	186.07	2478	20846	3.08	372.03	363	41	4.75E-02	31.9	5.40E+00	T
10	190.95	1812	25957	3.91	381.78	363	41	3.48E-02	51.5	5.33E+00	
0	209.11	437	8873	1.40	418.10	415	8	8.46E-03	82.3	5.06E+00	
0	305.79	458	5875	2.59	611.46	608	8	9.21E-03	63.1	3.87E+00	T
0	433.02	422	7413	3.32	865.95	862	9	8.81E-03	78.1	2.96E+00	T
0	503.66	101	3642	0.57	1007.27	1006	8	2.14E-03	****	2.63E+00	
0	569.31	332	2405	1.92	1138.60	1133	11	7.12E-03	62.4	2.39E+00	T
0	646.82	119	945	1.67	1293.67	1291	6	2.58E-03	86.3	2.16E+00	T
3	693.11	59	287	2.14	1386.29	1380	16	1.28E-03	****	2.05E+00	
1	768.26	154	229	1.99	1536.65	1521	33	3.42E-03	43.3	1.89E+00	T
1	772.62	74	213	1.96	1545.36	1521	33	1.65E-03	87.0	1.88E+00	T
1	798.43	45	145	1.82	1597.00	1584	20	1.01E-03	****	1.83E+00	
4	803.32	4	59	1.44	1606.79	1604	13	9.51E-05	****	1.82E+00	T
4	806.10	55	128	1.95	1612.35	1604	13	1.23E-03	84.9	1.81E+00	
0	825.90	39	120	0.89	1651.98	1648	8	8.66E-04	****	1.78E+00	
0	926.91	28	222	4.21	1854.11	1843	18	6.41E-04	****	1.62E+00	T
0	933.63	93	134	3.55	1867.56	1862	13	2.10E-03	56.0	1.61E+00	
2	964.89	174	181	2.28	1930.10	1923	27	3.97E-03	36.5	1.57E+00	T
0	1181.88	28	121	3.73	2364.39	2360	11	6.63E-04	****	1.32E+00	
0	1195.35	20	158	4.18	2391.36	2386	13	4.64E-04	****	1.31E+00	
0	1238.69	99	164	1.76	2478.10	2474	14	2.33E-03	58.2	1.27E+00	T
0	1378.50	43	76	1.19	2757.97	2753	9	1.02E-03	79.5	1.16E+00	
0	1384.84	23	62	1.40	2770.67	2766	10	5.46E-04	****	1.15E+00	T
0	1402.23	32	68	1.10	2805.49	2800	12	7.51E-04	****	1.14E+00	
0	1497.93	40	55	4.38	2997.08	2990	13	9.56E-04	83.7	1.08E+00	
0	1588.52	33	71	1.89	3178.45	3172	11	8.07E-04	****	1.03E+00	
0	1608.38	30	17	2.20	3218.22	3214	9	7.32E-04	59.9	1.02E+00	
0	1631.86	40	81	2.27	3265.24	3255	18	9.68E-04	****	1.00E+00	
0	1661.45	34	35	3.12	3324.49	3317	14	8.21E-04	81.1	9.89E-01	
0	1683.41	35	39	1.46	3368.46	3361	15	8.59E-04	82.3	9.78E-01	
0	1730.00	67	46	2.25	3461.74	3455	15	1.64E-03	49.2	9.56E-01	
0	1848.33	27	40	1.87	3698.71	3690	12	6.74E-04	89.9	9.07E-01	
0	1872.31	26	28	1.11	3746.75	3741	12	6.40E-04	87.6	8.97E-01	
0	1927.71	28	39	4.45	3857.70	3850	17	7.00E-04	****	8.77E-01	
0	1969.11	28	48	3.02	3940.62	3927	19	6.88E-04	****	8.63E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656014.CNF;1  *
* Acquisition date   : 23-JUN-2016 14:59:59 Sensitivity      : 3.000          *
* Detector ID        : GAM12 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:30.95 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 11:40:00 Nuclide Library : SOLID      *
* Sample ID          : G398656014 Analyst initials: MXR1        *
* Batch Number       : 1572234 Sample Quantity : 1.5646E+02 GRAM  *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 29-SEP-2015 06:02:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	7.521E-02
CD-109	5.517E-01
SN-126	5.384E-02
BA-137M	1.786E-02
CS-137	1.886E-02
PR-144	6.466E-01
HG-203	4.134E-02
TL-208	2.154E-02
PB-210	2.199E+00
BI-212	1.161E-01
PB-212	4.370E-02
BI-214	3.919E-02
PB-214	6.316E-02
RN-222	3.919E-02
RA-226	3.919E-02
AC-228	3.065E-02
RA-228	3.065E-02
TH-228	4.370E-02
TH-229	4.184E-01
TH-230	3.919E-02
TH-232	3.065E-02
TH-234	1.180E+00
U-234	3.919E-02
U-238	1.180E+00
AM-243	3.971E-02
ANH-511	2.347E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.702E-01	NOT IDENT.
NA-22	8.377E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	7.709E-03	NOT IDENT.
SC-46	1.057E-02	FAIL ABUN

V-48	3.955E-02	NOT IDENT.
CR-51	5.431E-01	NOT IDENT.
MN-54	9.744E-03	NOT IDENT.
CO-56	1.163E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	1.909E-02	NOT IDENT.
CO-58	1.048E-02	NOT IDENT.
FE-59	2.533E-02	NOT IDENT.
CO-60	8.836E-03	NOT IDENT.
ZN-65	1.821E-02	NOT IDENT.
GE-68	2.962E-01	NOT IDENT.
AS-73	1.218E+00	NOT IDENT.
AS-74	1.321E-01	NOT IDENT.
SE-75	4.042E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.337E-01	NOT IDENT.
RB-83	6.831E-02	NOT IDENT.
KR-85	5.646E+00	NOT IDENT.
SR-85	3.781E-02	NOT IDENT.
RB-86	4.044E-01	NOT IDENT.
Y-88	9.354E-03	NOT IDENT.
Y-91	5.457E+00	NOT IDENT.
NB-94	8.325E-03	NOT IDENT.
NB-95	1.325E-02	NOT IDENT.
NB-95M	1.162E-01	NOT IDENT.
ZR-95	2.211E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	2.254E-02	NOT IDENT.
RH-102	3.224E-02	FAIL ABUN
RU-103	5.342E-02	FAIL ABUN
RH-106	1.957E-01	NOT IDENT.
RU-106	1.957E-01	NOT IDENT.
AG-108M	3.211E-02	FAIL ABUN
AG-110M	1.112E-02	FAIL ABUN
SN-113	4.895E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	1.156E-01	NOT IDENT.
TE-123M	2.203E-02	NOT IDENT.
SB-124	2.140E-02	FAIL ABUN
SB-125	9.700E-02	NOT IDENT.
TE-125M	8.995E+00	NOT IDENT.
I-126	2.677E-01	NOT IDENT.
SB-126	1.160E-01	FAIL ABUN
SB-127	1.728E+01	FAIL ABUN
I-131	7.201E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	3.693E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.104E-02	FAIL ABUN
CS-135	1.211E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.580E-02	NOT IDENT.
CE-139	2.273E-02	NOT IDENT.
BA-140	6.476E-01	FAIL ABUN
LA-140	6.975E-02	NOT IDENT.
CE-141	6.786E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.452E-01	NOT IDENT.
PM-144	8.733E-03	FAIL ABUN
PM-146	4.969E-02	NOT IDENT.
ND-147	1.757E+00	NOT IDENT.
PM-147	5.354E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	2.245E-02	FAIL ABUN
EU-152	8.399E-02	FAIL ABUN
GD-153	6.432E-02	NOT IDENT.
EU-154	2.339E-02	NOT IDENT.
EU-155	7.494E-02	FAIL ABUN
TB-160	3.664E-02	FAIL ABUN
HO-166M	1.425E-02	NOT IDENT.
TM-171	2.226E+01	FAIL ABUN
HF-172	1.364E-01	FAIL ABUN
LU-172	1.401E-02	FAIL ABUN
LU-176	2.185E-02	FAIL ABUN

HF-181	6.337E-02	NOT IDENT.
TA-182	4.131E-02	FAIL ABUN
RE-183	2.636E-01	NOT IDENT.
RE-184	4.508E-02	NOT IDENT.
W-188	7.125E+00	FAIL ABUN
IR-192	3.601E-02	FAIL ABUN
BI-207	1.119E-02	FAIL ABUN
BI-211	1.965E-01	FAIL ABUN
PB-211	7.004E-01	NOT IDENT.
RN-219	3.953E-01	NOT IDENT.
RA-223	5.268E-01	FAIL ABUN
RA-224	5.093E-01	FAIL ABUN
AC-227	1.966E-01	FAIL ABUN
TH-227	1.966E-01	FAIL ABUN
PA-231	3.812E-01	NOT IDENT.
TH-231	5.268E-01	FAIL ABUN
PA-233	5.343E-02	FAIL ABUN
PA-234	6.525E-02	FAIL ABUN
PA-234M	1.019E+00	NOT IDENT.
U-235	1.351E-01	FAIL ABUN
NP-237	5.343E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.903E-01	FAIL ABUN
PU-239	2.363E+02	FAIL ABUN
AM-241	1.535E-01	NOT IDENT.
CM-243	7.505E-02	FAIL ABUN
BK-247	6.391E-02	FAIL ABUN
CM-247	3.643E-02	FAIL ABUN
CF-249	3.791E-02	NOT IDENT.
CF-251	9.099E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656014.CNF;1
Acquisition date : 23-JUN-2016 14:59:59 Sensitivity : 3.000
Detector ID : GAM12 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:30.95 Half life ratio : *****
Sample date : 17-MAY-2016 11:40:00 Nuclide Library : SOLID
Sample ID : G398656014 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5646E+02 GRAM
Quantity Err(%) : 1.2783E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 29-SEP-2015 06:02:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.013E+00	5.532E-01	5.532E-01
CD-109	8.984E-01	7.961E-01	7.961E-01
SN-126	8.493E-02	7.512E-02	7.512E-02
BA-137M	4.781E+01	3.922E+00	3.922E+00
CS-137	5.051E+01	4.140E+00	4.140E+00
PR-144	5.938E-01	7.183E-01	7.183E-01
HG-203	1.957E-02	6.165E-02	6.165E-02
TL-208	1.795E-01	4.183E-02	4.183E-02
PB-210	1.357E+01	8.205E+00	8.205E+00
BI-212	8.128E-01	2.607E-01	2.607E-01
PB-212	5.884E-01	9.771E-02	9.771E-02
BI-214	4.694E-01	9.014E-02	9.014E-02
PB-214	5.633E-01	1.232E-01	1.232E-01
RN-222	4.694E-01	9.014E-02	9.014E-02
RA-226	4.694E-01	9.014E-02	9.014E-02
AC-228	5.856E-01	1.141E-01	1.141E-01
RA-228	5.856E-01	1.141E-01	1.141E-01
TH-228	5.884E-01	9.771E-02	9.771E-02
TH-229	2.102E+00	4.702E-01	4.702E-01
TH-230	4.694E-01	9.014E-02	9.014E-02
TH-232	5.856E-01	1.141E-01	1.141E-01
TH-234	1.389E+00	2.176E+00	2.176E+00
U-234	4.694E-01	9.014E-02	9.014E-02
U-238	1.389E+00	2.176E+00	2.176E+00
AM-243	1.857E-01	8.788E-02	8.788E-02
ANH-511	2.803E-04	4.884E-02	4.884E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-5.128E-01	5.454E-01	5.924E-01	NOT IDENT.
NA-22	-8.353E-03	1.039E-02	1.105E-02	NOT IDENT.
NA-24	1.000E+16	9.587E+15	0.000E+00	SHORT HLIF
AL-26	-4.494E-03	9.737E-03	9.945E-03	NOT IDENT.

SC-46	8.986E-03	1.170E-02	1.238E-02	FAIL ABUN
V-48	9.953E-03	4.504E-02	4.526E-02	NOT IDENT.
CR-51	1.347E-01	6.076E-01	6.106E-01	NOT IDENT.
MN-54	5.089E-03	1.090E-02	1.114E-02	NOT IDENT.
CO-56	4.486E-03	1.307E-02	1.323E-02	FAIL ABUN
MN-56	1.000E+41	2.998E+41	0.000E+00	SHORT HLIF
CO-57	1.060E-03	2.153E-02	2.154E-02	NOT IDENT.
CO-58	-1.263E-02	1.548E-02	1.650E-02	NOT IDENT.
FE-59	-1.222E-02	3.017E-02	3.067E-02	NOT IDENT.
CO-60	3.369E-03	1.020E-02	1.031E-02	NOT IDENT.
ZN-65	-1.249E-02	2.569E-02	2.630E-02	NOT IDENT.
GE-68	3.499E-01	3.299E-01	3.657E-01	NOT IDENT.
AS-73	-6.624E-01	1.529E+00	1.558E+00	NOT IDENT.
AS-74	4.684E-03	1.537E-01	1.537E-01	NOT IDENT.
SE-75	2.332E-02	4.468E-02	4.590E-02	NOT IDENT.
BR-77	6.038E+04	6.590E+04	7.130E+04	SHORT HLIF
SR-82	-1.502E-01	2.532E-01	2.621E-01	NOT IDENT.
RB-83	3.802E-02	7.859E-02	8.044E-02	NOT IDENT.
KR-85	1.221E+01	7.405E+00	9.226E+00	NOT IDENT.
SR-85	8.144E-02	4.959E-02	6.170E-02	NOT IDENT.
RB-86	4.436E-01	4.514E-01	4.937E-01	NOT IDENT.
Y-88	-1.186E-02	1.250E-02	1.359E-02	NOT IDENT.
Y-91	-5.801E-01	6.555E+00	6.560E+00	NOT IDENT.
NB-94	9.228E-03	9.688E-03	1.054E-02	NOT IDENT.
NB-95	2.400E-02	1.484E-02	1.836E-02	NOT IDENT.
NB-95M	1.544E-01	1.464E-01	1.621E-01	NOT IDENT.
ZR-95	2.816E-02	2.857E-02	3.127E-02	NOT IDENT.
NB-97	1.000E+41	8.543E+39	0.000E+00	SHORT HLIF
ZR-97	6.220E+15	8.701E+15	9.142E+15	SHORT HLIF
MO-99	-4.068E+02	9.215E+02	9.396E+02	SHORT HLIF
TC-99M	1.000E+41	2.424E+41	0.000E+00	SHORT HLIF
RH-101	3.262E-02	2.945E-02	3.291E-02	NOT IDENT.
RH-102	-1.481E-02	3.797E-02	3.855E-02	FAIL ABUN
RU-103	3.667E-02	6.117E-02	6.336E-02	FAIL ABUN
RH-106	1.130E-01	2.268E-01	2.324E-01	NOT IDENT.
RU-106	1.130E-01	2.268E-01	2.324E-01	NOT IDENT.
AG-108M	6.314E-02	4.863E-02	5.635E-02	FAIL ABUN
AG-110M	-9.079E-03	1.322E-02	1.383E-02	FAIL ABUN
SN-113	8.844E-03	5.543E-02	5.557E-02	NOT IDENT.
CD-115	-7.178E+03	1.029E+04	1.079E+04	SHORT HLIF
SN-117M	-4.218E-02	1.325E-01	1.339E-01	NOT IDENT.
TE-123M	-1.073E-02	2.528E-02	2.574E-02	NOT IDENT.
SB-124	-3.703E-03	3.060E-02	3.064E-02	FAIL ABUN
SB-125	-2.110E-02	1.279E-01	1.282E-01	NOT IDENT.
TE-125M	2.147E+00	1.008E+01	1.013E+01	NOT IDENT.
I-126	1.561E+00	3.294E-01	7.771E-01	NOT IDENT.
SB-126	-1.434E-02	1.596E-01	1.597E-01	FAIL ABUN
SB-127	2.218E+00	2.232E+01	2.234E+01	FAIL ABUN
I-131	2.573E-01	8.257E-01	8.338E-01	NOT IDENT.
I-132	1.000E+41	2.494E+41	0.000E+00	SHORT HLIF
TE-132	2.169E+01	7.608E+01	7.671E+01	SHORT HLIF
BA-133	-5.575E-03	4.806E-02	4.813E-02	FAIL ABUN
I-133	1.541E+11	2.785E+11	2.870E+11	SHORT HLIF
CS-134	3.519E-02	1.613E-02	2.263E-02	FAIL ABUN
CS-135	4.251E-02	1.341E-01	1.355E-01	NOT IDENT.
I-135	-1.002E+39	3.854E+39	0.000E+00	SHORT HLIF
CS-136	4.307E-02	8.577E-02	8.794E-02	NOT IDENT.
CE-139	2.102E-03	2.602E-02	2.604E-02	NOT IDENT.
BA-140	-5.839E-01	7.580E-01	8.024E-01	FAIL ABUN
LA-140	-4.229E-02	8.865E-02	9.068E-02	NOT IDENT.
CE-141	-1.980E-02	7.967E-02	8.017E-02	NOT IDENT.
CE-143	2.629E+07	9.385E+06	1.512E+07	SHORT HLIF
CE-144	1.878E-01	1.869E-01	2.051E-01	NOT IDENT.
PM-144	7.843E-03	9.487E-03	1.012E-02	FAIL ABUN
PM-146	4.822E-02	5.670E-02	6.072E-02	NOT IDENT.
ND-147	1.257E+00	2.017E+00	2.096E+00	NOT IDENT.
PM-147	1.025E+02	6.031E+02	6.048E+02	NOT IDENT.
PM-149	-5.674E+04	8.651E+04	9.021E+04	SHORT HLIF
EU-150	-4.119E-03	2.911E-02	2.916E-02	FAIL ABUN
EU-152	2.465E-02	1.086E-01	1.092E-01	FAIL ABUN
GD-153	-2.798E-02	8.432E-02	8.526E-02	NOT IDENT.
EU-154	-2.415E-02	2.905E-02	3.103E-02	NOT IDENT.
EU-155	-5.528E-02	8.463E-02	8.822E-02	FAIL ABUN
TB-160	2.302E-02	4.084E-02	4.214E-02	FAIL ABUN
HO-166M	-2.558E-03	1.690E-02	1.694E-02	NOT IDENT.
TM-171	-8.467E+00	2.777E+01	2.803E+01	FAIL ABUN
HF-172	1.486E-02	1.764E-01	1.765E-01	FAIL ABUN
LU-172	1.425E-02	1.573E-02	1.699E-02	FAIL ABUN

LU-176	5.051E-02	3.146E-02	3.884E-02	FAIL ABUN
HF-181	-3.598E-02	7.315E-02	7.493E-02	NOT IDENT.
TA-182	-8.484E-03	4.882E-02	4.897E-02	FAIL ABUN
RE-183	3.941E-01	3.105E-01	3.577E-01	NOT IDENT.
RE-184	-3.535E-03	5.422E-02	5.424E-02	NOT IDENT.
W-188	2.865E+00	9.112E+00	9.203E+00	FAIL ABUN
IR-192	4.859E-03	4.029E-02	4.035E-02	FAIL ABUN
BI-207	8.989E-03	1.255E-02	1.319E-02	FAIL ABUN
BI-211	1.552E+00	3.403E-01	7.780E-01	FAIL ABUN
PB-211	-6.141E-03	7.958E-01	7.958E-01	NOT IDENT.
RN-219	1.331E-04	4.488E-01	4.488E-01	NOT IDENT.
RA-223	-8.488E-01	6.026E-01	7.139E-01	FAIL ABUN
RA-224	7.620E-01	6.312E-01	7.187E-01	FAIL ABUN
AC-227	4.546E-02	2.174E-01	2.184E-01	FAIL ABUN
TH-227	4.546E-02	2.174E-01	2.184E-01	FAIL ABUN
PA-231	4.845E-01	7.276E-01	7.597E-01	NOT IDENT.
TH-231	-8.488E-01	6.026E-01	7.139E-01	FAIL ABUN
PA-233	7.839E-04	6.332E-02	6.332E-02	FAIL ABUN
PA-234	1.861E-02	7.703E-02	7.748E-02	FAIL ABUN
PA-234M	-1.401E-01	1.541E+00	1.542E+00	NOT IDENT.
U-235	-1.864E-02	1.583E-01	1.585E-01	FAIL ABUN
NP-237	7.839E-04	6.332E-02	6.332E-02	FAIL ABUN
NP-238	1.345E+03	7.193E+03	7.218E+03	SHORT HLIF
NP-239	1.527E-01	2.135E-01	2.243E-01	FAIL ABUN
PU-239	4.004E+02	3.412E+02	3.860E+02	FAIL ABUN
AM-241	-5.367E-02	1.925E-01	1.940E-01	NOT IDENT.
CM-243	-1.011E-01	8.567E-02	9.703E-02	FAIL ABUN
BK-247	3.107E-02	7.093E-02	7.230E-02	FAIL ABUN
CM-247	7.880E-03	4.134E-02	4.149E-02	FAIL ABUN
CF-249	1.645E-02	4.286E-02	4.350E-02	NOT IDENT.
CF-251	-3.348E-03	1.085E-01	1.085E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1404.0865	87.09	7553.3750	136.47	7543.9365
45.60	1407.5883	87.57	7512.6274	140.51	0.0000
46.54	1409.1501	88.03	7165.3887	143.76	7558.6113
49.72	0.0000	88.34	7082.4775	144.24	7487.0610
51.35	6772.0674	88.47	7083.2427	145.44	7533.3965
51.87	6825.0835	89.96	7176.6455	152.43	7446.8042
52.39	6933.8301	1093.63	7180.5952	153.25	7495.8574
52.97	6974.3018	91.11	7272.4868	323.87	7485.7368
53.44	6979.5127	92.59	7587.1216	156.02	7407.1948
54.07	7056.4854	93.35	7254.6689	158.56	7464.8608
57.36	0.0000	94.56	7024.2578	159.00	7508.9863
57.53	6770.6982	94.65	7024.7612	162.33	7419.9233
57.98	6743.8452	94.67	7024.8618	162.66	7474.8018
59.27	6943.4053	94.87	7121.3525	163.33	7378.5166
59.32	6943.7646	97.43	7058.7920	165.86	7369.0459
59.54	6981.6431	98.43	6927.6055	176.31	7529.8599
60.96	6983.4604	98.44	6944.4507	176.60	7608.5317
61.17	6984.9429	99.53	6800.3262	177.52	7664.1743
62.93	6995.1797	100.11	6806.5435	181.07	0.0000
63.29	6990.4258	102.03	7068.0039	181.52	7767.9751
63.58	6929.2402	103.18	7145.8799	184.41	8427.9883
64.28	7150.8496	103.37	7146.8975	143.76	8433.8652
66.73	7191.5459	105.21	7167.4233	193.51	8468.3232
67.24	7012.8076	105.31	7167.9580	197.03	8483.6689
125.81	7035.1787	106.12	7033.7334	198.01	8487.9482
67.75	6951.0474	106.47	7011.9053	201.83	8795.2275
69.67	7046.1958	109.28	7225.3926	203.43	8725.6660
70.83	7102.2002	111.00	7322.7119	205.31	8926.0752
72.81	7182.0342	111.76	0.0000	210.85	8473.8076
72.87	7182.4277	114.06	7206.9395	215.65	8265.1572
74.66	7125.4370	116.30	0.0000	222.11	8194.1270
74.82	7126.4756	116.74	7274.6035	227.09	8195.0254
74.97	7127.4365	119.76	7508.8120	227.38	8127.0200
77.11	7141.0454	121.12	7376.9131	228.16	0.0000
78.74	7065.1431	121.22	7360.0420	228.18	7996.4614
79.69	7084.3091	121.78	7413.8872	116.74	7996.4614
80.12	7180.9072	122.06	7426.1528	235.69	8028.6870
80.19	7181.3242	122.92	7394.6294	235.96	8029.6411
80.57	6939.6089	123.07	7381.2563	238.63	8042.5835
81.00	7186.3511	265.00	7333.9219	238.98	0.0000
81.07	7186.7939	125.81	7510.4443	240.99	8417.3438
81.75	7283.6660	127.23	7414.6631	242.00	7635.9844
83.79	7148.6045	127.91	7404.0713	244.70	7128.3267
84.00	7154.9229	129.30	7561.3940	252.40	7036.6260
85.43	7345.4165	131.20	7524.9214	252.80	7014.5723
86.55	7352.2598	133.02	7171.5498	254.15	0.0000
86.79	7551.4956	133.52	7236.9224	256.23	6972.8496
86.94	7552.4487	136.00	7496.7490	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	6951.4800	355.39	0.0000	584.27	1855.9468
264.80	6951.8428	356.01	6480.4907	595.83	1881.2953
265.00	6954.3506	364.49	6410.6484	427.87	1868.9680
268.22	7015.4629	366.42	0.0000	602.52	0.0000
269.46	6827.6333	372.51	6560.3672	604.72	1825.6420
270.03	6898.7959	375.05	6617.0015	607.14	1816.2922
271.23	6955.3149	377.52	6616.6719	609.32	1762.1974
273.65	7168.1851	356.01	6778.0513	610.33	1784.5889
276.40	6787.3633	388.16	6756.5220	614.28	1796.8561
277.37	6736.4111	388.63	6765.4673	618.01	1705.1962
277.60	6735.1382	391.69	6909.9360	620.36	1753.4078
278.00	6738.1572	264.66	7039.0376	621.93	1707.9131
279.20	6660.1094	401.81	7065.3154	630.19	0.0000
279.54	6602.9307	402.40	7083.4795	631.29	1693.9983
279.70	6603.3584	404.85	7196.7554	633.25	1676.9281
280.46	6624.3555	410.95	7336.7681	634.78	1641.7457
283.69	6647.2656	413.71	7321.5132	635.95	1637.9890
284.31	6652.1323	414.70	7286.2368	636.99	1665.8013
285.41	6706.7954	423.72	7417.5679	645.85	1789.8058
285.90	0.0000	427.09	7445.4731	657.76	2077.3264
287.50	6512.6582	427.87	7541.7603	657.90	0.0000
290.67	6483.1050	433.94	7855.0654	661.66	1254.9938
293.27	0.0000	439.40	8005.6558	664.57	0.0000
351.93	6417.5010	453.88	8565.2363	666.33	316.5713
295.96	6035.0903	463.37	8834.2354	666.50	316.5859
879.38	6041.3789	468.07	8999.6943	667.71	0.0000
299.98	6589.6289	473.00	8176.1313	677.62	254.2934
300.09	6589.9673	475.06	7747.4063	685.70	261.9293
300.13	6590.0518	476.78	7549.4858	695.00	273.4875
301.36	6380.8892	477.60	7506.8921	696.49	283.1993
302.85	6479.8081	482.18	6152.3423	696.51	283.1993
256.23	6483.9648	487.02	5417.9854	697.00	281.4504
304.85	6346.8018	492.35	0.0000	697.30	293.9398
306.78	6446.8999	497.08	4641.8750	697.49	293.9532
308.46	6382.7695	505.52	4367.7871	702.65	261.6021
311.90	6413.1499	507.63	0.0000	706.68	296.7133
316.51	6497.9619	511.00	3981.2112	711.68	267.0306
319.41	6407.4980	514.00	3905.6292	720.70	256.1152
320.08	6458.9409	514.00	3905.6292	721.93	0.0000
321.04	6447.9136	520.40	3561.7449	722.78	263.3989
323.87	6649.5415	520.69	0.0000	722.91	270.5785
325.23	6472.4951	522.65	0.0000	723.31	270.5970
328.76	6425.3174	527.90	0.0000	724.19	265.2751
333.37	6454.7085	528.26	3284.8262	727.33	253.9823
333.97	6375.8604	529.59	3170.2168	733.00	222.6964
334.37	6460.2920	529.87	0.0000	735.93	237.2197
338.28	6394.0815	531.02	3124.3486	333.97	232.9857
338.32	6394.1626	537.26	2986.9805	739.50	0.0000
311.90	6453.8740	546.56	0.0000	747.24	220.5202
340.48	6453.8740	552.55	2272.4983	748.06	222.7224
340.55	6454.0376	563.25	2176.6399	752.31	243.4955
344.28	6409.6938	569.33	2091.0649	753.82	228.4168
345.93	6498.9258	946.00	1912.6707	756.73	207.6186
351.06	6373.7236	569.70	1914.4871	756.80	207.6233
351.93	6405.4541	583.19	1985.3555	884.68	228.9216

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	229.0143	1274.44	193.1343	1620.50	66.6328
766.42	229.0452	1001.03	152.5589	1621.92	70.8112
766.84	229.0658	1002.74	146.9176	1678.03	0.0000
772.60	0.0000	1004.73	176.3655	1690.97	50.4277
776.52	239.3359	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	54.0692
778.90	234.0172	1028.54	0.0000	1063.66	43.6490
783.70	228.8108	1037.84	145.9340	1771.35	38.1973
785.37	228.8928	1038.76	0.0000	1791.20	0.0000
792.07	229.2158	631.29	166.2190	1808.65	68.2135
794.95	180.2109	1048.07	152.8841	1810.72	0.0000
795.86	180.2432	1049.04	147.1760	1836.06	71.6455
810.06	211.8265	1050.41	161.5526		
810.29	211.8359	1063.66	137.0184		
344.28	226.4554	1077.00	138.2930		
810.76	226.4705	1077.34	134.4572		
815.77	200.7460	1085.87	118.3054		
1048.07	201.2236	1093.63	130.0177		
832.01	254.3746	1099.45	154.2513		
834.85	254.2154	1112.07	150.7124		
835.71	249.6709	1112.84	150.7378		
836.80	0.0000	1115.54	167.3728		
846.75	0.0000	1120.29	138.3451		
846.77	217.1160	1120.55	138.3509		
856.80	158.0287	1221.41	142.6535		
860.56	173.9659	1129.67	144.8206		
871.09	186.7448	1131.51	0.0000		
873.19	185.8980	1147.95	0.0000		
875.33	0.0000	1173.23	123.9459		
879.38	166.6809	1177.95	143.9912		
880.51	169.4962	1189.05	172.2044		
883.24	176.0762	1204.77	160.5136		
884.68	190.9582	1221.41	152.4457		
889.28	158.6565	1231.02	154.8397		
894.76	201.5524	1235.36	174.0424		
898.04	185.8805	1238.28	157.2164		
900.72	203.6461	1260.41	0.0000		
903.28	208.7725	1271.87	125.8941		
911.20	186.3566	1274.44	139.8239		
912.08	186.3892	1274.54	139.8296		
923.98	0.0000	1291.59	130.2484		
926.50	166.6133	1298.22	0.0000		
929.11	100.9797	1312.11	101.7302		
937.49	168.5669	1332.49	112.0456		
944.13	152.8390	1362.66	0.0000		
946.00	163.2100	1365.19	98.5144		
949.00	178.3183	1368.63	0.0000		
667.71	0.0000	1384.29	92.2335		
962.31	170.9671	1408.01	97.1016		
964.08	171.2915	1457.56	0.0000		
966.17	171.3582	1460.82	88.6567		
911.20	171.4470	1489.16	72.2970		
968.97	171.4470	1505.03	123.0322		
983.53	153.0154	1584.12	69.2783		
984.45	0.0000	1596.21	104.1657		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 03:00:57.12

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656015.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM17.CNF;467
Background date    : 20-JUN-2016 14:03:38
Sample date       : 17-MAY-2016 11:45:00 Acquisition date : 23-JUN-2016 15:00:19
Sample ID        : G398656015 Sample quantity : 1.55230E+02 GRAM
Detector name     : GAM17 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:06.90 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	36.63	533	1816	1.65	73.39	71	8	1.23E-02	14.6	
2	0	46.54*	53	2319	1.51	93.21	89	10	1.23E-03	197.2	
3	0	53.42	136	1342	1.16	106.99	104	6	3.15E-03	43.4	
4	0	63.38*	265	2140	1.43	126.93	123	8	6.13E-03	36.1	
5	1	74.92*	1439	2443	1.46	150.02	143	22	3.33E-02	7.3	4.03E+00
6	1	77.28*	2072	2010	1.41	154.73	143	22	4.80E-02	4.9	
7	3	84.38*	429	2009	1.75	168.95	165	28	9.94E-03	20.5	1.36E+00
8	3	87.23	847	1962	1.51	174.66	165	28	1.96E-02	10.1	
9	3	90.02	550	1907	1.51	180.23	165	28	1.27E-02	15.4	
10	3	92.81*	787	1856	1.54	185.83	165	28	1.82E-02	12.6	
11	0	99.21	128	1612	2.22	198.63	196	8	2.97E-03	55.0	
12	0	105.25	212	1560	0.89	210.71	207	8	4.90E-03	33.0	
13	0	129.14	160	1601	1.47	258.54	255	8	3.70E-03	44.1	
14	0	185.83*	342	2135	1.38	371.99	367	10	7.92E-03	29.3	
15	0	209.28	238	1460	1.49	418.93	416	8	5.51E-03	28.6	
16	2	238.58*	2358	1383	1.42	477.55	470	20	5.46E-02	3.8	2.47E+00
17	2	241.53	475	1573	1.70	483.47	470	20	1.10E-02	17.8	
18	0	270.08	270	1465	2.42	540.58	535	11	6.26E-03	28.1	
19	0	287.71	81	1033	2.39	575.88	573	8	1.89E-03	69.1	
20	0	295.11*	640	1267	1.65	590.68	586	10	1.48E-02	12.4	
21	0	300.00	214	1242	2.88	600.46	596	10	4.94E-03	31.6	
22	0	328.64*	118	1197	2.59	657.77	652	10	2.73E-03	60.8	
23	0	338.36*	387	1361	1.31	677.23	672	11	8.95E-03	21.2	
24	0	351.97*	1268	1383	1.53	704.48	699	13	2.94E-02	7.2	
25	0	411.37	46	828	1.25	823.34	822	7	1.06E-03	105.0	
26	0	431.49	45	1133	2.19	863.60	860	10	1.04E-03	141.2	
27	0	462.60	224	1244	2.45	925.86	921	10	5.20E-03	30.1	
28	0	510.71*	314	1106	2.33	1022.13	1014	17	7.26E-03	29.5	
29	0	583.00*	712	411	1.58	1166.78	1161	12	1.65E-02	7.7	
30	0	609.17*	733	623	1.42	1219.16	1212	15	1.70E-02	8.8	
31	0	661.49	21831	420	1.70	1323.84	1316	15	5.05E-01	0.7	
32	0	727.10	171	198	1.06	1455.13	1448	12	3.95E-03	18.2	
33	0	767.56	94	205	3.19	1536.08	1531	13	2.19E-03	32.7	
34	0	785.07	90	208	1.86	1571.13	1565	15	2.08E-03	36.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	794.93	129	202	1.55	1590.87	1584	15	2.99E-03	25.6	
36	0	860.58	75	159	1.45	1722.22	1717	12	1.74E-03	35.9	
37	0	911.16*	431	215	1.94	1823.41	1815	19	9.99E-03	10.6	
38	5	964.24	118	136	2.47	1929.62	1924	22	2.73E-03	19.9	1.17E+00
39	5	968.86	330	103	2.08	1938.88	1924	22	7.64E-03	8.8	
40	0	981.63	15	101	1.52	1964.43	1958	10	3.42E-04	131.5	
41	0	1034.04	113	400	21.66	2069.28	2044	47	2.60E-03	64.1	
42	0	1120.29	238	153	1.93	2241.84	2233	20	5.50E-03	14.4	
43	0	1225.07	55	128	3.31	2451.49	2442	15	1.28E-03	46.4	
44	0	1237.14	37	167	1.95	2475.63	2473	14	8.47E-04	76.3	
45	0	1377.60	79	66	2.13	2756.64	2749	15	1.83E-03	25.3	
46	0	1408.05	24	54	1.13	2817.56	2813	11	5.64E-04	61.1	
47	0	1426.94	23	40	3.26	2855.34	2850	11	5.21E-04	57.6	
48	0	1460.40*	943	62	2.25	2922.28	2911	19	2.18E-02	4.3	
49	0	1526.31	14	31	0.55	3054.13	3048	11	3.25E-04	83.1	
50	0	1531.43	15	34	0.69	3064.38	3058	12	3.55E-04	79.4	
51	1	1588.46	71	34	2.53	3178.46	3166	34	1.64E-03	22.4	2.51E+00
52	1	1591.73	45	39	2.31	3185.00	3166	34	1.04E-03	33.2	
53	0	1733.93	87	51	7.48	3469.47	3455	35	2.01E-03	29.9	
54	0	1764.17	109	74	1.57	3529.96	3522	17	2.52E-03	20.4	
55	0	1809.43	40	125	17.83	3620.50	3580	50	9.26E-04	103.9	
56	0	1914.58	15	21	1.28	3830.82	3823	12	3.47E-04	66.3	
57	0	2037.82	9	28	0.47	4077.33	4070	14	2.08E-04	129.1	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656015.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:45:00 Acquisition date : 23-JUN-2016 15:00:19
Sample ID        : G398656015 Sample quantity  : 155.23 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA17 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:06.90 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AL-26	1129.67	2.50	1.000E+00	----- Line	Not Found	-----	Absent
	1808.65	99.76*	6.364E-01	2.395E-02	2.395E-02	207.82	OK
K-40	1460.82	10.66*	7.900E-01	4.367E+00	4.367E+00	8.62	OK
AS-73	53.44	10.30*	6.842E+00	1.049E-01	1.448E-01	86.82	OK
CD-109	88.03	3.70*	6.705E+00	1.323E+00	1.400E+00	28.45	OK
SN-126	64.28	9.60	6.715E+00	2.196E-01	2.196E-01	72.28	OK
	86.94	8.90	6.705E+00	5.502E-01	5.502E-01	28.45	OK
	87.57	37.00*	6.705E+00	1.323E-01	1.323E-01	28.45	OK
BA-137M	661.66	89.90*	1.587E+00	6.525E+00	6.540E+00	1.41	OK
CS-137	661.66	85.10*	1.587E+00	6.893E+00	6.909E+00	1.41	OK
EU-155	86.55	30.70	6.705E+00	1.595E-01	1.619E-01	28.45	OK
	105.31	21.10*	6.575E+00	7.802E-02	7.919E-02	65.95	OK
TL-208	277.37	6.60	3.487E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.771E+00	2.045E-01	2.045E-01	15.34	OK
	860.56	12.50	1.267E+00	1.969E-01	1.969E-01	71.79	OK
PB-210	46.54	4.25*	6.816E+00	1.009E-01	1.012E-01	394.32	OK
BI-211	72.87	1.23	6.698E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	2.795E+00	2.512E-01	2.512E-01	161.60	OK
BI-212	727.33	6.67*	1.463E+00	7.387E-01	7.387E-01	36.34	OK
	785.37	1.10	1.370E+00	2.490E+00	2.490E+00	73.01	OK
	1620.50	1.47	7.133E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	6.701E+00	8.247E-01	8.247E-01	21.26	OK
	77.11	17.10	6.704E+00	9.495E-01	9.495E-01	9.72	OK
	238.63	43.60*	3.997E+00	6.407E-01	6.407E-01	7.67	OK
	300.09	3.30	3.243E+00	9.241E-01	9.241E-01	63.19	OK
BI-214	609.32	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67	OK
	1120.29	14.92	1.008E+00	6.358E-01	6.358E-01	28.74	OK
	1764.49	15.30	6.537E-01	4.147E-01	4.147E-01	40.70	OK
PB-214	74.82	5.80	6.701E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.704E+00	1.674E+00	1.674E+00	9.72	OK
	87.09	3.41	6.705E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.947E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.292E+00	4.895E-01	4.895E-01	24.78	OK
	351.93	35.60*	2.795E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67	OK
	1120.29	14.92	1.008E+00	6.358E-01	6.358E-01	28.74	OK
	1764.49	15.30	6.537E-01	4.147E-01	4.147E-01	40.70	OK
RA-224	240.99	4.10*	3.954E+00	5.215E-01	5.215E-01	103.45	OK
RA-226	609.32	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67	OK
	1120.29	14.92	1.008E+00	6.358E-01	6.358E-01	28.74	OK
	1764.49	15.30	6.537E-01	4.147E-01	4.147E-01	40.70	OK
AC-228	105.21	1.10	6.575E+00	1.497E+00	1.497E+00	65.95	OK
	338.32	11.27	2.899E+00	5.411E-01	5.411E-01	42.42	OK
	794.95	4.25	1.356E+00	9.368E-01	9.368E-01	51.15	OK
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	5.708E-01	5.708E-01	21.10	OK
	968.97	15.80	1.144E+00	7.468E-01	7.468E-01	17.64	OK
RA-228	105.21	1.10	6.575E+00	1.497E+00	1.497E+00	65.95	OK
	338.32	11.27	2.899E+00	5.411E-01	5.411E-01	42.42	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	794.95	4.25	1.356E+00	9.368E-01	9.368E-01	51.15	OK
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	5.708E-01	5.708E-01	21.10	OK
	968.97	15.80	1.144E+00	7.468E-01	7.468E-01	17.64	OK
TH-228	74.82	10.28	6.701E+00	8.247E-01	8.247E-01	21.26	OK
	77.11	17.10	6.704E+00	9.495E-01	9.495E-01	9.72	OK
	238.63	43.60*	3.997E+00	6.407E-01	6.407E-01	7.67	OK
	300.09	3.30	3.243E+00	9.241E-01	9.241E-01	63.19	OK
TH-229	85.43	14.70	6.708E+00	2.269E-01	2.269E-01	40.91	OK
	88.47	24.00	6.705E+00	2.040E-01	2.040E-01	28.45	OK
	193.51	4.41*	4.774E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.449E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67	OK
	1120.29	14.92	1.008E+00	6.358E-01	6.358E-01	28.74	OK
	1764.49	15.30	6.537E-01	4.147E-01	4.147E-01	40.70	OK
PA-231	283.69	1.70	3.415E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.243E+00	5.700E-01	5.700E-01	63.19	OK
TH-232	105.21	1.10	6.575E+00	1.497E+00	1.497E+00	65.95	OK
	338.32	11.27	2.899E+00	5.411E-01	5.411E-01	42.42	OK
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	5.708E-01	5.708E-01	21.10	OK
	968.97	15.80	1.144E+00	7.468E-01	7.468E-01	17.64	OK
TH-234	63.29	3.70*	6.715E+00	5.698E-01	5.698E-01	72.28	OK
	92.59	4.23	6.684E+00	1.439E+00	1.439E+00	25.16	OK
U-234	609.32	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67	OK
	1120.29	14.92	1.008E+00	6.358E-01	6.358E-01	28.74	OK
	1764.49	15.30	6.537E-01	4.147E-01	4.147E-01	40.70	OK
U-235	89.96	3.47	6.697E+00	1.227E+00	1.227E+00	30.76	OK
	93.35	5.60	6.684E+00	1.087E+00	1.087E+00	25.16	OK
	143.76	10.96*	5.850E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	5.410E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	4.928E+00	5.890E-02	5.890E-02	58.58	OK
	205.31	5.01	4.549E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	6.715E+00	5.698E-01	5.698E-01	72.28	OK
	92.59	4.23	6.684E+00	1.439E+00	1.439E+00	25.16	OK
AM-243	43.53	5.90	6.544E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.701E+00	1.262E-01	1.262E-01	21.26	OK
ANH-511	511.00	100.00*	1.991E+00	6.904E-02	6.904E-02	59.07	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*                                     DETECTOR AND SAMPLE DATA                       *
*                                     *                                               *
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656015.CNF;1      *
* Acquisition date   : 23-JUN-2016 15:00:19 Sensitivity      : 3.000                *
* Detector ID        : GAM17 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:06.90 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 11:45:00 Analyst initials: MXR1      *
* Sample ID          : G398656015 Sample Quantity : 1.5523E+02 GRAM  *
* Batch Number       : 1572234 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6                                               *
*****
*                                     CALIBRATION INFORMATION                       *
*                                     *                                               *
* Eff. Cal. date     : 1-JUN-2016 09:40:09 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
AL-26	2.395E-02	4.878E-02	1.943E-02
K-40	4.367E+00	3.688E-01	1.782E-01
AS-73	1.448E-01	1.232E-01	1.751E-01
CD-109	1.400E+00	3.902E-01	3.676E-01
SN-126	1.323E-01	3.689E-02	3.475E-02
BA-137M	6.540E+00	9.061E-02	2.595E-02
CS-137	6.909E+00	9.572E-02	2.741E-02
EU-155	7.919E-02	5.119E-02	6.265E-02
TL-208	2.045E-01	3.074E-02	2.699E-02
PB-210	1.012E-01	3.911E-01	3.016E-01
BI-211	2.512E-01	3.979E-01	1.901E-01
BI-212	7.387E-01	2.631E-01	2.807E-01
PB-212	6.407E-01	4.815E-02	4.469E-02
BI-214	4.070E-01	7.046E-02	5.424E-02
PB-214	5.807E-01	8.198E-02	9.764E-02
RN-222	4.070E-01	7.046E-02	5.424E-02
RA-224	5.215E-01	5.287E-01	4.797E-01
RA-226	4.070E-01	7.046E-02	5.424E-02
AC-228	5.708E-01	1.181E-01	7.747E-02
RA-228	5.708E-01	1.181E-01	7.747E-02
TH-228	6.407E-01	4.815E-02	4.469E-02
TH-229	6.264E-02	2.372E-01	4.190E-01
TH-230	4.070E-01	7.045E-02	5.424E-02
PA-231	5.700E-01	3.530E-01	4.073E-01
TH-232	5.708E-01	1.181E-01	7.747E-02
TH-234	5.698E-01	4.036E-01	3.966E-01
U-234	4.070E-01	7.045E-02	5.424E-02
U-235	-6.933E-03	8.912E-02	1.336E-01
U-238	5.698E-01	4.036E-01	3.966E-01
AM-243	1.262E-01	2.629E-02	2.162E-02
ANH-511	6.904E-02	3.997E-02	2.726E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	8.322E-02	2.875E-01	5.074E-01	NOT IDENT.
NA-22	4.823E-03	1.346E-02	2.503E-02	NOT IDENT.
NA-24	0.000E+00	1.332E+16	0.000E+00	SHORT HLIF
SC-46	-3.741E-03	1.600E-02	2.837E-02	FAIL ABUN
V-48	-4.355E-02	7.077E-02	1.027E-01	NOT IDENT.
CR-51	-1.389E-01	3.210E-01	5.750E-01	NOT IDENT.
MN-54	3.228E-03	1.334E-02	2.423E-02	NOT IDENT.
CO-56	-1.001E-03	1.599E-02	2.871E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.231E-03	9.585E-03	1.744E-02	NOT IDENT.
CO-58	-1.742E-02	1.564E-02	2.665E-02	NOT IDENT.
FE-59	5.360E-03	4.249E-02	7.557E-02	NOT IDENT.
CO-60	2.959E-03	1.267E-02	2.345E-02	NOT IDENT.
ZN-65	-2.269E-02	3.512E-02	5.008E-02	NOT IDENT.
GE-68	9.819E-02	4.298E-01	7.721E-01	NOT IDENT.
AS-74	-2.652E-02	1.009E-01	1.742E-01	NOT IDENT.
SE-75	-8.517E-03	2.669E-02	4.207E-02	NOT IDENT.
BR-77	0.000E+00	4.936E+03	0.000E+00	SHORT HLIF
SR-82	-7.669E-02	2.343E-01	3.720E-01	NOT IDENT.
RB-83	1.157E-02	4.604E-02	8.119E-02	NOT IDENT.
KR-85	0.000E+00	4.376E+00	7.178E+00	NOT IDENT.
SR-85	0.000E+00	2.930E-02	4.805E-02	NOT IDENT.
RB-86	8.525E-02	5.792E-01	1.036E+00	NOT IDENT.
Y-88	2.190E-03	1.429E-02	2.651E-02	NOT IDENT.
Y-91	2.973E+00	8.554E+00	1.530E+01	NOT IDENT.
NB-94	3.334E-03	1.192E-02	2.185E-02	NOT IDENT.
NB-95	1.621E-02	2.077E-02	3.385E-02	NOT IDENT.
NB-95M	0.000E+00	7.707E-02	1.329E-01	NOT IDENT.
ZR-95	-7.453E-03	3.215E-02	5.756E-02	NOT IDENT.
NB-97	0.000E+00	4.235E+39	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.538E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.144E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.607E+41	0.000E+00	SHORT HLIF
RH-101	5.173E-03	1.336E-02	2.126E-02	NOT IDENT.
RH-102	7.216E-03	2.437E-02	4.470E-02	FAIL ABUN
RU-103	-9.652E-04	3.377E-02	5.922E-02	FAIL ABUN
RH-106	-6.327E-03	1.436E-01	2.608E-01	NOT IDENT.
RU-106	-6.327E-03	1.436E-01	2.608E-01	NOT IDENT.
AG-108M	-1.203E-02	2.216E-02	3.332E-02	NOT IDENT.
AG-110M	4.693E-04	1.754E-02	3.156E-02	NOT IDENT.
SN-113	-9.141E-03	2.903E-02	5.138E-02	NOT IDENT.
CD-115	0.000E+00	6.116E+03	0.000E+00	SHORT HLIF
SN-117M	-7.178E-02	6.506E-02	1.136E-01	NOT IDENT.
TE-123M	-1.025E-02	1.239E-02	2.174E-02	NOT IDENT.
SB-124	-2.310E-02	3.481E-02	5.949E-02	NOT IDENT.
SB-125	-3.500E-02	6.752E-02	1.017E-01	FAIL ABUN
TE-125M	2.899E+00	4.778E+00	7.719E+00	NOT IDENT.
I-126	2.864E-01	2.983E-01	4.936E-01	NOT IDENT.
SB-126	-6.916E-02	2.042E-01	3.122E-01	NOT IDENT.
SB-127	-4.654E+00	2.346E+01	4.246E+01	FAIL ABUN
I-131	1.077E-01	4.318E-01	7.769E-01	NOT IDENT.
I-132	0.000E+00	7.838E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.794E+01	0.000E+00	SHORT HLIF
BA-133	-1.242E-02	2.506E-02	3.840E-02	NOT IDENT.
I-133	0.000E+00	1.649E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	2.417E-02	2.935E-02	FAIL ABUN
CS-135	0.000E+00	8.083E-02	1.338E-01	NOT IDENT.
I-135	0.000E+00	4.659E+39	0.000E+00	SHORT HLIF
CS-136	9.559E-04	1.339E-01	2.036E-01	NOT IDENT.
CE-139	2.749E-03	1.280E-02	2.284E-02	NOT IDENT.
BA-140	-1.750E-01	4.585E-01	7.935E-01	NOT IDENT.
LA-140	4.371E-02	1.075E-01	1.758E-01	FAIL ABUN
CE-141	-1.601E-02	4.522E-02	6.741E-02	NOT IDENT.
CE-143	0.000E+00	7.492E+06	0.000E+00	SHORT HLIF
CE-144	2.640E-04	8.748E-02	1.376E-01	NOT IDENT.
PM-144	1.837E-03	1.256E-02	2.294E-02	NOT IDENT.
PR-144	1.357E-01	9.507E-01	1.737E+00	NOT IDENT.
PM-146	9.801E-04	2.895E-02	5.097E-02	NOT IDENT.
ND-147	9.453E-01	1.187E+00	2.125E+00	FAIL ABUN
PM-147	-7.709E+00	2.694E+02	4.872E+02	NOT IDENT.
PM-149	0.000E+00	5.254E+04	0.000E+00	SHORT HLIF
EU-150	1.574E-02	1.951E-02	2.481E-02	FAIL ABUN
EU-152	-4.964E-02	6.222E-02	8.907E-02	FAIL ABUN
GD-153	1.080E-02	4.293E-02	5.007E-02	NOT IDENT.
EU-154	1.351E-02	3.772E-02	7.013E-02	NOT IDENT.
TB-160	-2.956E-02	5.396E-02	9.421E-02	FAIL ABUN
HO-166M	-9.842E-03	2.103E-02	3.744E-02	FAIL ABUN

TM-171	2.385E+00	2.029E+00	2.916E+00	FAIL ABUN
HF-172	-5.641E-02	8.093E-02	1.256E-01	FAIL ABUN
LU-172	3.172E-02	2.167E-02	4.138E-02	FAIL ABUN
LU-176	7.194E-03	1.381E-02	2.388E-02	FAIL ABUN
HF-181	-2.114E-02	3.914E-02	6.788E-02	NOT IDENT.
TA-182	9.949E-03	8.106E-02	1.223E-01	FAIL ABUN
RE-183	-1.468E-02	3.798E-02	5.780E-02	NOT IDENT.
RE-184	-3.223E-02	7.653E-02	1.139E-01	NOT IDENT.
W-188	-9.936E-01	7.424E+00	7.793E+00	FAIL ABUN
IR-192	3.107E-03	2.109E-02	3.823E-02	FAIL ABUN
HG-203	2.934E-02	2.512E-02	4.667E-02	NOT IDENT.
BI-207	-2.561E-03	1.718E-02	3.020E-02	FAIL ABUN
PB-211	-1.317E-01	4.175E-01	7.370E-01	NOT IDENT.
RN-219	5.327E-02	2.360E-01	4.213E-01	FAIL ABUN
RA-223	1.466E-01	3.654E-01	5.786E-01	FAIL ABUN
AC-227	6.581E-02	1.128E-01	2.087E-01	FAIL ABUN
TH-227	6.581E-02	1.128E-01	2.087E-01	FAIL ABUN
TH-231	1.466E-01	3.654E-01	5.786E-01	FAIL ABUN
PA-233	-2.429E-02	3.192E-02	5.691E-02	FAIL ABUN
PA-234	1.096E-01	1.022E-01	1.924E-01	FAIL ABUN
PA-234M	1.516E+00	1.506E+00	2.819E+00	FAIL ABUN
NP-237	-2.429E-02	3.192E-02	5.691E-02	FAIL ABUN
NP-238	0.000E+00	1.106E+04	0.000E+00	SHORT HLIF
NP-239	6.123E-02	9.197E-02	1.687E-01	FAIL ABUN
PU-239	2.063E+02	1.783E+02	2.263E+02	FAIL ABUN
AM-241	2.063E-02	2.346E-02	3.934E-02	NOT IDENT.
CM-243	3.229E-02	5.226E-02	6.169E-02	FAIL ABUN
BK-247	-9.467E-03	4.216E-02	6.661E-02	FAIL ABUN
CM-247	-9.161E-03	2.172E-02	3.827E-02	FAIL ABUN
CF-249	1.642E-02	2.260E-02	4.087E-02	NOT IDENT.
CF-251	-1.059E-02	5.248E-02	9.253E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AL-26	1129.67	-----	2.50	1.000E+00	-----	Line Not Found	-----
	1808.65	38	99.76*	6.364E-01	2.395E-02	2.395E-02	207.82
K-40	1460.82	912	10.66*	7.900E-01	4.367E+00	4.367E+00	8.62
AS-73	53.44	183	10.30*	6.842E+00	1.049E-01	1.448E-01	86.82
CD-109	88.03	1092	3.70*	6.705E+00	1.775E+00	1.877E+00	20.26
SN-126	64.28	351	9.60	6.715E+00	2.196E-01	2.196E-01	72.28
	86.94	1092	8.90	6.705E+00	7.377E-01	7.377E-01	20.26
	87.57	1092	37.00*	6.705E+00	1.775E-01	1.775E-01	20.26
BA-137M	661.66	23102	89.90*	1.587E+00	6.525E+00	6.540E+00	1.41
CS-137	661.66	23102	85.10*	1.587E+00	6.893E+00	6.909E+00	1.41
EU-155	86.55	1092	30.70	6.705E+00	2.139E-01	2.171E-01	20.26
	105.31	269	21.10*	6.575E+00	7.802E-02	7.919E-02	65.95
TL-208	277.37	-----	6.60	3.487E+00	-----	Line Not Found	-----
	583.19	764	85.00*	1.771E+00	2.045E-01	2.045E-01	15.34
	860.56	77	12.50	1.267E+00	1.969E-01	1.969E-01	71.79
PB-210	46.54	73	4.25*	6.816E+00	1.009E-01	1.012E-01	394.32
BI-211	72.87	-----	1.23	6.698E+00	-----	Line Not Found	-----
	351.06	1434	12.92*	2.795E+00	1.600E+00	1.600E+00	14.41
BI-212	727.33	179	6.67*	1.463E+00	7.387E-01	7.387E-01	36.34
	785.37	93	1.10	1.370E+00	2.490E+00	2.490E+00	73.01
	1620.50	-----	1.47	7.133E-01	-----	Line Not Found	-----
PB-212	74.82	1882	10.28	6.701E+00	1.101E+00	1.101E+00	14.66
	77.11	2701	17.10	6.704E+00	9.495E-01	9.495E-01	9.72
	238.63	2770	43.60*	3.997E+00	6.407E-01	6.407E-01	7.67
	300.09	245	3.30	3.243E+00	9.241E-01	9.241E-01	63.19
BI-214	609.32	783	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67
	1120.29	237	14.92	1.008E+00	6.358E-01	6.358E-01	28.74
	1764.49	103	15.30	6.537E-01	4.147E-01	4.147E-01	40.70
PB-214	74.82	1882	5.80	6.701E+00	1.951E+00	1.951E+00	14.66
	77.11	2701	9.70	6.704E+00	1.674E+00	1.674E+00	9.72
	87.09	1092	3.41	6.705E+00	1.925E+00	1.926E+00	20.26
	242.00	558	7.25	3.954E+00	7.844E-01	7.845E-01	35.69
	295.22	737	18.42	3.292E+00	4.895E-01	4.895E-01	24.78
	351.93	1434	35.60*	2.795E+00	5.807E-01	5.807E-01	14.41
RN-222	609.32	783	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67
	1120.29	237	14.92	1.008E+00	6.358E-01	6.358E-01	28.74
	1764.49	103	15.30	6.537E-01	4.147E-01	4.147E-01	40.70
RA-224	240.99	558	4.10*	3.954E+00	1.387E+00	1.387E+00	35.69
RA-226	609.32	783	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67
	1120.29	237	14.92	1.008E+00	6.358E-01	6.358E-01	28.74
	1764.49	103	15.30	6.537E-01	4.147E-01	4.147E-01	40.70
AC-228	105.21	269	1.10	6.575E+00	1.497E+00	1.497E+00	65.95
	338.32	439	11.27	2.899E+00	5.411E-01	5.411E-01	42.42
	794.95	134	4.25	1.356E+00	9.368E-01	9.368E-01	51.15
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	441	25.80*	1.206E+00	5.708E-01	5.708E-01	21.10
	968.97	335	15.80	1.144E+00	7.468E-01	7.468E-01	17.64

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	105.21	269	1.10	6.575E+00	1.497E+00	1.497E+00	65.95
	338.32	439	11.27	2.899E+00	5.411E-01	5.411E-01	42.42
	794.95	134	4.25	1.356E+00	9.368E-01	9.368E-01	51.15
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	441	25.80*	1.206E+00	5.708E-01	5.708E-01	21.10
TH-228	968.97	335	15.80	1.144E+00	7.468E-01	7.468E-01	17.64
	74.82	1882	10.28	6.701E+00	1.101E+00	1.101E+00	14.66
	77.11	2701	17.10	6.704E+00	9.495E-01	9.495E-01	9.72
	238.63	2770	43.60*	3.997E+00	6.407E-01	6.407E-01	7.67
	300.09	245	3.30	3.243E+00	9.241E-01	9.241E-01	63.19
TH-229	85.43	555	14.70	6.708E+00	2.269E-01	2.269E-01	40.91
	88.47	1092	24.00	6.705E+00	2.736E-01	2.736E-01	20.26
	193.51	-----	4.41*	4.774E+00	-----	Line Not Found	-----
	210.85	-----	2.80	4.449E+00	-----	Line Not Found	-----
	609.32	783	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67
TH-230	1120.29	237	14.92	1.008E+00	6.358E-01	6.358E-01	28.74
	1764.49	103	15.30	6.537E-01	4.147E-01	4.147E-01	40.70
	283.69	-----	1.70	3.415E+00	-----	Line Not Found	-----
TH-232	301.36	245	5.35*	3.243E+00	5.700E-01	5.700E-01	63.19
	105.21	269	1.10	6.575E+00	1.497E+00	1.497E+00	65.95
	338.32	439	11.27	2.899E+00	5.411E-01	5.411E-01	42.42
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	441	25.80*	1.206E+00	5.708E-01	5.708E-01	21.10
TH-234	968.97	335	15.80	1.144E+00	7.468E-01	7.468E-01	17.64
	63.29	351	3.70*	6.715E+00	5.698E-01	5.698E-01	72.28
	92.59	1010	4.23	6.684E+00	1.439E+00	1.439E+00	25.16
U-234	609.32	783	45.49*	1.705E+00	4.070E-01	4.070E-01	17.67
	1120.29	237	14.92	1.008E+00	6.358E-01	6.358E-01	28.74
	1764.49	103	15.30	6.537E-01	4.147E-01	4.147E-01	40.70
U-235	89.96	708	3.47	6.697E+00	1.227E+00	1.227E+00	30.76
	93.35	1010	5.60	6.684E+00	1.087E+00	1.087E+00	25.16
	143.76	-----	10.96*	5.850E+00	-----	Line Not Found	-----
	163.33	-----	5.08	5.410E+00	-----	Line Not Found	-----
	185.72	412	57.20	4.928E+00	5.890E-02	5.890E-02	58.58
U-238	205.31	-----	5.01	4.549E+00	-----	Line Not Found	-----
	63.29	351	3.70*	6.715E+00	5.698E-01	5.698E-01	72.28
	92.59	1010	4.23	6.684E+00	1.439E+00	1.439E+00	25.16
AM-243	43.53	-----	5.90	6.544E+00	-----	Line Not Found	-----
	74.66	1882	67.20*	6.701E+00	1.684E-01	1.684E-01	14.66
ANH-511	511.00	341	100.00*	1.991E+00	6.904E-02	6.904E-02	59.07

Flag: "*" = Keyline

Total number of lines in spectrum 57
Number of unidentified lines 15
Number of lines tentatively identified by NID 42 73.68%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AL-26	7.17E+05Y	1.00	2.395E-02	2.395E-02	4.977E-02	207.82	
K-40	1.25E+09Y	1.00	4.367E+00	4.367E+00	0.376E+00	8.62	
AS-73	80.30D	1.38	1.049E-01	1.448E-01	1.257E-01	86.82	
CD-109	461.40D	1.06	1.775E+00	1.877E+00	0.380E+00	20.26	
SN-126	2.30E+05Y	1.00	1.775E-01	1.775E-01	0.359E-01	20.26	
BA-137M	30.08Y	1.00	6.525E+00	6.540E+00	0.092E+00	1.41	
CS-137	30.08Y	1.00	6.893E+00	6.909E+00	0.098E+00	1.41	
EU-155	4.75Y	1.02	7.802E-02	7.919E-02	5.223E-02	65.95	
TL-208	1.41E+10Y	1.00	2.045E-01	2.045E-01	0.314E-01	15.34	
PB-210	22.20Y	1.00	1.009E-01	1.012E-01	3.991E-01	394.32	
BI-211	7.04E+08Y	1.00	1.600E+00	1.600E+00	0.230E+00	14.41	
BI-212	1.41E+10Y	1.00	7.387E-01	7.387E-01	2.684E-01	36.34	
PB-212	1.41E+10Y	1.00	6.407E-01	6.407E-01	0.491E-01	7.67	
BI-214	1600.00Y	1.00	4.070E-01	4.070E-01	0.719E-01	17.67	
PB-214	1600.00Y	1.00	5.807E-01	5.807E-01	0.837E-01	14.41	
RN-222	1600.00Y	1.00	4.070E-01	4.070E-01	0.719E-01	17.67	
RA-224	1.41E+10Y	1.00	1.387E+00	1.387E+00	0.495E+00	35.69	
RA-226	1600.00Y	1.00	4.070E-01	4.070E-01	0.719E-01	17.67	
AC-228	1.41E+10Y	1.00	5.708E-01	5.708E-01	1.205E-01	21.10	
RA-228	1.41E+10Y	1.00	5.708E-01	5.708E-01	1.205E-01	21.10	
TH-228	1.41E+10Y	1.00	6.407E-01	6.407E-01	0.491E-01	7.67	
TH-229	7340.00Y	1.00	2.736E-01	2.736E-01	0.554E-01	20.26	K
TH-230	7.54E+04Y	1.00	4.070E-01	4.070E-01	0.719E-01	17.67	
PA-231	7.04E+08Y	1.00	5.700E-01	5.700E-01	3.602E-01	63.19	
TH-232	1.41E+10Y	1.00	5.708E-01	5.708E-01	1.205E-01	21.10	
TH-234	4.47E+09Y	1.00	5.698E-01	5.698E-01	4.118E-01	72.28	
U-234	2.45E+05Y	1.00	4.070E-01	4.070E-01	0.719E-01	17.67	
U-235	7.04E+08Y	1.00	5.890E-02	5.890E-02	3.450E-02	58.58	K
U-238	4.47E+09Y	1.00	5.698E-01	5.698E-01	4.118E-01	72.28	
AM-243	7370.00Y	1.00	1.684E-01	1.684E-01	0.247E-01	14.66	
ANH-511	1.00E+09Y	1.00	6.904E-02	6.904E-02	4.079E-02	59.07	
Total Activity :			3.186E+01	3.204E+01			

Grand Total Activity : 3.186E+01 3.204E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	36.63	740	2523	1.65	73.39	71	8	1.23E-02	29.2	3.92E+00	
0	99.21	164	2055	2.22	198.63	196	8	2.97E-03	****	6.64E+00	T
0	129.14	199	1993	1.47	258.54	255	8	3.70E-03	88.2	6.17E+00	T
0	209.28	283	1737	1.49	418.93	416	8	5.51E-03	57.1	4.48E+00	
0	270.08	314	1700	2.42	540.58	535	11	6.26E-03	56.2	3.57E+00	T
0	287.71	94	1191	2.39	575.88	573	8	1.89E-03	****	3.37E+00	T
0	328.64	134	1362	2.59	657.77	652	10	2.73E-03	****	2.98E+00	T
0	411.37	51	921	1.25	823.34	822	7	1.06E-03	****	2.42E+00	T
0	431.49	50	1254	2.19	863.60	860	10	1.04E-03	****	2.32E+00	
0	462.60	247	1367	2.45	925.86	921	10	5.20E-03	60.2	2.18E+00	T
0	767.56	98	213	3.19	1536.08	1531	13	2.19E-03	65.4	1.40E+00	T
5	964.24	120	138	2.47	1929.62	1924	22	2.73E-03	39.8	1.15E+00	T
0	981.63	15	103	1.52	1964.43	1958	10	3.42E-04	****	1.13E+00	
0	1034.04	113	402	21.66	2069.28	2044	47	2.60E-03	****	1.08E+00	
0	1225.07	55	126	3.31	2451.49	2442	15	1.28E-03	92.9	9.30E-01	
0	1237.14	36	165	1.95	2475.63	2473	14	8.47E-04	****	9.22E-01	T
0	1377.60	77	64	2.13	2756.64	2749	15	1.83E-03	50.5	8.35E-01	
0	1408.05	24	52	1.13	2817.56	2813	11	5.64E-04	****	8.18E-01	T
0	1426.94	22	38	3.26	2855.34	2850	11	5.21E-04	****	8.08E-01	
0	1526.31	13	30	0.55	3054.13	3048	11	3.25E-04	****	7.57E-01	
0	1531.43	15	32	0.69	3064.38	3058	12	3.55E-04	****	7.54E-01	
1	1588.46	68	32	2.53	3178.46	3166	34	1.64E-03	44.8	7.28E-01	
1	1591.73	43	37	2.31	3185.00	3166	34	1.04E-03	66.4	7.26E-01	
0	1733.93	82	48	7.48	3469.47	3455	35	2.01E-03	59.7	6.66E-01	
0	1914.58	14	20	1.28	3830.82	3823	12	3.47E-04	****	5.99E-01	
0	2037.82	8	26	0.47	4077.33	4070	14	2.08E-04	****	5.58E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656015.CNF;1  *
* Acquisition date   : 23-JUN-2016 15:00:19 Sensitivity      : 3.000          *
* Detector ID        : GAM17 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:06.90 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 11:45:00 Nuclide Library : SOLID      *
* Sample ID          : G398656015 Analyst initials: MXR1        *
* Batch Number       : 1572234 Sample Quantity : 1.5523E+02 GRAM  *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 1-JUN-2016 09:40:09 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14          *
*****
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
AL-26	8.859E-03
K-40	8.262E-02
AS-73	8.641E-02
CD-109	1.814E-01
SN-126	1.714E-02
BA-137M	1.259E-02
CS-137	1.330E-02
EU-155	3.091E-02
TL-208	1.313E-02
PB-210	1.488E-01
BI-211	9.351E-02
BI-212	1.347E-01
PB-212	2.203E-02
BI-214	2.641E-02
PB-214	4.827E-02
RN-222	2.641E-02
RA-224	2.364E-01
RA-226	2.641E-02
AC-228	3.697E-02
RA-228	3.697E-02
TH-228	2.203E-02
TH-229	2.069E-01
TH-230	2.641E-02
PA-231	2.005E-01
TH-232	3.697E-02
TH-234	1.960E-01
U-234	2.641E-02
U-235	6.593E-02
U-238	1.960E-01
AM-243	1.068E-02
ANH-511	1.335E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)

BE-7	2.497E-01	NOT IDENT.
NA-22	1.189E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
SC-46	1.358E-02	FAIL ABUN
V-48	4.887E-02	NOT IDENT.
CR-51	2.828E-01	NOT IDENT.
MN-54	1.165E-02	NOT IDENT.
CO-56	1.375E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	8.603E-03	NOT IDENT.
CO-58	1.273E-02	NOT IDENT.
FE-59	3.609E-02	NOT IDENT.
CO-60	1.108E-02	NOT IDENT.
ZN-65	2.385E-02	NOT IDENT.
GE-68	3.681E-01	NOT IDENT.
AS-74	8.479E-02	NOT IDENT.
SE-75	2.071E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.786E-01	NOT IDENT.
RB-83	3.975E-02	NOT IDENT.
KR-85	3.525E+00	NOT IDENT.
SR-85	2.359E-02	NOT IDENT.
RB-86	4.937E-01	NOT IDENT.
Y-88	1.214E-02	NOT IDENT.
Y-91	7.303E+00	NOT IDENT.
NB-94	1.056E-02	NOT IDENT.
NB-95	1.633E-02	NOT IDENT.
NB-95M	6.562E-02	NOT IDENT.
ZR-95	2.770E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.049E-02	NOT IDENT.
RH-102	2.174E-02	FAIL ABUN
RU-103	2.904E-02	FAIL ABUN
RH-106	1.268E-01	NOT IDENT.
RU-106	1.268E-01	NOT IDENT.
AG-108M	1.640E-02	NOT IDENT.
AG-110M	1.510E-02	NOT IDENT.
SN-113	2.527E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	5.601E-02	NOT IDENT.
TE-123M	1.072E-02	NOT IDENT.
SB-124	2.716E-02	NOT IDENT.
SB-125	5.006E-02	FAIL ABUN
TE-125M	3.809E+00	NOT IDENT.
I-126	2.389E-01	NOT IDENT.
SB-126	1.504E-01	NOT IDENT.
SB-127	2.041E+01	FAIL ABUN
I-131	3.821E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.887E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	1.418E-02	FAIL ABUN
CS-135	6.595E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	9.718E-02	NOT IDENT.
CE-139	1.126E-02	NOT IDENT.
BA-140	3.876E-01	NOT IDENT.
LA-140	8.190E-02	FAIL ABUN
CE-141	3.326E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	6.788E-02	NOT IDENT.
PM-144	1.108E-02	NOT IDENT.
PR-144	8.385E-01	NOT IDENT.
PM-146	2.510E-02	NOT IDENT.
ND-147	1.040E+00	FAIL ABUN
PM-147	2.404E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.221E-02	FAIL ABUN
EU-152	4.380E-02	FAIL ABUN
GD-153	2.471E-02	NOT IDENT.
EU-154	3.331E-02	NOT IDENT.
TB-160	4.499E-02	FAIL ABUN
HO-166M	1.803E-02	FAIL ABUN
TM-171	1.439E+00	FAIL ABUN

HF-172	6.198E-02	FAIL ABUN
LU-172	1.981E-02	FAIL ABUN
LU-176	1.175E-02	FAIL ABUN
HF-181	3.334E-02	NOT IDENT.
TA-182	5.844E-02	FAIL ABUN
RE-183	2.854E-02	NOT IDENT.
RE-184	5.449E-02	NOT IDENT.
W-188	3.837E+00	FAIL ABUN
IR-192	1.881E-02	FAIL ABUN
HG-203	2.299E-02	NOT IDENT.
BI-207	1.440E-02	FAIL ABUN
PB-211	3.626E-01	NOT IDENT.
RN-219	2.073E-01	FAIL ABUN
RA-223	2.847E-01	FAIL ABUN
AC-227	1.028E-01	FAIL ABUN
TH-227	1.028E-01	FAIL ABUN
TH-231	2.847E-01	FAIL ABUN
PA-233	2.799E-02	FAIL ABUN
PA-234	9.227E-02	FAIL ABUN
PA-234M	1.351E+00	FAIL ABUN
NP-237	2.799E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	8.322E-02	FAIL ABUN
PU-239	1.117E+02	FAIL ABUN
AM-241	1.943E-02	NOT IDENT.
CM-243	3.043E-02	FAIL ABUN
BK-247	3.279E-02	FAIL ABUN
CM-247	1.882E-02	FAIL ABUN
CF-249	2.011E-02	NOT IDENT.
CF-251	4.563E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656015.CNF;1
Acquisition date : 23-JUN-2016 15:00:19 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.90 Half life ratio : *****
Sample date : 17-MAY-2016 11:45:00 Nuclide Library : SOLID
Sample ID : G398656015 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.5523E+02 GRAM
Quantity Err(%) : 1.2884E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
AL-26	2.395E-02	4.880E-02	4.880E-02
K-40	4.367E+00	4.336E-01	4.336E-01
AS-73	1.448E-01	1.268E-01	1.268E-01
CD-109	1.400E+00	4.109E-01	4.109E-01
SN-126	1.323E-01	3.821E-02	3.821E-02
BA-137M	6.540E+00	2.959E-01	2.959E-01
CS-137	6.909E+00	3.119E-01	3.119E-01
EU-155	7.919E-02	5.149E-02	5.149E-02
TL-208	2.045E-01	3.195E-02	3.195E-02
PB-210	1.012E-01	3.912E-01	3.912E-01
BI-211	2.512E-01	4.064E-01	4.064E-01
BI-212	7.387E-01	2.657E-01	2.657E-01
PB-212	6.407E-01	5.885E-02	5.885E-02
BI-214	4.070E-01	7.259E-02	7.259E-02
PB-214	5.807E-01	8.544E-02	8.544E-02
RN-222	4.070E-01	7.259E-02	7.259E-02
RA-224	5.215E-01	5.325E-01	5.325E-01
RA-226	4.070E-01	7.259E-02	7.259E-02
AC-228	5.708E-01	1.216E-01	1.216E-01
RA-228	5.708E-01	1.216E-01	1.216E-01
TH-228	6.407E-01	5.885E-02	5.885E-02
TH-229	6.264E-02	2.373E-01	2.373E-01
TH-230	4.070E-01	7.259E-02	7.259E-02
PA-231	5.700E-01	3.734E-01	3.734E-01
TH-232	5.708E-01	1.216E-01	1.216E-01
TH-234	5.698E-01	4.228E-01	4.228E-01
U-234	4.070E-01	7.259E-02	7.259E-02
U-235	-6.933E-03	8.912E-02	8.912E-02
U-238	5.698E-01	4.228E-01	4.228E-01
AM-243	1.262E-01	2.792E-02	2.792E-02
ANH-511	6.904E-02	4.007E-02	4.007E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	8.322E-02	2.876E-01	2.900E-01	NOT IDENT.
NA-22	4.823E-03	1.346E-02	1.364E-02	NOT IDENT.
NA-24	-8.175E+14	1.332E+16	0.000E+00	SHORT HLIF
SC-46	-3.741E-03	1.600E-02	1.609E-02	FAIL ABUN
V-48	-4.355E-02	7.079E-02	7.346E-02	NOT IDENT.
CR-51	-1.389E-01	3.211E-01	3.271E-01	NOT IDENT.
MN-54	3.228E-03	1.334E-02	1.342E-02	NOT IDENT.
CO-56	-1.001E-03	1.599E-02	1.600E-02	FAIL ABUN
MN-56	-1.000E+41	1.570E+42	0.000E+00	SHORT HLIF
CO-57	3.231E-03	9.586E-03	9.696E-03	NOT IDENT.
CO-58	-1.742E-02	1.566E-02	1.752E-02	NOT IDENT.
FE-59	5.360E-03	4.249E-02	4.256E-02	NOT IDENT.
CO-60	2.959E-03	1.267E-02	1.274E-02	NOT IDENT.
ZN-65	-2.269E-02	3.513E-02	3.659E-02	NOT IDENT.
GE-68	9.819E-02	4.298E-01	4.320E-01	NOT IDENT.
AS-74	-2.652E-02	1.009E-01	1.016E-01	NOT IDENT.
SE-75	-8.517E-03	2.670E-02	2.697E-02	NOT IDENT.
BR-77	6.568E+04	7.110E+04	7.702E+04	SHORT HLIF
SR-82	-7.669E-02	2.344E-01	2.369E-01	NOT IDENT.
RB-83	1.157E-02	4.607E-02	4.637E-02	NOT IDENT.
KR-85	1.093E+01	4.399E+00	6.605E+00	NOT IDENT.
SR-85	7.288E-02	2.945E-02	4.412E-02	NOT IDENT.
RB-86	8.525E-02	5.792E-01	5.805E-01	NOT IDENT.
Y-88	2.190E-03	1.429E-02	1.433E-02	NOT IDENT.
Y-91	2.973E+00	8.555E+00	8.659E+00	NOT IDENT.
NB-94	3.334E-03	1.192E-02	1.201E-02	NOT IDENT.
NB-95	1.621E-02	2.079E-02	2.203E-02	NOT IDENT.
NB-95M	2.735E-01	8.006E-02	1.470E-01	NOT IDENT.
ZR-95	-7.453E-03	3.215E-02	3.232E-02	NOT IDENT.
NB-97	1.000E+41	6.030E+39	0.000E+00	SHORT HLIF
ZR-97	1.045E+16	3.564E+15	5.906E+15	SHORT HLIF
MO-99	5.636E+02	1.145E+03	1.173E+03	SHORT HLIF
TC-99M	-1.000E+41	1.610E+41	0.000E+00	SHORT HLIF
RH-101	5.173E-03	1.339E-02	1.359E-02	NOT IDENT.
RH-102	7.216E-03	2.438E-02	2.459E-02	FAIL ABUN
RU-103	-9.652E-04	3.377E-02	3.377E-02	FAIL ABUN
RH-106	-6.327E-03	1.436E-01	1.436E-01	NOT IDENT.
RU-106	-6.327E-03	1.436E-01	1.436E-01	NOT IDENT.
AG-108M	-1.203E-02	2.216E-02	2.282E-02	NOT IDENT.
AG-110M	4.693E-04	1.754E-02	1.754E-02	NOT IDENT.
SN-113	-9.141E-03	2.904E-02	2.933E-02	NOT IDENT.
CD-115	-9.564E+02	6.117E+03	6.132E+03	SHORT HLIF
SN-117M	-7.178E-02	6.515E-02	7.274E-02	NOT IDENT.
TE-123M	-1.025E-02	1.239E-02	1.323E-02	NOT IDENT.
SB-124	-2.310E-02	3.483E-02	3.635E-02	NOT IDENT.
SB-125	-3.500E-02	6.754E-02	6.935E-02	FAIL ABUN
TE-125M	2.899E+00	4.781E+00	4.956E+00	NOT IDENT.
I-126	2.864E-01	2.989E-01	3.256E-01	NOT IDENT.
SB-126	-6.916E-02	2.043E-01	2.067E-01	NOT IDENT.
SB-127	-4.654E+00	2.348E+01	2.357E+01	FAIL ABUN
I-131	1.077E-01	4.318E-01	4.345E-01	NOT IDENT.
I-132	1.000E+41	2.427E+41	0.000E+00	SHORT HLIF
TE-132	-5.547E+00	3.794E+01	3.802E+01	SHORT HLIF
BA-133	-1.242E-02	2.507E-02	2.569E-02	NOT IDENT.
I-133	6.084E+10	1.656E+11	1.678E+11	SHORT HLIF
CS-134	4.821E-02	2.425E-02	3.257E-02	FAIL ABUN
CS-135	1.384E-01	8.137E-02	1.025E-01	NOT IDENT.
I-135	4.554E+38	4.675E+39	0.000E+00	SHORT HLIF
CS-136	9.559E-04	1.339E-01	1.339E-01	NOT IDENT.
CE-139	2.749E-03	1.281E-02	1.287E-02	NOT IDENT.
BA-140	-1.750E-01	4.586E-01	4.653E-01	NOT IDENT.
LA-140	4.371E-02	1.075E-01	1.093E-01	FAIL ABUN
CE-141	-1.601E-02	4.523E-02	4.580E-02	NOT IDENT.
CE-143	2.117E+07	7.565E+06	1.218E+07	SHORT HLIF
CE-144	2.640E-04	8.748E-02	8.748E-02	NOT IDENT.
PM-144	1.837E-03	1.256E-02	1.259E-02	NOT IDENT.
PR-144	1.357E-01	9.508E-01	9.527E-01	NOT IDENT.
PM-146	9.801E-04	2.895E-02	2.895E-02	NOT IDENT.
ND-147	9.453E-01	1.188E+00	1.262E+00	FAIL ABUN
PM-147	-7.709E+00	2.694E+02	2.695E+02	NOT IDENT.
PM-149	1.840E+04	5.260E+04	5.325E+04	SHORT HLIF
EU-150	1.574E-02	1.952E-02	2.077E-02	FAIL ABUN
EU-152	-4.964E-02	6.228E-02	6.618E-02	FAIL ABUN
GD-153	1.080E-02	4.294E-02	4.321E-02	NOT IDENT.
EU-154	1.351E-02	3.772E-02	3.821E-02	NOT IDENT.
TB-160	-2.956E-02	5.398E-02	5.560E-02	FAIL ABUN
HO-166M	-9.842E-03	2.104E-02	2.150E-02	FAIL ABUN

TM-171	2.385E+00	2.040E+00	2.306E+00	FAIL	ABUN
HF-172	-5.641E-02	8.144E-02	8.532E-02	FAIL	ABUN
LU-172	3.172E-02	2.190E-02	2.615E-02	FAIL	ABUN
LU-176	7.194E-03	1.382E-02	1.419E-02	FAIL	ABUN
HF-181	-2.114E-02	3.915E-02	4.029E-02	NOT	IDENT.
TA-182	9.949E-03	8.106E-02	8.118E-02	FAIL	ABUN
RE-183	-1.468E-02	3.801E-02	3.858E-02	NOT	IDENT.
RE-184	-3.223E-02	7.657E-02	7.794E-02	NOT	IDENT.
W-188	-9.936E-01	7.425E+00	7.439E+00	FAIL	ABUN
IR-192	3.107E-03	2.109E-02	2.113E-02	FAIL	ABUN
HG-203	2.934E-02	2.515E-02	2.842E-02	NOT	IDENT.
BI-207	-2.561E-03	1.718E-02	1.722E-02	FAIL	ABUN
PB-211	-1.317E-01	4.176E-01	4.218E-01	NOT	IDENT.
RN-219	5.327E-02	2.361E-01	2.373E-01	FAIL	ABUN
RA-223	1.466E-01	3.655E-01	3.715E-01	FAIL	ABUN
AC-227	6.581E-02	1.131E-01	1.169E-01	FAIL	ABUN
TH-227	6.581E-02	1.131E-01	1.169E-01	FAIL	ABUN
TH-231	1.466E-01	3.655E-01	3.715E-01	FAIL	ABUN
PA-233	-2.429E-02	3.194E-02	3.377E-02	FAIL	ABUN
PA-234	1.096E-01	1.617E-01	1.691E-01	FAIL	ABUN
PA-234M	1.516E+00	1.507E+00	1.655E+00	FAIL	ABUN
NP-237	-2.429E-02	3.194E-02	3.377E-02	FAIL	ABUN
NP-238	-5.893E+03	1.106E+04	1.138E+04	SHORT	HLIF
NP-239	6.123E-02	9.211E-02	9.616E-02	FAIL	ABUN
PU-239	2.063E+02	1.785E+02	2.013E+02	FAIL	ABUN
AM-241	2.063E-02	2.350E-02	2.528E-02	NOT	IDENT.
CM-243	3.229E-02	5.234E-02	5.433E-02	FAIL	ABUN
BK-247	-9.467E-03	4.221E-02	4.242E-02	FAIL	ABUN
CM-247	-9.161E-03	2.177E-02	2.216E-02	FAIL	ABUN
CF-249	1.642E-02	2.264E-02	2.382E-02	NOT	IDENT.
CF-251	-1.059E-02	5.249E-02	5.271E-02	NOT	IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1786.6010	87.09	1744.4423	136.47	1694.9794
45.60	1697.7424	87.57	1745.4891	140.51	0.0000
46.54	1729.0105	88.03	1746.4834	143.76	1707.5769
49.72	0.0000	88.34	1747.1549	323.87	1712.6244
51.35	1735.0886	88.47	1747.4381	145.44	1730.6223
51.87	1824.9985	89.96	1750.6445	152.43	1704.7041
52.39	1797.1255	90.64	1752.0996	153.25	1623.6649
52.97	1857.5422	91.11	1753.1005	154.21	1570.8591
53.44	1832.7257	92.59	1756.2411	156.02	1651.4731
54.07	1815.3713	93.35	1757.8411	158.56	1694.2561
57.36	0.0000	94.56	1735.2180	159.00	1676.3925
57.53	2047.6718	94.65	1725.8860	57.98	1543.7051
57.98	2041.3762	94.67	1725.9247	162.66	1535.4067
59.27	1975.5499	94.87	1726.3346	143.76	1572.3083
59.32	1975.7050	97.43	1731.5336	165.86	1566.8947
59.54	1976.3871	98.43	1688.4670	176.31	1621.1990
60.96	2011.9598	98.44	1688.4858	176.60	1651.3844
61.17	2014.1736	99.53	1629.8832	177.52	1643.7682
125.81	2217.4998	100.11	1691.7423	181.07	0.0000
63.29	2253.9265	102.03	1592.5662	181.52	1606.4358
63.58	2254.9153	103.18	1594.6329	184.41	1691.8336
64.28	2238.4775	103.37	1594.9755	185.72	1865.6792
66.73	2268.6504	105.21	1738.0842	193.51	1871.2628
67.24	2231.7666	105.31	1738.2833	197.03	1863.8855
67.68	2296.2119	106.12	1814.0204	198.01	1846.1697
67.75	2271.4961	106.47	1814.7168	201.83	1811.5614
69.67	2335.2112	109.28	1699.1813	203.43	1784.8521
70.83	2282.0811	111.00	1693.3127	205.31	1791.8066
72.81	2278.9050	111.76	0.0000	193.51	1658.5157
72.87	2279.0979	114.06	1719.9984	879.38	1670.9990
74.66	2216.3188	116.30	0.0000	1221.41	1538.3356
74.82	2216.8035	116.74	1675.7130	227.09	1478.5276
74.97	2217.2625	265.00	1778.4761	227.38	1496.2423
77.11	2223.6987	121.12	1747.3511	228.16	0.0000
1093.63	2228.5449	121.22	1747.5288	228.18	1498.8938
79.69	2231.3508	121.78	1715.9445	235.69	1498.1858
80.12	2232.6091	122.06	1710.1300	235.96	1507.6748
80.19	1823.2770	122.92	1751.5928	238.63	1494.6354
80.57	1824.1865	123.07	1760.4240	238.98	0.0000
81.00	1825.2140	123.68	1764.5171	240.99	1496.9661
81.07	1825.3806	125.81	1831.5798	351.93	1497.9536
81.75	1826.9913	127.23	1793.5815	244.70	1378.7872
83.79	1831.7958	127.91	1766.0353	252.40	1341.2017
84.00	1832.2887	129.30	1763.7825	252.80	1338.7476
85.43	1740.8143	946.00	1676.6935	254.15	0.0000
86.55	1743.2637	133.02	1728.9371	256.23	1306.1497
86.79	1743.7838	133.52	1717.8630	260.90	0.0000
86.94	1744.1196	136.00	1716.5916	264.66	1341.5209

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	1333.7981	356.01	1124.8962	595.83	451.2448
265.00	1330.8401	364.49	1136.3063	600.60	434.1253
268.22	1272.2860	366.42	0.0000	507.63	0.0000
269.46	1332.9017	372.51	1113.9058	604.72	471.2888
270.03	1333.3680	375.05	1174.1552	607.14	409.5182
271.23	1346.9259	377.52	1139.6072	609.32	446.7958
273.65	1424.4470	383.85	1219.2284	610.33	466.7114
276.40	1362.1641	388.16	1125.3652	614.28	439.8633
277.37	1332.4568	388.63	1162.7780	618.01	440.4297
103.37	1321.4797	391.69	1175.5214	620.36	423.3337
277.60	1321.4797	400.66	1201.6937	621.93	415.2989
278.00	1318.9629	401.81	1172.0220	630.19	0.0000
279.20	1302.8428	402.40	1208.7308	631.29	400.0320
264.66	1294.5819	404.85	1212.1268	633.25	416.8990
279.70	1283.3248	711.68	1197.2708	634.78	417.1105
280.46	1355.0206	413.71	1190.3171	635.95	420.9688
283.69	1385.4878	414.70	1184.0848	364.49	422.9642
284.31	1343.2188	423.72	1208.3102	645.85	433.4846
285.41	1244.2262	427.09	1306.5466	657.76	396.9393
285.90	0.0000	427.87	1264.3981	657.90	0.0000
287.50	1252.1073	433.94	1286.6049	661.66	343.5802
290.67	1316.4243	439.40	1291.3967	664.57	0.0000
293.27	0.0000	453.88	1329.8452	666.33	249.3867
295.22	1256.1155	427.87	1406.8546	666.50	249.3976
295.96	1162.5557	316.51	1388.8270	667.71	0.0000
298.58	1164.2910	473.00	1319.7494	677.62	215.2694
256.23	1173.2173	475.06	1235.3231	685.70	212.0727
238.63	1173.2920	476.78	1226.8079	695.00	256.9373
300.13	1149.3292	477.60	1178.1349	696.49	254.2291
301.36	1231.7148	482.18	1028.6222	696.51	254.2346
302.85	1256.7633	487.02	966.7043	720.70	253.3313
304.50	1261.1343	492.35	0.0000	697.30	258.0624
304.85	1266.1987	497.08	820.0991	697.49	251.4858
306.78	1202.1810	505.52	779.9097	702.65	258.4972
308.46	1165.0055	507.63	0.0000	884.68	241.8229
311.90	1241.5740	511.00	745.2500	711.68	246.9283
316.51	1161.4746	514.00	724.2274	720.70	247.2121
319.41	1216.6392	514.00	724.2274	293.27	0.0000
320.08	1202.5215	520.40	691.6875	722.78	260.3906
321.04	1171.8925	520.69	0.0000	722.91	260.4018
323.87	1169.3721	522.65	0.0000	723.31	252.2967
325.23	1212.3650	527.90	0.0000	724.19	244.2208
328.76	1200.0330	528.26	673.5367	727.33	185.7868
333.37	1113.4482	529.59	632.3065	733.00	230.1872
333.97	1107.2827	529.87	0.0000	735.93	203.9775
334.37	1107.5179	531.02	591.0461	737.46	202.1660
338.28	1192.7092	537.26	614.9103	739.50	0.0000
338.32	1192.7241	546.56	0.0000	453.88	216.1511
340.48	1153.5555	552.55	547.4733	748.06	231.5129
1048.07	1191.1805	563.25	483.7656	752.31	190.6193
344.28	1223.9303	569.33	470.7792	753.82	189.7460
345.93	1173.8571	569.50	470.8110	756.73	227.3179
351.06	1186.1471	569.70	469.7605	756.80	227.3227
351.93	1110.4130	583.19	415.1371	763.94	201.0285
355.39	0.0000	333.97	444.3117	765.81	212.6799

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.42	209.4180	996.26	165.6947	1620.50	70.5493
631.29	211.0938	1001.03	139.2622	1621.92	70.5667
667.71	0.0000	1002.74	147.5156	1678.03	0.0000
776.52	208.3887	1004.73	163.9844	1690.97	49.2598
777.92	0.0000	1021.30	0.0000	1750.46	0.0000
344.28	198.6035	1025.87	0.0000	1764.49	49.8425
685.70	195.5651	984.45	0.0000	1770.23	57.0156
785.37	181.0682	1037.84	139.4604	846.77	49.8972
792.07	203.5144	1038.76	0.0000	1791.20	0.0000
794.95	196.6977	1046.59	154.3862	1808.65	35.8484
795.86	206.2313	1048.07	147.3400	1810.72	0.0000
801.95	186.5977	1049.04	149.1504	1836.06	37.0283
810.06	176.3122	1050.41	141.2853		
810.29	181.1941	1063.66	145.5029		
810.45	187.0469	1077.00	130.3101		
810.76	188.0407	1077.34	131.3628		
815.77	152.2041	1085.87	137.8867		
818.51	166.9678	1093.63	119.2974		
832.01	196.0246	1099.45	145.6514		
834.85	201.0837	1112.07	122.4958		
835.71	188.3750	1112.84	111.7047		
911.20	188.3750	1115.54	158.6468		
836.80	0.0000	1120.29	134.7500		
846.75	0.0000	1120.55	134.7604		
846.77	175.1717	1121.30	134.7813		
856.80	191.1604	1129.67	142.8679		
860.56	144.2207	1260.41	0.0000		
871.09	159.4900	1147.95	0.0000		
1274.44	148.6786	1173.23	127.8027		
875.33	0.0000	1177.95	116.2028		
879.38	169.7754	1189.05	149.6102		
880.51	161.8791	1204.77	135.0952		
883.24	164.9801	1221.41	147.5558		
884.68	162.0582	1231.02	120.7454		
889.28	172.2116	1235.36	147.9855		
894.76	175.4521	1238.28	153.6276		
898.04	177.5980	1260.41	0.0000		
900.72	177.5432	1271.87	102.5035		
903.28	178.1261	1274.44	109.0836		
911.20	144.1699	1274.54	109.0876		
912.08	144.2021	1291.59	110.3945		
923.98	0.0000	1298.22	0.0000		
926.50	160.8236	1312.11	100.5140		
929.11	190.0997	1332.49	92.4287		
937.49	187.4796	1362.66	0.0000		
944.13	150.4399	1365.19	80.6777		
946.00	144.4489	1368.63	0.0000		
949.00	141.5267	1384.29	75.0174		
954.55	0.0000	1408.01	94.7323		
962.31	170.3994	1457.56	0.0000		
964.08	161.7769	1460.82	54.1113		
966.17	140.1057	1489.16	61.1873		
968.97	140.2040	1505.03	92.5283		
983.53	153.8189	1584.12	55.3027		
984.45	0.0000	1596.21	51.9525		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 03:02:36.96

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656016.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33.CNF;219
Background date : 20-JUN-2016 14:04:29
Sample date     : 17-MAY-2016 11:50:00 Acquisition date : 23-JUN-2016 15:00:40
Sample ID      : G398656016 Sample quantity : 1.63840E+02 GRAM
Detector name   : GAM33 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:10.15 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572234 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.50*	13	1042	1.06	127.11	123	8	3.06E-04	494.9	
2	0	69.28	95	940	2.09	138.66	137	7	2.19E-03	54.7	
3	2	74.86*	694	900	1.21	149.81	143	22	1.61E-02	9.7	4.73E+00
4	2	77.16*	985	892	1.12	154.40	143	22	2.28E-02	6.7	
5	2	80.76	111	884	1.23	161.58	143	22	2.56E-03	45.8	
6	0	84.09*	158	960	1.25	168.24	165	7	3.65E-03	41.8	
7	0	87.32	371	824	1.08	174.68	172	6	8.59E-03	13.3	
8	3	90.05	311	523	1.29	180.14	178	14	7.20E-03	11.7	2.88E+00
9	3	92.75*	304	1042	1.37	185.54	178	14	7.04E-03	28.3	
10	0	105.25	60	546	1.19	210.50	209	5	1.40E-03	59.2	
11	0	109.12	80	942	1.96	218.23	215	8	1.86E-03	67.2	
12	0	129.04	52	968	1.20	258.03	254	8	1.20E-03	104.5	
13	0	143.66*	56	973	1.28	287.22	283	9	1.30E-03	120.2	
14	0	154.07	117	689	1.20	308.02	305	7	2.71E-03	38.3	
15	0	163.29*	73	1038	1.37	326.43	323	11	1.68E-03	100.4	
16	0	185.81*	240	1274	1.14	371.41	364	12	5.56E-03	35.9	
17	0	197.71*	13	950	1.46	395.19	391	10	3.12E-04	506.2	
18	2	203.35	69	333	0.96	406.45	405	9	1.60E-03	39.3	3.68E+00
19	2	205.32*	82	610	1.11	410.40	405	9	1.89E-03	61.2	
20	0	209.32	237	782	1.28	418.38	414	9	5.48E-03	22.3	
21	3	238.68*	2253	476	1.07	477.03	471	18	5.22E-02	3.1	1.39E+00
22	3	241.58	510	730	1.62	482.83	471	18	1.18E-02	12.3	
23	0	258.80	52	460	1.28	517.23	514	8	1.19E-03	73.6	
24	0	263.32	47	383	1.11	526.26	523	7	1.09E-03	70.6	
25	0	270.42	329	713	2.04	540.44	534	13	7.62E-03	17.6	
26	0	277.17	228	686	2.44	553.94	547	13	5.28E-03	24.6	
27	0	295.18*	660	566	1.16	589.92	584	11	1.53E-02	9.0	
28	0	300.15	192	513	0.80	599.85	595	10	4.44E-03	23.2	
29	0	328.29	97	408	1.43	656.07	652	8	2.25E-03	37.5	
30	0	331.42	48	408	1.75	662.33	660	8	1.11E-03	74.2	
31	0	338.34*	414	473	1.22	676.15	671	10	9.58E-03	13.0	
32	0	352.03*	1116	520	1.31	703.51	698	11	2.58E-02	5.4	
33	0	388.80	45	358	1.03	776.98	772	10	1.04E-03	80.0	
34	0	425.20	57	232	1.33	849.73	847	8	1.32E-03	48.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	463.05	152	183	1.15	925.37	922	7	3.52E-03	16.8	
36	0	470.85	9	288	1.44	940.95	936	10	2.14E-04	344.0	
37	0	511.15*	209	512	2.18	1021.50	1014	19	4.83E-03	37.4	
38	0	558.41*	5	215	1.31	1115.95	1112	10	1.09E-04	768.3	
39	0	583.38*	699	293	1.49	1165.87	1160	12	1.62E-02	7.0	
40	0	594.58	12	318	3.37	1188.27	1187	12	2.89E-04	286.0	
41	0	609.60*	783	252	1.49	1218.28	1214	11	1.81E-02	6.0	
42	0	649.33	34	232	1.60	1297.70	1290	12	7.93E-04	90.9	
43	0	663.10	109	310	3.77	1325.24	1319	15	2.51E-03	36.8	
44	0	727.35	205	248	1.53	1453.70	1446	14	4.73E-03	17.8	
45	0	768.45*	3	175	1.22	1535.86	1531	10	7.29E-05	977.8	
46	0	772.71	75	112	2.62	1544.38	1540	9	1.73E-03	28.0	
47	0	786.24	22	197	1.70	1571.44	1564	10	5.15E-04	120.0	
48	0	795.05	70	140	1.66	1589.05	1586	9	1.61E-03	32.9	
49	0	803.00*	3	93	2.83	1604.95	1601	8	7.58E-05	710.0	
50	0	825.06	46	135	1.33	1649.06	1644	11	1.07E-03	51.0	
51	0	835.86	42	143	1.43	1670.67	1667	9	9.63E-04	54.2	
52	0	860.66	75	165	1.46	1720.26	1713	13	1.73E-03	37.4	
53	0	881.86	28	82	1.46	1762.66	1759	7	6.56E-04	56.2	
54	0	911.44*	514	143	1.71	1821.81	1813	16	1.19E-02	8.1	
55	1	965.21	85	137	1.88	1929.34	1924	23	1.96E-03	27.6	1.63E+00
56	1	969.49	330	109	1.89	1937.91	1924	23	7.63E-03	8.4	
57	0	1093.46	35	115	3.55	2185.90	2180	12	8.19E-04	62.7	
58	0	1120.81*	192	126	1.60	2240.62	2233	14	4.45E-03	15.9	
59	0	1155.96	32	102	1.64	2310.93	2307	10	7.39E-04	62.4	
60	0	1219.31	41	190	0.82	2437.69	2430	18	9.48E-04	80.3	
61	0	1239.68	75	118	1.51	2478.44	2475	11	1.74E-03	31.5	
62	0	1378.66	45	42	1.97	2756.59	2752	8	1.04E-03	29.0	
63	0	1461.38*	1201	109	1.86	2922.16	2916	14	2.78E-02	3.7	
64	0	1632.48	27	46	1.10	3264.71	3256	12	6.15E-04	55.4	
65	0	1639.31	17	26	0.93	3278.39	3274	9	3.95E-04	59.7	
66	0	1652.60	11	45	2.93	3304.99	3295	16	2.48E-04	142.2	
67	0	1664.14	14	29	0.81	3328.10	3321	12	3.16E-04	87.2	
68	0	1679.26*	7	27	0.69	3358.38	3352	11	1.65E-04	209.6	
69	0	1730.68	34	52	1.91	3461.34	3453	16	7.76E-04	51.1	
70	0	1753.19	14	57	3.78	3506.43	3495	19	3.24E-04	132.0	
71	0	1765.42	180	32	2.23	3530.91	3522	21	4.16E-03	10.8	
72	0	1848.25	42	15	1.69	3696.82	3693	8	9.72E-04	22.5	
73	2	1930.21	22	29	2.12	3861.00	3852	21	5.02E-04	56.4	1.73E+00
74	2	1933.57	19	19	2.57	3867.73	3852	21	4.32E-04	53.8	
75	0	2028.64	14	23	1.25	4058.19	4050	13	3.25E-04	75.0	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656016.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 11:50:00 Acquisition date : 23-JUN-2016 15:00:40
Sample ID        : G398656016 Sample quantity : 163.84 GRAM
Sample type      : SOLID Sample geometry :
Detector name    : GAMMA33 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:10.15 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.133E+00	3.695E+00	3.695E+00	7.42	OK
MN-54	834.85	99.98*	1.766E+00	9.407E-03	1.022E-02	108.43	OK
AS-74	595.83	59.00*	2.299E+00	3.829E-03	1.646E-02	572.08	OK
	634.78	15.40	2.184E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	4.908E+00	6.774E-01	7.165E-01	42.21	OK
TE-125M	109.28	0.27*	5.957E+00	2.495E+00	3.918E+00	134.33	OK
SN-126	64.28	9.60	2.480E+00	2.928E-02	2.928E-02	989.73	OK
	86.94	8.90	4.908E+00	2.816E-01	2.816E-01	42.21	OK
	87.57	37.00*	4.908E+00	6.774E-02	6.774E-02	42.21	OK
BA-137M	661.66	89.90*	2.111E+00	2.350E-02	2.356E-02	73.65	OK
CS-137	661.66	85.10*	2.111E+00	2.483E-02	2.489E-02	73.65	OK
EU-155	86.55	30.70	4.908E+00	8.164E-02	8.286E-02	42.21	OK
	105.31	21.10*	5.841E+00	2.462E-02	2.499E-02	118.33	OK
TL-208	277.37	6.60	4.261E+00	3.682E-01	3.682E-01	49.15	OK
	583.19	85.00*	2.334E+00	1.469E-01	1.469E-01	13.93	OK
	860.56	12.50	1.727E+00	1.374E-01	1.374E-01	74.85	OK
BI-212	727.33	6.67*	1.965E+00	6.335E-01	6.335E-01	35.56	OK
	785.37	1.10	1.851E+00	4.396E-01	4.396E-01	239.94	OK
	1620.50	1.47	1.036E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.804E+00	6.955E-01	6.955E-01	26.43	OK
	77.11	17.10	4.038E+00	7.374E-01	7.374E-01	13.44	OK
	238.63	43.60*	4.775E+00	4.992E-01	4.992E-01	6.14	OK
	300.09	3.30	3.999E+00	6.543E-01	6.543E-01	46.44	OK
BI-214	609.32	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09	OK
	1120.29	14.92	1.407E+00	3.523E-01	3.523E-01	31.76	OK
	1764.49	15.30	9.587E-01	4.432E-01	4.432E-01	21.62	OK
PB-214	74.82	5.80	3.800E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	4.038E+00	1.300E+00	1.300E+00	13.44	OK
	87.09	3.41	4.892E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.727E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.053E+00	3.988E-01	3.988E-01	18.03	OK
	351.93	35.60*	3.512E+00	3.944E-01	3.944E-01	10.83	OK
RN-222	609.32	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09	OK
	1120.29	14.92	1.407E+00	3.523E-01	3.523E-01	31.76	OK
	1764.49	15.30	9.587E-01	4.432E-01	4.432E-01	21.62	OK
RA-223	81.07	15.00	4.376E+00	8.671E-02	8.671E-02	91.61	OK
	83.79	24.70	4.661E+00	7.031E-02	7.031E-02	83.54	OK
	94.56	8.67	5.371E+00	----- Line	Not Found	-----	Absent
	144.24	3.27	6.182E+00	1.353E-01	1.353E-01	240.34	OK
	154.21	5.70	6.082E+00	1.630E-01	1.630E-01	76.60	OK
	269.46	13.90	4.344E+00	2.481E-01	2.481E-01	35.25	OK
	323.87	3.99*	3.760E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	3.628E+00	1.783E+00	1.783E+00	26.03	OK
RA-224	240.99	4.10*	4.733E+00	5.047E-01	5.047E-01	63.98	OK
RA-226	609.32	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09	OK
	1120.29	14.92	1.407E+00	3.523E-01	3.523E-01	31.76	OK
	1764.49	15.30	9.587E-01	4.432E-01	4.432E-01	21.62	OK
AC-228	105.21	1.10	5.841E+00	4.722E-01	4.722E-01	118.33	OK
	338.32	11.27	3.628E+00	4.492E-01	4.492E-01	26.03	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
RA-228	794.95	4.25	1.835E+00	3.579E-01	3.579E-01	65.80	OK
	835.71	1.61	1.766E+00	5.842E-01	5.842E-01	108.43	OK
	911.20	25.80*	1.652E+00	4.765E-01	4.765E-01	16.10	OK
	968.97	15.80	1.576E+00	5.191E-01	5.191E-01	16.81	OK
	105.21	1.10	5.841E+00	4.722E-01	4.722E-01	118.33	OK
	338.32	11.27	3.628E+00	4.492E-01	4.492E-01	26.03	OK
	794.95	4.25	1.835E+00	3.579E-01	3.579E-01	65.80	OK
	835.71	1.61	1.766E+00	5.842E-01	5.842E-01	108.43	OK
TH-228	911.20	25.80*	1.652E+00	4.765E-01	4.765E-01	16.10	OK
	968.97	15.80	1.576E+00	5.191E-01	5.191E-01	16.81	OK
	74.82	10.28	3.804E+00	6.955E-01	6.955E-01	26.43	OK
	77.11	17.10	4.038E+00	7.374E-01	7.374E-01	13.44	OK
	238.63	43.60*	4.775E+00	4.992E-01	4.992E-01	6.14	OK
	300.09	3.30	3.999E+00	6.543E-01	6.543E-01	46.44	OK
	85.43	14.70	4.661E+00	1.181E-01	1.181E-01	83.54	OK
	88.47	24.00	4.908E+00	1.044E-01	1.044E-01	42.21	OK
TH-230	193.51	4.41*	5.490E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.205E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09	OK
	1120.29	14.92	1.407E+00	3.523E-01	3.523E-01	31.76	OK
	1764.49	15.30	9.587E-01	4.432E-01	4.432E-01	21.62	OK
	283.69	1.70	4.183E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.999E+00	4.036E-01	4.036E-01	46.44	OK
	81.07	15.00	4.376E+00	8.671E-02	8.671E-02	91.61	OK
TH-231	83.79	24.70	4.661E+00	7.031E-02	7.031E-02	83.54	OK
	94.87	5.69	5.388E+00	----- Line	Not Found	-----	Absent
	144.24	3.27	6.182E+00	1.353E-01	1.353E-01	240.34	OK
	154.21	5.70	6.082E+00	1.630E-01	1.630E-01	76.60	OK
	269.46	13.90	4.344E+00	2.481E-01	2.481E-01	35.25	OK
	323.87	3.99*	3.760E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	3.628E+00	1.783E+00	1.783E+00	26.03	OK
	105.21	1.10	5.841E+00	4.722E-01	4.722E-01	118.33	OK
TH-232	338.32	11.27	3.628E+00	4.492E-01	4.492E-01	26.03	OK
	835.71	1.61	1.766E+00	5.842E-01	5.842E-01	108.43	OK
	911.20	25.80*	1.652E+00	4.765E-01	4.765E-01	16.10	OK
	968.97	15.80	1.576E+00	5.191E-01	5.191E-01	16.81	OK
	63.29	3.70*	2.480E+00	7.596E-02	7.596E-02	989.73	OK
	92.59	4.23	5.267E+00	6.933E-01	6.933E-01	56.68	OK
	609.32	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09	OK
	1120.29	14.92	1.407E+00	3.523E-01	3.523E-01	31.76	OK
U-234	1764.49	15.30	9.587E-01	4.432E-01	4.432E-01	21.62	OK
	89.96	3.47	5.098E+00	8.958E-01	8.958E-01	23.42	OK
	93.35	5.60	5.267E+00	5.237E-01	5.237E-01	56.68	OK
	143.76	10.96*	6.182E+00	4.036E-02	4.036E-02	240.34	OK
	163.33	5.08	5.964E+00	1.153E-01	1.153E-01	200.79	OK
	185.72	57.20	5.616E+00	3.542E-02	3.542E-02	71.79	OK
	205.31	5.01	5.295E+00	1.446E-01	1.446E-01	122.45	OK
	63.29	3.70*	2.480E+00	7.596E-02	7.596E-02	989.73	OK
U-238	92.59	4.23	5.267E+00	6.933E-01	6.933E-01	56.68	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AM-243	43.53	5.90	2.461E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.804E+00	1.064E-01	1.064E-01	26.43	OK
CF-249	252.80	2.50	4.575E+00	----- Line	Not Found	-----	Absent
	333.37	14.60	3.672E+00	----- Line	Not Found	-----	Absent
	388.16	66.00*	3.237E+00	9.233E-03	9.235E-03	159.99	OK
ANH-511	511.00	100.00*	2.592E+00	3.409E-02	3.409E-02	74.73	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656016.CNF;1
Acquisition date : 23-JUN-2016 15:00:40 Sensitivity : 3.000
Detector ID : GAM33 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.15 Half life ratio : *****
Sample date : 17-MAY-2016 11:50:00 Analyst initials: MXR1
Sample ID : G398656016 Sample Quantity : 1.6384E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUN-2016 07:00:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	3.695E+00	2.685E-01	1.298E-01
MN-54	1.022E-02	1.086E-02	1.533E-02
AS-74	1.646E-02	9.226E-02	9.442E-02
CD-109	7.165E-01	2.964E-01	3.254E-01
TE-125M	3.918E+00	5.158E+00	5.600E+00
SN-126	6.774E-02	2.802E-02	3.096E-02
BA-137M	2.356E-02	1.700E-02	1.556E-02
CS-137	2.489E-02	1.796E-02	1.644E-02
EU-155	2.499E-02	2.898E-02	4.220E-02
TL-208	1.469E-01	2.007E-02	1.454E-02
BI-212	6.335E-01	2.208E-01	1.906E-01
PB-212	4.992E-01	3.003E-02	2.229E-02
BI-214	3.166E-01	3.750E-02	3.101E-02
PB-214	3.944E-01	4.185E-02	3.013E-02
RN-222	3.166E-01	3.750E-02	3.101E-02
RA-223	8.132E-02	1.604E-01	2.654E-01
RA-224	5.047E-01	3.165E-01	2.390E-01
RA-226	3.166E-01	3.750E-02	3.101E-02
AC-228	4.765E-01	7.519E-02	5.089E-02
RA-228	4.765E-01	7.519E-02	5.089E-02
TH-228	4.992E-01	3.003E-02	2.229E-02
TH-229	1.107E-01	1.233E-01	2.136E-01
TH-230	3.166E-01	3.750E-02	3.101E-02
PA-231	4.036E-01	1.837E-01	1.845E-01
TH-231	8.132E-02	1.604E-01	2.654E-01
TH-232	4.765E-01	7.519E-02	5.089E-02
TH-234	7.596E-02	7.368E-01	6.388E-01
U-234	3.166E-01	3.750E-02	3.101E-02
U-235	4.036E-02	9.507E-02	8.119E-02
U-238	7.596E-02	7.368E-01	6.388E-01
AM-243	1.064E-01	2.755E-02	2.282E-02
CF-249	9.235E-03	1.448E-02	1.605E-02
ANH-511	3.409E-02	2.497E-02	1.214E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-6.040E-02	9.793E-02	1.706E-01	NOT IDENT.
NA-22	-2.011E-03	7.924E-03	1.435E-02	NOT IDENT.
NA-24	0.000E+00	7.610E+15	0.000E+00	SHORT HLIF
AL-26	1.059E-03	7.823E-03	1.435E-02	NOT IDENT.
SC-46	-1.566E-03	1.014E-02	1.815E-02	FAIL ABUN
V-48	-1.729E-02	3.899E-02	6.799E-02	NOT IDENT.
CR-51	-8.773E-02	1.464E-01	2.643E-01	NOT IDENT.
CO-56	-2.005E-03	1.142E-02	2.043E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-3.785E-03	6.026E-03	1.085E-02	NOT IDENT.
CO-58	-7.811E-04	1.099E-02	1.989E-02	NOT IDENT.
FE-59	2.554E-02	3.021E-02	4.964E-02	NOT IDENT.
CO-60	-6.655E-03	8.146E-03	1.410E-02	NOT IDENT.
ZN-65	-1.218E-02	2.091E-02	3.019E-02	NOT IDENT.
GE-68	4.074E-01	2.849E-01	5.480E-01	NOT IDENT.
AS-73	-2.055E-02	2.950E-01	5.686E-01	NOT IDENT.
SE-75	1.019E-02	1.410E-02	1.989E-02	FAIL ABUN
BR-77	0.000E+00	3.075E+03	0.000E+00	SHORT HLIF
SR-82	-3.903E-02	1.463E-01	2.273E-01	NOT IDENT.
RB-83	-6.068E-03	2.060E-02	3.482E-02	NOT IDENT.
KR-85	0.000E+00	1.942E+00	3.978E+00	NOT IDENT.
SR-85	0.000E+00	1.300E-02	2.662E-02	NOT IDENT.
RB-86	5.776E-01	3.872E-01	7.472E-01	NOT IDENT.
Y-88	2.075E-03	9.462E-03	1.760E-02	NOT IDENT.
Y-91	-6.561E+00	5.324E+00	8.572E+00	NOT IDENT.
NB-94	2.072E-03	7.931E-03	1.466E-02	NOT IDENT.
NB-95	-1.034E-02	1.690E-02	2.268E-02	NOT IDENT.
NB-95M	2.732E-02	3.662E-02	6.223E-02	NOT IDENT.
ZR-95	1.553E-02	2.033E-02	3.845E-02	NOT IDENT.
NB-97	0.000E+00	1.917E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.521E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.429E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.257E-03	8.141E-03	1.336E-02	FAIL ABUN
RH-102	3.616E-04	1.230E-02	2.282E-02	NOT IDENT.
RU-103	-1.377E-02	1.423E-02	2.429E-02	FAIL ABUN
RH-106	5.286E-03	7.369E-02	1.370E-01	NOT IDENT.
RU-106	5.286E-03	7.369E-02	1.370E-01	NOT IDENT.
AG-108M	4.033E-03	6.842E-03	1.262E-02	NOT IDENT.
AG-110M	-7.602E-03	1.330E-02	1.984E-02	NOT IDENT.
SN-113	9.341E-04	1.280E-02	2.047E-02	NOT IDENT.
CD-115	0.000E+00	2.616E+03	0.000E+00	SHORT HLIF
SN-117M	1.295E-02	4.129E-02	6.680E-02	NOT IDENT.
TE-123M	3.912E-03	8.600E-03	1.276E-02	NOT IDENT.
SB-124	1.875E-02	2.439E-02	4.741E-02	NOT IDENT.
SB-125	4.243E-03	2.352E-02	3.757E-02	FAIL ABUN
I-126	1.557E-01	1.811E-01	3.063E-01	FAIL ABUN
SB-126	1.114E-01	1.240E-01	2.095E-01	NOT IDENT.
SB-127	2.623E+00	1.555E+01	2.887E+01	NOT IDENT.
I-131	-1.274E-01	1.778E-01	3.162E-01	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.920E+01	0.000E+00	SHORT HLIF
BA-133	2.686E-03	1.049E-02	1.706E-02	FAIL ABUN
I-133	0.000E+00	6.943E+10	0.000E+00	SHORT HLIF
CS-134	1.842E-02	1.188E-02	1.874E-02	FAIL ABUN
CS-135	6.071E-02	4.335E-02	6.493E-02	NOT IDENT.
I-135	0.000E+00	2.830E+39	0.000E+00	SHORT HLIF
CS-136	-3.043E-02	7.144E-02	1.239E-01	FAIL ABUN
CE-139	2.266E-03	8.402E-03	1.351E-02	NOT IDENT.
BA-140	7.114E-02	2.106E-01	3.793E-01	FAIL ABUN
LA-140	-3.689E-02	6.900E-02	1.196E-01	FAIL ABUN
CE-141	2.930E-02	2.522E-02	4.219E-02	NOT IDENT.
CE-143	0.000E+00	2.295E+06	0.000E+00	SHORT HLIF
CE-144	1.388E-03	4.879E-02	8.454E-02	FAIL ABUN
PM-144	1.829E-03	8.335E-03	1.541E-02	NOT IDENT.
PR-144	1.379E-01	6.310E-01	1.167E+00	NOT IDENT.
PM-146	1.262E-03	9.935E-03	1.794E-02	NOT IDENT.
ND-147	-1.720E-02	4.967E-01	8.832E-01	FAIL ABUN
PM-147	4.697E+01	1.672E+02	3.087E+02	NOT IDENT.
PM-149	0.000E+00	2.131E+04	0.000E+00	SHORT HLIF
EU-150	-6.661E-04	9.427E-03	1.092E-02	FAIL ABUN
EU-152	-1.452E-02	2.274E-02	3.928E-02	FAIL ABUN
GD-153	-3.228E-02	2.795E-02	3.963E-02	FAIL ABUN
EU-154	-8.973E-03	2.241E-02	4.018E-02	NOT IDENT.
TB-160	2.086E-04	3.950E-02	6.197E-02	FAIL ABUN

HO-166M	6.682E-03	1.346E-02	2.523E-02	FAIL ABUN
TM-171	5.145E+00	5.310E+00	1.053E+01	NOT IDENT.
HF-172	3.819E-02	4.743E-02	7.946E-02	FAIL ABUN
LU-172	1.570E-02	1.928E-02	2.575E-02	FAIL ABUN
LU-176	-2.815E-04	5.599E-03	1.034E-02	FAIL ABUN
HF-181	1.536E-02	1.477E-02	2.757E-02	NOT IDENT.
TA-182	3.767E-02	4.365E-02	8.328E-02	FAIL ABUN
RE-183	-4.850E-02	6.595E-02	1.243E-01	FAIL ABUN
RE-184	-2.013E-04	5.019E-02	7.815E-02	NOT IDENT.
W-188	-2.934E+00	2.234E+00	3.433E+00	FAIL ABUN
IR-192	3.300E-03	9.646E-03	1.797E-02	FAIL ABUN
HG-203	1.042E-02	1.322E-02	2.231E-02	NOT IDENT.
BI-207	-4.410E-03	1.349E-02	2.030E-02	FAIL ABUN
PB-210	6.482E-01	1.327E+00	2.613E+00	NOT IDENT.
BI-211	0.000E+00	1.153E-01	1.629E-01	FAIL ABUN
PB-211	-4.233E-02	1.626E-01	2.917E-01	NOT IDENT.
RN-219	-8.687E-02	9.266E-02	1.619E-01	FAIL ABUN
AC-227	-2.057E-02	6.098E-02	9.912E-02	FAIL ABUN
TH-227	-2.057E-02	6.098E-02	9.912E-02	FAIL ABUN
PA-233	-4.983E-03	1.402E-02	2.559E-02	FAIL ABUN
PA-234	-1.434E-02	6.397E-02	1.134E-01	FAIL ABUN
PA-234M	-5.068E-01	1.261E+00	1.994E+00	NOT IDENT.
NP-237	-4.983E-03	1.402E-02	2.559E-02	FAIL ABUN
NP-238	0.000E+00	6.144E+03	0.000E+00	SHORT HLIF
NP-239	-7.364E-02	6.111E-02	1.086E-01	FAIL ABUN
PU-239	6.508E+01	1.333E+02	1.465E+02	FAIL ABUN
AM-241	3.903E-02	4.385E-02	7.752E-02	NOT IDENT.
CM-243	-1.423E-02	2.611E-02	4.231E-02	FAIL ABUN
BK-247	4.647E-03	2.566E-02	3.108E-02	FAIL ABUN
CM-247	-6.208E-03	8.414E-03	1.482E-02	FAIL ABUN
CF-251	-8.114E-03	2.920E-02	5.163E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1169	10.66*	1.133E+00	3.695E+00	3.695E+00	7.42
MN-54	834.85	44	99.98*	1.766E+00	9.407E-03	1.022E-02	108.43
AS-74	595.83	14	59.00*	2.299E+00	3.829E-03	1.646E-02	572.08
	634.78	-----	15.40	2.184E+00	-----	Line Not Found	-----
CD-109	88.03	497	3.70*	4.908E+00	1.045E+00	1.105E+00	26.62
TE-125M	109.28	105	0.27*	5.957E+00	2.495E+00	3.918E+00	134.33
SN-126	64.28	18	9.60	2.480E+00	2.928E-02	2.928E-02	989.73
	86.94	497	8.90	4.908E+00	4.344E-01	4.344E-01	26.62
	87.57	497	37.00*	4.908E+00	1.045E-01	1.045E-01	26.62
BA-137M	661.66	117	89.90*	2.111E+00	2.350E-02	2.356E-02	73.65
CS-137	661.66	117	85.10*	2.111E+00	2.483E-02	2.489E-02	73.65
EU-155	86.55	497	30.70	4.908E+00	1.259E-01	1.278E-01	26.62
	105.31	79	21.10*	5.841E+00	2.462E-02	2.499E-02	118.33
TL-208	277.37	271	6.60	4.261E+00	3.682E-01	3.682E-01	49.15
	583.19	763	85.00*	2.334E+00	1.469E-01	1.469E-01	13.93
	860.56	78	12.50	1.727E+00	1.374E-01	1.374E-01	74.85
BI-211	72.87	-----	1.23	3.591E+00	-----	Line Not Found	-----
	351.06	1291	12.92*	3.512E+00	1.087E+00	1.087E+00	10.83
BI-212	727.33	217	6.67*	1.965E+00	6.335E-01	6.335E-01	35.56
	785.37	23	1.10	1.851E+00	4.396E-01	4.396E-01	239.94
	1620.50	-----	1.47	1.036E+00	-----	Line Not Found	-----
PB-212	74.82	943	10.28	3.804E+00	9.205E-01	9.205E-01	19.48
	77.11	1333	17.10	4.038E+00	7.374E-01	7.374E-01	13.44
	238.63	2722	43.60*	4.775E+00	4.992E-01	4.992E-01	6.14
	300.09	226	3.30	3.999E+00	6.543E-01	6.543E-01	46.44
BI-214	609.32	850	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09
	1120.29	194	14.92	1.407E+00	3.523E-01	3.523E-01	31.76
	1764.49	170	15.30	9.587E-01	4.432E-01	4.432E-01	21.62
PB-214	74.82	943	5.80	3.804E+00	1.631E+00	1.632E+00	19.48
	77.11	1333	9.70	4.038E+00	1.300E+00	1.300E+00	13.44
	87.09	497	3.41	4.908E+00	1.134E+00	1.134E+00	26.62
	242.00	615	7.25	4.733E+00	6.842E-01	6.842E-01	24.54
	295.22	780	18.42	4.053E+00	3.988E-01	3.988E-01	18.03
	351.93	1291	35.60*	3.512E+00	3.944E-01	3.944E-01	10.83
RN-222	609.32	850	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09
	1120.29	194	14.92	1.407E+00	3.523E-01	3.523E-01	31.76
	1764.49	170	15.30	9.587E-01	4.432E-01	4.432E-01	21.62
RA-223	81.07	149	15.00	4.376E+00	8.671E-02	8.671E-02	91.61
	83.79	212	24.70	4.661E+00	7.031E-02	7.031E-02	83.54
	94.56	-----	8.67	5.371E+00	-----	Line Not Found	-----
	144.24	72	3.27	6.182E+00	1.353E-01	1.353E-01	240.34
	154.21	148	5.70	6.082E+00	1.630E-01	1.630E-01	76.60
	269.46	392	13.90	4.344E+00	2.481E-01	2.481E-01	35.25
	323.87	-----	3.99*	3.760E+00	-----	Line Not Found	-----
	338.28	481	2.84	3.628E+00	1.783E+00	1.783E+00	26.03
RA-224	240.99	615	4.10*	4.733E+00	1.210E+00	1.210E+00	24.54
RA-226	609.32	850	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AC-228	1120.29	194	14.92	1.407E+00	3.523E-01	3.523E-01	31.76
	1764.49	170	15.30	9.587E-01	4.432E-01	4.432E-01	21.62
	105.21	79	1.10	5.841E+00	4.722E-01	4.722E-01	118.33
	338.32	481	11.27	3.628E+00	4.492E-01	4.492E-01	26.03
	794.95	73	4.25	1.835E+00	3.579E-01	3.579E-01	65.80
RA-228	835.71	44	1.61	1.766E+00	5.842E-01	5.842E-01	108.43
	911.20	532	25.80*	1.652E+00	4.765E-01	4.765E-01	16.10
	968.97	338	15.80	1.576E+00	5.191E-01	5.191E-01	16.81
	105.21	79	1.10	5.841E+00	4.722E-01	4.722E-01	118.33
	338.32	481	11.27	3.628E+00	4.492E-01	4.492E-01	26.03
TH-228	794.95	73	4.25	1.835E+00	3.579E-01	3.579E-01	65.80
	835.71	44	1.61	1.766E+00	5.842E-01	5.842E-01	108.43
	911.20	532	25.80*	1.652E+00	4.765E-01	4.765E-01	16.10
	968.97	338	15.80	1.576E+00	5.191E-01	5.191E-01	16.81
	74.82	943	10.28	3.804E+00	9.205E-01	9.205E-01	19.48
TH-229	77.11	1333	17.10	4.038E+00	7.374E-01	7.374E-01	13.44
	238.63	2722	43.60*	4.775E+00	4.992E-01	4.992E-01	6.14
	300.09	226	3.30	3.999E+00	6.543E-01	6.543E-01	46.44
	85.43	212	14.70	4.661E+00	1.181E-01	1.181E-01	83.54
	88.47	497	24.00	4.908E+00	1.611E-01	1.611E-01	26.62
TH-230	193.51	-----	4.41*	5.490E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.205E+00	-----	Line Not Found	-----
	609.32	850	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09
	1120.29	194	14.92	1.407E+00	3.523E-01	3.523E-01	31.76
	1764.49	170	15.30	9.587E-01	4.432E-01	4.432E-01	21.62
PA-231	283.69	-----	1.70	4.183E+00	-----	Line Not Found	-----
TH-231	301.36	226	5.35*	3.999E+00	4.036E-01	4.036E-01	46.44
	81.07	149	15.00	4.376E+00	8.671E-02	8.671E-02	91.61
	83.79	212	24.70	4.661E+00	7.031E-02	7.031E-02	83.54
	94.87	-----	5.69	5.388E+00	-----	Line Not Found	-----
	144.24	72	3.27	6.182E+00	1.353E-01	1.353E-01	240.34
TH-232	154.21	148	5.70	6.082E+00	1.630E-01	1.630E-01	76.60
	269.46	392	13.90	4.344E+00	2.481E-01	2.481E-01	35.25
	323.87	-----	3.99*	3.760E+00	-----	Line Not Found	-----
	338.28	481	2.84	3.628E+00	1.783E+00	1.783E+00	26.03
	105.21	79	1.10	5.841E+00	4.722E-01	4.722E-01	118.33
TH-234	338.32	481	11.27	3.628E+00	4.492E-01	4.492E-01	26.03
	835.71	44	1.61	1.766E+00	5.842E-01	5.842E-01	108.43
	911.20	532	25.80*	1.652E+00	4.765E-01	4.765E-01	16.10
	968.97	338	15.80	1.576E+00	5.191E-01	5.191E-01	16.81
	63.29	18	3.70*	2.480E+00	7.596E-02	7.596E-02	989.73
U-234	92.59	404	4.23	5.267E+00	6.933E-01	6.933E-01	56.68
	609.32	850	45.49*	2.254E+00	3.166E-01	3.166E-01	12.09
U-235	1120.29	194	14.92	1.407E+00	3.523E-01	3.523E-01	31.76
	1764.49	170	15.30	9.587E-01	4.432E-01	4.432E-01	21.62
	89.96	415	3.47	5.098E+00	8.958E-01	8.958E-01	23.42
	93.35	404	5.60	5.267E+00	5.237E-01	5.237E-01	56.68
	143.76	72	10.96*	6.182E+00	4.036E-02	4.036E-02	240.34
	163.33	91	5.08	5.964E+00	1.153E-01	1.153E-01	200.79

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	185.72	298	57.20	5.616E+00	3.542E-02	3.542E-02	71.79
	205.31	100	5.01	5.295E+00	1.446E-01	1.446E-01	122.45
U-238	63.29	18	3.70*	2.480E+00	7.596E-02	7.596E-02	989.73
	92.59	404	4.23	5.267E+00	6.933E-01	6.933E-01	56.68
AM-243	43.53	-----	5.90	2.461E-01	-----	Line Not Found	-----
	74.66	943	67.20*	3.804E+00	1.408E-01	1.408E-01	19.48
CF-249	252.80	-----	2.50	4.575E+00	-----	Line Not Found	-----
	333.37	-----	14.60	3.672E+00	-----	Line Not Found	-----
	388.16	52	66.00*	3.237E+00	9.233E-03	9.235E-03	159.99
ANH-511	511.00	231	100.00*	2.592E+00	3.409E-02	3.409E-02	74.73

Flag: "*" = Keyline

Total number of lines in spectrum 75
Number of unidentified lines 21
Number of lines tentatively identified by NID 54 72.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	3.695E+00	3.695E+00	0.274E+00	7.42	
MN-54	312.05D	1.09	9.407E-03	1.022E-02	1.108E-02	108.43	
AS-74	17.77D	4.30	3.829E-03	1.646E-02	9.415E-02	572.08	
CD-109	461.40D	1.06	1.045E+00	1.105E+00	0.294E+00	26.62	
TE-125M	57.40D	1.57	2.495E+00	3.918E+00	5.264E+00	134.33	
SN-126	2.30E+05Y	1.00	1.045E-01	1.045E-01	0.278E-01	26.62	
BA-137M	30.08Y	1.00	2.350E-02	2.356E-02	1.735E-02	73.65	
CS-137	30.08Y	1.00	2.483E-02	2.489E-02	1.833E-02	73.65	
EU-155	4.75Y	1.02	2.462E-02	2.499E-02	2.957E-02	118.33	
TL-208	1.41E+10Y	1.00	1.469E-01	1.469E-01	0.205E-01	13.93	
BI-211	7.04E+08Y	1.00	1.087E+00	1.087E+00	0.118E+00	10.83	
BI-212	1.41E+10Y	1.00	6.335E-01	6.335E-01	2.253E-01	35.56	
PB-212	1.41E+10Y	1.00	4.992E-01	4.992E-01	0.306E-01	6.14	
BI-214	1600.00Y	1.00	3.166E-01	3.166E-01	0.383E-01	12.09	
PB-214	1600.00Y	1.00	3.944E-01	3.944E-01	0.427E-01	10.83	
RN-222	1600.00Y	1.00	3.166E-01	3.166E-01	0.383E-01	12.09	
RA-223	7.04E+08Y	1.00	7.031E-02	7.031E-02	5.874E-02	83.54	K
RA-224	1.41E+10Y	1.00	1.210E+00	1.210E+00	0.297E+00	24.54	
RA-226	1600.00Y	1.00	3.166E-01	3.166E-01	0.383E-01	12.09	
AC-228	1.41E+10Y	1.00	4.765E-01	4.765E-01	0.767E-01	16.10	
RA-228	1.41E+10Y	1.00	4.765E-01	4.765E-01	0.767E-01	16.10	
TH-228	1.41E+10Y	1.00	4.992E-01	4.992E-01	0.306E-01	6.14	
TH-229	7340.00Y	1.00	1.611E-01	1.611E-01	0.429E-01	26.62	K
TH-230	7.54E+04Y	1.00	3.166E-01	3.166E-01	0.383E-01	12.09	
PA-231	7.04E+08Y	1.00	4.036E-01	4.036E-01	1.875E-01	46.44	
TH-231	7.04E+08Y	1.00	7.031E-02	7.031E-02	5.874E-02	83.54	K
TH-232	1.41E+10Y	1.00	4.765E-01	4.765E-01	0.767E-01	16.10	
TH-234	4.47E+09Y	1.00	7.596E-02	7.596E-02	75.18E-02	989.73	
U-234	2.45E+05Y	1.00	3.166E-01	3.166E-01	0.383E-01	12.09	
U-235	7.04E+08Y	1.00	4.036E-02	4.036E-02	9.701E-02	240.34	
U-238	4.47E+09Y	1.00	7.596E-02	7.596E-02	75.18E-02	989.73	
AM-243	7370.00Y	1.00	1.408E-01	1.408E-01	0.274E-01	19.48	
CF-249	351.00Y	1.00	9.233E-03	9.235E-03	14.77E-03	159.99	
ANH-511	1.00E+09Y	1.00	3.409E-02	3.409E-02	2.548E-02	74.73	
Total Activity :			1.599E+01	1.749E+01			

Grand Total Activity : 1.599E+01 1.749E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	69.28	129	1287	2.09	138.66	137	7	2.19E-03	****	3.19E+00	T
0	129.04	67	1246	1.20	258.03	254	8	1.20E-03	****	6.22E+00	T
0	197.71	17	1171	1.46	395.19	391	10	3.12E-04	****	5.42E+00	T
2	203.35	85	409	0.96	406.45	405	9	1.60E-03	78.6	5.33E+00	T
0	209.32	290	958	1.28	418.38	414	9	5.48E-03	44.6	5.23E+00	
0	258.80	62	551	1.28	517.23	514	8	1.19E-03	****	4.49E+00	
0	263.32	56	458	1.11	526.26	523	7	1.09E-03	****	4.43E+00	T
0	328.29	113	476	1.43	656.07	652	8	2.25E-03	75.1	3.72E+00	T
0	331.42	56	475	1.75	662.33	660	8	1.11E-03	****	3.69E+00	
0	425.20	65	263	1.33	849.73	847	8	1.32E-03	96.1	3.01E+00	T
0	463.05	171	205	1.15	925.37	922	7	3.52E-03	33.7	2.81E+00	T
0	470.85	10	322	1.44	940.95	936	10	2.14E-04	****	2.77E+00	
0	558.41	5	236	1.31	1115.95	1112	10	1.09E-04	****	2.42E+00	
0	649.33	37	250	1.60	1297.70	1290	12	7.93E-04	****	2.15E+00	
0	768.45	3	185	1.22	1535.86	1531	10	7.29E-05	****	1.88E+00	
0	772.71	79	118	2.62	1544.38	1540	9	1.73E-03	56.0	1.88E+00	T
0	803.00	3	97	2.83	1604.95	1601	8	7.58E-05	****	1.82E+00	T
0	825.06	49	141	1.33	1649.06	1644	11	1.07E-03	****	1.78E+00	
0	881.86	29	85	1.46	1762.66	1759	7	6.56E-04	****	1.69E+00	T
1	965.21	87	140	1.88	1929.34	1924	23	1.96E-03	55.2	1.58E+00	T
0	1093.46	36	116	3.55	2185.90	2180	12	8.19E-04	****	1.43E+00	T
0	1155.96	32	102	1.64	2310.93	2307	10	7.39E-04	****	1.37E+00	
0	1219.31	41	189	0.82	2437.69	2430	18	9.48E-04	****	1.32E+00	
0	1239.68	75	117	1.51	2478.44	2475	11	1.74E-03	63.0	1.30E+00	T
0	1378.66	44	41	1.97	2756.59	2752	8	1.04E-03	58.1	1.19E+00	
0	1632.48	25	44	1.10	3264.71	3256	12	6.15E-04	****	1.03E+00	
0	1639.31	16	25	0.93	3278.39	3274	9	3.95E-04	****	1.03E+00	
0	1652.60	10	43	2.93	3304.99	3295	16	2.48E-04	****	1.02E+00	
0	1664.14	13	28	0.81	3328.10	3321	12	3.16E-04	****	1.01E+00	
0	1679.26	7	26	0.69	3358.38	3352	11	1.65E-04	****	1.00E+00	T
0	1730.68	32	50	1.91	3461.34	3453	16	7.76E-04	****	9.76E-01	
0	1753.19	13	54	3.78	3506.43	3495	19	3.24E-04	****	9.65E-01	
0	1848.25	40	14	1.69	3696.82	3693	8	9.72E-04	44.9	9.18E-01	
2	1930.21	20	27	2.12	3861.00	3852	21	5.02E-04	****	8.81E-01	
2	1933.57	17	18	2.57	3867.73	3852	21	4.32E-04	****	8.80E-01	
0	2028.64	13	21	1.25	4058.19	4050	13	3.25E-04	****	8.39E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656016.CNF;1
Acquisition date : 23-JUN-2016 15:00:40 Sensitivity : 3.000
Detector ID : GAM33 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.15 Half life ratio : *****
Sample date : 17-MAY-2016 11:50:00 Nuclide Library : SOLID
Sample ID : G398656016 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6384E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUN-2016 07:00:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.058E-02
MN-54	7.344E-03
AS-74	4.553E-02
CD-109	1.595E-01
TE-125M	2.747E+00
SN-126	1.518E-02
BA-137M	7.503E-03
CS-137	7.927E-03
EU-155	2.065E-02
TL-208	7.003E-03
BI-212	9.125E-02
PB-212	1.089E-02
BI-214	1.499E-02
PB-214	1.464E-02
RN-222	1.499E-02
RA-223	1.291E-01
RA-224	1.167E-01
RA-226	1.499E-02
AC-228	2.421E-02
RA-228	2.421E-02
TH-228	1.089E-02
TH-229	1.046E-01
TH-230	1.499E-02
PA-231	8.972E-02
TH-231	1.291E-01
TH-232	2.421E-02
TH-234	3.133E-01
U-234	1.499E-02
U-235	3.979E-02
U-238	3.133E-01
AM-243	1.119E-02
CF-249	7.777E-03
ANH-511	5.864E-03

---- Non-Identified Nuclides ----

Lc

Nuclide	(pCi/GRAM)	
BE-7	8.227E-02	NOT IDENT.
NA-22	6.755E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.624E-03	NOT IDENT.
SC-46	8.652E-03	FAIL ABUN
V-48	3.229E-02	NOT IDENT.
CR-51	1.285E-01	NOT IDENT.
CO-56	9.795E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.310E-03	NOT IDENT.
CO-58	9.521E-03	NOT IDENT.
FE-59	2.366E-02	NOT IDENT.
CO-60	6.621E-03	NOT IDENT.
ZN-65	1.428E-02	NOT IDENT.
GE-68	2.617E-01	NOT IDENT.
AS-73	2.781E-01	NOT IDENT.
SE-75	9.690E-03	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.085E-01	NOT IDENT.
RB-83	1.679E-02	NOT IDENT.
KR-85	1.942E+00	NOT IDENT.
SR-85	1.299E-02	NOT IDENT.
RB-86	3.569E-01	NOT IDENT.
Y-88	8.080E-03	NOT IDENT.
Y-91	4.051E+00	NOT IDENT.
NB-94	7.070E-03	NOT IDENT.
NB-95	1.092E-02	NOT IDENT.
NB-95M	3.044E-02	NOT IDENT.
ZR-95	1.847E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.547E-03	FAIL ABUN
RH-102	1.097E-02	NOT IDENT.
RU-103	1.172E-02	FAIL ABUN
RH-106	6.592E-02	NOT IDENT.
RU-106	6.592E-02	NOT IDENT.
AG-108M	6.113E-03	NOT IDENT.
AG-110M	9.443E-03	NOT IDENT.
SN-113	9.916E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.270E-02	NOT IDENT.
TE-123M	6.246E-03	NOT IDENT.
SB-124	2.203E-02	NOT IDENT.
SB-125	1.817E-02	FAIL ABUN
I-126	1.475E-01	FAIL ABUN
SB-126	1.007E-01	NOT IDENT.
SB-127	1.385E+01	NOT IDENT.
I-131	1.532E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.280E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.024E-03	FAIL ABUN
CS-135	3.170E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.879E-02	FAIL ABUN
CE-139	6.615E-03	NOT IDENT.
BA-140	1.830E-01	FAIL ABUN
LA-140	5.586E-02	FAIL ABUN
CE-141	2.069E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.140E-02	FAIL ABUN
PM-144	7.425E-03	NOT IDENT.
PR-144	5.621E-01	NOT IDENT.
PM-146	8.677E-03	NOT IDENT.
ND-147	4.245E-01	FAIL ABUN
PM-147	1.511E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.305E-03	FAIL ABUN
EU-152	1.907E-02	FAIL ABUN
GD-153	1.943E-02	FAIL ABUN
EU-154	1.891E-02	NOT IDENT.
TB-160	2.952E-02	FAIL ABUN
HO-166M	1.213E-02	FAIL ABUN

TM-171	5.148E+00	NOT IDENT.
HF-172	3.892E-02	FAIL ABUN
LU-172	1.228E-02	FAIL ABUN
LU-176	5.024E-03	FAIL ABUN
HF-181	1.334E-02	NOT IDENT.
TA-182	3.980E-02	FAIL ABUN
RE-183	6.080E-02	FAIL ABUN
RE-184	3.735E-02	NOT IDENT.
W-188	1.669E+00	FAIL ABUN
IR-192	8.745E-03	FAIL ABUN
HG-203	1.089E-02	NOT IDENT.
BI-207	9.672E-03	FAIL ABUN
PB-210	1.279E+00	NOT IDENT.
BI-211	8.032E-02	FAIL ABUN
PB-211	1.413E-01	NOT IDENT.
RN-219	7.837E-02	FAIL ABUN
AC-227	4.831E-02	FAIL ABUN
TH-227	4.831E-02	FAIL ABUN
PA-233	1.244E-02	FAIL ABUN
PA-234	5.400E-02	FAIL ABUN
PA-234M	9.564E-01	NOT IDENT.
NP-237	1.244E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.319E-02	FAIL ABUN
PU-239	7.188E+01	FAIL ABUN
AM-241	3.797E-02	NOT IDENT.
CM-243	2.070E-02	FAIL ABUN
BK-247	1.513E-02	FAIL ABUN
CM-247	7.172E-03	FAIL ABUN
CF-251	2.527E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656016.CNF;1
Acquisition date : 23-JUN-2016 15:00:40 Sensitivity : 3.000
Detector ID : GAM33 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:10.15 Half life ratio : *****
Sample date : 17-MAY-2016 11:50:00 Nuclide Library : SOLID
Sample ID : G398656016 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6384E+02 GRAM
Quantity Err(%) : 1.2207E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-JUN-2016 07:00:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF;8

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	3.695E+00	3.305E-01	3.305E-01
MN-54	1.022E-02	1.087E-02	1.087E-02
AS-74	1.646E-02	9.227E-02	9.227E-02
CD-109	7.165E-01	3.059E-01	3.059E-01
TE-125M	3.918E+00	5.163E+00	5.163E+00
SN-126	6.774E-02	2.870E-02	2.870E-02
BA-137M	2.356E-02	1.703E-02	1.703E-02
CS-137	2.489E-02	1.799E-02	1.799E-02
EU-155	2.499E-02	2.903E-02	2.903E-02
TL-208	1.469E-01	2.101E-02	2.101E-02
BI-212	6.335E-01	2.231E-01	2.231E-01
PB-212	4.992E-01	3.994E-02	3.994E-02
BI-214	3.166E-01	3.988E-02	3.988E-02
PB-214	3.944E-01	4.493E-02	4.493E-02
RN-222	3.166E-01	3.988E-02	3.988E-02
RA-223	8.132E-02	1.605E-01	1.605E-01
RA-224	5.047E-01	3.210E-01	3.210E-01
RA-226	3.166E-01	3.988E-02	3.988E-02
AC-228	4.765E-01	7.905E-02	7.905E-02
RA-228	4.765E-01	7.905E-02	7.905E-02
TH-228	4.992E-01	3.994E-02	3.994E-02
TH-229	1.107E-01	1.234E-01	1.234E-01
TH-230	3.166E-01	3.988E-02	3.988E-02
PA-231	4.036E-01	2.029E-01	2.029E-01
TH-231	8.132E-02	1.605E-01	1.605E-01
TH-232	4.765E-01	7.905E-02	7.905E-02
TH-234	7.596E-02	7.370E-01	7.370E-01
U-234	3.166E-01	3.988E-02	3.988E-02
U-235	4.036E-02	9.509E-02	9.509E-02
U-238	7.596E-02	7.370E-01	7.370E-01
AM-243	1.064E-01	2.866E-02	2.866E-02
CF-249	9.235E-03	1.450E-02	1.450E-02
ANH-511	3.409E-02	2.501E-02	2.501E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-6.040E-02	9.796E-02	1.017E-01	NOT IDENT.
NA-22	-2.011E-03	7.925E-03	7.976E-03	NOT IDENT.
NA-24	6.030E+15	7.620E+15	8.091E+15	SHORT HLIF
AL-26	1.059E-03	7.823E-03	7.838E-03	NOT IDENT.
SC-46	-1.566E-03	1.014E-02	1.016E-02	FAIL ABUN
V-48	-1.729E-02	3.900E-02	3.977E-02	NOT IDENT.
CR-51	-8.773E-02	1.464E-01	1.517E-01	NOT IDENT.
CO-56	-2.005E-03	1.142E-02	1.145E-02	FAIL ABUN
MN-56	-1.000E+41	8.596E+41	0.000E+00	SHORT HLIF
CO-57	-3.785E-03	6.029E-03	6.266E-03	NOT IDENT.
CO-58	-7.811E-04	1.099E-02	1.100E-02	NOT IDENT.
FE-59	2.554E-02	3.027E-02	3.238E-02	NOT IDENT.
CO-60	-6.655E-03	8.150E-03	8.684E-03	NOT IDENT.
ZN-65	-1.218E-02	2.092E-02	2.163E-02	NOT IDENT.
GE-68	4.074E-01	2.854E-01	3.393E-01	NOT IDENT.
AS-73	-2.055E-02	2.951E-01	2.952E-01	NOT IDENT.
SE-75	1.019E-02	1.411E-02	1.484E-02	FAIL ABUN
BR-77	5.113E+04	5.530E+04	5.991E+04	SHORT HLIF
SR-82	-3.903E-02	1.463E-01	1.473E-01	NOT IDENT.
RB-83	-6.068E-03	2.062E-02	2.080E-02	NOT IDENT.
KR-85	9.381E+00	1.979E+00	4.669E+00	NOT IDENT.
SR-85	6.263E-02	1.325E-02	3.119E-02	NOT IDENT.
RB-86	5.776E-01	3.878E-01	4.671E-01	NOT IDENT.
Y-88	2.075E-03	9.463E-03	9.510E-03	NOT IDENT.
Y-91	-6.561E+00	5.329E+00	6.095E+00	NOT IDENT.
NB-94	2.072E-03	7.931E-03	7.986E-03	NOT IDENT.
NB-95	-1.034E-02	1.690E-02	1.754E-02	NOT IDENT.
NB-95M	2.732E-02	3.668E-02	3.870E-02	NOT IDENT.
ZR-95	1.553E-02	2.034E-02	2.151E-02	NOT IDENT.
NB-97	1.000E+41	1.917E+41	0.000E+00	SHORT HLIF
ZR-97	3.229E+15	1.527E+15	2.109E+15	SHORT HLIF
MO-99	-5.654E+02	7.436E+02	7.861E+02	SHORT HLIF
TC-99M	1.000E+41	1.965E+41	0.000E+00	SHORT HLIF
RH-101	2.257E-03	8.151E-03	8.214E-03	FAIL ABUN
RH-102	3.616E-04	1.231E-02	1.231E-02	NOT IDENT.
RU-103	-1.377E-02	1.424E-02	1.554E-02	FAIL ABUN
RH-106	5.286E-03	7.369E-02	7.373E-02	NOT IDENT.
RU-106	5.286E-03	7.369E-02	7.373E-02	NOT IDENT.
AG-108M	4.033E-03	6.844E-03	7.081E-03	NOT IDENT.
AG-110M	-7.602E-03	1.331E-02	1.374E-02	NOT IDENT.
SN-113	9.341E-04	1.280E-02	1.281E-02	NOT IDENT.
CD-115	-5.753E+02	2.617E+03	2.629E+03	SHORT HLIF
SN-117M	1.295E-02	4.130E-02	4.171E-02	NOT IDENT.
TE-123M	3.912E-03	8.602E-03	8.781E-03	NOT IDENT.
SB-124	1.875E-02	2.441E-02	2.583E-02	NOT IDENT.
SB-125	4.243E-03	2.352E-02	2.359E-02	FAIL ABUN
I-126	1.557E-01	1.814E-01	1.945E-01	FAIL ABUN
SB-126	1.114E-01	1.245E-01	1.343E-01	NOT IDENT.
SB-127	2.623E+00	1.555E+01	1.560E+01	NOT IDENT.
I-131	-1.274E-01	1.779E-01	1.869E-01	FAIL ABUN
I-132	-1.000E+41	3.276E+41	0.000E+00	SHORT HLIF
TE-132	1.052E+01	1.923E+01	1.980E+01	SHORT HLIF
BA-133	2.686E-03	1.049E-02	1.056E-02	FAIL ABUN
I-133	1.085E+10	6.948E+10	6.965E+10	SHORT HLIF
CS-134	1.842E-02	1.190E-02	1.451E-02	FAIL ABUN
CS-135	6.071E-02	4.354E-02	5.143E-02	NOT IDENT.
I-135	-1.856E+39	3.237E+39	0.000E+00	SHORT HLIF
CS-136	-3.043E-02	7.148E-02	7.279E-02	FAIL ABUN
CE-139	2.266E-03	8.415E-03	8.476E-03	NOT IDENT.
BA-140	7.114E-02	2.106E-01	2.130E-01	FAIL ABUN
LA-140	-3.689E-02	6.902E-02	7.100E-02	FAIL ABUN
CE-141	2.930E-02	2.525E-02	2.850E-02	NOT IDENT.
CE-143	1.082E+07	2.357E+06	5.419E+06	SHORT HLIF
CE-144	1.388E-03	4.879E-02	4.880E-02	FAIL ABUN
PM-144	1.829E-03	8.335E-03	8.376E-03	NOT IDENT.
PR-144	1.379E-01	6.311E-01	6.341E-01	NOT IDENT.
PM-146	1.262E-03	9.935E-03	9.951E-03	NOT IDENT.
ND-147	-1.720E-02	4.967E-01	4.968E-01	FAIL ABUN
PM-147	4.697E+01	1.672E+02	1.686E+02	NOT IDENT.
PM-149	2.127E+03	2.132E+04	2.134E+04	SHORT HLIF
EU-150	-6.661E-04	9.427E-03	9.431E-03	FAIL ABUN
EU-152	-1.452E-02	2.275E-02	2.367E-02	FAIL ABUN
GD-153	-3.228E-02	2.802E-02	3.157E-02	FAIL ABUN
EU-154	-8.973E-03	2.242E-02	2.278E-02	NOT IDENT.
TB-160	2.086E-04	3.950E-02	3.950E-02	FAIL ABUN

HO-166M	6.682E-03	1.346E-02	1.380E-02	FAIL ABUN
TM-171	5.145E+00	5.329E+00	5.812E+00	NOT IDENT.
HF-172	3.819E-02	4.783E-02	5.083E-02	FAIL ABUN
LU-172	1.570E-02	1.934E-02	2.060E-02	FAIL ABUN
LU-176	-2.815E-04	5.599E-03	5.600E-03	FAIL ABUN
HF-181	1.536E-02	1.478E-02	1.632E-02	NOT IDENT.
TA-182	3.767E-02	4.368E-02	4.686E-02	FAIL ABUN
RE-183	-4.850E-02	6.615E-02	6.967E-02	FAIL ABUN
RE-184	-2.013E-04	5.019E-02	5.019E-02	NOT IDENT.
W-188	-2.934E+00	2.258E+00	2.617E+00	FAIL ABUN
IR-192	3.300E-03	9.648E-03	9.762E-03	FAIL ABUN
HG-203	1.042E-02	1.323E-02	1.404E-02	NOT IDENT.
BI-207	-4.410E-03	1.349E-02	1.363E-02	FAIL ABUN
PB-210	6.482E-01	1.328E+00	1.360E+00	NOT IDENT.
BI-211	1.087E+00	1.250E-01	5.056E-01	FAIL ABUN
PB-211	-4.233E-02	1.627E-01	1.638E-01	NOT IDENT.
RN-219	-8.687E-02	9.330E-02	1.012E-01	FAIL ABUN
AC-227	-2.057E-02	6.104E-02	6.175E-02	FAIL ABUN
TH-227	-2.057E-02	6.104E-02	6.175E-02	FAIL ABUN
PA-233	-4.983E-03	1.403E-02	1.420E-02	FAIL ABUN
PA-234	-1.434E-02	6.604E-02	6.635E-02	FAIL ABUN
PA-234M	-5.068E-01	1.261E+00	1.281E+00	NOT IDENT.
NP-237	-4.983E-03	1.403E-02	1.420E-02	FAIL ABUN
NP-238	-1.334E+03	6.144E+03	6.173E+03	SHORT HLIF
NP-239	-7.364E-02	6.141E-02	6.981E-02	FAIL ABUN
PU-239	6.508E+01	1.334E+02	1.365E+02	FAIL ABUN
AM-241	3.903E-02	4.395E-02	4.734E-02	NOT IDENT.
CM-243	-1.423E-02	2.614E-02	2.692E-02	FAIL ABUN
BK-247	4.647E-03	2.567E-02	2.576E-02	FAIL ABUN
CM-247	-6.208E-03	8.479E-03	8.929E-03	FAIL ABUN
CF-251	-8.114E-03	2.922E-02	2.945E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	668.7924	87.09	895.3015	136.47	722.5980
45.60	601.7838	87.57	803.9581	140.51	0.0000
46.54	629.5780	88.03	804.5698	143.76	784.3399
49.72	0.0000	88.34	804.9816	144.24	743.8389
51.35	626.3719	88.47	805.1535	145.44	729.9340
51.87	602.3077	89.96	807.1204	152.43	702.3825
52.39	583.9133	1093.63	764.8357	153.25	706.4033
52.97	608.6104	91.11	765.4147	323.87	701.0151
53.44	645.6630	92.59	767.2349	156.02	708.6324
54.07	658.0919	93.35	768.1658	158.56	670.1435
57.36	0.0000	94.56	788.2581	159.00	659.7805
57.53	682.4634	94.65	788.3705	162.33	674.6494
57.98	724.7309	94.67	788.3937	162.66	673.1966
59.27	672.3942	94.87	815.0333	163.33	688.9659
59.32	672.4664	97.43	843.2302	165.86	711.2876
59.54	672.7801	98.43	765.5391	176.31	731.8464
60.96	734.6731	98.44	765.5522	176.60	711.4132
61.17	746.6833	99.53	702.6147	177.52	710.9395
62.93	833.9667	100.11	732.4497	181.07	0.0000
63.29	834.5795	102.03	800.4975	181.52	750.7718
63.58	835.0719	103.18	762.5637	184.41	729.8441
64.28	874.9810	103.37	703.0176	143.76	730.8069
66.73	721.1433	105.21	667.0822	193.51	633.0593
67.24	730.7410	105.31	667.1790	197.03	712.5170
125.81	731.3704	106.12	690.0807	198.01	693.6738
67.75	769.9667	106.47	783.6506	201.83	645.9060
69.67	873.8981	109.28	842.3597	203.43	655.1370
70.83	685.1709	111.00	866.6935	205.31	686.9807
72.81	879.0930	111.76	0.0000	210.85	589.4396
72.87	879.1917	114.06	742.3423	215.65	624.7387
74.66	843.0986	116.30	0.0000	222.11	600.4977
74.82	843.3473	116.74	805.7999	227.09	560.7014
74.97	843.5789	119.76	712.5382	227.38	570.7731
77.11	846.8547	121.12	662.2388	228.16	0.0000
78.74	849.3244	121.22	695.6613	228.18	584.7296
79.69	850.7479	121.78	738.1458	116.74	584.7296
80.12	851.3911	122.06	745.9563	235.69	596.7072
80.19	851.4940	122.92	711.2469	235.96	575.0114
80.57	852.0599	123.07	711.3879	238.63	570.8420
81.00	764.6998	265.00	744.3239	238.98	0.0000
81.07	764.7940	125.81	673.3903	240.99	571.9739
81.75	765.6976	127.23	762.4184	242.00	572.4562
83.79	792.7747	127.91	714.2793	244.70	538.1846
84.00	793.0603	129.30	785.6458	252.40	479.6130
85.43	892.8242	131.20	740.1686	252.80	466.8510
86.55	894.4995	133.02	738.6006	254.15	0.0000
86.79	894.8538	133.52	730.2160	256.23	504.7816
86.94	895.0787	136.00	694.7789	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	432.1680	355.39	0.0000	584.27	202.3572
264.80	432.2104	356.01	343.2480	595.83	241.1804
265.00	432.2813	364.49	362.4572	427.87	291.5762
268.22	438.3529	366.42	0.0000	602.52	0.0000
269.46	423.3185	372.51	347.1985	604.72	254.4490
270.03	423.5051	375.05	317.5912	607.14	290.8822
271.23	423.8920	377.52	336.1864	609.32	277.5797
273.65	393.9230	356.01	318.4753	610.33	255.3629
276.40	422.5702	388.16	316.0562	614.28	213.1581
277.37	422.8789	388.63	316.1466	618.01	230.7518
277.60	422.9544	391.69	308.5969	620.36	246.4406
278.00	423.0847	264.66	326.5527	621.93	212.9366
279.20	467.1721	401.81	351.2804	630.19	0.0000
279.54	467.2856	402.40	339.1429	631.29	204.6297
279.70	471.8689	404.85	333.4864	633.25	211.1992
280.46	454.0353	410.95	342.8678	634.78	200.3508
283.69	460.1059	413.71	313.5912	635.95	200.4470
284.31	470.8568	414.70	267.4744	636.99	202.3693
285.41	470.2905	423.72	277.9342	645.85	208.3109
285.90	0.0000	427.09	285.0850	657.76	198.5391
287.50	434.0643	427.87	276.9199	657.90	0.0000
290.67	492.4547	433.94	279.7172	661.66	238.9331
293.27	0.0000	439.40	301.4136	664.57	0.0000
351.93	417.8433	453.88	284.8486	666.33	185.3223
295.96	385.2598	463.37	277.8242	666.50	191.5148
879.38	385.9933	468.07	254.1467	667.71	0.0000
299.98	371.8446	473.00	258.1922	677.62	190.8062
300.09	371.8742	475.06	263.5681	685.70	179.2688
300.13	371.8861	476.78	291.7634	695.00	205.2163
301.36	412.0376	477.60	269.2333	696.49	222.2106
302.85	381.8101	482.18	242.1296	696.51	222.2106
256.23	397.6055	487.02	257.6916	697.00	238.1994
304.85	388.4933	492.35	0.0000	697.30	242.9137
306.78	387.2947	497.08	292.3037	697.49	246.6845
308.46	412.7724	505.52	272.8046	702.65	229.3159
311.90	407.9805	507.63	0.0000	706.68	221.1960
316.51	410.2518	511.00	268.3419	711.68	184.8362
319.41	423.6772	514.00	268.7297	720.70	167.1691
320.08	440.3598	514.00	268.7297	721.93	0.0000
321.04	460.0627	520.40	250.9289	722.78	211.4906
323.87	392.1012	520.69	0.0000	722.91	211.5015
325.23	409.5891	522.65	0.0000	723.31	216.2700
328.76	382.4656	527.90	0.0000	724.19	194.2345
333.37	391.4795	528.26	222.5647	727.33	169.7965
333.97	399.4647	529.59	223.7996	733.00	196.4544
334.37	399.5706	529.87	0.0000	735.93	166.5320
338.28	386.0162	531.02	204.2859	333.97	156.1523
338.32	386.0282	537.26	232.2761	739.50	0.0000
311.90	391.7434	546.56	0.0000	747.24	177.7354
340.48	391.7434	552.55	198.6163	748.06	183.5250
340.55	371.3082	563.25	241.2805	752.31	190.5075
344.28	405.5587	569.33	244.6063	753.82	181.0312
345.93	382.8788	946.00	253.5220	756.73	165.8832
351.06	380.1855	569.70	253.5428	756.80	165.8874
351.93	380.3965	583.19	225.9801	884.68	181.0501

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	202.0173	1274.44	168.8618	1620.50	59.0600
766.42	205.2656	1001.03	130.7127	1621.92	63.3551
766.84	221.3357	1002.74	115.2086	1678.03	0.0000
772.60	0.0000	1004.73	171.3527	1690.97	42.6204
776.52	154.5039	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	34.9781
778.90	135.3037	1028.54	0.0000	1063.66	33.5442
783.70	169.4159	1037.84	137.3325	1771.35	38.8484
785.37	163.0565	1038.76	0.0000	1791.20	0.0000
792.07	178.6498	631.29	125.0604	1808.65	45.6292
794.95	156.4758	1048.07	128.2668	1810.72	0.0000
795.86	159.8757	1049.04	146.1808	1836.06	38.5582
810.06	163.1553	1050.41	147.2871		
810.29	170.0068	1063.66	119.3176		
344.28	171.9695	1077.00	103.8618		
810.76	171.0095	1077.34	104.9313		
815.77	157.6000	1085.87	100.9236		
1048.07	141.3690	1093.63	145.4953		
832.01	130.4135	1099.45	108.4031		
834.85	170.7646	1112.07	118.8748		
835.71	191.1819	1112.84	117.7129		
836.80	0.0000	1115.54	123.1477		
846.75	0.0000	1120.29	122.2327		
846.77	185.9483	1120.55	122.2438		
856.80	130.6605	1221.41	135.8512		
860.56	123.2038	1129.67	138.6624		
871.09	134.5946	1131.51	0.0000		
873.19	117.7234	1147.95	0.0000		
875.33	0.0000	1173.23	119.5820		
879.38	133.2878	1177.95	114.2798		
880.51	119.0029	1189.05	106.9626		
883.24	136.7868	1204.77	136.9751		
884.68	153.5392	1221.41	127.4563		
889.28	142.3987	1231.02	136.0280		
894.76	144.6574	1235.36	132.4922		
898.04	157.8816	1238.28	153.1052		
900.72	148.9539	1260.41	0.0000		
903.28	156.1258	1271.87	90.9698		
911.20	128.2402	1274.44	95.6698		
912.08	128.2743	1274.54	91.9585		
923.98	0.0000	1291.59	86.7334		
926.50	135.9498	1298.22	0.0000		
929.11	141.1379	1312.11	98.3990		
937.49	171.0228	1332.49	99.8063		
944.13	131.5857	1362.66	0.0000		
946.00	137.7850	1365.19	86.3234		
949.00	151.1905	1368.63	0.0000		
667.71	0.0000	1384.29	81.4574		
962.31	141.8795	1408.01	78.5333		
964.08	143.6641	1457.56	0.0000		
966.17	113.9782	1460.82	66.4314		
911.20	114.0731	1489.16	43.8593		
968.97	114.0731	1505.03	86.0521		
983.53	133.1415	1584.12	94.4124		
984.45	0.0000	1596.21	79.6973		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 03:03:25.74

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656017.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM44.CNF;95
Background date    : 20-JUN-2016 14:04:44
Sample date       : 17-MAY-2016 13:30:00 Acquisition date : 23-JUN-2016 15:01:04
Sample ID        : G398656017 Sample quantity : 1.66520E+02 GRAM
Detector name     : GAM44 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:12.73 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.95*	22	1892	0.71	126.23	124	6	5.14E-04	341.3	
2	2	74.93	362	2289	1.20	150.19	143	15	8.37E-03	22.6	2.17E+00
3	2	77.15	584	1909	0.96	154.63	143	15	1.35E-02	12.6	
4	0	84.08	221	2481	2.18	168.49	165	8	5.11E-03	39.6	
5	0	87.39	204	1646	0.97	175.11	173	5	4.72E-03	30.6	
6	4	185.94*	426	3609	1.72	372.27	366	21	9.85E-03	28.6	1.60E+00
7	4	188.54	217	3700	1.73	377.47	366	21	5.01E-03	53.9	
8	0	209.65*	89	2370	1.67	419.71	416	7	2.06E-03	95.6	
9	0	238.80*	1167	2461	1.17	478.03	474	8	2.70E-02	8.7	
10	0	241.95	313	1722	1.71	484.33	482	6	7.24E-03	21.8	
11	0	295.15	364	2231	1.09	590.77	586	9	8.41E-03	24.0	
12	0	300.40	117	1936	1.31	601.28	598	8	2.71E-03	65.7	
13	0	338.35	246	1795	1.71	677.19	674	8	5.68E-03	30.6	
14	0	352.66*	685	2627	1.14	705.84	700	12	1.59E-02	15.9	
15	0	511.17*	111	2020	2.59	1023.00	1015	16	2.56E-03	104.1	
16	0	583.29*	323	722	1.37	1167.30	1163	10	7.47E-03	17.9	
17	0	609.57*	345	1014	1.82	1219.90	1212	14	7.98E-03	21.6	
18	0	661.83	65287	733	1.48	1324.48	1316	15	1.51E+00	0.4	
19	0	727.40	93	147	1.48	1455.69	1451	10	2.15E-03	26.6	
20	0	795.50	44	160	2.37	1591.97	1584	12	1.02E-03	59.7	
21	0	803.32*	32	89	1.17	1607.62	1601	11	7.45E-04	80.6	
22	0	837.28	64	211	5.49	1675.59	1664	18	1.47E-03	55.1	
23	0	860.27	74	113	1.38	1721.59	1715	12	1.72E-03	31.0	
24	0	911.34*	261	137	1.92	1823.80	1816	14	6.05E-03	13.5	
25	0	934.87	46	152	6.21	1870.90	1860	16	1.07E-03	61.5	
26	1	964.39	44	155	2.01	1929.98	1925	21	1.03E-03	50.0	5.20E+00
27	1	969.36	163	117	2.02	1939.93	1925	21	3.77E-03	16.5	
28	0	1001.10	42	107	2.99	2003.44	1996	14	9.81E-04	54.3	
29	0	1045.45	49	98	4.71	2092.22	2084	17	1.13E-03	48.4	
30	0	1120.27	122	50	1.56	2241.98	2237	10	2.82E-03	14.1	
31	0	1150.33	35	94	4.62	2302.14	2294	15	8.00E-04	63.4	
32	0	1158.58	37	50	3.43	2318.64	2312	11	8.54E-04	41.2	
33	0	1173.86	17	84	0.98	2349.24	2342	10	3.91E-04	104.9	
34	0	1206.30	33	64	3.00	2414.17	2409	11	7.66E-04	49.7	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1221.58	67	54	4.64	2444.76	2439	13	1.55E-03	25.9	
36	0	1239.45	25	112	0.96	2480.53	2472	12	5.85E-04	86.6	
37	0	1306.82	36	51	1.54	2615.38	2610	12	8.44E-04	42.5	
38	0	1460.95*	762	61	1.75	2923.92	2915	19	1.76E-02	4.8	
39	0	1637.89	31	35	1.55	3278.15	3269	18	7.22E-04	48.4	
40	0	1764.66*	94	32	2.23	3531.96	3523	18	2.19E-03	20.8	
41	0	1779.48	13	13	0.52	3561.63	3558	8	3.04E-04	60.0	
42	0	1827.38	33	16	6.15	3657.55	3650	16	7.64E-04	32.2	
43	0	1996.30	7	16	1.50	3995.78	3988	9	1.69E-04	109.4	
44	0	2025.29	12	46	7.82	4053.83	4036	23	2.78E-04	149.7	

Flag: "*" = Peak area was modified by background subtraction

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656017.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 13:30:00 Acquisition date : 23-JUN-2016 15:01:04
Sample ID        : G398656017 Sample quantity  : 166.52 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA44 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:12.73 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.037E+00	2.522E+00	2.522E+00	9.61	OK
CD-109	88.03	3.70*	4.706E+00	3.687E-01	3.899E-01	100.26	OK
SN-126	64.28	9.60	1.972E+00	6.156E-02	6.156E-02	682.54	OK
	86.94	8.90	4.706E+00	1.533E-01	1.533E-01	100.26	OK
	87.57	37.00*	4.706E+00	3.687E-02	3.687E-02	100.26	OK
BA-137M	661.66	89.90*	2.079E+00	1.419E+01	1.422E+01	0.80	OK
CS-137	661.66	85.10*	2.079E+00	1.499E+01	1.503E+01	0.80	OK
TL-208	277.37	6.60	3.978E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.295E+00	6.824E-02	6.824E-02	35.76	OK
	860.56	12.50	1.670E+00	1.396E-01	1.396E-01	62.01	OK
PB-212	74.82	10.28	3.467E+00	3.851E-01	3.851E-01	62.24	OK
	77.11	17.10	3.720E+00	4.727E-01	4.727E-01	25.27	OK
	238.63	43.60*	4.437E+00	2.762E-01	2.762E-01	17.42	OK
	300.09	3.30	3.751E+00	4.226E-01	4.226E-01	131.37	OK
BI-214	609.32	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23	OK
	1120.29	14.92	1.317E+00	2.354E-01	2.354E-01	28.28	OK
	1764.49	15.30	8.956E-01	2.458E-01	2.458E-01	41.56	OK
PB-214	74.82	5.80	3.454E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.720E+00	8.332E-01	8.333E-01	25.27	OK
	87.09	3.41	4.682E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.395E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.800E+00	2.321E-01	2.321E-01	47.99	OK
	351.93	35.60*	3.332E+00	2.529E-01	2.529E-01	31.77	OK
RN-222	609.32	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23	OK
	1120.29	14.92	1.317E+00	2.354E-01	2.354E-01	28.28	OK
	1764.49	15.30	8.956E-01	2.458E-01	2.458E-01	41.56	OK
RA-224	240.99	4.10*	4.396E+00	3.584E-01	3.584E-01	101.67	OK
RA-226	609.32	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23	OK
	1120.29	14.92	1.317E+00	2.354E-01	2.354E-01	28.28	OK
	1764.49	15.30	8.956E-01	2.458E-01	2.458E-01	41.56	OK
AC-228	105.21	1.10	5.698E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.436E+00	2.791E-01	2.791E-01	61.13	OK
	794.95	4.25	1.787E+00	2.301E-01	2.301E-01	119.32	OK
	835.71	1.61	1.713E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.588E+00	2.489E-01	2.489E-01	27.00	OK
	968.97	15.80	1.503E+00	2.655E-01	2.655E-01	32.94	OK
RA-228	105.21	1.10	5.698E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.436E+00	2.791E-01	2.791E-01	61.13	OK
	794.95	4.25	1.787E+00	2.301E-01	2.301E-01	119.32	OK
	835.71	1.61	1.713E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.588E+00	2.489E-01	2.489E-01	27.00	OK
	968.97	15.80	1.503E+00	2.655E-01	2.655E-01	32.94	OK
TH-228	74.82	10.28	3.467E+00	3.851E-01	3.851E-01	62.24	OK
	77.11	17.10	3.720E+00	4.727E-01	4.727E-01	25.27	OK
	238.63	43.60*	4.437E+00	2.762E-01	2.762E-01	17.42	OK
	300.09	3.30	3.751E+00	4.226E-01	4.226E-01	131.37	OK
TH-229	85.43	14.70	4.422E+00	1.732E-01	1.732E-01	79.28	OK
	88.47	24.00	4.706E+00	5.683E-02	5.684E-02	100.26	OK
	193.51	4.41*	5.121E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-230	210.85	2.80	4.860E+00	3.039E-01	3.039E-01	191.17	OK
	609.32	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23	OK
	1120.29	14.92	1.317E+00	2.354E-01	2.354E-01	28.28	OK
PA-231	1764.49	15.30	8.956E-01	2.458E-01	2.458E-01	41.56	OK
	283.69	1.70	3.913E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.751E+00	2.607E-01	2.607E-01	131.37	OK
TH-232	105.21	1.10	5.698E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.436E+00	2.791E-01	2.791E-01	61.13	OK
	835.71	1.61	1.713E+00	----- Line	Not Found	-----	Absent
U-234	911.20	25.80*	1.588E+00	2.489E-01	2.489E-01	27.00	OK
	968.97	15.80	1.503E+00	2.655E-01	2.655E-01	32.94	OK
	609.32	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23	OK
AM-243	1120.29	14.92	1.317E+00	2.354E-01	2.354E-01	28.28	OK
	1764.49	15.30	8.956E-01	2.458E-01	2.458E-01	41.56	OK
	43.53	5.90	1.974E-01	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	3.467E+00	5.891E-02	5.891E-02	62.24	OK
	511.00	100.00*	2.536E+00	1.828E-02	1.828E-02	208.30	OK

Flag: "*" = Keyline


```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656017.CNF;1  *
* Acquisition date   : 23-JUN-2016 15:01:04 Sensitivity      : 3.000          *
* Detector ID        : GAM44 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:12.73 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 13:30:00 Analyst initials: MXR1      *
* Sample ID          : G398656017 Sample Quantity : 1.6652E+02 GRAM    *
* Batch Number       : 1572234 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6                                           *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 9-SEP-2015 08:01:56 Eff. Geometry    : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;2          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	2.522E+00	2.376E-01	1.373E-01
CD-109	3.899E-01	3.831E-01	5.511E-01
SN-126	3.687E-02	3.622E-02	5.278E-02
BA-137M	1.422E+01	1.118E-01	2.086E-02
CS-137	1.503E+01	1.181E-01	2.204E-02
TL-208	6.824E-02	2.391E-02	2.594E-02
PB-212	2.762E-01	4.715E-02	4.678E-02
BI-214	1.403E-01	5.944E-02	4.888E-02
PB-214	2.529E-01	7.875E-02	6.903E-02
RN-222	1.403E-01	5.944E-02	4.888E-02
RA-224	3.584E-01	3.571E-01	5.008E-01
RA-226	1.403E-01	5.944E-02	4.888E-02
AC-228	2.489E-01	6.586E-02	5.242E-02
RA-228	2.489E-01	6.586E-02	5.242E-02
TH-228	2.762E-01	4.715E-02	4.678E-02
TH-229	9.267E-02	2.670E-01	4.461E-01
TH-230	1.403E-01	5.943E-02	4.888E-02
PA-231	2.607E-01	3.356E-01	3.980E-01
TH-232	2.489E-01	6.586E-02	5.242E-02
U-234	1.403E-01	5.943E-02	4.888E-02
AM-243	5.891E-02	3.594E-02	3.786E-02
ANH-511	1.828E-02	3.732E-02	2.616E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	3.501E-01	2.935E-01	5.181E-01	NOT IDENT.
NA-22	1.008E-02	8.264E-03	1.626E-02	NOT IDENT.
NA-24	0.000E+00	7.674E+15	0.000E+00	SHORT HLIF
AL-26	-3.707E-03	7.543E-03	1.329E-02	NOT IDENT.
SC-46	4.835E-04	9.770E-03	1.750E-02	FAIL ABUN
V-48	-5.193E-03	3.511E-02	6.457E-02	NOT IDENT.
CR-51	3.623E-02	3.437E-01	5.876E-01	NOT IDENT.
MN-54	3.522E-03	8.354E-03	1.527E-02	NOT IDENT.

CO-56	-4.875E-04	1.045E-02	1.863E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.023E-03	1.059E-02	1.925E-02	NOT IDENT.
CO-58	4.462E-03	9.755E-03	1.806E-02	NOT IDENT.
FE-59	9.346E-03	2.373E-02	4.467E-02	NOT IDENT.
CO-60	4.012E-03	8.229E-03	1.542E-02	FAIL ABUN
ZN-65	-3.288E-03	2.039E-02	3.162E-02	NOT IDENT.
GE-68	-1.355E-01	2.690E-01	4.781E-01	NOT IDENT.
AS-73	-5.930E-02	6.625E-01	1.278E+00	NOT IDENT.
AS-74	3.249E-02	8.804E-02	1.607E-01	NOT IDENT.
SE-75	-1.349E-02	2.388E-02	4.345E-02	NOT IDENT.
BR-77	0.000E+00	4.732E+03	0.000E+00	SHORT HLIF
SR-82	-1.271E-01	1.281E-01	2.179E-01	NOT IDENT.
RB-83	-6.458E-03	4.570E-02	7.640E-02	NOT IDENT.
KR-85	0.000E+00	3.886E+00	6.547E+00	NOT IDENT.
SR-85	0.000E+00	2.600E-02	4.379E-02	NOT IDENT.
RB-86	-1.055E-01	3.621E-01	6.525E-01	NOT IDENT.
Y-88	-3.012E-03	9.834E-03	1.551E-02	NOT IDENT.
Y-91	5.126E+00	5.450E+00	9.318E+00	NOT IDENT.
NB-94	6.640E-03	7.211E-03	1.365E-02	NOT IDENT.
NB-95	1.054E-02	1.122E-02	2.114E-02	NOT IDENT.
NB-95M	5.434E-04	7.466E-02	1.218E-01	NOT IDENT.
ZR-95	1.126E-02	1.865E-02	3.487E-02	NOT IDENT.
NB-97	0.000E+00	1.502E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.843E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	6.446E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.768E-03	1.276E-02	2.322E-02	NOT IDENT.
RH-102	-1.041E-02	2.159E-02	3.839E-02	FAIL ABUN
RU-103	5.234E-04	3.207E-02	5.871E-02	FAIL ABUN
RH-106	-1.322E-01	1.292E-01	2.266E-01	NOT IDENT.
RU-106	-1.322E-01	1.292E-01	2.266E-01	NOT IDENT.
AG-108M	1.408E-02	1.955E-02	3.457E-02	NOT IDENT.
AG-110M	-1.279E-02	1.121E-02	1.854E-02	NOT IDENT.
SN-113	1.116E-02	2.942E-02	5.236E-02	NOT IDENT.
CD-115	0.000E+00	5.265E+03	0.000E+00	SHORT HLIF
SN-117M	1.196E-02	6.885E-02	1.230E-01	NOT IDENT.
TE-123M	1.035E-03	1.312E-02	2.339E-02	NOT IDENT.
SB-124	-6.048E-03	2.335E-02	4.249E-02	NOT IDENT.
SB-125	2.364E-02	5.964E-02	1.051E-01	NOT IDENT.
TE-125M	-1.058E+00	4.797E+00	8.777E+00	NOT IDENT.
I-126	2.854E-01	1.805E-01	3.145E-01	NOT IDENT.
SB-126	-4.607E-02	1.044E-01	1.738E-01	NOT IDENT.
SB-127	2.688E+00	1.503E+01	2.764E+01	NOT IDENT.
I-131	1.955E-01	4.341E-01	7.791E-01	NOT IDENT.
I-132	0.000E+00	1.238E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.928E+01	0.000E+00	SHORT HLIF
BA-133	1.847E-02	2.536E-02	4.032E-02	NOT IDENT.
I-133	0.000E+00	1.369E+11	0.000E+00	SHORT HLIF
CS-134	1.184E-02	1.385E-02	1.672E-02	FAIL ABUN
CS-135	3.089E-02	7.299E-02	1.345E-01	NOT IDENT.
I-135	0.000E+00	2.497E+39	0.000E+00	SHORT HLIF
CS-136	-1.973E-04	7.520E-02	1.195E-01	NOT IDENT.
CE-139	-7.770E-03	1.361E-02	2.393E-02	NOT IDENT.
BA-140	-1.676E-01	3.970E-01	7.173E-01	NOT IDENT.
LA-140	-2.033E-02	6.340E-02	1.101E-01	NOT IDENT.
CE-141	-2.965E-02	4.395E-02	7.051E-02	NOT IDENT.
CE-143	0.000E+00	4.663E+06	0.000E+00	SHORT HLIF
CE-144	1.122E-02	8.188E-02	1.483E-01	NOT IDENT.
PM-144	-7.231E-04	8.318E-03	1.500E-02	NOT IDENT.
PR-144	-5.782E-02	6.297E-01	1.135E+00	NOT IDENT.
PM-146	2.401E-02	2.986E-02	5.259E-02	NOT IDENT.
ND-147	-4.530E-01	1.042E+00	1.883E+00	NOT IDENT.
PM-147	2.635E+01	2.941E+02	5.363E+02	NOT IDENT.
PM-149	0.000E+00	4.579E+04	0.000E+00	SHORT HLIF
EU-150	-1.078E-02	1.597E-02	2.478E-02	FAIL ABUN
EU-152	-1.169E-02	5.345E-02	9.213E-02	FAIL ABUN
GD-153	8.926E-03	3.361E-02	6.251E-02	NOT IDENT.
EU-154	2.936E-02	2.324E-02	4.581E-02	NOT IDENT.
EU-155	-1.939E-02	4.007E-02	7.322E-02	FAIL ABUN
TB-160	5.126E-02	3.254E-02	6.397E-02	FAIL ABUN
HO-166M	-4.511E-03	1.309E-02	2.332E-02	NOT IDENT.
TM-171	4.162E+00	1.222E+01	2.375E+01	NOT IDENT.
HF-172	-3.318E-02	7.770E-02	1.401E-01	FAIL ABUN
LU-172	7.186E-03	1.245E-02	2.369E-02	FAIL ABUN
LU-176	2.579E-03	1.316E-02	2.392E-02	FAIL ABUN
HF-181	-5.938E-02	4.004E-02	6.761E-02	NOT IDENT.
TA-182	0.000E+00	4.867E-02	7.719E-02	FAIL ABUN

RE-183	1.438E-02	1.364E-01	2.624E-01	NOT IDENT.
RE-184	-7.209E-03	4.527E-02	7.195E-02	NOT IDENT.
W-188	-2.726E+00	5.243E+00	7.817E+00	FAIL ABUN
IR-192	8.361E-03	2.151E-02	3.909E-02	FAIL ABUN
HG-203	4.773E-03	2.516E-02	4.608E-02	NOT IDENT.
BI-207	1.310E-03	1.023E-02	1.895E-02	FAIL ABUN
PB-210	-1.426E+00	3.287E+00	5.824E+00	NOT IDENT.
BI-211	0.000E+00	1.345E-01	2.124E-01	NOT IDENT.
PB-211	1.004E-01	4.317E-01	7.635E-01	NOT IDENT.
BI-212	0.000E+00	1.511E-01	2.267E-01	FAIL ABUN
RN-219	-4.725E-02	2.436E-01	4.285E-01	NOT IDENT.
RA-223	-1.781E-01	3.215E-01	5.743E-01	FAIL ABUN
AC-227	-8.630E-02	1.162E-01	2.115E-01	FAIL ABUN
TH-227	-8.630E-02	1.162E-01	2.115E-01	FAIL ABUN
TH-231	-1.781E-01	3.215E-01	5.743E-01	FAIL ABUN
PA-233	-3.404E-02	3.230E-02	5.744E-02	FAIL ABUN
PA-234	-1.088E-02	5.998E-02	1.053E-01	NOT IDENT.
PA-234M	1.332E+00	1.416E+00	1.731E+00	FAIL ABUN
TH-234	1.597E-01	1.068E+00	1.163E+00	FAIL ABUN
U-235	-4.752E-03	8.724E-02	1.417E-01	FAIL ABUN
NP-237	-3.404E-02	3.230E-02	5.744E-02	FAIL ABUN
NP-238	0.000E+00	5.454E+03	0.000E+00	SHORT HLIF
U-238	1.597E-01	1.068E+00	1.163E+00	FAIL ABUN
NP-239	1.109E-01	1.029E-01	1.911E-01	NOT IDENT.
PU-239	1.456E+02	1.339E+02	2.465E+02	NOT IDENT.
AM-241	2.466E-02	8.780E-02	1.518E-01	NOT IDENT.
CM-243	-1.007E-02	3.997E-02	7.342E-02	NOT IDENT.
BK-247	-2.310E-02	3.789E-02	6.889E-02	FAIL ABUN
CM-247	1.451E-03	2.230E-02	3.937E-02	NOT IDENT.
CF-249	-1.219E-02	2.282E-02	4.006E-02	NOT IDENT.
CF-251	-1.978E-02	5.510E-02	9.662E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	742	10.66*	1.037E+00	2.522E+00	2.522E+00	9.61
CD-109	88.03	276	3.70*	4.706E+00	5.952E-01	6.295E-01	61.27
SN-126	64.28	31	9.60	1.972E+00	6.156E-02	6.156E-02	682.54
	86.94	276	8.90	4.706E+00	2.474E-01	2.474E-01	61.27
	87.57	276	37.00*	4.706E+00	5.952E-02	5.952E-02	61.27
BA-137M	661.66	70578	89.90*	2.079E+00	1.419E+01	1.422E+01	0.80
CS-137	661.66	70578	85.10*	2.079E+00	1.499E+01	1.503E+01	0.80
TL-208	277.37	-----	6.60	3.978E+00	-----	Line Not Found	-----
	583.19	354	85.00*	2.295E+00	6.824E-02	6.824E-02	35.76
	860.56	78	12.50	1.670E+00	1.396E-01	1.396E-01	62.01
PB-212	74.82	497	10.28	3.467E+00	5.238E-01	5.238E-01	45.22
	77.11	800	17.10	3.720E+00	4.727E-01	4.727E-01	25.27
	238.63	1422	43.60*	4.437E+00	2.762E-01	2.762E-01	17.42
	300.09	139	3.30	3.751E+00	4.226E-01	4.226E-01	131.37
BI-214	609.32	377	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23
	1120.29	123	14.92	1.317E+00	2.354E-01	2.354E-01	28.28
	1764.49	90	15.30	8.956E-01	2.458E-01	2.458E-01	41.56
PB-214	74.82	497	5.80	3.467E+00	9.284E-01	9.284E-01	45.22
	77.11	800	9.70	3.720E+00	8.332E-01	8.333E-01	25.27
	87.09	276	3.41	4.706E+00	6.458E-01	6.459E-01	61.27
	242.00	380	7.25	4.396E+00	4.485E-01	4.485E-01	43.59
	295.22	432	18.42	3.800E+00	2.321E-01	2.321E-01	47.99
	351.93	799	35.60*	3.332E+00	2.529E-01	2.529E-01	31.77
RN-222	609.32	377	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23
	1120.29	123	14.92	1.317E+00	2.354E-01	2.354E-01	28.28
	1764.49	90	15.30	8.956E-01	2.458E-01	2.458E-01	41.56
RA-224	240.99	380	4.10*	4.396E+00	7.930E-01	7.930E-01	43.59
RA-226	609.32	377	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23
	1120.29	123	14.92	1.317E+00	2.354E-01	2.354E-01	28.28
	1764.49	90	15.30	8.956E-01	2.458E-01	2.458E-01	41.56
AC-228	105.21	-----	1.10	5.698E+00	-----	Line Not Found	-----
	338.32	288	11.27	3.436E+00	2.791E-01	2.791E-01	61.13
	794.95	47	4.25	1.787E+00	2.301E-01	2.301E-01	119.32
	835.71	-----	1.61	1.713E+00	-----	Line Not Found	-----
	911.20	271	25.80*	1.588E+00	2.489E-01	2.489E-01	27.00
	968.97	168	15.80	1.503E+00	2.655E-01	2.655E-01	32.94
RA-228	105.21	-----	1.10	5.698E+00	-----	Line Not Found	-----
	338.32	288	11.27	3.436E+00	2.791E-01	2.791E-01	61.13
	794.95	47	4.25	1.787E+00	2.301E-01	2.301E-01	119.32
	835.71	-----	1.61	1.713E+00	-----	Line Not Found	-----
	911.20	271	25.80*	1.588E+00	2.489E-01	2.489E-01	27.00
	968.97	168	15.80	1.503E+00	2.655E-01	2.655E-01	32.94
TH-228	74.82	497	10.28	3.467E+00	5.238E-01	5.238E-01	45.22
	77.11	800	17.10	3.720E+00	4.727E-01	4.727E-01	25.27
	238.63	1422	43.60*	4.437E+00	2.762E-01	2.762E-01	17.42
	300.09	139	3.30	3.751E+00	4.226E-01	4.226E-01	131.37
TH-229	85.43	300	14.70	4.422E+00	1.732E-01	1.732E-01	79.28

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	88.47	276	24.00	4.706E+00	9.176E-02	9.176E-02	61.27
	193.51	-----	4.41*	5.121E+00	-----	Line Not Found	-----
	210.85	110	2.80	4.860E+00	3.039E-01	3.039E-01	191.17
TH-230	609.32	377	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23
	1120.29	123	14.92	1.317E+00	2.354E-01	2.354E-01	28.28
	1764.49	90	15.30	8.956E-01	2.458E-01	2.458E-01	41.56
PA-231	283.69	-----	1.70	3.913E+00	-----	Line Not Found	-----
	301.36	139	5.35*	3.751E+00	2.607E-01	2.607E-01	131.37
TH-232	105.21	-----	1.10	5.698E+00	-----	Line Not Found	-----
	338.32	288	11.27	3.436E+00	2.791E-01	2.791E-01	61.13
	835.71	-----	1.61	1.713E+00	-----	Line Not Found	-----
	911.20	271	25.80*	1.588E+00	2.489E-01	2.489E-01	27.00
	968.97	168	15.80	1.503E+00	2.655E-01	2.655E-01	32.94
U-234	609.32	377	45.49*	2.218E+00	1.403E-01	1.403E-01	43.23
	1120.29	123	14.92	1.317E+00	2.354E-01	2.354E-01	28.28
	1764.49	90	15.30	8.956E-01	2.458E-01	2.458E-01	41.56
AM-243	43.53	-----	5.90	1.974E-01	-----	Line Not Found	-----
	74.66	497	67.20*	3.467E+00	8.013E-02	8.013E-02	45.22
ANH-511	511.00	123	100.00*	2.536E+00	1.828E-02	1.828E-02	208.30

Flag: "*" = Keyline

Total number of lines in spectrum 44
Number of unidentified lines 11
Number of lines tentatively identified by NID 33 75.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	2.522E+00	2.522E+00	0.242E+00	9.61	
CD-109	461.40D	1.06	5.952E-01	6.295E-01	3.857E-01	61.27	
SN-126	2.30E+05Y	1.00	5.952E-02	5.952E-02	3.647E-02	61.27	
BA-137M	30.08Y	1.00	1.419E+01	1.422E+01	0.011E+01	0.80	
CS-137	30.08Y	1.00	1.499E+01	1.503E+01	0.012E+01	0.80	
TL-208	1.41E+10Y	1.00	6.824E-02	6.824E-02	2.440E-02	35.76	
PB-212	1.41E+10Y	1.00	2.762E-01	2.762E-01	0.481E-01	17.42	
BI-214	1600.00Y	1.00	1.403E-01	1.403E-01	0.606E-01	43.23	
PB-214	1600.00Y	1.00	2.529E-01	2.529E-01	0.804E-01	31.77	
RN-222	1600.00Y	1.00	1.403E-01	1.403E-01	0.606E-01	43.23	
RA-224	1.41E+10Y	1.00	7.930E-01	7.930E-01	3.457E-01	43.59	
RA-226	1600.00Y	1.00	1.403E-01	1.403E-01	0.606E-01	43.23	
AC-228	1.41E+10Y	1.00	2.489E-01	2.489E-01	0.672E-01	27.00	
RA-228	1.41E+10Y	1.00	2.489E-01	2.489E-01	0.672E-01	27.00	
TH-228	1.41E+10Y	1.00	2.762E-01	2.762E-01	0.481E-01	17.42	
TH-229	7340.00Y	1.00	9.176E-02	9.176E-02	5.622E-02	61.27	K
TH-230	7.54E+04Y	1.00	1.403E-01	1.403E-01	0.606E-01	43.23	
PA-231	7.04E+08Y	1.00	2.607E-01	2.607E-01	3.425E-01	131.37	
TH-232	1.41E+10Y	1.00	2.489E-01	2.489E-01	0.672E-01	27.00	
U-234	2.45E+05Y	1.00	1.403E-01	1.403E-01	0.606E-01	43.23	
AM-243	7370.00Y	1.00	8.013E-02	8.013E-02	3.624E-02	45.22	
ANH-511	1.00E+09Y	1.00	1.828E-02	1.828E-02	3.808E-02	208.30	

Total Activity : 3.592E+01 3.603E+01

Grand Total Activity : 3.592E+01 3.603E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	185.94	533	4518	1.72	372.27	366	21	9.85E-03	57.2	5.25E+00	T
4	188.54	271	4625	1.73	377.47	366	21	5.01E-03	****	5.20E+00	
0	727.40	99	157	1.48	1455.69	1451	10	2.15E-03	53.2	1.93E+00	T
0	803.32	34	93	1.17	1607.62	1601	11	7.45E-04	****	1.77E+00	T
0	837.28	67	222	5.49	1675.59	1664	18	1.47E-03	****	1.71E+00	T
0	934.87	48	157	6.21	1870.90	1860	16	1.07E-03	****	1.55E+00	
1	964.39	46	160	2.01	1929.98	1925	21	1.03E-03	99.9	1.51E+00	T
0	1001.10	43	109	2.99	2003.44	1996	14	9.81E-04	****	1.46E+00	T
0	1045.45	50	100	4.71	2092.22	2084	17	1.13E-03	96.9	1.40E+00	T
0	1150.33	35	95	4.62	2302.14	2294	15	8.00E-04	****	1.29E+00	
0	1158.58	37	50	3.43	2318.64	2312	11	8.54E-04	82.3	1.28E+00	
0	1173.86	17	84	0.98	2349.24	2342	10	3.91E-04	****	1.26E+00	T
0	1206.30	33	64	3.00	2414.17	2409	11	7.66E-04	99.4	1.23E+00	
0	1221.58	67	54	4.64	2444.76	2439	13	1.55E-03	51.7	1.22E+00	T
0	1239.45	25	111	0.96	2480.53	2472	12	5.85E-04	****	1.20E+00	T
0	1306.82	36	50	1.54	2615.38	2610	12	8.44E-04	85.0	1.14E+00	
0	1637.89	30	33	1.55	3278.15	3269	18	7.22E-04	96.8	9.45E-01	
0	1779.48	12	12	0.52	3561.63	3558	8	3.04E-04	****	8.91E-01	
0	1827.38	31	15	6.15	3657.55	3650	16	7.64E-04	64.4	8.76E-01	
0	1996.30	7	15	1.50	3995.78	3988	9	1.69E-04	****	8.34E-01	
0	2025.29	11	43	7.82	4053.83	4036	23	2.78E-04	****	8.29E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656017.CNF;1
Acquisition date : 23-JUN-2016 15:01:04 Sensitivity : 3.000
Detector ID : GAM44 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:12.73 Half life ratio : *****
Sample date : 17-MAY-2016 13:30:00 Nuclide Library : SOLID
Sample ID : G398656017 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6652E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 9-SEP-2015 08:01:56 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;2

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.404E-02
CD-109	2.723E-01
SN-126	2.608E-02
BA-137M	1.015E-02
CS-137	1.073E-02
TL-208	1.270E-02
PB-212	2.312E-02
BI-214	2.393E-02
PB-214	3.408E-02
RN-222	2.393E-02
RA-224	2.475E-01
RA-226	2.393E-02
AC-228	2.495E-02
RA-228	2.495E-02
TH-228	2.312E-02
TH-229	2.207E-01
TH-230	2.393E-02
PA-231	1.964E-01
TH-232	2.495E-02
U-234	2.393E-02
AM-243	1.870E-02
ANH-511	1.288E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	2.561E-01	NOT IDENT.
NA-22	7.678E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.068E-03	NOT IDENT.
SC-46	8.315E-03	FAIL ABUN
V-48	3.053E-02	NOT IDENT.
CR-51	2.901E-01	NOT IDENT.
MN-54	7.309E-03	NOT IDENT.
CO-56	8.889E-03	FAIL ABUN

MN-56	0.000E+00	SHORT HLIF
CO-57	9.511E-03	NOT IDENT.
CO-58	8.601E-03	NOT IDENT.
FE-59	2.112E-02	NOT IDENT.
CO-60	7.248E-03	FAIL ABUN
ZN-65	1.495E-02	NOT IDENT.
GE-68	2.262E-01	NOT IDENT.
AS-73	6.305E-01	NOT IDENT.
AS-74	7.869E-02	NOT IDENT.
SE-75	2.146E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.037E-01	NOT IDENT.
RB-83	3.758E-02	NOT IDENT.
KR-85	3.226E+00	NOT IDENT.
SR-85	2.158E-02	NOT IDENT.
RB-86	3.088E-01	NOT IDENT.
Y-88	7.008E-03	NOT IDENT.
Y-91	4.410E+00	NOT IDENT.
NB-94	6.563E-03	NOT IDENT.
NB-95	1.015E-02	NOT IDENT.
NB-95M	6.021E-02	NOT IDENT.
ZR-95	1.667E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.148E-02	NOT IDENT.
RH-102	1.876E-02	FAIL ABUN
RU-103	2.893E-02	FAIL ABUN
RH-106	1.108E-01	NOT IDENT.
RU-106	1.108E-01	NOT IDENT.
AG-108M	1.709E-02	NOT IDENT.
AG-110M	8.787E-03	NOT IDENT.
SN-113	2.586E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	6.077E-02	NOT IDENT.
TE-123M	1.156E-02	NOT IDENT.
SB-124	1.946E-02	NOT IDENT.
SB-125	5.197E-02	NOT IDENT.
TE-125M	4.335E+00	NOT IDENT.
I-126	1.516E-01	NOT IDENT.
SB-126	8.285E-02	NOT IDENT.
SB-127	1.324E+01	NOT IDENT.
I-131	3.847E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.991E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	8.010E-03	FAIL ABUN
CS-135	6.647E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.648E-02	NOT IDENT.
CE-139	1.182E-02	NOT IDENT.
BA-140	3.521E-01	NOT IDENT.
LA-140	5.086E-02	NOT IDENT.
CE-141	3.484E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	7.327E-02	NOT IDENT.
PM-144	7.219E-03	NOT IDENT.
PR-144	5.463E-01	NOT IDENT.
PM-146	2.601E-02	NOT IDENT.
ND-147	9.249E-01	NOT IDENT.
PM-147	2.650E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.223E-02	FAIL ABUN
EU-152	4.549E-02	FAIL ABUN
GD-153	3.087E-02	NOT IDENT.
EU-154	2.164E-02	NOT IDENT.
EU-155	3.616E-02	FAIL ABUN
TB-160	3.048E-02	FAIL ABUN
HO-166M	1.117E-02	NOT IDENT.
TM-171	1.172E+01	NOT IDENT.
HF-172	6.924E-02	FAIL ABUN
LU-172	1.122E-02	FAIL ABUN
LU-176	1.181E-02	FAIL ABUN
HF-181	3.336E-02	NOT IDENT.
TA-182	3.664E-02	FAIL ABUN
RE-183	1.295E-01	NOT IDENT.

RE-184	3.421E-02	NOT IDENT.
W-188	3.860E+00	FAIL ABUN
IR-192	1.930E-02	FAIL ABUN
HG-203	2.276E-02	NOT IDENT.
BI-207	8.974E-03	FAIL ABUN
PB-210	2.875E+00	NOT IDENT.
BI-211	1.050E-01	NOT IDENT.
PB-211	3.773E-01	NOT IDENT.
BI-212	1.093E-01	FAIL ABUN
RN-219	2.117E-01	NOT IDENT.
RA-223	2.835E-01	FAIL ABUN
AC-227	1.044E-01	FAIL ABUN
TH-227	1.044E-01	FAIL ABUN
TH-231	2.835E-01	FAIL ABUN
PA-233	2.835E-02	FAIL ABUN
PA-234	4.987E-02	NOT IDENT.
PA-234M	8.234E-01	FAIL ABUN
TH-234	5.744E-01	FAIL ABUN
U-235	7.001E-02	FAIL ABUN
NP-237	2.835E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	5.744E-01	FAIL ABUN
NP-239	9.445E-02	NOT IDENT.
PU-239	1.218E+02	NOT IDENT.
AM-241	7.495E-02	NOT IDENT.
CM-243	3.625E-02	NOT IDENT.
BK-247	3.402E-02	FAIL ABUN
CM-247	1.945E-02	NOT IDENT.
CF-249	1.978E-02	NOT IDENT.
CF-251	4.775E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656017.CNF;1
Acquisition date : 23-JUN-2016 15:01:04 Sensitivity : 3.000
Detector ID : GAM44 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:12.73 Half life ratio : *****
Sample date : 17-MAY-2016 13:30:00 Nuclide Library : SOLID
Sample ID : G398656017 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6652E+02 GRAM
Quantity Err(%) : 1.2011E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 9-SEP-2015 08:01:56 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;2

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	2.522E+00	3.214E-01	3.214E-01
CD-109	3.901E-01	3.866E-01	3.866E-01
SN-126	3.688E-02	3.650E-02	3.650E-02
BA-137M	1.422E+01	1.275E+00	1.275E+00
CS-137	1.503E+01	1.346E+00	1.346E+00
TL-208	6.824E-02	2.469E-02	2.469E-02
PB-212	2.762E-01	5.293E-02	5.293E-02
BI-214	1.403E-01	6.076E-02	6.076E-02
PB-214	2.529E-01	8.182E-02	8.182E-02
RN-222	1.403E-01	6.076E-02	6.076E-02
RA-224	3.587E-01	3.615E-01	3.615E-01
RA-226	1.403E-01	6.076E-02	6.076E-02
AC-228	2.489E-01	7.591E-02	7.591E-02
RA-228	2.489E-01	7.591E-02	7.591E-02
TH-228	2.762E-01	5.293E-02	5.293E-02
TH-229	9.267E-02	2.671E-01	2.671E-01
TH-230	1.403E-01	6.076E-02	6.076E-02
PA-231	2.607E-01	3.408E-01	3.408E-01
TH-232	2.489E-01	7.591E-02	7.591E-02
U-234	1.403E-01	6.076E-02	6.076E-02
AM-243	5.893E-02	3.642E-02	3.642E-02
ANH-511	1.828E-02	3.735E-02	3.735E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	3.501E-01	2.951E-01	3.347E-01	NOT IDENT.
NA-22	1.008E-02	8.308E-03	9.470E-03	NOT IDENT.
NA-24	-1.732E+15	7.676E+15	7.715E+15	SHORT HLIF
AL-26	-3.707E-03	7.548E-03	7.731E-03	NOT IDENT.
SC-46	4.835E-04	9.770E-03	9.772E-03	FAIL ABUN
V-48	-5.193E-03	3.512E-02	3.520E-02	NOT IDENT.
CR-51	3.623E-02	3.437E-01	3.441E-01	NOT IDENT.
MN-54	3.522E-03	8.367E-03	8.516E-03	NOT IDENT.

CO-56	-4.875E-04	1.045E-02	1.045E-02	FAIL ABUN
MN-56	-1.000E+41	2.611E+42	0.000E+00	SHORT HLIF
CO-57	-1.023E-03	1.059E-02	1.060E-02	NOT IDENT.
CO-58	4.462E-03	9.771E-03	9.975E-03	NOT IDENT.
FE-59	9.346E-03	2.380E-02	2.417E-02	NOT IDENT.
CO-60	4.012E-03	8.235E-03	8.432E-03	FAIL ABUN
ZN-65	-3.288E-03	2.040E-02	2.045E-02	NOT IDENT.
GE-68	-1.355E-01	2.702E-01	2.770E-01	NOT IDENT.
AS-73	-5.930E-02	6.626E-01	6.632E-01	NOT IDENT.
AS-74	3.249E-02	8.811E-02	8.932E-02	NOT IDENT.
SE-75	-1.349E-02	2.391E-02	2.467E-02	NOT IDENT.
BR-77	2.772E+04	3.031E+04	3.278E+04	SHORT HLIF
SR-82	-1.271E-01	1.289E-01	1.411E-01	NOT IDENT.
RB-83	-6.458E-03	4.571E-02	4.580E-02	NOT IDENT.
KR-85	9.310E+00	3.972E+00	5.779E+00	NOT IDENT.
SR-85	6.208E-02	2.657E-02	3.859E-02	NOT IDENT.
RB-86	-1.055E-01	3.627E-01	3.658E-01	NOT IDENT.
Y-88	-3.012E-03	9.836E-03	9.929E-03	NOT IDENT.
Y-91	5.126E+00	5.471E+00	5.939E+00	NOT IDENT.
NB-94	6.640E-03	7.240E-03	7.835E-03	NOT IDENT.
NB-95	1.054E-02	1.128E-02	1.224E-02	NOT IDENT.
NB-95M	5.434E-04	7.466E-02	7.466E-02	NOT IDENT.
ZR-95	1.126E-02	1.869E-02	1.937E-02	NOT IDENT.
NB-97	1.000E+41	1.748E+40	0.000E+00	SHORT HLIF
ZR-97	7.625E+14	2.844E+15	2.865E+15	SHORT HLIF
MO-99	4.205E+02	6.463E+02	6.735E+02	SHORT HLIF
TC-99M	-1.000E+41	4.008E+41	0.000E+00	SHORT HLIF
RH-101	2.768E-03	1.277E-02	1.283E-02	NOT IDENT.
RH-102	-1.041E-02	2.162E-02	2.213E-02	FAIL ABUN
RU-103	5.234E-04	3.207E-02	3.207E-02	FAIL ABUN
RH-106	-1.322E-01	1.298E-01	1.429E-01	NOT IDENT.
RU-106	-1.322E-01	1.298E-01	1.429E-01	NOT IDENT.
AG-108M	1.408E-02	1.958E-02	2.059E-02	NOT IDENT.
AG-110M	-1.279E-02	1.136E-02	1.274E-02	NOT IDENT.
SN-113	1.116E-02	2.944E-02	2.986E-02	NOT IDENT.
CD-115	6.346E+02	5.265E+03	5.273E+03	SHORT HLIF
SN-117M	1.196E-02	6.885E-02	6.906E-02	NOT IDENT.
TE-123M	1.035E-03	1.312E-02	1.313E-02	NOT IDENT.
SB-124	-6.048E-03	2.336E-02	2.351E-02	NOT IDENT.
SB-125	2.364E-02	5.967E-02	6.062E-02	NOT IDENT.
TE-125M	-1.058E+00	4.798E+00	4.821E+00	NOT IDENT.
I-126	2.854E-01	1.827E-01	2.235E-01	NOT IDENT.
SB-126	-4.607E-02	1.046E-01	1.066E-01	NOT IDENT.
SB-127	2.688E+00	1.503E+01	1.508E+01	NOT IDENT.
I-131	1.955E-01	4.344E-01	4.433E-01	NOT IDENT.
I-132	1.000E+41	2.607E+41	0.000E+00	SHORT HLIF
TE-132	-1.685E+01	3.933E+01	4.006E+01	SHORT HLIF
BA-133	1.847E-02	2.541E-02	2.674E-02	NOT IDENT.
I-133	-1.296E+11	1.406E+11	1.523E+11	SHORT HLIF
CS-134	1.184E-02	1.392E-02	1.491E-02	FAIL ABUN
CS-135	3.089E-02	7.306E-02	7.437E-02	NOT IDENT.
I-135	-3.875E+38	2.518E+39	0.000E+00	SHORT HLIF
CS-136	-1.973E-04	7.520E-02	7.520E-02	NOT IDENT.
CE-139	-7.770E-03	1.371E-02	1.415E-02	NOT IDENT.
BA-140	-1.676E-01	3.973E-01	4.044E-01	NOT IDENT.
LA-140	-2.033E-02	6.342E-02	6.407E-02	NOT IDENT.
CE-141	-2.965E-02	4.401E-02	4.600E-02	NOT IDENT.
CE-143	5.196E+06	4.688E+06	5.241E+06	SHORT HLIF
CE-144	1.122E-02	8.189E-02	8.204E-02	NOT IDENT.
PM-144	-7.231E-04	8.319E-03	8.325E-03	NOT IDENT.
PR-144	-5.782E-02	6.297E-01	6.302E-01	NOT IDENT.
PM-146	2.401E-02	2.996E-02	3.186E-02	NOT IDENT.
ND-147	-4.530E-01	1.042E+00	1.062E+00	NOT IDENT.
PM-147	2.635E+01	2.941E+02	2.943E+02	NOT IDENT.
PM-149	-1.836E+02	4.579E+04	4.579E+04	SHORT HLIF
EU-150	-1.078E-02	1.600E-02	1.672E-02	FAIL ABUN
EU-152	-1.169E-02	5.346E-02	5.372E-02	FAIL ABUN
GD-153	8.926E-03	3.361E-02	3.385E-02	NOT IDENT.
EU-154	2.936E-02	2.338E-02	2.686E-02	NOT IDENT.
EU-155	-1.939E-02	4.011E-02	4.105E-02	FAIL ABUN
TB-160	5.126E-02	3.339E-02	4.061E-02	FAIL ABUN
HO-166M	-4.511E-03	1.309E-02	1.325E-02	NOT IDENT.
TM-171	4.162E+00	1.223E+01	1.238E+01	NOT IDENT.
HF-172	-3.318E-02	7.792E-02	7.935E-02	FAIL ABUN
LU-172	7.186E-03	1.255E-02	1.296E-02	FAIL ABUN
LU-176	2.579E-03	1.317E-02	1.322E-02	FAIL ABUN
HF-181	-5.938E-02	4.038E-02	4.845E-02	NOT IDENT.
TA-182	9.604E-02	4.946E-02	6.573E-02	FAIL ABUN

RE-183	1.438E-02	1.364E-01	1.366E-01	NOT IDENT.
RE-184	-7.209E-03	4.528E-02	4.540E-02	NOT IDENT.
W-188	-2.726E+00	5.256E+00	5.398E+00	FAIL ABUN
IR-192	8.361E-03	2.152E-02	2.185E-02	FAIL ABUN
HG-203	4.773E-03	2.517E-02	2.526E-02	NOT IDENT.
BI-207	1.310E-03	1.023E-02	1.025E-02	FAIL ABUN
PB-210	-1.426E+00	3.291E+00	3.353E+00	NOT IDENT.
BI-211	3.273E-01	1.377E-01	2.018E-01	NOT IDENT.
PB-211	1.004E-01	4.318E-01	4.341E-01	NOT IDENT.
BI-212	2.898E-01	1.543E-01	2.021E-01	FAIL ABUN
RN-219	-4.725E-02	2.437E-01	2.447E-01	NOT IDENT.
RA-223	-1.781E-01	3.220E-01	3.318E-01	FAIL ABUN
AC-227	-8.630E-02	1.169E-01	1.232E-01	FAIL ABUN
TH-227	-8.630E-02	1.169E-01	1.232E-01	FAIL ABUN
TH-231	-1.781E-01	3.220E-01	3.318E-01	FAIL ABUN
PA-233	-3.404E-02	3.245E-02	3.590E-02	FAIL ABUN
PA-234	-1.088E-02	6.128E-02	6.148E-02	NOT IDENT.
PA-234M	1.332E+00	1.434E+00	1.555E+00	FAIL ABUN
TH-234	1.597E-01	1.069E+00	1.071E+00	FAIL ABUN
U-235	-4.752E-03	8.724E-02	8.727E-02	FAIL ABUN
NP-237	-3.404E-02	3.245E-02	3.590E-02	FAIL ABUN
NP-238	4.074E+03	5.496E+03	5.795E+03	SHORT HLIF
U-238	1.597E-01	1.069E+00	1.071E+00	FAIL ABUN
NP-239	1.109E-01	1.036E-01	1.151E-01	NOT IDENT.
PU-239	1.456E+02	1.345E+02	1.496E+02	NOT IDENT.
AM-241	2.466E-02	8.785E-02	8.855E-02	NOT IDENT.
CM-243	-1.007E-02	3.998E-02	4.024E-02	NOT IDENT.
BK-247	-2.310E-02	3.821E-02	3.961E-02	FAIL ABUN
CM-247	1.451E-03	2.230E-02	2.231E-02	NOT IDENT.
CF-249	-1.219E-02	2.286E-02	2.351E-02	NOT IDENT.
CF-251	-1.978E-02	5.515E-02	5.587E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1828.7581	87.09	2184.8491	136.47	2113.6748
45.60	1841.3893	87.57	2235.6321	140.51	0.0000
46.54	1812.6165	88.03	2213.2998	143.76	2188.2373
49.72	0.0000	88.34	2094.2410	144.24	2215.3469
51.35	1781.2692	88.47	2094.7756	145.44	2221.3203
51.87	1800.6718	89.96	2444.9187	152.43	2217.9639
52.39	1768.6979	1093.63	2451.2136	153.25	2174.1672
52.97	1831.4668	91.11	2241.9600	323.87	2189.3975
53.44	1814.1511	92.59	2125.9021	156.02	2249.0586
54.07	1851.0857	93.35	2083.8389	158.56	2204.3464
57.36	0.0000	94.56	2100.9519	159.00	2198.8076
57.53	1832.2540	94.65	2282.3281	162.33	2179.8223
57.98	1841.0404	94.67	2282.4072	162.66	2139.6106
59.27	1840.9987	94.87	2283.2649	163.33	2130.0254
59.32	1841.2347	97.43	1986.0729	165.86	2218.3828
59.54	1797.9662	98.43	2010.4427	176.31	2214.9221
60.96	1860.4027	98.44	2010.4822	176.60	2227.3228
61.17	1849.9036	99.53	1993.7234	177.52	2272.8777
62.93	1815.2687	100.11	1970.8796	181.07	0.0000
63.29	1833.2288	102.03	2033.9984	181.52	2305.5952
63.58	1871.1104	103.18	2001.5929	184.41	2605.8752
64.28	1878.6503	103.37	2002.2750	143.76	2609.8962
66.73	1926.1194	105.21	2059.0894	193.51	2745.0574
67.24	1898.1469	105.31	2059.4490	197.03	2707.4536
125.81	1920.7225	106.12	2003.5612	198.01	2657.6948
67.75	1921.0341	106.47	1978.5062	201.83	2762.4028
69.67	1892.5486	109.28	2079.9487	203.43	2519.9658
70.83	1921.0851	111.00	2036.2528	205.31	2527.6838
72.81	1980.8512	111.76	0.0000	210.85	2528.3713
72.87	1981.1176	114.06	2168.0217	215.65	2448.5420
74.66	1989.0155	116.30	0.0000	222.11	2385.2708
74.82	1989.7223	116.74	2040.7505	227.09	2302.4934
74.97	1990.3779	119.76	2187.1509	227.38	2328.9866
77.11	1971.8784	121.12	2103.6150	228.16	0.0000
78.74	1957.8440	121.22	2116.8738	228.18	2329.0474
79.69	1952.8065	121.78	2158.6287	116.74	2329.0474
80.12	1699.7628	122.06	2175.7488	235.69	2272.3630
80.19	1700.0137	122.92	2194.8992	235.96	2274.4668
80.57	1701.3721	123.07	2179.2180	238.63	2284.9128
81.00	1958.1887	265.00	2174.8159	238.98	0.0000
81.07	1958.4773	125.81	2311.0869	240.99	2284.9475
81.75	1965.7550	127.23	2288.9661	242.00	2228.0493
83.79	1971.0107	127.91	2321.8245	244.70	2098.7578
84.00	1971.8472	129.30	2202.4346	252.40	2041.5784
85.43	1948.7798	131.20	2275.4800	252.80	2086.7761
86.55	1953.1655	133.02	2242.2107	254.15	0.0000
86.79	2083.2458	133.52	2162.6785	256.23	2097.2720
86.94	2083.8840	136.00	2165.0918	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	2089.6687	355.39	0.0000	584.27	708.9449
264.80	2089.9355	356.01	1826.3844	595.83	694.3277
265.00	2099.8647	364.49	1884.7898	427.87	743.6840
268.22	2106.9558	366.42	0.0000	602.52	0.0000
269.46	2083.3801	372.51	2022.5709	604.72	711.2838
270.03	2106.5330	375.05	2022.0127	607.14	700.9955
271.23	2106.8516	377.52	1974.2610	609.32	704.5955
273.65	2154.7634	356.01	1887.3843	610.33	721.1761
276.40	2007.3551	388.16	1997.1819	614.28	724.1167
277.37	2019.7024	388.63	1977.8088	618.01	655.7449
277.60	1995.9412	391.69	1966.0768	620.36	677.5773
278.00	1990.8298	264.66	2114.8892	621.93	678.0944
279.20	2025.8270	401.81	2132.4375	630.19	0.0000
279.54	2039.0260	402.40	2104.5657	631.29	631.8607
279.70	2076.1294	404.85	2142.0481	633.25	626.6589
280.46	2140.5161	410.95	2182.6804	634.78	598.1148
283.69	2002.6346	413.71	2160.9067	635.95	610.0334
284.31	1988.1406	414.70	2140.8623	636.99	609.3589
285.41	1963.7251	423.72	2245.9539	645.85	606.9946
285.90	0.0000	427.09	2202.1860	657.76	620.0552
287.50	1985.7649	427.87	2198.9216	657.90	0.0000
290.67	2002.8750	433.94	2220.3528	661.66	435.2874
293.27	0.0000	439.40	2317.1262	664.57	0.0000
351.93	1986.9703	453.88	2420.0752	666.33	166.6382
295.96	1984.2765	463.37	2560.8574	666.50	168.2845
879.38	1988.6224	468.07	2515.9238	667.71	0.0000
299.98	1990.9342	473.00	2524.3147	677.62	154.6657
300.09	1901.7194	475.06	2351.6853	685.70	166.0887
300.13	1901.8076	476.78	2238.2869	695.00	189.5918
301.36	1788.7349	477.60	2129.0898	696.49	220.5041
302.85	1869.9545	482.18	1960.5756	696.51	220.5041
256.23	2007.0372	487.02	1648.0488	697.00	220.5529
304.85	1990.1783	492.35	0.0000	697.30	220.5800
306.78	1905.9226	497.08	1482.7061	697.49	225.5646
308.46	1798.3414	505.52	1392.2743	702.65	170.2945
311.90	1965.5674	507.63	0.0000	706.68	170.5909
316.51	1863.9215	511.00	1274.5515	711.68	183.9461
319.41	1877.2316	514.00	1204.7925	720.70	154.2905
320.08	1842.1428	514.00	1204.8248	721.93	0.0000
321.04	1904.6967	520.40	1158.8440	722.78	159.0291
323.87	1939.0410	520.69	0.0000	722.91	154.0146
325.23	1917.9701	522.65	0.0000	723.31	154.0408
328.76	1949.4584	527.90	0.0000	724.19	152.4220
333.37	1967.4932	528.26	1016.2133	727.33	146.9196
333.97	2020.2252	529.59	1038.9521	733.00	156.3434
334.37	2033.8292	529.87	0.0000	735.93	148.4535
338.28	1945.3894	531.02	997.5401	333.97	126.3153
338.32	1945.4479	537.26	947.4538	739.50	0.0000
311.90	1882.0560	546.56	0.0000	747.24	126.8219
340.48	1882.0560	552.55	781.4812	748.06	141.0735
340.55	1882.1689	563.25	795.1306	752.31	144.3678
344.28	1972.0863	569.33	738.6088	753.82	120.0396
345.93	1963.9955	946.00	738.6666	756.73	135.4580
351.06	1982.2290	569.70	733.1259	756.80	137.4983
351.93	1914.9449	583.19	739.9813	884.68	171.6012

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	156.3954	1274.44	93.5580	1620.50	49.4490
766.42	167.6796	1001.03	104.6869	1621.92	45.7324
766.84	163.6172	1002.74	98.5206	1678.03	0.0000
772.60	0.0000	1004.73	95.4032	1690.97	44.5084
776.52	163.2234	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	44.2176
778.90	152.0722	1028.54	0.0000	1063.66	38.7339
783.70	127.6510	1037.84	75.5193	1771.35	38.1808
785.37	145.2479	1038.76	0.0000	1791.20	0.0000
792.07	123.9375	631.29	82.7041	1808.65	45.5739
794.95	124.0752	1048.07	98.3251	1810.72	0.0000
795.86	127.5669	1049.04	83.8435	1836.06	34.8781
810.06	124.7988	1050.41	77.4241		
810.29	125.9662	1063.66	102.9814		
344.28	123.7763	1077.00	111.9358		
810.76	119.6298	1077.34	116.6888		
815.77	108.3951	1085.87	94.1620		
1048.07	112.6802	1093.63	89.6167		
832.01	145.0609	1099.45	89.7697		
834.85	149.0653	1112.07	105.6178		
835.71	149.1104	1112.84	100.9916		
836.80	0.0000	1115.54	106.9217		
846.75	0.0000	1120.29	109.5422		
846.77	144.4520	1120.55	107.6296		
856.80	132.2845	1221.41	102.1599		
860.56	160.7237	1129.67	105.0216		
871.09	104.2470	1131.51	0.0000		
873.19	137.3270	1147.95	0.0000		
875.33	0.0000	1173.23	86.8271		
879.38	89.6212	1177.95	85.4079		
880.51	104.6011	1189.05	104.8536		
883.24	126.0693	1204.77	75.9249		
884.68	145.3732	1221.41	81.3549		
889.28	119.9160	1231.02	95.1641		
894.76	135.1670	1235.36	127.5984		
898.04	127.8030	1238.28	99.3205		
900.72	116.1000	1260.41	0.0000		
903.28	130.6513	1271.87	79.1672		
911.20	129.4717	1274.44	66.1853		
912.08	124.1135	1274.54	66.1880		
923.98	0.0000	1291.59	78.5713		
926.50	110.2696	1298.22	0.0000		
929.11	110.3689	1312.11	95.4789		
937.49	101.6094	1332.49	70.2382		
944.13	112.3847	1362.66	0.0000		
946.00	110.2740	1365.19	61.5796		
949.00	104.9203	1368.63	0.0000		
667.71	0.0000	1384.29	86.6182		
962.31	118.9260	1408.01	66.3750		
964.08	124.4868	1457.56	0.0000		
966.17	115.4128	1460.82	64.0654		
911.20	115.5205	1489.16	48.6298		
968.97	115.5205	1505.03	46.6855		
983.53	104.0960	1584.12	69.1172		
984.45	0.0000	1596.21	55.2230		

VAX/VMS Nuclide Identification Report Generated 24-JUN-2016 05:18:02.64

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656018.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;135
Background date  : 20-JUN-2016 14:17:28
Sample date      : 17-MAY-2016 13:35:00 Acquisition date : 23-JUN-2016 17:17:36
Sample ID        : G398656018 Sample quantity : 1.62740E+02 GRAM
Detector name     : GAM43 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:05.35 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	38.41	433	93	2.19	76.58	72	26	1.00E-02	8.7	3.25E+00
2	9	40.64	155	249	1.49	81.05	72	26	3.59E-03	25.7	
3	9	43.21	132	577	2.20	86.20	72	26	3.05E-03	39.8	
4	9	46.00*	76	792	2.44	91.78	72	26	1.76E-03	78.2	
5	0	66.19	80	569	1.77	132.17	130	7	1.84E-03	51.2	
6	7	73.56*	44	448	2.17	146.91	144	15	1.02E-03	89.8	5.77E+00
7	7	74.87*	274	699	1.27	149.53	144	15	6.34E-03	20.0	
8	7	77.09	433	506	1.03	153.97	144	15	1.00E-02	9.6	
9	2	84.15	109	653	1.38	168.11	164	29	2.53E-03	40.2	2.01E+00
10	2	87.12	244	624	1.39	174.05	164	29	5.66E-03	18.5	
11	2	89.83	147	522	1.15	179.47	164	29	3.41E-03	27.1	
12	2	92.62*	169	496	1.19	185.04	164	29	3.91E-03	34.7	
13	2	94.44	95	543	1.41	188.69	164	29	2.19E-03	51.2	
14	0	129.12*	36	478	0.86	258.06	255	7	8.26E-04	127.9	
15	0	143.88*	12	465	0.93	287.59	284	7	2.85E-04	389.3	
16	0	185.81*	161	614	1.25	371.48	366	11	3.72E-03	39.6	
17	0	209.09	57	419	0.95	418.06	416	7	1.32E-03	60.7	
18	3	238.57*	1071	351	1.10	477.03	471	18	2.48E-02	5.4	2.17E+00
19	3	241.58	293	537	1.88	483.05	471	18	6.78E-03	19.2	
20	0	277.81	89	294	1.53	555.54	552	8	2.06E-03	35.2	
21	0	295.30*	269	401	1.04	590.52	585	11	6.22E-03	17.9	
22	0	299.99	70	282	1.14	599.90	596	8	1.63E-03	43.0	
23	0	328.33	136	470	6.74	656.60	650	16	3.15E-03	36.6	
24	0	338.27*	171	333	1.30	676.47	672	10	3.95E-03	24.2	
25	0	351.87*	530	358	1.40	703.70	698	14	1.23E-02	9.8	
26	3	462.32	106	245	2.26	924.64	917	21	2.44E-03	32.8	3.66E-01
27	3	466.72	41	143	1.99	933.45	917	21	9.47E-04	60.8	
28	0	510.66*	96	320	2.34	1021.35	1013	18	2.23E-03	69.1	
29	0	582.86*	224	239	1.79	1165.78	1159	16	5.18E-03	19.8	
30	0	595.22	23	236	1.39	1190.49	1187	11	5.28E-04	131.7	
31	0	602.18	50	252	1.54	1204.42	1197	13	1.16E-03	67.5	
32	0	608.87*	375	247	1.56	1217.80	1210	15	8.69E-03	11.7	
33	0	620.73	31	292	4.00	1241.52	1231	20	7.10E-04	138.2	
34	4	726.89	110	118	2.35	1453.89	1448	15	2.55E-03	21.7	2.21E+00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	4	729.87	19	55	1.28	1459.84	1448	15	4.46E-04	66.4	
36	0	755.66	8	123	1.22	1511.43	1506	10	1.83E-04	265.8	
37	0	767.45	57	116	1.61	1535.02	1530	11	1.31E-03	39.2	
38	0	821.49	15	93	1.05	1643.12	1635	11	3.48E-04	127.0	
39	0	859.73	41	132	2.15	1719.61	1712	12	9.51E-04	58.1	
40	0	910.56*	239	126	1.56	1821.28	1812	17	5.54E-03	14.5	
41	0	950.46	21	99	1.58	1901.09	1895	13	4.92E-04	97.2	
42	0	969.06	113	152	1.50	1938.31	1929	15	2.61E-03	26.2	
43	0	1119.91	73	79	2.45	2240.04	2234	12	1.69E-03	26.9	
44	0	1237.37	48	79	2.88	2474.96	2470	14	1.11E-03	41.6	
45	0	1343.39	54	58	10.73	2687.02	2674	24	1.25E-03	40.4	
46	0	1412.84	8	32	0.64	2825.92	2819	9	1.76E-04	141.7	
47	0	1460.09*	657	51	2.34	2920.42	2913	19	1.52E-02	5.5	
48	0	1502.59	7	50	2.36	3005.42	2995	12	1.61E-04	203.6	
49	0	1720.79	13	40	4.46	3441.82	3424	23	3.02E-04	129.5	
50	0	1742.97	23	25	4.19	3486.17	3476	20	5.42E-04	56.2	
51	0	1763.67	80	34	2.78	3527.58	3516	19	1.86E-03	20.5	
52	0	1997.78	48	39	5.28	3995.77	3976	39	1.11E-03	45.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 24-JUN-2016 05:18:04

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656018.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 13:35:00 Acquisition date : 23-JUN-2016 17:17:36
Sample ID         : G398656018 Sample quantity  : 162.74 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA43 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:05.35 0.0%
Energy tolerance  : 1.50 keV Half life ratio : 10.00
Errors propagated : No Systematic Error : 0.00 %
Efficiency type   : Empirical Efficiency at : Peak Energy
Abundance limit   : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.017E+00	2.266E+00	2.266E+00	11.00	OK
AS-74	595.83	59.00*	2.318E+00	6.969E-03	2.998E-02	263.36	OK
	634.78	15.40	2.199E+00	----- Line	Not Found	-----	Absent
RH-106	621.93	9.93*	2.240E+00	5.734E-02	6.148E-02	276.45	OK
	1050.41	1.56	1.389E+00	----- Line	Not Found	-----	Absent
RU-106	621.93	9.93*	2.240E+00	5.734E-02	6.148E-02	276.45	OK
	1050.41	1.56	1.389E+00	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	4.658E+00	5.700E-01	6.030E-01	48.26	OK
SN-126	64.28	9.60	1.984E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.658E+00	2.370E-01	2.370E-01	48.26	OK
	87.57	37.00*	4.658E+00	5.700E-02	5.700E-02	48.26	OK
HG-203	70.83	3.69	2.839E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	3.188E+00	1.162E-01	2.028E-01	179.61	OK
	279.20	81.56*	4.068E+00	8.293E-03	1.447E-02	105.05	OK
TL-208	277.37	6.60	4.073E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	2.357E+00	4.683E-02	4.683E-02	39.69	OK
	860.56	12.50	1.684E+00	7.802E-02	7.802E-02	116.15	OK
PB-210	46.54	4.25*	2.391E-01	4.063E+00	4.076E+00	156.42	OK
BI-211	72.87	1.23	3.188E+00	5.850E-01	5.850E-01	179.61	OK
	351.06	12.92*	3.431E+00	6.383E-02	6.383E-02	308.36	OK
PB-212	74.82	10.28	3.351E+00	3.176E-01	3.176E-01	53.08	OK
	77.11	17.10	3.618E+00	3.623E-01	3.623E-01	19.22	OK
	238.63	43.60*	4.536E+00	2.507E-01	2.507E-01	10.82	OK
	300.09	3.30	3.849E+00	2.499E-01	2.499E-01	85.90	OK
BI-214	609.32	45.49*	2.276E+00	1.511E-01	1.512E-01	23.36	OK
	1120.29	14.92	1.304E+00	1.449E-01	1.449E-01	53.90	OK
	1764.49	15.30	8.858E-01	2.160E-01	2.160E-01	41.07	OK
PB-214	74.82	5.80	3.345E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.618E+00	6.388E-01	6.388E-01	19.22	OK
	87.09	3.41	4.655E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.490E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.893E+00	1.694E-01	1.694E-01	35.78	OK
	351.93	35.60*	3.430E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.276E+00	1.511E-01	1.512E-01	23.36	OK
	1120.29	14.92	1.304E+00	1.449E-01	1.449E-01	53.90	OK
	1764.49	15.30	8.858E-01	2.160E-01	2.160E-01	41.07	OK
RA-224	240.99	4.10*	4.496E+00	4.349E-01	4.349E-01	69.43	OK
RA-226	609.32	45.49*	2.276E+00	1.511E-01	1.512E-01	23.36	OK
	1120.29	14.92	1.304E+00	1.449E-01	1.449E-01	53.90	OK
	1764.49	15.30	8.858E-01	2.160E-01	2.160E-01	41.07	OK
AC-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.530E+00	1.914E-01	1.914E-01	48.36	OK
	794.95	4.25	1.810E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.595E+00	2.309E-01	2.309E-01	28.97	OK
	968.97	15.80	1.502E+00	1.868E-01	1.868E-01	52.39	OK
RA-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.530E+00	1.914E-01	1.914E-01	48.36	OK
	794.95	4.25	1.810E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.595E+00	2.309E-01	2.309E-01	28.97	OK
	968.97	15.80	1.502E+00	1.868E-01	1.868E-01	52.39	OK
	74.82	10.28	3.351E+00	3.176E-01	3.176E-01	53.08	OK
	77.11	17.10	3.618E+00	3.623E-01	3.623E-01	19.22	OK
TH-229	238.63	43.60*	4.536E+00	2.507E-01	2.507E-01	10.82	OK
	300.09	3.30	3.849E+00	2.499E-01	2.499E-01	85.90	OK
	85.43	14.70	4.382E+00	8.732E-02	8.733E-02	80.42	OK
	88.47	24.00	4.658E+00	8.788E-02	8.788E-02	48.26	OK
	193.51	4.41*	5.221E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	4.939E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.276E+00	1.511E-01	1.511E-01	23.36	OK
	1120.29	14.92	1.304E+00	1.449E-01	1.449E-01	53.90	OK
	1764.49	15.30	8.858E-01	2.160E-01	2.160E-01	41.07	OK
PA-231	283.69	1.70	4.007E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	3.849E+00	1.542E-01	1.542E-01	85.90	OK
	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.530E+00	1.914E-01	1.914E-01	48.36	OK
	835.71	1.61	1.729E+00	----- Line	Not Found	-----	Absent
U-234	911.20	25.80*	1.595E+00	2.309E-01	2.309E-01	28.97	OK
	968.97	15.80	1.502E+00	1.868E-01	1.868E-01	52.39	OK
	609.32	45.49*	2.276E+00	1.511E-01	1.511E-01	23.36	OK
	1120.29	14.92	1.304E+00	1.449E-01	1.449E-01	53.90	OK
U-235	1764.49	15.30	8.858E-01	2.160E-01	2.160E-01	41.07	OK
	89.96	3.47	4.885E+00	4.436E-01	4.436E-01	54.25	OK
	93.35	5.60	5.094E+00	3.014E-01	3.014E-01	69.44	OK
	143.76	10.96*	6.013E+00	9.097E-03	9.097E-03	778.52	OK
AM-243	163.33	5.08	5.735E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.352E+00	2.494E-02	2.494E-02	79.24	OK
	205.31	5.01	5.027E+00	----- Line	Not Found	-----	Absent
	43.53	5.90	1.329E-01	9.173E+00	9.173E+00	79.63	OK
ANH-511	74.66	67.20*	3.351E+00	4.859E-02	4.859E-02	53.08	OK
	511.00	100.00*	2.611E+00	1.568E-02	1.568E-02	138.29	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656018.CNF;1
Acquisition date : 23-JUN-2016 17:17:36 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.35 Half life ratio : *****
Sample date : 17-MAY-2016 13:35:00 Analyst initials: MXR1
Sample ID : G398656018 Sample Quantity : 1.6274E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	2.266E+00	2.443E-01	1.363E-01
AS-74	2.998E-02	7.738E-02	8.206E-02
RH-106	6.148E-02	1.666E-01	1.249E-01
RU-106	6.148E-02	1.666E-01	1.249E-01
CD-109	6.030E-01	2.852E-01	2.776E-01
SN-126	5.700E-02	2.696E-02	2.646E-02
HG-203	1.447E-02	1.489E-02	1.785E-02
TL-208	4.683E-02	1.821E-02	1.252E-02
PB-210	4.076E+00	6.249E+00	2.921E+00
BI-211	6.383E-02	1.929E-01	7.688E-02
PB-212	2.507E-01	2.659E-02	2.066E-02
BI-214	1.512E-01	3.460E-02	2.499E-02
PB-214	1.926E-01	3.703E-02	4.510E-02
RN-222	1.512E-01	3.460E-02	2.499E-02
RA-224	4.349E-01	2.959E-01	2.214E-01
RA-226	1.512E-01	3.460E-02	2.499E-02
AC-228	2.309E-01	6.555E-02	4.560E-02
RA-228	2.309E-01	6.555E-02	4.560E-02
TH-228	2.507E-01	2.659E-02	2.066E-02
TH-229	-1.618E-02	1.055E-01	1.930E-01
TH-230	1.511E-01	3.460E-02	2.499E-02
PA-231	1.542E-01	1.298E-01	1.733E-01
TH-232	2.309E-01	6.555E-02	4.560E-02
U-234	1.511E-01	3.460E-02	2.499E-02
U-235	9.097E-03	6.941E-02	7.075E-02
AM-243	4.859E-02	2.527E-02	2.214E-02
ANH-511	1.568E-02	2.125E-02	1.082E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.208E-02	8.859E-02	1.624E-01	NOT IDENT.
NA-22	-1.859E-02	9.789E-03	1.566E-02	NOT IDENT.
NA-24	0.000E+00	8.301E+15	0.000E+00	SHORT HLIF

AL-26	4.903E-04	6.926E-03	1.299E-02	NOT IDENT.
SC-46	-7.585E-04	9.176E-03	1.647E-02	FAIL ABUN
V-48	-1.010E-02	4.018E-02	7.030E-02	NOT IDENT.
CR-51	3.055E-02	1.385E-01	2.541E-01	NOT IDENT.
MN-54	-1.105E-03	8.052E-03	1.441E-02	NOT IDENT.
CO-56	-1.257E-03	1.014E-02	1.815E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.294E-03	5.044E-03	9.556E-03	NOT IDENT.
CO-58	-1.228E-03	9.354E-03	1.687E-02	NOT IDENT.
FE-59	-2.261E-03	2.371E-02	4.333E-02	NOT IDENT.
CO-60	-2.784E-03	1.025E-02	1.528E-02	NOT IDENT.
ZN-65	-5.679E-03	2.254E-02	3.435E-02	NOT IDENT.
GE-68	-6.566E-02	3.802E-01	5.097E-01	NOT IDENT.
AS-73	2.048E-01	4.331E-01	8.284E-01	NOT IDENT.
SE-75	-8.787E-03	1.057E-02	1.839E-02	NOT IDENT.
BR-77	0.000E+00	2.740E+03	0.000E+00	SHORT HLIF
SR-82	-1.418E-01	1.255E-01	2.133E-01	NOT IDENT.
RB-83	-6.894E-03	1.762E-02	3.108E-02	NOT IDENT.
KR-85	0.000E+00	1.845E+00	3.591E+00	NOT IDENT.
SR-85	0.000E+00	1.235E-02	2.403E-02	NOT IDENT.
RB-86	-1.521E-01	5.142E-01	6.791E-01	NOT IDENT.
Y-88	2.588E-03	9.486E-03	1.803E-02	NOT IDENT.
Y-91	7.979E-01	5.212E+00	9.549E+00	NOT IDENT.
NB-94	-4.879E-03	7.549E-03	1.335E-02	NOT IDENT.
NB-95	1.623E-02	1.248E-02	2.132E-02	NOT IDENT.
NB-95M	4.470E-02	3.572E-02	5.958E-02	NOT IDENT.
ZR-95	4.683E-03	2.439E-02	3.475E-02	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.570E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	7.102E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	2.542E-03	6.792E-03	1.154E-02	NOT IDENT.
RH-102	-3.571E-03	1.148E-02	2.091E-02	FAIL ABUN
RU-103	3.821E-03	1.222E-02	2.241E-02	FAIL ABUN
AG-108M	-7.722E-03	5.956E-03	1.024E-02	NOT IDENT.
AG-110M	-4.575E-03	1.099E-02	1.926E-02	FAIL ABUN
SN-113	-2.275E-03	1.028E-02	1.875E-02	NOT IDENT.
CD-115	0.000E+00	2.310E+03	0.000E+00	SHORT HLIF
SN-117M	-4.523E-02	3.278E-02	5.879E-02	NOT IDENT.
TE-123M	-1.043E-02	6.285E-03	1.117E-02	NOT IDENT.
SB-124	-6.502E-04	2.444E-02	4.521E-02	NOT IDENT.
SB-125	-2.571E-02	2.228E-02	3.361E-02	FAIL ABUN
TE-125M	-4.875E-01	2.442E+00	4.670E+00	NOT IDENT.
I-126	2.541E-02	1.421E-01	2.641E-01	NOT IDENT.
SB-126	9.432E-02	1.082E-01	1.828E-01	NOT IDENT.
SB-127	1.879E+00	1.392E+01	2.583E+01	NOT IDENT.
I-131	1.495E-01	1.637E-01	3.135E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.769E+01	0.000E+00	SHORT HLIF
BA-133	9.087E-03	9.402E-03	1.599E-02	FAIL ABUN
I-133	0.000E+00	6.414E+10	0.000E+00	SHORT HLIF
CS-134	5.416E-03	8.483E-03	1.591E-02	NOT IDENT.
CS-135	1.922E-02	3.252E-02	5.952E-02	NOT IDENT.
I-135	0.000E+00	3.335E+39	0.000E+00	SHORT HLIF
CS-136	-2.108E-02	6.641E-02	1.200E-01	NOT IDENT.
BA-137M	3.524E-03	7.009E-03	1.324E-02	NOT IDENT.
CS-137	3.722E-03	7.405E-03	1.399E-02	NOT IDENT.
CE-139	-1.054E-02	6.553E-03	1.163E-02	NOT IDENT.
BA-140	2.675E-02	1.823E-01	3.298E-01	NOT IDENT.
LA-140	2.266E-03	5.699E-02	1.070E-01	FAIL ABUN
CE-141	2.160E-02	2.145E-02	3.687E-02	NOT IDENT.
CE-143	0.000E+00	2.678E+06	0.000E+00	SHORT HLIF
CE-144	2.683E-02	4.303E-02	7.363E-02	NOT IDENT.
PM-144	8.746E-03	8.320E-03	1.584E-02	NOT IDENT.
PR-144	6.579E-01	6.298E-01	1.198E+00	NOT IDENT.
PM-146	1.436E-03	9.313E-03	1.610E-02	NOT IDENT.
ND-147	-3.687E-01	4.542E-01	7.817E-01	FAIL ABUN
PM-147	-3.021E+01	1.415E+02	2.686E+02	NOT IDENT.
PM-149	0.000E+00	2.039E+04	0.000E+00	SHORT HLIF
EU-150	-1.864E-03	9.636E-03	1.027E-02	FAIL ABUN
EU-152	7.027E-03	2.321E-02	3.809E-02	NOT IDENT.
GD-153	-3.016E-03	1.886E-02	3.215E-02	NOT IDENT.
EU-154	-5.168E-02	2.745E-02	4.398E-02	FAIL ABUN
EU-155	8.062E-04	1.966E-02	3.797E-02	FAIL ABUN
TB-160	3.607E-03	3.439E-02	6.227E-02	FAIL ABUN
HO-166M	3.274E-04	1.243E-02	2.276E-02	FAIL ABUN
TM-171	-1.095E+00	8.117E+00	1.525E+01	FAIL ABUN
HF-172	-2.805E-03	4.105E-02	6.866E-02	FAIL ABUN

LU-172	5.035E-03	1.186E-02	2.249E-02	FAIL ABUN
LU-176	-3.630E-03	5.471E-03	1.003E-02	FAIL ABUN
HF-181	-9.048E-03	1.322E-02	2.315E-02	NOT IDENT.
TA-182	-1.006E-03	4.259E-02	7.688E-02	FAIL ABUN
RE-183	2.415E-02	8.540E-02	1.615E-01	FAIL ABUN
RE-184	-2.113E-02	4.623E-02	6.803E-02	NOT IDENT.
W-188	8.974E-01	2.127E+00	3.379E+00	NOT IDENT.
IR-192	-6.328E-03	8.872E-03	1.618E-02	FAIL ABUN
BI-207	-7.639E-03	1.096E-02	1.926E-02	FAIL ABUN
PB-211	-1.397E-02	1.469E-01	2.686E-01	NOT IDENT.
BI-212	0.000E+00	1.461E-01	2.205E-01	FAIL ABUN
RN-219	-8.376E-03	1.114E-01	1.545E-01	NOT IDENT.
RA-223	-3.786E-02	1.494E-01	2.397E-01	FAIL ABUN
AC-227	-1.703E-02	5.230E-02	9.303E-02	FAIL ABUN
TH-227	-1.703E-02	5.230E-02	9.303E-02	FAIL ABUN
TH-231	-3.786E-02	1.494E-01	2.397E-01	FAIL ABUN
PA-233	1.006E-02	1.345E-02	2.581E-02	FAIL ABUN
PA-234	4.243E-02	7.015E-02	1.137E-01	FAIL ABUN
PA-234M	-2.770E-01	1.423E+00	1.766E+00	FAIL ABUN
TH-234	1.612E-01	5.420E-01	7.656E-01	FAIL ABUN
NP-237	1.006E-02	1.345E-02	2.581E-02	FAIL ABUN
NP-238	0.000E+00	6.506E+03	0.000E+00	SHORT HLIF
U-238	1.612E-01	5.420E-01	7.656E-01	FAIL ABUN
NP-239	-2.290E-02	5.039E-02	9.525E-02	FAIL ABUN
PU-239	4.560E+01	1.143E+02	1.247E+02	FAIL ABUN
AM-241	-1.049E-02	5.028E-02	9.340E-02	NOT IDENT.
CM-243	-1.265E-02	1.974E-02	3.747E-02	FAIL ABUN
BK-247	-1.086E-02	1.672E-02	2.929E-02	FAIL ABUN
CM-247	-2.732E-03	1.027E-02	1.414E-02	FAIL ABUN
CF-249	4.285E-04	8.055E-03	1.488E-02	NOT IDENT.
CF-251	7.112E-03	2.526E-02	4.720E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	639	10.66*	1.017E+00	2.266E+00	2.266E+00	11.00
AS-74	595.83	25	59.00*	2.318E+00	6.969E-03	2.998E-02	263.36
	634.78	-----	15.40	2.199E+00	-----	Line Not Found	-----
RH-106	621.93	33	9.93*	2.240E+00	5.734E-02	6.148E-02	276.45
	1050.41	-----	1.56	1.389E+00	-----	Line Not Found	-----
RU-106	621.93	33	9.93*	2.240E+00	5.734E-02	6.148E-02	276.45
	1050.41	-----	1.56	1.389E+00	-----	Line Not Found	-----
CD-109	88.03	326	3.70*	4.658E+00	7.261E-01	7.681E-01	37.09
SN-126	64.28	-----	9.60	1.984E+00	-----	Line Not Found	-----
	86.94	326	8.90	4.658E+00	3.019E-01	3.019E-01	37.09
	87.57	326	37.00*	4.658E+00	7.261E-02	7.261E-02	37.09
HG-203	70.83	-----	3.69	2.839E+00	-----	Line Not Found	-----
	72.87	60	6.19	3.188E+00	1.162E-01	2.028E-01	179.61
	279.20	105	81.56*	4.068E+00	1.219E-02	2.126E-02	70.47
TL-208	277.37	105	6.60	4.068E+00	1.506E-01	1.506E-01	70.47
	583.19	244	85.00*	2.357E+00	4.683E-02	4.683E-02	39.69
	860.56	43	12.50	1.684E+00	7.802E-02	7.802E-02	116.15
PB-210	46.54	107	4.25*	2.391E-01	4.063E+00	4.076E+00	156.42
BI-211	72.87	60	1.23	3.188E+00	5.850E-01	5.850E-01	179.61
	351.06	612	12.92*	3.431E+00	5.306E-01	5.306E-01	19.62
PB-212	74.82	370	10.28	3.351E+00	4.132E-01	4.132E-01	39.95
	77.11	583	17.10	3.618E+00	3.623E-01	3.623E-01	19.22
	238.63	1289	43.60*	4.536E+00	2.507E-01	2.507E-01	10.82
	300.09	83	3.30	3.849E+00	2.499E-01	2.499E-01	85.90
BI-214	609.32	407	45.49*	2.276E+00	1.511E-01	1.512E-01	23.36
	1120.29	73	14.92	1.304E+00	1.449E-01	1.449E-01	53.90
	1764.49	76	15.30	8.858E-01	2.160E-01	2.160E-01	41.07
PB-214	74.82	370	5.80	3.351E+00	7.323E-01	7.323E-01	39.95
	77.11	583	9.70	3.618E+00	6.388E-01	6.388E-01	19.22
	87.09	326	3.41	4.658E+00	7.879E-01	7.879E-01	37.09
	242.00	352	7.25	4.496E+00	4.153E-01	4.154E-01	38.44
	295.22	316	18.42	3.893E+00	1.694E-01	1.694E-01	35.78
	351.93	612	35.60*	3.431E+00	1.926E-01	1.926E-01	19.62
RN-222	609.32	407	45.49*	2.276E+00	1.511E-01	1.512E-01	23.36
	1120.29	73	14.92	1.304E+00	1.449E-01	1.449E-01	53.90
	1764.49	76	15.30	8.858E-01	2.160E-01	2.160E-01	41.07
RA-224	240.99	352	4.10*	4.496E+00	7.344E-01	7.344E-01	38.44
RA-226	609.32	407	45.49*	2.276E+00	1.511E-01	1.512E-01	23.36
	1120.29	73	14.92	1.304E+00	1.449E-01	1.449E-01	53.90
	1764.49	76	15.30	8.858E-01	2.160E-01	2.160E-01	41.07
AC-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	198	11.27	3.530E+00	1.914E-01	1.914E-01	48.36
	794.95	-----	4.25	1.810E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	247	25.80*	1.595E+00	2.309E-01	2.309E-01	28.97
	968.97	115	15.80	1.502E+00	1.868E-01	1.868E-01	52.39
RA-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	198	11.27	3.530E+00	1.914E-01	1.914E-01	48.36
	794.95	-----	4.25	1.810E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	247	25.80*	1.595E+00	2.309E-01	2.309E-01	28.97
	968.97	115	15.80	1.502E+00	1.868E-01	1.868E-01	52.39
TH-228	74.82	370	10.28	3.351E+00	4.132E-01	4.132E-01	39.95
	77.11	583	17.10	3.618E+00	3.623E-01	3.623E-01	19.22
	238.63	1289	43.60*	4.536E+00	2.507E-01	2.507E-01	10.82
	300.09	83	3.30	3.849E+00	2.499E-01	2.499E-01	85.90
TH-229	85.43	146	14.70	4.382E+00	8.732E-02	8.733E-02	80.42
	88.47	326	24.00	4.658E+00	1.119E-01	1.119E-01	37.09
	193.51	-----	4.41*	5.221E+00	-----	Line Not Found	-----
	210.85	-----	2.80	4.939E+00	-----	Line Not Found	-----
TH-230	609.32	407	45.49*	2.276E+00	1.511E-01	1.511E-01	23.36
	1120.29	73	14.92	1.304E+00	1.449E-01	1.449E-01	53.90
	1764.49	76	15.30	8.858E-01	2.160E-01	2.160E-01	41.07
PA-231	283.69	-----	1.70	4.007E+00	-----	Line Not Found	-----
	301.36	83	5.35*	3.849E+00	1.542E-01	1.542E-01	85.90
TH-232	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	198	11.27	3.530E+00	1.914E-01	1.914E-01	48.36
	835.71	-----	1.61	1.729E+00	-----	Line Not Found	-----
	911.20	247	25.80*	1.595E+00	2.309E-01	2.309E-01	28.97
	968.97	115	15.80	1.502E+00	1.868E-01	1.868E-01	52.39
U-234	609.32	407	45.49*	2.276E+00	1.511E-01	1.511E-01	23.36
	1120.29	73	14.92	1.304E+00	1.449E-01	1.449E-01	53.90
	1764.49	76	15.30	8.858E-01	2.160E-01	2.160E-01	41.07
U-235	89.96	196	3.47	4.885E+00	4.436E-01	4.436E-01	54.25
	93.35	224	5.60	5.094E+00	3.014E-01	3.014E-01	69.44
	143.76	16	10.96*	6.013E+00	9.097E-03	9.097E-03	778.52
	163.33	-----	5.08	5.735E+00	-----	Line Not Found	-----
	185.72	199	57.20	5.352E+00	2.494E-02	2.494E-02	79.24
	205.31	-----	5.01	5.027E+00	-----	Line Not Found	-----
AM-243	43.53	187	5.90	1.329E-01	9.173E+00	9.173E+00	79.63
	74.66	370	67.20*	3.351E+00	6.321E-02	6.321E-02	39.95
ANH-511	511.00	107	100.00*	2.611E+00	1.568E-02	1.568E-02	138.29

Flag: "*" = Keyline

Total number of lines in spectrum 52
Number of unidentified lines 11
Number of lines tentatively identified by NID 41 78.85%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	2.266E+00	2.266E+00	0.249E+00	11.00	
AS-74	17.77D	4.30	6.969E-03	2.998E-02	7.895E-02	263.36	
RH-106	371.80D	1.07	5.734E-02	6.148E-02	17.00E-02	276.45	
RU-106	371.80D	1.07	5.734E-02	6.148E-02	17.00E-02	276.45	
CD-109	461.40D	1.06	7.261E-01	7.681E-01	2.849E-01	37.09	
SN-126	2.30E+05Y	1.00	7.261E-02	7.261E-02	2.693E-02	37.09	
HG-203	46.59D	1.74	1.219E-02	2.126E-02	1.498E-02	70.47	
TL-208	1.41E+10Y	1.00	4.683E-02	4.683E-02	1.859E-02	39.69	
PB-210	22.20Y	1.00	4.063E+00	4.076E+00	6.376E+00	156.42	
BI-211	7.04E+08Y	1.00	5.306E-01	5.306E-01	1.041E-01	19.62	
PB-212	1.41E+10Y	1.00	2.507E-01	2.507E-01	0.271E-01	10.82	
BI-214	1600.00Y	1.00	1.511E-01	1.512E-01	0.353E-01	23.36	
PB-214	1600.00Y	1.00	1.926E-01	1.926E-01	0.378E-01	19.62	
RN-222	1600.00Y	1.00	1.511E-01	1.512E-01	0.353E-01	23.36	
RA-224	1.41E+10Y	1.00	7.344E-01	7.344E-01	2.823E-01	38.44	
RA-226	1600.00Y	1.00	1.511E-01	1.512E-01	0.353E-01	23.36	
AC-228	1.41E+10Y	1.00	2.309E-01	2.309E-01	0.669E-01	28.97	
RA-228	1.41E+10Y	1.00	2.309E-01	2.309E-01	0.669E-01	28.97	
TH-228	1.41E+10Y	1.00	2.507E-01	2.507E-01	0.271E-01	10.82	
TH-229	7340.00Y	1.00	1.119E-01	1.119E-01	0.415E-01	37.09	K
TH-230	7.54E+04Y	1.00	1.511E-01	1.511E-01	0.353E-01	23.36	
PA-231	7.04E+08Y	1.00	1.542E-01	1.542E-01	1.324E-01	85.90	
TH-232	1.41E+10Y	1.00	2.309E-01	2.309E-01	0.669E-01	28.97	
U-234	2.45E+05Y	1.00	1.511E-01	1.511E-01	0.353E-01	23.36	
U-235	7.04E+08Y	1.00	9.097E-03	9.097E-03	70.82E-03	778.52	
AM-243	7370.00Y	1.00	6.321E-02	6.321E-02	2.525E-02	39.95	
ANH-511	1.00E+09Y	1.00	1.568E-02	1.568E-02	2.169E-02	138.29	
Total Activity :			1.107E+01	1.117E+01			

Grand Total Activity : 1.107E+01 1.117E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
9	38.41	622	134	2.19	76.58	72	26	1.00E-02	17.3	3.57E-02	
9	40.64	222	356	1.49	81.05	72	26	3.59E-03	51.5	6.95E-02	
0	66.19	109	779	1.77	132.17	130	7	1.84E-03	****	2.23E+00	T
2	94.44	125	718	1.41	188.69	164	29	2.19E-03	****	5.22E+00	T
0	129.12	46	613	0.86	258.06	255	7	8.26E-04	****	6.11E+00	T
0	209.09	70	511	0.95	418.06	416	7	1.32E-03	****	4.97E+00	
0	328.33	158	547	6.74	656.60	650	16	3.15E-03	73.2	3.61E+00	T
3	462.32	118	274	2.26	924.64	917	21	2.44E-03	65.5	2.81E+00	T
3	466.72	46	160	1.99	933.45	917	21	9.47E-04	****	2.79E+00	T
0	602.18	54	274	1.54	1204.42	1197	13	1.16E-03	****	2.30E+00	T
4	726.89	117	125	2.35	1453.89	1448	15	2.55E-03	43.4	1.96E+00	T
4	729.87	20	58	1.28	1459.84	1448	15	4.46E-04	****	1.95E+00	
0	755.66	8	130	1.22	1511.43	1506	10	1.83E-04	****	1.89E+00	T
0	767.45	60	122	1.61	1535.02	1530	11	1.31E-03	78.3	1.87E+00	T
0	821.49	16	97	1.05	1643.12	1635	11	3.48E-04	****	1.76E+00	
0	950.46	22	101	1.58	1901.09	1895	13	4.92E-04	****	1.53E+00	T
0	1237.37	48	79	2.88	2474.96	2470	14	1.11E-03	83.2	1.18E+00	T
0	1343.39	53	57	10.73	2687.02	2674	24	1.25E-03	80.8	1.10E+00	
0	1412.84	7	32	0.64	2825.92	2819	9	1.76E-04	****	1.05E+00	
0	1502.59	7	48	2.36	3005.42	2995	12	1.61E-04	****	9.93E-01	
0	1720.79	12	38	4.46	3441.82	3424	23	3.02E-04	****	8.99E-01	
0	1742.97	22	23	4.19	3486.17	3476	20	5.42E-04	****	8.92E-01	
0	1997.78	45	36	5.28	3995.77	3976	39	1.11E-03	90.1	8.39E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656018.CNF;1  *
* Acquisition date   : 23-JUN-2016 17:17:36 Sensitivity      : 3.000          *
* Detector ID        : GAM43 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:05.35 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 13:35:00 Nuclide Library : SOLID          *
* Sample ID          : G398656018 Analyst initials: MXR1          *
* Batch Number       : 1572234 Sample Quantity : 1.6274E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000         *
*                                     Dry Weight    : 0.00000         *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-SEP-2015 10:32:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.335E-02
AS-74	3.935E-02
RH-106	5.987E-02
RU-106	5.987E-02
CD-109	1.354E-01
SN-126	1.291E-02
HG-203	8.638E-03
TL-208	5.995E-03
PB-210	1.409E+00
BI-211	3.722E-02
PB-212	1.005E-02
BI-214	1.198E-02
PB-214	2.211E-02
RN-222	1.198E-02
RA-224	1.077E-01
RA-226	1.198E-02
AC-228	2.151E-02
RA-228	2.151E-02
TH-228	1.005E-02
TH-229	9.414E-02
TH-230	1.198E-02
PA-231	8.401E-02
TH-232	2.151E-02
U-234	1.198E-02
U-235	3.454E-02
AM-243	1.082E-02
ANH-511	5.203E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.816E-02	NOT IDENT.
NA-22	7.364E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	5.900E-03	NOT IDENT.

SC-46	7.792E-03	FAIL ABUN
V-48	3.335E-02	NOT IDENT.
CR-51	1.233E-01	NOT IDENT.
MN-54	6.870E-03	NOT IDENT.
CO-56	8.641E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	4.661E-03	NOT IDENT.
CO-58	8.003E-03	NOT IDENT.
FE-59	2.041E-02	NOT IDENT.
CO-60	7.157E-03	NOT IDENT.
ZN-65	1.629E-02	NOT IDENT.
GE-68	2.416E-01	NOT IDENT.
AS-73	4.041E-01	NOT IDENT.
SE-75	8.923E-03	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.014E-01	NOT IDENT.
RB-83	1.491E-02	NOT IDENT.
KR-85	1.748E+00	NOT IDENT.
SR-85	1.170E-02	NOT IDENT.
RB-86	3.215E-01	NOT IDENT.
Y-88	8.245E-03	NOT IDENT.
Y-91	4.516E+00	NOT IDENT.
NB-94	6.413E-03	NOT IDENT.
NB-95	1.023E-02	NOT IDENT.
NB-95M	2.907E-02	NOT IDENT.
ZR-95	1.660E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	5.634E-03	NOT IDENT.
RH-102	1.002E-02	FAIL ABUN
RU-103	1.078E-02	FAIL ABUN
AG-108M	4.916E-03	NOT IDENT.
AG-110M	9.138E-03	FAIL ABUN
SN-113	9.050E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	2.866E-02	NOT IDENT.
TE-123M	5.447E-03	NOT IDENT.
SB-124	2.075E-02	NOT IDENT.
SB-125	1.618E-02	FAIL ABUN
TE-125M	2.280E+00	NOT IDENT.
I-126	1.264E-01	NOT IDENT.
SB-126	8.732E-02	NOT IDENT.
SB-127	1.232E+01	NOT IDENT.
I-131	1.518E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	7.738E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	7.602E-03	NOT IDENT.
CS-135	2.895E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.661E-02	NOT IDENT.
BA-137M	6.342E-03	NOT IDENT.
CS-137	6.699E-03	NOT IDENT.
CE-139	5.667E-03	NOT IDENT.
BA-140	1.582E-01	NOT IDENT.
LA-140	4.907E-02	FAIL ABUN
CE-141	1.802E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.592E-02	NOT IDENT.
PM-144	7.637E-03	NOT IDENT.
PR-144	5.779E-01	NOT IDENT.
PM-146	7.756E-03	NOT IDENT.
ND-147	3.737E-01	FAIL ABUN
PM-147	1.310E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	4.979E-03	FAIL ABUN
EU-152	1.846E-02	NOT IDENT.
GD-153	1.568E-02	NOT IDENT.
EU-154	2.068E-02	FAIL ABUN
EU-155	1.852E-02	FAIL ABUN
TB-160	2.961E-02	FAIL ABUN
HO-166M	1.089E-02	FAIL ABUN
TM-171	7.437E+00	FAIL ABUN
HF-172	3.350E-02	FAIL ABUN
LU-172	1.060E-02	FAIL ABUN

LU-176	4.861E-03	FAIL ABUN
HF-181	1.113E-02	NOT IDENT.
TA-182	3.641E-02	FAIL ABUN
RE-183	7.877E-02	FAIL ABUN
RE-184	3.222E-02	NOT IDENT.
W-188	1.640E+00	NOT IDENT.
IR-192	7.841E-03	FAIL ABUN
BI-207	9.113E-03	FAIL ABUN
PB-211	1.297E-01	NOT IDENT.
BI-212	1.062E-01	FAIL ABUN
RN-219	7.465E-02	NOT IDENT.
RA-223	1.161E-01	FAIL ABUN
AC-227	4.519E-02	FAIL ABUN
TH-227	4.519E-02	FAIL ABUN
TH-231	1.161E-01	FAIL ABUN
PA-233	1.253E-02	FAIL ABUN
PA-234	5.397E-02	FAIL ABUN
PA-234M	8.399E-01	FAIL ABUN
TH-234	3.746E-01	FAIL ABUN
NP-237	1.253E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	3.746E-01	FAIL ABUN
NP-239	4.647E-02	FAIL ABUN
PU-239	6.090E+01	FAIL ABUN
AM-241	4.557E-02	NOT IDENT.
CM-243	1.827E-02	FAIL ABUN
BK-247	1.422E-02	FAIL ABUN
CM-247	6.829E-03	FAIL ABUN
CF-249	7.184E-03	NOT IDENT.
CF-251	2.302E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656018.CNF;1
Acquisition date : 23-JUN-2016 17:17:36 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.35 Half life ratio : *****
Sample date : 17-MAY-2016 13:35:00 Nuclide Library : SOLID
Sample ID : G398656018 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6274E+02 GRAM
Quantity Err(%) : 1.2290E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	2.266E+00	3.116E-01	3.116E-01
AS-74	2.998E-02	7.745E-02	7.745E-02
RH-106	6.148E-02	1.667E-01	1.667E-01
RU-106	6.148E-02	1.667E-01	1.667E-01
CD-109	6.030E-01	2.935E-01	2.935E-01
SN-126	5.700E-02	2.758E-02	2.758E-02
HG-203	1.446E-02	1.500E-02	1.500E-02
TL-208	4.683E-02	1.869E-02	1.869E-02
PB-210	4.076E+00	6.271E+00	6.271E+00
BI-211	6.383E-02	2.026E-01	2.026E-01
PB-212	2.507E-01	3.506E-02	3.506E-02
BI-214	1.512E-01	3.717E-02	3.717E-02
PB-214	1.926E-01	4.083E-02	4.083E-02
RN-222	1.512E-01	3.717E-02	3.717E-02
RA-224	4.349E-01	3.012E-01	3.012E-01
RA-226	1.512E-01	3.717E-02	3.717E-02
AC-228	2.309E-01	7.505E-02	7.505E-02
RA-228	2.309E-01	7.505E-02	7.505E-02
TH-228	2.507E-01	3.506E-02	3.506E-02
TH-229	-1.618E-02	1.055E-01	1.055E-01
TH-230	1.511E-01	3.717E-02	3.717E-02
PA-231	1.542E-01	1.345E-01	1.345E-01
TH-232	2.309E-01	7.505E-02	7.505E-02
U-234	1.511E-01	3.717E-02	3.717E-02
U-235	9.097E-03	6.941E-02	6.941E-02
AM-243	4.859E-02	2.581E-02	2.581E-02
ANH-511	1.568E-02	2.130E-02	2.130E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.208E-02	8.861E-02	8.916E-02	NOT IDENT.
NA-22	-1.859E-02	9.904E-03	1.297E-02	NOT IDENT.
NA-24	-2.539E+15	8.304E+15	8.383E+15	SHORT HLIF

AL-26	4.903E-04	6.926E-03	6.929E-03	NOT IDENT.
SC-46	-7.585E-04	9.177E-03	9.183E-03	FAIL ABUN
V-48	-1.010E-02	4.022E-02	4.048E-02	NOT IDENT.
CR-51	3.055E-02	1.385E-01	1.392E-01	NOT IDENT.
MN-54	-1.105E-03	8.054E-03	8.069E-03	NOT IDENT.
CO-56	-1.257E-03	1.014E-02	1.016E-02	FAIL ABUN
MN-56	-1.000E+41	8.407E+41	0.000E+00	SHORT HLIF
CO-57	-1.294E-03	5.045E-03	5.079E-03	NOT IDENT.
CO-58	-1.228E-03	9.355E-03	9.371E-03	NOT IDENT.
FE-59	-2.261E-03	2.372E-02	2.374E-02	NOT IDENT.
CO-60	-2.784E-03	1.025E-02	1.033E-02	NOT IDENT.
ZN-65	-5.679E-03	2.257E-02	2.272E-02	NOT IDENT.
GE-68	-6.566E-02	3.804E-01	3.816E-01	NOT IDENT.
AS-73	2.048E-01	4.359E-01	4.456E-01	NOT IDENT.
SE-75	-8.787E-03	1.061E-02	1.132E-02	NOT IDENT.
BR-77	2.584E+04	2.812E+04	3.043E+04	SHORT HLIF
SR-82	-1.418E-01	1.266E-01	1.418E-01	NOT IDENT.
RB-83	-6.894E-03	1.765E-02	1.792E-02	NOT IDENT.
KR-85	8.984E+00	2.004E+00	4.519E+00	NOT IDENT.
SR-85	6.001E-02	1.341E-02	3.019E-02	NOT IDENT.
RB-86	-1.521E-01	5.150E-01	5.195E-01	NOT IDENT.
Y-88	2.588E-03	9.488E-03	9.559E-03	NOT IDENT.
Y-91	7.979E-01	5.212E+00	5.225E+00	NOT IDENT.
NB-94	-4.879E-03	7.564E-03	7.878E-03	NOT IDENT.
NB-95	1.623E-02	1.262E-02	1.459E-02	NOT IDENT.
NB-95M	4.470E-02	3.604E-02	4.129E-02	NOT IDENT.
ZR-95	4.683E-03	2.440E-02	2.449E-02	FAIL ABUN
NB-97	1.000E+41	5.109E+41	0.000E+00	SHORT HLIF
ZR-97	8.087E+15	1.720E+15	4.031E+15	SHORT HLIF
MO-99	3.937E+01	7.102E+02	7.104E+02	SHORT HLIF
TC-99M	1.000E+41	2.864E+41	0.000E+00	SHORT HLIF
RH-101	2.542E-03	6.810E-03	6.906E-03	NOT IDENT.
RH-102	-3.571E-03	1.149E-02	1.160E-02	FAIL ABUN
RU-103	3.821E-03	1.223E-02	1.235E-02	FAIL ABUN
AG-108M	-7.722E-03	5.990E-03	6.928E-03	NOT IDENT.
AG-110M	-4.575E-03	1.101E-02	1.121E-02	FAIL ABUN
SN-113	-2.275E-03	1.028E-02	1.033E-02	NOT IDENT.
CD-115	-2.481E+03	2.323E+03	2.578E+03	SHORT HLIF
SN-117M	-4.523E-02	3.295E-02	3.875E-02	NOT IDENT.
TE-123M	-1.043E-02	6.332E-03	7.887E-03	NOT IDENT.
SB-124	-6.502E-04	2.444E-02	2.444E-02	NOT IDENT.
SB-125	-2.571E-02	2.238E-02	2.521E-02	FAIL ABUN
TE-125M	-4.875E-01	2.442E+00	2.452E+00	NOT IDENT.
I-126	2.541E-02	1.421E-01	1.426E-01	NOT IDENT.
SB-126	9.432E-02	1.090E-01	1.170E-01	NOT IDENT.
SB-127	1.879E+00	1.393E+01	1.395E+01	NOT IDENT.
I-131	1.495E-01	1.642E-01	1.775E-01	NOT IDENT.
I-132	1.000E+41	3.343E+41	0.000E+00	SHORT HLIF
TE-132	2.491E+00	1.769E+01	1.773E+01	SHORT HLIF
BA-133	9.087E-03	9.436E-03	1.029E-02	FAIL ABUN
I-133	-8.385E+10	6.741E+10	7.729E+10	SHORT HLIF
CS-134	5.416E-03	8.509E-03	8.852E-03	NOT IDENT.
CS-135	1.922E-02	3.259E-02	3.372E-02	NOT IDENT.
I-135	-3.068E+39	4.234E+39	0.000E+00	SHORT HLIF
CS-136	-2.108E-02	6.654E-02	6.722E-02	NOT IDENT.
BA-137M	3.524E-03	7.017E-03	7.194E-03	NOT IDENT.
CS-137	3.722E-03	7.412E-03	7.600E-03	NOT IDENT.
CE-139	-1.054E-02	6.912E-03	8.387E-03	NOT IDENT.
BA-140	2.675E-02	1.823E-01	1.827E-01	NOT IDENT.
LA-140	2.266E-03	5.699E-02	5.700E-02	FAIL ABUN
CE-141	2.160E-02	2.152E-02	2.362E-02	NOT IDENT.
CE-143	6.004E+06	2.744E+06	3.854E+06	SHORT HLIF
CE-144	2.683E-02	4.309E-02	4.476E-02	NOT IDENT.
PM-144	8.746E-03	8.365E-03	9.247E-03	NOT IDENT.
PR-144	6.579E-01	6.331E-01	6.991E-01	NOT IDENT.
PM-146	1.436E-03	9.315E-03	9.337E-03	NOT IDENT.
ND-147	-3.687E-01	4.554E-01	4.848E-01	FAIL ABUN
PM-147	-3.021E+01	1.416E+02	1.422E+02	NOT IDENT.
PM-149	2.625E+03	2.040E+04	2.043E+04	SHORT HLIF
EU-150	-1.864E-03	9.638E-03	9.675E-03	FAIL ABUN
EU-152	7.027E-03	2.322E-02	2.344E-02	NOT IDENT.
GD-153	-3.016E-03	1.887E-02	1.892E-02	NOT IDENT.
EU-154	-5.168E-02	2.778E-02	3.625E-02	FAIL ABUN
EU-155	8.062E-04	1.966E-02	1.966E-02	FAIL ABUN
TB-160	3.607E-03	3.440E-02	3.444E-02	FAIL ABUN
HO-166M	3.274E-04	1.243E-02	1.243E-02	FAIL ABUN
TM-171	-1.095E+00	8.118E+00	8.133E+00	FAIL ABUN
HF-172	-2.805E-03	4.106E-02	4.108E-02	FAIL ABUN

LU-172	5.035E-03	1.191E-02	1.213E-02	FAIL ABUN
LU-176	-3.630E-03	5.482E-03	5.721E-03	FAIL ABUN
HF-181	-9.048E-03	1.324E-02	1.386E-02	NOT IDENT.
TA-182	-1.006E-03	4.259E-02	4.259E-02	FAIL ABUN
RE-183	2.415E-02	8.549E-02	8.618E-02	FAIL ABUN
RE-184	-2.113E-02	4.637E-02	4.734E-02	NOT IDENT.
W-188	8.974E-01	2.131E+00	2.169E+00	NOT IDENT.
IR-192	-6.328E-03	8.892E-03	9.338E-03	FAIL ABUN
BI-207	-7.639E-03	1.106E-02	1.158E-02	FAIL ABUN
PB-211	-1.397E-02	1.469E-01	1.471E-01	NOT IDENT.
BI-212	3.436E-01	1.508E-01	2.162E-01	FAIL ABUN
RN-219	-8.376E-03	1.114E-01	1.115E-01	NOT IDENT.
RA-223	-3.786E-02	1.494E-01	1.504E-01	FAIL ABUN
AC-227	-1.703E-02	5.237E-02	5.293E-02	FAIL ABUN
TH-227	-1.703E-02	5.237E-02	5.293E-02	FAIL ABUN
TH-231	-3.786E-02	1.494E-01	1.504E-01	FAIL ABUN
PA-233	1.006E-02	1.348E-02	1.422E-02	FAIL ABUN
PA-234	4.243E-02	8.557E-02	8.768E-02	FAIL ABUN
PA-234M	-2.770E-01	1.424E+00	1.429E+00	FAIL ABUN
TH-234	1.612E-01	5.434E-01	5.482E-01	FAIL ABUN
NP-237	1.006E-02	1.348E-02	1.422E-02	FAIL ABUN
NP-238	-1.985E+03	6.515E+03	6.576E+03	SHORT HLIF
U-238	1.612E-01	5.434E-01	5.482E-01	FAIL ABUN
NP-239	-2.290E-02	5.045E-02	5.150E-02	FAIL ABUN
PU-239	4.560E+01	1.144E+02	1.162E+02	FAIL ABUN
AM-241	-1.049E-02	5.030E-02	5.052E-02	NOT IDENT.
CM-243	-1.265E-02	1.979E-02	2.060E-02	FAIL ABUN
BK-247	-1.086E-02	1.689E-02	1.759E-02	FAIL ABUN
CM-247	-2.732E-03	1.028E-02	1.035E-02	FAIL ABUN
CF-249	4.285E-04	8.056E-03	8.058E-03	NOT IDENT.
CF-251	7.112E-03	2.528E-02	2.548E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	248.7157	87.09	522.3166	136.47	527.4951
45.60	250.4001	87.57	522.8384	140.51	0.0000
46.54	251.1522	88.03	523.3395	143.76	553.2958
49.72	0.0000	88.34	523.6767	144.24	513.8551
51.35	552.9566	88.47	523.8176	145.44	516.2875
51.87	510.1379	89.96	525.4247	152.43	559.2996
52.39	502.8895	1093.63	526.1521	153.25	532.9180
52.97	481.5196	91.11	526.6555	323.87	520.0998
53.44	485.3566	92.59	528.2280	156.02	528.2016
54.07	479.8695	93.35	529.0316	158.56	578.6896
57.36	0.0000	94.56	524.7557	159.00	596.5563
57.53	517.8048	94.65	504.6965	162.33	493.6842
57.98	502.3428	94.67	504.7163	162.66	483.1455
59.27	526.7330	94.87	504.9141	163.33	486.5194
59.32	526.8040	97.43	518.7219	165.86	595.2321
59.54	542.2086	98.43	485.8286	176.31	546.6293
60.96	650.3145	98.44	485.8370	176.60	519.9371
61.17	657.1743	99.53	476.4746	177.52	499.6049
62.93	546.5551	100.11	473.6272	181.07	0.0000
63.29	534.0027	102.03	531.4645	181.52	540.4053
63.58	508.2543	103.18	530.8239	184.41	524.6403
64.28	532.0923	103.37	531.0126	143.76	516.8239
66.73	664.4513	105.21	514.0462	193.51	519.6744
67.24	623.5074	105.31	514.1405	197.03	513.6723
125.81	624.1909	106.12	530.1248	198.01	508.1252
67.75	630.9039	106.47	515.2307	201.83	542.2200
69.67	584.1038	109.28	572.7867	203.43	489.7202
70.83	585.7419	111.00	532.9860	205.31	484.9995
72.81	665.4184	111.76	0.0000	210.85	454.8427
72.87	665.5125	114.06	560.3731	215.65	483.9694
74.66	602.2563	116.30	0.0000	222.11	455.8669
74.82	602.4807	116.74	552.9255	227.09	424.5027
74.97	602.6887	119.76	532.8323	227.38	425.6894
77.11	605.6522	121.12	529.4465	228.16	0.0000
78.74	551.3878	121.22	531.3742	228.18	413.3613
79.69	546.8954	121.78	530.9490	116.74	413.3613
80.12	547.4162	122.06	533.0356	235.69	443.2441
80.19	574.7047	122.92	523.6510	235.96	453.5995
80.57	575.1870	123.07	526.5475	238.63	433.8933
81.00	575.7336	265.00	525.3604	238.98	0.0000
81.07	579.2285	125.81	530.5759	240.99	434.9372
81.75	576.6774	127.23	530.3043	242.00	435.3801
83.79	518.6796	127.91	520.4766	244.70	409.4663
84.00	518.9129	129.30	545.8475	252.40	388.9751
85.43	520.4946	131.20	478.3555	252.80	397.7999
86.55	521.7255	133.02	527.6906	254.15	0.0000
86.79	521.9864	133.52	480.0938	256.23	395.8644
86.94	522.1526	136.00	552.5294	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	396.8710	355.39	0.0000	584.27	166.7536
264.80	396.9262	356.01	246.2383	595.83	180.8877
265.00	391.5146	364.49	260.1931	427.87	252.7529
268.22	379.5021	366.42	0.0000	602.52	0.0000
269.46	362.3187	372.51	266.5230	604.72	176.1875
270.03	359.2039	375.05	259.3312	607.14	176.4023
271.23	391.5964	377.52	285.7719	609.32	178.1665
273.65	463.4509	356.01	265.8054	610.33	181.0967
276.40	384.8201	388.16	256.9225	614.28	226.8113
277.37	408.2332	388.63	267.6782	618.01	178.2713
277.60	409.4269	391.69	260.4756	620.36	178.4755
278.00	409.5790	264.66	247.4316	621.93	178.6130
279.20	296.9061	401.81	232.9477	630.19	0.0000
279.54	296.9958	402.40	242.8323	631.29	183.1404
279.70	318.3849	404.85	265.7997	633.25	175.8686
280.46	339.9623	410.95	265.9164	634.78	163.8900
283.69	351.9164	413.71	253.5836	635.95	170.5051
284.31	365.0309	414.70	268.5602	636.99	172.4551
285.41	345.2722	423.72	233.4222	645.85	185.3511
285.90	0.0000	427.09	229.9595	657.76	141.2018
287.50	357.1129	427.87	212.1472	657.90	0.0000
290.67	330.4947	433.94	248.9848	661.66	152.7748
293.27	0.0000	439.40	236.8153	664.57	0.0000
351.93	344.1383	453.88	222.7903	666.33	156.8847
295.96	293.2300	463.37	235.3059	666.50	155.0046
879.38	293.8965	468.07	211.1270	667.71	0.0000
299.98	322.9200	473.00	224.1386	677.62	146.2956
300.09	328.9870	475.06	232.8828	685.70	140.1542
300.13	328.9958	476.78	219.7732	695.00	173.2926
301.36	330.8570	477.60	206.5231	696.49	199.2741
302.85	358.5040	482.18	228.7261	696.51	199.2741
256.23	325.6844	487.02	198.3844	697.00	208.8989
304.85	342.4485	492.35	0.0000	697.30	207.0132
306.78	364.2578	497.08	196.4382	697.49	209.9062
308.46	351.0916	505.52	184.5166	702.65	220.9501
311.90	325.5844	507.63	0.0000	706.68	181.8864
316.51	354.3689	511.00	211.6364	711.68	161.0677
319.41	322.0880	514.00	178.4128	720.70	119.5087
320.08	334.5399	514.00	178.4128	721.93	0.0000
321.04	302.7694	520.40	203.2814	722.78	137.8914
323.87	332.4946	520.69	0.0000	722.91	137.9001
325.23	332.8594	522.65	0.0000	723.31	136.2615
328.76	311.5547	527.90	0.0000	724.19	144.6248
333.37	325.7281	528.26	198.8871	727.33	146.6223
333.97	339.8483	529.59	204.3274	733.00	150.1768
334.37	339.9597	529.87	0.0000	735.93	158.5331
338.28	333.5327	531.02	187.5353	333.97	154.0847
338.32	333.5414	537.26	179.6739	739.50	0.0000
311.90	299.4766	546.56	0.0000	747.24	152.7627
340.48	299.4766	552.55	206.8907	748.06	156.7318
340.55	299.4961	563.25	213.4591	752.31	159.8155
344.28	308.1852	569.33	194.6733	753.82	158.2316
345.93	336.7729	946.00	193.6093	756.73	138.2005
351.06	306.6473	569.70	192.5451	756.80	153.3721
351.93	290.7991	583.19	166.6602	884.68	130.1604

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	138.7182	1274.44	133.1905	1620.50	39.9787
766.42	153.9814	1001.03	91.4435	1621.92	40.9437
766.84	162.8952	1002.74	85.0369	1678.03	0.0000
772.60	0.0000	1004.73	122.7926	1690.97	42.5243
776.52	158.5840	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	34.8915
778.90	126.9896	1028.54	0.0000	1063.66	34.9327
783.70	130.2164	1037.84	97.0538	1771.35	41.9284
785.37	150.1982	1038.76	0.0000	1791.20	0.0000
792.07	129.6588	631.29	100.1334	1808.65	31.6836
794.95	133.8010	1048.07	101.1144	1810.72	0.0000
795.86	130.8534	1049.04	100.2117	1836.06	33.8475
810.06	127.5710	1050.41	104.9375		
810.29	122.5610	1063.66	124.1966		
344.28	122.5684	1077.00	98.2581		
810.76	117.5594	1077.34	98.2690		
815.77	105.2778	1085.87	84.3160		
1048.07	112.3014	1093.63	77.8703		
832.01	127.6509	1099.45	90.3779		
834.85	146.0449	1112.07	93.5874		
835.71	147.1093	1112.84	85.2532		
836.80	0.0000	1115.54	122.1271		
846.75	0.0000	1120.29	105.3080		
846.77	135.5029	1120.55	105.5550		
856.80	159.5356	1221.41	92.1747		
860.56	158.0054	1129.67	93.1230		
871.09	123.3765	1131.51	0.0000		
873.19	100.8352	1147.95	0.0000		
875.33	0.0000	1173.23	93.3482		
879.38	121.6899	1177.95	102.2388		
880.51	121.7403	1189.05	89.8662		
883.24	115.6663	1204.77	97.1389		
884.68	127.0940	1221.41	107.4489		
889.28	105.5714	1231.02	98.5950		
894.76	124.4482	1235.36	95.2496		
898.04	96.5609	1238.28	89.1368		
900.72	109.4736	1260.41	0.0000		
903.28	123.0482	1271.87	82.9595		
911.20	92.9950	1274.44	92.0193		
912.08	94.8129	1274.54	92.0225		
923.98	0.0000	1291.59	78.3754		
926.50	87.0561	1298.22	0.0000		
929.11	118.6302	1312.11	95.9774		
937.49	114.7680	1332.49	81.7634		
944.13	99.5033	1362.66	0.0000		
946.00	97.7563	1365.19	63.5029		
949.00	112.3555	1368.63	0.0000		
667.71	0.0000	1384.29	59.6931		
962.31	127.4341	1408.01	59.7883		
964.08	140.2607	1457.56	0.0000		
966.17	116.6629	1460.82	57.6798		
911.20	107.6515	1489.16	61.2366		
968.97	107.6515	1505.03	77.8912		
983.53	120.8626	1584.12	40.6012		
984.45	0.0000	1596.21	40.7114		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:59:54.20

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656019.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM31.CNF;291
Background date    : 20-JUN-2016 14:41:13
Sample date       : 17-MAY-2016 13:45:00 Acquisition date : 24-JUN-2016 15:53:07
Sample ID        : G398656019 Sample quantity : 1.61940E+02 GRAM
Detector name     : GAM31 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:01:14.55 0.2%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572234 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.59*	196	2746	0.92	92.82	89	9	4.53E-03	58.9	
2	0	58.12	137	2346	1.06	115.86	113	7	3.17E-03	59.2	
3	0	63.42*	245	2554	1.06	126.45	122	9	5.68E-03	46.2	
4	0	74.89	570	1126	0.99	149.37	147	5	1.32E-02	9.8	
5	0	77.52*	523	1624	0.83	154.63	151	7	1.21E-02	15.9	
6	3	84.23*	76	663	1.25	168.04	165	13	1.75E-03	71.5	1.44E+00
7	3	87.23	392	884	1.20	174.05	165	13	9.08E-03	13.7	
8	3	89.95*	139	745	0.96	179.48	177	12	3.21E-03	37.4	1.27E+00
9	3	92.73*	272	717	1.08	185.03	177	12	6.31E-03	25.2	
10	0	110.06	44	715	1.04	219.68	217	7	1.02E-03	102.0	
11	0	185.79*	195	686	1.05	371.02	366	9	4.52E-03	34.9	
12	0	193.48	87	554	0.95	386.39	383	8	2.02E-03	47.9	
13	0	209.35	129	531	1.48	418.11	414	8	2.98E-03	32.2	
14	3	238.68*	1208	404	1.13	476.73	469	21	2.80E-02	5.3	1.63E+00
15	3	241.72	265	519	1.60	482.80	469	21	6.14E-03	19.1	
16	3	243.46	56	405	1.28	486.27	469	21	1.31E-03	70.7	
17	0	270.30*	91	476	1.67	539.92	535	10	2.10E-03	54.6	
18	0	283.68	58	286	1.18	566.66	564	7	1.35E-03	50.0	
19	0	295.35*	302	491	1.00	589.99	585	10	6.98E-03	17.3	
20	0	299.87	59	371	0.89	599.03	596	8	1.37E-03	57.9	
21	0	328.14	106	334	1.63	655.51	652	9	2.46E-03	32.5	
22	0	338.38*	163	442	0.86	675.98	671	10	3.78E-03	34.7	
23	0	351.92*	513	434	1.03	703.04	697	12	1.19E-02	10.5	
24	0	356.18	49	219	1.68	711.56	709	7	1.14E-03	51.9	
25	0	369.31	35	539	4.49	737.81	725	15	8.17E-04	145.5	
26	0	409.59	47	248	0.95	818.30	814	8	1.09E-03	59.9	
27	0	462.97	77	399	1.68	925.00	917	14	1.77E-03	56.5	
28	0	479.25	38	336	4.57	957.54	948	15	8.73E-04	108.3	
29	0	511.03*	87	405	2.46	1021.05	1012	18	2.01E-03	86.3	
30	5	579.52	33	148	1.77	1157.94	1155	17	7.66E-04	59.1	2.25E+00
31	5	583.19*	365	158	1.46	1165.27	1155	17	8.45E-03	10.7	
32	0	609.08*	341	290	1.30	1217.03	1211	14	7.89E-03	13.8	
33	0	660.81	86	166	0.83	1320.41	1314	12	2.00E-03	31.9	
34	0	727.02	102	123	1.38	1452.75	1449	8	2.37E-03	21.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	767.44	69	160	1.35	1533.54	1529	12	1.60E-03	38.5	
36	0	772.40	44	85	0.64	1543.46	1540	8	1.02E-03	39.5	
37	0	802.94*	17	128	2.17	1604.50	1601	10	3.99E-04	164.6	
38	0	860.04	93	133	1.01	1718.63	1711	14	2.16E-03	28.2	
39	0	910.95*	175	166	1.47	1820.38	1813	13	4.06E-03	20.4	
40	1	964.70	57	88	1.89	1927.83	1924	19	1.32E-03	28.0	5.63E+00
41	1	968.97*	184	116	2.00	1936.36	1924	19	4.25E-03	15.8	
42	0	1000.04*	16	114	3.99	1998.45	1992	13	3.72E-04	178.0	
43	0	1016.43*	31	96	6.15	2031.21	2024	16	7.10E-04	82.9	
44	0	1120.33	91	102	1.87	2238.89	2230	13	2.10E-03	25.2	
45	0	1239.05	24	84	0.68	2476.21	2471	10	5.62E-04	73.1	
46	5	1373.54	24	24	2.40	2745.04	2742	20	5.63E-04	34.4	1.30E+00
47	5	1377.52	32	45	2.06	2753.00	2742	20	7.37E-04	46.8	
48	0	1460.46*	532	51	2.18	2918.80	2911	18	1.23E-02	6.5	
49	0	1578.93	23	36	4.29	3155.63	3149	14	5.35E-04	58.3	
50	0	1594.55	32	62	4.55	3186.84	3178	17	7.34E-04	60.2	
51	0	1652.65	74	98	18.68	3302.98	3280	45	1.71E-03	49.0	
52	0	1700.15	25	26	0.81	3397.94	3386	17	5.83E-04	50.1	
53	0	1764.68	83	42	1.60	3526.95	3518	15	1.93E-03	20.1	
54	0	1793.39	14	23	3.87	3584.33	3577	13	3.23E-04	75.4	
55	0	1945.09	40	41	7.54	3887.59	3873	24	9.16E-04	46.1	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 03:59:56

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656019.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 13:45:00 Acquisition date : 24-JUN-2016 15:53:07
Sample ID        : G398656019 Sample quantity  : 161.94 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA31 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:01:14.55 0.2%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Linear Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	6.949E-01	2.694E+00	2.694E+00	13.04	OK
CD-109	88.03	3.70*	5.391E+00	7.517E-01	7.963E-01	38.56	OK
TE-125M	109.28	0.27*	5.153E+00	1.582E+00	2.513E+00	204.01	OK
SN-126	64.28	9.60	5.586E+00	2.418E-01	2.418E-01	92.50	OK
	86.94	8.90	5.391E+00	3.125E-01	3.125E-01	38.56	OK
	87.57	37.00*	5.391E+00	7.517E-02	7.517E-02	38.56	OK
BA-137M	661.66	89.90*	1.342E+00	2.959E-02	2.966E-02	63.79	OK
CS-137	661.66	85.10*	1.342E+00	3.126E-02	3.133E-02	63.79	OK
TL-208	277.37	6.60	2.816E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	1.487E+00	1.214E-01	1.214E-01	21.36	OK
	860.56	12.50	1.085E+00	2.760E-01	2.760E-01	56.40	OK
PB-210	46.54	4.25*	5.490E+00	4.555E-01	4.570E-01	117.79	OK
BI-211	72.87	1.23	5.491E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	2.286E+00	4.647E-03	4.647E-03	6715.02	OK
PB-212	74.82	10.28	5.476E+00	3.701E-01	3.701E-01	31.46	OK
	77.11	17.10	5.457E+00	2.908E-01	2.908E-01	31.87	OK
	238.63	43.60*	3.202E+00	4.013E-01	4.013E-01	10.60	OK
	300.09	3.30	2.630E+00	3.095E-01	3.095E-01	115.88	OK
BI-214	609.32	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53	OK
	1120.29	14.92	8.740E-01	2.697E-01	2.697E-01	50.40	OK
	1764.49	15.30	5.813E-01	3.427E-01	3.427E-01	40.19	OK
PB-214	74.82	5.80	5.476E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.457E+00	5.127E-01	5.127E-01	31.87	OK
	87.09	3.41	5.392E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.165E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	2.666E+00	2.785E-01	2.785E-01	34.69	OK
	351.93	35.60*	2.286E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53	OK
	1120.29	14.92	8.740E-01	2.697E-01	2.697E-01	50.40	OK
	1764.49	15.30	5.813E-01	3.427E-01	3.427E-01	40.19	OK
RA-224	240.99	4.10*	3.168E+00	4.527E-01	4.527E-01	88.24	OK
RA-226	609.32	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53	OK
	1120.29	14.92	8.740E-01	2.697E-01	2.697E-01	50.40	OK
	1764.49	15.30	5.813E-01	3.427E-01	3.427E-01	40.19	OK
AC-228	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.366E+00	2.735E-01	2.735E-01	69.33	OK
	794.95	4.25	1.156E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	2.618E-01	2.618E-01	40.85	OK
	968.97	15.80	9.848E-01	4.664E-01	4.664E-01	31.56	OK
RA-228	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.366E+00	2.735E-01	2.735E-01	69.33	OK
	794.95	4.25	1.156E+00	----- Line	Not Found	-----	Absent
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.035E+00	2.618E-01	2.618E-01	40.85	OK
	968.97	15.80	9.848E-01	4.664E-01	4.664E-01	31.56	OK
TH-228	74.82	10.28	5.476E+00	3.701E-01	3.701E-01	31.46	OK
	77.11	17.10	5.457E+00	2.908E-01	2.908E-01	31.87	OK
	238.63	43.60*	3.202E+00	4.013E-01	4.013E-01	10.60	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-229	300.09	3.30	2.630E+00	3.095E-01	3.095E-01	115.88	OK
	85.43	14.70	5.412E+00	4.889E-02	4.889E-02	143.09	OK
	88.47	24.00	5.391E+00	1.159E-01	1.159E-01	38.56	OK
	193.51	4.41*	3.791E+00	2.474E-01	2.474E-01	95.85	OK
TH-230	210.85	2.80	3.566E+00	6.065E-01	6.065E-01	64.41	OK
	609.32	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53	OK
	1120.29	14.92	8.740E-01	2.697E-01	2.697E-01	50.40	OK
	1764.49	15.30	5.813E-01	3.427E-01	3.427E-01	40.19	OK
PA-231	283.69	1.70	2.761E+00	5.643E-01	5.643E-01	100.03	OK
TH-232	301.36	5.35*	2.630E+00	1.909E-01	1.909E-01	115.88	OK
	105.21	1.10	5.215E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	2.366E+00	2.735E-01	2.735E-01	69.33	OK
	835.71	1.61	1.110E+00	----- Line	Not Found	-----	Absent
PA-234M	911.20	25.80*	1.035E+00	2.618E-01	2.618E-01	40.85	OK
	968.97	15.80	9.848E-01	4.664E-01	4.664E-01	31.56	OK
	766.42	0.32	1.189E+00	7.372E+00	7.372E+00	77.08	OK
	1001.03	0.84*	9.598E-01	7.857E-01	7.857E-01	356.05	OK
TH-234	63.29	3.70*	5.586E+00	6.274E-01	6.274E-01	92.50	OK
U-234	92.59	4.23	5.346E+00	6.144E-01	6.144E-01	50.36	OK
	609.32	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53	OK
	1120.29	14.92	8.740E-01	2.697E-01	2.697E-01	50.40	OK
	1764.49	15.30	5.813E-01	3.427E-01	3.427E-01	40.19	OK
U-235	89.96	3.47	5.370E+00	3.805E-01	3.805E-01	74.87	OK
	93.35	5.60	5.346E+00	4.641E-01	4.641E-01	50.36	OK
	143.76	10.96*	4.611E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	4.273E+00	----- Line	Not Found	-----	Absent
U-238	185.72	57.20	3.908E+00	4.157E-02	4.157E-02	69.86	OK
	205.31	5.01	3.621E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	5.586E+00	6.274E-01	6.274E-01	92.50	OK
	92.59	4.23	5.346E+00	6.144E-01	6.144E-01	50.36	OK
AM-241	59.54	35.90*	5.659E+00	3.593E-02	3.594E-02	118.49	OK
AM-243	43.53	5.90	5.049E+00	----- Line	Not Found	-----	Absent
ANH-511	74.66	67.20*	5.476E+00	5.662E-02	5.662E-02	31.46	OK
	511.00	100.00*	1.659E+00	2.232E-02	2.232E-02	172.65	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656019.CNF;1
Acquisition date : 24-JUN-2016 15:53:07 Sensitivity : 3.000
Detector ID : GAM31 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:01:14.55 Half life ratio : *****
Sample date : 17-MAY-2016 13:45:00 Analyst initials: MXR1
Sample ID : G398656019 Sample Quantity : 1.6194E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	2.694E+00	3.443E-01	2.055E-01
CD-109	7.963E-01	3.009E-01	2.669E-01
TE-125M	2.513E+00	5.024E+00	5.630E+00
SN-126	7.517E-02	2.841E-02	2.518E-02
BA-137M	2.966E-02	1.854E-02	2.059E-02
CS-137	3.133E-02	1.959E-02	2.175E-02
TL-208	1.214E-01	2.541E-02	2.165E-02
PB-210	4.570E-01	5.276E-01	3.471E-01
BI-211	4.647E-03	3.058E-01	1.109E-01
PB-212	4.013E-01	4.168E-02	2.970E-02
BI-214	2.183E-01	5.891E-02	4.309E-02
PB-214	2.802E-01	5.791E-02	7.129E-02
RN-222	2.183E-01	5.891E-02	4.309E-02
RA-224	4.527E-01	3.914E-01	3.188E-01
RA-226	2.183E-01	5.891E-02	4.309E-02
AC-228	2.618E-01	1.048E-01	7.288E-02
RA-228	2.618E-01	1.048E-01	7.288E-02
TH-228	4.013E-01	4.168E-02	2.970E-02
TH-229	2.474E-01	2.324E-01	2.660E-01
TH-230	2.183E-01	5.891E-02	4.309E-02
PA-231	1.909E-01	2.168E-01	2.631E-01
TH-232	2.618E-01	1.048E-01	7.288E-02
PA-234M	7.857E-01	2.742E+00	2.475E+00
TH-234	6.274E-01	5.687E-01	3.862E-01
U-234	2.183E-01	5.891E-02	4.309E-02
U-235	-1.305E-02	7.308E-02	1.037E-01
U-238	6.274E-01	5.687E-01	3.862E-01
AM-241	3.594E-02	4.173E-02	4.113E-02
AM-243	5.662E-02	1.746E-02	2.131E-02
ANH-511	2.232E-02	3.777E-02	1.787E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	-6.691E-02	1.471E-01	2.564E-01	NOT IDENT.
NA-22	-8.423E-03	1.301E-02	2.245E-02	NOT IDENT.
NA-24	0.000E+00	4.126E+16	0.000E+00	SHORT HLIF
AL-26	2.775E-03	1.173E-02	2.226E-02	NOT IDENT.
SC-46	6.238E-03	1.638E-02	2.983E-02	FAIL ABUN
V-48	-1.512E-02	6.196E-02	1.078E-01	NOT IDENT.
CR-51	-9.895E-02	2.076E-01	3.761E-01	NOT IDENT.
MN-54	-2.302E-03	1.327E-02	2.350E-02	NOT IDENT.
CO-56	-1.864E-03	1.786E-02	3.168E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-5.832E-03	6.706E-03	1.212E-02	NOT IDENT.
CO-58	-4.386E-03	1.699E-02	2.925E-02	NOT IDENT.
FE-59	4.968E-03	3.982E-02	7.340E-02	NOT IDENT.
CO-60	-5.071E-03	1.297E-02	2.271E-02	NOT IDENT.
ZN-65	3.237E-03	3.322E-02	5.259E-02	NOT IDENT.
GE-68	-8.284E-02	4.075E-01	7.388E-01	NOT IDENT.
AS-73	-4.682E-02	1.428E-01	2.004E-01	NOT IDENT.
AS-74	-3.235E-03	7.994E-02	1.471E-01	NOT IDENT.
SE-75	7.679E-03	1.640E-02	2.902E-02	NOT IDENT.
BR-77	0.000E+00	5.643E+03	0.000E+00	SHORT HLIF
SR-82	2.858E-02	2.275E-01	3.601E-01	NOT IDENT.
RB-83	-1.369E-02	2.962E-02	5.116E-02	NOT IDENT.
KR-85	0.000E+00	3.043E+00	5.779E+00	NOT IDENT.
SR-85	0.000E+00	2.058E-02	3.907E-02	NOT IDENT.
RB-86	-1.125E-01	5.730E-01	1.039E+00	NOT IDENT.
Y-88	-2.685E-03	1.531E-02	2.784E-02	NOT IDENT.
Y-91	-4.725E+00	8.347E+00	1.456E+01	NOT IDENT.
NB-94	2.882E-03	1.183E-02	2.169E-02	NOT IDENT.
NB-95	1.103E-02	2.138E-02	3.450E-02	NOT IDENT.
NB-95M	-6.045E-03	4.838E-02	8.017E-02	NOT IDENT.
ZR-95	-2.186E-02	3.176E-02	5.528E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	5.491E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.471E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-8.643E-04	8.357E-03	1.538E-02	NOT IDENT.
RH-102	-1.510E-02	1.883E-02	3.326E-02	FAIL ABUN
RU-103	-5.811E-03	2.043E-02	3.578E-02	FAIL ABUN
RH-106	4.730E-02	1.153E-01	2.156E-01	NOT IDENT.
RU-106	4.730E-02	1.153E-01	2.156E-01	NOT IDENT.
AG-108M	1.062E-05	1.002E-02	1.800E-02	NOT IDENT.
AG-110M	-1.153E-02	1.835E-02	3.145E-02	NOT IDENT.
SN-113	-1.601E-02	1.653E-02	2.875E-02	NOT IDENT.
CD-115	0.000E+00	5.465E+03	0.000E+00	SHORT HLIF
SN-117M	1.731E-03	4.949E-02	8.987E-02	NOT IDENT.
TE-123M	1.048E-03	9.064E-03	1.649E-02	NOT IDENT.
SB-124	-2.667E-02	4.212E-02	6.082E-02	NOT IDENT.
SB-125	9.757E-03	3.124E-02	5.693E-02	FAIL ABUN
I-126	-1.607E-01	2.914E-01	4.442E-01	NOT IDENT.
SB-126	-1.052E-01	1.808E-01	2.986E-01	NOT IDENT.
SB-127	-1.201E+00	2.825E+01	5.146E+01	NOT IDENT.
I-131	1.253E-02	3.347E-01	5.354E-01	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.036E+01	0.000E+00	SHORT HLIF
BA-133	1.575E-02	1.601E-02	2.469E-02	FAIL ABUN
I-133	0.000E+00	2.301E+11	0.000E+00	SHORT HLIF
CS-134	1.518E-02	1.409E-02	2.676E-02	FAIL ABUN
CS-135	1.065E-02	5.245E-02	8.709E-02	NOT IDENT.
I-135	0.000E+00	5.127E+40	0.000E+00	SHORT HLIF
CS-136	-2.196E-03	1.140E-01	2.092E-01	NOT IDENT.
CE-139	-1.098E-02	9.275E-03	1.615E-02	NOT IDENT.
BA-140	1.146E-01	3.043E-01	5.771E-01	NOT IDENT.
LA-140	1.111E-01	1.150E-01	1.997E-01	FAIL ABUN
CE-141	1.337E-02	2.790E-02	5.163E-02	NOT IDENT.
CE-143	0.000E+00	5.255E+06	0.000E+00	SHORT HLIF
CE-144	-3.983E-03	5.562E-02	1.021E-01	NOT IDENT.
PM-144	-1.266E-03	1.290E-02	2.329E-02	NOT IDENT.
PR-144	-9.004E-02	9.775E-01	1.766E+00	NOT IDENT.
PM-146	6.171E-03	1.497E-02	2.723E-02	NOT IDENT.
ND-147	1.126E+00	8.338E-01	1.571E+00	FAIL ABUN
PM-147	-9.007E+01	1.885E+02	3.449E+02	NOT IDENT.
PM-149	0.000E+00	4.479E+04	0.000E+00	SHORT HLIF
EU-150	-9.125E-04	1.227E-02	1.655E-02	FAIL ABUN
EU-152	3.034E-03	3.171E-02	5.636E-02	FAIL ABUN
GD-153	-3.590E-02	2.642E-02	3.665E-02	NOT IDENT.
EU-154	-2.245E-02	3.651E-02	6.316E-02	NOT IDENT.
EU-155	2.771E-02	2.501E-02	4.823E-02	FAIL ABUN
TB-160	2.918E-02	5.543E-02	1.021E-01	FAIL ABUN

HO-166M	2.230E-03	2.113E-02	3.852E-02	FAIL ABUN
TM-171	-1.377E+00	2.324E+00	3.236E+00	NOT IDENT.
HF-172	3.900E-02	4.944E-02	9.343E-02	FAIL ABUN
LU-172	2.517E-03	2.004E-02	3.701E-02	FAIL ABUN
LU-176	-1.573E-03	8.410E-03	1.545E-02	FAIL ABUN
HF-181	5.531E-03	2.477E-02	3.908E-02	FAIL ABUN
TA-182	1.414E-02	6.359E-02	1.165E-01	FAIL ABUN
RE-183	5.497E-02	6.383E-02	6.648E-02	FAIL ABUN
RE-184	8.591E-03	7.755E-02	1.256E-01	NOT IDENT.
W-188	-1.113E+00	3.199E+00	5.139E+00	FAIL ABUN
IR-192	7.921E-04	1.356E-02	2.506E-02	FAIL ABUN
HG-203	8.170E-03	1.777E-02	3.124E-02	NOT IDENT.
BI-207	5.078E-03	1.646E-02	3.075E-02	FAIL ABUN
PB-211	1.939E-01	2.612E-01	4.313E-01	NOT IDENT.
BI-212	0.000E+00	2.098E-01	3.736E-01	FAIL ABUN
RN-219	-1.042E-01	1.338E-01	2.340E-01	FAIL ABUN
RA-223	-3.029E-02	2.271E-01	3.649E-01	FAIL ABUN
AC-227	-3.270E-03	7.611E-02	1.425E-01	FAIL ABUN
TH-227	-3.270E-03	7.611E-02	1.425E-01	FAIL ABUN
TH-231	-3.029E-02	2.271E-01	3.649E-01	FAIL ABUN
PA-233	-3.217E-03	2.043E-02	3.751E-02	FAIL ABUN
PA-234	3.239E-02	1.022E-01	1.845E-01	FAIL ABUN
NP-237	-3.217E-03	2.043E-02	3.751E-02	FAIL ABUN
NP-238	0.000E+00	1.299E+04	0.000E+00	SHORT HLIF
NP-239	-2.491E-02	6.608E-02	1.216E-01	NOT IDENT.
PU-239	-1.362E+01	8.898E+01	1.634E+02	NOT IDENT.
CM-243	3.195E-03	2.485E-02	4.679E-02	NOT IDENT.
BK-247	-7.800E-04	2.752E-02	4.530E-02	FAIL ABUN
CM-247	-2.798E-03	1.215E-02	2.176E-02	NOT IDENT.
CF-249	7.790E-03	1.335E-02	2.476E-02	NOT IDENT.
CF-251	-2.011E-02	3.686E-02	6.511E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	517	10.66*	6.949E-01	2.694E+00	2.694E+00	13.04
CD-109	88.03	521	3.70*	5.391E+00	1.008E+00	1.068E+00	27.35
TE-125M	109.28	57	0.27*	5.153E+00	1.582E+00	2.513E+00	204.01
SN-126	64.28	336	9.60	5.586E+00	2.418E-01	2.418E-01	92.50
	86.94	521	8.90	5.391E+00	4.192E-01	4.192E-01	27.35
	87.57	521	37.00*	5.391E+00	1.008E-01	1.008E-01	27.35
BA-137M	661.66	92	89.90*	1.342E+00	2.959E-02	2.966E-02	63.79
CS-137	661.66	92	85.10*	1.342E+00	3.126E-02	3.133E-02	63.79
TL-208	277.37	-----	6.60	2.816E+00	-----	Line Not Found	-----
	583.19	397	85.00*	1.487E+00	1.214E-01	1.214E-01	21.36
	860.56	97	12.50	1.085E+00	2.760E-01	2.760E-01	56.40
PB-210	46.54	275	4.25*	5.490E+00	4.555E-01	4.570E-01	117.79
BI-211	72.87	-----	1.23	5.491E+00	-----	Line Not Found	-----
	351.06	590	12.92*	2.286E+00	7.720E-01	7.720E-01	21.09
PB-212	74.82	768	10.28	5.476E+00	5.272E-01	5.272E-01	19.52
	77.11	702	17.10	5.457E+00	2.908E-01	2.908E-01	31.87
	238.63	1450	43.60*	3.202E+00	4.013E-01	4.013E-01	10.60
	300.09	70	3.30	2.630E+00	3.095E-01	3.095E-01	115.88
BI-214	609.32	369	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53
	1120.29	91	14.92	8.740E-01	2.697E-01	2.697E-01	50.40
	1764.49	79	15.30	5.813E-01	3.427E-01	3.427E-01	40.19
PB-214	74.82	768	5.80	5.476E+00	9.344E-01	9.345E-01	19.52
	77.11	702	9.70	5.457E+00	5.127E-01	5.127E-01	31.87
	87.09	521	3.41	5.391E+00	1.094E+00	1.094E+00	27.35
	242.00	318	7.25	3.168E+00	5.345E-01	5.345E-01	38.20
	295.22	354	18.42	2.666E+00	2.785E-01	2.785E-01	34.69
	351.93	590	35.60*	2.286E+00	2.802E-01	2.802E-01	21.09
RN-222	609.32	369	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53
	1120.29	91	14.92	8.740E-01	2.697E-01	2.697E-01	50.40
	1764.49	79	15.30	5.813E-01	3.427E-01	3.427E-01	40.19
RA-224	240.99	318	4.10*	3.168E+00	9.451E-01	9.451E-01	38.20
RA-226	609.32	369	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53
	1120.29	91	14.92	8.740E-01	2.697E-01	2.697E-01	50.40
	1764.49	79	15.30	5.813E-01	3.427E-01	3.427E-01	40.19
AC-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	189	11.27	2.366E+00	2.735E-01	2.735E-01	69.33
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	181	25.80*	1.035E+00	2.618E-01	2.618E-01	40.85
	968.97	188	15.80	9.848E-01	4.664E-01	4.664E-01	31.56
RA-228	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	189	11.27	2.366E+00	2.735E-01	2.735E-01	69.33
	794.95	-----	4.25	1.156E+00	-----	Line Not Found	-----
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	181	25.80*	1.035E+00	2.618E-01	2.618E-01	40.85
	968.97	188	15.80	9.848E-01	4.664E-01	4.664E-01	31.56
TH-228	74.82	768	10.28	5.476E+00	5.272E-01	5.272E-01	19.52

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	77.11	702	17.10	5.457E+00	2.908E-01	2.908E-01	31.87
	238.63	1450	43.60*	3.202E+00	4.013E-01	4.013E-01	10.60
	300.09	70	3.30	2.630E+00	3.095E-01	3.095E-01	115.88
TH-229	85.43	101	14.70	5.412E+00	4.889E-02	4.889E-02	143.09
	88.47	521	24.00	5.391E+00	1.555E-01	1.555E-01	27.35
	193.51	107	4.41*	3.791E+00	2.474E-01	2.474E-01	95.85
	210.85	157	2.80	3.566E+00	6.065E-01	6.065E-01	64.41
TH-230	609.32	369	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53
	1120.29	91	14.92	8.740E-01	2.697E-01	2.697E-01	50.40
	1764.49	79	15.30	5.813E-01	3.427E-01	3.427E-01	40.19
PA-231	283.69	69	1.70	2.761E+00	5.643E-01	5.643E-01	100.03
	301.36	70	5.35*	2.630E+00	1.909E-01	1.909E-01	115.88
TH-232	105.21	-----	1.10	5.215E+00	-----	Line Not Found	-----
	338.32	189	11.27	2.366E+00	2.735E-01	2.735E-01	69.33
	835.71	-----	1.61	1.110E+00	-----	Line Not Found	-----
	911.20	181	25.80*	1.035E+00	2.618E-01	2.618E-01	40.85
	968.97	188	15.80	9.848E-01	4.664E-01	4.664E-01	31.56
PA-234M	766.42	73	0.32	1.189E+00	7.372E+00	7.372E+00	77.08
	1001.03	16	0.84*	9.598E-01	7.857E-01	7.857E-01	356.05
TH-234	63.29	336	3.70*	5.586E+00	6.274E-01	6.274E-01	92.50
	92.59	360	4.23	5.346E+00	6.144E-01	6.144E-01	50.36
U-234	609.32	369	45.49*	1.434E+00	2.183E-01	2.183E-01	27.53
	1120.29	91	14.92	8.740E-01	2.697E-01	2.697E-01	50.40
	1764.49	79	15.30	5.813E-01	3.427E-01	3.427E-01	40.19
U-235	89.96	184	3.47	5.370E+00	3.805E-01	3.805E-01	74.87
	93.35	360	5.60	5.346E+00	4.641E-01	4.641E-01	50.36
	143.76	-----	10.96*	4.611E+00	-----	Line Not Found	-----
	163.33	-----	5.08	4.273E+00	-----	Line Not Found	-----
	185.72	240	57.20	3.908E+00	4.157E-02	4.157E-02	69.86
	205.31	-----	5.01	3.621E+00	-----	Line Not Found	-----
U-238	63.29	336	3.70*	5.586E+00	6.274E-01	6.274E-01	92.50
	92.59	360	4.23	5.346E+00	6.144E-01	6.144E-01	50.36
AM-241	59.54	189	35.90*	5.659E+00	3.593E-02	3.594E-02	118.49
AM-243	43.53	-----	5.90	5.049E+00	-----	Line Not Found	-----
	74.66	768	67.20*	5.476E+00	8.065E-02	8.065E-02	19.52
ANH-511	511.00	96	100.00*	1.659E+00	2.232E-02	2.232E-02	172.65

Flag: "*" = Keyline

Total number of lines in spectrum 55
Number of unidentified lines 12
Number of lines tentatively identified by NID 43 78.18%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	2.694E+00	2.694E+00	0.351E+00	13.04	
CD-109	461.40D	1.06	1.008E+00	1.068E+00	0.292E+00	27.35	
TE-125M	57.40D	1.59	1.582E+00	2.513E+00	5.126E+00	204.01	
SN-126	2.30E+05Y	1.00	1.008E-01	1.008E-01	0.276E-01	27.35	
BA-137M	30.08Y	1.00	2.959E-02	2.966E-02	1.892E-02	63.79	
CS-137	30.08Y	1.00	3.126E-02	3.133E-02	1.999E-02	63.79	
TL-208	1.41E+10Y	1.00	1.214E-01	1.214E-01	0.259E-01	21.36	
PB-210	22.20Y	1.00	4.555E-01	4.570E-01	5.383E-01	117.79	
BI-211	7.04E+08Y	1.00	7.720E-01	7.720E-01	1.628E-01	21.09	
PB-212	1.41E+10Y	1.00	4.013E-01	4.013E-01	0.425E-01	10.60	
BI-214	1600.00Y	1.00	2.183E-01	2.183E-01	0.601E-01	27.53	
PB-214	1600.00Y	1.00	2.802E-01	2.802E-01	0.591E-01	21.09	
RN-222	1600.00Y	1.00	2.183E-01	2.183E-01	0.601E-01	27.53	
RA-224	1.41E+10Y	1.00	9.451E-01	9.451E-01	3.611E-01	38.20	
RA-226	1600.00Y	1.00	2.183E-01	2.183E-01	0.601E-01	27.53	
AC-228	1.41E+10Y	1.00	2.618E-01	2.618E-01	1.069E-01	40.85	
RA-228	1.41E+10Y	1.00	2.618E-01	2.618E-01	1.069E-01	40.85	
TH-228	1.41E+10Y	1.00	4.013E-01	4.013E-01	0.425E-01	10.60	
TH-229	7340.00Y	1.00	2.474E-01	2.474E-01	2.372E-01	95.85	
TH-230	7.54E+04Y	1.00	2.183E-01	2.183E-01	0.601E-01	27.53	
PA-231	7.04E+08Y	1.00	1.909E-01	1.909E-01	2.212E-01	115.88	
TH-232	1.41E+10Y	1.00	2.618E-01	2.618E-01	1.069E-01	40.85	
PA-234M	4.47E+09Y	1.00	7.857E-01	7.857E-01	27.98E-01	356.05	
TH-234	4.47E+09Y	1.00	6.274E-01	6.274E-01	5.804E-01	92.50	
U-234	2.45E+05Y	1.00	2.183E-01	2.183E-01	0.601E-01	27.53	
U-235	7.04E+08Y	1.00	4.157E-02	4.157E-02	2.904E-02	69.86	K
U-238	4.47E+09Y	1.00	6.274E-01	6.274E-01	5.804E-01	92.50	
AM-241	432.60Y	1.00	3.593E-02	3.594E-02	4.258E-02	118.49	
AM-243	7370.00Y	1.00	8.065E-02	8.065E-02	1.574E-02	19.52	
ANH-511	1.00E+09Y	1.00	2.232E-02	2.232E-02	3.854E-02	172.65	
Total Activity :			1.336E+01	1.435E+01			

Grand Total Activity : 1.336E+01 1.435E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	243.46	68	485	1.28	486.27	469	21	1.31E-03	****	3.15E+00	T
0	270.30	108	564	1.67	539.92	535	10	2.10E-03	****	2.88E+00	T
0	328.14	123	387	1.63	655.51	652	9	2.46E-03	65.0	2.43E+00	T
0	356.18	57	251	1.68	711.56	709	7	1.14E-03	****	2.26E+00	T
0	369.31	40	617	4.49	737.81	725	15	8.17E-04	****	2.19E+00	
0	409.59	53	281	0.95	818.30	814	8	1.09E-03	****	2.00E+00	T
0	462.97	85	446	1.68	925.00	917	14	1.77E-03	****	1.80E+00	T
0	479.25	42	374	4.57	957.54	948	15	8.73E-04	****	1.75E+00	
5	579.52	36	161	1.77	1157.94	1155	17	7.66E-04	****	1.49E+00	
0	727.02	108	130	1.38	1452.75	1449	8	2.37E-03	42.4	1.24E+00	T
0	772.40	46	89	0.64	1543.46	1540	8	1.02E-03	78.9	1.18E+00	T
0	802.94	18	135	2.17	1604.50	1601	10	3.99E-04	****	1.15E+00	T
1	964.70	58	90	1.89	1927.83	1924	19	1.32E-03	55.9	9.88E-01	T
0	1016.43	31	98	6.15	2031.21	2024	16	7.10E-04	****	9.47E-01	
0	1239.05	24	83	0.68	2476.21	2471	10	5.62E-04	****	8.03E-01	T
5	1373.54	24	23	2.40	2745.04	2742	20	5.63E-04	68.7	7.34E-01	
5	1377.52	31	44	2.06	2753.00	2742	20	7.37E-04	93.6	7.32E-01	
0	1578.93	22	35	4.29	3155.63	3149	14	5.35E-04	****	6.47E-01	
0	1594.55	30	60	4.55	3186.84	3178	17	7.34E-04	****	6.41E-01	
0	1652.65	71	94	18.68	3302.98	3280	45	1.71E-03	98.0	6.19E-01	
0	1700.15	24	25	0.81	3397.94	3386	17	5.83E-04	****	6.03E-01	
0	1793.39	13	22	3.87	3584.33	3577	13	3.23E-04	****	5.72E-01	
0	1945.09	37	39	7.54	3887.59	3873	24	9.16E-04	92.2	5.27E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656019.CNF;1  *
* Acquisition date   : 24-JUN-2016 15:53:07 Sensitivity      : 3.000          *
* Detector ID        : GAM31 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:01:14.55 Half life ratio : *****        *
* Sample date        : 17-MAY-2016 13:45:00 Nuclide Library : SOLID       *
* Sample ID          : G398656019 Analyst initials: MXR1          *
* Batch Number       : 1572234 Sample Quantity : 1.6194E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000           *
*                                     Dry Weight : 0.00000         *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 15-JUN-2016 06:54:07 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	9.566E-02
CD-109	1.305E-01
TE-125M	2.752E+00
SN-126	1.231E-02
BA-137M	9.850E-03
CS-137	1.041E-02
TL-208	1.040E-02
PB-210	1.711E-01
BI-211	5.363E-02
PB-212	1.446E-02
BI-214	2.073E-02
PB-214	3.499E-02
RN-222	2.073E-02
RA-224	1.552E-01
RA-226	2.073E-02
AC-228	3.445E-02
RA-228	3.445E-02
TH-228	1.446E-02
TH-229	1.297E-01
TH-230	2.072E-02
PA-231	1.277E-01
TH-232	3.445E-02
PA-234M	1.172E+00
TH-234	1.904E-01
U-234	2.072E-02
U-235	5.078E-02
U-238	1.904E-01
AM-241	2.029E-02
AM-243	1.050E-02
ANH-511	8.609E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	1.234E-01 NOT IDENT.

NA-22	1.053E-02	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.021E-02	NOT IDENT.
SC-46	1.423E-02	FAIL ABUN
V-48	5.104E-02	NOT IDENT.
CR-51	1.823E-01	NOT IDENT.
MN-54	1.123E-02	NOT IDENT.
CO-56	1.516E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.917E-03	NOT IDENT.
CO-58	1.394E-02	NOT IDENT.
FE-59	3.479E-02	NOT IDENT.
CO-60	1.065E-02	NOT IDENT.
ZN-65	2.497E-02	NOT IDENT.
GE-68	3.493E-01	NOT IDENT.
AS-73	9.889E-02	NOT IDENT.
AS-74	7.076E-02	NOT IDENT.
SE-75	1.411E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.715E-01	NOT IDENT.
RB-83	2.458E-02	NOT IDENT.
KR-85	2.815E+00	NOT IDENT.
SR-85	1.903E-02	NOT IDENT.
RB-86	4.914E-01	NOT IDENT.
Y-88	1.271E-02	NOT IDENT.
Y-91	6.893E+00	NOT IDENT.
NB-94	1.043E-02	NOT IDENT.
NB-95	1.657E-02	NOT IDENT.
NB-95M	3.905E-02	NOT IDENT.
ZR-95	2.641E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.522E-03	NOT IDENT.
RH-102	1.593E-02	FAIL ABUN
RU-103	1.721E-02	FAIL ABUN
RH-106	1.037E-01	NOT IDENT.
RU-106	1.037E-01	NOT IDENT.
AG-108M	8.687E-03	NOT IDENT.
AG-110M	1.496E-02	NOT IDENT.
SN-113	1.387E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.390E-02	NOT IDENT.
TE-123M	8.058E-03	NOT IDENT.
SB-124	2.759E-02	NOT IDENT.
SB-125	2.750E-02	FAIL ABUN
I-126	2.126E-01	NOT IDENT.
SB-126	1.425E-01	NOT IDENT.
SB-127	2.462E+01	NOT IDENT.
I-131	2.595E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.196E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.282E-02	FAIL ABUN
CS-135	4.237E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	9.919E-02	NOT IDENT.
CE-139	7.876E-03	NOT IDENT.
BA-140	2.774E-01	NOT IDENT.
LA-140	9.297E-02	FAIL ABUN
CE-141	2.525E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.991E-02	NOT IDENT.
PM-144	1.120E-02	NOT IDENT.
PR-144	8.488E-01	NOT IDENT.
PM-146	1.316E-02	NOT IDENT.
ND-147	7.569E-01	FAIL ABUN
PM-147	1.684E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	8.038E-03	FAIL ABUN
EU-152	2.730E-02	FAIL ABUN
GD-153	1.792E-02	NOT IDENT.
EU-154	2.964E-02	NOT IDENT.
EU-155	2.360E-02	FAIL ABUN
TB-160	4.865E-02	FAIL ABUN
HO-166M	1.848E-02	FAIL ABUN

TM-171	1.596E+00	NOT IDENT.
HF-172	4.568E-02	FAIL ABUN
LU-172	1.753E-02	FAIL ABUN
LU-176	7.498E-03	FAIL ABUN
HF-181	1.882E-02	FAIL ABUN
TA-182	5.524E-02	FAIL ABUN
RE-183	3.282E-02	FAIL ABUN
RE-184	5.995E-02	NOT IDENT.
W-188	2.496E+00	FAIL ABUN
IR-192	1.216E-02	FAIL ABUN
HG-203	1.520E-02	NOT IDENT.
BI-207	1.460E-02	FAIL ABUN
PB-211	2.086E-01	NOT IDENT.
BI-212	1.804E-01	FAIL ABUN
RN-219	1.130E-01	FAIL ABUN
RA-223	1.769E-01	FAIL ABUN
AC-227	6.935E-02	FAIL ABUN
TH-227	6.935E-02	FAIL ABUN
TH-231	1.769E-01	FAIL ABUN
PA-233	1.820E-02	FAIL ABUN
PA-234	8.787E-02	FAIL ABUN
NP-237	1.820E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.942E-02	NOT IDENT.
PU-239	7.987E+01	NOT IDENT.
CM-243	2.288E-02	NOT IDENT.
BK-247	2.203E-02	FAIL ABUN
CM-247	1.051E-02	NOT IDENT.
CF-249	1.199E-02	NOT IDENT.
CF-251	3.177E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656019.CNF;1
Acquisition date : 24-JUN-2016 15:53:07 Sensitivity : 3.000
Detector ID : GAM31 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:01:14.55 Half life ratio : *****
Sample date : 17-MAY-2016 13:45:00 Nuclide Library : SOLID
Sample ID : G398656019 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6194E+02 GRAM
Quantity Err(%) : 1.2350E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 15-JUN-2016 06:54:07 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	2.694E+00	3.720E-01	3.720E-01
CD-109	7.963E-01	3.097E-01	3.097E-01
TE-125M	2.513E+00	5.026E+00	5.026E+00
SN-126	7.517E-02	2.896E-02	2.896E-02
BA-137M	2.966E-02	1.859E-02	1.859E-02
CS-137	3.133E-02	1.963E-02	1.963E-02
TL-208	1.214E-01	2.594E-02	2.594E-02
PB-210	4.570E-01	5.289E-01	5.289E-01
BI-211	4.647E-03	3.094E-01	3.094E-01
PB-212	4.013E-01	4.678E-02	4.678E-02
BI-214	2.183E-01	5.965E-02	5.965E-02
PB-214	2.802E-01	5.907E-02	5.907E-02
RN-222	2.183E-01	5.965E-02	5.965E-02
RA-224	4.527E-01	3.935E-01	3.935E-01
RA-226	2.183E-01	5.965E-02	5.965E-02
AC-228	2.618E-01	1.056E-01	1.056E-01
RA-228	2.618E-01	1.056E-01	1.056E-01
TH-228	4.013E-01	4.678E-02	4.678E-02
TH-229	2.474E-01	2.327E-01	2.327E-01
TH-230	2.183E-01	5.965E-02	5.965E-02
PA-231	1.909E-01	2.206E-01	2.206E-01
TH-232	2.618E-01	1.056E-01	1.056E-01
PA-234M	7.857E-01	2.742E+00	2.742E+00
TH-234	6.274E-01	5.854E-01	5.854E-01
U-234	2.183E-01	5.965E-02	5.965E-02
U-235	-1.305E-02	7.308E-02	7.308E-02
U-238	6.274E-01	5.854E-01	5.854E-01
AM-241	3.594E-02	4.182E-02	4.182E-02
AM-243	5.662E-02	1.806E-02	1.806E-02
ANH-511	2.232E-02	3.778E-02	3.778E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	-6.691E-02	1.471E-01	1.502E-01	NOT IDENT.
NA-22	-8.423E-03	1.301E-02	1.356E-02	NOT IDENT.
NA-24	-9.258E+14	4.126E+16	0.000E+00	SHORT HLIF
AL-26	2.775E-03	1.174E-02	1.180E-02	NOT IDENT.
SC-46	6.238E-03	1.638E-02	1.662E-02	FAIL ABUN
V-48	-1.512E-02	6.196E-02	6.233E-02	NOT IDENT.
CR-51	-9.895E-02	2.077E-01	2.124E-01	NOT IDENT.
MN-54	-2.302E-03	1.327E-02	1.331E-02	NOT IDENT.
CO-56	-1.864E-03	1.786E-02	1.788E-02	FAIL ABUN
MN-56	-1.000E+41	1.024E+42	0.000E+00	SHORT HLIF
CO-57	-5.832E-03	6.711E-03	7.208E-03	NOT IDENT.
CO-58	-4.386E-03	1.699E-02	1.710E-02	NOT IDENT.
FE-59	4.968E-03	3.982E-02	3.988E-02	NOT IDENT.
CO-60	-5.071E-03	1.297E-02	1.317E-02	NOT IDENT.
ZN-65	3.237E-03	3.322E-02	3.325E-02	NOT IDENT.
GE-68	-8.284E-02	4.075E-01	4.093E-01	NOT IDENT.
AS-73	-4.682E-02	1.431E-01	1.446E-01	NOT IDENT.
AS-74	-3.235E-03	7.994E-02	7.995E-02	NOT IDENT.
SE-75	7.679E-03	1.641E-02	1.677E-02	NOT IDENT.
BR-77	5.434E+04	6.044E+04	6.521E+04	SHORT HLIF
SR-82	2.858E-02	2.275E-01	2.278E-01	NOT IDENT.
RB-83	-1.369E-02	2.968E-02	3.032E-02	NOT IDENT.
KR-85	1.377E+01	3.095E+00	6.937E+00	NOT IDENT.
SR-85	9.293E-02	2.093E-02	4.683E-02	NOT IDENT.
RB-86	-1.125E-01	5.730E-01	5.752E-01	NOT IDENT.
Y-88	-2.685E-03	1.531E-02	1.535E-02	NOT IDENT.
Y-91	-4.725E+00	8.349E+00	8.616E+00	NOT IDENT.
NB-94	2.882E-03	1.183E-02	1.190E-02	NOT IDENT.
NB-95	1.103E-02	2.139E-02	2.196E-02	NOT IDENT.
NB-95M	-6.045E-03	4.838E-02	4.846E-02	NOT IDENT.
ZR-95	-2.186E-02	3.178E-02	3.327E-02	NOT IDENT.
NB-97	-1.000E+41	4.738E+41	0.000E+00	SHORT HLIF
ZR-97	1.331E+16	5.517E+15	8.152E+15	SHORT HLIF
MO-99	-9.697E+02	1.472E+03	1.535E+03	SHORT HLIF
TC-99M	-1.000E+41	2.546E+41	0.000E+00	SHORT HLIF
RH-101	-8.643E-04	8.359E-03	8.368E-03	NOT IDENT.
RH-102	-1.510E-02	1.887E-02	2.006E-02	FAIL ABUN
RU-103	-5.811E-03	2.043E-02	2.060E-02	FAIL ABUN
RH-106	4.730E-02	1.153E-01	1.173E-01	NOT IDENT.
RU-106	4.730E-02	1.153E-01	1.173E-01	NOT IDENT.
AG-108M	1.062E-05	1.002E-02	1.002E-02	NOT IDENT.
AG-110M	-1.153E-02	1.836E-02	1.908E-02	NOT IDENT.
SN-113	-1.601E-02	1.655E-02	1.805E-02	NOT IDENT.
CD-115	-4.212E+03	5.471E+03	5.792E+03	SHORT HLIF
SN-117M	1.731E-03	4.949E-02	4.950E-02	NOT IDENT.
TE-123M	1.048E-03	9.064E-03	9.076E-03	NOT IDENT.
SB-124	-2.667E-02	4.214E-02	4.383E-02	NOT IDENT.
SB-125	9.757E-03	3.124E-02	3.155E-02	FAIL ABUN
I-126	-1.607E-01	2.916E-01	3.005E-01	NOT IDENT.
SB-126	-1.052E-01	1.811E-01	1.872E-01	NOT IDENT.
SB-127	-1.201E+00	2.825E+01	2.825E+01	NOT IDENT.
I-131	1.253E-02	3.347E-01	3.348E-01	FAIL ABUN
I-132	1.000E+41	3.067E+41	0.000E+00	SHORT HLIF
TE-132	-1.139E+01	3.038E+01	3.081E+01	SHORT HLIF
BA-133	1.575E-02	1.602E-02	1.753E-02	FAIL ABUN
I-133	2.559E+11	2.382E+11	2.647E+11	SHORT HLIF
CS-134	1.518E-02	1.410E-02	1.567E-02	FAIL ABUN
CS-135	1.065E-02	5.246E-02	5.267E-02	NOT IDENT.
I-135	-3.441E+40	5.934E+40	0.000E+00	SHORT HLIF
CS-136	-2.196E-03	1.140E-01	1.140E-01	NOT IDENT.
CE-139	-1.098E-02	9.534E-03	1.074E-02	NOT IDENT.
BA-140	1.146E-01	3.044E-01	3.087E-01	NOT IDENT.
LA-140	1.111E-01	1.152E-01	1.256E-01	FAIL ABUN
CE-141	1.337E-02	2.790E-02	2.855E-02	NOT IDENT.
CE-143	7.890E+06	5.269E+06	6.357E+06	SHORT HLIF
CE-144	-3.983E-03	5.562E-02	5.565E-02	NOT IDENT.
PM-144	-1.266E-03	1.290E-02	1.291E-02	NOT IDENT.
PR-144	-9.004E-02	9.775E-01	9.783E-01	NOT IDENT.
PM-146	6.171E-03	1.497E-02	1.523E-02	NOT IDENT.
ND-147	1.126E+00	8.353E-01	9.775E-01	FAIL ABUN
PM-147	-9.007E+01	1.885E+02	1.928E+02	NOT IDENT.
PM-149	-2.311E+03	4.479E+04	4.480E+04	SHORT HLIF
EU-150	-9.125E-04	1.227E-02	1.227E-02	FAIL ABUN
EU-152	3.034E-03	3.171E-02	3.174E-02	FAIL ABUN
GD-153	-3.590E-02	2.650E-02	3.105E-02	NOT IDENT.
EU-154	-2.245E-02	3.652E-02	3.790E-02	NOT IDENT.
EU-155	2.771E-02	2.509E-02	2.803E-02	FAIL ABUN
TB-160	2.918E-02	5.545E-02	5.699E-02	FAIL ABUN

HO-166M	2.230E-03	2.113E-02	2.115E-02	FAIL ABUN
TM-171	-1.377E+00	2.327E+00	2.408E+00	NOT IDENT.
HF-172	3.900E-02	4.984E-02	5.285E-02	FAIL ABUN
LU-172	2.517E-03	2.005E-02	2.008E-02	FAIL ABUN
LU-176	-1.573E-03	8.411E-03	8.440E-03	FAIL ABUN
HF-181	5.531E-03	2.477E-02	2.490E-02	FAIL ABUN
TA-182	1.414E-02	6.360E-02	6.392E-02	FAIL ABUN
RE-183	5.497E-02	6.409E-02	6.872E-02	FAIL ABUN
RE-184	8.591E-03	7.755E-02	7.765E-02	NOT IDENT.
W-188	-1.113E+00	3.201E+00	3.240E+00	FAIL ABUN
IR-192	7.921E-04	1.356E-02	1.356E-02	FAIL ABUN
HG-203	8.170E-03	1.777E-02	1.815E-02	NOT IDENT.
BI-207	5.078E-03	1.647E-02	1.662E-02	FAIL ABUN
PB-211	1.939E-01	2.614E-01	2.756E-01	NOT IDENT.
BI-212	5.052E-01	2.113E-01	3.107E-01	FAIL ABUN
RN-219	-1.042E-01	1.344E-01	1.424E-01	FAIL ABUN
RA-223	-3.029E-02	2.272E-01	2.276E-01	FAIL ABUN
AC-227	-3.270E-03	7.611E-02	7.612E-02	FAIL ABUN
TH-227	-3.270E-03	7.611E-02	7.612E-02	FAIL ABUN
TH-231	-3.029E-02	2.272E-01	2.276E-01	FAIL ABUN
PA-233	-3.217E-03	2.043E-02	2.048E-02	FAIL ABUN
PA-234	3.239E-02	1.087E-01	1.097E-01	FAIL ABUN
NP-237	-3.217E-03	2.043E-02	2.048E-02	FAIL ABUN
NP-238	-6.503E+03	1.299E+04	1.332E+04	SHORT HLIF
NP-239	-2.491E-02	6.611E-02	6.706E-02	NOT IDENT.
PU-239	-1.362E+01	8.898E+01	8.919E+01	NOT IDENT.
CM-243	3.195E-03	2.485E-02	2.489E-02	NOT IDENT.
BK-247	-7.800E-04	2.752E-02	2.752E-02	FAIL ABUN
CM-247	-2.798E-03	1.216E-02	1.222E-02	NOT IDENT.
CF-249	7.790E-03	1.337E-02	1.382E-02	NOT IDENT.
CF-251	-2.011E-02	3.693E-02	3.803E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1495.2977	87.09	852.7783	136.47	608.9398
45.60	1509.9304	87.57	620.8583	140.51	0.0000
46.54	1577.8184	88.03	621.4878	143.76	594.7494
49.72	0.0000	88.34	621.9097	144.24	588.8167
51.35	1787.3882	88.47	622.0876	145.44	611.2034
51.87	1733.7499	89.96	694.8944	152.43	587.5621
52.39	1705.9689	1093.63	695.9146	153.25	595.8206
52.97	1695.9054	91.11	696.6155	323.87	605.2961
53.44	1710.6487	92.59	698.8173	156.02	602.5781
54.07	1675.9905	93.35	659.1953	158.56	580.9221
57.36	0.0000	94.56	617.1020	159.00	582.3733
57.53	1733.1365	94.65	617.2181	162.33	602.6213
57.98	1777.8276	94.67	617.2440	162.66	601.8099
59.27	1703.0730	94.87	617.5021	163.33	558.6516
59.32	1703.3157	97.43	662.1561	165.86	594.6541
59.54	1704.3928	98.43	610.7655	176.31	549.7851
60.96	1789.3134	98.44	589.2097	176.60	558.9029
61.17	1790.3737	99.53	606.2296	177.52	564.0513
62.93	1569.2042	100.11	638.4138	181.07	0.0000
63.29	1570.7618	102.03	657.6500	181.52	568.1522
63.58	1572.0140	103.18	640.3361	184.41	615.8484
64.28	1403.9391	103.37	640.5764	143.76	578.0174
66.73	1359.9113	105.21	603.1315	193.51	506.3694
67.24	1317.9535	105.31	603.2488	197.03	545.1553
125.81	1260.5604	106.12	634.5526	198.01	523.4974
67.75	1260.7886	106.47	651.4154	201.83	550.6522
69.67	1303.8407	109.28	608.3436	203.43	539.0493
70.83	1283.0311	111.00	644.9683	205.31	509.0943
72.81	1228.6505	111.76	0.0000	210.85	503.7215
72.87	1135.8025	114.06	594.0682	215.65	509.1640
74.66	1528.5735	116.30	0.0000	222.11	468.7816
74.82	1529.1755	116.74	622.3474	227.09	452.7519
74.97	1547.8805	119.76	548.1329	227.38	461.7761
77.11	958.2593	121.12	601.6287	228.16	0.0000
78.74	839.4573	121.22	601.7334	228.18	457.7407
79.69	839.4576	121.78	603.3469	116.74	457.7407
80.12	833.7117	122.06	606.7181	235.69	474.5842
80.19	833.8467	122.92	621.9940	235.96	451.7743
80.57	809.1274	123.07	586.2241	238.63	444.0807
81.00	787.2835	265.00	589.9260	238.98	0.0000
81.07	835.5618	125.81	572.4877	240.99	445.1963
81.75	883.2117	127.23	637.9775	242.00	445.6711
83.79	839.3718	127.91	597.3057	244.70	399.5295
84.00	846.9005	129.30	642.2792	252.40	406.7361
85.43	849.6332	131.20	635.9922	252.80	420.5880
86.55	851.7586	133.02	604.4915	254.15	0.0000
86.79	852.2073	133.52	619.6146	256.23	433.9564
86.94	852.4928	136.00	568.6137	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	390.2263	355.39	0.0000	584.27	192.8864
264.80	395.9478	356.01	268.8697	595.83	216.1066
265.00	412.2811	364.49	325.4193	427.87	231.5857
268.22	410.6173	366.42	0.0000	602.52	0.0000
269.46	391.4460	372.51	277.1736	604.72	223.0302
270.03	391.6649	375.05	300.4398	607.14	229.5559
271.23	388.0336	377.52	313.2026	609.32	210.1148
273.65	439.6047	356.01	326.9434	610.33	210.2242
276.40	389.5374	388.16	280.8358	614.28	216.2876
277.37	386.9626	388.63	258.3754	618.01	197.8542
277.60	381.4354	391.69	292.8625	620.36	193.3737
278.00	377.8376	264.66	298.9000	621.93	194.4678
279.20	395.7469	401.81	295.0065	630.19	0.0000
279.54	430.0936	402.40	276.4926	631.29	201.0739
279.70	430.1567	404.85	247.3051	633.25	187.9791
280.46	445.4637	410.95	258.3724	634.78	173.8679
283.69	379.8719	413.71	248.8511	635.95	165.4147
284.31	393.2654	414.70	267.4063	636.99	173.1088
285.41	390.2768	423.72	272.2314	645.85	154.7543
285.90	0.0000	427.09	250.7324	657.76	188.9604
287.50	360.8398	427.87	252.9749	657.90	0.0000
290.67	399.7512	433.94	252.9565	661.66	162.0414
293.27	0.0000	439.40	248.5679	664.57	0.0000
351.93	374.0449	453.88	252.0147	666.33	188.1279
295.96	387.9847	463.37	264.3463	666.50	180.1042
879.38	373.6549	468.07	226.8289	667.71	0.0000
299.98	369.5404	473.00	185.8472	677.62	171.6762
300.09	363.4729	475.06	226.0876	685.70	164.5357
300.13	363.4846	476.78	232.8608	695.00	181.8677
301.36	353.1830	477.60	232.9784	696.49	209.3867
302.85	359.7749	482.18	214.8626	696.51	209.3919
256.23	355.7031	487.02	231.0517	697.00	197.6947
304.85	361.9454	492.35	0.0000	697.30	197.7193
306.78	371.5876	497.08	219.2474	697.49	204.5914
308.46	349.0585	505.52	235.6399	702.65	195.2590
311.90	358.7913	507.63	0.0000	706.68	195.6185
316.51	339.8867	511.00	232.1847	711.68	181.2822
319.41	320.3471	514.00	202.9915	720.70	165.6925
320.08	351.6100	514.00	202.9915	721.93	0.0000
321.04	368.4228	520.40	220.0619	722.78	136.9689
323.87	341.4390	520.69	0.0000	722.91	125.4235
325.23	309.0559	522.65	0.0000	723.31	125.4482
328.76	353.8037	527.90	0.0000	724.19	135.4038
333.37	298.5867	528.26	224.4324	727.33	167.6714
333.97	382.5906	529.59	179.6826	733.00	166.6003
334.37	369.6086	529.87	0.0000	735.93	141.4176
338.28	354.0316	531.02	174.2094	333.97	151.4805
338.32	354.0425	537.26	190.3945	739.50	0.0000
311.90	309.8149	546.56	0.0000	747.24	149.1237
340.48	309.8149	552.55	182.9316	748.06	171.2004
340.55	309.8341	563.25	194.0763	752.31	154.4662
344.28	310.3142	569.33	230.5388	753.82	140.5127
345.93	304.8281	946.00	231.4819	756.73	175.8630
351.06	280.5731	569.70	230.5879	756.80	175.8673
351.93	280.7664	583.19	198.0231	884.68	164.6453

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	174.8610	1274.44	127.4015	1620.50	58.8120
766.42	181.6348	1001.03	105.5521	1621.92	56.9641
766.84	176.6235	1002.74	115.0707	1678.03	0.0000
772.60	0.0000	1004.73	118.3044	1690.97	44.8011
776.52	128.3644	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	40.4531
778.90	147.0886	1028.54	0.0000	1063.66	33.7512
783.70	133.1524	1037.84	117.2278	1771.35	33.7585
785.37	147.4851	1038.76	0.0000	1791.20	0.0000
792.07	167.2752	631.29	117.5662	1808.65	36.9358
794.95	145.0092	1048.07	112.9550	1810.72	0.0000
795.86	136.8887	1049.04	112.0557	1836.06	40.0748
810.06	143.8521	1050.41	107.4335		
810.29	143.8623	1063.66	107.8967		
344.28	150.2954	1077.00	106.4755		
810.76	146.1736	1077.34	106.4893		
815.77	127.7055	1085.87	76.5374		
1048.07	138.1548	1093.63	103.2520		
832.01	152.3761	1099.45	106.2852		
834.85	159.8126	1112.07	96.3606		
835.71	165.0557	1112.84	84.9498		
836.80	0.0000	1115.54	114.4482		
846.75	0.0000	1120.29	104.7946		
846.77	166.8164	1120.55	104.8036		
856.80	127.3460	1221.41	101.5501		
860.56	125.7832	1129.67	109.2036		
871.09	121.0308	1131.51	0.0000		
873.19	116.9158	1147.95	0.0000		
875.33	0.0000	1173.23	114.5286		
879.38	120.3568	1177.95	107.8881		
880.51	118.2973	1189.05	103.3647		
883.24	142.7355	1204.77	121.4722		
884.68	147.0461	1221.41	104.3394		
889.28	128.2257	1231.02	105.4181		
894.76	138.0457	1235.36	123.6763		
898.04	153.0984	1238.28	99.8986		
900.72	135.1576	1260.41	0.0000		
903.28	144.5708	1271.87	73.8856		
911.20	99.7135	1274.44	93.9197		
912.08	119.3383	1274.54	93.9235		
923.98	0.0000	1291.59	89.3440		
926.50	134.2926	1298.22	0.0000		
929.11	127.9686	1312.11	83.7869		
937.49	108.9399	1332.49	85.2612		
944.13	130.8224	1362.66	0.0000		
946.00	122.2530	1365.19	65.5234		
949.00	129.9668	1368.63	0.0000		
667.71	0.0000	1384.29	70.5525		
962.31	136.0199	1408.01	73.4961		
964.08	103.4377	1457.56	0.0000		
966.17	123.1275	1460.82	60.8391		
911.20	123.2489	1489.16	65.4865		
968.97	123.2489	1505.03	73.1581		
983.53	111.8140	1584.12	73.4508		
984.45	0.0000	1596.21	38.9927		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:57:33.99

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656020.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;478
Background date    : 20-JUN-2016 14:02:47
Sample date       : 17-MAY-2016 13:55:00 Acquisition date : 24-JUN-2016 15:53:26
Sample ID        : G398656020 Sample quantity : 1.69030E+02 GRAM
Detector name    : GAM02 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:02.62 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1572234 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.33*	91	1141	0.89	126.28	122	9	2.11E-03	85.9	
2	0	77.06	429	973	1.09	153.72	152	6	9.93E-03	12.6	
3	7	84.50*	101	1422	1.65	168.58	162	16	2.33E-03	83.7	1.49E+00
4	7	87.16	199	1020	1.09	173.91	162	16	4.60E-03	27.3	
5	0	92.77*	280	1314	1.33	185.12	181	10	6.48E-03	32.9	
6	0	112.78*	32	778	0.71	225.12	222	7	7.38E-04	183.6	
7	0	185.83*	180	1127	1.43	371.13	366	12	4.17E-03	49.3	
8	0	209.46	120	821	0.87	418.36	413	9	2.78E-03	44.1	
9	4	238.59*	1467	546	1.27	476.59	469	20	3.40E-02	4.8	1.38E+00
10	4	241.51*	255	771	1.93	482.43	469	20	5.90E-03	28.8	
11	0	269.91	73	539	1.31	539.18	536	8	1.68E-03	56.5	
12	0	295.14	350	600	1.24	589.62	585	10	8.10E-03	14.2	
13	0	299.66	27	426	0.72	598.65	597	7	6.30E-04	127.4	
14	0	328.18	128	422	1.33	655.67	652	9	2.95E-03	30.4	
15	0	332.52	70	440	2.30	664.33	661	9	1.62E-03	55.2	
16	0	338.35*	214	557	0.93	676.00	671	10	4.95E-03	26.7	
17	0	351.93*	536	498	1.63	703.14	697	11	1.24E-02	11.3	
18	0	384.91	38	291	0.57	769.06	766	7	8.68E-04	77.3	
19	0	463.50	97	447	1.85	926.17	918	13	2.25E-03	46.2	
20	0	511.13*	243	485	2.60	1021.38	1013	20	5.62E-03	33.2	
21	0	520.72	106	316	1.39	1040.54	1033	15	2.46E-03	37.6	
22	0	563.60	91	274	2.36	1126.27	1121	12	2.11E-03	37.7	
23	0	582.95*	427	249	1.60	1164.94	1159	11	9.88E-03	10.6	
24	0	608.84*	414	356	1.52	1216.70	1209	15	9.57E-03	12.8	
25	0	726.88	131	204	1.63	1452.67	1446	12	3.03E-03	23.5	
26	0	787.52	43	219	1.94	1573.91	1563	14	9.84E-04	76.1	
27	0	794.80	57	214	2.23	1588.47	1579	15	1.33E-03	57.2	
28	0	859.79*	116	140	2.69	1718.38	1712	13	2.69E-03	26.5	
29	0	904.35	28	111	1.39	1807.48	1803	9	6.52E-04	70.3	
30	0	910.70*	270	217	1.63	1820.17	1812	17	6.26E-03	16.0	
31	0	968.40*	212	231	2.05	1935.53	1925	22	4.90E-03	21.5	
32	0	1001.06*	27	131	1.80	2000.83	1992	16	6.16E-04	122.8	
33	0	1104.07	33	46	1.32	2206.79	2203	7	7.59E-04	40.2	
34	0	1119.98*	74	109	1.78	2238.60	2233	12	1.71E-03	41.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1128.83	20	58	1.16	2256.30	2253	8	4.53E-04	71.1	
36	0	1238.10*	48	115	2.92	2474.76	2468	14	1.11E-03	57.2	
37	0	1248.68	29	149	7.49	2495.92	2482	20	6.73E-04	104.8	
38	0	1320.36	70	86	5.87	2639.25	2630	19	1.62E-03	33.8	
39	0	1460.49*	757	81	2.24	2919.45	2911	15	1.75E-02	5.4	
40	0	1569.61	40	48	2.37	3137.65	3128	19	9.14E-04	44.8	
41	0	1616.49	7	36	1.36	3231.39	3223	10	1.69E-04	159.9	
42	0	1629.97	40	35	1.02	3258.35	3251	14	9.30E-04	35.0	
43	0	1700.56	21	39	3.11	3399.50	3390	16	4.87E-04	70.5	
44	0	1707.81	22	26	1.41	3414.00	3406	13	5.09E-04	52.3	
45	0	1729.87*	50	37	3.69	3458.12	3448	21	1.17E-03	40.1	
46	0	1764.30*	94	48	2.58	3526.97	3514	24	2.18E-03	27.2	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 03:57:36

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656020.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 13:55:00 Acquisition date : 24-JUN-2016 15:53:26
Sample ID        : G398656020 Sample quantity  : 169.03 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA2 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:02.62 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.046E+00	2.454E+00	2.454E+00	10.88	OK
CD-109	88.03	3.70*	5.099E+00	3.322E-01	3.519E-01	89.40	OK
SN-126	64.28	9.60	2.470E+00	2.008E-01	2.008E-01	171.82	OK
	86.94	8.90	5.099E+00	1.381E-01	1.381E-01	89.40	OK
	87.57	37.00*	5.099E+00	3.322E-02	3.322E-02	89.40	OK
TL-208	277.37	6.60	4.043E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.355E+00	8.714E-02	8.714E-02	21.27	OK
	860.56	12.50	1.704E+00	2.121E-01	2.121E-01	52.96	OK
PB-212	74.82	10.28	3.936E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	4.184E+00	3.074E-01	3.074E-01	25.30	OK
	238.63	43.60*	4.497E+00	3.401E-01	3.401E-01	9.62	OK
	300.09	3.30	3.826E+00	9.539E-02	9.539E-02	254.75	OK
BI-214	609.32	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57	OK
	1120.29	14.92	1.335E+00	1.391E-01	1.392E-01	82.87	OK
	1764.49	15.30	9.018E-01	2.403E-01	2.403E-01	54.49	OK
PB-214	74.82	5.80	3.936E+00	----- Line	Not Found	-----	Absent
	77.11	9.70	4.184E+00	5.420E-01	5.420E-01	25.30	OK
	87.09	3.41	5.094E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.453E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.868E+00	2.178E-01	2.178E-01	28.34	OK
	351.93	35.60*	3.411E+00	1.919E-01	1.919E-01	22.60	OK
RN-222	609.32	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57	OK
	1120.29	14.92	1.335E+00	1.391E-01	1.392E-01	82.87	OK
	1764.49	15.30	9.018E-01	2.403E-01	2.403E-01	54.49	OK
RA-224	240.99	4.10*	4.459E+00	2.476E-01	2.476E-01	153.56	OK
RA-226	609.32	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57	OK
	1120.29	14.92	1.335E+00	1.391E-01	1.392E-01	82.87	OK
	1764.49	15.30	9.018E-01	2.403E-01	2.403E-01	54.49	OK
AC-228	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.508E+00	2.359E-01	2.359E-01	53.46	OK
	794.95	4.25	1.827E+00	2.896E-01	2.896E-01	114.39	OK
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.618E+00	2.496E-01	2.496E-01	32.04	OK
	968.97	15.80	1.530E+00	3.347E-01	3.347E-01	43.05	OK
RA-228	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.508E+00	2.359E-01	2.359E-01	53.46	OK
	794.95	4.25	1.827E+00	2.896E-01	2.896E-01	114.39	OK
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.618E+00	2.496E-01	2.496E-01	32.04	OK
	968.97	15.80	1.530E+00	3.347E-01	3.347E-01	43.05	OK
TH-228	74.82	10.28	3.936E+00	----- Line	Not Found	-----	Absent
	77.11	17.10	4.184E+00	3.074E-01	3.074E-01	25.30	OK
	238.63	43.60*	4.497E+00	3.401E-01	3.401E-01	9.62	OK
	300.09	3.30	3.826E+00	9.539E-02	9.539E-02	254.75	OK
TH-229	85.43	14.70	4.890E+00	7.123E-02	7.123E-02	167.32	OK
	88.47	24.00	5.099E+00	5.122E-02	5.122E-02	89.40	OK
	193.51	4.41*	5.172E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.914E+00	4.022E-01	4.022E-01	88.18	OK
TH-230	609.32	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	1120.29	14.92	1.335E+00	1.391E-01	1.392E-01	82.87	OK
	1764.49	15.30	9.018E-01	2.403E-01	2.403E-01	54.49	OK
TH-232	105.21	1.10	5.964E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.508E+00	2.359E-01	2.359E-01	53.46	OK
	835.71	1.61	1.748E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.618E+00	2.496E-01	2.496E-01	32.04	OK
	968.97	15.80	1.530E+00	3.347E-01	3.347E-01	43.05	OK
TH-234	63.29	3.70*	2.470E+00	5.210E-01	5.210E-01	171.82	OK
	92.59	4.23	5.464E+00	6.094E-01	6.094E-01	65.87	OK
U-234	609.32	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57	OK
	1120.29	14.92	1.335E+00	1.391E-01	1.391E-01	82.87	OK
	1764.49	15.30	9.018E-01	2.403E-01	2.403E-01	54.49	OK
U-238	63.29	3.70*	2.470E+00	5.210E-01	5.210E-01	171.82	OK
	92.59	4.23	5.464E+00	6.094E-01	6.094E-01	65.87	OK
ANH-511	511.00	100.00*	2.602E+00	3.875E-02	3.875E-02	66.35	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656020.CNF;1
Acquisition date : 24-JUN-2016 15:53:26 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:02.62 Half life ratio : *****
Sample date : 17-MAY-2016 13:55:00 Analyst initials: MXR1
Sample ID : G398656020 Sample Quantity : 1.6903E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	2.454E+00	2.617E-01	1.518E-01
CD-109	3.519E-01	3.083E-01	3.553E-01
SN-126	3.322E-02	2.911E-02	3.473E-02
TL-208	8.714E-02	1.816E-02	1.509E-02
PB-212	3.401E-01	3.207E-02	2.322E-02
BI-214	1.623E-01	4.066E-02	2.816E-02
PB-214	1.919E-01	4.252E-02	3.060E-02
RN-222	1.623E-01	4.066E-02	2.816E-02
RA-224	2.476E-01	3.727E-01	2.488E-01
RA-226	1.623E-01	4.066E-02	2.816E-02
AC-228	2.496E-01	7.836E-02	5.442E-02
RA-228	2.496E-01	7.836E-02	5.442E-02
TH-228	3.401E-01	3.207E-02	2.322E-02
TH-229	6.320E-02	1.150E-01	2.194E-01
TH-230	1.623E-01	4.066E-02	2.816E-02
TH-232	2.496E-01	7.836E-02	5.442E-02
TH-234	5.210E-01	8.772E-01	6.125E-01
U-234	1.623E-01	4.066E-02	2.816E-02
U-238	5.210E-01	8.772E-01	6.125E-01
ANH-511	3.875E-02	2.519E-02	1.149E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-3.507E-03	9.771E-02	1.812E-01	NOT IDENT.
NA-22	-1.519E-03	9.491E-03	1.678E-02	NOT IDENT.
NA-24	0.000E+00	2.336E+16	0.000E+00	SHORT HLIF
AL-26	2.313E-03	7.721E-03	1.458E-02	FAIL ABUN
SC-46	-8.198E-03	1.025E-02	1.813E-02	FAIL ABUN
V-48	-5.502E-02	3.979E-02	6.700E-02	NOT IDENT.
CR-51	-3.297E-02	1.662E-01	2.987E-01	NOT IDENT.
MN-54	6.854E-03	8.818E-03	1.621E-02	NOT IDENT.
CO-56	5.639E-03	1.140E-02	2.066E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF

CO-57	-3.235E-03	6.311E-03	1.127E-02	NOT IDENT.
CO-58	3.767E-03	1.093E-02	1.978E-02	NOT IDENT.
FE-59	-5.816E-03	3.344E-02	5.116E-02	NOT IDENT.
CO-60	-8.938E-04	8.940E-03	1.586E-02	NOT IDENT.
ZN-65	3.552E-03	2.272E-02	3.568E-02	NOT IDENT.
GE-68	1.808E-01	2.925E-01	5.483E-01	NOT IDENT.
AS-73	-5.067E-01	5.149E-01	6.260E-01	NOT IDENT.
AS-74	6.693E-03	5.457E-02	9.975E-02	NOT IDENT.
SE-75	3.380E-04	1.301E-02	2.216E-02	NOT IDENT.
BR-77	0.000E+00	4.333E+03	0.000E+00	SHORT HLIF
SR-82	-1.157E-01	1.447E-01	2.470E-01	NOT IDENT.
RB-83	0.000E+00	3.832E-02	3.682E-02	FAIL ABUN
KR-85	0.000E+00	1.995E+00	3.844E+00	NOT IDENT.
SR-85	0.000E+00	1.348E-02	2.598E-02	NOT IDENT.
RB-86	2.190E-01	4.089E-01	7.633E-01	NOT IDENT.
Y-88	4.318E-03	1.045E-02	1.981E-02	NOT IDENT.
Y-91	-8.794E-01	5.486E+00	9.750E+00	NOT IDENT.
NB-94	1.556E-03	7.724E-03	1.398E-02	NOT IDENT.
NB-95	-1.750E-02	1.986E-02	2.285E-02	NOT IDENT.
NB-95M	4.876E-02	3.972E-02	6.747E-02	NOT IDENT.
ZR-95	1.322E-02	2.120E-02	3.899E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.843E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.797E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	4.490E+40	0.000E+00	SHORT HLIF
RH-101	-9.682E-04	7.460E-03	1.341E-02	NOT IDENT.
RH-102	-5.162E-03	1.320E-02	2.351E-02	NOT IDENT.
RU-103	8.105E-03	1.349E-02	2.556E-02	FAIL ABUN
RH-106	-6.111E-02	7.636E-02	1.337E-01	NOT IDENT.
RU-106	-6.111E-02	7.636E-02	1.337E-01	NOT IDENT.
AG-108M	-2.124E-03	6.733E-03	1.245E-02	NOT IDENT.
AG-110M	-1.679E-02	1.812E-02	2.031E-02	NOT IDENT.
SN-113	-5.650E-03	1.225E-02	2.145E-02	NOT IDENT.
CD-115	0.000E+00	3.721E+03	0.000E+00	SHORT HLIF
SN-117M	2.566E-02	3.841E-02	7.448E-02	NOT IDENT.
TE-123M	2.712E-03	7.071E-03	1.362E-02	NOT IDENT.
SB-124	-7.556E-03	2.876E-02	4.541E-02	NOT IDENT.
SB-125	3.240E-04	2.090E-02	3.916E-02	FAIL ABUN
TE-125M	7.568E-01	3.255E+00	5.327E+00	NOT IDENT.
I-126	-1.457E-02	1.740E-01	3.126E-01	NOT IDENT.
SB-126	1.385E-02	1.387E-01	2.162E-01	NOT IDENT.
SB-127	2.050E+00	1.851E+01	3.358E+01	NOT IDENT.
I-131	-7.496E-02	2.095E-01	3.707E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.514E+01	0.000E+00	SHORT HLIF
BA-133	-4.365E-03	1.144E-02	1.760E-02	FAIL ABUN
I-133	0.000E+00	1.477E+11	0.000E+00	SHORT HLIF
CS-134	1.491E-02	1.672E-02	1.802E-02	FAIL ABUN
CS-135	2.368E-02	4.215E-02	6.931E-02	NOT IDENT.
I-135	0.000E+00	3.476E+40	0.000E+00	SHORT HLIF
CS-136	-2.607E-02	7.986E-02	1.424E-01	NOT IDENT.
BA-137M	-1.751E-02	1.160E-02	1.454E-02	NOT IDENT.
CS-137	-1.850E-02	1.225E-02	1.536E-02	NOT IDENT.
CE-139	-7.584E-03	7.483E-03	1.390E-02	NOT IDENT.
BA-140	9.334E-02	2.132E-01	3.991E-01	NOT IDENT.
LA-140	-5.244E-02	7.444E-02	1.291E-01	FAIL ABUN
CE-141	-4.084E-02	3.582E-02	4.418E-02	NOT IDENT.
CE-143	0.000E+00	4.133E+06	0.000E+00	SHORT HLIF
CE-144	-1.327E-03	4.717E-02	8.480E-02	NOT IDENT.
PM-144	1.411E-05	8.243E-03	1.480E-02	NOT IDENT.
PR-144	1.069E-03	6.244E-01	1.121E+00	NOT IDENT.
PM-146	-4.658E-03	9.864E-03	1.806E-02	NOT IDENT.
ND-147	-7.102E-02	5.387E-01	9.872E-01	NOT IDENT.
PM-147	-3.153E+01	1.742E+02	3.140E+02	NOT IDENT.
PM-149	0.000E+00	3.029E+04	0.000E+00	SHORT HLIF
EU-150	9.002E-03	9.732E-03	1.228E-02	FAIL ABUN
EU-152	-2.421E-02	2.399E-02	4.004E-02	NOT IDENT.
GD-153	-1.399E-02	2.736E-02	3.851E-02	NOT IDENT.
EU-154	-4.975E-03	2.653E-02	4.683E-02	NOT IDENT.
EU-155	2.638E-03	2.380E-02	4.371E-02	FAIL ABUN
TB-160	2.579E-02	3.586E-02	6.857E-02	FAIL ABUN
HO-166M	-4.058E-03	1.368E-02	2.420E-02	FAIL ABUN
TM-171	-9.644E+00	9.346E+00	1.134E+01	NOT IDENT.
HF-172	-3.728E-02	4.565E-02	8.063E-02	FAIL ABUN
LU-172	1.755E-02	1.429E-02	2.758E-02	FAIL ABUN
LU-176	-5.298E-04	6.187E-03	1.122E-02	FAIL ABUN
HF-181	3.555E-03	1.453E-02	2.720E-02	NOT IDENT.
TA-182	-4.649E-03	4.242E-02	7.554E-02	FAIL ABUN

RE-183	-2.553E-02	7.172E-02	1.291E-01	NOT IDENT.
RE-184	3.712E-02	5.113E-02	8.239E-02	FAIL ABUN
W-188	-2.227E-01	2.442E+00	3.886E+00	FAIL ABUN
IR-192	2.679E-03	1.053E-02	1.924E-02	FAIL ABUN
HG-203	7.240E-03	1.270E-02	2.364E-02	NOT IDENT.
BI-207	2.952E-03	1.179E-02	2.165E-02	NOT IDENT.
PB-210	1.365E-01	1.718E+00	2.518E+00	NOT IDENT.
BI-211	0.000E+00	1.171E-01	1.340E-01	FAIL ABUN
PB-211	-1.607E-02	1.744E-01	3.086E-01	NOT IDENT.
BI-212	0.000E+00	1.822E-01	2.455E-01	FAIL ABUN
RN-219	3.538E-02	9.986E-02	1.798E-01	FAIL ABUN
RA-223	1.614E-03	1.790E-01	2.831E-01	FAIL ABUN
AC-227	-2.078E-02	5.898E-02	1.076E-01	FAIL ABUN
TH-227	-2.078E-02	5.898E-02	1.076E-01	FAIL ABUN
PA-231	1.102E-01	1.285E-01	2.122E-01	NOT IDENT.
TH-231	1.614E-03	1.790E-01	2.831E-01	FAIL ABUN
PA-233	-7.662E-03	1.542E-02	2.753E-02	FAIL ABUN
PA-234	6.008E-02	6.602E-02	1.266E-01	NOT IDENT.
PA-234M	8.130E-01	1.956E+00	2.127E+00	FAIL ABUN
U-235	-6.476E-03	6.982E-02	8.973E-02	FAIL ABUN
NP-237	-7.662E-03	1.542E-02	2.753E-02	FAIL ABUN
NP-238	0.000E+00	8.323E+03	0.000E+00	SHORT HLIF
NP-239	-1.151E-02	6.952E-02	1.116E-01	NOT IDENT.
PU-239	9.806E+01	7.790E+01	1.450E+02	NOT IDENT.
AM-241	1.012E-02	4.561E-02	7.818E-02	NOT IDENT.
AM-243	9.985E-03	2.004E-02	3.062E-02	NOT IDENT.
CM-243	-1.435E-02	2.371E-02	4.277E-02	NOT IDENT.
BK-247	4.753E-03	2.061E-02	3.535E-02	FAIL ABUN
CM-247	7.308E-03	9.022E-03	1.652E-02	NOT IDENT.
CF-249	4.255E-03	1.101E-02	1.747E-02	FAIL ABUN
CF-251	1.965E-03	2.836E-02	5.380E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	739	10.66*	1.046E+00	2.454E+00	2.454E+00	10.88
CD-109	88.03	272	3.70*	5.099E+00	5.329E-01	5.645E-01	54.70
SN-126	64.28	129	9.60	2.470E+00	2.008E-01	2.008E-01	171.82
	86.94	272	8.90	5.099E+00	2.216E-01	2.216E-01	54.70
	87.57	272	37.00*	5.099E+00	5.329E-02	5.329E-02	54.70
TL-208	277.37	-----	6.60	4.043E+00	-----	Line Not Found	-----
	583.19	471	85.00*	2.355E+00	8.714E-02	8.714E-02	21.27
	860.56	122	12.50	1.704E+00	2.121E-01	2.121E-01	52.96
BI-211	72.87	-----	1.23	3.707E+00	-----	Line Not Found	-----
	351.06	630	12.92*	3.411E+00	5.288E-01	5.288E-01	22.60
PB-212	74.82	-----	10.28	3.936E+00	-----	Line Not Found	-----
	77.11	594	17.10	4.184E+00	3.074E-01	3.074E-01	25.30
	238.63	1802	43.60*	4.497E+00	3.401E-01	3.401E-01	9.62
	300.09	33	3.30	3.826E+00	9.539E-02	9.539E-02	254.75
BI-214	609.32	454	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57
	1120.29	75	14.92	1.335E+00	1.391E-01	1.392E-01	82.87
	1764.49	90	15.30	9.018E-01	2.403E-01	2.403E-01	54.49
PB-214	74.82	-----	5.80	3.936E+00	-----	Line Not Found	-----
	77.11	594	9.70	4.184E+00	5.420E-01	5.420E-01	25.30
	87.09	272	3.41	5.099E+00	5.782E-01	5.783E-01	54.70
	242.00	313	7.25	4.459E+00	3.578E-01	3.578E-01	57.58
	295.22	419	18.42	3.868E+00	2.178E-01	2.178E-01	28.34
	351.93	630	35.60*	3.411E+00	1.919E-01	1.919E-01	22.60
RN-222	609.32	454	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57
	1120.29	75	14.92	1.335E+00	1.391E-01	1.392E-01	82.87
	1764.49	90	15.30	9.018E-01	2.403E-01	2.403E-01	54.49
RA-224	240.99	313	4.10*	4.459E+00	6.327E-01	6.327E-01	57.58
RA-226	609.32	454	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57
	1120.29	75	14.92	1.335E+00	1.391E-01	1.392E-01	82.87
	1764.49	90	15.30	9.018E-01	2.403E-01	2.403E-01	54.49
AC-228	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	252	11.27	3.508E+00	2.359E-01	2.359E-01	53.46
	794.95	61	4.25	1.827E+00	2.896E-01	2.896E-01	114.39
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	282	25.80*	1.618E+00	2.496E-01	2.496E-01	32.04
	968.97	219	15.80	1.530E+00	3.347E-01	3.347E-01	43.05
RA-228	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	252	11.27	3.508E+00	2.359E-01	2.359E-01	53.46
	794.95	61	4.25	1.827E+00	2.896E-01	2.896E-01	114.39
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	282	25.80*	1.618E+00	2.496E-01	2.496E-01	32.04
	968.97	219	15.80	1.530E+00	3.347E-01	3.347E-01	43.05
TH-228	74.82	-----	10.28	3.936E+00	-----	Line Not Found	-----
	77.11	594	17.10	4.184E+00	3.074E-01	3.074E-01	25.30
	238.63	1802	43.60*	4.497E+00	3.401E-01	3.401E-01	9.62
	300.09	33	3.30	3.826E+00	9.539E-02	9.539E-02	254.75
TH-229	85.43	138	14.70	4.890E+00	7.123E-02	7.123E-02	167.32

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	88.47	272	24.00	5.099E+00	8.216E-02	8.216E-02	54.70
	193.51	-----	4.41*	5.172E+00	-----	Line Not Found	-----
	210.85	150	2.80	4.914E+00	4.022E-01	4.022E-01	88.18
TH-230	609.32	454	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57
	1120.29	75	14.92	1.335E+00	1.391E-01	1.392E-01	82.87
	1764.49	90	15.30	9.018E-01	2.403E-01	2.403E-01	54.49
TH-232	105.21	-----	1.10	5.964E+00	-----	Line Not Found	-----
	338.32	252	11.27	3.508E+00	2.359E-01	2.359E-01	53.46
	835.71	-----	1.61	1.748E+00	-----	Line Not Found	-----
	911.20	282	25.80*	1.618E+00	2.496E-01	2.496E-01	32.04
	968.97	219	15.80	1.530E+00	3.347E-01	3.347E-01	43.05
TH-234	63.29	129	3.70*	2.470E+00	5.210E-01	5.210E-01	171.82
	92.59	381	4.23	5.464E+00	6.094E-01	6.094E-01	65.87
U-234	609.32	454	45.49*	2.277E+00	1.623E-01	1.623E-01	25.57
	1120.29	75	14.92	1.335E+00	1.391E-01	1.391E-01	82.87
	1764.49	90	15.30	9.018E-01	2.403E-01	2.403E-01	54.49
U-238	63.29	129	3.70*	2.470E+00	5.210E-01	5.210E-01	171.82
	92.59	381	4.23	5.464E+00	6.094E-01	6.094E-01	65.87
ANH-511	511.00	272	100.00*	2.602E+00	3.875E-02	3.875E-02	66.35

Flag: "*" = Keyline

Total number of lines in spectrum 46
Number of unidentified lines 10
Number of lines tentatively identified by NID 36 78.26%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	2.454E+00	2.454E+00	0.267E+00	10.88	
CD-109	461.40D	1.06	5.329E-01	5.645E-01	3.088E-01	54.70	
SN-126	2.30E+05Y	1.00	5.329E-02	5.329E-02	2.915E-02	54.70	
TL-208	1.41E+10Y	1.00	8.714E-02	8.714E-02	1.853E-02	21.27	
BI-211	7.04E+08Y	1.00	5.288E-01	5.288E-01	1.195E-01	22.60	
PB-212	1.41E+10Y	1.00	3.401E-01	3.401E-01	0.327E-01	9.62	
BI-214	1600.00Y	1.00	1.623E-01	1.623E-01	0.415E-01	25.57	
PB-214	1600.00Y	1.00	1.919E-01	1.919E-01	0.434E-01	22.60	
RN-222	1600.00Y	1.00	1.623E-01	1.623E-01	0.415E-01	25.57	
RA-224	1.41E+10Y	1.00	6.327E-01	6.327E-01	3.643E-01	57.58	
RA-226	1600.00Y	1.00	1.623E-01	1.623E-01	0.415E-01	25.57	
AC-228	1.41E+10Y	1.00	2.496E-01	2.496E-01	0.800E-01	32.04	
RA-228	1.41E+10Y	1.00	2.496E-01	2.496E-01	0.800E-01	32.04	
TH-228	1.41E+10Y	1.00	3.401E-01	3.401E-01	0.327E-01	9.62	
TH-229	7340.00Y	1.00	8.216E-02	8.216E-02	4.494E-02	54.70	K
TH-230	7.54E+04Y	1.00	1.623E-01	1.623E-01	0.415E-01	25.57	
TH-232	1.41E+10Y	1.00	2.496E-01	2.496E-01	0.800E-01	32.04	
TH-234	4.47E+09Y	1.00	5.210E-01	5.210E-01	8.951E-01	171.82	
U-234	2.45E+05Y	1.00	1.623E-01	1.623E-01	0.415E-01	25.57	
U-238	4.47E+09Y	1.00	5.210E-01	5.210E-01	8.951E-01	171.82	
ANH-511	1.00E+09Y	1.00	3.875E-02	3.875E-02	2.571E-02	66.35	

Total Activity : 7.884E+00 7.915E+00

Grand Total Activity : 7.884E+00 7.915E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	112.78	42	1036	0.71	225.12	222	7	7.38E-04	****	6.11E+00	T
0	185.83	227	1424	1.43	371.13	366	12	4.17E-03	98.6	5.30E+00	T
0	269.91	88	653	1.31	539.18	536	8	1.68E-03	****	4.12E+00	T
0	328.18	151	500	1.33	655.67	652	9	2.95E-03	60.8	3.59E+00	T
0	332.52	83	520	2.30	664.33	661	9	1.62E-03	****	3.55E+00	T
0	384.91	44	339	0.57	769.06	766	7	8.68E-04	****	3.20E+00	T
0	463.50	110	507	1.85	926.17	918	13	2.25E-03	92.3	2.80E+00	T
0	520.72	119	353	1.39	1040.54	1033	15	2.46E-03	75.2	2.57E+00	T
0	563.60	101	303	2.36	1126.27	1121	12	2.11E-03	75.4	2.42E+00	T
0	726.88	141	219	1.63	1452.67	1446	12	3.03E-03	47.0	1.97E+00	T
0	787.52	45	233	1.94	1573.91	1563	14	9.84E-04	****	1.84E+00	
0	904.35	29	116	1.39	1807.48	1803	9	6.52E-04	****	1.63E+00	T
0	1001.06	27	135	1.80	2000.83	1992	16	6.16E-04	****	1.48E+00	T
0	1104.07	33	47	1.32	2206.79	2203	7	7.59E-04	80.4	1.35E+00	
0	1128.83	20	59	1.16	2256.30	2253	8	4.53E-04	****	1.33E+00	T
0	1238.10	48	115	2.92	2474.76	2468	14	1.11E-03	****	1.21E+00	T
0	1248.68	29	149	7.49	2495.92	2482	20	6.73E-04	****	1.21E+00	
0	1320.36	69	85	5.87	2639.25	2630	19	1.62E-03	67.6	1.14E+00	
0	1569.61	38	46	2.37	3137.65	3128	19	9.14E-04	89.5	9.84E-01	
0	1616.49	7	34	1.36	3231.39	3223	10	1.69E-04	****	9.61E-01	
0	1629.97	39	33	1.02	3258.35	3251	14	9.30E-04	70.0	9.55E-01	
0	1700.56	20	37	3.11	3399.50	3390	16	4.87E-04	****	9.25E-01	
0	1707.81	21	25	1.41	3414.00	3406	13	5.09E-04	****	9.22E-01	
0	1729.87	48	35	3.69	3458.12	3448	21	1.17E-03	80.1	9.14E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656020.CNF;1
Acquisition date : 24-JUN-2016 15:53:26 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:02.62 Half life ratio : *****
Sample date : 17-MAY-2016 13:55:00 Nuclide Library : SOLID
Sample ID : G398656020 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6903E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	7.139E-02
CD-109	1.747E-01
SN-126	1.708E-02
TL-208	7.288E-03
PB-212	1.134E-02
BI-214	1.358E-02
PB-214	1.487E-02
RN-222	1.358E-02
RA-224	1.215E-01
RA-226	1.358E-02
AC-228	2.599E-02
RA-228	2.599E-02
TH-228	1.134E-02
TH-229	1.074E-01
TH-230	1.358E-02
TH-232	2.599E-02
TH-234	3.003E-01
U-234	1.358E-02
U-238	3.003E-01
ANH-511	5.545E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.761E-02	NOT IDENT.
NA-22	7.952E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.724E-03	FAIL ABUN
SC-46	8.639E-03	FAIL ABUN
V-48	3.172E-02	NOT IDENT.
CR-51	1.456E-01	NOT IDENT.
MN-54	7.787E-03	NOT IDENT.
CO-56	9.915E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.523E-03	NOT IDENT.

CO-58	9.475E-03	NOT IDENT.
FE-59	2.438E-02	NOT IDENT.
CO-60	7.478E-03	NOT IDENT.
ZN-65	1.701E-02	NOT IDENT.
GE-68	2.616E-01	NOT IDENT.
AS-73	3.068E-01	NOT IDENT.
AS-74	4.819E-02	NOT IDENT.
SE-75	1.082E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.183E-01	NOT IDENT.
RB-83	1.780E-02	FAIL ABUN
KR-85	1.876E+00	NOT IDENT.
SR-85	1.268E-02	NOT IDENT.
RB-86	3.640E-01	NOT IDENT.
Y-88	9.169E-03	NOT IDENT.
Y-91	4.629E+00	NOT IDENT.
NB-94	6.735E-03	NOT IDENT.
NB-95	1.101E-02	NOT IDENT.
NB-95M	3.303E-02	NOT IDENT.
ZR-95	1.875E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.576E-03	NOT IDENT.
RH-102	1.133E-02	NOT IDENT.
RU-103	1.236E-02	FAIL ABUN
RH-106	6.436E-02	NOT IDENT.
RU-106	6.436E-02	NOT IDENT.
AG-108M	6.030E-03	NOT IDENT.
AG-110M	9.685E-03	NOT IDENT.
SN-113	1.040E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.649E-02	NOT IDENT.
TE-123M	6.671E-03	NOT IDENT.
SB-124	2.094E-02	NOT IDENT.
SB-125	1.898E-02	FAIL ABUN
TE-125M	2.612E+00	NOT IDENT.
I-126	1.506E-01	NOT IDENT.
SB-126	1.040E-01	NOT IDENT.
SB-127	1.612E+01	NOT IDENT.
I-131	1.801E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.552E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	8.671E-03	FAIL ABUN
CS-135	3.386E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.786E-02	NOT IDENT.
BA-137M	7.001E-03	NOT IDENT.
CS-137	7.396E-03	NOT IDENT.
CE-139	6.808E-03	NOT IDENT.
BA-140	1.928E-01	NOT IDENT.
LA-140	6.018E-02	FAIL ABUN
CE-141	2.167E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.154E-02	NOT IDENT.
PM-144	7.127E-03	NOT IDENT.
PR-144	5.399E-01	NOT IDENT.
PM-146	8.746E-03	NOT IDENT.
ND-147	4.761E-01	NOT IDENT.
PM-147	1.539E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.988E-03	FAIL ABUN
EU-152	1.945E-02	NOT IDENT.
GD-153	1.889E-02	NOT IDENT.
EU-154	2.219E-02	NOT IDENT.
EU-155	2.142E-02	FAIL ABUN
TB-160	3.282E-02	FAIL ABUN
HO-166M	1.163E-02	FAIL ABUN
TM-171	5.557E+00	NOT IDENT.
HF-172	3.952E-02	FAIL ABUN
LU-172	1.318E-02	FAIL ABUN
LU-176	5.462E-03	FAIL ABUN
HF-181	1.316E-02	NOT IDENT.
TA-182	3.585E-02	FAIL ABUN
RE-183	6.323E-02	NOT IDENT.

RE-184	3.946E-02	FAIL ABUN
W-188	1.894E+00	FAIL ABUN
IR-192	9.374E-03	FAIL ABUN
HG-203	1.154E-02	NOT IDENT.
BI-207	1.034E-02	NOT IDENT.
PB-210	1.234E+00	NOT IDENT.
BI-211	6.581E-02	FAIL ABUN
PB-211	1.499E-01	NOT IDENT.
BI-212	1.189E-01	FAIL ABUN
RN-219	8.736E-02	FAIL ABUN
RA-223	1.379E-01	FAIL ABUN
AC-227	5.250E-02	FAIL ABUN
TH-227	5.250E-02	FAIL ABUN
PA-231	1.035E-01	NOT IDENT.
TH-231	1.379E-01	FAIL ABUN
PA-233	1.340E-02	FAIL ABUN
PA-234	6.059E-02	NOT IDENT.
PA-234M	1.023E+00	FAIL ABUN
U-235	4.406E-02	FAIL ABUN
NP-237	1.340E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.469E-02	NOT IDENT.
PU-239	7.115E+01	NOT IDENT.
AM-241	3.831E-02	NOT IDENT.
AM-243	1.511E-02	NOT IDENT.
CM-243	2.095E-02	NOT IDENT.
BK-247	1.726E-02	FAIL ABUN
CM-247	8.029E-03	NOT IDENT.
CF-249	8.485E-03	FAIL ABUN
CF-251	2.634E-02	NOT IDENT.

GEL Laboratories LLC
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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656020.CNF;1
Acquisition date : 24-JUN-2016 15:53:26 Sensitivity : 3.000
Detector ID : GAM02 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:02.62 Half life ratio : *****
Sample date : 17-MAY-2016 13:55:00 Nuclide Library : SOLID
Sample ID : G398656020 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6903E+02 GRAM
Quantity Err(%) : 1.1832E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-AUG-2015 11:34:20 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	2.454E+00	3.354E-01	3.354E-01
CD-109	3.519E-01	3.127E-01	3.127E-01
SN-126	3.322E-02	2.947E-02	2.947E-02
TL-208	8.714E-02	1.965E-02	1.965E-02
PB-212	3.401E-01	4.569E-02	4.569E-02
BI-214	1.623E-01	4.302E-02	4.302E-02
PB-214	1.919E-01	4.600E-02	4.600E-02
RN-222	1.623E-01	4.302E-02	4.302E-02
RA-224	2.476E-01	3.774E-01	3.774E-01
RA-226	1.623E-01	4.302E-02	4.302E-02
AC-228	2.496E-01	8.605E-02	8.605E-02
RA-228	2.496E-01	8.605E-02	8.605E-02
TH-228	3.401E-01	4.569E-02	4.569E-02
TH-229	6.320E-02	1.151E-01	1.151E-01
TH-230	1.623E-01	4.302E-02	4.302E-02
TH-232	2.496E-01	8.605E-02	8.605E-02
TH-234	5.210E-01	8.860E-01	8.860E-01
U-234	1.623E-01	4.302E-02	4.302E-02
U-238	5.210E-01	8.860E-01	8.860E-01
ANH-511	3.875E-02	2.540E-02	2.540E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-3.507E-03	9.771E-02	9.772E-02	NOT IDENT.
NA-22	-1.519E-03	9.492E-03	9.516E-03	NOT IDENT.
NA-24	-1.584E+16	2.341E+16	0.000E+00	SHORT HLIF
AL-26	2.313E-03	7.723E-03	7.793E-03	FAIL ABUN
SC-46	-8.198E-03	1.031E-02	1.095E-02	FAIL ABUN
V-48	-5.502E-02	4.074E-02	4.770E-02	NOT IDENT.
CR-51	-3.297E-02	1.662E-01	1.669E-01	NOT IDENT.
MN-54	6.854E-03	8.857E-03	9.380E-03	NOT IDENT.
CO-56	5.639E-03	1.142E-02	1.170E-02	FAIL ABUN
MN-56	1.000E+41	1.993E+41	0.000E+00	SHORT HLIF

CO-57	-3.235E-03	6.316E-03	6.482E-03	NOT IDENT.
CO-58	3.767E-03	1.093E-02	1.106E-02	NOT IDENT.
FE-59	-5.816E-03	3.346E-02	3.356E-02	NOT IDENT.
CO-60	-8.938E-04	8.940E-03	8.949E-03	NOT IDENT.
ZN-65	3.552E-03	2.273E-02	2.278E-02	NOT IDENT.
GE-68	1.808E-01	2.945E-01	3.055E-01	NOT IDENT.
AS-73	-5.067E-01	5.279E-01	5.752E-01	NOT IDENT.
AS-74	6.693E-03	5.457E-02	5.466E-02	NOT IDENT.
SE-75	3.380E-04	1.301E-02	1.302E-02	NOT IDENT.
BR-77	4.595E+04	5.119E+04	5.522E+04	SHORT HLIF
SR-82	-1.157E-01	1.453E-01	1.543E-01	NOT IDENT.
RB-83	5.198E-02	3.916E-02	4.564E-02	FAIL ABUN
KR-85	9.379E+00	2.145E+00	4.741E+00	NOT IDENT.
SR-85	6.322E-02	1.450E-02	3.198E-02	NOT IDENT.
RB-86	2.190E-01	4.109E-01	4.226E-01	NOT IDENT.
Y-88	4.318E-03	1.045E-02	1.063E-02	NOT IDENT.
Y-91	-8.794E-01	5.487E+00	5.501E+00	NOT IDENT.
NB-94	1.556E-03	7.726E-03	7.758E-03	NOT IDENT.
NB-95	-1.750E-02	1.995E-02	2.146E-02	NOT IDENT.
NB-95M	4.876E-02	4.009E-02	4.572E-02	NOT IDENT.
ZR-95	1.322E-02	2.125E-02	2.207E-02	NOT IDENT.
NB-97	-1.000E+41	5.410E+41	0.000E+00	SHORT HLIF
ZR-97	1.372E+16	4.012E+15	7.371E+15	SHORT HLIF
MO-99	-4.778E+02	9.810E+02	1.004E+03	SHORT HLIF
TC-99M	-1.000E+41	4.636E+40	0.000E+00	SHORT HLIF
RH-101	-9.682E-04	7.462E-03	7.475E-03	NOT IDENT.
RH-102	-5.162E-03	1.322E-02	1.342E-02	NOT IDENT.
RU-103	8.105E-03	1.351E-02	1.400E-02	FAIL ABUN
RH-106	-6.111E-02	7.659E-02	8.140E-02	NOT IDENT.
RU-106	-6.111E-02	7.659E-02	8.140E-02	NOT IDENT.
AG-108M	-2.124E-03	6.735E-03	6.803E-03	NOT IDENT.
AG-110M	-1.679E-02	1.827E-02	1.977E-02	NOT IDENT.
SN-113	-5.650E-03	1.226E-02	1.252E-02	NOT IDENT.
CD-115	2.368E+02	3.721E+03	3.722E+03	SHORT HLIF
SN-117M	2.566E-02	3.846E-02	4.016E-02	NOT IDENT.
TE-123M	2.712E-03	7.074E-03	7.178E-03	NOT IDENT.
SB-124	-7.556E-03	2.876E-02	2.896E-02	NOT IDENT.
SB-125	3.240E-04	2.090E-02	2.091E-02	FAIL ABUN
TE-125M	7.568E-01	3.255E+00	3.273E+00	NOT IDENT.
I-126	-1.457E-02	1.740E-01	1.742E-01	NOT IDENT.
SB-126	1.385E-02	1.387E-01	1.389E-01	NOT IDENT.
SB-127	2.050E+00	1.851E+01	1.854E+01	NOT IDENT.
I-131	-7.496E-02	2.096E-01	2.123E-01	NOT IDENT.
I-132	-1.000E+41	5.597E+41	0.000E+00	SHORT HLIF
TE-132	1.738E+00	2.514E+01	2.515E+01	SHORT HLIF
BA-133	-4.365E-03	1.145E-02	1.162E-02	FAIL ABUN
I-133	-9.825E+10	1.498E+11	1.562E+11	SHORT HLIF
CS-134	1.491E-02	1.680E-02	1.810E-02	FAIL ABUN
CS-135	2.368E-02	4.224E-02	4.357E-02	NOT IDENT.
I-135	-1.203E+40	3.631E+40	0.000E+00	SHORT HLIF
CS-136	-2.607E-02	8.002E-02	8.088E-02	NOT IDENT.
BA-137M	-1.751E-02	1.170E-02	1.411E-02	NOT IDENT.
CS-137	-1.850E-02	1.236E-02	1.491E-02	NOT IDENT.
CE-139	-7.584E-03	7.647E-03	8.377E-03	NOT IDENT.
BA-140	9.334E-02	2.134E-01	2.175E-01	NOT IDENT.
LA-140	-5.244E-02	7.455E-02	7.821E-02	FAIL ABUN
CE-141	-4.084E-02	3.594E-02	4.038E-02	NOT IDENT.
CE-143	1.216E+07	4.334E+06	6.989E+06	SHORT HLIF
CE-144	-1.327E-03	4.717E-02	4.718E-02	NOT IDENT.
PM-144	1.411E-05	8.243E-03	8.243E-03	NOT IDENT.
PR-144	1.069E-03	6.244E-01	6.244E-01	NOT IDENT.
PM-146	-4.658E-03	9.875E-03	1.010E-02	NOT IDENT.
ND-147	-7.102E-02	5.387E-01	5.397E-01	NOT IDENT.
PM-147	-3.153E+01	1.742E+02	1.748E+02	NOT IDENT.
PM-149	1.439E+04	3.039E+04	3.107E+04	SHORT HLIF
EU-150	9.002E-03	9.771E-03	1.058E-02	FAIL ABUN
EU-152	-2.421E-02	2.411E-02	2.646E-02	NOT IDENT.
GD-153	-1.399E-02	2.739E-02	2.810E-02	NOT IDENT.
EU-154	-4.975E-03	2.653E-02	2.663E-02	NOT IDENT.
EU-155	2.638E-03	2.380E-02	2.383E-02	FAIL ABUN
TB-160	2.579E-02	3.604E-02	3.787E-02	FAIL ABUN
HO-166M	-4.058E-03	1.369E-02	1.381E-02	FAIL ABUN
TM-171	-9.644E+00	9.437E+00	1.039E+01	NOT IDENT.
HF-172	-3.728E-02	4.611E-02	4.907E-02	FAIL ABUN
LU-172	1.755E-02	1.476E-02	1.675E-02	FAIL ABUN
LU-176	-5.298E-04	6.188E-03	6.192E-03	FAIL ABUN
HF-181	3.555E-03	1.453E-02	1.462E-02	NOT IDENT.
TA-182	-4.649E-03	4.242E-02	4.247E-02	FAIL ABUN

RE-183	-2.553E-02	7.182E-02	7.274E-02	NOT IDENT.
RE-184	3.712E-02	5.145E-02	5.410E-02	FAIL ABUN
W-188	-2.227E-01	2.442E+00	2.444E+00	FAIL ABUN
IR-192	2.679E-03	1.053E-02	1.060E-02	FAIL ABUN
HG-203	7.240E-03	1.273E-02	1.314E-02	NOT IDENT.
BI-207	2.952E-03	1.180E-02	1.188E-02	NOT IDENT.
PB-210	1.365E-01	1.718E+00	1.719E+00	NOT IDENT.
BI-211	5.288E-01	1.270E-01	2.701E-01	FAIL ABUN
PB-211	-1.607E-02	1.744E-01	1.746E-01	NOT IDENT.
BI-212	3.957E-01	1.866E-01	2.581E-01	FAIL ABUN
RN-219	3.538E-02	9.999E-02	1.013E-01	FAIL ABUN
RA-223	1.614E-03	1.790E-01	1.790E-01	FAIL ABUN
AC-227	-2.078E-02	5.907E-02	5.981E-02	FAIL ABUN
TH-227	-2.078E-02	5.907E-02	5.981E-02	FAIL ABUN
PA-231	1.102E-01	1.311E-01	1.402E-01	NOT IDENT.
TH-231	1.614E-03	1.790E-01	1.790E-01	FAIL ABUN
PA-233	-7.662E-03	1.544E-02	1.582E-02	FAIL ABUN
PA-234	6.008E-02	9.569E-02	9.945E-02	NOT IDENT.
PA-234M	8.130E-01	1.961E+00	1.995E+00	FAIL ABUN
U-235	-6.476E-03	6.983E-02	6.989E-02	FAIL ABUN
NP-237	-7.662E-03	1.544E-02	1.582E-02	FAIL ABUN
NP-238	-8.554E+03	8.433E+03	9.273E+03	SHORT HLIF
NP-239	-1.151E-02	6.953E-02	6.972E-02	NOT IDENT.
PU-239	9.806E+01	7.827E+01	8.989E+01	NOT IDENT.
AM-241	1.012E-02	4.563E-02	4.585E-02	NOT IDENT.
AM-243	9.985E-03	2.007E-02	2.056E-02	NOT IDENT.
CM-243	-1.435E-02	2.376E-02	2.462E-02	NOT IDENT.
BK-247	4.753E-03	2.064E-02	2.075E-02	FAIL ABUN
CM-247	7.308E-03	9.119E-03	9.696E-03	NOT IDENT.
CF-249	4.255E-03	1.101E-02	1.118E-02	FAIL ABUN
CF-251	1.965E-03	2.836E-02	2.838E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	790.1628	87.09	1030.2549	136.47	752.5263
45.60	725.6951	87.57	1158.0267	140.51	0.0000
46.54	709.7701	88.03	1093.8867	143.76	746.5915
49.72	0.0000	88.34	925.1191	144.24	741.7370
51.35	771.0867	88.47	925.3401	145.44	790.0022
51.87	745.0135	89.96	1097.7268	152.43	711.9297
52.39	751.0350	1093.63	1036.9203	153.25	726.1262
52.97	735.0292	91.11	1099.9929	323.87	787.2050
53.44	751.0249	92.59	991.2877	156.02	787.1815
54.07	740.1004	93.35	992.6149	158.56	710.1477
57.36	0.0000	94.56	833.3257	159.00	734.0351
57.53	756.6047	94.65	833.4570	162.33	742.4546
57.98	755.9938	94.67	833.4879	162.66	742.7542
59.27	720.8941	94.87	850.2552	163.33	736.0833
59.32	720.9784	97.43	794.4324	165.86	812.1389
59.54	762.7925	98.43	770.5874	176.31	715.9730
60.96	754.5509	98.44	770.5980	176.60	704.2114
61.17	791.8938	99.53	793.9449	177.52	702.1790
62.93	810.5695	100.11	798.0432	181.07	0.0000
63.29	811.2321	102.03	861.7603	181.52	706.8298
63.58	811.7639	103.18	790.9822	184.41	750.8136
64.28	783.5645	103.37	790.1169	143.76	705.8353
66.73	878.3130	105.21	782.4335	193.51	653.5138
67.24	844.9328	105.31	776.9720	197.03	719.1887
125.81	809.7860	106.12	786.9454	198.01	711.4297
67.75	809.9085	106.47	767.2280	201.83	766.4386
69.67	1015.2714	109.28	784.7407	203.43	744.9053
70.83	1100.6528	111.00	800.4069	205.31	744.8177
72.81	1466.5957	111.76	0.0000	210.85	626.4760
72.87	1258.1431	114.06	809.3148	215.65	615.6250
74.66	1259.5979	116.30	0.0000	222.11	629.2065
74.82	1260.0098	116.74	812.6304	227.09	674.0455
74.97	1260.3914	119.76	835.7563	227.38	664.5014
77.11	1583.6176	121.12	812.2371	228.16	0.0000
78.74	911.6599	121.22	790.5899	228.18	620.2187
79.69	913.3560	121.78	825.6409	116.74	620.2187
80.12	914.1213	122.06	825.9814	235.69	605.5799
80.19	914.2474	122.92	763.8480	235.96	605.7307
80.57	866.7678	123.07	764.0154	238.63	578.1216
81.00	867.4887	265.00	754.3459	238.98	0.0000
81.07	915.8087	125.81	854.7197	240.99	579.3733
81.75	888.0465	127.23	826.4042	242.00	579.9071
83.79	1023.9377	127.91	770.5181	244.70	548.9013
84.00	1024.3440	129.30	754.6459	252.40	562.4395
85.43	1027.0914	131.20	828.7291	252.80	562.6378
86.55	1029.2294	133.02	758.5861	254.15	0.0000
86.79	1029.6792	133.52	745.1165	256.23	557.3423
86.94	1029.9695	136.00	758.1885	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	533.9097	355.39	0.0000	584.27	243.7074
264.80	533.9704	356.01	405.5815	595.83	264.4341
265.00	534.0676	364.49	402.5035	427.87	266.9941
268.22	550.5951	366.42	0.0000	602.52	0.0000
269.46	543.0879	372.51	327.2232	604.72	310.4341
270.03	533.6477	375.05	352.9067	607.14	259.5330
271.23	564.9438	377.52	391.7810	609.32	245.2271
273.65	559.5974	356.01	395.6012	610.33	246.6661
276.40	528.3551	388.16	357.9114	614.28	270.3269
277.37	538.9525	388.63	338.6203	618.01	224.2639
277.60	517.6910	391.69	371.0940	620.36	225.5034
278.00	524.9837	264.66	380.9814	621.93	254.6140
279.20	505.1350	401.81	366.8037	630.19	0.0000
279.54	518.5220	402.40	343.5890	631.29	252.6706
279.70	510.4335	404.85	374.1855	633.25	230.8142
280.46	508.7156	410.95	364.4220	634.78	224.9461
283.69	514.1443	413.71	370.6426	635.95	243.1462
284.31	491.8991	414.70	347.3357	636.99	245.2688
285.41	462.6558	423.72	359.6066	645.85	229.0672
285.90	0.0000	427.09	335.0458	657.76	232.2762
287.50	469.5870	427.87	322.5551	657.90	0.0000
290.67	496.6853	433.94	326.4390	661.66	232.6676
293.27	0.0000	439.40	326.5796	664.57	0.0000
351.93	513.0571	453.88	332.0793	666.33	229.0594
295.96	536.7499	463.37	305.8929	666.50	229.0759
879.38	537.8528	468.07	322.1126	667.71	0.0000
299.98	475.4839	473.00	292.0864	677.62	183.0992
300.09	449.0158	475.06	314.7006	685.70	186.7944
300.13	449.0290	476.78	301.0605	695.00	213.2717
301.36	467.7028	477.60	283.5323	696.49	226.8052
302.85	468.2398	482.18	277.7235	696.51	226.8052
256.23	423.9500	487.02	290.6020	697.00	226.8535
304.85	470.6257	492.35	0.0000	697.30	226.8804
306.78	444.4681	497.08	255.5346	697.49	240.3040
308.46	425.2386	505.52	301.9766	702.65	224.2740
311.90	467.1006	507.63	0.0000	706.68	212.2220
316.51	456.1407	511.00	255.5277	711.68	211.6151
319.41	471.8419	514.00	255.9265	720.70	204.7475
320.08	497.3082	514.00	255.9265	721.93	0.0000
321.04	492.4012	520.40	233.0012	722.78	210.1252
323.87	472.3496	520.69	0.0000	722.91	208.4033
325.23	455.9348	522.65	0.0000	723.31	208.4326
328.76	380.9235	527.90	0.0000	724.19	218.9312
333.37	479.8707	528.26	238.7146	727.33	182.6733
333.97	484.3260	529.59	262.7606	733.00	198.7764
334.37	484.4652	529.87	0.0000	735.93	166.5346
338.28	453.4339	531.02	247.6498	333.97	194.9322
338.32	453.4469	537.26	245.5563	739.50	0.0000
311.90	401.2155	546.56	0.0000	747.24	184.1046
340.48	401.2155	552.55	288.0182	748.06	192.5834
340.55	401.2384	563.25	288.5599	752.31	202.3875
344.28	440.2002	569.33	238.7314	753.82	191.9576
345.93	394.1895	946.00	238.7554	756.73	182.6679
351.06	390.2294	569.70	253.3984	756.80	182.6721
351.93	390.4621	583.19	263.2038	884.68	229.7625

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	181.1865	1274.44	149.0366	1620.50	37.5348
766.42	180.1685	1001.03	125.3364	1621.92	46.9321
766.84	193.9773	1002.74	136.2066	1678.03	0.0000
772.60	0.0000	1004.73	134.6456	1690.97	52.8836
776.52	202.1348	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	42.3731
778.90	204.0904	1028.54	0.0000	1063.66	51.7932
783.70	168.9018	1037.84	124.8060	1771.35	55.2578
785.37	167.7354	1038.76	0.0000	1791.20	0.0000
792.07	149.8096	631.29	126.1015	1808.65	41.7378
794.95	167.8238	1048.07	145.5688	1810.72	0.0000
795.86	150.0215	1049.04	136.8691	1836.06	43.9509
810.06	165.8846	1050.41	132.0710		
810.29	162.6642	1063.66	141.3596		
344.28	162.6752	1077.00	124.2973		
810.76	158.3839	1077.34	124.3077		
815.77	151.1152	1085.87	124.6125		
1048.07	154.5070	1093.63	114.0742		
832.01	172.6291	1099.45	143.5324		
834.85	168.4565	1112.07	118.6279		
835.71	161.9866	1112.84	114.2029		
836.80	0.0000	1115.54	132.3160		
846.75	0.0000	1120.29	137.7274		
846.77	168.0766	1120.55	130.8022		
856.80	158.8097	1221.41	134.7936		
860.56	153.5352	1129.67	138.0894		
871.09	132.9993	1131.51	0.0000		
873.19	145.9441	1147.95	0.0000		
875.33	0.0000	1173.23	115.6224		
879.38	141.6554	1177.95	114.7607		
880.51	146.3096	1189.05	100.9684		
883.24	162.1032	1204.77	122.6838		
884.68	161.2605	1221.41	119.1471		
889.28	164.2821	1231.02	119.0095		
894.76	121.1281	1235.36	117.3902		
898.04	173.5611	1238.28	108.7119		
900.72	146.1212	1260.41	0.0000		
903.28	130.3500	1271.87	106.2607		
911.20	149.8191	1274.44	113.5539		
912.08	161.0216	1274.54	113.5584		
923.98	0.0000	1291.59	85.0163		
926.50	143.9019	1298.22	0.0000		
929.11	170.2103	1312.11	94.6798		
937.49	172.5524	1332.49	94.2554		
944.13	150.3678	1362.66	0.0000		
946.00	134.4698	1365.19	72.8352		
949.00	143.0721	1368.63	0.0000		
667.71	0.0000	1384.29	84.8275		
962.31	136.1191	1408.01	67.1759		
964.08	145.9235	1457.56	0.0000		
966.17	145.7504	1460.82	83.2544		
911.20	145.8789	1489.16	80.0611		
968.97	145.8789	1505.03	77.5404		
983.53	147.4979	1584.12	88.3746		
984.45	0.0000	1596.21	80.0244		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:59:05.26

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561383.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;484
Background date    : 20-JUN-2016 15:14:16
Sample date       : 7-JUN-2016 00:00:00. Acquisition date : 24-JUN-2016 15:53:53
Sample ID        : G1203561383. Sample quantity : 1.79870E+02 GRAM
Detector name    : GAM06. Detector geometry: CAN
Elapsed live time: 0 12:00:00.00. Elapsed real time: 0 12:00:04.44 0.0%
Energy tolerance : 1.50000 keV. Analyst Initials : MXR1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID         : 1572234. Detector SN# :
Matrix Spike ID  : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	36.70	61	301	1.90	73.15	72	5	1.42E-03	44.9	
2	0	46.83	57	312	1.25	93.40	91	6	1.32E-03	51.1	
3	0	53.28	56	280	1.48	106.29	104	6	1.30E-03	48.9	
4	0	63.13*	43	548	1.24	125.98	122	10	9.95E-04	129.1	
5	0	66.76*	34	278	0.88	133.22	131	6	7.91E-04	107.6	
6	0	105.14	45	290	1.41	209.92	207	7	1.05E-03	64.2	
7	0	140.16*	4	322	1.12	279.91	276	7	8.11E-05	*****	
8	0	143.90*	11	370	0.90	287.38	284	8	2.44E-04	413.3	
9	0	163.16*	10	241	1.37	325.87	324	6	2.23E-04	414.7	
10	0	166.26	64	283	1.74	332.06	329	7	1.47E-03	45.5	
11	0	238.48*	28	284	1.08	476.40	473	8	6.46E-04	144.1	
12	0	278.65	26	211	1.26	556.69	554	7	6.13E-04	92.8	
13	0	338.15	54	253	1.48	675.61	671	11	1.25E-03	58.6	
14	0	439.98	20	117	0.90	879.16	875	7	4.70E-04	91.1	
15	0	544.21	24	62	1.47	1087.52	1085	6	5.62E-04	55.0	
16	0	564.39	38	102	1.02	1127.87	1123	9	8.89E-04	49.9	
17	0	571.99	16	163	0.63	1143.07	1137	13	3.64E-04	169.0	
18	0	583.58*	69	176	5.26	1166.24	1157	19	1.59E-03	59.4	
19	0	644.59	42	144	3.46	1288.22	1280	16	9.70E-04	65.9	
20	0	664.32	23	49	1.14	1327.66	1325	6	5.27E-04	53.6	
21	0	670.12	24	104	1.37	1339.26	1335	9	5.44E-04	80.7	
22	0	746.83	63	107	5.19	1492.63	1484	17	1.46E-03	39.5	
23	0	775.48	31	79	1.66	1549.91	1546	11	7.11E-04	58.4	
24	0	792.05	37	69	4.38	1583.05	1577	13	8.50E-04	49.3	
25	0	803.11	34	101	1.88	1605.16	1600	11	7.98E-04	59.1	
26	0	880.67	36	92	3.58	1760.26	1752	16	8.30E-04	62.1	
27	0	916.98	24	51	1.17	1832.86	1829	9	5.56E-04	58.4	
28	0	934.87	17	44	3.50	1868.65	1863	11	3.94E-04	79.4	
29	0	1002.01*	9	95	2.42	2002.90	1991	17	2.14E-04	307.2	
30	0	1103.72	18	39	0.61	2206.34	2198	13	4.16E-04	77.6	
31	0	1121.64	37	70	3.28	2242.18	2231	19	8.50E-04	57.4	
32	0	1188.73	19	24	1.25	2376.37	2373	8	4.40E-04	50.2	
33	0	1207.73	32	22	3.19	2414.37	2410	9	7.42E-04	31.9	
34	0	1218.56	16	59	0.55	2436.03	2427	13	3.59E-04	104.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1460.02*	35	17	2.19	2919.07	2910	17	8.19E-04	46.7	
36	0	1585.38	30	22	2.79	3169.89	3161	15	6.91E-04	39.1	
37	0	1792.09	18	26	3.82	3583.54	3571	18	4.20E-04	70.9	
38	0	1862.62	8	14	0.66	3724.69	3717	9	1.77E-04	103.5	
39	0	1976.96	14	4	2.88	3953.54	3950	8	3.24E-04	36.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 03:59:07

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561383.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 7-JUN-2016 00:00:00   Acquisition date : 24-JUN-2016 15:53:53
Sample ID        : G1203561383           Sample quantity  : 179.87 GRAM
Sample type      : SOLID                 Sample geometry   :
Detector name    : GAMMA6                Detector geometry: CAN
Elapsed live time: 0 12:00:00.00          Elapsed real time: 0 12:00:04.44   0.0%
Energy tolerance : 1.50 keV              Half life ratio   : 10.00
Errors propagated: No                     Systematic Error  : 0.00 %
Efficiency type  : Empirical              Efficiencies at   : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
TL-208	277.37	HG-203	279.20

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.005E+00	1.128E-01	1.128E-01	93.38	OK
AS-73	53.44	10.30*	1.323E+00	2.168E-01	2.530E-01	97.89	OK
SR-82	776.52	15.08*	1.777E+00	4.320E-02	7.050E-02	116.75	OK
CE-139	165.86	80.00*	5.617E+00	6.542E-03	7.159E-03	91.01	OK
HG-203	70.83	3.69	3.616E+00	----- Line	Not Found	-----	Absent
	72.87	6.19	3.859E+00	----- Line	Not Found	-----	Absent
	279.20	81.56*	3.944E+00	2.418E-03	3.156E-03	279.50	OK
TL-208	277.37	6.60	3.958E+00	----- Line	Not Found	-----	<<INT Reject
	583.19	85.00*	2.242E+00	1.418E-02	1.418E-02	118.78	OK
	860.56	12.50	1.624E+00	----- Line	Not Found	-----	Absent
PB-210	46.54	4.25*	6.451E-01	1.102E+00	1.104E+00	102.19	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561383.CNF;1
Acquisition date : 24-JUN-2016 15:53:53 Sensitivity : 3.000
Detector ID : GAM06 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:04.44 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561383 Sample Quantity : 1.7987E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 8-MAR-2016 07:26:53 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.128E-01	1.033E-01	9.248E-02
AS-73	2.530E-01	2.427E-01	2.681E-01
SR-82	7.050E-02	8.067E-02	1.054E-01
CE-139	7.159E-03	6.386E-03	7.273E-03
HG-203	3.156E-03	8.646E-03	1.110E-02
TL-208	1.418E-02	1.650E-02	9.929E-03
PB-210	1.104E+00	1.105E+00	1.286E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.156E-02	5.392E-02	1.001E-01	NOT IDENT.
NA-22	-1.129E-03	5.767E-03	1.062E-02	NOT IDENT.
NA-24	0.000E+00	2.362E+06	0.000E+00	SHORT HLIF
AL-26	4.399E-04	5.747E-03	1.109E-02	NOT IDENT.
SC-46	2.813E-03	6.456E-03	1.195E-02	FAIL ABUN
V-48	4.486E-04	1.197E-02	2.191E-02	NOT IDENT.
CR-51	6.250E-03	6.514E-02	1.238E-01	NOT IDENT.
MN-54	-1.641E-03	6.013E-03	1.085E-02	NOT IDENT.
CO-56	-1.724E-03	6.474E-03	1.170E-02	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-1.255E-03	3.326E-03	6.281E-03	NOT IDENT.
CO-58	-1.048E-03	6.555E-03	1.166E-02	NOT IDENT.
FE-59	-2.265E-02	1.586E-02	2.126E-02	NOT IDENT.
CO-60	4.641E-03	6.719E-03	1.312E-02	NOT IDENT.
ZN-65	9.690E-03	1.145E-02	2.097E-02	NOT IDENT.
GE-68	8.527E-02	1.818E-01	3.437E-01	NOT IDENT.
AS-74	-4.246E-03	1.824E-02	3.405E-02	NOT IDENT.
SE-75	-3.120E-03	6.711E-03	1.269E-02	FAIL ABUN
BR-77	2.235E+00	6.312E+00	6.378E+00	FAIL ABUN
RB-83	3.938E-03	1.125E-02	2.099E-02	NOT IDENT.
KR-85	-1.417E+01	2.061E+00	2.737E+00	NOT IDENT.
SR-85	-7.741E-02	1.125E-02	1.493E-02	NOT IDENT.
RB-86	3.798E-02	1.265E-01	2.356E-01	NOT IDENT.

Y-88	-3.768E-03	7.387E-03	1.317E-02	NOT IDENT.
Y-91	1.096E+00	3.064E+00	5.198E+00	NOT IDENT.
NB-94	-7.439E-05	5.747E-03	1.069E-02	NOT IDENT.
NB-95	-7.422E-03	9.125E-03	1.165E-02	NOT IDENT.
NB-95M	-1.117E-03	1.825E-02	3.128E-02	NOT IDENT.
ZR-95	-2.139E-03	1.092E-02	2.012E-02	NOT IDENT.
NB-97	0.000E+00	1.410E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	7.313E+06	0.000E+00	SHORT HLIF
MO-99	3.178E+00	4.111E+00	7.186E+00	FAIL ABUN
TC-99M	0.000E+00	1.909E+19	0.000E+00	SHORT HLIF
RH-101	-3.483E-04	3.958E-03	7.540E-03	NOT IDENT.
RH-102	-3.575E-03	8.508E-03	1.570E-02	NOT IDENT.
RU-103	3.180E-03	6.463E-03	1.221E-02	NOT IDENT.
RH-106	1.414E-02	5.220E-02	1.000E-01	NOT IDENT.
RU-106	1.414E-02	5.220E-02	1.000E-01	NOT IDENT.
AG-108M	1.858E-03	5.022E-03	9.155E-03	NOT IDENT.
CD-109	-7.306E-02	1.258E-01	1.794E-01	NOT IDENT.
AG-110M	-2.613E-03	9.128E-03	1.405E-02	NOT IDENT.
SN-113	4.981E-03	7.070E-03	1.366E-02	NOT IDENT.
CD-115	1.048E+00	4.088E+00	7.590E+00	NOT IDENT.
SN-117M	-8.291E-03	8.518E-03	1.531E-02	NOT IDENT.
TE-123M	-4.453E-03	4.168E-03	7.054E-03	NOT IDENT.
SB-124	1.933E-02	1.435E-02	3.096E-02	FAIL ABUN
SB-125	-1.489E-02	1.374E-02	2.387E-02	NOT IDENT.
TE-125M	-2.011E-01	1.936E+00	2.509E+00	NOT IDENT.
I-126	6.700E-03	6.405E-02	7.180E-02	NOT IDENT.
SB-126	-1.301E-02	2.605E-02	4.711E-02	NOT IDENT.
SN-126	-7.527E-03	1.237E-02	1.768E-02	FAIL ABUN
SB-127	-4.715E-02	3.420E-01	6.364E-01	NOT IDENT.
I-131	-1.445E-02	2.384E-02	4.340E-02	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	5.636E-02	1.829E-01	3.608E-01	NOT IDENT.
BA-133	-3.789E-03	6.601E-03	1.207E-02	NOT IDENT.
I-133	0.000E+00	8.149E+03	0.000E+00	SHORT HLIF
CS-134	-6.385E-03	1.126E-02	1.117E-02	FAIL ABUN
CS-135	9.974E-03	2.339E-02	4.569E-02	NOT IDENT.
I-135	0.000E+00	9.479E+17	0.000E+00	SHORT HLIF
CS-136	8.860E-04	2.022E-02	3.658E-02	NOT IDENT.
BA-137M	3.574E-03	5.797E-03	1.006E-02	NOT IDENT.
CS-137	3.776E-03	6.124E-03	1.063E-02	NOT IDENT.
BA-140	3.317E-02	4.898E-02	9.288E-02	FAIL ABUN
LA-140	-9.002E-03	1.762E-02	3.057E-02	NOT IDENT.
CE-141	9.337E-05	1.004E-02	1.689E-02	NOT IDENT.
CE-143	0.000E+00	7.282E+01	0.000E+00	SHORT HLIF
CE-144	3.171E-03	2.632E-02	5.029E-02	NOT IDENT.
PM-144	-8.578E-04	6.071E-03	1.121E-02	NOT IDENT.
PR-144	-6.596E-02	4.549E-01	8.397E-01	NOT IDENT.
PM-146	-2.164E-03	6.940E-03	1.255E-02	FAIL ABUN
ND-147	3.604E-02	1.012E-01	1.891E-01	NOT IDENT.
PM-147	-3.248E+01	9.558E+01	1.809E+02	NOT IDENT.
PM-149	1.236E+01	3.341E+01	6.488E+01	NOT IDENT.
EU-150	-8.439E-04	4.779E-03	7.845E-03	FAIL ABUN
EU-152	2.374E-03	1.623E-02	2.860E-02	NOT IDENT.
GD-153	-2.446E-03	1.047E-02	2.026E-02	NOT IDENT.
EU-154	-3.371E-03	1.630E-02	2.998E-02	NOT IDENT.
EU-155	1.753E-02	2.206E-02	2.540E-02	FAIL ABUN
TB-160	3.285E-02	4.000E-02	4.096E-02	FAIL ABUN
HO-166M	-2.479E-03	9.885E-03	1.816E-02	NOT IDENT.
TM-171	4.836E+00	4.639E+00	5.906E+00	FAIL ABUN
HF-172	-1.283E-02	2.473E-02	4.631E-02	FAIL ABUN
LU-172	9.303E-03	8.839E-03	1.785E-02	FAIL ABUN
LU-176	3.008E-03	4.100E-03	8.046E-03	NOT IDENT.
HF-181	-9.490E-05	7.756E-03	1.418E-02	NOT IDENT.
TA-182	3.462E-03	2.696E-02	4.438E-02	FAIL ABUN
RE-183	6.718E-03	2.812E-02	5.764E-02	FAIL ABUN
RE-184	-1.456E-02	1.995E-02	3.452E-02	FAIL ABUN
W-188	3.191E-01	1.110E+00	2.147E+00	FAIL ABUN
IR-192	2.604E-04	5.798E-03	1.101E-02	NOT IDENT.
BI-207	1.431E-03	8.239E-03	1.507E-02	NOT IDENT.
BI-211	-5.954E-03	4.604E-02	6.387E-02	NOT IDENT.
PB-211	2.865E-02	1.136E-01	2.138E-01	NOT IDENT.
BI-212	-8.191E-02	1.146E-01	1.432E-01	NOT IDENT.
PB-212	6.383E-03	1.802E-02	1.816E-02	FAIL ABUN
BI-214	-8.479E-03	2.143E-02	2.340E-02	FAIL ABUN
PB-214	2.605E-03	1.671E-02	2.353E-02	NOT IDENT.
RN-219	-8.954E-03	6.264E-02	1.158E-01	NOT IDENT.
RN-222	-8.479E-03	2.143E-02	2.340E-02	FAIL ABUN
RA-223	-4.270E-02	1.049E-01	1.948E-01	FAIL ABUN

RA-224	5.012E-02	9.631E-02	1.695E-01	NOT IDENT.
RA-226	-8.479E-03	2.143E-02	2.340E-02	FAIL ABUN
AC-227	-1.536E-02	3.794E-02	7.209E-02	NOT IDENT.
TH-227	-1.536E-02	3.794E-02	7.209E-02	NOT IDENT.
AC-228	2.920E-03	3.996E-02	4.804E-02	FAIL ABUN
RA-228	2.920E-03	3.996E-02	4.804E-02	FAIL ABUN
TH-228	6.383E-03	1.802E-02	1.816E-02	FAIL ABUN
TH-229	-3.599E-02	7.610E-02	1.372E-01	NOT IDENT.
TH-230	-8.479E-03	2.143E-02	2.340E-02	FAIL ABUN
PA-231	4.373E-02	7.240E-02	1.414E-01	NOT IDENT.
TH-231	-4.270E-02	1.049E-01	1.948E-01	FAIL ABUN
TH-232	2.920E-03	3.996E-02	4.804E-02	FAIL ABUN
PA-233	-6.215E-03	1.029E-02	1.902E-02	NOT IDENT.
PA-234	-2.308E-02	4.013E-02	7.011E-02	FAIL ABUN
PA-234M	2.811E-01	1.692E+00	1.419E+00	FAIL ABUN
TH-234	2.286E-01	5.786E-01	4.194E-01	FAIL ABUN
U-234	-8.479E-03	2.143E-02	2.340E-02	FAIL ABUN
U-235	7.538E-03	6.106E-02	5.355E-02	FAIL ABUN
NP-237	-6.215E-03	1.029E-02	1.902E-02	NOT IDENT.
NP-238	4.317E+00	7.781E+00	1.482E+01	NOT IDENT.
U-238	2.286E-01	5.786E-01	4.194E-01	FAIL ABUN
NP-239	-2.007E-02	3.443E-02	6.472E-02	FAIL ABUN
PU-239	5.221E+00	4.194E+01	8.049E+01	NOT IDENT.
AM-241	2.037E-03	2.276E-02	4.169E-02	NOT IDENT.
AM-243	8.138E-04	6.329E-03	1.265E-02	NOT IDENT.
CM-243	-4.420E-03	1.476E-02	2.529E-02	FAIL ABUN
BK-247	-1.017E-02	1.206E-02	2.244E-02	FAIL ABUN
CM-247	-6.980E-04	5.811E-03	1.075E-02	FAIL ABUN
CF-249	-3.244E-03	6.099E-03	1.108E-02	NOT IDENT.
CF-251	-8.540E-03	1.871E-02	3.401E-02	NOT IDENT.
ANH-511	-2.229E-02	1.462E-02	2.106E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	35	10.66*	1.005E+00	1.128E-01	1.128E-01	93.38
AS-73	53.44	85	10.30*	1.323E+00	2.168E-01	2.530E-01	97.89
SR-82	776.52	33	15.08*	1.777E+00	4.320E-02	7.050E-02	116.75
CE-139	165.86	85	80.00*	5.617E+00	6.542E-03	7.159E-03	91.01
HG-203	70.83	-----	3.69	3.616E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.859E+00	-----	Line Not Found	-----
	279.20	33	81.56*	3.944E+00	3.565E-03	4.654E-03	185.68
TL-208	277.37	33	6.60	3.944E+00	4.406E-02	4.406E-02	185.68
	583.19	78	85.00*	2.242E+00	1.418E-02	1.418E-02	118.78
	860.56	-----	12.50	1.624E+00	-----	Line Not Found	-----
PB-210	46.54	87	4.25*	6.451E-01	1.102E+00	1.104E+00	102.19

Flag: "*" = Keyline

Total number of lines in spectrum 39
Number of unidentified lines 11
Number of lines tentatively identified by NID 28 71.79%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.128E-01	1.128E-01	1.054E-01	93.38	
AS-73	80.30D	1.17	2.168E-01	2.530E-01	2.477E-01	97.89	
SR-82	25.35D	1.63	4.320E-02	7.050E-02	8.232E-02	116.75	
CE-139	137.64D	1.09	6.542E-03	7.159E-03	6.516E-03	91.01	
HG-203	46.59D	1.31	3.565E-03	4.654E-03	8.641E-03	185.68	
TL-208	1.41E+10Y	1.00	1.418E-02	1.418E-02	1.684E-02	118.78	
PB-210	22.20Y	1.00	1.102E+00	1.104E+00	1.128E+00	102.19	
Total Activity :			1.499E+00	1.566E+00			

Grand Total Activity : 1.499E+00 1.566E+00

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	36.70	96	471	1.90	73.15	72	5	1.42E-03	89.8	9.10E-02	
0	63.13	64	812	1.24	125.98	122	10	9.95E-04	****	2.62E+00	T
0	66.76	50	409	0.88	133.22	131	6	7.91E-04	****	3.10E+00	T
0	105.14	63	405	1.41	209.92	207	7	1.05E-03	****	6.01E+00	T
0	140.16	5	436	1.12	279.91	276	7	8.11E-05	****	6.04E+00	T
0	143.90	14	499	0.90	287.38	284	8	2.44E-04	****	5.99E+00	T
0	163.16	13	321	1.37	325.87	324	6	2.23E-04	****	5.67E+00	T
0	238.48	35	361	1.08	476.40	473	8	6.46E-04	****	4.43E+00	T
0	338.15	66	307	1.48	675.61	671	11	1.25E-03	****	3.41E+00	T
0	439.98	24	137	0.90	879.16	875	7	4.70E-04	****	2.79E+00	T
0	544.21	28	70	1.47	1087.52	1085	6	5.62E-04	****	2.37E+00	
0	564.39	44	115	1.02	1127.87	1123	9	8.89E-04	99.9	2.30E+00	T
0	571.99	18	185	0.63	1143.07	1137	13	3.64E-04	****	2.28E+00	
0	644.59	47	160	3.46	1288.22	1280	16	9.70E-04	****	2.07E+00	T
0	664.32	25	55	1.14	1327.66	1325	6	5.27E-04	****	2.02E+00	T
0	670.12	26	114	1.37	1339.26	1335	9	5.44E-04	****	2.01E+00	
0	746.83	69	116	5.19	1492.63	1484	17	1.46E-03	79.1	1.83E+00	T
0	792.05	40	75	4.38	1583.05	1577	13	8.50E-04	98.6	1.74E+00	T
0	803.11	37	108	1.88	1605.16	1600	11	7.98E-04	****	1.72E+00	T
0	880.67	38	98	3.58	1760.26	1752	16	8.30E-04	****	1.59E+00	T
0	916.98	25	54	1.17	1832.86	1829	9	5.56E-04	****	1.54E+00	
0	934.87	18	46	3.50	1868.65	1863	11	3.94E-04	****	1.51E+00	
0	1002.01	10	99	2.42	2002.90	1991	17	2.14E-04	****	1.42E+00	T
0	1103.72	18	40	0.61	2206.34	2198	13	4.16E-04	****	1.30E+00	
0	1121.64	38	72	3.28	2242.18	2231	19	8.50E-04	****	1.28E+00	T
0	1188.73	19	24	1.25	2376.37	2373	8	4.40E-04	****	1.21E+00	T
0	1207.73	32	22	3.19	2414.37	2410	9	7.42E-04	63.8	1.19E+00	
0	1218.56	16	59	0.55	2436.03	2427	13	3.59E-04	****	1.18E+00	
0	1585.38	29	21	2.79	3169.89	3161	15	6.91E-04	78.3	9.36E-01	T
0	1792.09	17	25	3.82	3583.54	3571	18	4.20E-04	****	8.49E-01	T
0	1862.62	7	14	0.66	3724.69	3717	9	1.77E-04	****	8.26E-01	
0	1976.96	13	4	2.88	3953.54	3950	8	3.24E-04	72.8	7.95E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                               DETECTOR AND SAMPLE DATA                      *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561383.CNF;1
* Acquisition date   : 24-JUN-2016 15:53:53 Sensitivity      : 3.000
* Detector ID        : GAM06 Energy tolerance: 1.500
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 12:00:04.44 Half life ratio : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203561383 Analyst initials: MXR1
* Batch Number       : 1572234 Sample Quantity : 1.7987E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                               Dry Weight : 0.00000
*****
*
*                               CALIBRATION INFORMATION                      *
*
* Eff. Cal. date     : 8-MAR-2016 07:26:53 Eff. Geometry    : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	4.179E-02
AS-73	1.296E-01
SR-82	4.974E-02
CE-139	3.513E-03
HG-203	5.345E-03
TL-208	4.707E-03
PB-210	6.228E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.779E-02	NOT IDENT.
NA-22	4.883E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.982E-03	NOT IDENT.
SC-46	5.619E-03	FAIL ABUN
V-48	1.023E-02	NOT IDENT.
CR-51	5.967E-02	NOT IDENT.
MN-54	5.124E-03	NOT IDENT.
CO-56	5.503E-03	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.039E-03	NOT IDENT.
CO-58	5.491E-03	NOT IDENT.
FE-59	9.767E-03	NOT IDENT.
CO-60	6.122E-03	NOT IDENT.
ZN-65	9.709E-03	NOT IDENT.
GE-68	1.601E-01	NOT IDENT.
AS-74	1.627E-02	NOT IDENT.
SE-75	6.114E-03	FAIL ABUN
BR-77	3.098E+00	FAIL ABUN
RB-83	9.980E-03	NOT IDENT.
KR-85	1.323E+00	NOT IDENT.
SR-85	7.214E-03	NOT IDENT.
RB-86	1.096E-01	NOT IDENT.
Y-88	5.943E-03	NOT IDENT.

Y-91	2.409E+00	NOT IDENT.
NB-94	5.090E-03	NOT IDENT.
NB-95	5.494E-03	NOT IDENT.
NB-95M	1.509E-02	NOT IDENT.
ZR-95	9.461E-03	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	3.394E+00	FAIL ABUN
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.646E-03	NOT IDENT.
RH-102	7.429E-03	NOT IDENT.
RU-103	5.810E-03	NOT IDENT.
RH-106	4.763E-02	NOT IDENT.
RU-106	4.763E-02	NOT IDENT.
AG-108M	4.384E-03	NOT IDENT.
CD-109	8.697E-02	NOT IDENT.
AG-110M	6.582E-03	NOT IDENT.
SN-113	6.553E-03	NOT IDENT.
CD-115	3.601E+00	NOT IDENT.
SN-117M	7.401E-03	NOT IDENT.
TE-123M	3.410E-03	NOT IDENT.
SB-124	1.410E-02	FAIL ABUN
SB-125	1.135E-02	NOT IDENT.
TE-125M	1.215E+00	NOT IDENT.
I-126	3.398E-02	NOT IDENT.
SB-126	2.225E-02	NOT IDENT.
SN-126	8.574E-03	FAIL ABUN
SB-127	3.013E-01	NOT IDENT.
I-131	2.081E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.744E-01	NOT IDENT.
BA-133	5.788E-03	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	5.252E-03	FAIL ABUN
CS-135	2.207E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	1.715E-02	NOT IDENT.
BA-137M	4.764E-03	NOT IDENT.
CS-137	5.033E-03	NOT IDENT.
BA-140	4.421E-02	FAIL ABUN
LA-140	1.387E-02	NOT IDENT.
CE-141	8.187E-03	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.436E-02	NOT IDENT.
PM-144	5.344E-03	NOT IDENT.
PR-144	4.003E-01	NOT IDENT.
PM-146	5.995E-03	FAIL ABUN
ND-147	8.972E-02	NOT IDENT.
PM-147	8.750E+01	NOT IDENT.
PM-149	3.130E+01	NOT IDENT.
EU-150	3.771E-03	FAIL ABUN
EU-152	1.374E-02	NOT IDENT.
GD-153	9.804E-03	NOT IDENT.
EU-154	1.379E-02	NOT IDENT.
EU-155	1.229E-02	FAIL ABUN
TB-160	1.928E-02	FAIL ABUN
HO-166M	8.610E-03	NOT IDENT.
TM-171	2.859E+00	FAIL ABUN
HF-172	2.241E-02	FAIL ABUN
LU-172	8.332E-03	FAIL ABUN
LU-176	3.878E-03	NOT IDENT.
HF-181	6.774E-03	NOT IDENT.
TA-182	2.052E-02	FAIL ABUN
RE-183	2.787E-02	FAIL ABUN
RE-184	1.610E-02	FAIL ABUN
W-188	1.035E+00	FAIL ABUN
IR-192	5.306E-03	NOT IDENT.
BI-207	7.057E-03	NOT IDENT.
BI-211	3.077E-02	NOT IDENT.
PB-211	1.025E-01	NOT IDENT.
BI-212	6.769E-02	NOT IDENT.
PB-212	8.818E-03	FAIL ABUN
BI-214	1.120E-02	FAIL ABUN
PB-214	1.134E-02	NOT IDENT.
RN-219	5.540E-02	NOT IDENT.
RN-222	1.120E-02	FAIL ABUN
RA-223	9.384E-02	FAIL ABUN
RA-224	8.196E-02	NOT IDENT.

RA-226	1.120E-02	FAIL ABUN
AC-227	3.479E-02	NOT IDENT.
TH-227	3.479E-02	NOT IDENT.
AC-228	2.281E-02	FAIL ABUN
RA-228	2.281E-02	FAIL ABUN
TH-228	8.818E-03	FAIL ABUN
TH-229	6.635E-02	NOT IDENT.
TH-230	1.120E-02	FAIL ABUN
PA-231	6.817E-02	NOT IDENT.
TH-231	9.384E-02	FAIL ABUN
TH-232	2.281E-02	FAIL ABUN
PA-233	9.153E-03	NOT IDENT.
PA-234	3.236E-02	FAIL ABUN
PA-234M	6.689E-01	FAIL ABUN
TH-234	2.043E-01	FAIL ABUN
U-234	1.120E-02	FAIL ABUN
U-235	2.600E-02	FAIL ABUN
NP-237	9.153E-03	NOT IDENT.
NP-238	6.944E+00	NOT IDENT.
U-238	2.043E-01	FAIL ABUN
NP-239	3.131E-02	FAIL ABUN
PU-239	3.892E+01	NOT IDENT.
AM-241	2.016E-02	NOT IDENT.
AM-243	6.132E-03	NOT IDENT.
CM-243	1.223E-02	FAIL ABUN
BK-247	1.081E-02	FAIL ABUN
CM-247	5.145E-03	FAIL ABUN
CF-249	5.296E-03	NOT IDENT.
CF-251	1.647E-02	NOT IDENT.
ANH-511	1.033E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561383.CNF;1
Acquisition date : 24-JUN-2016 15:53:53 Sensitivity : 3.000
Detector ID : GAM06 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:04.44 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561383 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.7987E+02 GRAM
Quantity Err(%) : 1.1119E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-MAR-2016 07:26:53 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.128E-01	1.037E-01	1.037E-01
AS-73	2.530E-01	2.483E-01	2.483E-01
SR-82	7.050E-02	8.099E-02	8.099E-02
CE-139	7.159E-03	6.558E-03	6.558E-03
HG-203	3.156E-03	8.654E-03	8.654E-03
TL-208	1.418E-02	1.655E-02	1.655E-02
PB-210	1.104E+00	1.109E+00	1.109E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.156E-02	5.393E-02	5.418E-02	NOT IDENT.
NA-22	-1.129E-03	5.768E-03	5.790E-03	NOT IDENT.
NA-24	5.892E+05	2.362E+06	2.377E+06	SHORT HLIF
AL-26	4.399E-04	5.747E-03	5.750E-03	NOT IDENT.
SC-46	2.813E-03	6.466E-03	6.589E-03	FAIL ABUN
V-48	4.486E-04	1.197E-02	1.197E-02	NOT IDENT.
CR-51	6.250E-03	6.514E-02	6.520E-02	NOT IDENT.
MN-54	-1.641E-03	6.016E-03	6.061E-03	NOT IDENT.
CO-56	-1.724E-03	6.477E-03	6.524E-03	NOT IDENT.
MN-56	-1.000E+41	3.650E+41	0.000E+00	SHORT HLIF
CO-57	-1.255E-03	3.327E-03	3.375E-03	NOT IDENT.
CO-58	-1.048E-03	6.556E-03	6.573E-03	NOT IDENT.
FE-59	-2.265E-02	1.640E-02	1.932E-02	NOT IDENT.
CO-60	4.641E-03	6.729E-03	7.046E-03	NOT IDENT.
ZN-65	9.690E-03	1.158E-02	1.237E-02	NOT IDENT.
GE-68	8.527E-02	1.823E-01	1.863E-01	NOT IDENT.
AS-74	-4.246E-03	1.825E-02	1.835E-02	NOT IDENT.
SE-75	-3.120E-03	6.717E-03	6.863E-03	FAIL ABUN
BR-77	2.235E+00	6.420E+00	6.498E+00	FAIL ABUN
RB-83	3.938E-03	1.127E-02	1.141E-02	NOT IDENT.
KR-85	-1.417E+01	2.396E+00	6.823E+00	NOT IDENT.
SR-85	-7.741E-02	1.308E-02	3.727E-02	NOT IDENT.
RB-86	3.798E-02	1.266E-01	1.278E-01	NOT IDENT.

Y-88	-3.768E-03	7.392E-03	7.585E-03	NOT IDENT.
Y-91	1.096E+00	3.066E+00	3.105E+00	NOT IDENT.
NB-94	-7.439E-05	5.747E-03	5.747E-03	NOT IDENT.
NB-95	-7.422E-03	9.155E-03	9.747E-03	NOT IDENT.
NB-95M	-1.117E-03	1.825E-02	1.826E-02	NOT IDENT.
ZR-95	-2.139E-03	1.093E-02	1.097E-02	NOT IDENT.
NB-97	-1.000E+41	1.413E+41	0.000E+00	SHORT HLIF
ZR-97	-3.898E+07	8.049E+06	1.933E+07	SHORT HLIF
MO-99	3.178E+00	4.124E+00	4.366E+00	FAIL ABUN
TC-99M	8.913E+17	1.909E+19	0.000E+00	SHORT HLIF
RH-101	-3.483E-04	3.959E-03	3.962E-03	NOT IDENT.
RH-102	-3.575E-03	8.517E-03	8.668E-03	NOT IDENT.
RU-103	3.180E-03	6.469E-03	6.626E-03	NOT IDENT.
RH-106	1.414E-02	5.222E-02	5.261E-02	NOT IDENT.
RU-106	1.414E-02	5.222E-02	5.261E-02	NOT IDENT.
AG-108M	1.858E-03	5.024E-03	5.094E-03	NOT IDENT.
CD-109	-7.306E-02	1.260E-01	1.303E-01	NOT IDENT.
AG-110M	-2.613E-03	9.134E-03	9.210E-03	NOT IDENT.
SN-113	4.981E-03	7.082E-03	7.429E-03	NOT IDENT.
CD-115	1.048E+00	4.089E+00	4.117E+00	NOT IDENT.
SN-117M	-8.291E-03	8.539E-03	9.321E-03	NOT IDENT.
TE-123M	-4.453E-03	4.180E-03	4.637E-03	NOT IDENT.
SB-124	1.933E-02	1.443E-02	1.686E-02	FAIL ABUN
SB-125	-1.489E-02	1.379E-02	1.534E-02	NOT IDENT.
TE-125M	-2.011E-01	1.936E+00	1.938E+00	NOT IDENT.
I-126	6.700E-03	6.406E-02	6.413E-02	NOT IDENT.
SB-126	-1.301E-02	2.610E-02	2.676E-02	NOT IDENT.
SN-126	-7.527E-03	1.239E-02	1.284E-02	FAIL ABUN
SB-127	-4.715E-02	3.421E-01	3.427E-01	NOT IDENT.
I-131	-1.445E-02	2.387E-02	2.475E-02	NOT IDENT.
I-132	1.000E+41	3.085E+41	0.000E+00	SHORT HLIF
TE-132	5.636E-02	1.830E-01	1.848E-01	NOT IDENT.
BA-133	-3.789E-03	6.610E-03	6.827E-03	NOT IDENT.
I-133	-1.191E+03	8.150E+03	8.168E+03	SHORT HLIF
CS-134	-6.385E-03	1.128E-02	1.164E-02	FAIL ABUN
CS-135	9.974E-03	2.341E-02	2.384E-02	NOT IDENT.
I-135	2.003E+17	9.516E+17	0.000E+00	SHORT HLIF
CS-136	8.860E-04	2.022E-02	2.023E-02	NOT IDENT.
BA-137M	3.574E-03	5.804E-03	6.024E-03	NOT IDENT.
CS-137	3.776E-03	6.132E-03	6.363E-03	NOT IDENT.
BA-140	3.317E-02	4.907E-02	5.129E-02	FAIL ABUN
LA-140	-9.002E-03	1.764E-02	1.810E-02	NOT IDENT.
CE-141	9.337E-05	1.004E-02	1.004E-02	NOT IDENT.
CE-143	-6.371E+01	7.308E+01	7.852E+01	SHORT HLIF
CE-144	3.171E-03	2.632E-02	2.636E-02	NOT IDENT.
PM-144	-8.578E-04	6.072E-03	6.084E-03	NOT IDENT.
PR-144	-6.596E-02	4.550E-01	4.559E-01	NOT IDENT.
PM-146	-2.164E-03	6.943E-03	7.011E-03	FAIL ABUN
ND-147	3.604E-02	1.013E-01	1.026E-01	NOT IDENT.
PM-147	-3.248E+01	9.561E+01	9.673E+01	NOT IDENT.
PM-149	1.236E+01	3.347E+01	3.393E+01	NOT IDENT.
EU-150	-8.439E-04	4.780E-03	4.795E-03	FAIL ABUN
EU-152	2.374E-03	1.623E-02	1.627E-02	NOT IDENT.
GD-153	-2.446E-03	1.047E-02	1.053E-02	NOT IDENT.
EU-154	-3.371E-03	1.630E-02	1.637E-02	NOT IDENT.
EU-155	1.753E-02	2.212E-02	2.349E-02	FAIL ABUN
TB-160	3.285E-02	4.022E-02	4.286E-02	FAIL ABUN
HO-166M	-2.479E-03	9.888E-03	9.951E-03	NOT IDENT.
TM-171	4.836E+00	4.660E+00	5.145E+00	FAIL ABUN
HF-172	-1.283E-02	2.483E-02	2.550E-02	FAIL ABUN
LU-172	9.303E-03	9.026E-03	9.953E-03	FAIL ABUN
LU-176	3.008E-03	4.110E-03	4.328E-03	NOT IDENT.
HF-181	-9.490E-05	7.756E-03	7.756E-03	NOT IDENT.
TA-182	3.462E-03	2.696E-02	2.700E-02	FAIL ABUN
RE-183	6.718E-03	2.813E-02	2.830E-02	FAIL ABUN
RE-184	-1.456E-02	2.006E-02	2.111E-02	FAIL ABUN
W-188	3.191E-01	1.111E+00	1.120E+00	FAIL ABUN
IR-192	2.604E-04	5.798E-03	5.799E-03	NOT IDENT.
BI-207	1.431E-03	8.242E-03	8.267E-03	NOT IDENT.
BI-211	-5.954E-03	4.605E-02	4.612E-02	NOT IDENT.
PB-211	2.865E-02	1.136E-01	1.143E-01	NOT IDENT.
BI-212	-8.191E-02	1.148E-01	1.206E-01	NOT IDENT.
PB-212	6.383E-03	1.803E-02	1.826E-02	FAIL ABUN
BI-214	-8.479E-03	2.144E-02	2.178E-02	FAIL ABUN
PB-214	2.605E-03	1.671E-02	1.676E-02	NOT IDENT.
RN-219	-8.954E-03	6.266E-02	6.279E-02	NOT IDENT.
RN-222	-8.479E-03	2.144E-02	2.178E-02	FAIL ABUN
RA-223	-4.270E-02	1.049E-01	1.067E-01	FAIL ABUN

RA-224	5.012E-02	9.642E-02	9.903E-02	NOT IDENT.
RA-226	-8.479E-03	2.144E-02	2.178E-02	FAIL ABUN
AC-227	-1.536E-02	3.801E-02	3.864E-02	NOT IDENT.
TH-227	-1.536E-02	3.801E-02	3.864E-02	NOT IDENT.
AC-228	2.920E-03	3.996E-02	3.998E-02	FAIL ABUN
RA-228	2.920E-03	3.996E-02	3.998E-02	FAIL ABUN
TH-228	6.383E-03	1.803E-02	1.826E-02	FAIL ABUN
TH-229	-3.599E-02	7.615E-02	7.786E-02	NOT IDENT.
TH-230	-8.479E-03	2.144E-02	2.178E-02	FAIL ABUN
PA-231	4.373E-02	7.309E-02	7.571E-02	NOT IDENT.
TH-231	-4.270E-02	1.049E-01	1.067E-01	FAIL ABUN
TH-232	2.920E-03	3.996E-02	3.998E-02	FAIL ABUN
PA-233	-6.215E-03	1.030E-02	1.068E-02	NOT IDENT.
PA-234	-2.308E-02	4.813E-02	4.924E-02	FAIL ABUN
PA-234M	2.811E-01	1.693E+00	1.698E+00	FAIL ABUN
TH-234	2.286E-01	5.809E-01	5.899E-01	FAIL ABUN
U-234	-8.479E-03	2.144E-02	2.178E-02	FAIL ABUN
U-235	7.538E-03	6.106E-02	6.115E-02	FAIL ABUN
NP-237	-6.215E-03	1.030E-02	1.068E-02	NOT IDENT.
NP-238	4.317E+00	7.806E+00	8.045E+00	NOT IDENT.
U-238	2.286E-01	5.809E-01	5.899E-01	FAIL ABUN
NP-239	-2.007E-02	3.448E-02	3.565E-02	FAIL ABUN
PU-239	5.221E+00	4.194E+01	4.200E+01	NOT IDENT.
AM-241	2.037E-03	2.276E-02	2.278E-02	NOT IDENT.
AM-243	8.138E-04	6.329E-03	6.340E-03	NOT IDENT.
CM-243	-4.420E-03	1.477E-02	1.490E-02	FAIL ABUN
BK-247	-1.017E-02	1.226E-02	1.309E-02	FAIL ABUN
CM-247	-6.980E-04	5.812E-03	5.821E-03	FAIL ABUN
CF-249	-3.244E-03	6.110E-03	6.282E-03	NOT IDENT.
CF-251	-8.540E-03	1.874E-02	1.913E-02	NOT IDENT.
ANH-511	-2.229E-02	1.474E-02	1.784E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	304.9068	87.09	338.2294	136.47	324.6731
45.60	332.6747	87.57	335.7077	140.51	276.4180
46.54	313.0670	88.03	329.3493	143.76	287.2326
49.72	265.4446	88.34	329.5616	144.24	287.4381
51.35	275.9096	88.47	322.0070	145.44	324.3352
51.87	276.3379	89.96	593.2870	152.43	329.2272
52.39	301.6864	1093.63	554.7634	153.25	311.4768
52.97	285.1205	91.11	398.6983	323.87	284.1268
53.44	277.1799	92.59	316.0634	156.02	298.7704
54.07	243.8556	93.35	309.7916	158.56	322.3969
57.36	0.0000	94.56	558.1969	159.00	332.9151
57.53	293.9146	94.65	558.2967	162.33	268.9749
57.98	269.2237	94.67	558.3201	162.66	267.4729
59.27	276.8652	94.87	558.5417	163.33	305.0353
59.32	276.9031	97.43	306.4604	165.86	263.7444
59.54	277.0689	98.43	285.6112	176.31	292.6828
60.96	272.7565	98.44	285.6157	176.60	288.3882
61.17	272.9090	99.53	267.6562	177.52	325.0930
62.93	295.7921	100.11	290.4454	181.07	299.9873
63.29	296.0699	102.03	298.8671	181.52	281.3265
63.58	296.2934	103.18	299.5130	184.41	339.0326
64.28	296.8310	103.37	299.6214	143.76	297.2733
66.73	313.6933	105.21	284.3555	193.51	311.3376
67.24	327.7515	105.31	284.4082	197.03	284.4254
125.81	295.3010	106.12	308.5675	198.01	298.3132
67.75	295.3521	106.47	313.2192	201.83	338.2390
69.67	272.0280	109.28	284.9801	203.43	294.5156
70.83	288.7757	111.00	342.2307	205.31	278.0593
72.81	330.3863	111.76	336.6983	210.85	274.0778
72.87	330.4337	114.06	280.8816	215.65	289.3813
74.66	329.9747	116.30	329.3069	222.11	308.8451
74.82	336.5885	116.74	318.4688	227.09	263.5151
74.97	336.7067	119.76	292.7586	227.38	267.9753
77.11	318.7968	121.12	302.5668	228.16	258.5549
78.74	337.7545	121.22	302.6169	228.18	258.5616
79.69	299.0950	121.78	289.6865	116.74	258.5616
80.12	279.6736	122.06	310.1596	235.69	248.7633
80.19	279.7176	122.92	317.7319	235.96	260.1448
80.57	281.8321	123.07	315.7725	238.63	276.4539
81.00	325.3553	265.00	274.2854	238.98	287.8997
81.07	325.4063	125.81	317.1963	240.99	257.2246
81.75	323.0681	127.23	288.1855	242.00	271.7157
83.79	321.6674	127.91	294.6637	244.70	268.3560
84.00	326.5461	129.30	277.8257	252.40	268.6203
85.43	307.6111	131.20	297.2461	252.80	264.2326
86.55	328.3280	133.02	300.1688	254.15	0.0000
86.79	328.4930	133.52	305.5842	256.23	268.7256
86.94	337.1695	136.00	329.1176	260.90	232.8004

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	250.9083	355.39	0.0000	584.27	111.2645
264.80	258.2157	356.01	205.2369	595.83	161.0544
265.00	266.4478	364.49	203.5828	427.87	176.9492
268.22	249.9263	366.42	191.0092	602.52	0.0000
269.46	266.6567	372.51	178.9426	604.72	180.0559
270.03	267.7130	375.05	180.2709	607.14	165.6309
271.23	253.3771	377.52	186.5806	609.32	149.3225
273.65	253.5548	356.01	158.3640	610.33	155.8140
276.40	260.2885	388.16	172.9238	614.28	141.4236
277.37	254.6344	388.63	167.9530	618.01	150.8832
277.60	235.5469	391.69	156.2228	620.36	116.9789
278.00	232.6874	264.66	176.4718	621.93	123.5182
279.20	226.6761	401.81	165.4449	630.19	0.0000
279.54	222.6918	402.40	168.5608	631.29	116.6730
279.70	222.7250	404.85	168.8445	633.25	124.1986
280.46	237.6401	410.95	164.4393	634.78	116.8699
283.69	235.6180	413.71	178.0489	635.95	88.1649
284.31	213.7091	414.70	176.1205	636.99	78.9238
285.41	234.4388	423.72	123.6163	645.85	100.7042
285.90	230.8349	427.09	162.0907	657.76	102.2061
287.50	238.5885	427.87	158.0404	657.90	0.0000
290.67	220.6433	433.94	155.2609	661.66	86.1098
293.27	0.0000	439.40	143.6180	664.57	0.0000
351.93	210.3092	453.88	161.7498	666.33	98.8477
295.96	202.9640	463.37	138.4059	666.50	98.8553
879.38	253.1085	468.07	127.1503	667.71	0.0000
299.98	225.2600	473.00	132.8468	677.62	119.2355
300.09	225.2802	475.06	134.0769	685.70	109.2247
300.13	225.2893	476.78	144.8694	695.00	123.9856
301.36	217.0701	477.60	138.5455	696.49	144.1099
302.85	238.0484	482.18	152.8190	696.51	144.1136
256.23	236.4998	487.02	145.7576	697.00	150.8252
304.85	231.8562	492.35	148.3685	697.30	147.0256
306.78	203.9139	497.08	115.3577	697.49	145.1311
308.46	210.8217	505.52	413.8547	702.65	134.9345
311.90	239.8783	507.63	0.0000	706.68	116.0017
316.51	231.2831	511.00	201.0593	711.68	118.1773
319.41	232.7896	514.00	710.8908	720.70	109.9616
320.08	233.8745	514.00	710.8958	721.93	0.0000
321.04	226.4150	520.40	113.6326	722.78	109.0963
323.87	247.0479	520.69	109.2773	722.91	104.2743
325.23	246.3609	522.65	0.0000	723.31	95.6017
328.76	196.1153	527.90	106.4283	724.19	90.8078
333.37	236.2087	528.26	106.4490	727.33	108.3414
333.97	213.1521	529.59	112.0201	733.00	95.0308
334.37	200.8589	529.87	0.0000	735.93	90.2958
338.28	192.7630	531.02	104.4136	333.97	84.1995
338.32	192.7691	537.26	109.1846	739.50	74.5497
311.90	197.1709	546.56	0.0000	747.24	87.8005
340.48	197.1709	552.55	123.4387	748.06	87.8313
340.55	197.1818	563.25	114.5281	752.31	96.1343
344.28	193.3435	569.33	103.2249	753.82	96.1967
345.93	201.7126	946.00	113.7062	756.73	88.1499
351.06	200.5519	569.70	113.7186	756.80	88.1543
351.93	190.8968	583.19	111.2015	884.68	87.4334

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	98.3154	1274.44	66.0101	1620.50	29.5267
766.42	97.3564	1001.03	60.0387	1621.92	42.1940
766.84	95.4062	1002.74	42.9092	1678.03	0.0000
772.60	0.0000	1004.73	62.6172	1690.97	16.0608
776.52	93.8102	507.63	0.0000	1750.46	0.0000
739.50	80.6897	1025.87	55.1245	1764.49	29.8214
778.90	84.0164	1028.54	59.4983	1063.66	35.4554
783.70	90.2325	1037.84	68.3587	1771.35	28.9306
785.37	67.7194	1038.76	0.0000	1791.20	0.0000
792.07	76.5150	631.29	84.8707	1808.65	25.3878
794.95	86.2202	1048.07	75.1150	1810.72	0.0000
795.86	79.6172	1049.04	65.3379	1836.06	36.8726
810.06	91.3257	1050.41	67.5431		
810.29	91.1956	1063.66	67.8276		
344.28	91.2001	1077.00	53.8306		
810.76	91.2112	1077.34	51.6380		
815.77	82.2522	1085.87	50.4905		
1048.07	71.2947	1093.63	44.1699		
832.01	90.8481	1099.45	79.0144		
834.85	103.0733	1112.07	53.9361		
835.71	86.9343	1112.84	63.4682		
836.80	0.0000	1115.54	34.9367		
846.75	0.0000	1120.29	51.0232		
846.77	91.3623	1120.55	51.0254		
856.80	93.7475	1221.41	51.0388		
860.56	86.7369	1129.67	47.1351		
871.09	70.6863	1131.51	0.0000		
873.19	85.4370	1147.95	0.0000		
875.33	0.0000	1173.23	54.6535		
879.38	59.6001	1177.95	55.6702		
880.51	59.6256	1189.05	49.2240		
883.24	89.1846	1204.77	45.6406		
884.68	82.3672	1221.41	47.4932		
889.28	72.1926	1231.02	53.6416		
894.76	81.6366	1235.36	59.4596		
898.04	66.2156	1238.28	54.7085		
900.72	91.1346	1260.41	0.0000		
903.28	81.8892	1271.87	47.4648		
911.20	74.4994	1274.44	47.4987		
912.08	71.0560	1274.54	47.4987		
923.98	82.3807	1291.59	44.7965		
926.50	81.5249	1298.22	0.0000		
929.11	66.2557	1312.11	46.9980		
937.49	54.2096	1332.49	50.2031		
944.13	39.9631	1362.66	0.0000		
946.00	59.9836	1365.19	49.6358		
949.00	67.4188	1368.63	0.0000		
667.71	0.0000	1384.29	46.8833		
962.31	63.4951	1408.01	52.1799		
964.08	86.8287	1457.56	0.0000		
966.17	67.8172	1460.82	29.6231		
911.20	65.7615	1489.16	38.8891		
968.97	65.7615	1505.03	53.4155		
983.53	65.0195	1584.12	40.7948		
984.45	61.8402	1596.21	40.9059		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 04:00:45.53

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                    *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561384.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;320
Background date    : 20-JUN-2016 14:03:09
Sample date       : 17-MAY-2016 10:20:00 Acquisition date : 24-JUN-2016 15:54:22
Sample ID        : G1203561384 Sample quantity : 1.68080E+02 GRAM
Detector name    : GAM09 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:06.32 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572234 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	42.28	68	945	1.17	84.22	82	5	1.57E-03	69.0	
2	0	63.38*	45	1632	0.68	126.44	123	7	1.03E-03	171.5	
3	2	74.84	1241	1413	1.03	149.36	143	23	2.87E-02	5.5	2.96E+00
4	2	77.13*	1893	1115	0.88	153.94	143	23	4.38E-02	3.8	
5	6	84.32*	374	1401	1.54	168.34	165	28	8.65E-03	19.3	3.14E+00
6	6	87.26*	884	1381	1.24	174.21	165	28	2.05E-02	8.3	
7	6	89.96	653	1355	1.14	179.61	165	28	1.51E-02	10.2	
8	6	92.77*	888	1519	1.30	185.23	165	28	2.06E-02	10.5	
9	6	94.61	205	1307	1.43	188.91	165	28	4.74E-03	32.8	
10	0	99.15	256	1639	1.54	198.00	194	9	5.93E-03	29.2	
11	0	105.47	147	1342	1.33	210.66	208	7	3.40E-03	42.1	
12	0	120.33	58	1155	1.13	240.39	238	6	1.34E-03	93.4	
13	0	129.17	309	1506	0.92	258.08	254	8	7.15E-03	22.6	
14	0	132.60	110	1302	1.86	264.93	262	7	2.55E-03	55.1	
15	0	143.87*	8	1170	1.00	287.48	285	6	1.89E-04	791.7	
16	0	154.32	213	1211	1.36	308.40	305	7	4.92E-03	28.0	
17	0	185.86*	526	1764	1.11	371.50	367	10	1.22E-02	17.7	
18	0	209.22*	360	1234	0.96	418.23	415	8	8.34E-03	19.2	
19	4	238.58*	4774	822	1.02	476.98	471	18	1.11E-01	1.8	2.01E+00
20	4	241.58	1056	1230	1.61	482.98	471	18	2.44E-02	7.9	
21	0	270.07	414	1162	1.26	539.99	535	11	9.58E-03	16.7	
22	0	277.55	207	1059	1.04	554.96	550	10	4.78E-03	30.4	
23	0	295.16	1333	901	1.04	590.20	586	10	3.09E-02	5.0	
24	0	299.92	257	776	1.34	599.71	596	8	5.95E-03	19.7	
25	0	311.39	52	607	0.81	622.65	620	7	1.20E-03	80.4	
26	0	327.97	254	814	1.19	655.85	652	9	5.87E-03	21.2	
27	0	338.15*	970	957	1.14	676.21	671	11	2.25E-02	7.3	
28	0	351.81*	2381	1011	1.15	703.53	697	14	5.51E-02	3.7	
29	0	409.37	110	537	1.48	818.71	815	8	2.54E-03	38.1	
30	0	462.62*	191	834	1.02	925.24	920	11	4.43E-03	32.1	
31	0	510.73*	646	985	1.92	1021.52	1013	20	1.49E-02	14.8	
32	0	562.01	78	355	1.57	1124.12	1121	9	1.80E-03	45.0	
33	0	582.87*	1496	459	1.29	1165.86	1159	14	3.46E-02	4.2	
34	0	609.00*	1598	484	1.25	1218.14	1212	13	3.70E-02	4.1	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	661.33	6768	603	1.35	1322.86	1316	15	1.57E-01	1.4	
36	0	726.77	359	276	1.80	1453.79	1447	12	8.30E-03	10.7	
37	0	755.25	20	248	0.68	1510.78	1506	10	4.60E-04	151.3	
38	0	767.96	128	319	1.59	1536.21	1530	11	2.96E-03	28.5	
39	0	771.88	60	180	1.59	1544.05	1541	8	1.38E-03	41.4	
40	0	785.37	88	178	1.01	1571.06	1567	9	2.04E-03	29.6	
41	0	794.43	162	183	1.60	1589.18	1585	10	3.75E-03	17.6	
42	0	802.25*	1	192	1.84	1604.82	1602	9	2.05E-05	*****	
43	0	806.46	46	168	3.28	1613.25	1610	10	1.07E-03	55.0	
44	0	835.28	64	139	1.44	1670.91	1668	7	1.47E-03	33.3	
45	0	860.17	220	209	1.39	1720.71	1716	12	5.09E-03	14.7	
46	0	897.21	34	216	1.52	1794.84	1789	12	7.78E-04	89.2	
47	0	910.75*	1006	218	1.49	1821.94	1816	13	2.33E-02	4.7	
48	0	933.34	90	129	1.38	1867.13	1863	9	2.09E-03	25.0	
49	0	950.17	50	146	1.67	1900.81	1895	11	1.17E-03	48.8	
50	3	964.15	272	154	1.89	1928.79	1923	21	6.30E-03	10.8	1.59E+00
51	3	968.52*	619	154	1.69	1937.52	1923	21	1.43E-02	5.9	
52	0	991.84	29	101	1.55	1984.20	1979	9	6.79E-04	64.9	
53	0	1119.83	396	254	1.98	2240.29	2231	18	9.16E-03	10.7	
54	0	1195.70	11	121	1.29	2392.12	2391	8	2.64E-04	168.0	
55	0	1212.99	23	146	0.67	2426.71	2422	11	5.25E-04	105.9	
56	0	1237.41	211	171	2.23	2475.57	2467	16	4.87E-03	15.5	
57	0	1247.36	43	79	2.07	2495.48	2492	8	9.88E-04	39.6	
58	0	1292.54	31	33	1.56	2585.90	2583	6	7.06E-04	35.1	
59	0	1326.16	48	73	2.86	2653.16	2647	12	1.12E-03	38.0	
60	0	1333.64	37	118	4.22	2668.14	2661	14	8.51E-04	65.0	
61	0	1377.46	101	141	2.01	2755.82	2745	21	2.34E-03	31.0	
62	0	1391.08*	14	35	1.46	2783.08	2780	7	3.14E-04	93.7	
63	0	1401.41	52	82	2.95	2803.75	2797	13	1.19E-03	39.2	
64	0	1407.41	73	60	1.92	2815.75	2810	12	1.69E-03	24.2	
65	0	1413.71	39	28	2.31	2828.37	2824	10	9.08E-04	29.7	
66	0	1430.12	31	63	2.82	2861.21	2855	11	7.17E-04	52.8	
67	0	1459.97*	1905	99	1.88	2920.93	2912	16	4.41E-02	2.7	
68	1	1494.68	43	56	2.12	2990.39	2984	47	1.00E-03	42.1	1.76E+00
69	1	1508.67	47	71	2.13	3018.39	2984	47	1.08E-03	39.4	
70	1	1511.48	30	69	1.94	3024.00	2984	47	6.86E-04	57.9	
71	0	1587.49	77	70	1.44	3176.11	3171	10	1.77E-03	23.4	
72	0	1591.88	52	42	2.05	3184.90	3181	9	1.21E-03	27.1	
73	0	1620.30	45	62	1.46	3241.76	3235	12	1.04E-03	38.4	
74	0	1629.93	74	49	2.13	3261.04	3255	13	1.70E-03	22.8	
75	0	1683.77	16	42	4.31	3368.79	3361	13	3.66E-04	88.4	
76	0	1728.58	87	69	0.72	3458.45	3452	16	2.02E-03	23.7	
77	0	1763.48	404	19	1.87	3528.28	3520	18	9.36E-03	5.6	
78	0	1846.86	78	42	2.13	3695.15	3687	17	1.82E-03	22.1	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561384.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 10:20:00 Acquisition date : 24-JUN-2016 15:54:22
Sample ID        : G1203561384 Sample quantity  : 168.08 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA9 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:06.32 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.146E+00	5.661E+00	5.661E+00	5.42	OK
MN-54	834.85	99.98*	1.799E+00	1.384E-02	1.507E-02	66.61	OK
CD-109	88.03	3.70*	4.862E+00	1.776E+00	1.882E+00	23.54	OK
SN-126	64.28	9.60	2.278E+00	1.066E-01	1.066E-01	342.94	OK
	86.94	8.90	4.862E+00	7.385E-01	7.385E-01	23.54	OK
	87.57	37.00*	4.862E+00	1.776E-01	1.776E-01	23.54	OK
BA-137M	661.66	89.90*	2.158E+00	1.408E+00	1.412E+00	2.90	OK
CS-137	661.66	85.10*	2.158E+00	1.488E+00	1.491E+00	2.90	OK
CE-144	80.12	1.36	4.226E+00	----- Line	Not Found	-----	Absent
	133.52	11.09*	6.348E+00	7.595E-02	8.340E-02	110.19	OK
PM-147	121.22	0.00*	6.268E+00	1.595E+02	1.640E+02	186.82	OK
EU-155	86.55	30.70	4.862E+00	2.141E-01	2.174E-01	23.54	OK
	105.31	21.10*	5.905E+00	5.865E-02	5.956E-02	84.30	OK
TL-208	277.37	6.60	4.350E+00	3.224E-01	3.224E-01	60.77	OK
	583.19	85.00*	2.383E+00	3.028E-01	3.028E-01	8.39	OK
	860.56	12.50	1.759E+00	3.903E-01	3.903E-01	29.46	OK
BI-211	72.87	1.23	3.448E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	3.589E+00	9.600E-02	9.600E-02	283.42	OK
BI-212	727.33	6.67*	2.005E+00	1.070E+00	1.070E+00	21.33	OK
	785.37	1.10	1.887E+00	1.675E+00	1.675E+00	59.27	OK
PB-212	1620.50	1.47	1.045E+00	1.044E+00	1.044E+00	76.78	OK
	74.82	10.28	3.671E+00	1.255E+00	1.255E+00	15.37	OK
	77.11	17.10	3.921E+00	1.449E+00	1.449E+00	7.60	OK
	238.63	43.60*	4.883E+00	1.022E+00	1.022E+00	3.63	OK
	300.09	3.30	4.089E+00	8.454E-01	8.454E-01	39.49	OK
BI-214	609.32	45.49*	2.302E+00	6.224E-01	6.225E-01	8.22	OK
	1120.29	14.92	1.429E+00	6.992E-01	6.992E-01	21.46	OK
	1764.49	15.30	9.661E-01	9.669E-01	9.669E-01	11.11	OK
PB-214	74.82	5.80	3.669E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.921E+00	2.555E+00	2.555E+00	7.60	OK
	87.09	3.41	4.849E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.832E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.142E+00	7.774E-01	7.774E-01	10.06	OK
RN-222	351.93	35.60*	3.588E+00	----- Line	Not Found	-----	<<INT Reject
	609.32	45.49*	2.302E+00	6.224E-01	6.225E-01	8.22	OK
	1120.29	14.92	1.429E+00	6.992E-01	6.992E-01	21.46	OK
	1764.49	15.30	9.661E-01	9.669E-01	9.669E-01	11.11	OK
RA-223	81.07	15.00	4.319E+00	----- Line	Not Found	-----	Absent
	83.79	24.70	4.617E+00	1.668E-01	1.668E-01	38.53	OK
	94.56	8.67	5.378E+00	2.210E-01	2.210E-01	65.51	OK
	144.24	3.27	6.310E+00	1.911E-02	1.911E-02	1583.45	OK
	154.21	5.70	6.211E+00	2.872E-01	2.872E-01	56.05	OK
	269.46	13.90	4.444E+00	3.011E-01	3.011E-01	33.44	OK
	323.87	3.99*	3.841E+00	----- Line	Not Found	-----	Absent
	338.28	2.84	3.708E+00	4.033E+00	4.033E+00	14.54	OK
RA-224	240.99	4.10*	4.839E+00	1.047E+00	1.047E+00	38.65	OK
RA-226	609.32	45.49*	2.302E+00	6.224E-01	6.225E-01	8.22	OK
	1120.29	14.92	1.429E+00	6.992E-01	6.992E-01	21.46	OK
	1764.49	15.30	9.661E-01	9.669E-01	9.669E-01	11.11	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AC-228	105.21	1.10	5.905E+00	1.125E+00	1.125E+00	84.30	OK
	338.32	11.27	3.708E+00	1.016E+00	1.016E+00	14.54	OK
	794.95	4.25	1.871E+00	8.030E-01	8.030E-01	35.23	OK
	835.71	1.61	1.799E+00	8.592E-01	8.592E-01	66.61	OK
	911.20	25.80*	1.682E+00	8.973E-01	8.973E-01	9.31	OK
RA-228	968.97	15.80	1.603E+00	9.384E-01	9.384E-01	11.82	OK
	105.21	1.10	5.905E+00	1.125E+00	1.125E+00	84.30	OK
	338.32	11.27	3.708E+00	1.016E+00	1.016E+00	14.54	OK
	794.95	4.25	1.871E+00	8.030E-01	8.030E-01	35.23	OK
	835.71	1.61	1.799E+00	8.592E-01	8.592E-01	66.61	OK
TH-228	911.20	25.80*	1.682E+00	8.973E-01	8.973E-01	9.31	OK
	968.97	15.80	1.603E+00	9.384E-01	9.384E-01	11.82	OK
	74.82	10.28	3.671E+00	1.255E+00	1.255E+00	15.37	OK
	77.11	17.10	3.921E+00	1.449E+00	1.449E+00	7.60	OK
	238.63	43.60*	4.883E+00	1.022E+00	1.022E+00	3.63	OK
TH-229	300.09	3.30	4.089E+00	8.454E-01	8.454E-01	39.49	OK
	85.43	14.70	4.617E+00	2.802E-01	2.802E-01	38.53	OK
	88.47	24.00	4.862E+00	2.739E-01	2.739E-01	23.54	OK
	193.51	4.41*	5.613E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.322E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.302E+00	6.224E-01	6.224E-01	8.22	OK
	1120.29	14.92	1.429E+00	6.992E-01	6.992E-01	21.46	OK
	1764.49	15.30	9.661E-01	9.669E-01	9.669E-01	11.11	OK
PA-231	283.69	1.70	4.275E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.089E+00	5.215E-01	5.215E-01	39.49	OK
TH-232	105.21	1.10	5.905E+00	1.125E+00	1.125E+00	84.30	OK
	338.32	11.27	3.708E+00	1.016E+00	1.016E+00	14.54	OK
	835.71	1.61	1.799E+00	8.592E-01	8.592E-01	66.61	OK
	911.20	25.80*	1.682E+00	8.973E-01	8.973E-01	9.31	OK
	968.97	15.80	1.603E+00	9.384E-01	9.384E-01	11.82	OK
PA-233	300.13	6.63	4.089E+00	4.208E-01	4.208E-01	39.49	OK
	311.90	38.50*	3.966E+00	1.498E-02	1.498E-02	160.78	OK
	340.48	4.45	3.687E+00	----- Line	Not Found	-----	Absent
TH-234	63.29	3.70*	2.278E+00	2.767E-01	2.767E-01	342.94	OK
	92.59	4.23	5.261E+00	2.012E+00	2.012E+00	20.90	OK
U-234	609.32	45.49*	2.302E+00	6.224E-01	6.224E-01	8.22	OK
	1120.29	14.92	1.429E+00	6.992E-01	6.992E-01	21.46	OK
	1764.49	15.30	9.661E-01	9.669E-01	9.669E-01	11.11	OK
U-235	89.96	3.47	5.068E+00	1.876E+00	1.876E+00	20.50	OK
	93.35	5.60	5.261E+00	1.519E+00	1.519E+00	20.90	OK
	143.76	10.96*	6.310E+00	5.700E-03	5.700E-03	1583.45	OK
	163.33	5.08	6.096E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.742E+00	7.507E-02	7.507E-02	35.41	OK
NP-237	205.31	5.01	5.415E+00	----- Line	Not Found	-----	Absent
	94.65	10.56	5.378E+00	1.814E-01	1.814E-01	65.51	OK
	98.43	16.90	5.630E+00	1.348E-01	1.348E-01	58.37	OK
	300.13	6.63	4.089E+00	4.208E-01	4.208E-01	39.49	OK
	311.90	38.50*	3.966E+00	1.498E-02	1.498E-02	160.78	OK
	340.48	4.45	3.687E+00	----- Line	Not Found	-----	Absent

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
U-238	63.29	3.70*	2.278E+00	2.767E-01	2.767E-01	342.94	OK
	92.59	4.23	5.261E+00	2.012E+00	2.012E+00	20.90	OK
AM-243	43.53	5.90	1.391E-01	4.493E+00	4.493E+00	138.08	OK
	74.66	67.20*	3.671E+00	1.920E-01	1.920E-01	15.37	OK
ANH-511	511.00	100.00*	2.647E+00	1.016E-01	1.016E-01	29.65	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561384.CNF;1
Acquisition date : 24-JUN-2016 15:54:22 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.32 Half life ratio : *****
Sample date : 17-MAY-2016 10:20:00 Analyst initials: MXR1
Sample ID : G1203561384 Sample Quantity : 1.6808E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.661E+00	3.008E-01	1.357E-01
MN-54	1.507E-02	9.838E-03	1.729E-02
CD-109	1.882E+00	4.342E-01	3.694E-01
SN-126	1.776E-01	4.098E-02	3.511E-02
BA-137M	1.412E+00	4.010E-02	1.680E-02
CS-137	1.491E+00	4.236E-02	1.774E-02
CE-144	8.340E-02	9.006E-02	9.815E-02
PM-147	1.640E+02	3.002E+02	3.721E+02
EU-155	5.956E-02	4.920E-02	5.209E-02
TL-208	3.028E-01	2.490E-02	1.621E-02
BI-211	9.600E-02	2.666E-01	9.801E-02
BI-212	1.070E+00	2.236E-01	2.036E-01
PB-212	1.022E+00	3.634E-02	2.663E-02
BI-214	6.225E-01	5.014E-02	3.408E-02
PB-214	8.123E-01	5.909E-02	7.839E-02
RN-222	6.225E-01	5.014E-02	3.408E-02
RA-223	-1.369E-01	1.933E-01	3.123E-01
RA-224	1.047E+00	3.966E-01	2.855E-01
RA-226	6.225E-01	5.014E-02	3.408E-02
AC-228	8.973E-01	8.186E-02	5.615E-02
RA-228	8.973E-01	8.186E-02	5.615E-02
TH-228	1.022E+00	3.634E-02	2.663E-02
TH-229	7.091E-02	1.369E-01	2.528E-01
TH-230	6.224E-01	5.014E-02	3.408E-02
PA-231	5.215E-01	2.018E-01	2.263E-01
TH-232	8.973E-01	8.186E-02	5.615E-02
PA-233	1.498E-02	2.361E-02	3.110E-02
TH-234	2.767E-01	9.299E-01	8.007E-01
U-234	6.224E-01	5.014E-02	3.408E-02
U-235	5.700E-03	8.846E-02	9.370E-02
NP-237	1.498E-02	2.361E-02	3.110E-02
U-238	2.767E-01	9.299E-01	8.007E-01
AM-243	1.920E-01	2.891E-02	2.822E-02
ANH-511	1.016E-01	2.953E-02	1.409E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.275E-02	1.331E-01	2.414E-01	NOT IDENT.
NA-22	-6.709E-03	9.403E-03	1.573E-02	NOT IDENT.
NA-24	0.000E+00	3.220E+16	0.000E+00	SHORT HLIF
AL-26	2.630E-03	7.222E-03	1.362E-02	NOT IDENT.
SC-46	-1.171E-02	1.145E-02	1.914E-02	FAIL ABUN
V-48	1.450E-02	4.296E-02	7.876E-02	NOT IDENT.
CR-51	1.147E-01	1.785E-01	3.402E-01	NOT IDENT.
CO-56	8.758E-03	1.155E-02	2.175E-02	FAIL ABUN
MN-56	0.000E+00	1.320E+41	0.000E+00	SHORT HLIF
CO-57	-4.781E-04	7.757E-03	1.319E-02	NOT IDENT.
CO-58	-7.658E-03	1.228E-02	1.874E-02	NOT IDENT.
FE-59	-1.213E-02	2.873E-02	4.987E-02	FAIL ABUN
CO-60	1.107E-02	1.411E-02	1.719E-02	FAIL ABUN
ZN-65	5.241E-03	2.450E-02	3.805E-02	NOT IDENT.
GE-68	2.299E-01	3.006E-01	5.574E-01	NOT IDENT.
AS-73	3.866E-01	4.247E-01	7.931E-01	NOT IDENT.
AS-74	5.826E-02	6.128E-02	1.129E-01	NOT IDENT.
SE-75	-2.751E-03	1.547E-02	2.430E-02	FAIL ABUN
BR-77	0.000E+00	5.129E+03	0.000E+00	SHORT HLIF
SR-82	6.834E-02	1.862E-01	2.740E-01	NOT IDENT.
RB-83	-4.688E-03	2.320E-02	4.147E-02	NOT IDENT.
KR-85	0.000E+00	2.063E+00	4.084E+00	NOT IDENT.
SR-85	0.000E+00	1.397E-02	2.765E-02	NOT IDENT.
RB-86	2.854E-01	4.237E-01	7.824E-01	NOT IDENT.
Y-88	6.626E-03	1.089E-02	2.060E-02	FAIL ABUN
Y-91	-3.767E+00	6.001E+00	1.017E+01	NOT IDENT.
NB-94	-2.747E-03	8.870E-03	1.529E-02	NOT IDENT.
NB-95	2.711E-02	1.574E-02	2.728E-02	NOT IDENT.
NB-95M	1.375E-02	4.602E-02	7.417E-02	NOT IDENT.
ZR-95	1.131E-02	3.355E-02	4.191E-02	FAIL ABUN
NB-97	0.000E+00	5.812E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	5.283E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.024E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.377E-03	9.088E-03	1.548E-02	NOT IDENT.
RH-102	4.071E-03	1.407E-02	2.523E-02	FAIL ABUN
RU-103	1.126E-02	1.703E-02	3.143E-02	FAIL ABUN
RH-106	-6.468E-02	8.680E-02	1.490E-01	NOT IDENT.
RU-106	-6.468E-02	8.680E-02	1.490E-01	NOT IDENT.
AG-108M	1.555E-04	8.981E-03	1.640E-02	NOT IDENT.
AG-110M	1.485E-02	1.231E-02	2.363E-02	NOT IDENT.
SN-113	-5.470E-03	1.451E-02	2.648E-02	NOT IDENT.
CD-115	0.000E+00	4.457E+03	0.000E+00	SHORT HLIF
SN-117M	-2.018E-02	4.756E-02	8.341E-02	NOT IDENT.
TE-123M	-4.465E-03	8.204E-03	1.507E-02	NOT IDENT.
SB-124	3.315E-03	2.701E-02	4.605E-02	NOT IDENT.
SB-125	-2.482E-03	2.735E-02	4.987E-02	FAIL ABUN
TE-125M	2.441E+00	3.628E+00	6.351E+00	NOT IDENT.
I-126	1.031E-01	2.299E-01	3.619E-01	FAIL ABUN
SB-126	1.021E-01	1.414E-01	2.374E-01	NOT IDENT.
SB-127	1.325E+01	2.315E+01	4.162E+01	NOT IDENT.
I-131	6.667E-02	2.394E-01	4.478E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.046E+01	0.000E+00	SHORT HLIF
BA-133	-6.559E-03	1.231E-02	1.980E-02	FAIL ABUN
I-133	0.000E+00	2.113E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.428E-02	2.156E-02	FAIL ABUN
CS-135	0.000E+00	4.693E-02	7.892E-02	NOT IDENT.
I-135	0.000E+00	5.182E+40	0.000E+00	SHORT HLIF
CS-136	-2.520E-02	8.353E-02	1.468E-01	FAIL ABUN
CE-139	-9.283E-03	8.340E-03	1.507E-02	NOT IDENT.
BA-140	-1.655E-01	2.593E-01	4.546E-01	NOT IDENT.
LA-140	8.695E-03	6.806E-02	1.092E-01	FAIL ABUN
CE-141	1.833E-02	2.937E-02	4.999E-02	NOT IDENT.
CE-143	0.000E+00	5.171E+06	0.000E+00	SHORT HLIF
PM-144	2.447E-03	9.267E-03	1.641E-02	NOT IDENT.
PR-144	1.818E-01	7.019E-01	1.243E+00	NOT IDENT.
PM-146	-1.347E-03	1.462E-02	2.385E-02	NOT IDENT.
ND-147	2.534E-01	6.868E-01	1.249E+00	FAIL ABUN
PM-149	0.000E+00	4.243E+04	0.000E+00	SHORT HLIF
EU-150	-3.239E-03	8.625E-03	1.309E-02	FAIL ABUN
EU-152	-8.313E-03	2.706E-02	4.844E-02	FAIL ABUN
GD-153	2.377E-02	3.072E-02	4.399E-02	NOT IDENT.
EU-154	-1.912E-02	2.631E-02	4.398E-02	NOT IDENT.

TB-160	-4.379E-02	3.729E-02	6.384E-02	FAIL ABUN
HO-166M	-2.319E-03	1.572E-02	2.730E-02	FAIL ABUN
TM-171	7.135E-01	7.833E+00	1.435E+01	NOT IDENT.
HF-172	-6.648E-03	5.552E-02	9.401E-02	FAIL ABUN
LU-172	-5.839E-04	1.532E-02	2.714E-02	FAIL ABUN
LU-176	2.693E-04	8.570E-03	1.306E-02	FAIL ABUN
HF-181	-2.528E-02	1.938E-02	3.363E-02	FAIL ABUN
TA-182	3.409E-02	4.737E-02	8.620E-02	FAIL ABUN
RE-183	-1.578E-02	9.289E-02	1.677E-01	NOT IDENT.
RE-184	2.362E-02	6.297E-02	8.916E-02	NOT IDENT.
W-188	-1.238E+00	2.803E+00	4.313E+00	FAIL ABUN
IR-192	7.971E-03	1.227E-02	2.186E-02	FAIL ABUN
HG-203	1.291E-03	1.794E-02	2.605E-02	NOT IDENT.
BI-207	-1.948E-03	1.137E-02	2.012E-02	FAIL ABUN
PB-210	-1.103E+00	2.395E+00	3.721E+00	NOT IDENT.
PB-211	-1.463E-01	2.353E-01	3.714E-01	NOT IDENT.
RN-219	7.870E-03	1.170E-01	2.155E-01	FAIL ABUN
AC-227	-2.134E-02	6.852E-02	1.211E-01	FAIL ABUN
TH-227	-2.134E-02	6.852E-02	1.211E-01	FAIL ABUN
TH-231	-1.369E-01	1.933E-01	3.123E-01	FAIL ABUN
PA-234	1.570E-02	7.806E-02	1.240E-01	FAIL ABUN
PA-234M	-2.822E-02	1.284E+00	1.954E+00	NOT IDENT.
NP-238	0.000E+00	9.644E+03	0.000E+00	SHORT HLIF
NP-239	-2.645E-02	7.529E-02	1.276E-01	FAIL ABUN
PU-239	0.000E+00	1.662E+02	1.764E+02	FAIL ABUN
AM-241	-6.931E-04	5.992E-02	9.957E-02	NOT IDENT.
CM-243	1.848E-02	3.695E-02	5.200E-02	FAIL ABUN
BK-247	-4.513E-03	2.434E-02	3.821E-02	FAIL ABUN
CM-247	9.866E-04	1.076E-02	1.982E-02	FAIL ABUN
CF-249	7.865E-03	1.138E-02	2.137E-02	NOT IDENT.
CF-251	3.000E-03	3.344E-02	6.162E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1859	10.66*	1.146E+00	5.661E+00	5.661E+00	5.42
MN-54	834.85	67	99.98*	1.799E+00	1.384E-02	1.507E-02	66.61
CD-109	88.03	1205	3.70*	4.862E+00	2.493E+00	2.641E+00	16.52
SN-126	64.28	63	9.60	2.278E+00	1.066E-01	1.066E-01	342.94
	86.94	1205	8.90	4.862E+00	1.036E+00	1.036E+00	16.52
	87.57	1205	37.00*	4.862E+00	2.493E-01	2.493E-01	16.52
BA-137M	661.66	7339	89.90*	2.158E+00	1.408E+00	1.412E+00	2.90
CS-137	661.66	7339	85.10*	2.158E+00	1.488E+00	1.491E+00	2.90
CE-144	80.12	-----	1.36	4.226E+00	-----	Line Not Found	-----
	133.52	144	11.09*	6.348E+00	7.595E-02	8.340E-02	110.19
PM-147	121.22	77	0.00*	6.268E+00	1.595E+02	1.640E+02	186.82
EU-155	86.55	1205	30.70	4.862E+00	3.005E-01	3.051E-01	16.52
	105.31	196	21.10*	5.905E+00	5.865E-02	5.956E-02	84.30
TL-208	277.37	249	6.60	4.350E+00	3.224E-01	3.224E-01	60.77
	583.19	1648	85.00*	2.383E+00	3.028E-01	3.028E-01	8.39
	860.56	231	12.50	1.759E+00	3.903E-01	3.903E-01	29.46
BI-211	72.87	-----	1.23	3.448E+00	-----	Line Not Found	-----
	351.06	2788	12.92*	3.589E+00	2.238E+00	2.238E+00	7.42
BI-212	727.33	384	6.67*	2.005E+00	1.070E+00	1.070E+00	21.33
	785.37	93	1.10	1.887E+00	1.675E+00	1.675E+00	59.27
	1620.50	43	1.47	1.045E+00	1.044E+00	1.044E+00	76.78
PB-212	74.82	1717	10.28	3.671E+00	1.693E+00	1.693E+00	11.09
	77.11	2610	17.10	3.921E+00	1.449E+00	1.449E+00	7.60
	238.63	5845	43.60*	4.883E+00	1.022E+00	1.022E+00	3.63
	300.09	306	3.30	4.089E+00	8.454E-01	8.454E-01	39.49
BI-214	609.32	1751	45.49*	2.302E+00	6.224E-01	6.225E-01	8.22
	1120.29	401	14.92	1.429E+00	6.992E-01	6.992E-01	21.46
	1764.49	384	15.30	9.661E-01	9.669E-01	9.669E-01	11.11
PB-214	74.82	1717	5.80	3.671E+00	3.001E+00	3.002E+00	11.09
	77.11	2610	9.70	3.921E+00	2.555E+00	2.555E+00	7.60
	87.09	1205	3.41	4.862E+00	2.705E+00	2.705E+00	16.52
	242.00	1291	7.25	4.839E+00	1.370E+00	1.370E+00	15.70
	295.22	1593	18.42	4.142E+00	7.774E-01	7.774E-01	10.06
	351.93	2788	35.60*	3.589E+00	8.123E-01	8.123E-01	7.42
RN-222	609.32	1751	45.49*	2.302E+00	6.224E-01	6.225E-01	8.22
	1120.29	401	14.92	1.429E+00	6.992E-01	6.992E-01	21.46
	1764.49	384	15.30	9.661E-01	9.669E-01	9.669E-01	11.11
RA-223	81.07	-----	15.00	4.319E+00	-----	Line Not Found	-----
	83.79	511	24.70	4.617E+00	1.668E-01	1.668E-01	38.53
	94.56	277	8.67	5.378E+00	2.210E-01	2.210E-01	65.51
	144.24	11	3.27	6.310E+00	1.911E-02	1.911E-02	1583.45
	154.21	273	5.70	6.211E+00	2.872E-01	2.872E-01	56.05
	269.46	500	13.90	4.444E+00	3.011E-01	3.011E-01	33.44
	323.87	-----	3.99*	3.841E+00	-----	Line Not Found	-----
	338.28	1141	2.84	3.708E+00	4.033E+00	4.033E+00	14.54
RA-224	240.99	1291	4.10*	4.839E+00	2.422E+00	2.422E+00	15.70
RA-226	609.32	1751	45.49*	2.302E+00	6.224E-01	6.225E-01	8.22

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AC-228	1120.29	401	14.92	1.429E+00	6.992E-01	6.992E-01	21.46
	1764.49	384	15.30	9.661E-01	9.669E-01	9.669E-01	11.11
	105.21	196	1.10	5.905E+00	1.125E+00	1.125E+00	84.30
	338.32	1141	11.27	3.708E+00	1.016E+00	1.016E+00	14.54
	794.95	172	4.25	1.871E+00	8.030E-01	8.030E-01	35.23
RA-228	835.71	67	1.61	1.799E+00	8.592E-01	8.592E-01	66.61
	911.20	1046	25.80*	1.682E+00	8.973E-01	8.973E-01	9.31
	968.97	639	15.80	1.603E+00	9.384E-01	9.384E-01	11.82
	105.21	196	1.10	5.905E+00	1.125E+00	1.125E+00	84.30
	338.32	1141	11.27	3.708E+00	1.016E+00	1.016E+00	14.54
TH-228	794.95	172	4.25	1.871E+00	8.030E-01	8.030E-01	35.23
	835.71	67	1.61	1.799E+00	8.592E-01	8.592E-01	66.61
	911.20	1046	25.80*	1.682E+00	8.973E-01	8.973E-01	9.31
	968.97	639	15.80	1.603E+00	9.384E-01	9.384E-01	11.82
	74.82	1717	10.28	3.671E+00	1.693E+00	1.693E+00	11.09
TH-229	77.11	2610	17.10	3.921E+00	1.449E+00	1.449E+00	7.60
	238.63	5845	43.60*	4.883E+00	1.022E+00	1.022E+00	3.63
	300.09	306	3.30	4.089E+00	8.454E-01	8.454E-01	39.49
	85.43	511	14.70	4.617E+00	2.802E-01	2.802E-01	38.53
	88.47	1205	24.00	4.862E+00	3.843E-01	3.843E-01	16.52
TH-230	193.51	-----	4.41*	5.613E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.322E+00	-----	Line Not Found	-----
	609.32	1751	45.49*	2.302E+00	6.224E-01	6.224E-01	8.22
	1120.29	401	14.92	1.429E+00	6.992E-01	6.992E-01	21.46
	1764.49	384	15.30	9.661E-01	9.669E-01	9.669E-01	11.11
PA-231	283.69	-----	1.70	4.275E+00	-----	Line Not Found	-----
TH-232	301.36	306	5.35*	4.089E+00	5.215E-01	5.215E-01	39.49
	105.21	196	1.10	5.905E+00	1.125E+00	1.125E+00	84.30
	338.32	1141	11.27	3.708E+00	1.016E+00	1.016E+00	14.54
	835.71	67	1.61	1.799E+00	8.592E-01	8.592E-01	66.61
	911.20	1046	25.80*	1.682E+00	8.973E-01	8.973E-01	9.31
PA-233	968.97	639	15.80	1.603E+00	9.384E-01	9.384E-01	11.82
	300.13	306	6.63	4.089E+00	4.208E-01	4.208E-01	39.49
	311.90	61	38.50*	3.966E+00	1.498E-02	1.498E-02	160.78
	340.48	-----	4.45	3.687E+00	-----	Line Not Found	-----
	63.29	63	3.70*	2.278E+00	2.767E-01	2.767E-01	342.94
U-234	92.59	1203	4.23	5.261E+00	2.012E+00	2.012E+00	20.90
	609.32	1751	45.49*	2.302E+00	6.224E-01	6.224E-01	8.22
	1120.29	401	14.92	1.429E+00	6.992E-01	6.992E-01	21.46
	1764.49	384	15.30	9.661E-01	9.669E-01	9.669E-01	11.11
	89.96	886	3.47	5.068E+00	1.876E+00	1.876E+00	20.50
U-235	93.35	1203	5.60	5.261E+00	1.519E+00	1.519E+00	20.90
	143.76	11	10.96*	6.310E+00	5.700E-03	5.700E-03	1583.45
	163.33	-----	5.08	6.096E+00	-----	Line Not Found	-----
	185.72	662	57.20	5.742E+00	7.507E-02	7.507E-02	35.41
	205.31	-----	5.01	5.415E+00	-----	Line Not Found	-----
NP-237	94.65	277	10.56	5.378E+00	1.814E-01	1.814E-01	65.51
	98.43	345	16.90	5.630E+00	1.348E-01	1.348E-01	58.37
	300.13	306	6.63	4.089E+00	4.208E-01	4.208E-01	39.49

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	311.90	61	38.50*	3.966E+00	1.498E-02	1.498E-02	160.78
	340.48	-----	4.45	3.687E+00	-----	Line Not Found	-----
U-238	63.29	63	3.70*	2.278E+00	2.767E-01	2.767E-01	342.94
	92.59	1203	4.23	5.261E+00	2.012E+00	2.012E+00	20.90
AM-243	43.53	99	5.90	1.391E-01	4.493E+00	4.493E+00	138.08
	74.66	1717	67.20*	3.671E+00	2.591E-01	2.591E-01	11.09
ANH-511	511.00	723	100.00*	2.647E+00	1.016E-01	1.016E-01	29.65

Flag: "*" = Keyline

Total number of lines in spectrum 78
Number of unidentified lines 23
Number of lines tentatively identified by NID 55 70.51%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.661E+00	5.661E+00	0.307E+00	5.42	
MN-54	312.05D	1.09	1.384E-02	1.507E-02	1.004E-02	66.61	
CD-109	461.40D	1.06	2.493E+00	2.641E+00	0.436E+00	16.52	
SN-126	2.30E+05Y	1.00	2.493E-01	2.493E-01	0.412E-01	16.52	
BA-137M	30.08Y	1.00	1.408E+00	1.412E+00	0.041E+00	2.90	
CS-137	30.08Y	1.00	1.488E+00	1.491E+00	0.043E+00	2.90	
CE-144	284.91D	1.10	7.595E-02	8.340E-02	9.190E-02	110.19	
PM-147	2.62Y	1.03	1.595E+02	1.640E+02	3.063E+02	186.82	
EU-155	4.75Y	1.02	5.865E-02	5.956E-02	5.021E-02	84.30	
TL-208	1.41E+10Y	1.00	3.028E-01	3.028E-01	0.254E-01	8.39	
BI-211	7.04E+08Y	1.00	2.238E+00	2.238E+00	0.166E+00	7.42	
BI-212	1.41E+10Y	1.00	1.070E+00	1.070E+00	0.228E+00	21.33	
PB-212	1.41E+10Y	1.00	1.022E+00	1.022E+00	0.037E+00	3.63	
BI-214	1600.00Y	1.00	6.224E-01	6.225E-01	0.512E-01	8.22	
PB-214	1600.00Y	1.00	8.123E-01	8.123E-01	0.603E-01	7.42	
RN-222	1600.00Y	1.00	6.224E-01	6.225E-01	0.512E-01	8.22	
RA-223	7.04E+08Y	1.00	1.668E-01	1.668E-01	0.643E-01	38.53	K
RA-224	1.41E+10Y	1.00	2.422E+00	2.422E+00	0.380E+00	15.70	
RA-226	1600.00Y	1.00	6.224E-01	6.225E-01	0.512E-01	8.22	
AC-228	1.41E+10Y	1.00	8.973E-01	8.973E-01	0.835E-01	9.31	
RA-228	1.41E+10Y	1.00	8.973E-01	8.973E-01	0.835E-01	9.31	
TH-228	1.41E+10Y	1.00	1.022E+00	1.022E+00	0.037E+00	3.63	
TH-229	7340.00Y	1.00	3.843E-01	3.843E-01	0.635E-01	16.52	K
TH-230	7.54E+04Y	1.00	6.224E-01	6.224E-01	0.512E-01	8.22	
PA-231	7.04E+08Y	1.00	5.215E-01	5.215E-01	2.059E-01	39.49	
TH-232	1.41E+10Y	1.00	8.973E-01	8.973E-01	0.835E-01	9.31	
PA-233	2.14E+06Y	1.00	1.498E-02	1.498E-02	2.409E-02	160.78	
TH-234	4.47E+09Y	1.00	2.767E-01	2.767E-01	9.488E-01	342.94	
U-234	2.45E+05Y	1.00	6.224E-01	6.224E-01	0.512E-01	8.22	
U-235	7.04E+08Y	1.00	5.700E-03	5.700E-03	90.26E-03	1583.45	
NP-237	2.14E+06Y	1.00	1.498E-02	1.498E-02	2.409E-02	160.78	
U-238	4.47E+09Y	1.00	2.767E-01	2.767E-01	9.488E-01	342.94	
AM-243	7370.00Y	1.00	2.591E-01	2.591E-01	0.287E-01	11.09	
ANH-511	1.00E+09Y	1.00	1.016E-01	1.016E-01	0.301E-01	29.65	
Total Activity :			1.876E+02	1.923E+02			

Grand Total Activity : 1.876E+02 1.923E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.17	404	1971	0.92	258.08	254	8	7.15E-03	45.1	6.34E+00	T
0	209.22	448	1533	0.96	418.23	415	8	8.34E-03	38.4	5.35E+00	
0	327.97	300	961	1.19	655.85	652	9	5.87E-03	42.4	3.80E+00	T
0	409.37	126	618	1.48	818.71	815	8	2.54E-03	76.1	3.17E+00	
0	462.62	217	945	1.02	925.24	920	11	4.43E-03	64.1	2.87E+00	T
0	562.01	86	393	1.57	1124.12	1121	9	1.80E-03	89.9	2.45E+00	T
0	755.25	21	265	0.68	1510.78	1506	10	4.60E-04	****	1.95E+00	T
0	767.96	136	340	1.59	1536.21	1530	11	2.96E-03	57.1	1.92E+00	T
0	771.88	63	192	1.59	1544.05	1541	8	1.38E-03	82.7	1.91E+00	T
0	802.25	1	203	1.84	1604.82	1602	9	2.05E-05	****	1.86E+00	T
0	806.46	49	177	3.28	1613.25	1610	10	1.07E-03	****	1.85E+00	
0	897.21	35	226	1.52	1794.84	1789	12	7.78E-04	****	1.70E+00	T
0	933.34	93	134	1.38	1867.13	1863	9	2.09E-03	50.0	1.65E+00	
0	950.17	52	151	1.67	1900.81	1895	11	1.17E-03	97.7	1.63E+00	T
3	964.15	281	159	1.89	1928.79	1923	21	6.30E-03	21.6	1.61E+00	T
0	991.84	30	104	1.55	1984.20	1979	9	6.79E-04	****	1.57E+00	
0	1195.70	11	121	1.29	2392.12	2391	8	2.64E-04	****	1.36E+00	
0	1212.99	23	146	0.67	2426.71	2422	11	5.25E-04	****	1.34E+00	
0	1237.41	210	171	2.23	2475.57	2467	16	4.87E-03	31.1	1.32E+00	T
0	1247.36	43	79	2.07	2495.48	2492	8	9.88E-04	79.3	1.31E+00	
0	1292.54	30	32	1.56	2585.90	2583	6	7.06E-04	70.2	1.27E+00	T
0	1326.16	48	72	2.86	2653.16	2647	12	1.12E-03	76.1	1.24E+00	
0	1333.64	36	117	4.22	2668.14	2661	14	8.51E-04	****	1.24E+00	T
0	1377.46	100	138	2.01	2755.82	2745	21	2.34E-03	62.1	1.21E+00	
0	1391.08	13	34	1.46	2783.08	2780	7	3.14E-04	****	1.20E+00	
0	1401.41	51	81	2.95	2803.75	2797	13	1.19E-03	78.3	1.19E+00	
0	1407.41	72	59	1.92	2815.75	2810	12	1.69E-03	48.5	1.18E+00	T
0	1413.71	38	27	2.31	2828.37	2824	10	9.08E-04	59.4	1.18E+00	
0	1430.12	30	62	2.82	2861.21	2855	11	7.17E-04	****	1.17E+00	
1	1494.68	42	54	2.12	2990.39	2984	47	1.00E-03	84.1	1.12E+00	
1	1508.67	45	69	2.13	3018.39	2984	47	1.08E-03	78.9	1.11E+00	
1	1511.48	29	67	1.94	3024.00	2984	47	6.86E-04	****	1.11E+00	
0	1587.49	74	68	1.44	3176.11	3171	10	1.77E-03	46.8	1.06E+00	
0	1591.88	50	40	2.05	3184.90	3181	9	1.21E-03	54.3	1.06E+00	
0	1629.93	71	47	2.13	3261.04	3255	13	1.70E-03	45.6	1.04E+00	
0	1683.77	15	40	4.31	3368.79	3361	13	3.66E-04	****	1.01E+00	
0	1728.58	83	65	0.72	3458.45	3452	16	2.02E-03	47.3	9.84E-01	
0	1846.86	74	39	2.13	3695.15	3687	17	1.82E-03	44.2	9.24E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561384.CNF;1
Acquisition date : 24-JUN-2016 15:54:22 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.32 Half life ratio : *****
Sample date : 17-MAY-2016 10:20:00 Nuclide Library : SOLID
Sample ID : G1203561384 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6808E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.371E-02
MN-54	8.337E-03
CD-109	1.816E-01
SN-126	1.726E-02
BA-137M	8.132E-03
CS-137	8.591E-03
CE-144	4.825E-02
PM-147	1.830E+02
EU-155	2.561E-02
TL-208	7.852E-03
BI-211	4.788E-02
BI-212	9.797E-02
PB-212	1.307E-02
BI-214	1.655E-02
PB-214	3.880E-02
RN-222	1.655E-02
RA-223	1.528E-01
RA-224	1.401E-01
RA-226	1.655E-02
AC-228	2.690E-02
RA-228	2.690E-02
TH-228	1.307E-02
TH-229	1.243E-01
TH-230	1.655E-02
PA-231	1.107E-01
TH-232	2.690E-02
PA-233	1.521E-02
TH-234	3.939E-01
U-234	1.655E-02
U-235	4.608E-02
NP-237	1.521E-02
U-238	3.939E-01
AM-243	1.389E-02
ANH-511	6.847E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.178E-01	NOT IDENT.
NA-22	7.461E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.273E-03	NOT IDENT.
SC-46	9.158E-03	FAIL ABUN
V-48	3.767E-02	NOT IDENT.
CR-51	1.665E-01	NOT IDENT.
CO-56	1.047E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	6.487E-03	NOT IDENT.
CO-58	8.962E-03	NOT IDENT.
FE-59	2.380E-02	FAIL ABUN
CO-60	8.183E-03	FAIL ABUN
ZN-65	1.824E-02	NOT IDENT.
GE-68	2.669E-01	NOT IDENT.
AS-73	3.894E-01	NOT IDENT.
AS-74	5.479E-02	NOT IDENT.
SE-75	1.190E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.319E-01	NOT IDENT.
RB-83	2.013E-02	NOT IDENT.
KR-85	1.997E+00	NOT IDENT.
SR-85	1.352E-02	NOT IDENT.
RB-86	3.745E-01	NOT IDENT.
Y-88	9.598E-03	FAIL ABUN
Y-91	4.855E+00	NOT IDENT.
NB-94	7.397E-03	NOT IDENT.
NB-95	1.323E-02	NOT IDENT.
NB-95M	3.643E-02	NOT IDENT.
ZR-95	2.022E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.614E-03	NOT IDENT.
RH-102	1.220E-02	FAIL ABUN
RU-103	1.530E-02	FAIL ABUN
RH-106	7.203E-02	NOT IDENT.
RU-106	7.203E-02	NOT IDENT.
AG-108M	8.010E-03	NOT IDENT.
AG-110M	1.136E-02	NOT IDENT.
SN-113	1.293E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.100E-02	NOT IDENT.
TE-123M	7.405E-03	NOT IDENT.
SB-124	2.138E-02	NOT IDENT.
SB-125	2.435E-02	FAIL ABUN
TE-125M	3.123E+00	NOT IDENT.
I-126	1.752E-01	FAIL ABUN
SB-126	1.146E-01	NOT IDENT.
SB-127	2.013E+01	NOT IDENT.
I-131	2.188E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	9.660E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.045E-02	FAIL ABUN
CS-135	3.873E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.017E-02	FAIL ABUN
CE-139	7.403E-03	NOT IDENT.
BA-140	2.205E-01	NOT IDENT.
LA-140	5.056E-02	FAIL ABUN
CE-141	2.460E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
PM-144	7.936E-03	NOT IDENT.
PR-144	6.009E-01	NOT IDENT.
PM-146	1.165E-02	NOT IDENT.
ND-147	6.073E-01	FAIL ABUN
PM-149	0.000E+00	SHORT HLIF
EU-150	6.400E-03	FAIL ABUN
EU-152	2.368E-02	FAIL ABUN
GD-153	2.162E-02	NOT IDENT.
EU-154	2.085E-02	NOT IDENT.
TB-160	3.049E-02	FAIL ABUN

HO-166M	1.318E-02	FAIL ABUN
TM-171	7.044E+00	NOT IDENT.
HF-172	4.623E-02	FAIL ABUN
LU-172	1.299E-02	FAIL ABUN
LU-176	6.390E-03	FAIL ABUN
HF-181	1.638E-02	FAIL ABUN
TA-182	4.132E-02	FAIL ABUN
RE-183	8.237E-02	NOT IDENT.
RE-184	4.290E-02	NOT IDENT.
W-188	2.111E+00	FAIL ABUN
IR-192	1.070E-02	FAIL ABUN
HG-203	1.276E-02	NOT IDENT.
BI-207	9.602E-03	FAIL ABUN
PB-210	1.827E+00	NOT IDENT.
PB-211	1.814E-01	NOT IDENT.
RN-219	1.053E-01	FAIL ABUN
AC-227	5.937E-02	FAIL ABUN
TH-227	5.937E-02	FAIL ABUN
TH-231	1.528E-01	FAIL ABUN
PA-234	5.940E-02	FAIL ABUN
PA-234M	9.381E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	6.272E-02	FAIL ABUN
PU-239	8.689E+01	FAIL ABUN
AM-241	4.894E-02	NOT IDENT.
CM-243	2.556E-02	FAIL ABUN
BK-247	1.872E-02	FAIL ABUN
CM-247	9.687E-03	FAIL ABUN
CF-249	1.045E-02	NOT IDENT.
CF-251	3.029E-02	NOT IDENT.

GEL Laboratories LLC
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Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561384.CNF;1
Acquisition date : 24-JUN-2016 15:54:22 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.32 Half life ratio : *****
Sample date : 17-MAY-2016 10:20:00 Nuclide Library : SOLID
Sample ID : G1203561384 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.6808E+02 GRAM
Quantity Err(%) : 1.1899E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 3-JUN-2016 07:32:22 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.661E+00	4.213E-01	4.213E-01
MN-54	1.507E-02	9.859E-03	9.859E-03
CD-109	1.882E+00	4.702E-01	4.702E-01
SN-126	1.776E-01	4.337E-02	4.337E-02
BA-137M	1.412E+00	7.266E-02	7.266E-02
CS-137	1.491E+00	7.662E-02	7.662E-02
CE-144	8.340E-02	9.017E-02	9.017E-02
PM-147	1.640E+02	3.003E+02	3.003E+02
EU-155	5.956E-02	4.938E-02	4.938E-02
TL-208	3.028E-01	2.802E-02	2.802E-02
BI-211	9.600E-02	2.968E-01	2.968E-01
BI-212	1.070E+00	2.300E-01	2.300E-01
PB-212	1.022E+00	6.501E-02	6.501E-02
BI-214	6.225E-01	5.678E-02	5.678E-02
PB-214	8.123E-01	6.799E-02	6.799E-02
RN-222	6.225E-01	5.678E-02	5.678E-02
RA-223	-1.369E-01	1.935E-01	1.935E-01
RA-224	1.047E+00	4.105E-01	4.105E-01
RA-226	6.225E-01	5.678E-02	5.678E-02
AC-228	8.973E-01	9.385E-02	9.385E-02
RA-228	8.973E-01	9.385E-02	9.385E-02
TH-228	1.022E+00	6.501E-02	6.501E-02
TH-229	7.091E-02	1.370E-01	1.370E-01
TH-230	6.224E-01	5.677E-02	5.677E-02
PA-231	5.215E-01	2.305E-01	2.305E-01
TH-232	8.973E-01	9.385E-02	9.385E-02
PA-233	1.498E-02	2.362E-02	2.362E-02
TH-234	2.767E-01	9.319E-01	9.319E-01
U-234	6.224E-01	5.677E-02	5.677E-02
U-235	5.700E-03	8.846E-02	8.846E-02
NP-237	1.498E-02	2.362E-02	2.362E-02
U-238	2.767E-01	9.319E-01	9.319E-01
AM-243	1.920E-01	3.238E-02	3.238E-02
ANH-511	1.016E-01	2.982E-02	2.982E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.275E-02	1.331E-01	1.332E-01	NOT IDENT.
NA-22	-6.709E-03	9.406E-03	9.880E-03	NOT IDENT.
NA-24	3.593E+15	3.220E+16	0.000E+00	SHORT HLIF
AL-26	2.630E-03	7.223E-03	7.320E-03	NOT IDENT.
SC-46	-1.171E-02	1.146E-02	1.262E-02	FAIL ABUN
V-48	1.450E-02	4.296E-02	4.345E-02	NOT IDENT.
CR-51	1.147E-01	1.786E-01	1.859E-01	NOT IDENT.
CO-56	8.758E-03	1.156E-02	1.221E-02	FAIL ABUN
MN-56	1.000E+41	1.321E+41	0.000E+00	SHORT HLIF
CO-57	-4.781E-04	7.757E-03	7.760E-03	NOT IDENT.
CO-58	-7.658E-03	1.228E-02	1.276E-02	NOT IDENT.
FE-59	-1.213E-02	2.874E-02	2.926E-02	FAIL ABUN
CO-60	1.107E-02	1.411E-02	1.497E-02	FAIL ABUN
ZN-65	5.241E-03	2.451E-02	2.462E-02	NOT IDENT.
GE-68	2.299E-01	3.007E-01	3.180E-01	NOT IDENT.
AS-73	3.866E-01	4.321E-01	4.659E-01	NOT IDENT.
AS-74	5.826E-02	6.145E-02	6.683E-02	NOT IDENT.
SE-75	-2.751E-03	1.547E-02	1.552E-02	FAIL ABUN
BR-77	1.442E+05	1.604E+05	1.731E+05	SHORT HLIF
SR-82	6.834E-02	1.863E-01	1.888E-01	NOT IDENT.
RB-83	-4.688E-03	2.320E-02	2.330E-02	NOT IDENT.
KR-85	7.372E+00	2.084E+00	3.923E+00	NOT IDENT.
SR-85	4.981E-02	1.412E-02	2.652E-02	NOT IDENT.
RB-86	2.854E-01	4.239E-01	4.430E-01	NOT IDENT.
Y-88	6.626E-03	1.090E-02	1.130E-02	FAIL ABUN
Y-91	-3.767E+00	6.003E+00	6.238E+00	NOT IDENT.
NB-94	-2.747E-03	8.871E-03	8.957E-03	NOT IDENT.
NB-95	2.711E-02	1.578E-02	1.996E-02	NOT IDENT.
NB-95M	1.375E-02	4.603E-02	4.644E-02	NOT IDENT.
ZR-95	1.131E-02	3.356E-02	3.394E-02	FAIL ABUN
NB-97	1.000E+41	5.827E+40	0.000E+00	SHORT HLIF
ZR-97	1.781E+16	5.332E+15	9.638E+15	SHORT HLIF
MO-99	-4.500E+02	1.024E+03	1.044E+03	SHORT HLIF
TC-99M	1.000E+41	1.009E+42	0.000E+00	SHORT HLIF
RH-101	1.377E-03	9.092E-03	9.113E-03	NOT IDENT.
RH-102	4.071E-03	1.407E-02	1.419E-02	FAIL ABUN
RU-103	1.126E-02	1.704E-02	1.778E-02	FAIL ABUN
RH-106	-6.468E-02	8.689E-02	9.165E-02	NOT IDENT.
RU-106	-6.468E-02	8.689E-02	9.165E-02	NOT IDENT.
AG-108M	1.555E-04	8.981E-03	8.981E-03	NOT IDENT.
AG-110M	1.485E-02	1.234E-02	1.404E-02	NOT IDENT.
SN-113	-5.470E-03	1.451E-02	1.472E-02	NOT IDENT.
CD-115	8.315E+02	4.458E+03	4.473E+03	SHORT HLIF
SN-117M	-2.018E-02	4.757E-02	4.843E-02	NOT IDENT.
TE-123M	-4.465E-03	8.206E-03	8.450E-03	NOT IDENT.
SB-124	3.315E-03	2.701E-02	2.705E-02	NOT IDENT.
SB-125	-2.482E-03	2.735E-02	2.737E-02	FAIL ABUN
TE-125M	2.441E+00	3.631E+00	3.794E+00	NOT IDENT.
I-126	1.031E-01	2.300E-01	2.347E-01	FAIL ABUN
SB-126	1.021E-01	1.418E-01	1.491E-01	NOT IDENT.
SB-127	1.325E+01	2.327E+01	2.403E+01	NOT IDENT.
I-131	6.667E-02	2.394E-01	2.413E-01	NOT IDENT.
I-132	1.000E+41	5.275E+41	0.000E+00	SHORT HLIF
TE-132	1.238E+01	3.048E+01	3.099E+01	SHORT HLIF
BA-133	-6.559E-03	1.231E-02	1.266E-02	FAIL ABUN
I-133	-6.998E+10	2.120E+11	2.143E+11	SHORT HLIF
CS-134	4.137E-02	1.439E-02	2.356E-02	FAIL ABUN
CS-135	9.035E-02	4.733E-02	6.244E-02	NOT IDENT.
I-135	-1.001E+40	5.255E+40	0.000E+00	SHORT HLIF
CS-136	-2.520E-02	8.356E-02	8.433E-02	FAIL ABUN
CE-139	-9.283E-03	8.547E-03	9.516E-03	NOT IDENT.
BA-140	-1.655E-01	2.594E-01	2.699E-01	NOT IDENT.
LA-140	8.695E-03	6.806E-02	6.817E-02	FAIL ABUN
CE-141	1.833E-02	2.938E-02	3.052E-02	NOT IDENT.
CE-143	2.518E+07	5.318E+06	1.253E+07	SHORT HLIF
PM-144	2.447E-03	9.267E-03	9.333E-03	NOT IDENT.
PR-144	1.818E-01	7.019E-01	7.067E-01	NOT IDENT.
PM-146	-1.347E-03	1.462E-02	1.463E-02	NOT IDENT.
ND-147	2.534E-01	6.869E-01	6.964E-01	FAIL ABUN
PM-149	-3.269E+04	4.266E+04	4.514E+04	SHORT HLIF
EU-150	-3.239E-03	8.627E-03	8.749E-03	FAIL ABUN
EU-152	-8.313E-03	2.706E-02	2.732E-02	FAIL ABUN
GD-153	2.377E-02	3.075E-02	3.257E-02	NOT IDENT.
EU-154	-1.912E-02	2.632E-02	2.769E-02	NOT IDENT.

TB-160	-4.379E-02	3.737E-02	4.227E-02	FAIL ABUN
HO-166M	-2.319E-03	1.572E-02	1.576E-02	FAIL ABUN
TM-171	7.135E-01	7.833E+00	7.839E+00	NOT IDENT.
HF-172	-6.648E-03	5.553E-02	5.561E-02	FAIL ABUN
LU-172	-5.839E-04	1.532E-02	1.532E-02	FAIL ABUN
LU-176	2.693E-04	8.570E-03	8.570E-03	FAIL ABUN
HF-181	-2.528E-02	1.940E-02	2.250E-02	FAIL ABUN
TA-182	3.409E-02	4.738E-02	4.981E-02	FAIL ABUN
RE-183	-1.578E-02	9.291E-02	9.318E-02	NOT IDENT.
RE-184	2.362E-02	6.300E-02	6.389E-02	NOT IDENT.
W-188	-1.238E+00	2.807E+00	2.862E+00	FAIL ABUN
IR-192	7.971E-03	1.227E-02	1.279E-02	FAIL ABUN
HG-203	1.291E-03	1.794E-02	1.795E-02	NOT IDENT.
BI-207	-1.948E-03	1.137E-02	1.141E-02	FAIL ABUN
PB-210	-1.103E+00	2.397E+00	2.448E+00	NOT IDENT.
PB-211	-1.463E-01	2.354E-01	2.445E-01	NOT IDENT.
RN-219	7.870E-03	1.170E-01	1.170E-01	FAIL ABUN
AC-227	-2.134E-02	6.858E-02	6.925E-02	FAIL ABUN
TH-227	-2.134E-02	6.858E-02	6.925E-02	FAIL ABUN
TH-231	-1.369E-01	1.935E-01	2.031E-01	FAIL ABUN
PA-234	1.570E-02	8.009E-02	8.041E-02	FAIL ABUN
PA-234M	-2.822E-02	1.284E+00	1.284E+00	NOT IDENT.
NP-238	-3.415E+03	9.645E+03	9.767E+03	SHORT HLIF
NP-239	-2.645E-02	7.532E-02	7.626E-02	FAIL ABUN
PU-239	3.758E+02	1.670E+02	2.379E+02	FAIL ABUN
AM-241	-6.931E-04	5.992E-02	5.992E-02	NOT IDENT.
CM-243	1.848E-02	3.699E-02	3.791E-02	FAIL ABUN
BK-247	-4.513E-03	2.436E-02	2.444E-02	FAIL ABUN
CM-247	9.866E-04	1.076E-02	1.077E-02	FAIL ABUN
CF-249	7.865E-03	1.140E-02	1.194E-02	NOT IDENT.
CF-251	3.000E-03	3.344E-02	3.347E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	908.0253	87.09	1062.6615	136.47	1126.6855
45.60	954.4279	87.57	1063.7863	140.51	0.0000
46.54	913.9525	88.03	1064.8616	143.76	1142.1465
49.72	0.0000	88.34	1065.5846	144.24	1132.3142
51.35	929.5881	88.47	1065.8873	145.44	1154.3463
51.87	905.9778	89.96	1069.3419	152.43	1103.1791
52.39	924.2330	1093.63	1070.9054	153.25	1117.8041
52.97	883.8660	91.11	1071.9868	323.87	1097.2058
53.44	882.7438	92.59	1075.3672	156.02	1048.2341
54.07	924.2130	93.35	1077.0914	158.56	1105.9773
57.36	0.0000	94.56	1079.8229	159.00	1108.8529
57.53	924.0787	94.65	1080.0267	162.33	1020.3880
57.98	1020.3779	94.67	1080.0701	162.66	1025.8457
59.27	1052.3308	94.87	1080.5211	163.33	1047.7942
59.32	1052.4817	97.43	970.9086	165.86	1090.6230
59.54	1053.1477	98.43	1019.9178	176.31	1080.8638
60.96	1073.7931	98.44	1019.9352	176.60	1110.7732
61.17	1018.6544	99.53	1022.1849	177.52	1072.4203
62.93	1168.3013	100.11	1050.3413	181.07	0.0000
63.29	1169.4567	102.03	998.8720	181.52	1147.1948
63.58	1170.3867	103.18	973.9990	184.41	1111.4243
64.28	1239.2189	103.37	1001.5071	143.76	1109.7026
66.73	1155.7913	105.21	1062.3002	193.51	1035.4432
67.24	1203.7123	105.31	1087.9359	197.03	1138.1111
125.81	1232.1471	106.12	1102.3696	198.01	1031.7998
67.75	1232.3723	106.47	1103.1094	201.83	1113.2782
69.67	1261.1996	109.28	1063.7211	203.43	1038.6071
70.83	1211.9165	111.00	1113.5146	205.31	1037.7825
72.81	1252.2367	111.76	0.0000	210.85	944.2703
72.87	1252.4249	114.06	1070.8912	215.65	988.5001
74.66	1257.9822	116.30	0.0000	222.11	910.8283
74.82	1258.4717	116.74	1097.9014	227.09	907.2524
74.97	1258.9386	119.76	1059.0562	227.38	930.2581
77.11	1265.4823	121.12	1128.9052	228.16	0.0000
78.74	1270.4071	121.22	1129.1017	228.18	932.1632
79.69	1273.2535	121.78	1142.8430	116.74	932.1632
80.12	1274.5411	122.06	1122.3319	235.69	967.6435
80.19	1274.7445	122.92	1126.8218	235.96	967.9230
80.57	1275.8740	123.07	1093.3439	238.63	896.7810
81.00	1277.1542	265.00	1097.3171	238.98	0.0000
81.07	1277.3574	125.81	1138.0869	240.99	899.0305
81.75	933.2776	127.23	1132.3260	242.00	899.9886
83.79	1065.2686	127.91	1102.4167	244.70	737.2448
84.00	1065.7740	129.30	1080.8105	252.40	798.6719
85.43	1058.7498	131.20	1012.9006	252.80	806.7762
86.55	1061.3947	133.02	1045.9939	254.15	0.0000
86.79	1061.9570	133.52	1071.1868	256.23	818.5074
86.94	1062.3093	136.00	1061.1340	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	764.1334	355.39	0.0000	584.27	294.2622
264.80	764.2302	356.01	570.1274	595.83	300.9466
265.00	764.3822	364.49	580.3359	427.87	368.8604
268.22	721.0981	366.42	0.0000	602.52	0.0000
269.46	768.2927	372.51	574.6448	604.72	379.4704
270.03	768.7216	375.05	567.3999	607.14	347.4194
271.23	774.1340	377.52	564.7397	609.32	368.3765
273.65	826.9920	356.01	600.0653	610.33	359.9941
276.40	777.9888	388.16	575.7555	614.28	336.6645
277.37	727.4683	388.63	584.3906	618.01	314.0729
277.60	727.6373	391.69	596.9584	620.36	314.4471
278.00	727.9103	264.66	583.8259	621.93	315.7744
279.20	723.6104	401.81	593.7617	630.19	0.0000
279.54	723.8428	402.40	594.9567	631.29	263.1116
279.70	737.6377	404.85	623.0924	633.25	306.7244
280.46	738.1638	410.95	560.3016	634.78	270.0793
283.69	694.0298	413.71	549.1846	635.95	309.3008
284.31	724.2181	414.70	535.3873	636.99	299.6851
285.41	765.1122	423.72	550.1101	645.85	287.9041
285.90	0.0000	427.09	582.1611	657.76	314.1415
287.50	694.1846	427.87	566.1079	657.90	0.0000
290.67	729.6396	433.94	575.1987	661.66	305.4963
293.27	0.0000	439.40	547.2184	664.57	0.0000
351.93	663.2307	453.88	548.5242	666.33	280.1831
295.96	663.6737	463.37	580.2559	666.50	269.6326
879.38	609.5093	468.07	569.3379	667.71	0.0000
299.98	700.9482	473.00	506.6570	677.62	243.5925
300.09	706.2534	475.06	543.0521	685.70	260.0722
300.13	706.2781	476.78	542.6425	695.00	283.5176
301.36	684.3611	477.60	518.0586	696.49	273.6586
302.85	707.9837	482.18	540.4700	696.51	273.6586
256.23	707.2712	487.02	437.0667	697.00	296.0628
304.85	673.6362	492.35	0.0000	697.30	296.1032
306.78	654.9056	497.08	404.5272	697.49	272.6682
308.46	666.1807	505.52	427.2082	702.65	301.3115
311.90	633.4695	507.63	0.0000	706.68	294.0064
316.51	638.0568	511.00	398.7628	711.68	268.8021
319.41	686.3439	514.00	399.4644	720.70	221.3374
320.08	659.2288	514.00	399.4644	721.93	0.0000
321.04	681.0847	520.40	376.4773	722.78	260.7249
323.87	703.5400	520.69	0.0000	722.91	263.7532
325.23	691.5157	522.65	0.0000	723.31	263.8031
328.76	705.0045	527.90	0.0000	724.19	272.9509
333.37	631.6191	528.26	364.8652	727.33	212.9286
333.97	655.2690	529.59	373.3422	733.00	214.5976
334.37	670.9363	529.87	0.0000	735.93	216.4603
338.28	610.7442	531.02	373.6532	333.97	211.1449
338.32	610.7649	537.26	381.1560	739.50	0.0000
311.90	648.2986	546.56	0.0000	747.24	215.7015
340.48	648.2986	552.55	349.1045	748.06	217.4076
340.55	680.1097	563.25	341.1322	752.31	230.5244
344.28	642.4313	569.33	356.5186	753.82	203.1800
345.93	645.3586	946.00	356.5497	756.73	238.6147
351.06	587.0212	569.70	350.2984	756.80	238.6211
351.93	587.4248	583.19	309.5242	884.68	257.7559

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	257.9609	1274.44	232.9166	1620.50	64.7797
766.42	276.4600	1001.03	150.0477	1621.92	56.7008
766.84	276.5112	1002.74	150.1350	1678.03	0.0000
772.60	0.0000	1004.73	216.7847	1690.97	53.8672
776.52	188.1777	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	56.4278
778.90	222.3340	1028.54	0.0000	1063.66	58.1091
783.70	191.8377	1037.84	153.9418	1771.35	58.1229
785.37	209.9273	1038.76	0.0000	1791.20	0.0000
792.07	191.8828	631.29	172.7876	1808.65	39.3437
794.95	186.5137	1048.07	168.7786	1810.72	0.0000
795.86	195.9111	1049.04	168.8350	1836.06	49.9766
810.06	190.7938	1050.41	163.7891		
810.29	190.8136	1063.66	150.1062		
344.28	190.8236	1077.00	142.4877		
810.76	184.5911	1077.34	141.4686		
815.77	164.5880	1085.87	141.8565		
1048.07	186.4226	1093.63	169.1921		
832.01	173.5445	1099.45	161.1833		
834.85	237.8678	1112.07	160.0791		
835.71	231.3115	1112.84	172.2993		
836.80	0.0000	1115.54	170.7025		
846.75	0.0000	1120.29	140.2485		
846.77	188.5206	1120.55	140.2616		
856.80	157.7128	1221.41	140.2943		
860.56	175.1725	1129.67	150.1011		
871.09	197.9833	1131.51	0.0000		
873.19	177.9451	1147.95	0.0000		
875.33	0.0000	1173.23	149.9571		
879.38	193.7913	1177.95	168.2762		
880.51	177.4729	1189.05	162.4129		
883.24	165.1052	1204.77	171.7500		
884.68	160.3667	1221.41	152.0776		
889.28	203.2222	1231.02	135.1929		
894.76	156.7685	1235.36	176.8753		
898.04	205.5068	1238.28	142.6989		
900.72	220.2861	1260.41	0.0000		
903.28	194.5557	1271.87	108.3102		
911.20	171.7074	1274.44	134.6634		
912.08	165.9077	1274.54	134.6634		
923.98	0.0000	1291.59	121.0000		
926.50	147.1619	1298.22	0.0000		
929.11	175.1246	1312.11	108.7716		
937.49	164.1602	1332.49	116.7817		
944.13	162.9053	1362.66	0.0000		
946.00	163.0140	1365.19	108.4432		
949.00	174.7257	1368.63	0.0000		
667.71	0.0000	1384.29	85.6818		
962.31	195.4231	1408.01	56.7114		
964.08	176.9831	1457.56	0.0000		
966.17	177.1135	1460.82	78.8103		
911.20	177.2873	1489.16	64.4795		
968.97	177.2873	1505.03	73.5755		
983.53	148.1518	1584.12	92.9890		
984.45	0.0000	1596.21	49.1661		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 09:36:29.46

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                    *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561385.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;305
Background date : 20-JUN-2016 14:03:03
Sample date     : 7-JUN-2016 00:00:00. Acquisition date : 25-JUN-2016 09:20:27
Sample ID      : G1203561385. Sample quantity : 1.15000E+02 GRAM
Detector name   : GAM08. Detector geometry: CAN
Elapsed live time: 0 00:15:00.00. Elapsed real time: 0 00:15:03.89 0.4%
Energy tolerance: 1.50000 keV. Analyst Initials : MXR1
Abundance limit : 75.00000. Sensitivity : 3.00000
Batch ID       : 1572234. Detector SN# :
Matrix Spike ID: LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	44.97	751	2560	2.57	90.16	86	11	8.35E-01	11.8	4.10E+00
2	10	46.51	3138	2032	0.95	93.26	86	11	3.49E+00	3.0	
3	0	59.48	11699	3385	1.10	119.20	113	13	1.30E+01	1.4	
4	9	88.05	2685	764	1.08	176.37	170	17	2.98E+00	2.5	8.70E-01
5	9	91.18*	43	1040	2.05	182.63	170	17	4.75E-02	171.5	
6	0	121.86	337	1191	1.04	244.03	238	12	3.75E-01	21.2	
7	0	233.34	36	655	0.55	467.08	465	8	3.98E-02	125.6	
8	0	510.90*	73	487	4.35	1022.42	1016	12	8.14E-02	62.3	
9	0	514.88	54	297	1.39	1030.38	1027	8	5.95E-02	57.2	
10	0	661.63	11086	476	1.61	1323.99	1315	15	1.23E+01	1.0	
11	0	742.21	53	218	0.68	1485.21	1482	9	5.87E-02	52.1	
12	0	837.42	27	220	0.75	1675.70	1673	7	3.00E-02	94.3	
13	0	872.49	41	426	4.59	1745.87	1738	12	4.59E-02	101.6	
14	0	958.05	32	321	1.26	1917.04	1915	8	3.53E-02	99.1	
15	0	970.54*	38	224	0.61	1942.03	1938	7	4.21E-02	67.8	
16	0	987.36	34	282	1.31	1975.66	1968	9	3.76E-02	91.7	
17	0	1032.52	20	276	1.10	2066.02	2063	9	2.27E-02	148.8	
18	0	1115.50	110	340	2.59	2232.03	2226	14	1.22E-01	36.9	
19	0	1173.14	7347	263	2.01	2347.34	2338	18	8.16E+00	1.3	
20	0	1332.43	6730	107	2.14	2666.01	2656	22	7.48E+00	1.3	
21	0	1391.97	6	18	3.77	2785.12	2776	13	7.15E-03	136.1	
22	0	1424.43	18	12	4.98	2850.04	2842	16	2.04E-02	48.0	
23	0	1435.70	12	10	3.49	2872.58	2866	13	1.34E-02	60.9	
24	0	1484.10	12	24	5.39	2969.41	2948	23	1.38E-02	104.2	
25	0	1487.85	12	3	3.43	2976.91	2971	11	1.38E-02	38.3	
26	0	1569.19	8	8	1.41	3139.64	3132	11	9.34E-03	74.0	
27	0	1610.36	14	8	2.44	3221.97	3214	15	1.61E-02	49.0	
28	0	1781.37	14	0	0.60	3564.07	3558	12	1.56E-02	26.7	
29	0	1817.98	15	5	1.34	3637.31	3631	12	1.63E-02	41.9	
30	0	1896.21	8	10	0.54	3793.78	3783	13	8.95E-03	87.5	
31	0	1951.58	6	6	0.63	3904.53	3899	9	6.25E-03	92.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 09:36:31

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561385.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 25-JUN-2016 09:20:27
Sample ID	: G1203561385	Sample quantity	: 115.00 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA8	Detector geometry	: CAN
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:03.89 0.4%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	353	85.60*	5.569E+00	1.936E+00	2.029E+00	42.36
	136.47	-----	10.68	5.503E+00	-----	Line Not Found	-----
CO-60	1173.23	6998	99.85	1.176E+00	1.557E+02	1.567E+02	2.55
	1332.49	6374	99.98*	1.046E+00	1.591E+02	1.601E+02	2.56
ZN-65	1115.54	105	50.60*	1.231E+00	4.404E+00	4.640E+00	73.82
KR-85	514.00	53	0.43*	2.341E+00	1.360E+02	1.364E+02	114.36
SR-85	514.00	53	96.00*	2.341E+00	6.147E-01	7.483E-01	114.36
CD-109	88.03	2851	3.70*	4.621E+00	4.355E+02	4.477E+02	5.03
SN-126	64.28	-----	9.60	2.266E+00	-----	Line Not Found	-----
	86.94	2851	8.90	4.621E+00	1.810E+02	1.810E+02	5.03
	87.57	2851	37.00*	4.621E+00	4.355E+01	4.355E+01	5.03
BA-137M	661.66	10827	89.90*	1.936E+00	1.625E+02	1.627E+02	2.08
CS-137	661.66	10827	85.10*	1.936E+00	1.717E+02	1.719E+02	2.08
PM-147	121.22	353	0.00*	5.569E+00	5.815E+04	5.892E+04	42.36
PB-210	46.54	3417	4.25*	4.234E-01	4.959E+03	4.966E+03	5.95
AM-241	59.54	12616	35.90*	1.683E+00	5.452E+02	5.453E+02	2.80
ANH-511	511.00	72	100.00*	2.354E+00	8.022E-01	8.022E-01	124.59

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561385.CNF;1
Acquisition date : 25-JUN-2016 09:20:27 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:03.89 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561385 Sample Quantity : 1.1500E+02 GRAM
Batch Number : 1572234 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	2.029E+00	8.423E-01	7.531E-01
CO-60	1.601E+02	4.023E+00	9.898E-01
ZN-65	4.640E+00	3.356E+00	3.753E+00
KR-85	1.364E+02	1.529E+02	1.833E+02
SR-85	7.483E-01	8.386E-01	1.005E+00
CD-109	4.477E+02	2.207E+01	2.230E+01
SN-126	4.355E+01	2.147E+00	2.183E+00
BA-137M	1.627E+02	3.316E+00	1.362E+00
CS-137	1.719E+02	3.503E+00	1.439E+00
PM-147	5.892E+04	2.446E+04	2.186E+04
PB-210	4.966E+03	2.896E+02	3.237E+02
AM-241	5.453E+02	1.498E+01	8.502E+00
ANH-511	8.022E-01	9.796E-01	1.127E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-1.893E+00	8.577E+00	1.492E+01	NOT IDENT.
NA-22	4.318E-02	4.985E-01	8.937E-01	NOT IDENT.
NA-24	0.000E+00	2.407E+08	0.000E+00	SHORT HLIF
AL-26	2.261E-02	4.098E-01	7.291E-01	NOT IDENT.
K-40	-8.913E-01	2.691E+00	5.037E+00	NOT IDENT.
SC-46	3.087E-01	1.141E+00	2.012E+00	NOT IDENT.
V-48	5.514E-01	2.677E+00	4.033E+00	NOT IDENT.
CR-51	1.608E+00	8.779E+00	1.504E+01	NOT IDENT.
MN-54	2.297E-01	1.069E+00	1.639E+00	NOT IDENT.
CO-56	-6.584E-01	1.035E+00	1.781E+00	NOT IDENT.
MN-56	0.000E+00	1.587E+41	0.000E+00	SHORT HLIF
CO-58	-3.756E-02	9.786E-01	1.727E+00	NOT IDENT.
FE-59	1.081E+00	2.750E+00	4.787E+00	NOT IDENT.
GE-68	-2.593E+01	3.468E+01	5.816E+01	NOT IDENT.
AS-73	-2.633E+01	4.082E+01	6.678E+01	NOT IDENT.
AS-74	-3.146E-01	2.196E+00	3.785E+00	NOT IDENT.
SE-75	-3.194E-02	9.491E-01	1.635E+00	FAIL ABUN

BR-77	-4.116E+01	4.994E+02	7.590E+02	NOT IDENT.
SR-82	1.437E-02	8.324E+00	1.413E+01	NOT IDENT.
RB-83	5.957E-01	1.794E+00	2.886E+00	NOT IDENT.
RB-86	-1.428E+01	2.451E+01	4.136E+01	NOT IDENT.
Y-88	-4.046E-01	3.976E-01	6.202E-01	NOT IDENT.
Y-91	1.481E+02	3.110E+02	5.613E+02	NOT IDENT.
NB-94	-4.453E-01	6.528E-01	1.087E+00	FAIL ABUN
NB-95	-3.173E-01	9.169E-01	1.536E+00	NOT IDENT.
NB-95M	-1.407E+00	2.661E+00	3.975E+00	NOT IDENT.
ZR-95	1.775E-01	1.600E+00	2.740E+00	NOT IDENT.
NB-97	0.000E+00	1.211E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.003E+09	0.000E+00	SHORT HLIF
MO-99	2.160E+01	7.253E+02	1.067E+03	NOT IDENT.
TC-99M	0.000E+00	4.551E+21	0.000E+00	SHORT HLIF
RH-101	3.936E-01	5.557E-01	9.052E-01	NOT IDENT.
RH-102	-6.670E-01	1.220E+00	2.061E+00	NOT IDENT.
RU-103	-3.788E-01	9.796E-01	1.694E+00	NOT IDENT.
RH-106	9.057E-01	7.054E+00	1.223E+01	NOT IDENT.
RU-106	9.057E-01	7.054E+00	1.223E+01	NOT IDENT.
AG-108M	-5.833E-01	7.648E-01	1.320E+00	NOT IDENT.
AG-110M	-9.003E-01	1.369E+00	2.346E+00	NOT IDENT.
SN-113	-1.445E-01	1.038E+00	1.837E+00	NOT IDENT.
CD-115	3.112E+02	7.098E+02	1.256E+03	NOT IDENT.
SN-117M	-5.835E-01	1.048E+00	1.839E+00	NOT IDENT.
TE-123M	-2.682E-01	4.702E-01	8.252E-01	NOT IDENT.
SB-124	-4.985E-01	9.277E-01	1.617E+00	NOT IDENT.
SB-125	-1.557E-01	2.296E+00	4.040E+00	NOT IDENT.
TE-125M	1.109E+02	1.692E+02	2.911E+02	NOT IDENT.
I-126	1.981E+00	6.065E+00	9.190E+00	NOT IDENT.
SB-126	-3.832E-02	3.700E+00	6.321E+00	NOT IDENT.
SB-127	1.364E+01	4.852E+01	8.436E+01	NOT IDENT.
I-131	4.905E+00	3.585E+00	6.298E+00	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-1.361E+01	2.974E+01	4.936E+01	NOT IDENT.
BA-133	4.865E-01	9.455E-01	1.624E+00	NOT IDENT.
I-133	0.000E+00	1.779E+06	0.000E+00	SHORT HLIF
CS-134	-8.020E-01	8.955E-01	1.536E+00	NOT IDENT.
CS-135	3.975E-01	3.119E+00	5.393E+00	NOT IDENT.
I-135	0.000E+00	2.564E+20	0.000E+00	SHORT HLIF
CS-136	3.225E+00	3.480E+00	6.206E+00	NOT IDENT.
CE-139	1.041E-01	4.932E-01	8.804E-01	NOT IDENT.
BA-140	2.185E+00	6.785E+00	1.197E+01	NOT IDENT.
LA-140	-1.552E-01	9.373E-01	1.751E+00	NOT IDENT.
CE-141	7.961E-01	1.042E+00	1.898E+00	NOT IDENT.
CE-143	0.000E+00	1.221E+04	0.000E+00	SHORT HLIF
CE-144	-1.482E+00	3.210E+00	5.704E+00	NOT IDENT.
PM-144	-2.143E-02	6.850E-01	1.174E+00	NOT IDENT.
PR-144	-1.650E+00	5.135E+01	8.802E+01	FAIL ABUN
PM-146	-1.904E-01	1.134E+00	1.979E+00	NOT IDENT.
ND-147	-4.459E+00	1.539E+01	2.659E+01	FAIL ABUN
PM-149	-4.439E+02	5.404E+03	9.251E+03	NOT IDENT.
EU-150	-4.129E-01	5.647E-01	9.382E-01	NOT IDENT.
EU-152	-7.160E-01	2.189E+00	3.673E+00	FAIL ABUN
GD-153	5.520E-01	1.432E+00	2.461E+00	NOT IDENT.
EU-154	2.063E-01	1.404E+00	2.531E+00	FAIL ABUN
EU-155	-1.504E+00	1.786E+00	2.953E+00	NOT IDENT.
TB-160	-8.195E-01	3.838E+00	6.369E+00	FAIL ABUN
HO-166M	-5.015E-01	1.239E+00	2.086E+00	NOT IDENT.
TM-171	-5.748E+02	8.097E+02	1.392E+03	NOT IDENT.
HF-172	2.248E+00	3.405E+00	5.539E+00	FAIL ABUN
LU-172	-9.283E-01	1.792E+00	3.027E+00	FAIL ABUN
LU-176	-8.369E-02	5.675E-01	9.656E-01	FAIL ABUN
HF-181	5.863E-02	1.135E+00	1.989E+00	NOT IDENT.
TA-182	-4.876E-01	2.569E+00	4.445E+00	NOT IDENT.
RE-183	0.000E+00	1.881E+01	2.668E+01	FAIL ABUN
RE-184	1.358E+00	3.933E+00	6.927E+00	NOT IDENT.
W-188	-5.649E+00	1.500E+02	2.571E+02	NOT IDENT.
IR-192	-5.565E-01	7.402E-01	1.234E+00	NOT IDENT.
HG-203	-8.847E-01	8.223E-01	1.371E+00	NOT IDENT.
BI-207	3.076E-01	1.460E+00	2.537E+00	NOT IDENT.
TL-208	1.878E-01	7.161E-01	1.258E+00	NOT IDENT.
BI-211	-1.003E+00	4.510E+00	7.590E+00	NOT IDENT.
PB-211	-5.899E+00	1.621E+01	2.844E+01	NOT IDENT.
BI-212	4.186E+00	1.052E+01	1.828E+01	NOT IDENT.
PB-212	1.562E-01	1.242E+00	1.902E+00	NOT IDENT.
BI-214	8.019E-01	1.418E+00	2.507E+00	NOT IDENT.
PB-214	-1.101E+00	1.629E+00	2.703E+00	FAIL ABUN
RN-219	1.685E+00	9.237E+00	1.645E+01	NOT IDENT.

RN-222	8.019E-01	1.418E+00	2.507E+00	NOT IDENT.
RA-223	7.245E+00	1.395E+01	2.410E+01	NOT IDENT.
RA-224	-2.151E+00	1.167E+01	2.014E+01	NOT IDENT.
RA-226	8.019E-01	1.418E+00	2.507E+00	NOT IDENT.
AC-227	-1.132E+00	5.020E+00	8.626E+00	NOT IDENT.
TH-227	-1.132E+00	5.020E+00	8.626E+00	NOT IDENT.
AC-228	-1.690E+00	4.081E+00	7.026E+00	NOT IDENT.
RA-228	-1.690E+00	4.081E+00	7.026E+00	NOT IDENT.
TH-228	1.562E-01	1.242E+00	1.902E+00	NOT IDENT.
TH-229	-1.628E+00	9.352E+00	1.637E+01	FAIL ABUN
TH-230	8.019E-01	1.418E+00	2.507E+00	NOT IDENT.
PA-231	1.517E-02	9.760E+00	1.670E+01	NOT IDENT.
TH-231	7.245E+00	1.395E+01	2.410E+01	NOT IDENT.
TH-232	-1.690E+00	4.081E+00	7.026E+00	NOT IDENT.
PA-233	5.519E-01	1.359E+00	2.349E+00	NOT IDENT.
PA-234	2.192E+00	9.522E+00	1.663E+01	NOT IDENT.
PA-234M	-1.572E+02	1.232E+02	2.042E+02	NOT IDENT.
TH-234	-3.853E+01	2.984E+01	4.432E+01	FAIL ABUN
U-234	8.019E-01	1.418E+00	2.507E+00	NOT IDENT.
U-235	-3.326E-02	3.086E+00	5.526E+00	FAIL ABUN
NP-237	5.519E-01	1.359E+00	2.349E+00	NOT IDENT.
NP-238	1.682E+03	1.674E+03	3.002E+03	NOT IDENT.
U-238	-3.853E+01	2.984E+01	4.432E+01	FAIL ABUN
NP-239	1.093E-01	5.178E+00	7.744E+00	NOT IDENT.
PU-239	-6.134E+03	5.291E+03	9.261E+03	NOT IDENT.
AM-243	1.545E-01	9.573E-01	1.653E+00	FAIL ABUN
CM-243	1.132E+00	1.804E+00	3.111E+00	NOT IDENT.
BK-247	-7.326E-02	1.667E+00	2.870E+00	NOT IDENT.
CM-247	1.648E-01	8.515E-01	1.516E+00	NOT IDENT.
CF-249	1.988E-01	9.008E-01	1.610E+00	NOT IDENT.
CF-251	1.359E+00	2.181E+00	3.916E+00	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	353	85.60*	5.569E+00	1.936E+00	2.029E+00	42.36
	136.47	-----	10.68	5.503E+00	-----	Line Not Found	-----
CO-60	1173.23	6998	99.85	1.176E+00	1.557E+02	1.567E+02	2.55
	1332.49	6374	99.98*	1.046E+00	1.591E+02	1.601E+02	2.56
ZN-65	1115.54	105	50.60*	1.231E+00	4.404E+00	4.640E+00	73.82
KR-85	514.00	53	0.43*	2.341E+00	1.360E+02	1.364E+02	114.36
SR-85	514.00	53	96.00*	2.341E+00	6.147E-01	7.483E-01	114.36
CD-109	88.03	2851	3.70*	4.621E+00	4.355E+02	4.477E+02	5.03
SN-126	64.28	-----	9.60	2.266E+00	-----	Line Not Found	-----
	86.94	2851	8.90	4.621E+00	1.810E+02	1.810E+02	5.03
	87.57	2851	37.00*	4.621E+00	4.355E+01	4.355E+01	5.03
BA-137M	661.66	10827	89.90*	1.936E+00	1.625E+02	1.627E+02	2.08
CS-137	661.66	10827	85.10*	1.936E+00	1.717E+02	1.719E+02	2.08
PM-147	121.22	353	0.00*	5.569E+00	5.815E+04	5.892E+04	42.36
PB-210	46.54	3417	4.25*	4.234E-01	4.959E+03	4.966E+03	5.95
AM-241	59.54	12616	35.90*	1.683E+00	5.452E+02	5.453E+02	2.80
ANH-511	511.00	72	100.00*	2.354E+00	8.022E-01	8.022E-01	124.59

Flag: "*" = Keyline

Total number of lines in spectrum 31
Number of unidentified lines 16
Number of lines tentatively identified by NID 15 48.39%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.05	1.936E+00	2.029E+00	0.859E+00	42.36	
CO-60	5.27Y	1.01	1.591E+02	1.601E+02	0.041E+02	2.56	
ZN-65	244.06D	1.05	4.404E+00	4.640E+00	3.425E+00	73.82	
KR-85	10.56Y	1.00	1.360E+02	1.364E+02	1.560E+02	114.36	
SR-85	64.84D	1.22	6.147E-01	7.483E-01	8.558E-01	114.36	
CD-109	461.40D	1.03	4.355E+02	4.477E+02	0.225E+02	5.03	
SN-126	2.30E+05Y	1.00	4.355E+01	4.355E+01	0.219E+01	5.03	
BA-137M	30.08Y	1.00	1.625E+02	1.627E+02	0.034E+02	2.08	
CS-137	30.08Y	1.00	1.717E+02	1.719E+02	0.036E+02	2.08	
PM-147	2.62Y	1.01	5.815E+04	5.892E+04	2.496E+04	42.36	
PB-210	22.20Y	1.00	4.959E+03	4.966E+03	0.296E+03	5.95	
AM-241	432.60Y	1.00	5.452E+02	5.453E+02	0.153E+02	2.80	
ANH-511	1.00E+09Y	1.00	8.022E-01	8.022E-01	9.995E-01	124.59	
Total Activity :			6.477E+04	6.557E+04			

Grand Total Activity : 6.477E+04 6.557E+04

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
10	44.97	819	2791	2.57	90.16	86	11	8.35E-01	23.5	3.29E-01	T
9	91.18	45	1103	2.05	182.63	170	17	4.75E-02	****	4.81E+00	T
0	233.34	37	669	0.55	467.08	465	8	3.98E-02	****	4.12E+00	
0	742.21	51	212	0.68	1485.21	1482	9	5.87E-02	****	1.76E+00	
0	837.42	26	213	0.75	1675.70	1673	7	3.00E-02	****	1.59E+00	T
0	872.49	40	411	4.59	1745.87	1738	12	4.59E-02	****	1.54E+00	T
0	958.05	31	309	1.26	1917.04	1915	8	3.53E-02	****	1.41E+00	
0	970.54	36	215	0.61	1942.03	1938	7	4.21E-02	****	1.40E+00	
0	987.36	32	271	1.31	1975.66	1968	9	3.76E-02	****	1.38E+00	
0	1032.52	20	264	1.10	2066.02	2063	9	2.27E-02	****	1.32E+00	
0	1391.97	6	17	3.77	2785.12	2776	13	7.15E-03	****	1.01E+00	
0	1424.43	17	11	4.98	2850.04	2842	16	2.04E-02	96.0	9.86E-01	
0	1435.70	11	9	3.49	2872.58	2866	13	1.34E-02	****	9.80E-01	
0	1484.10	12	22	5.39	2969.41	2948	23	1.38E-02	****	9.52E-01	
0	1487.85	12	2	3.43	2976.91	2971	11	1.38E-02	76.6	9.50E-01	T
0	1569.19	8	7	1.41	3139.64	3132	11	9.34E-03	****	9.09E-01	
0	1610.36	14	7	2.44	3221.97	3214	15	1.61E-02	98.0	8.91E-01	
0	1781.37	13	0	0.60	3564.07	3558	12	1.56E-02	53.5	8.28E-01	
0	1817.98	14	5	1.34	3637.31	3631	12	1.63E-02	83.9	8.17E-01	
0	1896.21	8	9	0.54	3793.78	3783	13	8.95E-03	****	7.97E-01	
0	1951.58	5	6	0.63	3904.53	3899	9	6.25E-03	****	7.85E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561385.CNF;1
* Acquisition date   : 25-JUN-2016 09:20:27 Sensitivity      : 3.000
* Detector ID        : GAM08 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:03.89 Half life ratio : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203561385 Analyst initials: MXR1
* Batch Number       : 1572234 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                                     Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 8-JUL-2015 05:34:49 Eff. Geometry    : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	3.688E-01
CO-60	4.612E-01
ZN-65	1.818E+00
KR-85	8.818E+01
SR-85	4.837E-01
CD-109	1.094E+01
SN-126	1.071E+00
BA-137M	6.610E-01
CS-137	6.983E-01
PM-147	1.071E+04
PB-210	1.599E+02
AM-241	4.194E+00
ANH-511	5.488E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.288E+00	NOT IDENT.
NA-22	4.142E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	3.217E-01	NOT IDENT.
K-40	2.177E+00	NOT IDENT.
SC-46	9.791E-01	NOT IDENT.
V-48	1.961E+00	NOT IDENT.
CR-51	7.348E+00	NOT IDENT.
MN-54	7.970E-01	NOT IDENT.
CO-56	8.647E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	8.377E-01	NOT IDENT.
FE-59	2.328E+00	NOT IDENT.
GE-68	2.819E+01	NOT IDENT.
AS-73	3.300E+01	NOT IDENT.
AS-74	1.835E+00	NOT IDENT.
SE-75	8.000E-01	FAIL ABUN
BR-77	3.715E+02	NOT IDENT.

SR-82	6.842E+00	NOT IDENT.
RB-83	1.404E+00	NOT IDENT.
RB-86	2.005E+01	NOT IDENT.
Y-88	2.611E-01	NOT IDENT.
Y-91	2.661E+02	NOT IDENT.
NB-94	5.246E-01	FAIL ABUN
NB-95	7.434E-01	NOT IDENT.
NB-95M	1.946E+00	NOT IDENT.
ZR-95	1.325E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	5.169E+02	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	4.432E-01	NOT IDENT.
RH-102	9.994E-01	NOT IDENT.
RU-103	8.249E-01	NOT IDENT.
RH-106	5.936E+00	NOT IDENT.
RU-106	5.936E+00	NOT IDENT.
AG-108M	6.456E-01	NOT IDENT.
AG-110M	1.140E+00	NOT IDENT.
SN-113	8.974E-01	NOT IDENT.
CD-115	6.110E+02	NOT IDENT.
SN-117M	8.998E-01	NOT IDENT.
TE-123M	4.037E-01	NOT IDENT.
SB-124	7.022E-01	NOT IDENT.
SB-125	1.976E+00	NOT IDENT.
TE-125M	1.426E+02	NOT IDENT.
I-126	4.447E+00	NOT IDENT.
SB-126	3.060E+00	NOT IDENT.
SB-127	4.080E+01	NOT IDENT.
I-131	3.080E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	2.417E+01	NOT IDENT.
BA-133	7.933E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	7.431E-01	NOT IDENT.
CS-135	2.638E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.015E+00	NOT IDENT.
CE-139	4.308E-01	NOT IDENT.
BA-140	5.815E+00	NOT IDENT.
LA-140	7.640E-01	NOT IDENT.
CE-141	9.289E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.792E+00	NOT IDENT.
PM-144	5.675E-01	NOT IDENT.
PR-144	4.254E+01	FAIL ABUN
PM-146	9.687E-01	NOT IDENT.
ND-147	1.292E+01	FAIL ABUN
PM-149	4.525E+03	NOT IDENT.
EU-150	4.577E-01	NOT IDENT.
EU-152	1.794E+00	FAIL ABUN
GD-153	1.205E+00	NOT IDENT.
EU-154	1.173E+00	FAIL ABUN
EU-155	1.445E+00	NOT IDENT.
TB-160	3.094E+00	FAIL ABUN
HO-166M	1.008E+00	NOT IDENT.
TM-171	6.875E+02	NOT IDENT.
HF-172	2.713E+00	FAIL ABUN
LU-172	1.469E+00	FAIL ABUN
LU-176	4.718E-01	FAIL ABUN
HF-181	9.709E-01	NOT IDENT.
TA-182	2.095E+00	NOT IDENT.
RE-183	1.327E+01	FAIL ABUN
RE-184	3.376E+00	NOT IDENT.
W-188	1.256E+02	NOT IDENT.
IR-192	6.019E-01	NOT IDENT.
HG-203	6.699E-01	NOT IDENT.
BI-207	1.232E+00	NOT IDENT.
TL-208	6.097E-01	NOT IDENT.
BI-211	3.707E+00	NOT IDENT.
PB-211	1.389E+01	NOT IDENT.
BI-212	8.847E+00	NOT IDENT.
PB-212	9.314E-01	NOT IDENT.
BI-214	1.216E+00	NOT IDENT.
PB-214	1.320E+00	FAIL ABUN
RN-219	8.037E+00	NOT IDENT.
RN-222	1.216E+00	NOT IDENT.

RA-223	1.178E+01	NOT IDENT.
RA-224	9.859E+00	NOT IDENT.
RA-226	1.216E+00	NOT IDENT.
AC-227	4.218E+00	NOT IDENT.
TH-227	4.218E+00	NOT IDENT.
AC-228	3.423E+00	NOT IDENT.
RA-228	3.423E+00	NOT IDENT.
TH-228	9.314E-01	NOT IDENT.
TH-229	8.016E+00	FAIL ABUN
TH-230	1.216E+00	NOT IDENT.
PA-231	8.160E+00	NOT IDENT.
TH-231	1.178E+01	NOT IDENT.
TH-232	3.423E+00	NOT IDENT.
PA-233	1.147E+00	NOT IDENT.
PA-234	8.112E+00	NOT IDENT.
PA-234M	9.905E+01	NOT IDENT.
TH-234	2.172E+01	FAIL ABUN
U-234	1.216E+00	NOT IDENT.
U-235	2.704E+00	FAIL ABUN
NP-237	1.147E+00	NOT IDENT.
NP-238	1.460E+03	NOT IDENT.
U-238	2.172E+01	FAIL ABUN
NP-239	3.792E+00	NOT IDENT.
PU-239	4.530E+03	NOT IDENT.
AM-243	8.116E-01	FAIL ABUN
CM-243	1.524E+00	NOT IDENT.
BK-247	1.404E+00	NOT IDENT.
CM-247	7.409E-01	NOT IDENT.
CF-249	7.864E-01	NOT IDENT.
CF-251	1.917E+00	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561385.CNF;1
Acquisition date : 25-JUN-2016 09:20:27 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:03.89 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561385 Analyst initials: MXR1
Batch Number : 1572234 Sample Quantity : 1.1500E+02 GRAM
Quantity Err(%) : 1.7391E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	2.029E+00	8.632E-01	8.632E-01
CO-60	1.601E+02	1.302E+01	1.302E+01
ZN-65	4.640E+00	3.477E+00	3.477E+00
KR-85	1.364E+02	1.534E+02	1.534E+02
SR-85	7.483E-01	8.412E-01	8.412E-01
CD-109	4.477E+02	4.889E+01	4.889E+01
SN-126	4.355E+01	4.159E+00	4.159E+00
BA-137M	1.627E+02	1.505E+01	1.505E+01
CS-137	1.719E+02	1.589E+01	1.589E+01
PM-147	5.892E+04	2.507E+04	2.507E+04
PB-210	4.966E+03	6.066E+02	6.066E+02
AM-241	5.453E+02	5.638E+01	5.638E+01
ANH-511	8.022E-01	9.820E-01	9.820E-01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-1.893E+00	8.579E+00	8.621E+00	NOT IDENT.
NA-22	4.318E-02	4.985E-01	4.989E-01	NOT IDENT.
NA-24	-1.209E+08	2.409E+08	2.470E+08	SHORT HLIF
AL-26	2.261E-02	4.098E-01	4.099E-01	NOT IDENT.
K-40	-8.913E-01	2.692E+00	2.722E+00	NOT IDENT.
SC-46	3.087E-01	1.142E+00	1.150E+00	NOT IDENT.
V-48	5.514E-01	2.679E+00	2.690E+00	NOT IDENT.
CR-51	1.608E+00	8.780E+00	8.810E+00	NOT IDENT.
MN-54	2.297E-01	1.070E+00	1.075E+00	NOT IDENT.
CO-56	-6.584E-01	1.039E+00	1.080E+00	NOT IDENT.
MN-56	-1.000E+41	1.593E+41	0.000E+00	SHORT HLIF
CO-58	-3.756E-02	9.786E-01	9.787E-01	NOT IDENT.
FE-59	1.081E+00	2.759E+00	2.802E+00	NOT IDENT.
GE-68	-2.593E+01	3.502E+01	3.692E+01	NOT IDENT.
AS-73	-2.633E+01	4.123E+01	4.290E+01	NOT IDENT.
AS-74	-3.146E-01	2.196E+00	2.200E+00	NOT IDENT.
SE-75	-3.194E-02	9.491E-01	9.493E-01	FAIL ABUN

BR-77	-4.116E+01	4.998E+02	5.002E+02	NOT IDENT.
SR-82	1.437E-02	8.324E+00	8.324E+00	NOT IDENT.
RB-83	5.957E-01	1.797E+00	1.817E+00	NOT IDENT.
RB-86	-1.428E+01	2.465E+01	2.548E+01	NOT IDENT.
Y-88	-4.046E-01	3.988E-01	4.385E-01	NOT IDENT.
Y-91	1.481E+02	3.113E+02	3.183E+02	NOT IDENT.
NB-94	-4.453E-01	6.543E-01	6.844E-01	FAIL ABUN
NB-95	-3.173E-01	9.176E-01	9.287E-01	NOT IDENT.
NB-95M	-1.407E+00	2.665E+00	2.740E+00	NOT IDENT.
ZR-95	1.775E-01	1.601E+00	1.603E+00	NOT IDENT.
NB-97	1.000E+41	1.510E+40	0.000E+00	SHORT HLIF
ZR-97	4.957E+08	1.004E+09	1.029E+09	SHORT HLIF
MO-99	2.160E+01	7.253E+02	7.253E+02	NOT IDENT.
TC-99M	-2.144E+21	4.558E+21	0.000E+00	SHORT HLIF
RH-101	3.936E-01	5.610E-01	5.884E-01	NOT IDENT.
RH-102	-6.670E-01	1.223E+00	1.259E+00	NOT IDENT.
RU-103	-3.788E-01	9.802E-01	9.950E-01	NOT IDENT.
RH-106	9.057E-01	7.054E+00	7.066E+00	NOT IDENT.
RU-106	9.057E-01	7.054E+00	7.066E+00	NOT IDENT.
AG-108M	-5.833E-01	7.664E-01	8.102E-01	NOT IDENT.
AG-110M	-9.003E-01	1.376E+00	1.434E+00	NOT IDENT.
SN-113	-1.445E-01	1.039E+00	1.041E+00	NOT IDENT.
CD-115	3.112E+02	7.104E+02	7.242E+02	NOT IDENT.
SN-117M	-5.835E-01	1.049E+00	1.081E+00	NOT IDENT.
TE-123M	-2.682E-01	4.707E-01	4.859E-01	NOT IDENT.
SB-124	-4.985E-01	9.285E-01	9.553E-01	NOT IDENT.
SB-125	-1.557E-01	2.296E+00	2.298E+00	NOT IDENT.
TE-125M	1.109E+02	1.695E+02	1.767E+02	NOT IDENT.
I-126	1.981E+00	6.068E+00	6.133E+00	NOT IDENT.
SB-126	-3.832E-02	3.700E+00	3.700E+00	NOT IDENT.
SB-127	1.364E+01	4.856E+01	4.894E+01	NOT IDENT.
I-131	4.905E+00	3.612E+00	4.235E+00	NOT IDENT.
I-132	-1.000E+41	1.152E+42	0.000E+00	SHORT HLIF
TE-132	-1.361E+01	2.978E+01	3.041E+01	NOT IDENT.
BA-133	4.865E-01	9.464E-01	9.715E-01	NOT IDENT.
I-133	6.950E+05	1.782E+06	1.810E+06	SHORT HLIF
CS-134	-8.020E-01	9.008E-01	9.706E-01	NOT IDENT.
CS-135	3.975E-01	3.119E+00	3.124E+00	NOT IDENT.
I-135	1.727E+20	2.668E+20	0.000E+00	SHORT HLIF
CS-136	3.225E+00	3.536E+00	3.823E+00	NOT IDENT.
CE-139	1.041E-01	4.936E-01	4.959E-01	NOT IDENT.
BA-140	2.185E+00	6.788E+00	6.859E+00	NOT IDENT.
LA-140	-1.552E-01	9.374E-01	9.400E-01	NOT IDENT.
CE-141	7.961E-01	1.044E+00	1.104E+00	NOT IDENT.
CE-143	-2.045E+03	1.221E+04	1.225E+04	SHORT HLIF
CE-144	-1.482E+00	3.213E+00	3.282E+00	NOT IDENT.
PM-144	-2.143E-02	6.850E-01	6.851E-01	NOT IDENT.
PR-144	-1.650E+00	5.135E+01	5.136E+01	FAIL ABUN
PM-146	-1.904E-01	1.134E+00	1.137E+00	NOT IDENT.
ND-147	-4.459E+00	1.540E+01	1.553E+01	FAIL ABUN
PM-149	-4.439E+02	5.405E+03	5.408E+03	NOT IDENT.
EU-150	-4.129E-01	5.660E-01	5.958E-01	NOT IDENT.
EU-152	-7.160E-01	2.190E+00	2.214E+00	FAIL ABUN
GD-153	5.520E-01	1.432E+00	1.454E+00	NOT IDENT.
EU-154	2.063E-01	1.404E+00	1.407E+00	FAIL ABUN
EU-155	-1.504E+00	1.792E+00	1.916E+00	NOT IDENT.
TB-160	-8.195E-01	3.840E+00	3.858E+00	FAIL ABUN
HO-166M	-5.015E-01	1.240E+00	1.261E+00	NOT IDENT.
TM-171	-5.748E+02	8.125E+02	8.528E+02	NOT IDENT.
HF-172	2.248E+00	3.429E+00	3.576E+00	FAIL ABUN
LU-172	-9.283E-01	1.803E+00	1.851E+00	FAIL ABUN
LU-176	-8.369E-02	5.676E-01	5.688E-01	FAIL ABUN
HF-181	5.863E-02	1.135E+00	1.135E+00	NOT IDENT.
TA-182	-4.876E-01	2.569E+00	2.579E+00	NOT IDENT.
RE-183	6.847E+02	8.602E+01	3.204E+02	FAIL ABUN
RE-184	1.358E+00	3.939E+00	3.986E+00	NOT IDENT.
W-188	-5.649E+00	1.500E+02	1.500E+02	NOT IDENT.
IR-192	-5.565E-01	7.421E-01	7.834E-01	NOT IDENT.
HG-203	-8.847E-01	8.270E-01	9.181E-01	NOT IDENT.
BI-207	3.076E-01	1.461E+00	1.468E+00	NOT IDENT.
TL-208	1.878E-01	7.163E-01	7.213E-01	NOT IDENT.
BI-211	-1.003E+00	4.511E+00	4.533E+00	NOT IDENT.
PB-211	-5.899E+00	1.622E+01	1.643E+01	NOT IDENT.
BI-212	4.186E+00	1.053E+01	1.070E+01	NOT IDENT.
PB-212	1.562E-01	1.242E+00	1.244E+00	NOT IDENT.
BI-214	8.019E-01	1.420E+00	1.466E+00	NOT IDENT.
PB-214	-1.101E+00	1.632E+00	1.706E+00	FAIL ABUN
RN-219	1.685E+00	9.241E+00	9.272E+00	NOT IDENT.

RN-222	8.019E-01	1.420E+00	1.466E+00	NOT IDENT.
RA-223	7.245E+00	1.397E+01	1.435E+01	NOT IDENT.
RA-224	-2.151E+00	1.167E+01	1.171E+01	NOT IDENT.
RA-226	8.019E-01	1.420E+00	1.466E+00	NOT IDENT.
AC-227	-1.132E+00	5.023E+00	5.049E+00	NOT IDENT.
TH-227	-1.132E+00	5.023E+00	5.049E+00	NOT IDENT.
AC-228	-1.690E+00	4.089E+00	4.160E+00	NOT IDENT.
RA-228	-1.690E+00	4.089E+00	4.160E+00	NOT IDENT.
TH-228	1.562E-01	1.242E+00	1.244E+00	NOT IDENT.
TH-229	-1.628E+00	9.353E+00	9.382E+00	FAIL ABUN
TH-230	8.019E-01	1.420E+00	1.466E+00	NOT IDENT.
PA-231	1.517E-02	9.760E+00	9.760E+00	NOT IDENT.
TH-231	7.245E+00	1.397E+01	1.435E+01	NOT IDENT.
TH-232	-1.690E+00	4.089E+00	4.160E+00	NOT IDENT.
PA-233	5.519E-01	1.360E+00	1.382E+00	NOT IDENT.
PA-234	2.192E+00	9.852E+00	9.901E+00	NOT IDENT.
PA-234M	-1.572E+02	1.261E+02	1.447E+02	NOT IDENT.
TH-234	-3.853E+01	3.113E+01	3.565E+01	FAIL ABUN
U-234	8.019E-01	1.420E+00	1.466E+00	NOT IDENT.
U-235	-3.326E-02	3.086E+00	3.086E+00	FAIL ABUN
NP-237	5.519E-01	1.360E+00	1.382E+00	NOT IDENT.
NP-238	1.682E+03	1.697E+03	1.859E+03	NOT IDENT.
U-238	-3.853E+01	3.113E+01	3.565E+01	FAIL ABUN
NP-239	1.093E-01	5.178E+00	5.178E+00	NOT IDENT.
PU-239	-6.134E+03	5.319E+03	5.995E+03	NOT IDENT.
AM-243	1.545E-01	9.574E-01	9.600E-01	FAIL ABUN
CM-243	1.132E+00	1.809E+00	1.879E+00	NOT IDENT.
BK-247	-7.326E-02	1.667E+00	1.667E+00	NOT IDENT.
CM-247	1.648E-01	8.520E-01	8.553E-01	NOT IDENT.
CF-249	1.988E-01	9.011E-01	9.055E-01	NOT IDENT.
CF-251	1.359E+00	2.187E+00	2.271E+00	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2344.2925	87.09	854.6901	136.47	707.7432
45.60	2124.8303	87.57	855.4637	140.51	712.6139
46.54	2130.5642	88.03	856.2057	143.76	674.1957
49.72	1980.4441	88.34	856.7070	144.24	666.4949
51.35	2110.2029	88.47	856.9162	145.44	647.6415
51.87	2168.1240	89.96	859.3001	152.43	690.1921
52.39	2206.8049	90.64	860.3856	153.25	707.3960
52.97	2256.1331	91.11	861.1295	154.21	684.4460
53.44	2287.3364	92.59	709.3536	156.02	652.0557
54.07	2272.3354	93.35	700.3046	158.56	701.1462
57.36	0.0000	94.56	731.9863	159.00	701.5353
57.53	2492.3191	94.65	732.1030	162.33	686.8674
57.98	1659.2567	94.67	732.1297	162.66	692.7070
59.27	1664.5229	94.87	717.3095	163.33	673.8140
59.32	1664.7268	97.43	716.0853	165.86	660.1052
59.54	1665.6202	98.43	728.5847	176.31	695.6992
60.96	1671.3351	98.44	728.5979	176.60	679.9267
61.17	791.2601	99.53	758.1451	177.52	655.2000
62.93	833.8238	100.11	776.9473	181.07	717.5300
63.29	875.3876	102.03	731.9951	181.52	715.0588
63.58	846.0995	103.18	684.6826	184.41	704.1117
64.28	858.5033	103.37	697.3773	185.72	708.9641
66.73	840.6204	105.21	752.9960	193.51	730.4838
67.24	839.4734	105.31	753.1207	197.03	745.8088
67.68	823.3683	106.12	768.9468	198.01	720.5559
67.75	841.4931	106.47	742.0370	201.83	719.6339
69.67	919.4981	109.28	685.9246	203.43	732.4949
70.83	934.6138	111.00	738.3635	205.31	732.0023
72.81	852.9863	111.76	747.3142	210.85	753.8297
72.87	853.0958	114.06	710.8213	215.65	759.4947
74.66	907.9082	116.30	700.0108	222.11	777.2868
74.82	929.7096	116.74	724.8251	227.09	724.4615
74.97	930.0000	119.76	709.0008	227.38	724.6674
77.11	975.1728	121.12	710.4721	228.16	759.4680
78.74	950.2529	121.22	732.4580	228.18	759.4796
79.69	944.4780	121.78	733.0806	235.69	735.8961
80.12	946.3788	122.06	733.3903	235.96	736.0865
80.19	946.5117	122.92	746.8002	238.63	700.9690
80.57	949.4044	123.07	746.9658	238.98	701.1978
81.00	961.1060	123.68	740.6241	240.99	714.0035
81.07	961.2407	125.81	678.1237	242.00	672.3381
81.75	1013.7676	127.23	661.1728	244.70	675.0382
83.79	955.4521	127.91	708.1009	252.40	675.7327
84.00	955.8384	129.30	739.5167	252.80	654.6020
85.43	965.0723	131.20	684.7131	254.15	0.0000
86.55	853.8139	133.02	698.0765	256.23	647.4301
86.79	854.1967	133.52	732.4324	260.90	651.1425
86.94	854.4454	136.00	710.8552	264.66	676.9661

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	677.0464	364.49	535.6749	600.60	350.4243
265.00	668.9339	366.42	625.4068	602.52	0.0000
268.22	648.1041	372.51	535.2644	604.72	350.0889
269.46	620.9001	375.05	601.1096	607.14	356.5967
270.03	644.9758	1093.63	512.4096	609.32	320.2401
271.23	659.0932	383.85	581.9047	610.33	346.9229
273.65	658.3901	388.16	575.4306	614.28	324.0427
276.40	619.3904	388.63	597.2964	618.01	368.6309
277.37	627.1804	391.69	597.5933	620.36	349.5500
277.60	647.0704	400.66	583.7623	621.93	352.8856
278.00	664.9750	401.81	575.0789	630.19	0.0000
279.20	678.1482	402.40	579.8609	631.29	361.6003
279.54	665.8428	404.85	592.6324	633.25	337.1709
279.70	659.6777	410.95	580.2629	634.78	369.3885
280.46	637.1607	413.71	617.9984	635.95	358.2250
283.69	639.9218	414.70	607.3583	636.99	320.1794
284.31	646.5256	423.72	612.6114	645.85	366.0393
285.41	658.6284	427.09	653.6877	657.76	345.7236
285.90	657.8495	427.87	650.2926	657.90	0.0000
287.50	614.6669	433.94	692.6718	661.66	355.0161
290.67	584.7095	439.40	674.4323	664.57	0.0000
293.27	0.0000	453.88	699.9794	666.33	279.0104
295.22	610.0945	463.37	703.8302	666.50	279.0299
295.96	592.5015	468.07	688.6542	667.71	0.0000
298.58	560.9415	473.00	647.7813	677.62	289.1260
299.98	574.2789	475.06	638.0540	685.70	272.1850
300.09	574.3285	476.78	602.4521	695.00	260.5462
300.13	574.3533	477.60	600.8225	696.49	277.6650
301.36	596.1217	482.18	536.3878	696.51	277.6650
302.85	600.0194	487.02	498.5259	697.00	280.9026
304.50	591.2251	492.35	478.8326	697.30	268.2195
304.85	594.5858	497.08	477.1807	697.49	268.2381
306.78	605.0687	505.52	479.3621	702.65	282.6315
308.46	581.3328	507.63	0.0000	706.68	252.2349
311.90	554.0109	511.00	446.7789	711.68	285.8165
316.51	561.3456	514.00	214.0166	720.70	302.9330
319.41	590.5587	514.00	214.0166	721.93	0.0000
320.08	594.0890	520.40	408.5670	722.78	305.3313
321.04	542.8213	520.69	404.4444	722.91	305.3452
323.87	588.2351	522.65	0.0000	723.31	305.3939
325.23	627.7382	527.90	401.7720	724.19	320.5125
328.76	547.0654	528.26	397.9216	727.33	282.2820
333.37	565.2350	529.59	393.2952	733.00	311.9695
333.97	569.8388	529.87	0.0000	735.93	297.5285
334.37	537.3727	531.02	410.2747	737.46	298.1597
338.28	590.1833	537.26	358.4192	739.50	307.3909
338.32	590.1998	546.56	0.0000	747.24	272.2743
340.48	532.1212	552.55	384.0333	748.06	268.7529
340.55	532.1509	563.25	348.1735	752.31	314.3767
344.28	610.2811	569.33	356.2173	753.82	310.2220
345.93	603.3249	569.50	380.2598	756.73	278.0000
351.06	591.2195	569.70	380.2969	756.80	278.0063
351.93	598.1982	583.19	313.2930	763.94	306.0060
355.39	0.0000	584.27	343.6890	765.81	311.6744
356.01	560.1478	595.83	337.4796	766.42	316.1113

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	309.6196	1002.74	385.5111	1678.03	0.0000
772.60	0.0000	1004.73	356.1526	1690.97	21.0645
776.52	303.1175	1021.30	0.0000	1750.46	0.0000
777.92	306.5645	1025.87	365.4395	1764.49	12.2139
778.90	329.6817	1028.54	356.0844	1770.23	19.3605
783.70	355.5220	1037.84	348.5474	1771.35	15.3661
785.37	314.0274	1038.76	0.0000	1791.20	0.0000
792.07	347.6634	1046.59	344.7614	1808.65	18.2917
794.95	319.5735	1048.07	337.9175	1810.72	0.0000
795.86	334.3776	1049.04	332.0135	1836.06	20.6383
801.95	311.2086	1050.41	331.1482		
810.06	357.3955	1063.66	367.6233		
810.29	355.5798	1077.00	366.0575		
810.45	355.6033	1077.34	368.1040		
810.76	352.8713	1085.87	335.6609		
815.77	364.6295	1093.63	379.9896		
818.51	378.8942	1099.45	390.7963		
832.01	374.2496	1112.07	382.4557		
834.85	389.8111	1112.84	391.2813		
835.71	393.1350	1115.54	314.0783		
836.80	0.0000	1120.29	241.5674		
846.75	0.0000	1120.55	241.5866		
846.77	394.9639	1121.30	257.4038		
856.80	385.1091	1129.67	223.1981		
860.56	396.9043	1131.51	0.0000		
871.09	398.3810	1147.95	0.0000		
873.19	361.1539	1173.23	196.9116		
875.33	0.0000	1177.95	136.9790		
879.38	396.5019	1189.05	128.0249		
880.51	390.2148	1204.77	97.2118		
883.24	405.7519	1221.41	94.4934		
884.68	423.0249	1231.02	87.3668		
889.28	421.7964	1235.36	62.1761		
894.76	458.7590	1238.28	73.8224		
898.04	466.9016	1260.41	0.0000		
900.72	469.2378	1271.87	46.8091		
903.28	463.9109	1274.44	51.0996		
911.20	485.2561	1274.54	52.1642		
912.08	494.0171	1291.59	48.1146		
923.98	475.8051	1298.22	0.0000		
926.50	504.1069	1312.11	50.5151		
929.11	458.3263	1332.49	62.6540		
937.49	520.4236	1362.66	0.0000		
944.13	525.4347	1365.19	18.6670		
946.00	511.2314	1368.63	0.0000		
949.00	558.2578	1384.29	22.9722		
954.55	0.0000	1408.01	13.2012		
962.31	405.4859	1457.56	0.0000		
964.08	393.4792	1460.82	16.2280		
966.17	486.5250	1489.16	6.7253		
968.97	442.8698	1505.03	20.2478		
983.53	389.7684	1584.12	20.6008		
984.45	362.7132	1596.21	17.7037		
996.26	352.2606	1620.50	10.6464		
1001.03	414.8672	1621.92	6.9221		

06/28/16

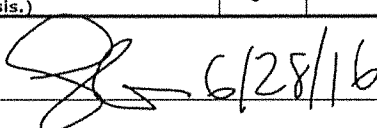
Gamma Solid

Batch# 1572236

Product: BRKL

Date: 06/28/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			n/a
Samples have been blank corrected (if required). Blank correction reported included (if required).			n/a
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			n/a
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			n/a
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.	✓		
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stated.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)	✓		
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			n/a
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			n/a
Aliquot Correction completed if required.			n/a
Review sample historical results if available (If REMF, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By:  6/28/16

Secondary Review Performed By:  6-28-16

Gamma Spec Queue Sheet

06/09/2016

Batch #: 1572236 Analyst: MXR1 First Client Due Date: 06/29/2016 Internal Due Date: 06/29/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 10
 Initials: HJ Prep Date: 6/7/16 Library: SOLID Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Wet/Dry Aliquot (1/g)	Detector	Sealing Date/Time (if Applicable)
398656021-1	37695-021	SAMPLE		BRKL007	SOIL	17-MAY-16 14:30:00	MS CAN	155.57 g	11	6/7/16
398656022-1	37695-022	SAMPLE		BRKL007	SOIL	17-MAY-16 14:35:00	MS	170.95 g	12	
398656023-1	37695-023	SAMPLE		BRKL007	SOIL	17-MAY-16 14:40:00	MS	161.89 g	14	
398656024-1	37695-024	SAMPLE		BRKL007	SOIL	17-MAY-16 14:45:00	MS	173.99 g	15	
398656025-1	37695-025	SAMPLE		BRKL007	SOIL	17-MAY-16 00:00:00	MS	160.77 g	17	
1203561386-1	MB	MB		QC ACCOUNT	SOIL	6/7/16	MS	173.99	28	6/28/16
1203561387-1	DUP 37695-021(398656021)	DUP		QC ACCOUNT	SOIL	17-MAY-16 14:30:00	MS	155.57	22	6/28/16
1203561388-1	LCS	LCS		QC ACCOUNT	SOIL	6/7/16	MS	115	8	

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By:

JS-6/28/16

Page 1 of 1

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:51:36.63

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656021.CNF:1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF:501
Background date  : 20-JUN-2016 14:03:14
Sample date     : 17-MAY-2016 14:30:00 Acquisition date : 24-JUN-2016 15:50:46
Sample ID      : G398656021 Sample quantity : 1.55570E+02 GRAM
Detector name   : GAM11 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:06.04 0.0%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID       : 1572236 Detector SN# :
Matrix Spike ID : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.69*	39	1205	0.66	93.26	90	7	8.93E-04	176.9	
2	0	53.15	83	1102	1.41	106.19	104	6	1.93E-03	63.8	
3	0	63.20*	304	1981	1.05	126.30	122	9	7.05E-03	29.1	
4	2	74.87	1588	1537	1.03	149.66	143	18	3.68E-02	4.6	2.43E+00
5	2	77.15*	2329	1179	0.91	154.23	143	18	5.39E-02	3.3	
6	5	87.24	976	1216	1.01	174.42	164	28	2.26E-02	6.5	9.03E+00
7	5	89.93	635	1166	1.03	179.80	164	28	1.47E-02	9.4	
8	5	92.80*	943	1492	1.36	185.55	164	28	2.18E-02	9.8	
9	0	99.56*	71	1515	1.76	199.08	195	9	1.65E-03	110.5	
10	0	105.98	130	1179	1.02	211.91	209	7	3.02E-03	44.5	
11	0	129.15	280	1145	1.00	258.30	255	7	6.49E-03	20.9	
12	0	154.20*	22	812	0.98	308.42	307	5	5.10E-04	237.6	
13	0	164.02	152	1136	1.57	328.09	324	8	3.52E-03	39.4	
14	0	171.84	58	856	0.51	343.73	342	6	1.33E-03	81.2	
15	0	186.04*	704	1443	1.23	372.15	367	11	1.63E-02	12.7	
16	0	205.18	121	807	0.91	410.45	408	7	2.81E-03	39.8	
17	0	209.28	429	1130	1.05	418.67	415	9	9.93E-03	14.9	
18	6	238.67*	4644	723	1.01	477.48	472	17	1.08E-01	1.9	4.17E+00
19	6	241.63	1015	958	1.53	483.40	472	17	2.35E-02	6.8	
20	0	270.29	388	954	1.19	540.75	536	11	8.99E-03	16.2	
21	0	277.79*	39	729	0.94	555.77	551	8	8.96E-04	134.5	
22	0	295.23	1272	803	1.17	590.67	586	11	2.95E-02	5.1	
23	0	300.19	246	696	1.11	600.60	597	9	5.69E-03	20.4	
24	0	327.99	252	631	1.09	656.22	652	9	5.84E-03	19.0	
25	0	338.35*	865	631	1.14	676.95	672	10	2.00E-02	7.3	
26	0	351.89*	2167	687	1.11	704.05	698	13	5.02E-02	3.5	
27	0	402.18	95	397	1.81	804.69	801	8	2.19E-03	38.0	
28	0	409.66	137	496	1.09	819.65	815	10	3.16E-03	31.6	
29	0	462.94	338	316	1.25	926.28	922	9	7.83E-03	10.9	
30	0	486.63	89	389	2.69	973.68	969	11	2.07E-03	44.2	
31	0	511.14*	456	648	1.90	1022.72	1014	19	1.06E-02	18.8	
32	0	558.59	31	258	1.34	1117.67	1114	8	7.23E-04	90.8	
33	0	561.83	33	303	0.96	1124.14	1122	8	7.68E-04	92.1	
34	0	583.31*	1316	454	1.39	1167.12	1162	13	3.05E-02	4.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	589.86	32	226	0.81	1180.23	1176	8	7.32E-04	84.8	
36	0	609.37*	1451	521	1.37	1219.28	1212	15	3.36E-02	4.7	
37	4	661.73*	180	268	1.48	1324.03	1318	18	4.17E-03	22.4	2.34E+00
38	4	665.56	42	224	1.68	1331.71	1318	18	9.78E-04	63.6	
39	0	727.30	371	383	1.39	1455.23	1448	15	8.58E-03	12.6	
40	0	768.13	130	230	1.07	1536.91	1533	9	3.02E-03	22.8	
41	0	772.05	68	248	1.73	1544.76	1542	12	1.58E-03	48.2	
42	0	780.00	92	277	5.35	1560.66	1553	15	2.13E-03	40.8	
43	0	785.68	107	187	1.91	1572.03	1568	9	2.47E-03	25.1	
44	0	795.36	175	247	1.32	1591.39	1585	12	4.04E-03	19.6	
45	0	799.87	33	117	1.58	1600.41	1598	7	7.72E-04	56.3	
46	0	835.56	82	198	0.97	1671.82	1667	10	1.90E-03	33.9	
47	0	860.71	182	196	1.55	1722.14	1718	11	4.22E-03	16.6	
48	0	911.34*	945	281	1.27	1823.42	1816	14	2.19E-02	5.4	
49	0	934.29	100	184	1.31	1869.34	1862	13	2.32E-03	29.8	
50	2	964.97	225	175	2.09	1930.71	1924	21	5.21E-03	14.2	1.34E+00
51	2	969.18*	596	146	1.59	1939.13	1924	21	1.38E-02	6.3	
52	0	1001.76	38	225	0.95	2004.31	2000	12	8.72E-04	81.3	
53	0	1079.42	43	167	1.58	2159.66	2153	12	1.00E-03	62.1	
54	0	1099.02	18	105	0.61	2198.86	2196	8	4.19E-04	101.8	
55	0	1120.39	359	160	1.67	2241.60	2236	12	8.31E-03	8.8	
56	0	1139.60	11	136	0.90	2280.04	2275	9	2.57E-04	192.3	
57	0	1153.30	17	126	1.34	2307.43	2305	8	3.84E-04	119.1	
58	0	1202.44	13	135	1.23	2405.72	2403	8	2.97E-04	159.1	
59	0	1222.27	17	120	0.57	2445.40	2444	8	3.90E-04	114.8	
60	0	1237.55	144	232	1.40	2475.95	2468	16	3.34E-03	25.0	
61	0	1281.20	46	93	2.78	2563.27	2557	10	1.07E-03	41.6	
62	0	1342.65	17	86	1.50	2686.16	2677	11	3.94E-04	109.0	
63	0	1377.68	88	91	1.76	2756.23	2752	10	2.03E-03	23.1	
64	0	1461.04*	2381	135	1.91	2922.94	2914	19	5.51E-02	2.5	
65	0	1494.69	55	63	5.00	2990.24	2983	16	1.28E-03	34.9	
66	2	1588.50	84	66	2.22	3177.85	3171	33	1.95E-03	21.8	2.85E+00
67	2	1593.12	42	64	2.48	3187.09	3171	33	9.64E-04	47.8	
68	0	1620.66	70	39	2.20	3242.17	3235	13	1.62E-03	21.9	
69	0	1632.00	42	75	8.05	3264.84	3252	19	9.64E-04	52.5	
70	0	1660.18	37	57	4.13	3321.19	3314	15	8.65E-04	46.8	
71	0	1729.81	87	52	1.81	3460.43	3451	19	2.02E-03	22.6	
72	0	1765.08*	238	93	2.37	3530.96	3524	20	5.50E-03	13.5	
73	0	1794.63	30	56	5.61	3590.05	3578	19	6.88E-04	63.6	
74	0	1847.76	70	45	2.34	3696.27	3688	14	1.62E-03	23.7	
75	0	1863.68	20	31	3.04	3728.11	3722	12	4.61E-04	59.7	
76	0	1873.48	44	51	8.19	3747.70	3735	21	1.01E-03	44.0	
77	0	1995.41	12	27	0.61	3991.50	3987	9	2.78E-04	83.2	
78	0	2024.92	12	32	5.25	4050.50	4040	13	2.66E-04	106.0	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 03:51:38

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656021.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 14:30:00 Acquisition date : 24-JUN-2016 15:50:46
Sample ID        : G398656021 Sample quantity  : 155.57 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA11 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:06.04 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	242.00	RA-224	240.99
TL-208	277.37	CM-247	278.00
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.256E+00	6.923E+00	6.923E+00	4.92	OK
MN-54	834.85	99.98*	2.034E+00	1.679E-02	1.828E-02	67.88	OK
AS-73	53.44	10.30*	2.286E+00	1.923E-01	2.676E-01	127.60	OK
CD-109	88.03	3.70*	6.499E+00	1.452E+00	1.539E+00	19.36	OK
SN-126	64.28	9.60	3.896E+00	4.350E-01	4.350E-01	58.15	OK
	86.94	8.90	6.499E+00	6.038E-01	6.038E-01	19.36	OK
	87.57	37.00*	6.499E+00	1.452E-01	1.452E-01	19.36	OK
BA-137M	661.66	89.90*	2.461E+00	3.463E-02	3.471E-02	44.77	OK
CS-137	661.66	85.10*	2.461E+00	3.658E-02	3.667E-02	44.77	OK
EU-155	86.55	30.70	6.499E+00	1.751E-01	1.778E-01	19.36	OK
	105.31	21.10*	7.184E+00	4.395E-02	4.462E-02	88.97	OK
TL-208	277.37	6.60	4.696E+00	5.821E-02	5.821E-02	268.94	OK
	583.19	85.00*	2.717E+00	2.460E-01	2.460E-01	9.84	OK
	860.56	12.50	1.984E+00	3.041E-01	3.041E-01	33.18	OK
PB-210	46.54	4.25*	1.307E+00	3.807E-01	3.819E-01	353.81	OK
BI-212	727.33	6.67*	2.281E+00	1.026E+00	1.026E+00	25.25	OK
	785.37	1.10	2.141E+00	1.893E+00	1.893E+00	50.27	OK
	1620.50	1.47	1.155E+00	1.587E+00	1.587E+00	43.83	OK
PB-212	74.82	10.28	5.441E+00	1.093E+00	1.093E+00	13.13	OK
	77.11	17.10	5.681E+00	1.259E+00	1.259E+00	6.54	OK
	238.63	43.60*	5.225E+00	9.642E-01	9.642E-01	3.80	OK
	300.09	3.30	4.442E+00	7.751E-01	7.751E-01	40.79	OK
BI-214	609.32	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39	OK
	1120.29	14.92	1.580E+00	6.119E-01	6.119E-01	17.65	OK
	1764.49	15.30	1.083E+00	5.452E-01	5.452E-01	27.00	OK
PB-214	74.82	5.80	5.435E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.681E+00	2.220E+00	2.220E+00	6.54	OK
	87.09	3.41	6.489E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.176E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.496E+00	7.116E-01	7.116E-01	10.26	OK
	351.93	35.60*	3.959E+00	6.995E-01	6.996E-01	7.02	OK
RN-219	271.23	10.80	4.789E+00	3.507E-01	3.507E-01	32.39	OK
	401.81	6.60*	3.591E+00	1.792E-01	1.792E-01	75.99	OK
RN-222	609.32	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39	OK
	1120.29	14.92	1.580E+00	6.119E-01	6.119E-01	17.65	OK
	1764.49	15.30	1.083E+00	5.452E-01	5.452E-01	27.00	OK
RA-224	240.99	4.10*	5.181E+00	9.995E-01	9.995E-01	33.35	OK
RA-226	609.32	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39	OK
	1120.29	14.92	1.580E+00	6.119E-01	6.119E-01	17.65	OK
	1764.49	15.30	1.083E+00	5.452E-01	5.452E-01	27.00	OK
AC-228	105.21	1.10	7.184E+00	8.430E-01	8.430E-01	88.97	OK
	338.32	11.27	4.074E+00	8.609E-01	8.609E-01	14.55	OK
	794.95	4.25	2.120E+00	8.094E-01	8.094E-01	39.13	OK
	835.71	1.61	2.034E+00	1.043E+00	1.043E+00	67.88	OK
	911.20	25.80*	1.890E+00	7.965E-01	7.965E-01	10.89	OK
	968.97	15.80	1.792E+00	8.593E-01	8.593E-01	12.59	OK
RA-228	105.21	1.10	7.184E+00	8.430E-01	8.430E-01	88.97	OK
	338.32	11.27	4.074E+00	8.609E-01	8.609E-01	14.55	OK
	794.95	4.25	2.120E+00	8.094E-01	8.094E-01	39.13	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	835.71	1.61	2.034E+00	1.043E+00	1.043E+00	67.88	OK
	911.20	25.80*	1.890E+00	7.965E-01	7.965E-01	10.89	OK
	968.97	15.80	1.792E+00	8.593E-01	8.593E-01	12.59	OK
	74.82	10.28	5.441E+00	1.093E+00	1.093E+00	13.13	OK
	77.11	17.10	5.681E+00	1.259E+00	1.259E+00	6.54	OK
TH-230	238.63	43.60*	5.225E+00	9.642E-01	9.642E-01	3.80	OK
	300.09	3.30	4.442E+00	7.751E-01	7.751E-01	40.79	OK
	609.32	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39	OK
	1120.29	14.92	1.580E+00	6.119E-01	6.119E-01	17.65	OK
PA-231	1764.49	15.30	1.083E+00	5.452E-01	5.452E-01	27.00	OK
	283.69	1.70	4.626E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.442E+00	4.781E-01	4.781E-01	40.79	OK
TH-232	105.21	1.10	7.184E+00	8.430E-01	8.430E-01	88.97	OK
	338.32	11.27	4.074E+00	8.609E-01	8.609E-01	14.55	OK
	835.71	1.61	2.034E+00	1.043E+00	1.043E+00	67.88	OK
TH-234	911.20	25.80*	1.890E+00	7.965E-01	7.965E-01	10.89	OK
	968.97	15.80	1.792E+00	8.593E-01	8.593E-01	12.59	OK
	63.29	3.70*	3.896E+00	1.129E+00	1.129E+00	58.15	OK
	92.59	4.23	6.799E+00	1.694E+00	1.694E+00	19.66	OK
U-234	609.32	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39	OK
	1120.29	14.92	1.580E+00	6.119E-01	6.119E-01	17.65	OK
	1764.49	15.30	1.083E+00	5.452E-01	5.452E-01	27.00	OK
U-235	89.96	3.47	6.656E+00	1.424E+00	1.424E+00	18.72	OK
	93.35	5.60	6.799E+00	1.279E+00	1.279E+00	19.66	OK
	143.76	10.96*	6.969E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.583E+00	2.229E-01	2.229E-01	78.72	OK
U-238	185.72	57.20	6.143E+00	9.706E-02	9.706E-02	25.39	OK
	205.31	5.01	5.781E+00	2.009E-01	2.009E-01	79.70	OK
	63.29	3.70*	3.896E+00	1.129E+00	1.129E+00	58.15	OK
	92.59	4.23	6.799E+00	1.694E+00	1.694E+00	19.66	OK
AM-243	43.53	5.90	9.036E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	5.441E+00	1.672E-01	1.672E-01	13.13	OK
CM-247	278.00	3.40	4.694E+00	----- Line	Not Found	-----	<<INT Reject
	287.50	2.00	4.582E+00	----- Line	Not Found	-----	Absent
	402.40	72.00*	3.591E+00	1.642E-02	1.642E-02	75.99	OK
ANH-511	511.00	100.00*	3.005E+00	6.650E-02	6.650E-02	37.62	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                           *
*****
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656021.CNF;1      *
* Acquisition date   : 24-JUN-2016 15:50:46 Sensitivity      : 3.000                *
* Detector ID        : GAM11 Energy tolerance: 1.500          *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:06.04 Half life ratio : *****      *
* Sample date       : 17-MAY-2016 14:30:00 Analyst initials: MXR1      *
* Sample ID         : G398656021 Sample Quantity : 1.5557E+02 GRAM  *
* Batch Number      : 1572236 Wet Weight      : 0.00000        *
* Wet wt corr       : 1.00000 Dry Weight       : 0.00000        *
* Nuclide Library    : SOLID.NLB;6
*****
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date    : 16-JUL-2015 08:37:24 Eff. Geometry   : CAN        *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13      *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	6.923E+00	3.340E-01	1.473E-01
MN-54	1.828E-02	1.216E-02	1.567E-02
AS-73	2.676E-01	3.347E-01	3.739E-01
CD-109	1.539E+00	2.920E-01	3.104E-01
SN-126	1.452E-01	2.756E-02	2.942E-02
BA-137M	3.471E-02	1.523E-02	1.508E-02
CS-137	3.667E-02	1.609E-02	1.593E-02
EU-155	4.462E-02	3.891E-02	4.271E-02
TL-208	2.460E-01	2.373E-02	1.627E-02
PB-210	3.819E-01	1.324E+00	1.146E+00
BI-212	1.026E+00	2.539E-01	2.039E-01
PB-212	9.642E-01	3.587E-02	2.484E-02
BI-214	5.218E-01	4.801E-02	2.927E-02
PB-214	6.996E-01	4.814E-02	3.036E-02
RN-219	1.792E-01	1.334E-01	1.744E-01
RN-222	5.218E-01	4.801E-02	2.927E-02
RA-224	9.995E-01	3.267E-01	2.662E-01
RA-226	5.218E-01	4.801E-02	2.927E-02
AC-228	7.965E-01	8.503E-02	5.766E-02
RA-228	7.965E-01	8.503E-02	5.766E-02
TH-228	9.642E-01	3.587E-02	2.484E-02
TH-230	5.218E-01	4.800E-02	2.927E-02
PA-231	4.781E-01	1.911E-01	2.027E-01
TH-232	7.965E-01	8.503E-02	5.766E-02
TH-234	1.129E+00	6.432E-01	5.051E-01
U-234	5.218E-01	4.800E-02	2.927E-02
U-235	5.409E-03	5.643E-02	9.124E-02
U-238	1.129E+00	6.432E-01	5.051E-01
AM-243	1.672E-01	2.152E-02	2.118E-02
CM-247	1.642E-02	1.223E-02	1.604E-02
ANH-511	6.650E-02	2.452E-02	1.148E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	-3.226E-02	1.071E-01	1.883E-01	NOT IDENT.
NA-22	1.595E-02	9.486E-03	1.699E-02	NOT IDENT.
NA-24	0.000E+00	2.486E+16	0.000E+00	SHORT HLIF
AL-26	-5.592E-03	8.008E-03	1.332E-02	NOT IDENT.
SC-46	-1.261E-02	1.097E-02	1.844E-02	FAIL ABUN
V-48	-1.252E-02	4.606E-02	8.014E-02	NOT IDENT.
CR-51	3.639E-03	1.590E-01	2.920E-01	NOT IDENT.
CO-56	-5.461E-03	1.203E-02	2.104E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	5.302E-03	6.206E-03	1.163E-02	NOT IDENT.
CO-58	-8.697E-03	1.146E-02	1.988E-02	NOT IDENT.
FE-59	1.456E-02	2.906E-02	5.079E-02	FAIL ABUN
CO-60	-1.752E-03	9.327E-03	1.585E-02	NOT IDENT.
ZN-65	-8.604E-03	2.476E-02	3.613E-02	NOT IDENT.
GE-68	2.835E-01	3.692E-01	5.876E-01	NOT IDENT.
AS-74	5.764E-02	5.814E-02	1.052E-01	NOT IDENT.
SE-75	9.400E-03	1.266E-02	2.243E-02	NOT IDENT.
BR-77	0.000E+00	4.810E+03	0.000E+00	SHORT HLIF
SR-82	0.000E+00	1.920E-01	2.553E-01	NOT IDENT.
RB-83	3.140E-03	2.025E-02	3.601E-02	NOT IDENT.
KR-85	0.000E+00	1.988E+00	3.716E+00	NOT IDENT.
SR-85	0.000E+00	1.343E-02	2.511E-02	NOT IDENT.
RB-86	1.282E-01	5.271E-01	8.079E-01	NOT IDENT.
Y-88	7.817E-03	1.004E-02	1.916E-02	NOT IDENT.
Y-91	2.251E+00	7.367E+00	1.168E+01	NOT IDENT.
NB-94	8.096E-03	8.260E-03	1.549E-02	NOT IDENT.
NB-95	0.000E+00	1.424E-02	2.508E-02	NOT IDENT.
NB-95M	-2.706E-02	4.514E-02	6.848E-02	NOT IDENT.
ZR-95	3.372E-02	2.153E-02	4.134E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.807E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	9.981E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	7.081E-03	8.314E-03	1.396E-02	NOT IDENT.
RH-102	2.072E-03	1.303E-02	2.404E-02	FAIL ABUN
RU-103	-1.311E-02	1.501E-02	2.571E-02	FAIL ABUN
RH-106	1.018E-02	7.737E-02	1.428E-01	NOT IDENT.
RU-106	1.018E-02	7.737E-02	1.428E-01	NOT IDENT.
AG-108M	-4.599E-03	7.171E-03	1.257E-02	NOT IDENT.
AG-110M	-1.088E-03	1.199E-02	2.131E-02	NOT IDENT.
SN-113	-8.471E-03	1.283E-02	2.268E-02	NOT IDENT.
CD-115	0.000E+00	3.724E+03	0.000E+00	SHORT HLIF
SN-117M	3.388E-02	4.570E-02	7.990E-02	NOT IDENT.
TE-123M	4.138E-03	8.362E-03	1.453E-02	NOT IDENT.
SB-124	2.009E-03	2.475E-02	4.473E-02	NOT IDENT.
SB-125	-2.241E-02	2.232E-02	3.865E-02	FAIL ABUN
TE-125M	9.592E-01	3.313E+00	5.540E+00	NOT IDENT.
I-126	1.738E-01	2.166E-01	3.291E-01	FAIL ABUN
SB-126	6.900E-02	1.395E-01	2.262E-01	FAIL ABUN
SB-127	-2.791E+01	1.928E+01	3.303E+01	NOT IDENT.
I-131	7.324E-02	2.003E-01	3.686E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.779E+01	0.000E+00	SHORT HLIF
BA-133	-3.644E-03	1.121E-02	1.770E-02	FAIL ABUN
I-133	0.000E+00	1.556E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.599E-02	2.186E-02	FAIL ABUN
CS-135	5.701E-02	4.130E-02	7.092E-02	NOT IDENT.
I-135	0.000E+00	4.376E+40	0.000E+00	SHORT HLIF
CS-136	4.109E-02	8.571E-02	1.539E-01	FAIL ABUN
CE-139	-1.466E-03	9.190E-03	1.464E-02	NOT IDENT.
BA-140	1.454E-01	2.199E-01	3.983E-01	FAIL ABUN
LA-140	6.472E-02	7.964E-02	1.490E-01	FAIL ABUN
CE-141	1.713E-02	2.494E-02	4.588E-02	NOT IDENT.
CE-143	0.000E+00	4.199E+06	0.000E+00	SHORT HLIF
CE-144	-1.417E-02	5.239E-02	9.058E-02	NOT IDENT.
PM-144	1.749E-03	8.839E-03	1.614E-02	NOT IDENT.
PR-144	1.286E-01	6.694E-01	1.222E+00	NOT IDENT.
PM-146	1.296E-02	1.032E-02	1.924E-02	NOT IDENT.
ND-147	-1.369E-01	5.796E-01	1.012E+00	FAIL ABUN
PM-147	2.475E+01	1.737E+02	3.207E+02	NOT IDENT.
PM-149	0.000E+00	3.055E+04	0.000E+00	SHORT HLIF
EU-150	5.831E-04	7.948E-03	1.196E-02	FAIL ABUN
EU-152	1.235E-02	2.380E-02	4.272E-02	FAIL ABUN
GD-153	-1.717E-02	3.136E-02	3.679E-02	NOT IDENT.
EU-154	4.028E-02	2.692E-02	4.749E-02	NOT IDENT.
TB-160	3.357E-02	3.606E-02	6.749E-02	FAIL ABUN
HO-166M	7.708E-03	1.431E-02	2.650E-02	FAIL ABUN

TM-171	4.376E+00	5.472E+00	6.781E+00	FAIL ABUN
HF-172	-9.894E-03	5.069E-02	8.268E-02	FAIL ABUN
LU-172	7.157E-03	1.626E-02	2.652E-02	FAIL ABUN
LU-176	2.790E-03	6.198E-03	1.156E-02	FAIL ABUN
HF-181	9.214E-03	1.814E-02	2.890E-02	NOT IDENT.
TA-182	2.135E-02	4.802E-02	8.567E-02	FAIL ABUN
RE-183	4.172E-02	4.943E-02	9.704E-02	NOT IDENT.
RE-184	-1.555E-02	4.725E-02	7.778E-02	NOT IDENT.
W-188	4.380E-01	2.379E+00	3.906E+00	FAIL ABUN
IR-192	-1.163E-03	1.034E-02	1.895E-02	FAIL ABUN
HG-203	8.329E-03	2.195E-02	2.442E-02	FAIL ABUN
BI-207	8.826E-03	1.227E-02	2.227E-02	FAIL ABUN
BI-211	0.000E+00	1.326E-01	1.953E-01	FAIL ABUN
PB-211	1.120E-01	2.606E-01	3.081E-01	NOT IDENT.
RA-223	1.160E-01	1.746E-01	2.889E-01	FAIL ABUN
AC-227	8.630E-03	6.005E-02	1.125E-01	FAIL ABUN
TH-227	8.630E-03	6.005E-02	1.125E-01	FAIL ABUN
TH-229	1.256E-01	1.312E-01	2.380E-01	FAIL ABUN
TH-231	1.160E-01	1.746E-01	2.889E-01	FAIL ABUN
PA-233	-8.067E-03	1.516E-02	2.749E-02	FAIL ABUN
PA-234	-9.262E-03	7.019E-02	1.235E-01	FAIL ABUN
PA-234M	1.047E+00	1.669E+00	2.087E+00	FAIL ABUN
NP-237	-8.067E-03	1.516E-02	2.749E-02	FAIL ABUN
NP-238	0.000E+00	1.071E+04	0.000E+00	SHORT HLIF
NP-239	-3.334E-02	6.069E-02	1.107E-01	FAIL ABUN
PU-239	0.000E+00	1.271E+02	1.611E+02	FAIL ABUN
AM-241	-1.220E-02	3.372E-02	5.802E-02	NOT IDENT.
CM-243	-9.983E-03	3.265E-02	4.256E-02	FAIL ABUN
BK-247	1.778E-02	2.082E-02	3.527E-02	FAIL ABUN
CF-249	6.526E-03	9.951E-03	1.834E-02	NOT IDENT.
CF-251	1.262E-02	3.224E-02	5.811E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	2305	10.66*	1.256E+00	6.923E+00	6.923E+00	4.92
MN-54	834.85	85	99.98*	2.034E+00	1.679E-02	1.828E-02	67.88
AS-73	53.44	113	10.30*	2.286E+00	1.923E-01	2.676E-01	127.60
CD-109	88.03	1261	3.70*	6.499E+00	2.108E+00	2.233E+00	12.95
SN-126	64.28	405	9.60	3.896E+00	4.350E-01	4.350E-01	58.15
	86.94	1261	8.90	6.499E+00	8.765E-01	8.765E-01	12.95
	87.57	1261	37.00*	6.499E+00	2.108E-01	2.108E-01	12.95
BA-137M	661.66	191	89.90*	2.461E+00	3.463E-02	3.471E-02	44.77
CS-137	661.66	191	85.10*	2.461E+00	3.658E-02	3.667E-02	44.77
EU-155	86.55	1261	30.70	6.499E+00	2.541E-01	2.580E-01	12.95
	105.31	166	21.10*	7.184E+00	4.395E-02	4.462E-02	88.97
HG-203	70.83	-----	3.69	4.964E+00	-----	Line Not Found	-----
	72.87	-----	6.19	5.213E+00	-----	Line Not Found	-----
	279.20	45	81.56*	4.696E+00	4.711E-03	8.329E-03	268.94
TL-208	277.37	45	6.60	4.696E+00	5.821E-02	5.821E-02	268.94
	583.19	1413	85.00*	2.717E+00	2.460E-01	2.460E-01	9.84
	860.56	188	12.50	1.984E+00	3.041E-01	3.041E-01	33.18
PB-210	46.54	53	4.25*	1.307E+00	3.807E-01	3.819E-01	353.81
BI-211	72.87	-----	1.23	5.213E+00	-----	Line Not Found	-----
	351.06	2452	12.92*	3.959E+00	1.928E+00	1.928E+00	7.02
BI-212	727.33	388	6.67*	2.281E+00	1.026E+00	1.026E+00	25.25
	785.37	111	1.10	2.141E+00	1.893E+00	1.893E+00	50.27
	1620.50	67	1.47	1.155E+00	1.587E+00	1.587E+00	43.83
PB-212	74.82	2079	10.28	5.441E+00	1.495E+00	1.495E+00	9.20
	77.11	3041	17.10	5.681E+00	1.259E+00	1.259E+00	6.54
	238.63	5462	43.60*	5.225E+00	9.642E-01	9.642E-01	3.80
	300.09	283	3.30	4.442E+00	7.751E-01	7.751E-01	40.79
BI-214	609.32	1550	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39
	1120.29	359	14.92	1.580E+00	6.119E-01	6.119E-01	17.65
	1764.49	225	15.30	1.083E+00	5.452E-01	5.452E-01	27.00
PB-214	74.82	2079	5.80	5.441E+00	2.649E+00	2.649E+00	9.20
	77.11	3041	9.70	5.681E+00	2.220E+00	2.220E+00	6.54
	87.09	1261	3.41	6.499E+00	2.288E+00	2.288E+00	12.95
	242.00	1193	7.25	5.181E+00	1.277E+00	1.277E+00	13.61
	295.22	1465	18.42	4.496E+00	7.116E-01	7.116E-01	10.26
	351.93	2452	35.60*	3.959E+00	6.995E-01	6.996E-01	7.02
RN-219	271.23	451	10.80	4.789E+00	3.507E-01	3.507E-01	32.39
	401.81	106	6.60*	3.591E+00	1.792E-01	1.792E-01	75.99
RN-222	609.32	1550	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39
	1120.29	359	14.92	1.580E+00	6.119E-01	6.119E-01	17.65
	1764.49	225	15.30	1.083E+00	5.452E-01	5.452E-01	27.00
RA-224	240.99	1193	4.10*	5.181E+00	2.258E+00	2.258E+00	13.61
RA-226	609.32	1550	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39
	1120.29	359	14.92	1.580E+00	6.119E-01	6.119E-01	17.65
	1764.49	225	15.30	1.083E+00	5.452E-01	5.452E-01	27.00
AC-228	105.21	166	1.10	7.184E+00	8.430E-01	8.430E-01	88.97
	338.32	983	11.27	4.074E+00	8.609E-01	8.609E-01	14.55

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	794.95	181	4.25	2.120E+00	8.094E-01	8.094E-01	39.13
	835.71	85	1.61	2.034E+00	1.043E+00	1.043E+00	67.88
	911.20	966	25.80*	1.890E+00	7.965E-01	7.965E-01	10.89
	968.97	605	15.80	1.792E+00	8.593E-01	8.593E-01	12.59
	105.21	166	1.10	7.184E+00	8.430E-01	8.430E-01	88.97
	338.32	983	11.27	4.074E+00	8.609E-01	8.609E-01	14.55
	794.95	181	4.25	2.120E+00	8.094E-01	8.094E-01	39.13
	835.71	85	1.61	2.034E+00	1.043E+00	1.043E+00	67.88
	911.20	966	25.80*	1.890E+00	7.965E-01	7.965E-01	10.89
	968.97	605	15.80	1.792E+00	8.593E-01	8.593E-01	12.59
TH-228	74.82	2079	10.28	5.441E+00	1.495E+00	1.495E+00	9.20
	77.11	3041	17.10	5.681E+00	1.259E+00	1.259E+00	6.54
	238.63	5462	43.60*	5.225E+00	9.642E-01	9.642E-01	3.80
	300.09	283	3.30	4.442E+00	7.751E-01	7.751E-01	40.79
TH-230	609.32	1550	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39
	1120.29	359	14.92	1.580E+00	6.119E-01	6.119E-01	17.65
	1764.49	225	15.30	1.083E+00	5.452E-01	5.452E-01	27.00
	283.69	-----	1.70	4.626E+00	-----	Line Not Found	-----
TH-232	301.36	283	5.35*	4.442E+00	4.781E-01	4.781E-01	40.79
	105.21	166	1.10	7.184E+00	8.430E-01	8.430E-01	88.97
	338.32	983	11.27	4.074E+00	8.609E-01	8.609E-01	14.55
	835.71	85	1.61	2.034E+00	1.043E+00	1.043E+00	67.88
	911.20	966	25.80*	1.890E+00	7.965E-01	7.965E-01	10.89
TH-234	968.97	605	15.80	1.792E+00	8.593E-01	8.593E-01	12.59
	63.29	405	3.70*	3.896E+00	1.129E+00	1.129E+00	58.15
	92.59	1211	4.23	6.799E+00	1.694E+00	1.694E+00	19.66
	609.32	1550	45.49*	2.626E+00	5.218E-01	5.218E-01	9.39
U-234	1120.29	359	14.92	1.580E+00	6.119E-01	6.119E-01	17.65
	1764.49	225	15.30	1.083E+00	5.452E-01	5.452E-01	27.00
	89.96	818	3.47	6.656E+00	1.424E+00	1.424E+00	18.72
	93.35	1211	5.60	6.799E+00	1.279E+00	1.279E+00	19.66
U-235	143.76	-----	10.96*	6.969E+00	-----	Line Not Found	-----
	163.33	185	5.08	6.583E+00	2.229E-01	2.229E-01	78.72
	185.72	848	57.20	6.143E+00	9.706E-02	9.706E-02	25.39
	205.31	145	5.01	5.781E+00	2.009E-01	2.009E-01	79.70
	63.29	405	3.70*	3.896E+00	1.129E+00	1.129E+00	58.15
	92.59	1211	4.23	6.799E+00	1.694E+00	1.694E+00	19.66
AM-243	43.53	-----	5.90	9.036E-01	-----	Line Not Found	-----
	74.66	2079	67.20*	5.441E+00	2.287E-01	2.287E-01	9.20
CM-247	278.00	45	3.40	4.696E+00	1.130E-01	1.130E-01	268.94
	287.50	-----	2.00	4.582E+00	-----	Line Not Found	-----
ANH-511	402.40	106	72.00*	3.591E+00	1.642E-02	1.642E-02	75.99
	511.00	497	100.00*	3.005E+00	6.650E-02	6.650E-02	37.62

Flag: "*" = Keyline

Total number of lines in spectrum 78
Number of unidentified lines 25
Number of lines tentatively identified by NID 53 67.95%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	6.923E+00	6.923E+00	0.341E+00	4.92	
MN-54	312.05D	1.09	1.679E-02	1.828E-02	1.241E-02	67.88	
AS-73	80.30D	1.39	1.923E-01	2.676E-01	3.415E-01	127.60	
CD-109	461.40D	1.06	2.108E+00	2.233E+00	0.289E+00	12.95	
SN-126	2.30E+05Y	1.00	2.108E-01	2.108E-01	0.273E-01	12.95	
BA-137M	30.08Y	1.00	3.463E-02	3.471E-02	1.554E-02	44.77	
CS-137	30.08Y	1.00	3.658E-02	3.667E-02	1.642E-02	44.77	
EU-155	4.75Y	1.02	4.395E-02	4.462E-02	3.970E-02	88.97	
HG-203	46.59D	1.77	4.711E-03	8.329E-03	22.40E-03	268.94	
TL-208	1.41E+10Y	1.00	2.460E-01	2.460E-01	0.242E-01	9.84	
PB-210	22.20Y	1.00	3.807E-01	3.819E-01	13.51E-01	353.81	
BI-211	7.04E+08Y	1.00	1.928E+00	1.928E+00	0.135E+00	7.02	
BI-212	1.41E+10Y	1.00	1.026E+00	1.026E+00	0.259E+00	25.25	
PB-212	1.41E+10Y	1.00	9.642E-01	9.642E-01	0.366E-01	3.80	
BI-214	1600.00Y	1.00	5.218E-01	5.218E-01	0.490E-01	9.39	
PB-214	1600.00Y	1.00	6.995E-01	6.996E-01	0.491E-01	7.02	
RN-219	7.04E+08Y	1.00	1.792E-01	1.792E-01	1.362E-01	75.99	
RN-222	1600.00Y	1.00	5.218E-01	5.218E-01	0.490E-01	9.39	
RA-224	1.41E+10Y	1.00	2.258E+00	2.258E+00	0.307E+00	13.61	
RA-226	1600.00Y	1.00	5.218E-01	5.218E-01	0.490E-01	9.39	
AC-228	1.41E+10Y	1.00	7.965E-01	7.965E-01	0.868E-01	10.89	
RA-228	1.41E+10Y	1.00	7.965E-01	7.965E-01	0.868E-01	10.89	
TH-228	1.41E+10Y	1.00	9.642E-01	9.642E-01	0.366E-01	3.80	
TH-230	7.54E+04Y	1.00	5.218E-01	5.218E-01	0.490E-01	9.39	
PA-231	7.04E+08Y	1.00	4.781E-01	4.781E-01	1.950E-01	40.79	
TH-232	1.41E+10Y	1.00	7.965E-01	7.965E-01	0.868E-01	10.89	
TH-234	4.47E+09Y	1.00	1.129E+00	1.129E+00	0.656E+00	58.15	
U-234	2.45E+05Y	1.00	5.218E-01	5.218E-01	0.490E-01	9.39	
U-235	7.04E+08Y	1.00	9.706E-02	9.706E-02	2.464E-02	25.39	K
U-238	4.47E+09Y	1.00	1.129E+00	1.129E+00	0.656E+00	58.15	
AM-243	7370.00Y	1.00	2.287E-01	2.287E-01	0.210E-01	9.20	
CM-247	1.56E+07Y	1.00	1.642E-02	1.642E-02	1.248E-02	75.99	
ANH-511	1.00E+09Y	1.00	6.650E-02	6.650E-02	2.502E-02	37.62	

Total Activity : 2.636E+01 2.657E+01

Grand Total Activity : 2.636E+01 2.657E+01

Flags: "K" = Keyline not found
"E" = Manually edited

"M" = Manually accepted
"A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	99.56	91	1933	1.76	199.08	195	9	1.65E-03	****	7.05E+00	T
0	129.15	349	1427	1.00	258.30	255	7	6.49E-03	41.8	7.18E+00	T
0	154.20	27	996	0.98	308.42	307	5	5.10E-04	****	6.78E+00	T
0	171.84	70	1039	0.51	343.73	342	6	1.33E-03	****	6.43E+00	
0	209.28	511	1346	1.05	418.67	415	9	9.93E-03	29.8	5.71E+00	
0	327.99	287	719	1.09	656.22	652	9	5.84E-03	38.0	4.17E+00	T
0	409.66	152	553	1.09	819.65	815	10	3.16E-03	63.3	3.54E+00	T
0	462.94	372	347	1.25	926.28	922	9	7.83E-03	21.8	3.24E+00	T
0	486.63	98	425	2.69	973.68	969	11	2.07E-03	88.4	3.12E+00	T
0	558.59	34	278	1.34	1117.67	1114	8	7.23E-04	****	2.81E+00	
0	561.83	36	326	0.96	1124.14	1122	8	7.68E-04	****	2.80E+00	T
0	589.86	34	243	0.81	1180.23	1176	8	7.32E-04	****	2.69E+00	
4	665.56	45	238	1.68	1331.71	1318	18	9.78E-04	****	2.45E+00	T
0	768.13	136	239	1.07	1536.91	1533	9	3.02E-03	45.5	2.18E+00	T
0	772.05	71	258	1.73	1544.76	1542	12	1.58E-03	96.5	2.17E+00	T
0	780.00	96	288	5.35	1560.66	1553	15	2.13E-03	81.5	2.15E+00	T
0	799.87	35	121	1.58	1600.41	1598	7	7.72E-04	****	2.11E+00	
0	934.29	102	187	1.31	1869.34	1862	13	2.32E-03	59.5	1.85E+00	
2	964.97	228	178	2.09	1930.71	1924	21	5.21E-03	28.5	1.80E+00	T
0	1001.76	38	228	0.95	2004.31	2000	12	8.72E-04	****	1.74E+00	T
0	1079.42	43	167	1.58	2159.66	2153	12	1.00E-03	****	1.63E+00	
0	1099.02	18	105	0.61	2198.86	2196	8	4.19E-04	****	1.61E+00	T
0	1139.60	11	135	0.90	2280.04	2275	9	2.57E-04	****	1.56E+00	
0	1153.30	17	126	1.34	2307.43	2305	8	3.84E-04	****	1.54E+00	
0	1202.44	13	134	1.23	2405.72	2403	8	2.97E-04	****	1.48E+00	
0	1222.27	17	119	0.57	2445.40	2444	8	3.90E-04	****	1.46E+00	T
0	1237.55	142	229	1.40	2475.95	2468	16	3.34E-03	50.0	1.45E+00	T
0	1281.20	46	91	2.78	2563.27	2557	10	1.07E-03	83.1	1.40E+00	
0	1342.65	17	84	1.50	2686.16	2677	11	3.94E-04	****	1.35E+00	
0	1377.68	85	89	1.76	2756.23	2752	10	2.03E-03	46.3	1.32E+00	
0	1494.69	53	60	5.00	2990.24	2983	16	1.28E-03	69.8	1.23E+00	
2	1588.50	81	63	2.22	3177.85	3171	33	1.95E-03	43.6	1.17E+00	
2	1593.12	40	62	2.48	3187.09	3171	33	9.64E-04	95.7	1.17E+00	
0	1632.00	40	72	8.05	3264.84	3252	19	9.64E-04	****	1.15E+00	
0	1660.18	36	54	4.13	3321.19	3314	15	8.65E-04	93.5	1.13E+00	
0	1729.81	83	49	1.81	3460.43	3451	19	2.02E-03	45.2	1.10E+00	
0	1794.63	28	53	5.61	3590.05	3578	19	6.88E-04	****	1.07E+00	
0	1847.76	66	42	2.34	3696.27	3688	14	1.62E-03	47.4	1.05E+00	
0	1863.68	19	29	3.04	3728.11	3722	12	4.61E-04	****	1.04E+00	
0	1873.48	41	48	8.19	3747.70	3735	21	1.01E-03	88.1	1.04E+00	
0	1995.41	11	25	0.61	3991.50	3987	9	2.78E-04	****	1.00E+00	
0	2024.92	11	29	5.25	4050.50	4040	13	2.66E-04	****	9.92E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656021.CNF;1
Acquisition date : 24-JUN-2016 15:50:46 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.04 Half life ratio : *****
Sample date : 17-MAY-2016 14:30:00 Nuclide Library : SOLID
Sample ID : G398656021 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.5557E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.959E-02
MN-54	7.540E-03
AS-73	1.836E-01
CD-109	1.527E-01
SN-126	1.447E-02
BA-137M	7.289E-03
CS-137	7.700E-03
EU-155	2.097E-02
TL-208	7.894E-03
PB-210	5.624E-01
BI-212	9.833E-02
PB-212	1.217E-02
BI-214	1.417E-02
PB-214	1.479E-02
RN-219	8.485E-02
RN-222	1.417E-02
RA-224	1.304E-01
RA-226	1.417E-02
AC-228	2.771E-02
RA-228	2.771E-02
TH-228	1.217E-02
TH-230	1.417E-02
PA-231	9.901E-02
TH-232	2.771E-02
TH-234	2.486E-01
U-234	1.417E-02
U-235	4.488E-02
U-238	2.486E-01
AM-243	1.043E-02
CM-247	7.806E-03
ANH-511	5.556E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)

BE-7	9.139E-02	NOT IDENT.
NA-22	8.096E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.151E-03	NOT IDENT.
SC-46	8.829E-03	FAIL ABUN
V-48	3.844E-02	NOT IDENT.
CR-51	1.425E-01	NOT IDENT.
CO-56	1.014E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.712E-03	NOT IDENT.
CO-58	9.552E-03	NOT IDENT.
FE-59	2.430E-02	FAIL ABUN
CO-60	7.520E-03	NOT IDENT.
ZN-65	1.730E-02	NOT IDENT.
GE-68	2.823E-01	NOT IDENT.
AS-74	5.104E-02	NOT IDENT.
SE-75	1.097E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.228E-01	NOT IDENT.
RB-83	1.744E-02	NOT IDENT.
KR-85	1.815E+00	NOT IDENT.
SR-85	1.226E-02	NOT IDENT.
RB-86	3.879E-01	NOT IDENT.
Y-88	8.914E-03	NOT IDENT.
Y-91	5.617E+00	NOT IDENT.
NB-94	7.509E-03	NOT IDENT.
NB-95	1.216E-02	NOT IDENT.
NB-95M	3.359E-02	NOT IDENT.
ZR-95	1.998E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.860E-03	NOT IDENT.
RH-102	1.162E-02	FAIL ABUN
RU-103	1.246E-02	FAIL ABUN
RH-106	6.906E-02	NOT IDENT.
RU-106	6.906E-02	NOT IDENT.
AG-108M	6.102E-03	NOT IDENT.
AG-110M	1.022E-02	NOT IDENT.
SN-113	1.105E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.926E-02	NOT IDENT.
TE-123M	7.138E-03	NOT IDENT.
SB-124	2.078E-02	NOT IDENT.
SB-125	1.876E-02	FAIL ABUN
TE-125M	2.724E+00	NOT IDENT.
I-126	1.592E-01	FAIL ABUN
SB-126	1.093E-01	FAIL ABUN
SB-127	1.589E+01	NOT IDENT.
I-131	1.795E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.619E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.062E-02	FAIL ABUN
CS-135	3.473E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.388E-02	FAIL ABUN
CE-139	7.191E-03	NOT IDENT.
BA-140	1.928E-01	FAIL ABUN
LA-140	7.058E-02	FAIL ABUN
CE-141	2.256E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.450E-02	NOT IDENT.
PM-144	7.820E-03	NOT IDENT.
PR-144	5.921E-01	NOT IDENT.
PM-146	9.357E-03	NOT IDENT.
ND-147	4.899E-01	FAIL ABUN
PM-147	1.575E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.838E-03	FAIL ABUN
EU-152	2.083E-02	FAIL ABUN
GD-153	1.808E-02	NOT IDENT.
EU-154	2.263E-02	NOT IDENT.
TB-160	3.239E-02	FAIL ABUN
HO-166M	1.281E-02	FAIL ABUN
TM-171	3.331E+00	FAIL ABUN

HF-172	4.062E-02	FAIL ABUN
LU-172	1.270E-02	FAIL ABUN
LU-176	5.645E-03	FAIL ABUN
HF-181	1.404E-02	NOT IDENT.
TA-182	4.110E-02	FAIL ABUN
RE-183	4.772E-02	NOT IDENT.
RE-184	3.728E-02	NOT IDENT.
W-188	1.908E+00	FAIL ABUN
IR-192	9.247E-03	FAIL ABUN
HG-203	1.195E-02	FAIL ABUN
BI-207	1.069E-02	FAIL ABUN
BI-211	9.659E-02	FAIL ABUN
PB-211	1.499E-01	NOT IDENT.
RA-223	1.411E-01	FAIL ABUN
AC-227	5.504E-02	FAIL ABUN
TH-227	5.504E-02	FAIL ABUN
TH-229	1.169E-01	FAIL ABUN
TH-231	1.411E-01	FAIL ABUN
PA-233	1.341E-02	FAIL ABUN
PA-234	5.927E-02	FAIL ABUN
PA-234M	1.006E+00	FAIL ABUN
NP-237	1.341E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.435E-02	FAIL ABUN
PU-239	7.933E+01	FAIL ABUN
AM-241	2.853E-02	NOT IDENT.
CM-243	2.089E-02	FAIL ABUN
BK-247	1.725E-02	FAIL ABUN
CF-249	8.941E-03	NOT IDENT.
CF-251	2.854E-02	NOT IDENT.

GEL Laboratories LLC
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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656021.CNF;1
Acquisition date : 24-JUN-2016 15:50:46 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.04 Half life ratio : *****
Sample date : 17-MAY-2016 14:30:00 Nuclide Library : SOLID
Sample ID : G398656021 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.5557E+02 GRAM
Quantity Err(%) : 1.2856E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	6.923E+00	6.851E-01	6.851E-01
MN-54	1.828E-02	1.236E-02	1.236E-02
AS-73	2.676E-01	3.392E-01	3.392E-01
CD-109	1.539E+00	3.443E-01	3.443E-01
SN-126	1.452E-01	3.158E-02	3.158E-02
BA-137M	3.471E-02	1.548E-02	1.548E-02
CS-137	3.667E-02	1.635E-02	1.635E-02
EU-155	4.462E-02	3.910E-02	3.910E-02
TL-208	2.460E-01	3.110E-02	3.110E-02
PB-210	3.819E-01	1.325E+00	1.325E+00
BI-212	1.026E+00	2.730E-01	2.730E-01
PB-212	9.642E-01	8.880E-02	8.880E-02
BI-214	5.218E-01	6.406E-02	6.406E-02
PB-214	6.996E-01	7.499E-02	7.499E-02
RN-219	1.792E-01	1.358E-01	1.358E-01
RN-222	5.218E-01	6.406E-02	6.406E-02
RA-224	9.995E-01	3.688E-01	3.688E-01
RA-226	5.218E-01	6.406E-02	6.406E-02
AC-228	7.965E-01	1.436E-01	1.436E-01
RA-228	7.965E-01	1.436E-01	1.436E-01
TH-228	9.642E-01	8.880E-02	8.880E-02
TH-230	5.218E-01	6.406E-02	6.406E-02
PA-231	4.781E-01	2.194E-01	2.194E-01
TH-232	7.965E-01	1.436E-01	1.436E-01
TH-234	1.129E+00	6.915E-01	6.915E-01
U-234	5.218E-01	6.406E-02	6.406E-02
U-235	5.409E-03	5.643E-02	5.643E-02
U-238	1.129E+00	6.915E-01	6.915E-01
AM-243	1.672E-01	2.658E-02	2.658E-02
CM-247	1.642E-02	1.259E-02	1.259E-02
ANH-511	6.650E-02	2.511E-02	2.511E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	-3.226E-02	1.072E-01	1.081E-01	NOT IDENT.
NA-22	1.595E-02	9.586E-03	1.198E-02	NOT IDENT.
NA-24	-1.474E+16	2.490E+16	0.000E+00	SHORT HLIF
AL-26	-5.592E-03	8.019E-03	8.406E-03	NOT IDENT.
SC-46	-1.261E-02	1.111E-02	1.248E-02	FAIL ABUN
V-48	-1.252E-02	4.611E-02	4.645E-02	NOT IDENT.
CR-51	3.639E-03	1.590E-01	1.590E-01	NOT IDENT.
CO-56	-5.461E-03	1.205E-02	1.229E-02	FAIL ABUN
MN-56	-1.000E+41	2.165E+41	0.000E+00	SHORT HLIF
CO-57	5.302E-03	6.218E-03	6.661E-03	NOT IDENT.
CO-58	-8.697E-03	1.150E-02	1.215E-02	NOT IDENT.
FE-59	1.456E-02	2.921E-02	2.993E-02	FAIL ABUN
CO-60	-1.752E-03	9.328E-03	9.362E-03	NOT IDENT.
ZN-65	-8.604E-03	2.481E-02	2.512E-02	NOT IDENT.
GE-68	2.835E-01	3.730E-01	3.943E-01	NOT IDENT.
AS-74	5.764E-02	5.845E-02	6.396E-02	NOT IDENT.
SE-75	9.400E-03	1.269E-02	1.338E-02	NOT IDENT.
BR-77	1.293E+05	1.434E+05	1.548E+05	SHORT HLIF
SR-82	3.443E-01	1.954E-01	2.496E-01	NOT IDENT.
RB-83	3.140E-03	2.026E-02	2.031E-02	NOT IDENT.
KR-85	9.434E+00	2.131E+00	4.757E+00	NOT IDENT.
SR-85	6.357E-02	1.440E-02	3.207E-02	NOT IDENT.
RB-86	1.282E-01	5.277E-01	5.308E-01	NOT IDENT.
Y-88	7.817E-03	1.006E-02	1.066E-02	NOT IDENT.
Y-91	2.251E+00	7.370E+00	7.440E+00	NOT IDENT.
NB-94	8.096E-03	8.291E-03	9.059E-03	NOT IDENT.
NB-95	3.286E-02	1.464E-02	2.083E-02	NOT IDENT.
NB-95M	-2.706E-02	4.523E-02	4.685E-02	NOT IDENT.
ZR-95	3.372E-02	2.180E-02	2.657E-02	NOT IDENT.
NB-97	1.000E+41	1.633E+42	0.000E+00	SHORT HLIF
ZR-97	6.708E+15	3.846E+15	4.893E+15	SHORT HLIF
MO-99	5.707E+01	9.981E+02	9.985E+02	SHORT HLIF
TC-99M	-1.000E+41	4.948E+42	0.000E+00	SHORT HLIF
RH-101	7.081E-03	8.419E-03	9.004E-03	NOT IDENT.
RH-102	2.072E-03	1.303E-02	1.306E-02	FAIL ABUN
RU-103	-1.311E-02	1.506E-02	1.617E-02	FAIL ABUN
RH-106	1.018E-02	7.738E-02	7.751E-02	NOT IDENT.
RU-106	1.018E-02	7.738E-02	7.751E-02	NOT IDENT.
AG-108M	-4.599E-03	7.180E-03	7.473E-03	NOT IDENT.
AG-110M	-1.088E-03	1.199E-02	1.200E-02	NOT IDENT.
SN-113	-8.471E-03	1.284E-02	1.340E-02	NOT IDENT.
CD-115	1.008E+03	3.725E+03	3.752E+03	SHORT HLIF
SN-117M	3.388E-02	4.576E-02	4.825E-02	NOT IDENT.
TE-123M	4.138E-03	8.367E-03	8.573E-03	NOT IDENT.
SB-124	2.009E-03	2.475E-02	2.477E-02	NOT IDENT.
SB-125	-2.241E-02	2.239E-02	2.456E-02	FAIL ABUN
TE-125M	9.592E-01	3.314E+00	3.342E+00	NOT IDENT.
I-126	1.738E-01	2.172E-01	2.309E-01	FAIL ABUN
SB-126	6.900E-02	1.398E-01	1.432E-01	FAIL ABUN
SB-127	-2.791E+01	2.003E+01	2.365E+01	NOT IDENT.
I-131	7.324E-02	2.004E-01	2.031E-01	NOT IDENT.
I-132	-1.000E+41	1.265E+42	0.000E+00	SHORT HLIF
TE-132	1.414E+01	2.784E+01	2.856E+01	SHORT HLIF
BA-133	-3.644E-03	1.122E-02	1.134E-02	FAIL ABUN
I-133	6.862E+10	1.566E+11	1.596E+11	SHORT HLIF
CS-134	4.169E-02	1.664E-02	2.511E-02	FAIL ABUN
CS-135	5.701E-02	4.168E-02	4.897E-02	NOT IDENT.
I-135	-4.386E+39	4.392E+40	0.000E+00	SHORT HLIF
CS-136	4.109E-02	8.608E-02	8.805E-02	FAIL ABUN
CE-139	-1.466E-03	9.196E-03	9.219E-03	NOT IDENT.
BA-140	1.454E-01	2.202E-01	2.298E-01	FAIL ABUN
LA-140	6.472E-02	7.980E-02	8.496E-02	FAIL ABUN
CE-141	1.713E-02	2.497E-02	2.613E-02	NOT IDENT.
CE-143	2.135E+07	4.601E+06	1.067E+07	SHORT HLIF
CE-144	-1.417E-02	5.241E-02	5.279E-02	NOT IDENT.
PM-144	1.749E-03	8.840E-03	8.876E-03	NOT IDENT.
PR-144	1.286E-01	6.695E-01	6.720E-01	NOT IDENT.
PM-146	1.296E-02	1.041E-02	1.193E-02	NOT IDENT.
ND-147	-1.369E-01	5.797E-01	5.830E-01	FAIL ABUN
PM-147	2.475E+01	1.737E+02	1.741E+02	NOT IDENT.
PM-149	-3.657E+03	3.056E+04	3.060E+04	SHORT HLIF
EU-150	5.831E-04	7.948E-03	7.952E-03	FAIL ABUN
EU-152	1.235E-02	2.382E-02	2.447E-02	FAIL ABUN
GD-153	-1.717E-02	3.139E-02	3.233E-02	NOT IDENT.
EU-154	4.028E-02	2.716E-02	3.267E-02	NOT IDENT.
TB-160	3.357E-02	3.636E-02	3.938E-02	FAIL ABUN
HO-166M	7.708E-03	1.433E-02	1.474E-02	FAIL ABUN

TM-171	4.376E+00	5.487E+00	5.831E+00	FAIL	ABUN
HF-172	-9.894E-03	5.072E-02	5.091E-02	FAIL	ABUN
LU-172	7.157E-03	1.633E-02	1.665E-02	FAIL	ABUN
LU-176	2.790E-03	6.202E-03	6.329E-03	FAIL	ABUN
HF-181	9.214E-03	1.815E-02	1.862E-02	NOT	IDENT.
TA-182	2.135E-02	4.806E-02	4.901E-02	FAIL	ABUN
RE-183	4.172E-02	4.964E-02	5.309E-02	NOT	IDENT.
RE-184	-1.555E-02	4.731E-02	4.783E-02	NOT	IDENT.
W-188	4.380E-01	2.380E+00	2.388E+00	FAIL	ABUN
IR-192	-1.163E-03	1.034E-02	1.036E-02	FAIL	ABUN
HG-203	8.329E-03	2.196E-02	2.228E-02	FAIL	ABUN
BI-207	8.826E-03	1.237E-02	1.300E-02	FAIL	ABUN
BI-211	1.928E+00	2.090E-01	8.937E-01	FAIL	ABUN
PB-211	1.120E-01	2.608E-01	2.656E-01	NOT	IDENT.
RA-223	1.160E-01	1.749E-01	1.826E-01	FAIL	ABUN
AC-227	8.630E-03	6.007E-02	6.019E-02	FAIL	ABUN
TH-227	8.630E-03	6.007E-02	6.019E-02	FAIL	ABUN
TH-229	1.256E-01	1.315E-01	1.432E-01	FAIL	ABUN
TH-231	1.160E-01	1.749E-01	1.826E-01	FAIL	ABUN
PA-233	-8.067E-03	1.518E-02	1.561E-02	FAIL	ABUN
PA-234	-9.262E-03	7.099E-02	7.112E-02	FAIL	ABUN
PA-234M	1.047E+00	1.678E+00	1.743E+00	FAIL	ABUN
NP-237	-8.067E-03	1.518E-02	1.561E-02	FAIL	ABUN
NP-238	-3.160E+03	1.072E+04	1.082E+04	SHORT	HLIF
NP-239	-3.334E-02	6.078E-02	6.261E-02	FAIL	ABUN
PU-239	3.100E+02	1.291E+02	1.902E+02	FAIL	ABUN
AM-241	-1.220E-02	3.373E-02	3.418E-02	NOT	IDENT.
CM-243	-9.983E-03	3.267E-02	3.298E-02	FAIL	ABUN
BK-247	1.778E-02	2.116E-02	2.263E-02	FAIL	ABUN
CF-249	6.526E-03	9.975E-03	1.040E-02	NOT	IDENT.
CF-251	1.262E-02	3.227E-02	3.277E-02	NOT	IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	892.7648	87.09	1179.7413	136.47	1009.0344
45.60	924.1382	87.57	1180.9159	140.51	0.0000
46.54	882.7474	88.03	1182.0330	143.76	1062.5575
49.72	0.0000	88.34	1182.7863	144.24	1010.3922
51.35	850.0982	88.47	1183.1053	145.44	1045.4094
51.87	870.8047	89.96	1186.6991	152.43	1120.9633
52.39	923.9620	1093.63	1188.3333	153.25	1117.5167
52.97	915.1306	91.11	1189.4567	323.87	1035.3601
53.44	949.7296	92.59	1192.9802	156.02	1063.2788
54.07	1053.4430	93.35	1194.7804	158.56	966.6428
57.36	0.0000	94.56	1047.8046	159.00	979.9285
57.53	1073.9226	94.65	1047.9889	162.33	984.6712
57.98	1048.7310	94.67	1048.0280	162.66	985.1043
59.27	1143.9786	94.87	1079.9460	163.33	931.1234
59.32	1144.1323	97.43	1065.1615	165.86	979.6828
59.54	1136.8729	98.43	1055.6622	176.31	966.9930
60.96	1105.3367	98.44	1055.6846	176.60	958.5678
61.17	1100.6361	99.53	971.1577	177.52	939.7083
62.93	1232.3936	100.11	972.2241	181.07	0.0000
63.29	1233.5338	102.03	987.3364	181.52	948.7659
63.58	1234.4503	103.18	989.4427	184.41	940.6552
64.28	1370.4922	103.37	981.0569	143.76	895.5718
66.73	1319.6937	105.21	933.2514	193.51	880.7386
67.24	1336.1852	105.31	955.3284	197.03	1014.3733
125.81	1348.7051	106.12	1039.6331	198.01	976.6035
67.75	1348.9337	106.47	1100.7937	201.83	928.3997
69.67	1433.6498	109.28	1066.6193	203.43	920.0256
70.83	1406.3431	111.00	1110.6818	205.31	906.8484
72.81	1380.1350	111.76	0.0000	210.85	878.6318
72.87	1380.3276	114.06	1016.7112	215.65	855.4828
74.66	1386.0685	116.30	0.0000	222.11	830.6173
74.82	1386.5770	116.74	1011.4398	227.09	801.7017
74.97	1387.0548	119.76	978.6292	227.38	801.9502
77.11	1393.8126	121.12	972.8306	228.16	0.0000
78.74	1398.8984	121.22	972.9888	228.18	788.8191
79.69	1240.8315	121.78	940.8245	116.74	788.8191
80.12	1125.3063	122.06	941.2543	235.69	914.3279
80.19	1125.4792	122.92	952.6202	235.96	893.7197
80.57	1243.2256	123.07	952.8519	238.63	783.3989
81.00	1244.3920	265.00	991.9951	238.98	0.0000
81.07	1244.5829	125.81	1019.6183	240.99	785.2706
81.75	1235.2640	127.23	980.9919	242.00	786.0660
83.79	1171.6028	127.91	994.2061	244.70	705.8578
84.00	1172.1262	129.30	1077.0084	252.40	653.9474
85.43	1175.6688	131.20	1049.7155	252.80	653.3174
86.55	1178.4200	133.02	1012.8996	254.15	0.0000
86.79	1179.0073	133.52	1041.2500	256.23	681.2109
86.94	1179.3776	136.00	1038.0303	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	594.8772	355.39	0.0000	584.27	355.0586
264.80	594.9584	356.01	473.9987	595.83	297.9876
265.00	582.4293	364.49	424.3573	427.87	342.3263
268.22	624.3673	366.42	0.0000	602.52	0.0000
269.46	634.9688	372.51	434.6586	604.72	337.1974
270.03	635.3032	375.05	468.7309	607.14	339.3971
271.23	636.0044	377.52	452.8990	609.32	306.7251
273.65	670.7761	356.01	439.1810	610.33	306.8751
276.40	638.7130	388.16	454.3427	614.28	307.8503
277.37	624.1965	388.63	433.7483	618.01	313.2234
277.60	606.5884	391.69	494.0813	620.36	298.2166
278.00	605.3652	264.66	408.0813	621.93	285.7810
279.20	600.2192	401.81	423.7549	630.19	0.0000
279.54	601.8513	402.40	425.9184	631.29	277.9849
279.70	601.9425	404.85	391.6591	633.25	270.9719
280.46	573.3190	410.95	418.9572	634.78	277.5381
283.69	603.1807	413.71	418.1201	635.95	305.9191
284.31	611.7070	414.70	392.6518	636.99	303.3340
285.41	607.7460	423.72	394.5882	645.85	263.4398
285.90	0.0000	427.09	440.0727	657.76	275.9473
287.50	577.8385	427.87	422.0366	657.90	0.0000
290.67	571.2034	433.94	404.3420	661.66	278.2883
293.27	0.0000	439.40	381.2299	664.57	0.0000
351.93	569.0582	453.88	341.3943	666.33	292.4296
295.96	569.4172	463.37	393.3934	666.50	292.4451
879.38	578.8129	468.07	389.5277	667.71	0.0000
299.98	579.5029	473.00	380.8785	677.62	281.2440
300.09	556.6733	475.06	384.4863	685.70	277.6071
300.13	556.6917	476.78	370.2372	695.00	275.0149
301.36	567.6188	477.60	370.4209	696.49	305.1554
302.85	532.8193	482.18	349.1820	696.51	305.1554
256.23	563.1997	487.02	372.4897	697.00	314.5816
304.85	542.6111	492.35	0.0000	697.30	329.6047
306.78	522.5206	497.08	377.8526	697.49	329.6305
308.46	515.8157	505.52	394.7908	702.65	286.2726
311.90	547.1238	507.63	0.0000	706.68	327.2016
316.51	545.4594	511.00	295.5192	711.68	255.3593
319.41	574.8839	514.00	278.7077	720.70	242.7994
320.08	544.2368	514.00	278.7077	721.93	0.0000
321.04	548.4178	520.40	302.4478	722.78	291.9305
323.87	531.6028	520.69	0.0000	722.91	295.1094
325.23	574.3928	522.65	0.0000	723.31	288.8416
328.76	569.9640	527.90	0.0000	724.19	284.2163
333.37	538.6709	528.26	300.5329	727.33	241.9076
333.97	542.7175	529.59	310.4561	733.00	209.2095
334.37	555.7999	529.87	0.0000	735.93	260.8820
338.28	529.3182	531.02	307.4657	333.97	242.9473
338.32	529.3351	537.26	273.8697	739.50	0.0000
311.90	498.9464	546.56	0.0000	747.24	249.6832
340.48	498.9464	552.55	328.0529	748.06	245.9445
340.55	498.9704	563.25	326.6443	752.31	258.8401
344.28	477.6715	569.33	296.1890	753.82	244.6157
345.93	485.7236	946.00	296.2136	756.73	205.5309
351.06	450.8944	569.70	296.2464	756.80	205.5361
351.93	451.1878	583.19	354.8633	884.68	191.0508

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	215.2964	1274.44	157.3279	1620.50	71.2096
766.42	244.2787	1001.03	178.5830	1621.92	49.5508
766.84	244.3219	1002.74	185.6941	1678.03	0.0000
772.60	0.0000	1004.73	166.5322	1690.97	55.5297
776.52	116.1855	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	54.7098
778.90	218.0566	1028.54	0.0000	1063.66	34.6906
783.70	218.4796	1037.84	162.6521	1771.35	34.6986
785.37	233.2031	1038.76	0.0000	1791.20	0.0000
792.07	209.4675	631.29	165.2324	1808.65	63.3261
794.95	225.9655	1048.07	172.7736	1810.72	0.0000
795.86	151.2385	1049.04	174.9627	1836.06	44.2448
810.06	252.1687	1050.41	173.9754		
810.29	252.1938	1063.66	163.9819		
344.28	239.4488	1077.00	181.1638		
810.76	232.6083	1077.34	166.8293		
815.77	189.7959	1085.87	129.4980		
1048.07	190.9782	1093.63	152.9818		
832.01	186.3654	1099.45	179.8847		
834.85	216.2865	1112.07	162.0739		
835.71	277.4639	1112.84	178.1661		
836.80	0.0000	1115.54	186.9306		
846.75	0.0000	1120.29	172.2879		
846.77	246.7891	1120.55	172.3033		
856.80	209.7590	1221.41	167.2516		
860.56	215.0577	1129.67	145.4363		
871.09	163.6765	1131.51	0.0000		
873.19	169.8335	1147.95	0.0000		
875.33	0.0000	1173.23	199.3447		
879.38	155.1129	1177.95	164.4993		
880.51	167.2685	1189.05	167.8021		
883.24	183.5730	1204.77	196.3573		
884.68	186.6937	1221.41	190.8516		
889.28	212.2764	1231.02	187.6139		
894.76	186.3629	1235.36	177.1003		
898.04	194.6953	1238.28	158.8501		
900.72	186.7627	1260.41	0.0000		
903.28	191.7591	1271.87	131.8509		
911.20	199.6894	1274.44	87.8705		
912.08	215.7181	1274.54	82.9888		
923.98	0.0000	1291.59	123.9644		
926.50	168.2805	1298.22	0.0000		
929.11	205.0488	1312.11	114.0901		
937.49	161.0920	1332.49	119.1290		
944.13	217.4547	1362.66	0.0000		
946.00	190.7858	1365.19	91.3608		
949.00	176.5275	1368.63	0.0000		
667.71	0.0000	1384.29	108.4030		
962.31	138.2682	1408.01	94.3047		
964.08	163.9482	1457.56	0.0000		
966.17	164.0639	1460.82	97.5135		
911.20	164.2182	1489.16	66.9741		
968.97	164.2182	1505.03	119.6488		
983.53	193.2202	1584.12	70.2009		
984.45	0.0000	1596.21	86.2251		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:52:30.64

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656022.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM12.CNF;448
Background date  : 20-JUN-2016 14:03:19
Sample date      : 17-MAY-2016 14:35:00 Acquisition date : 24-JUN-2016 15:51:06
Sample ID        : G398656022 Sample quantity : 1.70950E+02 GRAM
Detector name     : GAM12 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:04.94 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : 1572236 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	36.66*	418	169	1.96	73.24	68	31	9.67E-03	14.2	1.77E+01
2	4	39.96*	219	574	1.97	79.83	68	31	5.08E-03	32.3	
3	4	45.41*	128	1124	1.98	90.74	68	31	2.96E-03	52.0	
4	3	75.01	843	1804	1.86	149.92	143	17	1.95E-02	10.6	7.53E+00
5	3	77.31	1015	1251	1.32	154.52	143	17	2.35E-02	7.0	
6	3	84.25*	104	1225	1.30	168.40	163	30	2.41E-03	64.6	2.23E+00
7	3	87.37	421	1156	1.26	174.64	163	30	9.74E-03	14.7	
8	3	89.99	312	821	1.08	179.88	163	30	7.23E-03	15.6	
9	3	92.83*	461	1142	1.44	185.57	163	30	1.07E-02	18.4	
10	0	105.49	116	963	1.11	210.89	207	8	2.69E-03	47.1	
11	0	122.48	60	894	1.36	244.86	242	8	1.40E-03	86.9	
12	0	129.61	94	1184	1.08	259.12	254	9	2.17E-03	66.8	
13	0	143.52*	22	795	0.94	286.92	285	7	5.21E-04	255.8	
14	0	186.02*	396	1231	1.34	371.92	367	12	9.17E-03	21.6	
15	0	209.24	239	781	1.14	418.37	415	8	5.53E-03	21.3	
16	5	238.57*	2566	599	1.21	477.02	469	29	5.94E-02	2.9	1.34E+00
17	5	241.52	651	877	1.92	482.92	469	29	1.51E-02	12.2	
18	5	246.01	90	877	2.50	491.90	469	29	2.09E-03	74.1	
19	0	270.14	328	792	1.79	540.16	534	12	7.59E-03	18.0	
20	0	277.12	39	787	0.90	554.13	551	11	8.98E-04	141.4	
21	0	284.65	85	567	0.73	569.18	564	10	1.97E-03	53.5	
22	0	295.16	824	663	1.26	590.22	585	11	1.91E-02	7.0	
23	0	299.88	179	519	1.14	599.64	596	9	4.14E-03	24.1	
24	0	327.67	167	596	1.40	655.23	650	11	3.87E-03	29.3	
25	0	338.17	527	574	1.05	676.23	672	10	1.22E-02	9.6	
26	0	351.73	1362	674	1.31	703.35	697	13	3.15E-02	4.8	
27	0	409.72	88	495	1.73	819.34	811	12	2.04E-03	51.7	
28	0	463.08	135	391	1.23	926.08	921	11	3.13E-03	29.7	
29	0	496.90	28	421	4.52	993.74	987	14	6.58E-04	154.7	
30	0	510.91*	151	613	2.16	1021.76	1012	18	3.50E-03	51.8	
31	0	569.29*	325	452	2.30	1138.56	1132	15	7.52E-03	16.8	
32	0	583.06*	939	400	1.48	1166.10	1158	16	2.17E-02	6.4	
33	0	609.34*	1029	331	1.49	1218.69	1213	14	2.38E-02	5.3	
34	0	654.85	34	229	1.27	1309.74	1305	11	7.79E-04	88.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	727.49	141	310	1.65	1455.06	1449	12	3.26E-03	26.5	
36	0	755.42	58	167	0.90	1510.95	1507	9	1.35E-03	42.4	
37	0	768.04	103	263	1.41	1536.19	1530	13	2.37E-03	34.1	
38	0	772.84	83	146	2.03	1545.80	1542	11	1.92E-03	30.3	
39	0	782.06	42	101	1.59	1564.25	1561	7	9.73E-04	43.2	
40	0	786.44	119	155	2.42	1573.01	1568	12	2.76E-03	22.7	
41	0	795.09	110	129	1.65	1590.32	1586	8	2.55E-03	20.3	
42	0	860.62	163	174	2.00	1721.44	1716	13	3.78E-03	18.4	
43	0	893.49	28	179	0.87	1787.23	1779	13	6.57E-04	99.0	
44	0	911.63*	525	315	1.70	1823.52	1817	17	1.22E-02	9.6	
45	3	964.92	90	183	2.06	1930.18	1925	22	2.09E-03	28.2	2.62E+00
46	3	969.25*	335	176	2.05	1938.84	1925	22	7.75E-03	11.0	
47	0	987.27	23	108	0.88	1974.91	1972	10	5.38E-04	86.7	
48	0	1001.21*	10	129	1.35	2002.79	1999	9	2.38E-04	269.1	
49	0	1077.29	7	147	0.80	2155.05	2153	10	1.72E-04	305.4	
50	0	1120.94*	263	170	1.85	2242.41	2235	16	6.10E-03	13.6	
51	0	1212.30	50	119	2.01	2425.29	2421	12	1.16E-03	45.3	
52	0	1238.08	121	190	1.82	2476.89	2469	15	2.79E-03	26.6	
53	0	1281.61	55	105	4.38	2564.03	2558	12	1.27E-03	39.9	
54	0	1378.40	70	65	1.47	2757.77	2751	13	1.61E-03	27.1	
55	0	1411.90	85	172	9.15	2824.85	2812	29	1.97E-03	45.9	
56	0	1461.14*	1936	96	1.98	2923.41	2915	19	4.48E-02	2.8	
57	0	1509.55*	45	75	2.12	3020.33	3010	17	1.04E-03	52.4	
58	0	1589.37	25	68	2.46	3180.16	3175	9	5.67E-04	63.7	
59	0	1622.43	76	86	5.83	3246.36	3236	23	1.77E-03	33.6	
60	0	1631.59	52	30	1.21	3264.69	3259	13	1.21E-03	26.3	
61	0	1701.28	17	39	0.82	3404.24	3399	13	3.94E-04	79.5	
62	0	1730.88	40	55	1.24	3463.52	3455	12	9.23E-04	40.9	
63	0	1764.89	181	54	2.48	3531.63	3524	17	4.20E-03	11.9	
64	0	1849.96	10	42	3.08	3701.98	3694	9	2.33E-04	112.5	
65	0	1859.36	12	49	3.84	3720.80	3712	13	2.82E-04	121.6	
66	0	1865.64	28	43	0.56	3733.39	3725	17	6.50E-04	58.5	
67	0	1894.02	39	71	9.59	3790.23	3777	24	8.97E-04	60.1	
68	0	1975.38	28	40	4.67	3953.18	3945	20	6.48E-04	58.5	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656022.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 14:35:00 Acquisition date : 24-JUN-2016 15:51:06
Sample ID        : G398656022 Sample quantity   : 170.95 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA12 Detector geometry   : CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:04.94 0.0%
Energy tolerance  : 1.50 keV Half life ratio    : 10.00
Errors propagated : No Systematic Error       : 0.00 %
Efficiency type   : Empirical Efficiencies at   : Peak Energy
Abundance limit   : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.102E+00	5.895E+00	5.895E+00	5.52	OK
CO-57	122.06	85.60*	5.829E+00	5.891E-03	6.496E-03	173.73	OK
	136.47	10.68	5.905E+00	----- Line	Not Found	-----	Absent
GE-68	1077.34	3.22*	1.428E+00	6.044E-02	6.666E-02	610.80	OK
RB-86	1077.00	8.64*	1.428E+00	2.252E-02	9.359E-02	610.80	OK
RU-103	497.08	91.00*	2.656E+00	4.865E-03	9.566E-03	309.41	OK
	610.33	5.76	2.265E+00	3.181E+00	6.256E+00	10.69	OK
CD-109	88.03	3.70*	4.385E+00	8.514E-01	9.019E-01	45.74	OK
SN-126	64.28	9.60	2.064E+00	----- Line	Not Found	-----	Absent
	86.94	8.90	4.385E+00	3.540E-01	3.540E-01	45.74	OK
	87.57	37.00*	4.385E+00	8.514E-02	8.514E-02	45.74	OK
PM-147	121.22	0.00*	5.829E+00	1.769E+02	1.819E+02	173.73	OK
EU-155	86.55	30.70	4.385E+00	1.026E-01	1.042E-01	45.74	OK
	105.31	21.10*	5.419E+00	5.036E-02	5.114E-02	94.20	OK
TL-208	277.37	6.60	4.169E+00	6.265E-02	6.265E-02	282.87	OK
	583.19	85.00*	2.344E+00	1.911E-01	1.911E-01	12.77	OK
	860.56	12.50	1.720E+00	2.923E-01	2.923E-01	36.72	OK
PB-210	46.54	4.25*	3.504E-01	4.630E+00	4.645E+00	104.08	OK
BI-212	727.33	6.67*	1.969E+00	4.230E-01	4.230E-01	52.99	OK
	785.37	1.10	1.850E+00	2.282E+00	2.282E+00	45.47	OK
	1620.50	1.47	1.010E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	3.249E+00	1.014E+00	1.014E+00	27.26	OK
	77.11	17.10	3.485E+00	8.704E-01	8.704E-01	13.93	OK
	238.63	43.60*	4.643E+00	5.731E-01	5.731E-01	5.79	OK
	300.09	3.30	3.929E+00	6.073E-01	6.073E-01	48.18	OK
BI-214	609.32	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69	OK
	1120.29	14.92	1.381E+00	4.748E-01	4.749E-01	27.27	OK
	1764.49	15.30	9.410E-01	4.383E-01	4.383E-01	23.89	OK
PB-214	74.82	5.80	3.229E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.485E+00	1.534E+00	1.534E+00	13.93	OK
	87.09	3.41	4.364E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.597E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.977E+00	4.958E-01	4.959E-01	14.02	OK
	351.93	35.60*	3.476E+00	4.752E-01	4.752E-01	9.54	OK
RN-222	609.32	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69	OK
	1120.29	14.92	1.381E+00	4.748E-01	4.749E-01	27.27	OK
	1764.49	15.30	9.410E-01	4.383E-01	4.383E-01	23.89	OK
RA-224	240.99	4.10*	4.604E+00	6.815E-01	6.815E-01	58.70	OK
RA-226	609.32	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69	OK
	1120.29	14.92	1.381E+00	4.748E-01	4.749E-01	27.27	OK
	1764.49	15.30	9.410E-01	4.383E-01	4.383E-01	23.89	OK
AC-228	105.21	1.10	5.419E+00	9.660E-01	9.660E-01	94.20	OK
	338.32	11.27	3.583E+00	5.666E-01	5.666E-01	19.11	OK
	794.95	4.25	1.834E+00	5.498E-01	5.498E-01	40.59	OK
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	4.738E-01	4.738E-01	19.17	OK
	968.97	15.80	1.560E+00	5.148E-01	5.148E-01	22.06	OK
RA-228	105.21	1.10	5.419E+00	9.660E-01	9.660E-01	94.20	OK
	338.32	11.27	3.583E+00	5.666E-01	5.666E-01	19.11	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	794.95	4.25	1.834E+00	5.498E-01	5.498E-01	40.59	OK
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	4.738E-01	4.738E-01	19.17	OK
	968.97	15.80	1.560E+00	5.148E-01	5.148E-01	22.06	OK
TH-228	74.82	10.28	3.249E+00	1.014E+00	1.014E+00	27.26	OK
	77.11	17.10	3.485E+00	8.704E-01	8.704E-01	13.93	OK
	238.63	43.60*	4.643E+00	5.731E-01	5.731E-01	5.79	OK
	300.09	3.30	3.929E+00	6.073E-01	6.073E-01	48.18	OK
TH-229	85.43	14.70	4.131E+00	8.689E-02	8.689E-02	129.29	OK
	88.47	24.00	4.385E+00	1.313E-01	1.313E-01	45.74	OK
	193.51	4.41*	5.291E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.034E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69	OK
	1120.29	14.92	1.381E+00	4.748E-01	4.748E-01	27.27	OK
	1764.49	15.30	9.410E-01	4.383E-01	4.383E-01	23.89	OK
PA-231	283.69	1.70	4.087E+00	5.436E-01	5.436E-01	107.06	OK
	301.36	5.35*	3.929E+00	3.746E-01	3.746E-01	48.18	OK
TH-232	105.21	1.10	5.419E+00	9.660E-01	9.660E-01	94.20	OK
	338.32	11.27	3.583E+00	5.666E-01	5.666E-01	19.11	OK
	835.71	1.61	1.762E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.641E+00	4.738E-01	4.738E-01	19.17	OK
	968.97	15.80	1.560E+00	5.148E-01	5.148E-01	22.06	OK
U-234	609.32	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69	OK
	1120.29	14.92	1.381E+00	4.748E-01	4.748E-01	27.27	OK
	1764.49	15.30	9.410E-01	4.383E-01	4.383E-01	23.89	OK
U-235	89.96	3.47	4.581E+00	9.880E-01	9.880E-01	31.23	OK
	93.35	5.60	4.775E+00	8.643E-01	8.643E-01	36.83	OK
	143.76	10.96*	5.886E+00	1.669E-02	1.669E-02	511.56	OK
	163.33	5.08	5.710E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	5.402E+00	5.962E-02	5.962E-02	43.11	OK
	205.31	5.01	5.116E+00	----- Line	Not Found	-----	Absent
AM-243	43.53	5.90	2.582E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.249E+00	1.551E-01	1.551E-01	27.26	OK
ANH-511	511.00	100.00*	2.599E+00	2.396E-02	2.396E-02	103.61	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                      *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656022.CNF;1      *
* Acquisition date   : 24-JUN-2016 15:51:06 Sensitivity      : 3.000                *
* Detector ID        : GAM12 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:04.94 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 14:35:00 Analyst initials: MXR1      *
* Sample ID          : G398656022 Sample Quantity : 1.7095E+02 GRAM    *
* Batch Number       : 1572236 Wet Weight : 0.00000        *
* Wet wt corr        : 1.00000 Dry Weight : 0.00000         *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                      *
*
* Eff. Cal. date     : 29-SEP-2015 06:02:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12        *
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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.895E+00	3.187E-01	1.325E-01
CO-57	6.496E-03	1.106E-02	1.316E-02
GE-68	6.666E-02	3.990E-01	5.246E-01
RB-86	9.359E-02	5.602E-01	7.363E-01
RU-103	9.566E-03	2.901E-02	2.770E-02
CD-109	9.019E-01	4.043E-01	4.182E-01
SN-126	8.514E-02	3.817E-02	3.980E-02
PM-147	1.819E+02	3.097E+02	3.740E+02
EU-155	5.114E-02	4.721E-02	5.543E-02
TL-208	1.911E-01	2.393E-02	1.495E-02
PB-210	4.645E+00	4.738E+00	2.599E+00
BI-212	4.230E-01	2.197E-01	2.156E-01
PB-212	5.731E-01	3.252E-02	2.574E-02
BI-214	4.028E-01	4.218E-02	3.181E-02
PB-214	4.752E-01	4.445E-02	3.340E-02
RN-222	4.028E-01	4.218E-02	3.181E-02
RA-224	6.815E-01	3.920E-01	2.757E-01
RA-226	4.028E-01	4.218E-02	3.181E-02
AC-228	4.738E-01	8.904E-02	5.890E-02
RA-228	4.738E-01	8.904E-02	5.890E-02
TH-228	5.731E-01	3.252E-02	2.574E-02
TH-229	-4.365E-02	1.397E-01	2.486E-01
TH-230	4.028E-01	4.218E-02	3.181E-02
PA-231	3.746E-01	1.769E-01	2.038E-01
TH-232	4.738E-01	8.904E-02	5.890E-02
U-234	4.028E-01	4.218E-02	3.181E-02
U-235	1.669E-02	8.367E-02	9.823E-02
AM-243	1.551E-01	4.142E-02	3.334E-02
ANH-511	2.396E-02	2.433E-02	1.299E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	2.549E-02	1.090E-01	1.996E-01	NOT IDENT.

NA-22	-3.294E-03	1.147E-02	1.727E-02	NOT IDENT.
NA-24	0.000E+00	2.491E+16	0.000E+00	SHORT HLIF
AL-26	-1.509E-03	7.782E-03	1.374E-02	NOT IDENT.
SC-46	-2.845E-03	1.221E-02	1.907E-02	FAIL ABUN
V-48	1.544E-02	4.711E-02	7.633E-02	NOT IDENT.
CR-51	-4.588E-02	1.710E-01	3.059E-01	NOT IDENT.
MN-54	8.247E-04	9.183E-03	1.695E-02	NOT IDENT.
CO-56	4.197E-03	1.153E-02	2.154E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-58	-7.620E-03	1.207E-02	2.060E-02	NOT IDENT.
FE-59	2.803E-02	2.943E-02	5.581E-02	NOT IDENT.
CO-60	1.490E-04	8.770E-03	1.583E-02	NOT IDENT.
ZN-65	1.883E-02	2.323E-02	3.836E-02	NOT IDENT.
AS-73	-4.445E-02	4.925E-01	9.381E-01	NOT IDENT.
AS-74	5.699E-03	6.176E-02	1.109E-01	NOT IDENT.
SE-75	-4.665E-03	1.437E-02	2.308E-02	FAIL ABUN
BR-77	0.000E+00	4.356E+03	0.000E+00	SHORT HLIF
SR-82	-2.723E-02	2.568E-01	2.550E-01	NOT IDENT.
RB-83	-1.611E-02	2.097E-02	3.679E-02	NOT IDENT.
KR-85	0.000E+00	2.168E+00	4.178E+00	NOT IDENT.
SR-85	0.000E+00	1.465E-02	2.822E-02	NOT IDENT.
Y-88	-2.719E-03	1.034E-02	1.808E-02	NOT IDENT.
Y-91	-2.234E-01	6.388E+00	1.093E+01	NOT IDENT.
NB-94	-2.673E-03	8.816E-03	1.542E-02	NOT IDENT.
NB-95	1.586E-02	1.566E-02	2.526E-02	NOT IDENT.
NB-95M	0.000E+00	4.705E-02	8.721E-02	NOT IDENT.
ZR-95	3.327E-02	2.764E-02	4.241E-02	FAIL ABUN
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.350E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.069E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.282E+41	0.000E+00	SHORT HLIF
RH-101	1.014E-02	1.385E-02	1.648E-02	NOT IDENT.
RH-102	-1.243E-02	1.394E-02	2.397E-02	FAIL ABUN
RH-106	-5.553E-02	8.081E-02	1.404E-01	NOT IDENT.
RU-106	-5.553E-02	8.081E-02	1.404E-01	NOT IDENT.
AG-108M	4.300E-03	7.214E-03	1.345E-02	NOT IDENT.
AG-110M	7.090E-03	1.296E-02	2.282E-02	NOT IDENT.
SN-113	-4.238E-03	1.283E-02	2.329E-02	NOT IDENT.
CD-115	0.000E+00	3.893E+03	0.000E+00	SHORT HLIF
SN-117M	2.736E-02	4.647E-02	8.535E-02	NOT IDENT.
TE-123M	1.758E-03	8.569E-03	1.560E-02	NOT IDENT.
SB-124	-1.154E-02	2.436E-02	4.203E-02	NOT IDENT.
SB-125	-1.356E-02	2.276E-02	4.073E-02	FAIL ABUN
TE-125M	-2.573E-01	4.139E+00	6.662E+00	NOT IDENT.
I-126	7.297E-02	1.898E-01	3.435E-01	NOT IDENT.
SB-126	-6.746E-02	1.523E-01	2.260E-01	NOT IDENT.
SB-127	-1.356E+01	2.068E+01	3.573E+01	NOT IDENT.
I-131	-2.828E-01	2.610E-01	3.725E-01	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.625E+01	0.000E+00	SHORT HLIF
BA-133	-3.970E-03	1.232E-02	1.942E-02	FAIL ABUN
I-133	0.000E+00	1.677E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.127E-02	2.041E-02	FAIL ABUN
CS-135	0.000E+00	4.496E-02	7.990E-02	NOT IDENT.
I-135	0.000E+00	3.464E+40	0.000E+00	SHORT HLIF
CS-136	3.671E-03	8.119E-02	1.481E-01	NOT IDENT.
BA-137M	-1.653E-03	9.801E-03	1.566E-02	NOT IDENT.
CS-137	-1.746E-03	1.035E-02	1.655E-02	NOT IDENT.
CE-139	-1.067E-03	8.772E-03	1.581E-02	NOT IDENT.
BA-140	-1.229E-01	2.424E-01	4.287E-01	NOT IDENT.
LA-140	-7.140E-02	8.107E-02	1.273E-01	FAIL ABUN
CE-141	-2.116E-02	3.675E-02	5.050E-02	NOT IDENT.
CE-143	0.000E+00	4.661E+06	0.000E+00	SHORT HLIF
CE-144	-3.682E-02	6.543E-02	1.025E-01	NOT IDENT.
PM-144	1.663E-03	9.449E-03	1.687E-02	NOT IDENT.
PR-144	1.278E-01	7.158E-01	1.278E+00	NOT IDENT.
PM-146	1.076E-03	1.104E-02	2.015E-02	NOT IDENT.
ND-147	1.117E-01	6.284E-01	1.142E+00	FAIL ABUN
PM-149	0.000E+00	5.107E+04	0.000E+00	SHORT HLIF
EU-150	-4.928E-03	1.047E-02	1.281E-02	FAIL ABUN
EU-152	-1.813E-05	3.040E-02	4.592E-02	FAIL ABUN
GD-153	-1.094E-02	3.377E-02	4.802E-02	NOT IDENT.
EU-154	-9.906E-03	3.207E-02	4.822E-02	FAIL ABUN
TB-160	-9.335E-03	3.697E-02	6.725E-02	FAIL ABUN
HO-166M	-1.308E-03	1.481E-02	2.619E-02	FAIL ABUN
TM-171	-7.659E+00	9.680E+00	1.675E+01	NOT IDENT.
HF-172	-8.204E-02	8.727E-02	9.466E-02	FAIL ABUN
LU-172	-1.792E-03	1.517E-02	2.732E-02	FAIL ABUN

LU-176	-9.067E-03	6.694E-03	1.160E-02	FAIL ABUN
HF-181	-9.027E-03	1.604E-02	2.852E-02	NOT IDENT.
TA-182	4.926E-02	5.023E-02	9.248E-02	FAIL ABUN
RE-183	-7.830E-02	1.104E-01	2.067E-01	NOT IDENT.
RE-184	-3.678E-02	4.822E-02	8.099E-02	FAIL ABUN
W-188	2.487E+00	3.160E+00	4.219E+00	NOT IDENT.
IR-192	6.063E-03	1.100E-02	2.069E-02	FAIL ABUN
HG-203	6.403E-03	2.337E-02	2.589E-02	NOT IDENT.
BI-207	-1.085E-03	1.274E-02	2.299E-02	FAIL ABUN
BI-211	0.000E+00	1.225E-01	1.760E-01	FAIL ABUN
PB-211	-1.836E-01	2.085E-01	3.171E-01	NOT IDENT.
RN-219	4.494E-02	1.136E-01	1.920E-01	FAIL ABUN
RA-223	7.307E-03	1.823E-01	2.935E-01	FAIL ABUN
AC-227	1.022E-02	6.268E-02	1.178E-01	FAIL ABUN
TH-227	1.022E-02	6.268E-02	1.178E-01	FAIL ABUN
TH-231	7.307E-03	1.823E-01	2.935E-01	FAIL ABUN
PA-233	5.602E-03	1.634E-02	3.058E-02	FAIL ABUN
PA-234	8.711E-03	7.151E-02	1.314E-01	FAIL ABUN
PA-234M	3.039E-01	1.603E+00	2.088E+00	FAIL ABUN
TH-234	-1.880E-01	6.644E-01	1.017E+00	FAIL ABUN
NP-237	5.602E-03	1.634E-02	3.058E-02	FAIL ABUN
NP-238	0.000E+00	9.708E+03	0.000E+00	SHORT HLIF
U-238	-1.880E-01	6.644E-01	1.017E+00	FAIL ABUN
NP-239	5.612E-03	7.756E-02	1.379E-01	FAIL ABUN
PU-239	1.223E+02	1.601E+02	1.807E+02	FAIL ABUN
AM-241	-1.107E-01	6.654E-02	1.221E-01	NOT IDENT.
CM-243	-8.361E-03	3.568E-02	5.728E-02	FAIL ABUN
BK-247	-8.500E-03	2.260E-02	3.623E-02	FAIL ABUN
CM-247	2.201E-03	1.098E-02	1.758E-02	FAIL ABUN
CF-249	5.644E-03	1.025E-02	1.911E-02	NOT IDENT.
CF-251	8.101E-03	3.339E-02	6.051E-02	FAIL ABUN

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1892	10.66*	1.102E+00	5.895E+00	5.895E+00	5.52
CO-57	122.06	80	85.60*	5.829E+00	5.891E-03	6.496E-03	173.73
	136.47	-----	10.68	5.905E+00	-----	Line Not Found	-----
GE-68	1077.34	8	3.22*	1.428E+00	6.044E-02	6.666E-02	610.80
RB-86	1077.00	8	8.64*	1.428E+00	2.252E-02	9.359E-02	610.80
RU-103	497.08	32	91.00*	2.656E+00	4.865E-03	9.566E-03	309.41
	610.33	1134	5.76	2.265E+00	3.181E+00	6.256E+00	10.69
CD-109	88.03	580	3.70*	4.385E+00	1.308E+00	1.386E+00	29.36
SN-126	64.28	-----	9.60	2.064E+00	-----	Line Not Found	-----
	86.94	580	8.90	4.385E+00	5.440E-01	5.440E-01	29.36
	87.57	580	37.00*	4.385E+00	1.308E-01	1.308E-01	29.36
PM-147	121.22	80	0.00*	5.829E+00	1.769E+02	1.819E+02	173.73
EU-155	86.55	580	30.70	4.385E+00	1.577E-01	1.601E-01	29.36
	105.31	157	21.10*	5.419E+00	5.036E-02	5.114E-02	94.20
TL-208	277.37	47	6.60	4.169E+00	6.265E-02	6.265E-02	282.87
	583.19	1041	85.00*	2.344E+00	1.911E-01	1.911E-01	12.77
	860.56	172	12.50	1.720E+00	2.923E-01	2.923E-01	36.72
PB-210	46.54	188	4.25*	3.504E-01	4.630E+00	4.645E+00	104.08
BI-211	72.87	-----	1.23	3.022E+00	-----	Line Not Found	-----
	351.06	1607	12.92*	3.476E+00	1.309E+00	1.309E+00	9.54
BI-212	727.33	152	6.67*	1.969E+00	4.230E-01	4.230E-01	52.99
	785.37	127	1.10	1.850E+00	2.282E+00	2.282E+00	45.47
	1620.50	-----	1.47	1.010E+00	-----	Line Not Found	-----
PB-212	74.82	1181	10.28	3.249E+00	1.293E+00	1.293E+00	21.14
	77.11	1417	17.10	3.485E+00	8.704E-01	8.704E-01	13.93
	238.63	3170	43.60*	4.643E+00	5.731E-01	5.731E-01	5.79
	300.09	215	3.30	3.929E+00	6.073E-01	6.073E-01	48.18
BI-214	609.32	1134	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69
	1120.29	267	14.92	1.381E+00	4.748E-01	4.749E-01	27.27
	1764.49	172	15.30	9.410E-01	4.383E-01	4.383E-01	23.89
PB-214	74.82	1181	5.80	3.249E+00	2.293E+00	2.293E+00	21.14
	77.11	1417	9.70	3.485E+00	1.534E+00	1.534E+00	13.93
	87.09	580	3.41	4.385E+00	1.420E+00	1.420E+00	29.36
	242.00	804	7.25	4.604E+00	8.812E-01	8.813E-01	24.43
	295.22	992	18.42	3.977E+00	4.958E-01	4.959E-01	14.02
	351.93	1607	35.60*	3.476E+00	4.752E-01	4.752E-01	9.54
RN-222	609.32	1134	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69
	1120.29	267	14.92	1.381E+00	4.748E-01	4.749E-01	27.27
	1764.49	172	15.30	9.410E-01	4.383E-01	4.383E-01	23.89
RA-224	240.99	804	4.10*	4.604E+00	1.558E+00	1.558E+00	24.43
RA-226	609.32	1134	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69
	1120.29	267	14.92	1.381E+00	4.748E-01	4.749E-01	27.27
	1764.49	172	15.30	9.410E-01	4.383E-01	4.383E-01	23.89
AC-228	105.21	157	1.10	5.419E+00	9.660E-01	9.660E-01	94.20
	338.32	625	11.27	3.583E+00	5.666E-01	5.666E-01	19.11
	794.95	117	4.25	1.834E+00	5.498E-01	5.498E-01	40.59
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	911.20	548	25.80*	1.641E+00	4.738E-01	4.738E-01	19.17
	968.97	347	15.80	1.560E+00	5.148E-01	5.148E-01	22.06
	105.21	157	1.10	5.419E+00	9.660E-01	9.660E-01	94.20
	338.32	625	11.27	3.583E+00	5.666E-01	5.666E-01	19.11
	794.95	117	4.25	1.834E+00	5.498E-01	5.498E-01	40.59
TH-228	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	548	25.80*	1.641E+00	4.738E-01	4.738E-01	19.17
	968.97	347	15.80	1.560E+00	5.148E-01	5.148E-01	22.06
	74.82	1181	10.28	3.249E+00	1.293E+00	1.293E+00	21.14
	77.11	1417	17.10	3.485E+00	8.704E-01	8.704E-01	13.93
TH-229	238.63	3170	43.60*	4.643E+00	5.731E-01	5.731E-01	5.79
	300.09	215	3.30	3.929E+00	6.073E-01	6.073E-01	48.18
	85.43	144	14.70	4.131E+00	8.689E-02	8.689E-02	129.29
	88.47	580	24.00	4.385E+00	2.017E-01	2.017E-01	29.36
	193.51	-----	4.41*	5.291E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	5.034E+00	-----	Line Not Found	-----
	609.32	1134	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69
	1120.29	267	14.92	1.381E+00	4.748E-01	4.748E-01	27.27
	1764.49	172	15.30	9.410E-01	4.383E-01	4.383E-01	23.89
	283.69	103	1.70	4.087E+00	5.436E-01	5.436E-01	107.06
TH-232	301.36	215	5.35*	3.929E+00	3.746E-01	3.746E-01	48.18
	105.21	157	1.10	5.419E+00	9.660E-01	9.660E-01	94.20
	338.32	625	11.27	3.583E+00	5.666E-01	5.666E-01	19.11
	835.71	-----	1.61	1.762E+00	-----	Line Not Found	-----
	911.20	548	25.80*	1.641E+00	4.738E-01	4.738E-01	19.17
U-234	968.97	347	15.80	1.560E+00	5.148E-01	5.148E-01	22.06
	609.32	1134	45.49*	2.265E+00	4.028E-01	4.028E-01	10.69
	1120.29	267	14.92	1.381E+00	4.748E-01	4.748E-01	27.27
	1764.49	172	15.30	9.410E-01	4.383E-01	4.383E-01	23.89
	89.96	429	3.47	4.581E+00	9.880E-01	9.880E-01	31.23
U-235	93.35	632	5.60	4.775E+00	8.643E-01	8.643E-01	36.83
	143.76	29	10.96*	5.886E+00	1.669E-02	1.669E-02	511.56
	163.33	-----	5.08	5.710E+00	-----	Line Not Found	-----
	185.72	503	57.20	5.402E+00	5.962E-02	5.962E-02	43.11
	205.31	-----	5.01	5.116E+00	-----	Line Not Found	-----
AM-243	43.53	-----	5.90	2.582E-01	-----	Line Not Found	-----
	74.66	1181	67.20*	3.249E+00	1.979E-01	1.979E-01	21.14
ANH-511	511.00	170	100.00*	2.599E+00	2.396E-02	2.396E-02	103.61

Flag: "*" = Keyline

Total number of lines in spectrum 68
Number of unidentified lines 20
Number of lines tentatively identified by NID 48 70.59%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.895E+00	5.895E+00	0.325E+00	5.52	
CO-57	271.74D	1.10	5.891E-03	6.496E-03	11.28E-03	173.73	
GE-68	270.95D	1.10	6.044E-02	6.666E-02	40.72E-02	610.80	
RB-86	18.64D	4.16	2.252E-02	9.359E-02	57.16E-02	610.80	
RU-103	39.26D	1.97	4.865E-03	9.566E-03	29.60E-03	309.41	
CD-109	461.40D	1.06	1.308E+00	1.386E+00	0.407E+00	29.36	
SN-126	2.30E+05Y	1.00	1.308E-01	1.308E-01	0.384E-01	29.36	
PM-147	2.62Y	1.03	1.769E+02	1.819E+02	3.160E+02	173.73	
EU-155	4.75Y	1.02	5.036E-02	5.114E-02	4.817E-02	94.20	
TL-208	1.41E+10Y	1.00	1.911E-01	1.911E-01	0.244E-01	12.77	
PB-210	22.20Y	1.00	4.630E+00	4.645E+00	4.835E+00	104.08	
BI-211	7.04E+08Y	1.00	1.309E+00	1.309E+00	0.125E+00	9.54	
BI-212	1.41E+10Y	1.00	4.230E-01	4.230E-01	2.242E-01	52.99	
PB-212	1.41E+10Y	1.00	5.731E-01	5.731E-01	0.332E-01	5.79	
BI-214	1600.00Y	1.00	4.028E-01	4.028E-01	0.430E-01	10.69	
PB-214	1600.00Y	1.00	4.752E-01	4.752E-01	0.454E-01	9.54	
RN-222	1600.00Y	1.00	4.028E-01	4.028E-01	0.430E-01	10.69	
RA-224	1.41E+10Y	1.00	1.558E+00	1.558E+00	0.381E+00	24.43	
RA-226	1600.00Y	1.00	4.028E-01	4.028E-01	0.430E-01	10.69	
AC-228	1.41E+10Y	1.00	4.738E-01	4.738E-01	0.909E-01	19.17	
RA-228	1.41E+10Y	1.00	4.738E-01	4.738E-01	0.909E-01	19.17	
TH-228	1.41E+10Y	1.00	5.731E-01	5.731E-01	0.332E-01	5.79	
TH-229	7340.00Y	1.00	2.017E-01	2.017E-01	0.592E-01	29.36	K
TH-230	7.54E+04Y	1.00	4.028E-01	4.028E-01	0.430E-01	10.69	
PA-231	7.04E+08Y	1.00	3.746E-01	3.746E-01	1.805E-01	48.18	
TH-232	1.41E+10Y	1.00	4.738E-01	4.738E-01	0.909E-01	19.17	
U-234	2.45E+05Y	1.00	4.028E-01	4.028E-01	0.430E-01	10.69	
U-235	7.04E+08Y	1.00	1.669E-02	1.669E-02	8.538E-02	511.56	
AM-243	7370.00Y	1.00	1.979E-01	1.979E-01	0.418E-01	21.14	
ANH-511	1.00E+09Y	1.00	2.396E-02	2.396E-02	2.483E-02	103.61	
Total Activity :			1.984E+02	2.035E+02			

Grand Total Activity : 1.984E+02 2.035E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	36.66	627	254	1.96	73.24	68	31	9.67E-03	28.5	5.85E-02	
4	39.96	327	855	1.97	79.83	68	31	5.08E-03	64.5	1.30E-01	
0	129.61	124	1566	1.08	259.12	254	9	2.17E-03	****	5.89E+00	T
0	209.24	299	980	1.14	418.37	415	8	5.53E-03	42.6	5.06E+00	
5	246.01	111	1079	2.50	491.90	469	29	2.09E-03	****	4.54E+00	T
0	270.14	399	964	1.79	540.16	534	12	7.59E-03	36.1	4.25E+00	T
0	327.67	199	709	1.40	655.23	650	11	3.87E-03	58.6	3.67E+00	T
0	409.72	102	573	1.73	819.34	811	12	2.04E-03	****	3.09E+00	T
0	463.08	154	446	1.23	926.08	921	11	3.13E-03	59.5	2.81E+00	T
0	569.29	361	502	2.30	1138.56	1132	15	7.52E-03	33.5	2.39E+00	T
0	654.85	37	250	1.27	1309.74	1305	11	7.79E-04	****	2.14E+00	
0	755.42	62	179	0.90	1510.95	1507	9	1.35E-03	84.8	1.91E+00	T
0	768.04	110	282	1.41	1536.19	1530	13	2.37E-03	68.2	1.89E+00	T
0	772.84	88	156	2.03	1545.80	1542	11	1.92E-03	60.6	1.88E+00	T
0	782.06	45	108	1.59	1564.25	1561	7	9.73E-04	86.4	1.86E+00	
0	893.49	30	187	0.87	1787.23	1779	13	6.57E-04	****	1.67E+00	T
3	964.92	93	189	2.06	1930.18	1925	22	2.09E-03	56.5	1.57E+00	T
0	987.27	24	111	0.88	1974.91	1972	10	5.38E-04	****	1.54E+00	
0	1001.21	11	133	1.35	2002.79	1999	9	2.38E-04	****	1.52E+00	T
0	1212.30	51	119	2.01	2425.29	2421	12	1.16E-03	90.6	1.29E+00	
0	1238.08	121	191	1.82	2476.89	2469	15	2.79E-03	53.2	1.27E+00	T
0	1281.61	54	105	4.38	2564.03	2558	12	1.27E-03	79.7	1.23E+00	
0	1378.40	69	64	1.47	2757.77	2751	13	1.61E-03	54.2	1.16E+00	
0	1411.90	83	169	9.15	2824.85	2812	29	1.97E-03	91.7	1.13E+00	
0	1509.55	44	73	2.12	3020.33	3010	17	1.04E-03	****	1.07E+00	
0	1589.37	24	65	2.46	3180.16	3175	9	5.67E-04	****	1.03E+00	
0	1622.43	73	83	5.83	3246.36	3236	23	1.77E-03	67.3	1.01E+00	T
0	1631.59	50	29	1.21	3264.69	3259	13	1.21E-03	52.6	1.00E+00	
0	1701.28	16	37	0.82	3404.24	3399	13	3.94E-04	****	9.70E-01	
0	1730.88	38	53	1.24	3463.52	3455	12	9.23E-04	81.8	9.56E-01	
0	1849.96	9	40	3.08	3701.98	3694	9	2.33E-04	****	9.06E-01	
0	1859.36	11	46	3.84	3720.80	3712	13	2.82E-04	****	9.02E-01	
0	1865.64	26	40	0.56	3733.39	3725	17	6.50E-04	****	9.00E-01	
0	1894.02	36	67	9.59	3790.23	3777	24	8.97E-04	****	8.89E-01	
0	1975.38	26	37	4.67	3953.18	3945	20	6.48E-04	****	8.61E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656022.CNF;1  *
* Acquisition date   : 24-JUN-2016 15:51:06 Sensitivity      : 3.000          *
* Detector ID        : GAM12 Energy tolerance: 1.500          *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 12:00:04.94 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 14:35:00 Nuclide Library : SOLID          *
* Sample ID          : G398656022 Analyst initials: MXR1          *
* Batch Number       : 1572236 Sample Quantity : 1.7095E+02 GRAM          *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 29-SEP-2015 06:02:19 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.202E-02
CO-57	6.463E-03
GE-68	2.503E-01
RB-86	3.513E-01
RU-103	1.343E-02
CD-109	2.057E-01
SN-126	1.957E-02
PM-147	1.837E+02
EU-155	2.724E-02
TL-208	7.217E-03
PB-210	1.268E+00
BI-212	1.040E-01
PB-212	1.262E-02
BI-214	1.541E-02
PB-214	1.628E-02
RN-222	1.541E-02
RA-224	1.351E-01
RA-226	1.541E-02
AC-228	2.826E-02
RA-228	2.826E-02
TH-228	1.262E-02
TH-229	1.220E-01
TH-230	1.541E-02
PA-231	9.945E-02
TH-232	2.826E-02
U-234	1.541E-02
U-235	4.830E-02
AM-243	1.642E-02
ANH-511	6.301E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.685E-02	NOT IDENT.
NA-22	8.221E-03	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	6.330E-03	NOT IDENT.
SC-46	9.121E-03	FAIL ABUN
V-48	3.645E-02	NOT IDENT.
CR-51	1.493E-01	NOT IDENT.
MN-54	8.162E-03	NOT IDENT.
CO-56	1.036E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-58	9.892E-03	NOT IDENT.
FE-59	2.676E-02	NOT IDENT.
CO-60	7.491E-03	NOT IDENT.
ZN-65	1.838E-02	NOT IDENT.
AS-73	4.613E-01	NOT IDENT.
AS-74	5.378E-02	NOT IDENT.
SE-75	1.129E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.224E-01	NOT IDENT.
RB-83	1.779E-02	NOT IDENT.
KR-85	2.043E+00	NOT IDENT.
SR-85	1.380E-02	NOT IDENT.
Y-88	8.337E-03	NOT IDENT.
Y-91	5.231E+00	NOT IDENT.
NB-94	7.459E-03	NOT IDENT.
NB-95	1.222E-02	NOT IDENT.
NB-95M	4.293E-02	NOT IDENT.
ZR-95	2.047E-02	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	8.103E-03	NOT IDENT.
RH-102	1.156E-02	FAIL ABUN
RH-106	6.773E-02	NOT IDENT.
RU-106	6.773E-02	NOT IDENT.
AG-108M	6.535E-03	NOT IDENT.
AG-110M	1.095E-02	NOT IDENT.
SN-113	1.133E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.194E-02	NOT IDENT.
TE-123M	7.663E-03	NOT IDENT.
SB-124	1.935E-02	NOT IDENT.
SB-125	1.977E-02	FAIL ABUN
TE-125M	3.275E+00	NOT IDENT.
I-126	1.660E-01	NOT IDENT.
SB-126	1.089E-01	NOT IDENT.
SB-127	1.720E+01	NOT IDENT.
I-131	1.812E-01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	9.465E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.872E-03	FAIL ABUN
CS-135	3.920E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.081E-02	NOT IDENT.
BA-137M	7.565E-03	NOT IDENT.
CS-137	7.991E-03	NOT IDENT.
CE-139	7.766E-03	NOT IDENT.
BA-140	2.076E-01	NOT IDENT.
LA-140	5.957E-02	FAIL ABUN
CE-141	2.483E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	5.037E-02	NOT IDENT.
PM-144	8.164E-03	NOT IDENT.
PR-144	6.186E-01	NOT IDENT.
PM-146	9.797E-03	NOT IDENT.
ND-147	5.535E-01	FAIL ABUN
PM-149	0.000E+00	SHORT HLIF
EU-150	6.258E-03	FAIL ABUN
EU-152	2.241E-02	FAIL ABUN
GD-153	2.360E-02	NOT IDENT.
EU-154	2.295E-02	FAIL ABUN
TB-160	3.219E-02	FAIL ABUN
HO-166M	1.263E-02	FAIL ABUN
TM-171	8.234E+00	NOT IDENT.
HF-172	4.650E-02	FAIL ABUN
LU-172	1.307E-02	FAIL ABUN
LU-176	5.659E-03	FAIL ABUN

HF-181	1.382E-02	NOT IDENT.
TA-182	4.443E-02	FAIL ABUN
RE-183	1.017E-01	NOT IDENT.
RE-184	3.880E-02	FAIL ABUN
W-188	2.063E+00	NOT IDENT.
IR-192	1.011E-02	FAIL ABUN
HG-203	1.267E-02	NOT IDENT.
BI-207	1.103E-02	FAIL ABUN
BI-211	8.689E-02	FAIL ABUN
PB-211	1.542E-01	NOT IDENT.
RN-219	9.349E-02	FAIL ABUN
RA-223	1.433E-01	FAIL ABUN
AC-227	5.767E-02	FAIL ABUN
TH-227	5.767E-02	FAIL ABUN
TH-231	1.433E-01	FAIL ABUN
PA-233	1.494E-02	FAIL ABUN
PA-234	6.309E-02	FAIL ABUN
PA-234M	1.004E+00	FAIL ABUN
TH-234	5.009E-01	FAIL ABUN
NP-237	1.494E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
U-238	5.009E-01	FAIL ABUN
NP-239	6.782E-02	FAIL ABUN
PU-239	8.895E+01	FAIL ABUN
AM-241	6.007E-02	NOT IDENT.
CM-243	2.816E-02	FAIL ABUN
BK-247	1.771E-02	FAIL ABUN
CM-247	8.564E-03	FAIL ABUN
CF-249	9.315E-03	NOT IDENT.
CF-251	2.971E-02	FAIL ABUN

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656022.CNF;1
Acquisition date : 24-JUN-2016 15:51:06 Sensitivity : 3.000
Detector ID : GAM12 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:04.94 Half life ratio : *****
Sample date : 17-MAY-2016 14:35:00 Nuclide Library : SOLID
Sample ID : G398656022 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.7095E+02 GRAM
Quantity Err(%) : 1.1699E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 29-SEP-2015 06:02:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.895E+00	6.106E-01	6.106E-01
CO-57	6.496E-03	1.107E-02	1.107E-02
GE-68	6.666E-02	3.992E-01	3.992E-01
RB-86	9.359E-02	5.604E-01	5.604E-01
RU-103	9.566E-03	2.902E-02	2.902E-02
CD-109	9.019E-01	4.254E-01	4.254E-01
SN-126	8.514E-02	3.990E-02	3.990E-02
PM-147	1.819E+02	3.100E+02	3.100E+02
EU-155	5.114E-02	4.745E-02	4.745E-02
TL-208	1.911E-01	2.886E-02	2.886E-02
PB-210	4.645E+00	4.765E+00	4.765E+00
BI-212	4.230E-01	2.234E-01	2.234E-01
PB-212	5.731E-01	5.582E-02	5.582E-02
BI-214	4.028E-01	5.404E-02	5.404E-02
PB-214	4.752E-01	5.817E-02	5.817E-02
RN-222	4.028E-01	5.404E-02	5.404E-02
RA-224	6.815E-01	4.068E-01	4.068E-01
RA-226	4.028E-01	5.404E-02	5.404E-02
AC-228	4.738E-01	1.080E-01	1.080E-01
RA-228	4.738E-01	1.080E-01	1.080E-01
TH-228	5.731E-01	5.582E-02	5.582E-02
TH-229	-4.365E-02	1.398E-01	1.398E-01
TH-230	4.028E-01	5.404E-02	5.404E-02
PA-231	3.746E-01	1.955E-01	1.955E-01
TH-232	4.738E-01	1.080E-01	1.080E-01
U-234	4.028E-01	5.404E-02	5.404E-02
U-235	1.669E-02	8.368E-02	8.368E-02
AM-243	1.551E-01	4.454E-02	4.454E-02
ANH-511	2.396E-02	2.442E-02	2.442E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	2.549E-02	1.090E-01	1.096E-01 NOT IDENT.

NA-22	-3.294E-03	1.147E-02	1.157E-02	NOT IDENT.
NA-24	-6.102E+15	2.491E+16	0.000E+00	SHORT HLIF
AL-26	-1.509E-03	7.783E-03	7.812E-03	NOT IDENT.
SC-46	-2.845E-03	1.222E-02	1.229E-02	FAIL ABUN
V-48	1.544E-02	4.717E-02	4.768E-02	NOT IDENT.
CR-51	-4.588E-02	1.710E-01	1.722E-01	NOT IDENT.
MN-54	8.247E-04	9.183E-03	9.191E-03	NOT IDENT.
CO-56	4.197E-03	1.154E-02	1.169E-02	FAIL ABUN
MN-56	1.000E+41	2.632E+41	0.000E+00	SHORT HLIF
CO-58	-7.620E-03	1.210E-02	1.257E-02	NOT IDENT.
FE-59	2.803E-02	2.986E-02	3.243E-02	NOT IDENT.
CO-60	1.490E-04	8.770E-03	8.771E-03	NOT IDENT.
ZN-65	1.883E-02	2.346E-02	2.495E-02	NOT IDENT.
AS-73	-4.445E-02	4.926E-01	4.930E-01	NOT IDENT.
AS-74	5.699E-03	6.177E-02	6.182E-02	NOT IDENT.
SE-75	-4.665E-03	1.437E-02	1.452E-02	FAIL ABUN
BR-77	7.677E+04	8.516E+04	9.192E+04	SHORT HLIF
SR-82	-2.723E-02	2.568E-01	2.571E-01	NOT IDENT.
RB-83	-1.611E-02	2.112E-02	2.234E-02	NOT IDENT.
KR-85	1.195E+01	2.390E+00	5.893E+00	NOT IDENT.
SR-85	8.053E-02	1.614E-02	3.973E-02	NOT IDENT.
Y-88	-2.719E-03	1.034E-02	1.041E-02	NOT IDENT.
Y-91	-2.234E-01	6.388E+00	6.388E+00	NOT IDENT.
NB-94	-2.673E-03	8.819E-03	8.901E-03	NOT IDENT.
NB-95	1.586E-02	1.574E-02	1.728E-02	NOT IDENT.
NB-95M	2.322E-01	5.235E-02	1.170E-01	NOT IDENT.
ZR-95	3.327E-02	2.783E-02	3.161E-02	FAIL ABUN
NB-97	-1.000E+41	6.269E+41	0.000E+00	SHORT HLIF
ZR-97	1.788E+16	4.602E+15	9.283E+15	SHORT HLIF
MO-99	8.584E+01	1.069E+03	1.069E+03	SHORT HLIF
TC-99M	1.000E+41	1.287E+41	0.000E+00	SHORT HLIF
RH-101	1.014E-02	1.397E-02	1.470E-02	NOT IDENT.
RH-102	-1.243E-02	1.400E-02	1.508E-02	FAIL ABUN
RH-106	-5.553E-02	8.098E-02	8.477E-02	NOT IDENT.
RU-106	-5.553E-02	8.098E-02	8.477E-02	NOT IDENT.
AG-108M	4.300E-03	7.223E-03	7.478E-03	NOT IDENT.
AG-110M	7.090E-03	1.299E-02	1.337E-02	NOT IDENT.
SN-113	-4.238E-03	1.284E-02	1.298E-02	NOT IDENT.
CD-115	-4.611E+03	3.919E+03	4.436E+03	SHORT HLIF
SN-117M	2.736E-02	4.651E-02	4.812E-02	NOT IDENT.
TE-123M	1.758E-03	8.570E-03	8.607E-03	NOT IDENT.
SB-124	-1.154E-02	2.438E-02	2.493E-02	NOT IDENT.
SB-125	-1.356E-02	2.278E-02	2.359E-02	FAIL ABUN
TE-125M	-2.573E-01	4.139E+00	4.141E+00	NOT IDENT.
I-126	7.297E-02	1.899E-01	1.927E-01	NOT IDENT.
SB-126	-6.746E-02	1.525E-01	1.555E-01	NOT IDENT.
SB-127	-1.356E+01	2.085E+01	2.173E+01	NOT IDENT.
I-131	-2.828E-01	2.620E-01	2.914E-01	FAIL ABUN
I-132	1.000E+41	6.259E+41	0.000E+00	SHORT HLIF
TE-132	-4.522E+00	2.626E+01	2.634E+01	SHORT HLIF
BA-133	-3.970E-03	1.232E-02	1.245E-02	FAIL ABUN
I-133	-4.317E+10	1.681E+11	1.692E+11	SHORT HLIF
CS-134	2.832E-02	1.164E-02	1.728E-02	FAIL ABUN
CS-135	1.280E-01	4.641E-02	7.404E-02	NOT IDENT.
I-135	-2.464E+40	4.075E+40	0.000E+00	SHORT HLIF
CS-136	3.671E-03	8.119E-02	8.121E-02	NOT IDENT.
BA-137M	-1.653E-03	9.802E-03	9.831E-03	NOT IDENT.
CS-137	-1.746E-03	1.036E-02	1.039E-02	NOT IDENT.
CE-139	-1.067E-03	8.775E-03	8.788E-03	NOT IDENT.
BA-140	-1.229E-01	2.426E-01	2.489E-01	NOT IDENT.
LA-140	-7.140E-02	8.127E-02	8.741E-02	FAIL ABUN
CE-141	-2.116E-02	3.678E-02	3.800E-02	NOT IDENT.
CE-143	3.519E+07	5.426E+06	1.676E+07	SHORT HLIF
CE-144	-3.682E-02	6.549E-02	6.756E-02	NOT IDENT.
PM-144	1.663E-03	9.450E-03	9.479E-03	NOT IDENT.
PR-144	1.278E-01	7.159E-01	7.182E-01	NOT IDENT.
PM-146	1.076E-03	1.104E-02	1.105E-02	NOT IDENT.
ND-147	1.117E-01	6.284E-01	6.305E-01	FAIL ABUN
PM-149	4.867E+04	5.158E+04	5.605E+04	SHORT HLIF
EU-150	-4.928E-03	1.048E-02	1.071E-02	FAIL ABUN
EU-152	-1.813E-05	3.040E-02	3.040E-02	FAIL ABUN
GD-153	-1.094E-02	3.378E-02	3.414E-02	NOT IDENT.
EU-154	-9.906E-03	3.209E-02	3.240E-02	FAIL ABUN
TB-160	-9.335E-03	3.699E-02	3.723E-02	FAIL ABUN
HO-166M	-1.308E-03	1.481E-02	1.482E-02	FAIL ABUN
TM-171	-7.659E+00	9.710E+00	1.031E+01	NOT IDENT.
HF-172	-8.204E-02	8.839E-02	9.581E-02	FAIL ABUN
LU-172	-1.792E-03	1.517E-02	1.520E-02	FAIL ABUN

LU-176	-9.067E-03	6.730E-03	7.874E-03	FAIL ABUN
HF-181	-9.027E-03	1.606E-02	1.657E-02	NOT IDENT.
TA-182	4.926E-02	5.044E-02	5.512E-02	FAIL ABUN
RE-183	-7.830E-02	1.107E-01	1.162E-01	NOT IDENT.
RE-184	-3.678E-02	4.849E-02	5.125E-02	FAIL ABUN
W-188	2.487E+00	3.175E+00	3.368E+00	NOT IDENT.
IR-192	6.063E-03	1.101E-02	1.134E-02	FAIL ABUN
HG-203	6.403E-03	2.337E-02	2.355E-02	NOT IDENT.
BI-207	-1.085E-03	1.275E-02	1.276E-02	FAIL ABUN
BI-211	1.309E+00	1.617E-01	6.120E-01	FAIL ABUN
PB-211	-1.836E-01	2.091E-01	2.249E-01	NOT IDENT.
RN-219	4.494E-02	1.138E-01	1.156E-01	FAIL ABUN
RA-223	7.307E-03	1.823E-01	1.823E-01	FAIL ABUN
AC-227	1.022E-02	6.270E-02	6.287E-02	FAIL ABUN
TH-227	1.022E-02	6.270E-02	6.287E-02	FAIL ABUN
TH-231	7.307E-03	1.823E-01	1.823E-01	FAIL ABUN
PA-233	5.602E-03	1.634E-02	1.654E-02	FAIL ABUN
PA-234	8.711E-03	7.221E-02	7.232E-02	FAIL ABUN
PA-234M	3.039E-01	1.603E+00	1.609E+00	FAIL ABUN
TH-234	-1.880E-01	6.658E-01	6.711E-01	FAIL ABUN
NP-237	5.602E-03	1.634E-02	1.654E-02	FAIL ABUN
NP-238	8.037E+03	9.774E+03	1.042E+04	SHORT HLIF
U-238	-1.880E-01	6.658E-01	6.711E-01	FAIL ABUN
NP-239	5.612E-03	7.757E-02	7.761E-02	FAIL ABUN
PU-239	1.223E+02	1.603E+02	1.696E+02	FAIL ABUN
AM-241	-1.107E-01	6.719E-02	8.369E-02	NOT IDENT.
CM-243	-8.361E-03	3.569E-02	3.589E-02	FAIL ABUN
BK-247	-8.500E-03	2.267E-02	2.299E-02	FAIL ABUN
CM-247	2.201E-03	1.099E-02	1.104E-02	FAIL ABUN
CF-249	5.644E-03	1.027E-02	1.058E-02	NOT IDENT.
CF-251	8.101E-03	3.340E-02	3.360E-02	FAIL ABUN

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	533.0178	87.09	1138.9003	136.47	1110.4342
45.60	534.3472	87.57	1139.3519	140.51	0.0000
46.54	534.9401	88.03	1139.7832	143.76	1121.0178
49.72	0.0000	88.34	1140.0707	144.24	1097.1183
51.35	1161.6738	88.47	1140.1938	145.44	1118.2145
51.87	1159.0692	89.96	1141.5737	152.43	1040.5822
52.39	1149.3593	1093.63	1142.2020	153.25	1026.6932
52.97	1115.7478	91.11	1142.6375	323.87	1057.2010
53.44	1115.1477	92.59	1143.9885	156.02	1070.5321
54.07	1102.5758	93.35	1144.6826	158.56	968.7987
57.36	0.0000	94.56	1072.7958	159.00	1004.6061
57.53	1185.9016	94.65	1072.8727	162.33	1041.0607
57.98	1250.3097	94.67	1072.8881	162.66	1012.3055
59.27	1389.1349	94.87	1086.6833	163.33	989.2983
59.32	1389.2068	97.43	1063.2561	165.86	997.4152
59.54	1377.1415	98.43	1017.9617	176.31	906.7253
60.96	1331.6095	98.44	1019.6771	176.60	919.2193
61.17	1331.8922	99.53	1037.6240	177.52	921.9276
62.93	1257.6418	100.11	1046.6343	181.07	0.0000
63.29	1272.5868	102.03	1142.3555	181.52	979.8123
63.58	1273.9858	103.18	1136.4841	184.41	958.7848
64.28	1271.7550	103.37	1136.6460	143.76	992.5378
66.73	1542.8265	105.21	1064.3838	193.51	981.8706
67.24	1556.2018	105.31	1064.4633	197.03	949.3867
125.81	1505.7556	106.12	1080.5602	198.01	924.4390
67.75	1516.9451	106.47	1055.0614	201.83	996.2869
69.67	1333.5596	109.28	1091.6649	203.43	981.1537
70.83	1335.0000	111.00	1145.2321	205.31	884.1008
72.81	1444.4315	111.76	0.0000	210.85	857.5865
72.87	1444.5106	114.06	1063.6553	215.65	858.0699
74.66	1397.0977	116.30	0.0000	222.11	814.1747
74.82	1397.3013	116.74	1081.8864	227.09	812.4100
74.97	1397.4897	119.76	1104.9641	227.38	791.3297
77.11	1400.1580	121.12	1001.8191	228.16	0.0000
78.74	1369.7512	121.22	1001.8860	228.18	775.9618
79.69	1354.0647	121.78	977.9514	116.74	775.9618
80.12	1354.5707	122.06	976.3995	235.69	804.5641
80.19	1354.6493	122.92	1004.5347	235.96	804.6597
80.57	1355.0964	123.07	1019.5388	238.63	776.9404
81.00	1355.5977	265.00	1147.9182	238.98	0.0000
81.07	1355.6812	125.81	1149.5577	240.99	777.7700
81.75	1356.4722	127.23	1041.6791	242.00	778.1285
83.79	1135.7709	127.91	1151.1631	244.70	779.0707
84.00	1135.9700	129.30	1043.1014	252.40	696.1553
85.43	1137.3314	131.20	1017.3065	252.80	732.7232
86.55	1138.3910	133.02	1100.7577	254.15	0.0000
86.79	1138.6168	133.52	1097.6174	256.23	688.7917
86.94	1138.7606	136.00	1082.7054	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	658.8341	355.39	0.0000	584.27	256.4707
264.80	658.8685	356.01	516.0451	595.83	335.7966
265.00	658.9286	364.49	456.5823	427.87	344.5583
268.22	622.3042	366.42	0.0000	602.52	0.0000
269.46	652.3515	372.51	450.0490	604.72	334.4688
270.03	652.5127	375.05	460.2197	607.14	346.8735
271.23	676.3271	377.52	482.1193	609.32	319.1628
273.65	766.3408	356.01	492.9670	610.33	319.2373
276.40	712.3123	388.16	448.5373	614.28	275.9021
277.37	662.9992	388.63	434.8668	618.01	264.5070
277.60	663.0594	391.69	448.0846	620.36	283.3154
278.00	654.0202	264.66	412.8500	621.93	278.1788
279.20	673.8648	401.81	435.2264	630.19	0.0000
279.54	631.5437	402.40	445.4088	631.29	289.3475
279.70	631.5846	404.85	465.5060	633.25	229.4854
280.46	631.7891	410.95	438.4194	634.78	225.3583
283.69	632.6233	413.71	394.2683	635.95	245.4350
284.31	586.9132	414.70	381.1932	636.99	279.2140
285.41	584.2540	423.72	396.1994	645.85	252.3679
285.90	0.0000	427.09	374.7588	657.76	254.1504
287.50	629.8301	427.87	394.7368	657.90	0.0000
290.67	552.3580	433.94	345.6826	661.66	272.5614
293.27	0.0000	439.40	367.2273	664.57	0.0000
351.93	624.5166	453.88	392.9283	666.33	261.0387
295.96	507.6688	463.37	326.7099	666.50	263.1730
879.38	508.1978	468.07	337.2369	667.71	0.0000
299.98	552.8318	473.00	360.9192	677.62	240.4616
300.09	552.8603	475.06	361.1421	685.70	251.5739
300.13	552.8674	476.78	324.9912	695.00	285.2389
301.36	524.6086	477.60	340.2129	696.49	293.8861
302.85	550.2921	482.18	354.8262	696.51	293.8861
256.23	547.4713	487.02	318.8837	697.00	296.0573
304.85	515.8066	492.35	0.0000	697.30	298.2153
306.78	596.1410	497.08	340.1199	697.49	304.6425
308.46	541.6454	505.52	351.1192	702.65	305.0043
311.90	560.5090	507.63	0.0000	706.68	276.3611
316.51	550.9828	511.00	335.3595	711.68	243.4376
319.41	588.9421	514.00	285.6533	720.70	257.9063
320.08	564.0811	514.00	285.6533	721.93	0.0000
321.04	548.9275	520.40	321.9368	722.78	263.3989
323.87	541.9779	520.69	0.0000	722.91	259.8271
325.23	537.4551	522.65	0.0000	723.31	259.8448
328.76	560.5896	527.90	0.0000	724.19	274.2371
333.37	529.4690	528.26	333.9112	727.33	238.9156
333.97	619.4518	529.59	333.0060	733.00	202.9411
334.37	587.4452	529.87	0.0000	735.93	245.8459
338.28	567.0769	531.02	323.9154	333.97	254.5585
338.32	567.0840	537.26	337.8194	739.50	0.0000
311.90	538.8953	546.56	0.0000	747.24	232.4110
340.48	538.8953	552.55	276.3292	748.06	216.2354
340.55	538.9089	563.25	318.8269	752.31	268.7469
344.28	535.4567	569.33	307.6009	753.82	245.3766
345.93	535.1298	946.00	307.6154	756.73	229.2832
351.06	495.1061	569.70	307.6299	756.80	229.2883
351.93	495.2620	583.19	260.9027	884.68	211.5626

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	244.2096	1274.44	157.1583	1620.50	64.2531
766.42	265.9530	1001.03	142.1356	1621.92	64.2656
766.84	265.9769	1002.74	160.8646	1678.03	0.0000
772.60	0.0000	1004.73	156.0469	1690.97	54.6300
776.52	195.8203	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	58.3099
778.90	195.9214	1028.54	0.0000	1063.66	56.3800
783.70	119.8533	1037.84	160.2412	1771.35	60.0243
785.37	119.8962	1038.76	0.0000	1791.20	0.0000
792.07	196.4707	631.29	161.4426	1808.65	50.0943
794.95	180.2109	1048.07	157.6617	1810.72	0.0000
795.86	193.3518	1049.04	158.6443	1836.06	52.3975
810.06	212.5569	1050.41	154.8611		
810.29	212.5664	1063.66	187.8014		
344.28	218.0546	1077.00	143.2320		
810.76	218.0692	1077.34	143.2381		
815.77	217.2006	1085.87	159.0230		
1048.07	194.2722	1093.63	168.5415		
832.01	237.5589	1099.45	146.5387		
834.85	222.0943	1112.07	157.6684		
835.71	225.8053	1112.84	147.8390		
836.80	0.0000	1115.54	144.1726		
846.75	0.0000	1120.29	165.4336		
846.77	197.7963	1120.55	165.4406		
856.80	162.7696	1221.41	165.4614		
860.56	173.4387	1129.67	143.4111		
871.09	166.4063	1131.51	0.0000		
873.19	157.2272	1147.95	0.0000		
875.33	0.0000	1173.23	177.6233		
879.38	175.9409	1177.95	175.8032		
880.51	175.9796	1189.05	179.0535		
883.24	170.5159	1204.77	168.3252		
884.68	166.8567	1221.41	160.9397		
889.28	170.1879	1231.02	165.4775		
894.76	205.4003	1235.36	175.7321		
898.04	156.1396	1238.28	169.6134		
900.72	191.9295	1260.41	0.0000		
903.28	203.1904	1271.87	148.6938		
911.20	186.3566	1274.44	141.0988		
912.08	186.3892	1274.54	141.1046		
923.98	0.0000	1291.59	107.3804		
926.50	162.6082	1298.22	0.0000		
929.11	180.4545	1312.11	135.6403		
937.49	187.2965	1332.49	103.0419		
944.13	173.4676	1362.66	0.0000		
946.00	184.7837	1365.19	97.5091		
949.00	174.5642	1368.63	0.0000		
667.71	0.0000	1384.29	74.3052		
962.31	191.9348	1408.01	81.4960		
964.08	195.2239	1457.56	0.0000		
966.17	184.5396	1460.82	71.3330		
911.20	184.6353	1489.16	81.8457		
968.97	184.6353	1505.03	82.6074		
983.53	136.0137	1584.12	65.7256		
984.45	0.0000	1596.21	94.6549		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:53:23.20

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656023.CNF:1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM14.CNF:511
Background date  : 20-JUN-2016 14:03:26
Sample date      : 17-MAY-2016 14:40:00 Acquisition date : 24-JUN-2016 15:51:24
Sample ID        : G398656023 Sample quantity : 1.61890E+02 GRAM
Detector name     : GAM14 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:04.47 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572236 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.39*	135	976	1.00	95.25	91	9	3.12E-03	48.0	
2	0	63.78*	135	1051	1.28	128.02	124	8	3.13E-03	48.4	
3	1	73.37	66	688	1.06	147.20	145	18	1.52E-03	56.5	1.74E+00
4	1	75.67*	791	1141	1.10	151.80	145	18	1.83E-02	8.8	
5	1	77.86*	1250	927	1.00	156.17	145	18	2.89E-02	5.4	
6	4	84.77*	210	1276	1.48	170.00	166	28	4.87E-03	34.9	3.97E+00
7	4	88.04	617	1106	1.32	176.52	166	28	1.43E-02	10.2	
8	4	90.61	374	813	0.93	181.66	166	28	8.65E-03	13.1	
9	4	93.44*	352	925	1.13	187.32	166	28	8.16E-03	22.8	
10	0	99.90*	70	953	1.07	200.24	197	8	1.63E-03	86.8	
11	0	105.66	98	878	1.26	211.75	210	7	2.27E-03	50.8	
12	0	130.12	74	921	0.86	260.65	258	7	1.70E-03	69.3	
13	0	141.20	94	1119	1.57	282.81	279	9	2.17E-03	65.3	
14	0	144.55*	48	678	1.46	289.51	287	6	1.11E-03	109.6	
15	0	154.66	133	774	0.91	309.71	307	7	3.08E-03	35.8	
16	0	186.71*	260	1083	1.10	373.80	369	10	6.02E-03	29.8	
17	0	206.03	88	858	1.86	412.43	408	9	2.04E-03	61.1	
18	0	210.08*	285	822	1.10	420.53	416	9	6.59E-03	21.6	
19	4	237.22	149	617	1.60	474.79	471	19	3.44E-03	34.8	4.09E+00
20	4	239.37*	2791	465	1.06	479.08	471	19	6.46E-02	2.6	
21	4	242.28	571	701	1.49	484.90	471	19	1.32E-02	10.8	
22	0	271.00	256	536	1.76	542.32	538	9	5.92E-03	17.5	
23	0	277.92*	32	538	1.72	556.15	553	8	7.50E-04	161.9	
24	0	295.86	802	529	1.04	592.03	588	9	1.86E-02	6.2	
25	0	301.37	141	519	1.09	603.04	598	9	3.26E-03	30.5	
26	0	328.71	144	557	0.83	657.70	653	10	3.34E-03	31.7	
27	0	338.97	631	632	1.18	678.21	673	12	1.46E-02	8.9	
28	0	352.59*	1379	516	1.19	705.45	699	13	3.19E-02	4.8	
29	0	410.56	95	303	1.13	821.34	818	8	2.20E-03	33.3	
30	0	439.20	48	234	0.92	878.61	875	7	1.11E-03	55.0	
31	0	463.70	103	270	1.20	927.60	924	8	2.39E-03	29.4	
32	0	511.49*	234	486	1.90	1023.13	1015	18	5.42E-03	32.0	
33	0	583.95*	880	338	1.33	1168.01	1161	15	2.04E-02	6.1	
34	0	609.97*	1021	329	1.39	1220.02	1215	13	2.36E-02	5.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	662.13	132	217	1.70	1324.31	1319	11	3.05E-03	23.4	
36	0	664.54	8	181	0.72	1329.14	1329	8	1.94E-04	279.6	
37	0	699.12	36	136	1.66	1398.26	1396	7	8.38E-04	56.0	
38	0	727.78	273	278	1.76	1455.57	1447	18	6.32E-03	15.6	
39	0	767.54	202	221	2.89	1535.06	1526	17	4.68E-03	18.2	
40	0	773.37	46	166	1.10	1546.73	1543	11	1.06E-03	56.5	
41	0	795.74	140	152	1.89	1591.44	1586	13	3.23E-03	20.1	
42	0	803.60*	11	149	1.44	1607.16	1603	9	2.62E-04	283.1	
43	0	860.87	179	165	1.50	1721.65	1714	15	4.15E-03	17.3	
44	0	905.44	30	100	1.17	1810.77	1808	8	6.94E-04	60.6	
45	0	911.78*	560	166	1.49	1823.44	1817	13	1.30E-02	7.3	
46	0	921.99	24	91	2.21	1843.84	1839	8	5.58E-04	71.8	
47	0	935.08	54	135	1.27	1870.02	1865	12	1.26E-03	44.9	
48	4	965.34	168	167	2.56	1930.53	1921	25	3.90E-03	19.0	7.36E-01
49	4	969.60	348	113	1.65	1939.04	1921	25	8.06E-03	7.9	
50	1	1001.42*	19	96	1.80	2002.65	1998	16	4.32E-04	115.8	1.30E+00
51	1	1005.09	31	87	1.59	2009.99	1998	16	7.10E-04	54.0	
52	0	1066.22	18	118	1.81	2132.21	2125	10	4.19E-04	115.3	
53	0	1095.04	55	159	6.72	2189.82	2180	17	1.28E-03	54.3	
54	0	1113.10	50	195	7.28	2225.94	2214	20	1.16E-03	69.9	
55	0	1120.74	226	171	1.53	2241.20	2234	14	5.23E-03	14.0	
56	0	1172.69	44	103	3.94	2345.07	2339	12	1.01E-03	48.7	
57	0	1238.24*	73	169	2.27	2476.11	2469	15	1.68E-03	45.5	
58	0	1335.77	22	65	0.53	2671.10	2663	12	5.03E-04	77.8	
59	0	1346.89	37	88	4.74	2693.34	2686	14	8.52E-04	56.4	
60	0	1378.48	74	39	1.82	2756.49	2752	10	1.70E-03	19.8	
61	0	1429.96	16	26	0.91	2859.41	2856	8	3.80E-04	59.1	
62	0	1461.29*	1829	62	2.00	2922.06	2913	16	4.23E-02	2.7	
63	0	1498.02	11	57	2.30	2995.48	2987	10	2.61E-04	128.8	
64	0	1511.28	30	71	2.97	3022.00	3015	14	6.92E-04	63.3	
65	1	1588.82	77	46	2.25	3177.01	3167	34	1.78E-03	21.6	1.55E+00
66	1	1593.20	26	36	2.25	3185.76	3167	34	6.11E-04	58.7	
67	0	1620.91	37	24	1.99	3241.16	3237	8	8.56E-04	28.2	
68	0	1713.36	15	49	5.89	3426.00	3409	20	3.53E-04	116.2	
69	0	1729.98	42	36	1.92	3459.21	3453	12	9.72E-04	32.5	
70	0	1764.99	184	44	2.57	3529.22	3522	16	4.27E-03	10.9	
71	0	1788.95	39	33	1.02	3577.11	3565	23	8.97E-04	42.4	
72	1	1921.73	18	28	2.40	3842.56	3831	38	4.24E-04	62.5	1.30E+00
73	1	1926.17	23	28	2.40	3851.44	3831	38	5.30E-04	52.8	
74	0	1954.46	69	48	9.00	3908.00	3886	39	1.61E-03	35.0	
75	0	2025.95	28	14	3.54	4050.93	4044	15	6.56E-04	35.0	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656023.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 14:40:00 Acquisition date : 24-JUN-2016 15:51:24
Sample ID        : G398656023 Sample quantity   : 161.89 GRAM
Sample type      : SOLID Sample geometry      :
Detector name    : GAMMA14 Detector geometry : CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:04.47 0.0%
Energy tolerance : 1.50 keV Half life ratio   : 10.00
Errors propagated: No Systematic Error      : 0.00 %
Efficiency type  : Empirical Efficiencies at  : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
TL-208	277.37	HG-203	279.20
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.191E+00	5.408E+00	5.408E+00	5.33	OK
CD-109	88.03	3.70*	6.003E+00	1.015E+00	1.076E+00	28.73	OK
SN-126	64.28	9.60	3.220E+00	2.310E-01	2.310E-01	96.77	OK
	86.94	8.90	6.003E+00	4.221E-01	4.221E-01	28.73	OK
	87.57	37.00*	6.003E+00	1.015E-01	1.015E-01	28.73	OK
BA-137M	661.66	89.90*	2.407E+00	2.518E-02	2.524E-02	46.77	OK
CS-137	661.66	85.10*	2.407E+00	2.660E-02	2.666E-02	46.77	OK
EU-155	86.55	30.70	6.003E+00	1.224E-01	1.243E-01	28.73	OK
	105.31	21.10*	6.823E+00	3.438E-02	3.491E-02	101.59	OK
TL-208	277.37	6.60	4.633E+00	4.838E-02	4.838E-02	323.76	OK
	583.19	85.00*	2.664E+00	1.632E-01	1.632E-01	12.17	OK
	860.56	12.50	1.923E+00	2.992E-01	2.992E-01	34.62	OK
PB-210	46.54	4.25*	9.013E-01	1.911E+00	1.917E+00	95.96	OK
BI-212	727.33	6.67*	2.225E+00	7.539E-01	7.539E-01	31.12	OK
	785.37	1.10	2.084E+00	----- Line	Not Found	-----	Absent
	1620.50	1.47	1.094E+00	8.522E-01	8.522E-01	56.43	OK
PB-212	74.82	10.28	4.835E+00	5.769E-01	5.769E-01	25.49	OK
	77.11	17.10	5.082E+00	7.456E-01	7.456E-01	10.81	OK
	238.63	43.60*	5.146E+00	5.769E-01	5.769E-01	5.17	OK
	300.09	3.30	4.371E+00	4.423E-01	4.423E-01	61.00	OK
BI-214	609.32	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20	OK
	1120.29	14.92	1.512E+00	3.892E-01	3.892E-01	27.94	OK
	1764.49	15.30	1.028E+00	4.297E-01	4.298E-01	21.79	OK
PB-214	74.82	5.80	4.734E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.082E+00	1.314E+00	1.315E+00	10.81	OK
	87.09	3.41	5.933E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.107E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.430E+00	4.457E-01	4.457E-01	12.49	OK
	351.93	35.60*	3.900E+00	4.418E-01	4.419E-01	9.68	OK
RN-222	609.32	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20	OK
	1120.29	14.92	1.512E+00	3.892E-01	3.892E-01	27.94	OK
	1764.49	15.30	1.028E+00	4.297E-01	4.298E-01	21.79	OK
RA-224	240.99	4.10*	5.103E+00	4.807E-01	4.807E-01	57.98	OK
RA-226	609.32	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20	OK
	1120.29	14.92	1.512E+00	3.892E-01	3.892E-01	27.94	OK
	1764.49	15.30	1.028E+00	4.297E-01	4.298E-01	21.79	OK
AC-228	105.21	1.10	6.823E+00	6.595E-01	6.595E-01	101.59	OK
	338.32	11.27	4.014E+00	6.231E-01	6.231E-01	17.77	OK
	794.95	4.25	2.061E+00	6.461E-01	6.461E-01	40.21	OK
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.827E+00	4.732E-01	4.732E-01	14.58	OK
	968.97	15.80	1.728E+00	5.048E-01	5.048E-01	15.74	OK
RA-228	105.21	1.10	6.823E+00	6.595E-01	6.595E-01	101.59	OK
	338.32	11.27	4.014E+00	6.231E-01	6.231E-01	17.77	OK
	794.95	4.25	2.061E+00	6.461E-01	6.461E-01	40.21	OK
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.827E+00	4.732E-01	4.732E-01	14.58	OK
	968.97	15.80	1.728E+00	5.048E-01	5.048E-01	15.74	OK
TH-228	74.82	10.28	4.835E+00	5.769E-01	5.769E-01	25.49	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	77.11	17.10	5.082E+00	7.456E-01	7.456E-01	10.81	OK
	238.63	43.60*	5.146E+00	5.769E-01	5.769E-01	5.17	OK
	300.09	3.30	4.371E+00	4.423E-01	4.423E-01	61.00	OK
TH-229	85.43	14.70	5.749E+00	1.280E-01	1.280E-01	69.83	OK
	88.47	24.00	6.003E+00	1.565E-01	1.565E-01	28.73	OK
	193.51	4.41*	5.911E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	5.615E+00	8.508E-01	8.509E-01	43.21	OK
TH-230	609.32	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20	OK
	1120.29	14.92	1.512E+00	3.892E-01	3.892E-01	27.94	OK
	1764.49	15.30	1.028E+00	4.297E-01	4.297E-01	21.79	OK
PA-231	283.69	1.70	4.565E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.371E+00	2.728E-01	2.728E-01	61.00	OK
TH-232	105.21	1.10	6.823E+00	6.595E-01	6.595E-01	101.59	OK
	338.32	11.27	4.014E+00	6.231E-01	6.231E-01	17.77	OK
	835.71	1.61	1.974E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.827E+00	4.732E-01	4.732E-01	14.58	OK
	968.97	15.80	1.728E+00	5.048E-01	5.048E-01	15.74	OK
PA-234M	766.42	0.32	2.126E+00	1.210E+01	1.210E+01	36.49	OK
	1001.03	0.84*	1.678E+00	5.213E-01	5.213E-01	231.68	OK
TH-234	63.29	3.70*	3.220E+00	5.992E-01	5.992E-01	96.77	OK
	92.59	4.23	6.347E+00	6.688E-01	6.688E-01	45.65	OK
U-234	609.32	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20	OK
	1120.29	14.92	1.512E+00	3.892E-01	3.892E-01	27.94	OK
	1764.49	15.30	1.028E+00	4.297E-01	4.297E-01	21.79	OK
U-235	89.96	3.47	6.179E+00	8.905E-01	8.905E-01	26.29	OK
	93.35	5.60	6.347E+00	5.052E-01	5.052E-01	45.65	OK
	143.76	10.96*	6.802E+00	3.134E-02	3.134E-02	219.14	OK
	163.33	5.08	6.481E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.038E+00	3.584E-02	3.584E-02	59.51	OK
	205.31	5.01	5.686E+00	1.455E-01	1.455E-01	122.24	OK
U-238	63.29	3.70*	3.220E+00	5.992E-01	5.992E-01	96.77	OK
	92.59	4.23	6.347E+00	6.688E-01	6.688E-01	45.65	OK
AM-243	43.53	5.90	5.274E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	4.835E+00	8.826E-02	8.826E-02	25.49	OK
ANH-511	511.00	100.00*	2.955E+00	3.379E-02	3.379E-02	64.05	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656023.CNF;1  *
* Acquisition date   : 24-JUN-2016 15:51:24 Sensitivity      : 3.000          *
* Detector ID        : GAM14 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:04.47 Half life ratio : *****      *
* Sample date        : 17-MAY-2016 14:40:00 Analyst initials: MXR1      *
* Sample ID          : G398656023 Sample Quantity : 1.6189E+02 GRAM  *
* Batch Number       : 1572236 Wet Weight      : 0.00000      *
* Wet wt corr        : 1.00000 Dry Weight       : 0.00000      *
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 13-OCT-2015 08:09:23 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.408E+00	2.822E-01	1.285E-01
CD-109	1.076E+00	3.028E-01	2.839E-01
SN-126	1.015E-01	2.859E-02	2.695E-02
BA-137M	2.524E-02	1.157E-02	1.313E-02
CS-137	2.666E-02	1.222E-02	1.387E-02
EU-155	3.491E-02	3.476E-02	3.948E-02
TL-208	1.632E-01	1.947E-02	1.315E-02
PB-210	1.917E+00	1.803E+00	1.523E+00
BI-212	7.539E-01	2.299E-01	1.802E-01
PB-212	5.769E-01	2.923E-02	2.146E-02
BI-214	3.646E-01	4.001E-02	2.818E-02
PB-214	4.419E-01	4.193E-02	2.560E-02
RN-222	3.646E-01	4.001E-02	2.818E-02
RA-224	4.807E-01	2.732E-01	2.300E-01
RA-226	3.646E-01	4.001E-02	2.818E-02
AC-228	4.732E-01	6.763E-02	4.754E-02
RA-228	4.732E-01	6.763E-02	4.754E-02
TH-228	5.769E-01	2.923E-02	2.146E-02
TH-229	2.851E-02	1.070E-01	2.042E-01
TH-230	3.646E-01	4.001E-02	2.818E-02
PA-231	2.728E-01	1.631E-01	1.737E-01
TH-232	4.732E-01	6.763E-02	4.754E-02
PA-234M	5.213E-01	1.184E+00	1.506E+00
TH-234	5.992E-01	5.683E-01	4.988E-01
U-234	3.646E-01	4.001E-02	2.818E-02
U-235	3.134E-02	6.730E-02	7.052E-02
U-238	5.992E-01	5.683E-01	4.988E-01
AM-243	8.826E-02	2.204E-02	1.980E-02
ANH-511	3.379E-02	2.121E-02	1.031E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.223E-02	9.138E-02	1.659E-01	NOT IDENT.

NA-22	-7.605E-03	1.009E-02	1.575E-02	NOT IDENT.
NA-24	0.000E+00	2.019E+16	0.000E+00	SHORT HLIF
AL-26	-5.113E-03	7.145E-03	1.190E-02	NOT IDENT.
SC-46	7.435E-03	9.776E-03	1.823E-02	FAIL ABUN
V-48	8.689E-03	3.785E-02	6.831E-02	NOT IDENT.
CR-51	-3.764E-02	1.378E-01	2.504E-01	NOT IDENT.
MN-54	4.492E-03	8.010E-03	1.478E-02	NOT IDENT.
CO-56	9.421E-03	1.040E-02	1.949E-02	FAIL ABUN
MN-56	0.000E+00	1.185E+41	0.000E+00	SHORT HLIF
CO-57	5.367E-03	5.675E-03	1.061E-02	NOT IDENT.
CO-58	-4.881E-03	9.971E-03	1.704E-02	NOT IDENT.
FE-59	-2.311E-02	3.049E-02	4.295E-02	NOT IDENT.
CO-60	4.535E-03	8.501E-03	1.411E-02	FAIL ABUN
ZN-65	1.306E-02	2.979E-02	3.218E-02	NOT IDENT.
GE-68	2.613E-01	2.665E-01	4.980E-01	NOT IDENT.
AS-73	-2.041E-01	2.789E-01	4.280E-01	NOT IDENT.
AS-74	1.043E-03	4.767E-02	8.806E-02	NOT IDENT.
SE-75	4.253E-05	1.021E-02	1.899E-02	NOT IDENT.
BR-77	0.000E+00	3.912E+03	0.000E+00	SHORT HLIF
SR-82	-9.381E-02	1.464E-01	2.190E-01	NOT IDENT.
RB-83	-1.995E-03	1.815E-02	3.192E-02	NOT IDENT.
KR-85	0.000E+00	2.056E+00	3.985E+00	NOT IDENT.
SR-85	0.000E+00	1.390E-02	2.692E-02	NOT IDENT.
RB-86	3.489E-01	3.762E-01	7.004E-01	NOT IDENT.
Y-88	1.304E-03	9.253E-03	1.689E-02	NOT IDENT.
Y-91	-1.891E+00	5.392E+00	9.619E+00	NOT IDENT.
NB-94	5.752E-03	8.040E-03	1.326E-02	NOT IDENT.
NB-95	1.376E-02	1.230E-02	2.069E-02	NOT IDENT.
NB-95M	2.221E-03	3.478E-02	5.750E-02	NOT IDENT.
ZR-95	1.671E-02	1.938E-02	3.648E-02	NOT IDENT.
NB-97	0.000E+00	9.364E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.051E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	8.597E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.280E+41	0.000E+00	SHORT HLIF
RH-101	1.367E-03	7.558E-03	1.233E-02	NOT IDENT.
RH-102	1.523E-03	1.533E-02	2.099E-02	FAIL ABUN
RU-103	7.079E-04	1.239E-02	2.206E-02	FAIL ABUN
RH-106	1.101E-03	6.695E-02	1.234E-01	NOT IDENT.
RU-106	1.101E-03	6.695E-02	1.234E-01	NOT IDENT.
AG-108M	-2.049E-03	6.992E-03	1.141E-02	NOT IDENT.
AG-110M	-5.358E-03	1.080E-02	1.883E-02	NOT IDENT.
SN-113	-4.410E-03	1.066E-02	1.897E-02	NOT IDENT.
CD-115	0.000E+00	3.281E+03	0.000E+00	SHORT HLIF
SN-117M	1.871E-02	4.264E-02	6.896E-02	FAIL ABUN
TE-123M	3.276E-05	7.892E-03	1.256E-02	NOT IDENT.
SB-124	-1.204E-02	2.219E-02	3.805E-02	NOT IDENT.
SB-125	8.271E-03	1.967E-02	3.586E-02	FAIL ABUN
TE-125M	2.483E+00	2.951E+00	4.976E+00	NOT IDENT.
I-126	9.938E-03	1.812E-01	2.891E-01	NOT IDENT.
SB-126	2.682E-02	1.249E-01	1.999E-01	NOT IDENT.
SB-127	-1.779E+01	1.725E+01	3.004E+01	NOT IDENT.
I-131	1.654E-01	1.787E-01	3.353E-01	NOT IDENT.
I-132	0.000E+00	1.503E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.877E+01	0.000E+00	SHORT HLIF
BA-133	5.460E-03	9.456E-03	1.555E-02	FAIL ABUN
I-133	0.000E+00	1.403E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.311E-02	1.795E-02	FAIL ABUN
CS-135	2.549E-04	3.446E-02	5.636E-02	NOT IDENT.
I-135	0.000E+00	2.934E+40	0.000E+00	SHORT HLIF
CS-136	-4.203E-02	7.266E-02	1.237E-01	FAIL ABUN
CE-139	-1.368E-03	7.235E-03	1.285E-02	NOT IDENT.
BA-140	1.213E-01	1.925E-01	3.500E-01	NOT IDENT.
LA-140	-2.061E-02	6.343E-02	1.114E-01	FAIL ABUN
CE-141	1.609E-02	3.456E-02	4.066E-02	FAIL ABUN
CE-143	0.000E+00	3.278E+06	0.000E+00	SHORT HLIF
CE-144	-9.589E-03	5.055E-02	8.109E-02	NOT IDENT.
PM-144	9.708E-04	8.779E-03	1.397E-02	NOT IDENT.
PR-144	7.299E-02	6.650E-01	1.058E+00	NOT IDENT.
PM-146	3.204E-03	9.437E-03	1.706E-02	NOT IDENT.
ND-147	-1.110E-01	5.311E-01	9.276E-01	FAIL ABUN
PM-147	3.834E+01	1.595E+02	2.931E+02	NOT IDENT.
PM-149	0.000E+00	2.663E+04	0.000E+00	SHORT HLIF
EU-150	-1.021E-03	8.901E-03	1.020E-02	FAIL ABUN
EU-152	7.523E-03	2.238E-02	3.642E-02	FAIL ABUN
GD-153	-7.757E-03	2.577E-02	3.311E-02	NOT IDENT.
EU-154	-2.063E-02	2.829E-02	4.424E-02	FAIL ABUN
TB-160	1.795E-03	3.398E-02	6.111E-02	FAIL ABUN
HO-166M	-1.441E-04	1.282E-02	2.331E-02	FAIL ABUN

TM-171	-4.935E+00	5.095E+00	7.488E+00	NOT IDENT.
HF-172	-3.396E-02	4.392E-02	7.442E-02	FAIL ABUN
LU-172	2.298E-02	2.447E-02	2.496E-02	FAIL ABUN
LU-176	-3.749E-03	5.581E-03	9.689E-03	FAIL ABUN
HF-181	-4.951E-03	1.331E-02	2.330E-02	NOT IDENT.
TA-182	1.885E-02	4.189E-02	7.784E-02	FAIL ABUN
RE-183	-4.163E-03	5.200E-02	9.955E-02	NOT IDENT.
RE-184	9.948E-03	4.952E-02	7.748E-02	NOT IDENT.
W-188	4.971E-01	1.995E+00	3.446E+00	FAIL ABUN
IR-192	7.375E-06	9.287E-03	1.703E-02	FAIL ABUN
HG-203	6.922E-03	2.196E-02	2.225E-02	FAIL ABUN
BI-207	1.082E-03	1.318E-02	2.010E-02	FAIL ABUN
BI-211	0.000E+00	6.823E-02	1.487E-01	FAIL ABUN
PB-211	4.370E-02	1.602E-01	2.813E-01	NOT IDENT.
RN-219	-8.165E-03	1.103E-01	1.601E-01	FAIL ABUN
RA-223	2.740E-02	1.522E-01	2.466E-01	FAIL ABUN
AC-227	1.515E-03	5.266E-02	9.811E-02	FAIL ABUN
TH-227	1.515E-03	5.266E-02	9.811E-02	FAIL ABUN
TH-231	2.740E-02	1.522E-01	2.466E-01	FAIL ABUN
PA-233	5.508E-03	1.384E-02	2.571E-02	FAIL ABUN
PA-234	-9.967E-03	6.271E-02	1.106E-01	FAIL ABUN
NP-237	5.508E-03	1.384E-02	2.571E-02	FAIL ABUN
NP-238	0.000E+00	7.853E+03	0.000E+00	SHORT HLIF
NP-239	5.752E-02	5.583E-02	1.048E-01	FAIL ABUN
PU-239	8.261E+01	1.122E+02	1.379E+02	FAIL ABUN
AM-241	1.198E-02	3.851E-02	6.094E-02	NOT IDENT.
CM-243	7.152E-03	2.985E-02	3.929E-02	FAIL ABUN
BK-247	-5.233E-03	1.668E-02	2.969E-02	FAIL ABUN
CM-247	-5.572E-03	1.018E-02	1.452E-02	FAIL ABUN
CF-249	-2.280E-04	8.516E-03	1.537E-02	NOT IDENT.
CF-251	1.119E-02	2.816E-02	5.056E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1777	10.66*	1.191E+00	5.408E+00	5.408E+00	5.33
CD-109	88.03	818	3.70*	6.003E+00	1.424E+00	1.508E+00	20.37
SN-126	64.28	185	9.60	3.220E+00	2.310E-01	2.310E-01	96.77
	86.94	818	8.90	6.003E+00	5.920E-01	5.920E-01	20.37
	87.57	818	37.00*	6.003E+00	1.424E-01	1.424E-01	20.37
BA-137M	661.66	141	89.90*	2.407E+00	2.518E-02	2.524E-02	46.77
CS-137	661.66	141	85.10*	2.407E+00	2.660E-02	2.666E-02	46.77
CE-141	145.44	60	48.29*	6.802E+00	7.113E-03	1.609E-02	219.14
EU-155	86.55	818	30.70	6.003E+00	1.716E-01	1.743E-01	20.37
	105.31	128	21.10*	6.823E+00	3.438E-02	3.491E-02	101.59
HG-203	70.83	-----	3.69	4.227E+00	-----	Line Not Found	-----
	72.87	89	6.19	4.556E+00	1.217E-01	2.152E-01	113.03
	279.20	38	81.56*	4.633E+00	3.915E-03	6.922E-03	323.76
TL-208	277.37	38	6.60	4.633E+00	4.838E-02	4.838E-02	323.76
	583.19	957	85.00*	2.664E+00	1.632E-01	1.632E-01	12.17
	860.56	186	12.50	1.923E+00	2.992E-01	2.992E-01	34.62
PB-210	46.54	189	4.25*	9.013E-01	1.911E+00	1.917E+00	95.96
BI-212	727.33	289	6.67*	2.225E+00	7.539E-01	7.539E-01	31.12
	785.37	-----	1.10	2.084E+00	-----	Line Not Found	-----
	1620.50	35	1.47	1.094E+00	8.522E-01	8.522E-01	56.43
PB-212	74.82	1064	10.28	4.835E+00	8.270E-01	8.270E-01	17.63
	77.11	1677	17.10	5.082E+00	7.456E-01	7.456E-01	10.81
	238.63	3349	43.60*	5.146E+00	5.769E-01	5.769E-01	5.17
	300.09	165	3.30	4.371E+00	4.423E-01	4.423E-01	61.00
BI-214	609.32	1104	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20
	1120.29	227	14.92	1.512E+00	3.892E-01	3.892E-01	27.94
	1764.49	175	15.30	1.028E+00	4.297E-01	4.298E-01	21.79
PB-214	74.82	1064	5.80	4.835E+00	1.466E+00	1.466E+00	17.63
	77.11	1677	9.70	5.082E+00	1.314E+00	1.315E+00	10.81
	87.09	818	3.41	6.003E+00	1.545E+00	1.545E+00	20.37
	242.00	685	7.25	5.103E+00	7.151E-01	7.152E-01	21.52
	295.22	941	18.42	4.430E+00	4.457E-01	4.457E-01	12.49
	351.93	1587	35.60*	3.900E+00	4.418E-01	4.419E-01	9.68
RN-222	609.32	1104	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20
	1120.29	227	14.92	1.512E+00	3.892E-01	3.892E-01	27.94
	1764.49	175	15.30	1.028E+00	4.297E-01	4.298E-01	21.79
RA-224	240.99	685	4.10*	5.103E+00	1.265E+00	1.265E+00	21.52
RA-226	609.32	1104	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20
	1120.29	227	14.92	1.512E+00	3.892E-01	3.892E-01	27.94
	1764.49	175	15.30	1.028E+00	4.297E-01	4.298E-01	21.79
AC-228	105.21	128	1.10	6.823E+00	6.595E-01	6.595E-01	101.59
	338.32	729	11.27	4.014E+00	6.231E-01	6.231E-01	17.77
	794.95	146	4.25	2.061E+00	6.461E-01	6.461E-01	40.21
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	577	25.80*	1.827E+00	4.732E-01	4.732E-01	14.58
	968.97	357	15.80	1.728E+00	5.048E-01	5.048E-01	15.74
RA-228	105.21	128	1.10	6.823E+00	6.595E-01	6.595E-01	101.59

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	729	11.27	4.014E+00	6.231E-01	6.231E-01	17.77
	794.95	146	4.25	2.061E+00	6.461E-01	6.461E-01	40.21
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	577	25.80*	1.827E+00	4.732E-01	4.732E-01	14.58
	968.97	357	15.80	1.728E+00	5.048E-01	5.048E-01	15.74
TH-228	74.82	1064	10.28	4.835E+00	8.270E-01	8.270E-01	17.63
	77.11	1677	17.10	5.082E+00	7.456E-01	7.456E-01	10.81
	238.63	3349	43.60*	5.146E+00	5.769E-01	5.769E-01	5.17
	300.09	165	3.30	4.371E+00	4.423E-01	4.423E-01	61.00
TH-229	85.43	280	14.70	5.749E+00	1.280E-01	1.280E-01	69.83
	88.47	818	24.00	6.003E+00	2.195E-01	2.195E-01	20.37
	193.51	-----	4.41*	5.911E+00	-----	Line Not Found	-----
	210.85	346	2.80	5.615E+00	8.508E-01	8.509E-01	43.21
TH-230	609.32	1104	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20
	1120.29	227	14.92	1.512E+00	3.892E-01	3.892E-01	27.94
	1764.49	175	15.30	1.028E+00	4.297E-01	4.297E-01	21.79
PA-231	283.69	-----	1.70	4.565E+00	-----	Line Not Found	-----
	301.36	165	5.35*	4.371E+00	2.728E-01	2.728E-01	61.00
TH-232	105.21	128	1.10	6.823E+00	6.595E-01	6.595E-01	101.59
	338.32	729	11.27	4.014E+00	6.231E-01	6.231E-01	17.77
	835.71	-----	1.61	1.974E+00	-----	Line Not Found	-----
	911.20	577	25.80*	1.827E+00	4.732E-01	4.732E-01	14.58
	968.97	357	15.80	1.728E+00	5.048E-01	5.048E-01	15.74
PA-234M	766.42	213	0.32	2.126E+00	1.210E+01	1.210E+01	36.49
	1001.03	19	0.84*	1.678E+00	5.213E-01	5.213E-01	231.68
TH-234	63.29	185	3.70*	3.220E+00	5.992E-01	5.992E-01	96.77
	92.59	465	4.23	6.347E+00	6.688E-01	6.688E-01	45.65
U-234	609.32	1104	45.49*	2.573E+00	3.646E-01	3.646E-01	11.20
	1120.29	227	14.92	1.512E+00	3.892E-01	3.892E-01	27.94
	1764.49	175	15.30	1.028E+00	4.297E-01	4.297E-01	21.79
U-235	89.96	494	3.47	6.179E+00	8.905E-01	8.905E-01	26.29
	93.35	465	5.60	6.347E+00	5.052E-01	5.052E-01	45.65
	143.76	60	10.96*	6.802E+00	3.134E-02	3.134E-02	219.14
	163.33	-----	5.08	6.481E+00	-----	Line Not Found	-----
	185.72	320	57.20	6.038E+00	3.584E-02	3.584E-02	59.51
	205.31	107	5.01	5.686E+00	1.455E-01	1.455E-01	122.24
U-238	63.29	185	3.70*	3.220E+00	5.992E-01	5.992E-01	96.77
	92.59	465	4.23	6.347E+00	6.688E-01	6.688E-01	45.65
AM-243	43.53	-----	5.90	5.274E-01	-----	Line Not Found	-----
	74.66	1064	67.20*	4.835E+00	1.265E-01	1.265E-01	17.63
ANH-511	511.00	258	100.00*	2.955E+00	3.379E-02	3.379E-02	64.05

Flag: "*" = Keyline

Total number of lines in spectrum 75
Number of unidentified lines 21
Number of lines tentatively identified by NID 54 72.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.408E+00	5.408E+00	0.288E+00	5.33	
CD-109	461.40D	1.06	1.424E+00	1.508E+00	0.307E+00	20.37	
SN-126	2.30E+05Y	1.00	1.424E-01	1.424E-01	0.290E-01	20.37	
BA-137M	30.08Y	1.00	2.518E-02	2.524E-02	1.180E-02	46.77	
CS-137	30.08Y	1.00	2.660E-02	2.666E-02	1.247E-02	46.77	
CE-141	32.51D	2.26	7.113E-03	1.609E-02	3.527E-02	219.14	
EU-155	4.75Y	1.02	3.438E-02	3.491E-02	3.547E-02	101.59	
HG-203	46.59D	1.77	3.915E-03	6.922E-03	22.41E-03	323.76	
TL-208	1.41E+10Y	1.00	1.632E-01	1.632E-01	0.199E-01	12.17	
PB-210	22.20Y	1.00	1.911E+00	1.917E+00	1.840E+00	95.96	
BI-212	1.41E+10Y	1.00	7.539E-01	7.539E-01	2.346E-01	31.12	
PB-212	1.41E+10Y	1.00	5.769E-01	5.769E-01	0.298E-01	5.17	
BI-214	1600.00Y	1.00	3.646E-01	3.646E-01	0.408E-01	11.20	
PB-214	1600.00Y	1.00	4.418E-01	4.419E-01	0.428E-01	9.68	
RN-222	1600.00Y	1.00	3.646E-01	3.646E-01	0.408E-01	11.20	
RA-224	1.41E+10Y	1.00	1.265E+00	1.265E+00	0.272E+00	21.52	
RA-226	1600.00Y	1.00	3.646E-01	3.646E-01	0.408E-01	11.20	
AC-228	1.41E+10Y	1.00	4.732E-01	4.732E-01	0.690E-01	14.58	
RA-228	1.41E+10Y	1.00	4.732E-01	4.732E-01	0.690E-01	14.58	
TH-228	1.41E+10Y	1.00	5.769E-01	5.769E-01	0.298E-01	5.17	
TH-229	7340.00Y	1.00	2.195E-01	2.195E-01	0.447E-01	20.37	K
TH-230	7.54E+04Y	1.00	3.646E-01	3.646E-01	0.408E-01	11.20	
PA-231	7.04E+08Y	1.00	2.728E-01	2.728E-01	1.664E-01	61.00	
TH-232	1.41E+10Y	1.00	4.732E-01	4.732E-01	0.690E-01	14.58	
PA-234M	4.47E+09Y	1.00	5.213E-01	5.213E-01	12.08E-01	231.68	
TH-234	4.47E+09Y	1.00	5.992E-01	5.992E-01	5.799E-01	96.77	
U-234	2.45E+05Y	1.00	3.646E-01	3.646E-01	0.408E-01	11.20	
U-235	7.04E+08Y	1.00	3.134E-02	3.134E-02	6.867E-02	219.14	
U-238	4.47E+09Y	1.00	5.992E-01	5.992E-01	5.799E-01	96.77	
AM-243	7370.00Y	1.00	1.265E-01	1.265E-01	0.223E-01	17.63	
ANH-511	1.00E+09Y	1.00	3.379E-02	3.379E-02	2.164E-02	64.05	
Total Activity :			1.841E+01	1.851E+01			

Grand Total Activity : 1.841E+01 1.851E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	99.90	92	1249	1.07	200.24	197	8	1.63E-03	****	6.65E+00	T
0	130.12	94	1177	0.86	260.65	258	7	1.70E-03	****	6.97E+00	T
0	141.20	119	1418	1.57	282.81	279	9	2.17E-03	****	6.85E+00	T
0	154.66	167	972	0.91	309.71	307	7	3.08E-03	71.5	6.64E+00	T
4	237.22	179	741	1.60	474.79	471	19	3.44E-03	69.6	5.18E+00	T
0	271.00	303	635	1.76	542.32	538	9	5.92E-03	34.9	4.72E+00	T
0	328.71	167	646	0.83	657.70	653	10	3.34E-03	63.5	4.10E+00	T
0	410.56	108	343	1.13	821.34	818	8	2.20E-03	66.7	3.49E+00	T
0	439.20	54	263	0.92	878.61	875	7	1.11E-03	****	3.32E+00	T
0	463.70	115	301	1.20	927.60	924	8	2.39E-03	58.7	3.18E+00	T
0	664.54	9	193	0.72	1329.14	1329	8	1.94E-04	****	2.40E+00	T
0	699.12	39	145	1.66	1398.26	1396	7	8.38E-04	****	2.30E+00	
0	773.37	48	175	1.10	1546.73	1543	11	1.06E-03	****	2.11E+00	T
0	803.60	12	156	1.44	1607.16	1603	9	2.62E-04	****	2.04E+00	
0	905.44	31	103	1.17	1810.77	1808	8	6.94E-04	****	1.84E+00	
0	921.99	25	94	2.21	1843.84	1839	8	5.58E-04	****	1.81E+00	
0	935.08	56	138	1.27	1870.02	1865	12	1.26E-03	89.7	1.79E+00	
4	965.34	172	171	2.56	1930.53	1921	25	3.90E-03	37.9	1.73E+00	T
1	1005.09	31	89	1.59	2009.99	1998	16	7.10E-04	****	1.67E+00	T
0	1066.22	18	119	1.81	2132.21	2125	10	4.19E-04	****	1.58E+00	
0	1095.04	56	160	6.72	2189.82	2180	17	1.28E-03	****	1.55E+00	T
0	1113.10	50	196	7.28	2225.94	2214	20	1.16E-03	****	1.52E+00	T
0	1172.69	44	103	3.94	2345.07	2339	12	1.01E-03	97.5	1.45E+00	T
0	1238.24	72	168	2.27	2476.11	2469	15	1.68E-03	91.1	1.38E+00	T
0	1335.77	21	64	0.53	2671.10	2663	12	5.03E-04	****	1.29E+00	
0	1346.89	36	87	4.74	2693.34	2686	14	8.52E-04	****	1.28E+00	
0	1378.48	72	39	1.82	2756.49	2752	10	1.70E-03	39.6	1.25E+00	
0	1429.96	16	25	0.91	2859.41	2856	8	3.80E-04	****	1.21E+00	
0	1498.02	11	55	2.30	2995.48	2987	10	2.61E-04	****	1.17E+00	
0	1511.28	29	69	2.97	3022.00	3015	14	6.92E-04	****	1.16E+00	
1	1588.82	74	45	2.25	3177.01	3167	34	1.78E-03	43.2	1.11E+00	
1	1593.20	25	35	2.25	3185.76	3167	34	6.11E-04	****	1.11E+00	
0	1713.36	15	46	5.89	3426.00	3409	20	3.53E-04	****	1.05E+00	
0	1729.98	40	34	1.92	3459.21	3453	12	9.72E-04	64.9	1.04E+00	
0	1788.95	37	31	1.02	3577.11	3565	23	8.97E-04	84.9	1.02E+00	
1	1921.73	17	26	2.40	3842.56	3831	38	4.24E-04	****	9.74E-01	
1	1926.17	21	26	2.40	3851.44	3831	38	5.30E-04	****	9.73E-01	
0	1954.46	65	44	9.00	3908.00	3886	39	1.61E-03	70.1	9.65E-01	
0	2025.95	26	13	3.54	4050.93	4044	15	6.56E-04	69.9	9.47E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656023.CNF;1  *
* Acquisition date   : 24-JUN-2016 15:51:24 Sensitivity      : 3.000          *
* Detector ID        : GAM14 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:04.47 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 14:40:00 Nuclide Library : SOLID         *
* Sample ID          : G398656023 Analyst initials: MXR1          *
* Batch Number       : 1572236 Sample Quantity : 1.6189E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000         *
*                                     Dry Weight    : 0.00000         *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 13-OCT-2015 08:09:23 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.014E-02
CD-109	1.393E-01
SN-126	1.322E-02
BA-137M	6.318E-03
CS-137	6.674E-03
EU-155	1.935E-02
TL-208	6.338E-03
PB-210	7.447E-01
BI-212	8.649E-02
PB-212	1.049E-02
BI-214	1.363E-02
PB-214	1.241E-02
RN-222	1.363E-02
RA-224	1.124E-01
RA-226	1.363E-02
AC-228	2.264E-02
RA-228	2.264E-02
TH-228	1.049E-02
TH-229	1.000E-01
TH-230	1.363E-02
PA-231	8.453E-02
TH-232	2.264E-02
PA-234M	7.152E-01
TH-234	2.446E-01
U-234	1.363E-02
U-235	3.452E-02
U-238	2.446E-01
AM-243	9.721E-03
ANH-511	4.975E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	8.021E-02	NOT IDENT.
NA-22	7.470E-03	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	5.433E-03	NOT IDENT.
SC-46	8.723E-03	FAIL ABUN
V-48	3.252E-02	NOT IDENT.
CR-51	1.218E-01	NOT IDENT.
MN-54	7.097E-03	NOT IDENT.
CO-56	9.361E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.201E-03	NOT IDENT.
CO-58	8.138E-03	NOT IDENT.
FE-59	2.037E-02	NOT IDENT.
CO-60	6.643E-03	FAIL ABUN
ZN-65	1.533E-02	NOT IDENT.
GE-68	2.375E-01	NOT IDENT.
AS-73	2.094E-01	NOT IDENT.
AS-74	4.249E-02	NOT IDENT.
SE-75	9.254E-03	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.047E-01	NOT IDENT.
RB-83	1.540E-02	NOT IDENT.
KR-85	1.951E+00	NOT IDENT.
SR-85	1.318E-02	NOT IDENT.
RB-86	3.340E-01	NOT IDENT.
Y-88	7.770E-03	NOT IDENT.
Y-91	4.584E+00	NOT IDENT.
NB-94	6.395E-03	NOT IDENT.
NB-95	9.968E-03	NOT IDENT.
NB-95M	2.811E-02	NOT IDENT.
ZR-95	1.755E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.044E-03	NOT IDENT.
RH-102	1.010E-02	FAIL ABUN
RU-103	1.064E-02	FAIL ABUN
RH-106	5.943E-02	NOT IDENT.
RU-106	5.943E-02	NOT IDENT.
AG-108M	5.527E-03	NOT IDENT.
AG-110M	8.980E-03	NOT IDENT.
SN-113	9.194E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.380E-02	FAIL ABUN
TE-123M	6.157E-03	NOT IDENT.
SB-124	1.741E-02	NOT IDENT.
SB-125	1.738E-02	FAIL ABUN
TE-125M	2.441E+00	NOT IDENT.
I-126	1.393E-01	NOT IDENT.
SB-126	9.617E-02	NOT IDENT.
SB-127	1.441E+01	NOT IDENT.
I-131	1.629E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	7.549E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	8.663E-03	FAIL ABUN
CS-135	2.746E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	5.878E-02	FAIL ABUN
CE-139	6.293E-03	NOT IDENT.
BA-140	1.688E-01	NOT IDENT.
LA-140	5.171E-02	FAIL ABUN
CE-141	1.995E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	3.976E-02	NOT IDENT.
PM-144	6.735E-03	NOT IDENT.
PR-144	5.102E-01	NOT IDENT.
PM-146	8.269E-03	NOT IDENT.
ND-147	4.478E-01	FAIL ABUN
PM-147	1.437E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	4.962E-03	FAIL ABUN
EU-152	1.770E-02	FAIL ABUN
GD-153	1.623E-02	NOT IDENT.
EU-154	2.099E-02	FAIL ABUN
TB-160	2.920E-02	FAIL ABUN
HO-166M	1.122E-02	FAIL ABUN
TM-171	3.662E+00	NOT IDENT.

HF-172	3.648E-02	FAIL ABUN
LU-172	1.192E-02	FAIL ABUN
LU-176	4.710E-03	FAIL ABUN
HF-181	1.124E-02	NOT IDENT.
TA-182	3.716E-02	FAIL ABUN
RE-183	4.875E-02	NOT IDENT.
RE-184	3.714E-02	NOT IDENT.
W-188	1.679E+00	FAIL ABUN
IR-192	8.293E-03	FAIL ABUN
HG-203	1.087E-02	FAIL ABUN
BI-207	9.602E-03	FAIL ABUN
BI-211	7.329E-02	FAIL ABUN
PB-211	1.366E-01	NOT IDENT.
RN-219	7.776E-02	FAIL ABUN
RA-223	1.200E-01	FAIL ABUN
AC-227	4.789E-02	FAIL ABUN
TH-227	4.789E-02	FAIL ABUN
TH-231	1.200E-01	FAIL ABUN
PA-233	1.252E-02	FAIL ABUN
PA-234	5.282E-02	FAIL ABUN
NP-237	1.252E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.142E-02	FAIL ABUN
PU-239	6.771E+01	FAIL ABUN
AM-241	2.986E-02	NOT IDENT.
CM-243	1.925E-02	FAIL ABUN
BK-247	1.447E-02	FAIL ABUN
CM-247	7.049E-03	FAIL ABUN
CF-249	7.461E-03	NOT IDENT.
CF-251	2.477E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656023.CNF;1
Acquisition date : 24-JUN-2016 15:51:24 Sensitivity : 3.000
Detector ID : GAM14 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:04.47 Half life ratio : *****
Sample date : 17-MAY-2016 14:40:00 Nuclide Library : SOLID
Sample ID : G398656023 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.6189E+02 GRAM
Quantity Err(%) : 1.2354E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 13-OCT-2015 08:09:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.408E+00	5.518E-01	5.518E-01
CD-109	1.075E+00	3.304E-01	3.304E-01
SN-126	1.015E-01	3.073E-02	3.073E-02
BA-137M	2.524E-02	1.175E-02	1.175E-02
CS-137	2.666E-02	1.241E-02	1.241E-02
EU-155	3.491E-02	3.491E-02	3.491E-02
TL-208	1.632E-01	2.378E-02	2.378E-02
PB-210	1.917E+00	1.814E+00	1.814E+00
BI-212	7.539E-01	2.423E-01	2.423E-01
PB-212	5.769E-01	5.913E-02	5.913E-02
BI-214	3.646E-01	5.024E-02	5.024E-02
PB-214	4.419E-01	5.655E-02	5.655E-02
RN-222	3.646E-01	5.024E-02	5.024E-02
RA-224	4.805E-01	2.891E-01	2.891E-01
RA-226	3.646E-01	5.024E-02	5.024E-02
AC-228	4.732E-01	9.887E-02	9.887E-02
RA-228	4.732E-01	9.887E-02	9.887E-02
TH-228	5.769E-01	5.913E-02	5.913E-02
TH-229	2.851E-02	1.071E-01	1.071E-01
TH-230	3.646E-01	5.024E-02	5.024E-02
PA-231	2.728E-01	1.746E-01	1.746E-01
TH-232	4.732E-01	9.887E-02	9.887E-02
PA-234M	5.213E-01	1.187E+00	1.187E+00
TH-234	5.992E-01	5.856E-01	5.856E-01
U-234	3.646E-01	5.024E-02	5.024E-02
U-235	3.134E-02	6.735E-02	6.735E-02
U-238	5.992E-01	5.856E-01	5.856E-01
AM-243	8.824E-02	2.420E-02	2.420E-02
ANH-511	3.379E-02	2.139E-02	2.139E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	4.223E-02	9.145E-02	9.341E-02 NOT IDENT.

NA-22	-7.605E-03	1.011E-02	1.068E-02	NOT IDENT.
NA-24	1.770E+16	2.026E+16	0.000E+00	SHORT HLIF
AL-26	-5.113E-03	7.156E-03	7.518E-03	NOT IDENT.
SC-46	7.435E-03	9.834E-03	1.039E-02	FAIL ABUN
V-48	8.689E-03	3.788E-02	3.808E-02	NOT IDENT.
CR-51	-3.764E-02	1.378E-01	1.389E-01	NOT IDENT.
MN-54	4.492E-03	8.031E-03	8.282E-03	NOT IDENT.
CO-56	9.421E-03	1.047E-02	1.130E-02	FAIL ABUN
MN-56	1.000E+41	1.192E+41	0.000E+00	SHORT HLIF
CO-57	5.367E-03	5.692E-03	6.185E-03	NOT IDENT.
CO-58	-4.881E-03	9.989E-03	1.023E-02	NOT IDENT.
FE-59	-2.311E-02	3.086E-02	3.257E-02	NOT IDENT.
CO-60	4.535E-03	8.509E-03	8.751E-03	FAIL ABUN
ZN-65	1.306E-02	2.990E-02	3.048E-02	NOT IDENT.
GE-68	2.613E-01	2.711E-01	2.956E-01	NOT IDENT.
AS-73	-2.041E-01	2.826E-01	2.972E-01	NOT IDENT.
AS-74	1.043E-03	4.767E-02	4.767E-02	NOT IDENT.
SE-75	4.253E-05	1.021E-02	1.021E-02	NOT IDENT.
BR-77	7.720E+04	8.567E+04	9.247E+04	SHORT HLIF
SR-82	-9.381E-02	1.467E-01	1.527E-01	NOT IDENT.
RB-83	-1.995E-03	1.815E-02	1.817E-02	NOT IDENT.
KR-85	1.275E+01	2.313E+00	6.196E+00	NOT IDENT.
SR-85	8.597E-02	1.563E-02	4.179E-02	NOT IDENT.
RB-86	3.489E-01	3.820E-01	4.131E-01	NOT IDENT.
Y-88	1.304E-03	9.253E-03	9.272E-03	NOT IDENT.
Y-91	-1.891E+00	5.395E+00	5.462E+00	NOT IDENT.
NB-94	5.752E-03	8.057E-03	8.464E-03	NOT IDENT.
NB-95	1.376E-02	1.239E-02	1.385E-02	NOT IDENT.
NB-95M	2.221E-03	3.478E-02	3.479E-02	NOT IDENT.
ZR-95	1.671E-02	1.946E-02	2.087E-02	NOT IDENT.
NB-97	1.000E+41	9.400E+40	0.000E+00	SHORT HLIF
ZR-97	3.736E+15	3.066E+15	3.498E+15	SHORT HLIF
MO-99	-5.999E+02	8.621E+02	9.035E+02	SHORT HLIF
TC-99M	1.000E+41	1.285E+41	0.000E+00	SHORT HLIF
RH-101	1.367E-03	7.562E-03	7.587E-03	NOT IDENT.
RH-102	1.523E-03	1.533E-02	1.535E-02	FAIL ABUN
RU-103	7.079E-04	1.239E-02	1.239E-02	FAIL ABUN
RH-106	1.101E-03	6.695E-02	6.695E-02	NOT IDENT.
RU-106	1.101E-03	6.695E-02	6.695E-02	NOT IDENT.
AG-108M	-2.049E-03	6.994E-03	7.055E-03	NOT IDENT.
AG-110M	-5.358E-03	1.083E-02	1.109E-02	NOT IDENT.
SN-113	-4.410E-03	1.067E-02	1.085E-02	NOT IDENT.
CD-115	1.908E+03	3.286E+03	3.397E+03	SHORT HLIF
SN-117M	1.871E-02	4.266E-02	4.349E-02	FAIL ABUN
TE-123M	3.276E-05	7.892E-03	7.892E-03	NOT IDENT.
SB-124	-1.204E-02	2.221E-02	2.286E-02	NOT IDENT.
SB-125	8.271E-03	1.968E-02	2.003E-02	FAIL ABUN
TE-125M	2.483E+00	2.959E+00	3.163E+00	NOT IDENT.
I-126	9.938E-03	1.812E-01	1.813E-01	NOT IDENT.
SB-126	2.682E-02	1.250E-01	1.255E-01	NOT IDENT.
SB-127	-1.779E+01	1.760E+01	1.934E+01	NOT IDENT.
I-131	1.654E-01	1.793E-01	1.942E-01	NOT IDENT.
I-132	1.000E+41	2.793E+41	0.000E+00	SHORT HLIF
TE-132	-2.254E+01	2.889E+01	3.063E+01	SHORT HLIF
BA-133	5.460E-03	9.468E-03	9.783E-03	FAIL ABUN
I-133	1.033E+11	1.426E+11	1.501E+11	SHORT HLIF
CS-134	3.328E-02	1.367E-02	2.030E-02	FAIL ABUN
CS-135	2.549E-04	3.446E-02	3.446E-02	NOT IDENT.
I-135	-2.071E+40	3.444E+40	0.000E+00	SHORT HLIF
CS-136	-4.203E-02	7.313E-02	7.554E-02	FAIL ABUN
CE-139	-1.368E-03	7.240E-03	7.266E-03	NOT IDENT.
BA-140	1.213E-01	1.928E-01	2.004E-01	NOT IDENT.
LA-140	-2.061E-02	6.345E-02	6.412E-02	FAIL ABUN
CE-141	1.609E-02	3.458E-02	3.534E-02	FAIL ABUN
CE-143	3.239E+06	3.293E+06	3.602E+06	SHORT HLIF
CE-144	-9.589E-03	5.056E-02	5.074E-02	NOT IDENT.
PM-144	9.708E-04	8.779E-03	8.790E-03	NOT IDENT.
PR-144	7.299E-02	6.650E-01	6.658E-01	NOT IDENT.
PM-146	3.204E-03	9.442E-03	9.552E-03	NOT IDENT.
ND-147	-1.110E-01	5.311E-01	5.335E-01	FAIL ABUN
PM-147	3.834E+01	1.595E+02	1.605E+02	NOT IDENT.
PM-149	-1.229E+04	2.670E+04	2.727E+04	SHORT HLIF
EU-150	-1.021E-03	8.901E-03	8.913E-03	FAIL ABUN
EU-152	7.523E-03	2.239E-02	2.265E-02	FAIL ABUN
GD-153	-7.757E-03	2.578E-02	2.601E-02	NOT IDENT.
EU-154	-2.063E-02	2.835E-02	2.983E-02	FAIL ABUN
TB-160	1.795E-03	3.398E-02	3.399E-02	FAIL ABUN
HO-166M	-1.441E-04	1.282E-02	1.282E-02	FAIL ABUN

TM-171	-4.935E+00	5.131E+00	5.592E+00	NOT IDENT.
HF-172	-3.396E-02	4.432E-02	4.689E-02	FAIL ABUN
LU-172	2.298E-02	2.497E-02	2.703E-02	FAIL ABUN
LU-176	-3.749E-03	5.592E-03	5.842E-03	FAIL ABUN
HF-181	-4.951E-03	1.331E-02	1.350E-02	NOT IDENT.
TA-182	1.885E-02	4.192E-02	4.277E-02	FAIL ABUN
RE-183	-4.163E-03	5.201E-02	5.204E-02	NOT IDENT.
RE-184	9.948E-03	4.955E-02	4.975E-02	NOT IDENT.
W-188	4.971E-01	1.996E+00	2.008E+00	FAIL ABUN
IR-192	7.375E-06	9.287E-03	9.287E-03	FAIL ABUN
HG-203	6.922E-03	2.197E-02	2.219E-02	FAIL ABUN
BI-207	1.082E-03	1.318E-02	1.319E-02	FAIL ABUN
BI-211	9.069E-01	1.047E-01	4.220E-01	FAIL ABUN
PB-211	4.370E-02	1.602E-01	1.614E-01	NOT IDENT.
RN-219	-8.165E-03	1.103E-01	1.103E-01	FAIL ABUN
RA-223	2.740E-02	1.522E-01	1.527E-01	FAIL ABUN
AC-227	1.515E-03	5.266E-02	5.267E-02	FAIL ABUN
TH-227	1.515E-03	5.266E-02	5.267E-02	FAIL ABUN
TH-231	2.740E-02	1.522E-01	1.527E-01	FAIL ABUN
PA-233	5.508E-03	1.384E-02	1.407E-02	FAIL ABUN
PA-234	-9.967E-03	6.375E-02	6.391E-02	FAIL ABUN
NP-237	5.508E-03	1.384E-02	1.407E-02	FAIL ABUN
NP-238	3.960E+03	7.881E+03	8.081E+03	SHORT HLIF
NP-239	5.752E-02	5.615E-02	6.185E-02	FAIL ABUN
PU-239	8.261E+01	1.123E+02	1.184E+02	FAIL ABUN
AM-241	1.198E-02	3.854E-02	3.891E-02	NOT IDENT.
CM-243	7.152E-03	2.986E-02	3.003E-02	FAIL ABUN
BK-247	-5.233E-03	1.672E-02	1.689E-02	FAIL ABUN
CM-247	-5.572E-03	1.023E-02	1.054E-02	FAIL ABUN
CF-249	-2.280E-04	8.516E-03	8.517E-03	NOT IDENT.
CF-251	1.119E-02	2.820E-02	2.865E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	668.3654	87.09	878.4229	136.47	836.7713
45.60	686.0925	87.57	879.1699	140.51	0.0000
46.54	651.4675	88.03	879.8862	143.76	703.6475
49.72	0.0000	88.34	880.3652	144.24	812.0104
51.35	686.4697	88.47	880.5674	145.44	851.4922
51.87	678.8544	89.96	882.8657	152.43	744.8395
52.39	659.5772	1093.63	883.9116	153.25	742.2263
52.97	688.7490	91.11	884.6279	323.87	773.3582
53.44	669.6224	92.59	886.8779	156.02	771.6800
54.07	659.2467	93.35	888.0293	158.56	750.3679
57.36	0.0000	94.56	889.8486	159.00	784.5789
57.53	742.2491	94.65	889.9805	162.33	801.2390
57.98	728.6387	94.67	890.0112	162.66	789.0953
59.27	693.7788	94.87	890.3101	163.33	750.0566
59.32	693.8577	97.43	822.7106	165.86	776.1218
59.54	708.6370	98.43	693.4587	176.31	725.5370
60.96	710.9108	98.44	693.4723	176.60	730.3689
61.17	734.4213	99.53	814.1266	177.52	727.6577
62.93	778.0056	100.11	807.6203	181.07	0.0000
63.29	821.7957	102.03	738.1806	181.52	796.1762
63.58	822.3159	103.18	739.5346	184.41	805.6226
64.28	892.6031	103.37	739.7615	143.76	756.2153
66.73	931.0139	105.21	781.2075	193.51	712.3599
67.24	934.9474	105.31	781.3326	197.03	752.8533
125.81	959.3179	106.12	806.9830	198.01	711.2517
67.75	959.4575	106.47	800.0732	201.83	783.8127
69.67	951.4872	109.28	779.8248	203.43	738.2197
70.83	913.8170	111.00	838.6437	205.31	695.5118
72.81	1024.3608	111.76	0.0000	210.85	702.1743
72.87	1024.4872	114.06	815.7383	215.65	705.0304
74.66	969.5168	116.30	0.0000	222.11	701.1068
74.82	969.8196	116.74	768.8532	227.09	605.4356
74.97	970.1075	119.76	823.6414	227.38	611.0410
77.11	974.1484	121.12	815.5906	228.16	0.0000
78.74	977.1865	121.22	796.3872	228.18	663.2834
79.69	946.8472	121.78	762.6484	116.74	663.2834
80.12	927.5389	122.06	762.9553	235.69	619.1693
80.19	927.6611	122.92	811.2227	235.96	632.4961
80.57	916.2629	123.07	813.5475	238.63	605.3961
81.00	917.0005	265.00	829.3259	238.98	0.0000
81.07	929.1885	125.81	875.0157	240.99	606.6650
81.75	930.3634	127.23	813.4160	242.00	607.2089
83.79	954.0685	127.91	833.6857	244.70	568.0771
84.00	954.4335	129.30	856.4355	252.40	549.6027
85.43	875.8169	131.20	839.0696	252.80	560.0081
86.55	877.5747	133.02	796.9483	254.15	0.0000
86.79	877.9482	133.52	836.7766	256.23	543.0220
86.94	878.1855	136.00	834.6157	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	480.2734	355.39	0.0000	584.27	236.7104
264.80	476.0395	356.01	327.6451	595.83	248.9438
265.00	493.2743	364.49	334.1365	427.87	274.2464
268.22	477.1717	366.42	0.0000	602.52	0.0000
269.46	491.2126	372.51	370.3857	604.72	266.4800
270.03	485.4135	375.05	348.6315	607.14	277.5024
271.23	463.2582	377.52	352.2404	609.32	293.1216
273.65	532.9583	356.01	367.9706	610.33	286.4981
276.40	489.9494	388.16	359.7461	614.28	223.0166
277.37	467.0757	388.63	350.6262	618.01	236.8623
277.60	479.3001	391.69	349.2398	620.36	256.3062
278.00	517.7569	264.66	344.9828	621.93	222.2227
279.20	490.5405	401.81	330.7520	630.19	0.0000
279.54	490.6745	402.40	353.6216	631.29	194.3098
279.70	477.0638	404.85	356.2197	633.25	208.4359
280.46	469.7539	410.95	358.5713	634.78	218.8151
283.69	488.8074	413.71	328.1426	635.95	213.3345
284.31	501.2956	414.70	328.3350	636.99	218.0896
285.41	512.2296	423.72	341.4006	645.85	235.7578
285.90	0.0000	427.09	314.7949	657.76	175.5195
287.50	448.0963	427.87	306.5385	657.90	0.0000
290.67	455.9100	433.94	331.5005	661.66	215.0492
293.27	0.0000	439.40	310.6972	664.57	0.0000
351.93	462.8904	453.88	315.3762	666.33	226.4766
295.96	500.0842	463.37	297.7590	666.50	224.9213
879.38	601.3008	468.07	271.4622	667.71	0.0000
299.98	601.9387	473.00	281.0203	677.62	208.5703
300.09	493.9375	475.06	285.6425	685.70	222.5799
300.13	493.9531	476.78	265.4102	695.00	197.3172
301.36	431.0673	477.60	262.2884	696.49	234.0599
302.85	402.1621	482.18	270.5040	696.51	234.0599
256.23	399.5598	487.02	267.9458	697.00	253.2186
304.85	385.7251	492.35	0.0000	697.30	259.6221
306.78	438.8015	497.08	248.6444	697.49	259.6420
308.46	438.7992	505.52	219.0613	702.65	213.8842
311.90	443.8096	507.63	0.0000	706.68	244.6033
316.51	451.1648	511.00	246.0391	711.68	220.0994
319.41	435.4802	514.00	278.0951	720.70	202.5557
320.08	430.7953	514.00	278.0970	721.93	0.0000
321.04	460.4904	520.40	256.0369	722.78	210.7642
323.87	425.6936	520.69	0.0000	722.91	210.7748
325.23	415.0974	522.65	0.0000	723.31	207.5884
328.76	429.5401	527.90	0.0000	724.19	206.0521
333.37	387.4481	528.26	230.4580	727.33	191.4741
333.97	423.2064	529.59	239.4800	733.00	192.2177
334.37	414.0926	529.87	0.0000	735.93	170.4892
338.28	384.8089	531.02	266.2720	333.97	178.6318
338.32	384.8207	537.26	215.8996	739.50	0.0000
311.90	387.7789	546.56	0.0000	747.24	193.9181
340.48	387.7789	552.55	224.2371	748.06	188.1326
340.55	387.7968	563.25	233.4984	752.31	199.1739
344.28	363.3026	569.33	256.7718	753.82	183.6580
345.93	376.4707	946.00	254.0800	756.73	180.9260
351.06	340.9664	569.70	254.1006	756.80	180.9305
351.93	331.3586	583.19	236.5898	884.68	173.2420

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	178.2693	1274.44	125.4403	1620.50	49.4395
766.42	178.3092	1001.03	120.3115	1621.92	48.4248
766.84	178.3358	1002.74	120.0211	1678.03	0.0000
772.60	0.0000	1004.73	111.5907	1690.97	49.0960
776.52	185.5470	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	48.7384
778.90	177.4907	1028.54	0.0000	1063.66	34.5475
783.70	188.6685	1037.84	125.5693	1771.35	41.8303
785.37	164.0750	1038.76	0.0000	1791.20	0.0000
792.07	171.7422	631.29	130.1932	1808.65	50.2129
794.95	166.9648	1048.07	138.8640	1810.72	0.0000
795.86	159.8524	1049.04	142.1320	1836.06	41.8771
810.06	154.5762	1050.41	140.0356		
810.29	166.2231	1063.66	149.5797		
344.28	166.2313	1077.00	111.8013		
810.76	166.2516	1077.34	109.6402		
815.77	139.9009	1085.87	130.5820		
1048.07	158.0386	1093.63	112.3243		
832.01	172.8609	1099.45	142.0034		
834.85	173.0330	1112.07	135.1969		
835.71	174.0897	1112.84	135.2210		
836.80	0.0000	1115.54	109.7217		
846.75	0.0000	1120.29	155.6466		
846.77	162.6352	1120.55	155.6535		
856.80	141.9106	1221.41	164.8462		
860.56	145.1366	1129.67	165.2271		
871.09	147.6904	1131.51	0.0000		
873.19	149.8352	1147.95	0.0000		
875.33	0.0000	1173.23	117.8188		
879.38	153.2117	1177.95	140.2807		
880.51	153.2666	1189.05	147.3535		
883.24	156.4776	1204.77	148.8943		
884.68	159.6220	1221.41	133.5468		
889.28	139.3701	1231.02	134.1455		
894.76	168.3683	1235.36	148.8583		
898.04	163.4098	1238.28	141.6809		
900.72	138.8661	1260.41	0.0000		
903.28	169.8702	1271.87	112.4015		
911.20	134.1831	1274.44	122.0000		
912.08	134.2212	1274.54	122.0052		
923.98	0.0000	1291.59	118.6921		
926.50	121.0160	1298.22	0.0000		
929.11	152.2598	1312.11	73.1117		
937.49	150.9331	1332.49	71.2607		
944.13	159.5966	1362.66	0.0000		
946.00	153.4277	1365.19	92.5492		
949.00	142.0795	1368.63	0.0000		
667.71	0.0000	1384.29	57.0359		
962.31	131.1340	1408.01	81.6660		
964.08	137.5052	1457.56	0.0000		
966.17	137.5916	1460.82	70.6938		
911.20	137.7131	1489.16	67.6291		
968.97	137.7131	1505.03	75.8337		
983.53	123.5470	1584.12	63.0929		
984.45	0.0000	1596.21	63.5439		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:54:17.27

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656024.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM15.CNF;476
Background date  : 22-JUN-2016 09:28:24
Sample date      : 17-MAY-2016 14:45:00 Acquisition date : 24-JUN-2016 15:51:59
Sample ID        : G398656024 Sample quantity : 1.73990E+02 GRAM
Detector name     : GAM15 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:05.98 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572236 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	47.15*	27	864	1.62	94.28	90	8	6.28E-04	222.8	
2	4	63.34*	49	1045	1.43	126.63	122	14	1.14E-03	140.2	5.25E-01
3	4	66.23*	41	742	1.30	132.40	122	14	9.38E-04	123.4	
4	3	74.95	504	1000	1.24	149.83	144	14	1.17E-02	11.3	1.31E+00
5	3	77.27*	707	835	0.98	154.48	144	14	1.64E-02	9.8	
6	4	87.30	227	937	0.94	174.52	170	21	5.25E-03	21.7	3.94E+00
7	4	90.55	138	865	1.03	181.00	170	21	3.19E-03	34.5	
8	4	92.97*	181	924	1.19	185.84	170	21	4.19E-03	43.5	
9	0	129.42	76	783	0.84	258.69	256	7	1.77E-03	61.9	
10	0	139.97*	60	875	1.18	279.78	276	8	1.40E-03	100.1	
11	0	143.90*	16	870	0.99	287.62	284	8	3.72E-04	387.1	
12	0	186.17*	267	950	1.14	372.11	367	9	6.18E-03	28.2	
13	0	209.81	82	785	1.06	419.35	416	8	1.89E-03	60.4	
14	4	239.05*	2080	599	1.13	477.80	471	18	4.81E-02	3.5	1.10E+00
15	4	242.03	475	774	1.66	483.76	471	18	1.10E-02	13.0	
16	0	270.15	268	654	1.67	539.96	535	11	6.21E-03	19.4	
17	0	277.46	133	595	3.01	554.58	550	10	3.07E-03	35.5	
18	0	295.59*	501	616	1.13	590.82	585	10	1.16E-02	12.0	
19	0	300.52	81	677	0.74	600.67	596	10	1.88E-03	60.9	
20	0	329.11	139	597	1.38	657.82	652	11	3.22E-03	35.2	
21	0	338.72*	443	462	1.29	677.03	672	9	1.03E-02	12.2	
22	0	352.31*	875	511	1.25	704.21	699	11	2.02E-02	7.5	
23	0	393.06	53	224	0.95	785.67	783	6	1.23E-03	46.9	
24	0	410.11	98	329	1.16	819.75	815	9	2.28E-03	34.9	
25	0	413.58	33	408	2.08	826.68	824	11	7.57E-04	120.5	
26	0	463.50	101	354	1.25	926.47	922	10	2.35E-03	36.1	
27	0	511.59*	191	551	2.17	1022.64	1014	18	4.41E-03	41.7	
28	0	546.13	43	216	0.67	1091.69	1086	10	9.95E-04	65.9	
29	0	563.18*	20	239	0.93	1125.78	1123	9	4.67E-04	158.1	
30	0	583.95*	602	327	1.36	1167.32	1161	14	1.39E-02	8.9	
31	0	609.99*	764	314	1.43	1219.38	1214	13	1.77E-02	7.1	
32	0	652.89	20	153	1.18	1305.16	1300	8	4.63E-04	110.0	
33	0	703.43	30	171	1.21	1406.21	1403	8	6.94E-04	78.1	
34	0	728.13*	43	212	1.37	1455.61	1450	11	9.94E-04	92.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	769.72	40	129	1.40	1538.80	1535	7	9.17E-04	50.8	
36	0	795.92	65	188	1.10	1591.18	1586	11	1.51E-03	43.2	
37	0	803.82*	5	117	1.46	1606.99	1604	8	1.21E-04	457.7	
38	0	808.09	33	183	1.55	1615.53	1611	13	7.60E-04	86.6	
39	3	836.69	70	80	1.88	1672.72	1669	18	1.63E-03	24.2	1.82E+00
40	3	840.37	71	160	2.16	1680.09	1669	18	1.64E-03	39.2	
41	0	861.80	108	192	1.36	1722.94	1715	14	2.50E-03	28.9	
42	0	890.24	36	85	0.77	1779.83	1774	9	8.22E-04	49.8	
43	0	912.05*	430	188	1.43	1823.45	1815	16	9.96E-03	9.8	
44	0	935.08	45	109	2.00	1869.50	1865	10	1.05E-03	45.2	
45	0	960.37	26	64	1.86	1920.11	1916	7	5.96E-04	55.3	
46	1	965.79	81	117	1.77	1930.93	1927	18	1.88E-03	24.9	1.47E+00
47	1	969.98*	275	101	1.80	1939.32	1927	18	6.36E-03	10.7	
48	0	996.07*	190	300	16.23	1991.50	1970	40	4.41E-03	32.7	
49	0	1121.85*	143	166	1.75	2243.12	2237	16	3.32E-03	26.6	
50	0	1156.24	37	89	1.13	2311.92	2306	11	8.45E-04	53.1	
51	0	1175.09	20	102	1.28	2349.63	2347	10	4.61E-04	96.8	
52	0	1226.36	30	42	1.00	2452.21	2449	6	6.92E-04	39.2	
53	0	1239.01	70	121	2.18	2477.53	2473	12	1.63E-03	33.4	
54	0	1282.60	36	72	2.08	2564.75	2559	10	8.29E-04	48.0	
55	0	1314.96	28	56	0.61	2629.49	2624	10	6.47E-04	54.0	
56	0	1379.27	45	74	1.93	2758.17	2752	13	1.03E-03	42.7	
57	0	1388.51	15	66	3.27	2776.66	2768	11	3.36E-04	106.7	
58	0	1412.63	44	109	2.82	2824.94	2813	21	1.02E-03	61.4	
59	0	1462.09*	1173	89	1.88	2923.91	2914	20	2.72E-02	3.8	
60	0	1511.36	19	45	0.62	3022.52	3013	13	4.37E-04	77.1	
61	0	1567.61	13	31	1.27	3135.10	3130	11	2.95E-04	88.4	
62	0	1589.64	30	53	1.39	3179.19	3174	11	7.00E-04	49.8	
63	0	1594.71	41	45	2.10	3189.34	3184	14	9.53E-04	38.1	
64	0	1621.25	51	35	2.37	3242.45	3235	14	1.18E-03	28.2	
65	0	1632.74	23	48	2.17	3265.47	3259	13	5.40E-04	64.9	
66	0	1732.34	37	41	1.64	3464.83	3459	15	8.66E-04	40.8	
67	0	1766.37	197	39	2.65	3532.94	3522	23	4.56E-03	11.0	
68	0	1808.56*	14	37	4.17	3617.41	3607	21	3.32E-04	151.5	
69	0	1843.51	17	17	3.32	3687.37	3681	12	3.95E-04	60.4	
70	0	1848.58	37	15	2.46	3697.54	3693	10	8.54E-04	25.6	
71	0	1874.75	26	14	2.65	3749.92	3744	11	6.11E-04	33.4	
72	0	1910.76	37	66	10.00	3822.03	3806	29	8.62E-04	64.5	
73	0	1992.72	10	15	1.36	3986.13	3979	10	2.41E-04	76.0	
74	0	2006.75	35	40	7.06	4014.22	3993	25	8.02E-04	50.8	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656024.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 14:45:00 Acquisition date : 24-JUN-2016 15:51:59
Sample ID        : G398656024 Sample quantity  : 173.99 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA15 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:05.98 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error  : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AL-26	1129.67	2.50	1.275E+00	----- Line	Not Found	-----	Absent
	1808.65	99.76*	8.621E-01	5.683E-03	5.683E-03	303.03	OK
K-40	1460.82	10.66*	1.008E+00	3.843E+00	3.843E+00	7.64	OK
SC-46	889.28	99.98*	1.587E+00	8.465E-03	1.162E-02	99.57	OK
	1120.55	99.99	1.283E+00	4.093E-02	5.618E-02	53.13	OK
CD-109	88.03	3.70*	4.345E+00	4.064E-01	4.304E-01	77.53	OK
SN-113	391.69	64.94*	2.975E+00	1.161E-02	1.463E-02	93.89	OK
SN-126	64.28	9.60	1.749E+00	1.525E-01	1.525E-01	280.41	OK
	86.94	8.90	4.345E+00	1.689E-01	1.689E-01	77.53	OK
	87.57	37.00*	4.345E+00	4.064E-02	4.064E-02	77.53	OK
TL-208	277.37	6.60	3.800E+00	2.327E-01	2.327E-01	70.93	OK
	583.19	85.00*	2.242E+00	1.265E-01	1.265E-01	17.74	OK
	860.56	12.50	1.633E+00	2.008E-01	2.008E-01	57.87	OK
PB-210	46.54	4.25*	2.855E-01	1.194E+00	1.198E+00	445.66	OK
BI-212	727.33	6.67*	1.886E+00	1.328E-01	1.328E-01	185.55	OK
	785.37	1.10	1.770E+00	----- Line	Not Found	-----	Absent
	1620.50	1.47	9.276E-01	1.300E+00	1.300E+00	56.47	OK
PB-212	74.82	10.28	3.134E+00	6.139E-01	6.139E-01	30.27	OK
	77.11	17.10	3.392E+00	6.198E-01	6.198E-01	19.60	OK
	238.63	43.60*	4.221E+00	5.066E-01	5.066E-01	6.92	OK
	300.09	3.30	3.592E+00	2.990E-01	2.990E-01	121.72	OK
PB-214	74.82	5.80	3.119E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.392E+00	1.093E+00	1.093E+00	19.60	OK
	87.09	3.41	4.327E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.185E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.634E+00	3.273E-01	3.273E-01	23.98	OK
	351.93	35.60*	3.212E+00	3.272E-01	3.272E-01	14.92	OK
RA-224	240.99	4.10*	4.184E+00	6.600E-01	6.600E-01	53.27	OK
AC-228	105.21	1.10	5.346E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.301E+00	5.122E-01	5.122E-01	24.33	OK
	794.95	4.25	1.750E+00	3.375E-01	3.375E-01	86.46	OK
	835.71	1.61	1.676E+00	9.939E-01	9.939E-01	48.38	OK
	911.20	25.80*	1.553E+00	4.048E-01	4.048E-01	19.69	OK
	968.97	15.80	1.469E+00	4.428E-01	4.428E-01	21.47	OK
RA-228	105.21	1.10	5.346E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.301E+00	5.122E-01	5.122E-01	24.33	OK
	794.95	4.25	1.750E+00	3.375E-01	3.375E-01	86.46	OK
	835.71	1.61	1.676E+00	9.939E-01	9.939E-01	48.38	OK
	911.20	25.80*	1.553E+00	4.048E-01	4.048E-01	19.69	OK
	968.97	15.80	1.469E+00	4.428E-01	4.428E-01	21.47	OK
TH-228	74.82	10.28	3.134E+00	6.139E-01	6.139E-01	30.27	OK
	77.11	17.10	3.392E+00	6.198E-01	6.198E-01	19.60	OK
	238.63	43.60*	4.221E+00	5.066E-01	5.066E-01	6.92	OK
	300.09	3.30	3.592E+00	2.990E-01	2.990E-01	121.72	OK
PA-231	283.69	1.70	3.741E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.592E+00	1.844E-01	1.844E-01	121.72	OK
TH-232	105.21	1.10	5.346E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.301E+00	5.122E-01	5.122E-01	24.33	OK
	835.71	1.61	1.676E+00	9.939E-01	9.939E-01	48.38	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	911.20	25.80*	1.553E+00	4.048E-01	4.048E-01	19.69	OK
	968.97	15.80	1.469E+00	4.428E-01	4.428E-01	21.47	OK
TH-234	63.29	3.70*	1.749E+00	3.956E-01	3.956E-01	280.41	OK
	92.59	4.23	4.755E+00	4.488E-01	4.488E-01	86.93	OK
U-235	89.96	3.47	4.591E+00	4.327E-01	4.327E-01	68.95	OK
	93.35	5.60	4.755E+00	3.390E-01	3.390E-01	86.93	OK
	143.76	10.96*	5.585E+00	1.247E-02	1.247E-02	774.24	OK
	163.33	5.08	5.331E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	4.973E+00	4.330E-02	4.330E-02	56.48	OK
	205.31	5.01	4.679E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	1.749E+00	3.956E-01	3.956E-01	280.41	OK
	92.59	4.23	4.755E+00	4.488E-01	4.488E-01	86.93	OK
PU-239	129.30	0.01*	5.676E+00	1.025E+02	1.025E+02	123.89	OK
	375.05	0.00	3.074E+00	----- Line	Not Found	-----	Absent
	413.71	0.00	2.871E+00	3.257E+02	3.257E+02	240.92	OK
AM-243	43.53	5.90	1.396E-01	----- Line	Not Found	-----	Absent
	74.66	67.20*	3.134E+00	9.391E-02	9.391E-02	30.27	OK
ANH-511	511.00	100.00*	2.471E+00	3.148E-02	3.148E-02	83.33	OK

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656024.CNF;1
* Acquisition date   : 24-JUN-2016 15:51:59 Sensitivity      : 3.000
* Detector ID        : GAM15 Energy tolerance: 1.500
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 12:00:05.98 Half life ratio : *****
* Sample date        : 17-MAY-2016 14:45:00 Analyst initials: MXR1
* Sample ID          : G398656024 Sample Quantity : 1.7399E+02 GRAM
* Batch Number       : 1572236 Wet Weight : 0.00000
* Wet wt corr        : 1.00000 Dry Weight : 0.00000
* Nuclide Library    : SOLID.NLB;6
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 18-JUN-2015 05:21:57 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM15_CAN.CNF;10
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
AL-26	5.683E-03	1.688E-02	1.384E-02
K-40	3.843E+00	2.877E-01	1.446E-01
SC-46	1.162E-02	1.134E-02	1.878E-02
CD-109	4.304E-01	3.271E-01	3.621E-01
SN-113	1.463E-02	1.346E-02	2.191E-02
SN-126	4.064E-02	3.088E-02	3.446E-02
TL-208	1.265E-01	2.200E-02	1.431E-02
PB-210	1.198E+00	5.234E+00	4.569E+00
BI-212	1.328E-01	2.415E-01	2.101E-01
PB-212	5.066E-01	3.434E-02	2.462E-02
PB-214	3.272E-01	4.785E-02	3.200E-02
RA-224	6.600E-01	3.446E-01	2.638E-01
AC-228	4.048E-01	7.812E-02	5.284E-02
RA-228	4.048E-01	7.812E-02	5.284E-02
TH-228	5.066E-01	3.434E-02	2.462E-02
PA-231	1.844E-01	2.200E-01	2.055E-01
TH-232	4.048E-01	7.812E-02	5.284E-02
TH-234	3.956E-01	1.087E+00	8.030E-01
U-235	1.247E-02	9.458E-02	8.214E-02
U-238	3.956E-01	1.087E+00	8.030E-01
PU-239	1.025E+02	1.244E+02	1.380E+02
AM-243	9.391E-02	2.785E-02	2.715E-02
ANH-511	3.148E-02	2.571E-02	1.222E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.601E-02	1.044E-01	1.890E-01	NOT IDENT.
NA-22	-5.620E-03	9.152E-03	1.533E-02	NOT IDENT.
NA-24	0.000E+00	2.139E+16	0.000E+00	SHORT HLIF
V-48	-1.738E-02	4.452E-02	6.670E-02	NOT IDENT.
CR-51	-6.082E-02	1.583E-01	2.900E-01	NOT IDENT.
MN-54	3.527E-03	9.674E-03	1.562E-02	NOT IDENT.
CO-56	1.086E-02	1.206E-02	2.025E-02	FAIL ABUN

MN-56	0.000E+00	1.106E+41	0.000E+00	SHORT HLIF
CO-57	3.135E-03	6.290E-03	1.181E-02	NOT IDENT.
CO-58	7.997E-03	1.124E-02	1.885E-02	NOT IDENT.
FE-59	-9.408E-03	2.614E-02	4.538E-02	NOT IDENT.
CO-60	-3.784E-03	7.781E-03	1.383E-02	NOT IDENT.
ZN-65	8.262E-03	2.265E-02	3.565E-02	NOT IDENT.
GE-68	6.142E-02	2.703E-01	4.896E-01	NOT IDENT.
AS-73	-1.413E-01	4.637E-01	9.031E-01	NOT IDENT.
AS-74	-3.673E-02	5.325E-02	9.653E-02	NOT IDENT.
SE-75	-3.758E-03	1.342E-02	2.199E-02	NOT IDENT.
BR-77	0.000E+00	4.592E+03	0.000E+00	SHORT HLIF
SR-82	-1.560E-01	1.380E-01	2.377E-01	NOT IDENT.
RB-83	-6.291E-03	1.963E-02	3.457E-02	NOT IDENT.
KR-85	0.000E+00	2.283E+00	4.518E+00	NOT IDENT.
SR-85	0.000E+00	1.543E-02	3.052E-02	NOT IDENT.
RB-86	2.584E-02	3.829E-01	6.860E-01	NOT IDENT.
Y-88	7.488E-04	9.106E-03	1.465E-02	NOT IDENT.
Y-91	2.024E+00	5.702E+00	1.066E+01	NOT IDENT.
NB-94	6.058E-03	9.274E-03	1.458E-02	FAIL ABUN
NB-95	-6.126E-04	1.298E-02	2.052E-02	NOT IDENT.
NB-95M	-5.978E-03	4.057E-02	6.741E-02	NOT IDENT.
ZR-95	7.372E-03	2.002E-02	3.734E-02	NOT IDENT.
NB-97	0.000E+00	1.592E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	3.443E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	8.743E+02	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-4.136E-03	8.251E-03	1.334E-02	NOT IDENT.
RH-102	-8.385E-03	1.199E-02	2.161E-02	NOT IDENT.
RU-103	-3.600E-03	1.354E-02	2.403E-02	FAIL ABUN
RH-106	-6.382E-02	7.353E-02	1.317E-01	NOT IDENT.
RU-106	-6.382E-02	7.353E-02	1.317E-01	NOT IDENT.
AG-108M	-3.357E-03	6.900E-03	1.227E-02	NOT IDENT.
AG-110M	-8.305E-03	1.285E-02	1.905E-02	NOT IDENT.
CD-115	0.000E+00	3.558E+03	0.000E+00	SHORT HLIF
SN-117M	1.891E-02	4.298E-02	7.897E-02	NOT IDENT.
TE-123M	5.378E-03	7.851E-03	1.451E-02	NOT IDENT.
SB-124	-2.122E-02	2.544E-02	4.251E-02	NOT IDENT.
SB-125	1.664E-02	2.138E-02	4.002E-02	FAIL ABUN
TE-125M	7.190E-01	2.944E+00	5.537E+00	NOT IDENT.
I-126	-5.810E-02	1.639E-01	2.985E-01	NOT IDENT.
SB-126	9.316E-02	1.233E-01	2.223E-01	FAIL ABUN
SB-127	-5.589E+00	1.876E+01	3.417E+01	NOT IDENT.
I-131	6.116E-02	2.102E-01	3.897E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	2.528E+01	0.000E+00	SHORT HLIF
BA-133	-2.476E-03	1.183E-02	1.889E-02	FAIL ABUN
I-133	0.000E+00	1.495E+11	0.000E+00	SHORT HLIF
CS-134	1.739E-02	1.473E-02	1.908E-02	FAIL ABUN
CS-135	4.045E-02	4.047E-02	6.958E-02	NOT IDENT.
I-135	0.000E+00	3.230E+40	0.000E+00	SHORT HLIF
CS-136	5.504E-02	7.938E-02	1.472E-01	NOT IDENT.
BA-137M	2.216E-03	7.609E-03	1.428E-02	NOT IDENT.
CS-137	2.341E-03	8.038E-03	1.508E-02	NOT IDENT.
CE-139	-1.262E-03	8.055E-03	1.452E-02	NOT IDENT.
BA-140	-3.321E-02	2.169E-01	3.840E-01	NOT IDENT.
LA-140	1.280E-01	9.544E-02	1.422E-01	FAIL ABUN
CE-141	-2.110E-02	3.384E-02	4.507E-02	NOT IDENT.
CE-143	0.000E+00	3.942E+06	0.000E+00	SHORT HLIF
CE-144	-5.226E-02	5.481E-02	8.677E-02	NOT IDENT.
PM-144	6.876E-03	8.500E-03	1.612E-02	NOT IDENT.
PR-144	5.154E-01	6.436E-01	1.220E+00	NOT IDENT.
PM-146	-9.185E-04	1.016E-02	1.828E-02	NOT IDENT.
ND-147	3.681E-01	5.670E-01	1.042E+00	FAIL ABUN
PM-147	1.529E+02	1.730E+02	3.286E+02	NOT IDENT.
PM-149	0.000E+00	3.024E+04	0.000E+00	SHORT HLIF
EU-150	4.113E-03	9.965E-03	1.207E-02	FAIL ABUN
EU-152	-3.222E-03	2.967E-02	4.423E-02	NOT IDENT.
GD-153	-3.433E-02	2.858E-02	4.017E-02	NOT IDENT.
EU-154	-1.574E-02	2.563E-02	4.291E-02	FAIL ABUN
EU-155	1.232E-02	2.418E-02	4.595E-02	FAIL ABUN
TB-160	7.253E-03	3.456E-02	6.348E-02	FAIL ABUN
HO-166M	-6.474E-03	1.324E-02	2.381E-02	FAIL ABUN
TM-171	-3.577E+00	8.507E+00	1.654E+01	FAIL ABUN
HF-172	-1.472E-02	5.006E-02	8.164E-02	FAIL ABUN
LU-172	2.953E-03	1.364E-02	2.460E-02	FAIL ABUN
LU-176	-1.218E-03	6.622E-03	1.183E-02	FAIL ABUN
HF-181	4.814E-03	1.556E-02	2.830E-02	NOT IDENT.
TA-182	-2.163E-02	5.248E-02	8.010E-02	FAIL ABUN

RE-183	-3.192E-02	9.808E-02	1.810E-01	FAIL ABUN
RE-184	-1.612E-02	4.731E-02	7.862E-02	NOT IDENT.
W-188	2.495E+00	2.394E+00	4.104E+00	FAIL ABUN
IR-192	4.453E-03	1.047E-02	1.970E-02	FAIL ABUN
HG-203	1.630E-02	1.439E-02	2.479E-02	NOT IDENT.
BI-207	1.089E-02	1.084E-02	2.055E-02	FAIL ABUN
BI-211	0.000E+00	1.318E-01	1.558E-01	FAIL ABUN
PB-211	-5.061E-02	1.971E-01	3.100E-01	NOT IDENT.
BI-214	0.000E+00	4.313E-02	5.961E-02	FAIL ABUN
RN-219	8.135E-03	9.678E-02	1.769E-01	FAIL ABUN
RN-222	0.000E+00	4.313E-02	5.961E-02	FAIL ABUN
RA-223	7.671E-03	1.724E-01	2.812E-01	FAIL ABUN
RA-226	0.000E+00	4.313E-02	5.961E-02	FAIL ABUN
AC-227	2.738E-02	5.883E-02	1.124E-01	FAIL ABUN
TH-227	2.738E-02	5.883E-02	1.124E-01	FAIL ABUN
TH-229	-6.174E-02	1.220E-01	2.317E-01	FAIL ABUN
TH-230	0.000E+00	4.313E-02	5.961E-02	FAIL ABUN
TH-231	7.671E-03	1.724E-01	2.812E-01	FAIL ABUN
PA-233	-4.048E-04	1.543E-02	2.865E-02	FAIL ABUN
PA-234	2.824E-02	6.225E-02	1.153E-01	NOT IDENT.
PA-234M	-6.248E-02	1.494E+00	1.988E+00	NOT IDENT.
U-234	0.000E+00	4.313E-02	5.961E-02	FAIL ABUN
NP-237	-4.048E-04	1.543E-02	2.865E-02	FAIL ABUN
NP-238	0.000E+00	9.561E+03	0.000E+00	SHORT HLIF
NP-239	3.176E-02	6.289E-02	1.185E-01	FAIL ABUN
AM-241	3.088E-02	5.923E-02	1.053E-01	NOT IDENT.
CM-243	-4.097E-02	2.454E-02	4.400E-02	FAIL ABUN
BK-247	-1.234E-02	2.143E-02	3.468E-02	NOT IDENT.
CM-247	-7.439E-04	8.972E-03	1.630E-02	FAIL ABUN
CF-249	-1.424E-03	1.085E-02	1.821E-02	NOT IDENT.
CF-251	6.881E-03	3.165E-02	5.733E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AL-26	1129.67	-----	2.50	1.275E+00	-----	Line Not Found	-----
	1808.65	14	99.76*	8.621E-01	5.683E-03	5.683E-03	303.03
K-40	1460.82	1148	10.66*	1.008E+00	3.843E+00	3.843E+00	7.64
SC-46	889.28	37	99.98*	1.587E+00	8.465E-03	1.162E-02	99.57
	1120.55	146	99.99	1.283E+00	4.093E-02	5.618E-02	53.13
CD-109	88.03	317	3.70*	4.345E+00	7.080E-01	7.500E-01	43.31
SN-113	391.69	62	64.94*	2.975E+00	1.161E-02	1.463E-02	93.89
SN-126	64.28	71	9.60	1.749E+00	1.525E-01	1.525E-01	280.41
	86.94	317	8.90	4.345E+00	2.944E-01	2.944E-01	43.31
	87.57	317	37.00*	4.345E+00	7.080E-02	7.080E-02	43.31
TL-208	277.37	162	6.60	3.800E+00	2.327E-01	2.327E-01	70.93
	583.19	671	85.00*	2.242E+00	1.265E-01	1.265E-01	17.74
	860.56	114	12.50	1.633E+00	2.008E-01	2.008E-01	57.87
PB-210	46.54	40	4.25*	2.855E-01	1.194E+00	1.198E+00	445.66
BI-211	72.87	-----	1.23	2.894E+00	-----	Line Not Found	-----
	351.06	1040	12.92*	3.212E+00	9.014E-01	9.014E-01	14.92
BI-212	727.33	46	6.67*	1.886E+00	1.328E-01	1.328E-01	185.55
	785.37	-----	1.10	1.770E+00	-----	Line Not Found	-----
	1620.50	49	1.47	9.276E-01	1.300E+00	1.300E+00	56.47
PB-212	74.82	715	10.28	3.134E+00	7.986E-01	7.986E-01	22.60
	77.11	1000	17.10	3.392E+00	6.198E-01	6.198E-01	19.60
	238.63	2593	43.60*	4.221E+00	5.066E-01	5.066E-01	6.92
	300.09	99	3.30	3.592E+00	2.990E-01	2.990E-01	121.72
PB-214	74.82	715	5.80	3.134E+00	1.415E+00	1.415E+00	22.60
	77.11	1000	9.70	3.392E+00	1.093E+00	1.093E+00	19.60
	87.09	317	3.41	4.345E+00	7.683E-01	7.683E-01	43.31
	242.00	591	7.25	4.184E+00	7.006E-01	7.006E-01	26.08
	295.22	609	18.42	3.634E+00	3.273E-01	3.273E-01	23.98
	351.93	1040	35.60*	3.212E+00	3.272E-01	3.272E-01	14.92
RA-224	240.99	591	4.10*	4.184E+00	1.239E+00	1.239E+00	26.08
AC-228	105.21	-----	1.10	5.346E+00	-----	Line Not Found	-----
	338.32	530	11.27	3.301E+00	5.122E-01	5.122E-01	24.33
	794.95	70	4.25	1.750E+00	3.375E-01	3.375E-01	86.46
	835.71	75	1.61	1.676E+00	9.939E-01	9.939E-01	48.38
	911.20	451	25.80*	1.553E+00	4.048E-01	4.048E-01	19.69
	968.97	286	15.80	1.469E+00	4.428E-01	4.428E-01	21.47
RA-228	105.21	-----	1.10	5.346E+00	-----	Line Not Found	-----
	338.32	530	11.27	3.301E+00	5.122E-01	5.122E-01	24.33
	794.95	70	4.25	1.750E+00	3.375E-01	3.375E-01	86.46
	835.71	75	1.61	1.676E+00	9.939E-01	9.939E-01	48.38
	911.20	451	25.80*	1.553E+00	4.048E-01	4.048E-01	19.69
	968.97	286	15.80	1.469E+00	4.428E-01	4.428E-01	21.47
TH-228	74.82	715	10.28	3.134E+00	7.986E-01	7.986E-01	22.60
	77.11	1000	17.10	3.392E+00	6.198E-01	6.198E-01	19.60
	238.63	2593	43.60*	4.221E+00	5.066E-01	5.066E-01	6.92
	300.09	99	3.30	3.592E+00	2.990E-01	2.990E-01	121.72
PA-231	283.69	-----	1.70	3.741E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
TH-232	301.36	99	5.35*	3.592E+00	1.844E-01	1.844E-01	121.72
	105.21	-----	1.10	5.346E+00	-----	Line Not Found	-----
	338.32	530	11.27	3.301E+00	5.122E-01	5.122E-01	24.33
	835.71	75	1.61	1.676E+00	9.939E-01	9.939E-01	48.38
	911.20	451	25.80*	1.553E+00	4.048E-01	4.048E-01	19.69
TH-234	968.97	286	15.80	1.469E+00	4.428E-01	4.428E-01	21.47
	63.29	71	3.70*	1.749E+00	3.956E-01	3.956E-01	280.41
	92.59	251	4.23	4.755E+00	4.488E-01	4.488E-01	86.93
U-235	89.96	192	3.47	4.591E+00	4.327E-01	4.327E-01	68.95
	93.35	251	5.60	4.755E+00	3.390E-01	3.390E-01	86.93
	143.76	21	10.96*	5.585E+00	1.247E-02	1.247E-02	774.24
	163.33	-----	5.08	5.331E+00	-----	Line Not Found	-----
	185.72	343	57.20	4.973E+00	4.330E-02	4.330E-02	56.48
U-238	205.31	-----	5.01	4.679E+00	-----	Line Not Found	-----
	63.29	71	3.70*	1.749E+00	3.956E-01	3.956E-01	280.41
	92.59	251	4.23	4.755E+00	4.488E-01	4.488E-01	86.93
PU-239	129.30	102	0.01*	5.676E+00	1.025E+02	1.025E+02	123.89
	375.05	-----	0.00	3.074E+00	-----	Line Not Found	-----
	413.71	38	0.00	2.871E+00	3.257E+02	3.257E+02	240.92
AM-243	43.53	-----	5.90	1.396E-01	-----	Line Not Found	-----
	74.66	715	67.20*	3.134E+00	1.222E-01	1.222E-01	22.60
ANH-511	511.00	216	100.00*	2.471E+00	3.148E-02	3.148E-02	83.33

Flag: "*" = Keyline

Total number of lines in spectrum 74
Number of unidentified lines 27
Number of lines tentatively identified by NID 47 63.51%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AL-26	7.17E+05Y	1.00	5.683E-03	5.683E-03	17.22E-03	303.03	
K-40	1.25E+09Y	1.00	3.843E+00	3.843E+00	0.294E+00	7.64	
SC-46	83.79D	1.37	8.465E-03	1.162E-02	1.157E-02	99.57	
CD-109	461.40D	1.06	7.080E-01	7.500E-01	3.248E-01	43.31	
SN-113	115.09D	1.26	1.161E-02	1.463E-02	1.373E-02	93.89	
SN-126	2.30E+05Y	1.00	7.080E-02	7.080E-02	3.067E-02	43.31	
TL-208	1.41E+10Y	1.00	1.265E-01	1.265E-01	0.224E-01	17.74	
PB-210	22.20Y	1.00	1.194E+00	1.198E+00	5.341E+00	445.66	
BI-211	7.04E+08Y	1.00	9.014E-01	9.014E-01	1.345E-01	14.92	
BI-212	1.41E+10Y	1.00	1.328E-01	1.328E-01	2.464E-01	185.55	
PB-212	1.41E+10Y	1.00	5.066E-01	5.066E-01	0.350E-01	6.92	
PB-214	1600.00Y	1.00	3.272E-01	3.272E-01	0.488E-01	14.92	
RA-224	1.41E+10Y	1.00	1.239E+00	1.239E+00	0.323E+00	26.08	
AC-228	1.41E+10Y	1.00	4.048E-01	4.048E-01	0.797E-01	19.69	
RA-228	1.41E+10Y	1.00	4.048E-01	4.048E-01	0.797E-01	19.69	
TH-228	1.41E+10Y	1.00	5.066E-01	5.066E-01	0.350E-01	6.92	
PA-231	7.04E+08Y	1.00	1.844E-01	1.844E-01	2.245E-01	121.72	
TH-232	1.41E+10Y	1.00	4.048E-01	4.048E-01	0.797E-01	19.69	
TH-234	4.47E+09Y	1.00	3.956E-01	3.956E-01	11.09E-01	280.41	
U-235	7.04E+08Y	1.00	1.247E-02	1.247E-02	9.651E-02	774.24	
U-238	4.47E+09Y	1.00	3.956E-01	3.956E-01	11.09E-01	280.41	
PU-239	24110.00Y	1.00	1.025E+02	1.025E+02	1.270E+02	123.89	
AM-243	7370.00Y	1.00	1.222E-01	1.222E-01	0.276E-01	22.60	
ANH-511	1.00E+09Y	1.00	3.148E-02	3.148E-02	2.623E-02	83.33	
Total Activity :			1.144E+02	1.145E+02			

Grand Total Activity : 1.144E+02 1.145E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	66.23	58	1067	1.30	132.40	122	14	9.38E-04	****	2.10E+00	T
0	139.97	80	1160	1.18	279.78	276	8	1.40E-03	****	5.62E+00	T
0	209.81	104	994	1.06	419.35	416	8	1.89E-03	****	4.61E+00	T
0	270.15	330	803	1.67	539.96	535	11	6.21E-03	38.8	3.87E+00	T
0	329.11	167	716	1.38	657.82	652	11	3.22E-03	70.4	3.37E+00	T
0	410.11	115	384	1.16	819.75	815	9	2.28E-03	69.8	2.89E+00	T
0	463.50	116	406	1.25	926.47	922	10	2.35E-03	72.1	2.65E+00	T
0	546.13	48	243	0.67	1091.69	1086	10	9.95E-04	****	2.36E+00	T
0	563.18	23	268	0.93	1125.78	1123	9	4.67E-04	****	2.30E+00	T
0	609.99	847	348	1.43	1219.38	1214	13	1.77E-02	14.3	2.17E+00	T
0	652.89	22	168	1.18	1305.16	1300	8	4.63E-04	****	2.06E+00	
0	703.43	33	186	1.21	1406.21	1403	8	6.94E-04	****	1.94E+00	T
0	769.72	43	139	1.40	1538.80	1535	7	9.17E-04	****	1.80E+00	
0	803.82	6	125	1.46	1606.99	1604	8	1.21E-04	****	1.74E+00	
0	808.09	35	195	1.55	1615.53	1611	13	7.60E-04	****	1.73E+00	
3	840.37	75	170	2.16	1680.09	1669	18	1.64E-03	78.4	1.67E+00	
0	935.08	48	113	2.00	1869.50	1865	10	1.05E-03	90.4	1.52E+00	
0	960.37	27	67	1.86	1920.11	1916	7	5.96E-04	****	1.48E+00	
1	965.79	85	122	1.77	1930.93	1927	18	1.88E-03	49.7	1.47E+00	T
0	996.07	197	310	16.23	1991.50	1970	40	4.41E-03	65.4	1.43E+00	T
0	1156.24	37	91	1.13	2311.92	2306	11	8.45E-04	****	1.25E+00	
0	1175.09	20	103	1.28	2349.63	2347	10	4.61E-04	****	1.23E+00	
0	1226.36	30	42	1.00	2452.21	2449	6	6.92E-04	78.3	1.18E+00	
0	1239.01	70	121	2.18	2477.53	2473	12	1.63E-03	66.9	1.17E+00	T
0	1282.60	36	72	2.08	2564.75	2559	10	8.29E-04	96.0	1.13E+00	
0	1314.96	28	56	0.61	2629.49	2624	10	6.47E-04	****	1.11E+00	
0	1379.27	44	74	1.93	2758.17	2752	13	1.03E-03	85.5	1.06E+00	
0	1388.51	14	66	3.27	2776.66	2768	11	3.36E-04	****	1.05E+00	
0	1412.63	43	107	2.82	2824.94	2813	21	1.02E-03	****	1.04E+00	
0	1511.36	18	44	0.62	3022.52	3013	13	4.37E-04	****	9.80E-01	
0	1567.61	12	30	1.27	3135.10	3130	11	2.95E-04	****	9.52E-01	
0	1589.64	29	51	1.39	3179.19	3174	11	7.00E-04	99.5	9.42E-01	
0	1594.71	40	43	2.10	3189.34	3184	14	9.53E-04	76.1	9.39E-01	T
0	1632.74	22	46	2.17	3265.47	3259	13	5.40E-04	****	9.23E-01	
0	1732.34	36	39	1.64	3464.83	3459	15	8.66E-04	81.5	8.85E-01	
0	1766.37	187	37	2.65	3532.94	3522	23	4.56E-03	21.9	8.74E-01	
0	1843.51	16	16	3.32	3687.37	3681	12	3.95E-04	****	8.53E-01	
0	1848.58	35	14	2.46	3697.54	3693	10	8.54E-04	51.3	8.52E-01	
0	1874.75	25	13	2.65	3749.92	3744	11	6.11E-04	66.8	8.45E-01	
0	1910.76	35	62	10.00	3822.03	3806	29	8.62E-04	****	8.37E-01	
0	1992.72	10	14	1.36	3986.13	3979	10	2.41E-04	****	8.23E-01	
0	2006.75	32	38	7.06	4014.22	3993	25	8.02E-04	****	8.21E-01	

Flags: "T" = Tentatively associated


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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656024.CNF;1  *
* Acquisition date   : 24-JUN-2016 15:51:59 Sensitivity      : 3.000          *
* Detector ID        : GAM15 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:05.98 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 14:45:00 Nuclide Library : SOLID          *
* Sample ID          : G398656024 Analyst initials: MXR1          *
* Batch Number       : 1572236 Sample Quantity : 1.7399E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 18-JUN-2015 05:21:57 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM15_CAN.CNF;10          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
AL-26	6.355E-03
K-40	6.776E-02
SC-46	8.960E-03
CD-109	1.776E-01
SN-113	1.063E-02
SN-126	1.690E-02
TL-208	6.890E-03
PB-210	2.235E+00
BI-212	1.011E-01
PB-212	1.203E-02
PB-214	1.556E-02
RA-224	1.289E-01
AC-228	2.518E-02
RA-228	2.518E-02
TH-228	1.203E-02
PA-231	1.001E-01
TH-232	2.518E-02
TH-234	3.933E-01
U-235	4.022E-02
U-238	3.933E-01
PU-239	6.757E+01
AM-243	1.332E-02
ANH-511	5.904E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	9.141E-02	NOT IDENT.
NA-22	7.218E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
V-48	3.155E-02	NOT IDENT.
CR-51	1.411E-01	NOT IDENT.
MN-54	7.485E-03	NOT IDENT.
CO-56	9.705E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF

CO-57	5.788E-03	NOT IDENT.
CO-58	9.000E-03	NOT IDENT.
FE-59	2.148E-02	NOT IDENT.
CO-60	6.459E-03	NOT IDENT.
ZN-65	1.698E-02	NOT IDENT.
GE-68	2.321E-01	NOT IDENT.
AS-73	4.414E-01	NOT IDENT.
AS-74	4.655E-02	NOT IDENT.
SE-75	1.072E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.136E-01	NOT IDENT.
RB-83	1.666E-02	NOT IDENT.
KR-85	2.212E+00	NOT IDENT.
SR-85	1.494E-02	NOT IDENT.
RB-86	3.252E-01	NOT IDENT.
Y-88	6.588E-03	NOT IDENT.
Y-91	5.080E+00	NOT IDENT.
NB-94	7.035E-03	FAIL ABUN
NB-95	9.843E-03	NOT IDENT.
NB-95M	3.297E-02	NOT IDENT.
ZR-95	1.791E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.533E-03	NOT IDENT.
RH-102	1.037E-02	NOT IDENT.
RU-103	1.158E-02	FAIL ABUN
RH-106	6.332E-02	NOT IDENT.
RU-106	6.332E-02	NOT IDENT.
AG-108M	5.932E-03	NOT IDENT.
AG-110M	9.049E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	3.870E-02	NOT IDENT.
TE-123M	7.115E-03	NOT IDENT.
SB-124	1.948E-02	NOT IDENT.
SB-125	1.939E-02	FAIL ABUN
TE-125M	2.712E+00	NOT IDENT.
I-126	1.434E-01	NOT IDENT.
SB-126	1.070E-01	FAIL ABUN
SB-127	1.641E+01	NOT IDENT.
I-131	1.894E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	9.186E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.194E-03	FAIL ABUN
CS-135	3.397E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.021E-02	NOT IDENT.
BA-137M	6.865E-03	NOT IDENT.
CS-137	7.252E-03	NOT IDENT.
CE-139	7.110E-03	NOT IDENT.
BA-140	1.851E-01	NOT IDENT.
LA-140	6.673E-02	FAIL ABUN
CE-141	2.210E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.248E-02	NOT IDENT.
PM-144	7.783E-03	NOT IDENT.
PR-144	5.892E-01	NOT IDENT.
PM-146	8.849E-03	NOT IDENT.
ND-147	5.028E-01	FAIL ABUN
PM-147	1.610E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.878E-03	FAIL ABUN
EU-152	2.153E-02	NOT IDENT.
GD-153	1.968E-02	NOT IDENT.
EU-154	2.021E-02	FAIL ABUN
EU-155	2.250E-02	FAIL ABUN
TB-160	3.025E-02	FAIL ABUN
HO-166M	1.143E-02	FAIL ABUN
TM-171	8.079E+00	FAIL ABUN
HF-172	3.998E-02	FAIL ABUN
LU-172	1.168E-02	FAIL ABUN
LU-176	5.763E-03	FAIL ABUN
HF-181	1.369E-02	NOT IDENT.
TA-182	3.811E-02	FAIL ABUN
RE-183	8.849E-02	FAIL ABUN

RE-184	3.755E-02	NOT IDENT.
W-188	2.002E+00	FAIL ABUN
IR-192	9.593E-03	FAIL ABUN
HG-203	1.210E-02	NOT IDENT.
BI-207	9.784E-03	FAIL ABUN
BI-211	7.668E-02	FAIL ABUN
PB-211	1.504E-01	NOT IDENT.
BI-214	2.931E-02	FAIL ABUN
RN-219	8.585E-02	FAIL ABUN
RN-222	2.931E-02	FAIL ABUN
RA-223	1.368E-01	FAIL ABUN
RA-226	2.931E-02	FAIL ABUN
AC-227	5.485E-02	FAIL ABUN
TH-227	5.485E-02	FAIL ABUN
TH-229	1.135E-01	FAIL ABUN
TH-230	2.931E-02	FAIL ABUN
TH-231	1.368E-01	FAIL ABUN
PA-233	1.395E-02	FAIL ABUN
PA-234	5.490E-02	NOT IDENT.
PA-234M	9.527E-01	NOT IDENT.
U-234	2.931E-02	FAIL ABUN
NP-237	1.395E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.805E-02	FAIL ABUN
AM-241	5.153E-02	NOT IDENT.
CM-243	2.152E-02	FAIL ABUN
BK-247	1.690E-02	NOT IDENT.
CM-247	7.907E-03	FAIL ABUN
CF-249	8.851E-03	NOT IDENT.
CF-251	2.808E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656024.CNF;1
Acquisition date : 24-JUN-2016 15:51:59 Sensitivity : 3.000
Detector ID : GAM15 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:05.98 Half life ratio : *****
Sample date : 17-MAY-2016 14:45:00 Nuclide Library : SOLID
Sample ID : G398656024 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.7399E+02 GRAM
Quantity Err(%) : 1.1495E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 18-JUN-2015 05:21:57 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM15_CAN.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
AL-26	5.683E-03	1.688E-02	1.688E-02
K-40	3.843E+00	4.347E-01	4.347E-01
SC-46	1.162E-02	1.145E-02	1.145E-02
CD-109	4.304E-01	3.336E-01	3.336E-01
SN-113	1.463E-02	1.351E-02	1.351E-02
SN-126	4.064E-02	3.142E-02	3.142E-02
TL-208	1.265E-01	2.471E-02	2.471E-02
PB-210	1.198E+00	5.236E+00	5.236E+00
BI-212	1.328E-01	2.419E-01	2.419E-01
PB-212	5.066E-01	5.704E-02	5.704E-02
PB-214	3.272E-01	5.575E-02	5.575E-02
RA-224	6.600E-01	3.578E-01	3.578E-01
AC-228	4.048E-01	9.679E-02	9.679E-02
RA-228	4.048E-01	9.679E-02	9.679E-02
TH-228	5.066E-01	5.704E-02	5.704E-02
PA-231	1.844E-01	2.240E-01	2.240E-01
TH-232	4.048E-01	9.679E-02	9.679E-02
TH-234	3.956E-01	1.091E+00	1.091E+00
U-235	1.247E-02	9.459E-02	9.459E-02
U-238	3.956E-01	1.091E+00	1.091E+00
PU-239	1.025E+02	1.247E+02	1.247E+02
AM-243	9.391E-02	2.926E-02	2.926E-02
ANH-511	3.148E-02	2.585E-02	2.585E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.601E-02	1.044E-01	1.047E-01	NOT IDENT.
NA-22	-5.620E-03	9.164E-03	9.507E-03	NOT IDENT.
NA-24	-1.013E+16	2.141E+16	0.000E+00	SHORT HLIF
V-48	-1.738E-02	4.460E-02	4.528E-02	NOT IDENT.
CR-51	-6.082E-02	1.584E-01	1.608E-01	NOT IDENT.
MN-54	3.527E-03	9.684E-03	9.813E-03	NOT IDENT.
CO-56	1.086E-02	1.214E-02	1.309E-02	FAIL ABUN

MN-56	1.000E+41	1.113E+41	0.000E+00	SHORT HLIF
CO-57	3.135E-03	6.297E-03	6.453E-03	NOT IDENT.
CO-58	7.997E-03	1.128E-02	1.185E-02	NOT IDENT.
FE-59	-9.408E-03	2.620E-02	2.654E-02	NOT IDENT.
CO-60	-3.784E-03	7.786E-03	7.971E-03	NOT IDENT.
ZN-65	8.262E-03	2.270E-02	2.300E-02	NOT IDENT.
GE-68	6.142E-02	2.705E-01	2.720E-01	NOT IDENT.
AS-73	-1.413E-01	4.648E-01	4.692E-01	NOT IDENT.
AS-74	-3.673E-02	5.341E-02	5.591E-02	NOT IDENT.
SE-75	-3.758E-03	1.343E-02	1.353E-02	NOT IDENT.
BR-77	6.774E+04	7.523E+04	8.119E+04	SHORT HLIF
SR-82	-1.560E-01	1.391E-01	1.558E-01	NOT IDENT.
RB-83	-6.291E-03	1.965E-02	1.986E-02	NOT IDENT.
KR-85	1.499E+01	2.620E+00	7.246E+00	NOT IDENT.
SR-85	1.010E-01	1.770E-02	4.886E-02	NOT IDENT.
RB-86	2.584E-02	3.830E-01	3.831E-01	NOT IDENT.
Y-88	7.488E-04	9.106E-03	9.112E-03	NOT IDENT.
Y-91	2.024E+00	5.704E+00	5.777E+00	NOT IDENT.
NB-94	6.058E-03	9.293E-03	9.686E-03	FAIL ABUN
NB-95	-6.126E-04	1.298E-02	1.298E-02	NOT IDENT.
NB-95M	-5.978E-03	4.058E-02	4.067E-02	NOT IDENT.
ZR-95	7.372E-03	2.004E-02	2.031E-02	NOT IDENT.
NB-97	-1.000E+41	1.595E+41	0.000E+00	SHORT HLIF
ZR-97	4.998E+15	3.469E+15	4.137E+15	SHORT HLIF
MO-99	-8.700E+02	8.795E+02	9.630E+02	SHORT HLIF
TC-99M	1.000E+41	1.966E+41	0.000E+00	SHORT HLIF
RH-101	-4.136E-03	8.290E-03	8.497E-03	NOT IDENT.
RH-102	-8.385E-03	1.203E-02	1.261E-02	NOT IDENT.
RU-103	-3.600E-03	1.355E-02	1.364E-02	FAIL ABUN
RH-106	-6.382E-02	7.381E-02	7.922E-02	NOT IDENT.
RU-106	-6.382E-02	7.381E-02	7.922E-02	NOT IDENT.
AG-108M	-3.357E-03	6.906E-03	7.069E-03	NOT IDENT.
AG-110M	-8.305E-03	1.290E-02	1.343E-02	NOT IDENT.
CD-115	-2.752E+03	3.569E+03	3.778E+03	SHORT HLIF
SN-117M	1.891E-02	4.300E-02	4.384E-02	NOT IDENT.
TE-123M	5.378E-03	7.861E-03	8.226E-03	NOT IDENT.
SB-124	-2.122E-02	2.550E-02	2.723E-02	NOT IDENT.
SB-125	1.664E-02	2.142E-02	2.270E-02	FAIL ABUN
TE-125M	7.190E-01	2.945E+00	2.962E+00	NOT IDENT.
I-126	-5.810E-02	1.640E-01	1.661E-01	NOT IDENT.
SB-126	9.316E-02	1.239E-01	1.308E-01	FAIL ABUN
SB-127	-5.589E+00	1.880E+01	1.896E+01	NOT IDENT.
I-131	6.116E-02	2.102E-01	2.120E-01	NOT IDENT.
I-132	1.000E+41	4.107E+41	0.000E+00	SHORT HLIF
TE-132	-3.171E+00	2.528E+01	2.532E+01	SHORT HLIF
BA-133	-2.476E-03	1.183E-02	1.188E-02	FAIL ABUN
I-133	5.072E+10	1.501E+11	1.518E+11	SHORT HLIF
CS-134	1.739E-02	1.487E-02	1.681E-02	FAIL ABUN
CS-135	4.045E-02	4.069E-02	4.459E-02	NOT IDENT.
I-135	-1.117E+40	3.373E+40	0.000E+00	SHORT HLIF
CS-136	5.504E-02	8.001E-02	8.377E-02	NOT IDENT.
BA-137M	2.216E-03	7.611E-03	7.677E-03	NOT IDENT.
CS-137	2.341E-03	8.041E-03	8.110E-03	NOT IDENT.
CE-139	-1.262E-03	8.059E-03	8.079E-03	NOT IDENT.
BA-140	-3.321E-02	2.170E-01	2.175E-01	NOT IDENT.
LA-140	1.280E-01	9.596E-02	1.120E-01	FAIL ABUN
CE-141	-2.110E-02	3.388E-02	3.519E-02	NOT IDENT.
CE-143	4.994E+06	3.973E+06	4.567E+06	SHORT HLIF
CE-144	-5.226E-02	5.501E-02	5.984E-02	NOT IDENT.
PM-144	6.876E-03	8.526E-03	9.072E-03	NOT IDENT.
PR-144	5.154E-01	6.456E-01	6.861E-01	NOT IDENT.
PM-146	-9.185E-04	1.016E-02	1.017E-02	NOT IDENT.
ND-147	3.681E-01	5.680E-01	5.917E-01	FAIL ABUN
PM-147	1.529E+02	1.736E+02	1.868E+02	NOT IDENT.
PM-149	-1.324E+04	3.032E+04	3.090E+04	SHORT HLIF
EU-150	4.113E-03	9.972E-03	1.014E-02	FAIL ABUN
EU-152	-3.222E-03	2.967E-02	2.971E-02	NOT IDENT.
GD-153	-3.433E-02	2.871E-02	3.262E-02	NOT IDENT.
EU-154	-1.574E-02	2.566E-02	2.662E-02	FAIL ABUN
EU-155	1.232E-02	2.421E-02	2.484E-02	FAIL ABUN
TB-160	7.253E-03	3.458E-02	3.473E-02	FAIL ABUN
HO-166M	-6.474E-03	1.326E-02	1.358E-02	FAIL ABUN
TM-171	-3.577E+00	8.520E+00	8.671E+00	FAIL ABUN
HF-172	-1.472E-02	5.013E-02	5.057E-02	FAIL ABUN
LU-172	2.953E-03	1.365E-02	1.372E-02	FAIL ABUN
LU-176	-1.218E-03	6.623E-03	6.646E-03	FAIL ABUN
HF-181	4.814E-03	1.556E-02	1.571E-02	NOT IDENT.
TA-182	-2.163E-02	5.251E-02	5.340E-02	FAIL ABUN

RE-183	-3.192E-02	9.818E-02	9.923E-02	FAIL ABUN
RE-184	-1.612E-02	4.737E-02	4.792E-02	NOT IDENT.
W-188	2.495E+00	2.419E+00	2.668E+00	FAIL ABUN
IR-192	4.453E-03	1.048E-02	1.067E-02	FAIL ABUN
HG-203	1.630E-02	1.448E-02	1.624E-02	NOT IDENT.
BI-207	1.089E-02	1.100E-02	1.205E-02	FAIL ABUN
BI-211	9.014E-01	1.543E-01	4.347E-01	FAIL ABUN
PB-211	-5.061E-02	1.971E-01	1.984E-01	NOT IDENT.
BI-214	3.087E-01	5.127E-02	1.483E-01	FAIL ABUN
RN-219	8.135E-03	9.679E-02	9.686E-02	FAIL ABUN
RN-222	3.087E-01	5.127E-02	1.483E-01	FAIL ABUN
RA-223	7.671E-03	1.724E-01	1.725E-01	FAIL ABUN
RA-226	3.087E-01	5.127E-02	1.483E-01	FAIL ABUN
AC-227	2.738E-02	5.898E-02	6.026E-02	FAIL ABUN
TH-227	2.738E-02	5.898E-02	6.026E-02	FAIL ABUN
TH-229	-6.174E-02	1.221E-01	1.252E-01	FAIL ABUN
TH-230	3.087E-01	5.127E-02	1.483E-01	FAIL ABUN
TH-231	7.671E-03	1.724E-01	1.725E-01	FAIL ABUN
PA-233	-4.048E-04	1.543E-02	1.543E-02	FAIL ABUN
PA-234	2.824E-02	7.024E-02	7.139E-02	NOT IDENT.
PA-234M	-6.248E-02	1.494E+00	1.494E+00	NOT IDENT.
U-234	3.087E-01	5.127E-02	1.483E-01	FAIL ABUN
NP-237	-4.048E-04	1.543E-02	1.543E-02	FAIL ABUN
NP-238	-3.306E+03	9.575E+03	9.690E+03	SHORT HLIF
NP-239	3.176E-02	6.299E-02	6.460E-02	FAIL ABUN
AM-241	3.088E-02	5.932E-02	6.094E-02	NOT IDENT.
CM-243	-4.097E-02	2.495E-02	3.104E-02	FAIL ABUN
BK-247	-1.234E-02	2.160E-02	2.231E-02	NOT IDENT.
CM-247	-7.439E-04	8.973E-03	8.979E-03	FAIL ABUN
CF-249	-1.424E-03	1.085E-02	1.087E-02	NOT IDENT.
CF-251	6.881E-03	3.167E-02	3.182E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	701.9520	87.09	858.7964	136.47	738.7850
45.60	637.0313	87.57	859.5031	140.51	0.0000
46.54	651.7039	88.03	860.1797	143.76	720.6734
49.72	0.0000	88.34	860.6380	323.87	755.9960
51.35	633.1525	88.47	860.8264	145.44	782.0663
51.87	623.3015	89.96	863.0020	152.43	776.3800
52.39	612.6595	90.64	863.9913	153.25	731.2240
52.97	632.5558	91.11	864.6701	154.21	778.0108
53.44	625.6271	92.59	866.8007	156.02	761.6879
54.07	600.7618	93.35	867.8885	158.56	751.5488
57.36	0.0000	94.56	762.1999	159.00	741.7828
57.53	641.1581	94.65	762.3125	57.98	769.5101
57.98	660.3041	94.67	762.3350	162.66	776.5860
59.27	624.7941	94.87	730.0334	143.76	797.5717
59.32	624.8632	97.43	812.4310	165.86	750.9945
59.54	623.7152	98.43	762.8063	176.31	764.2386
60.96	644.5624	98.44	762.8175	176.60	733.4365
61.17	644.8565	99.53	706.8772	177.52	724.9576
125.81	726.6772	100.11	686.6829	181.07	0.0000
63.29	727.2313	102.03	750.4073	181.52	736.7073
63.58	727.6761	103.18	780.0090	184.41	784.1438
64.28	728.7462	103.37	779.1929	185.72	763.7375
66.73	814.4296	105.21	672.1614	193.51	751.9935
67.24	871.2958	105.31	691.1731	197.03	734.3917
67.68	888.3073	106.12	717.2607	198.01	729.8190
67.75	888.4313	106.47	721.8513	201.83	744.0687
69.67	820.7503	109.28	723.8337	203.43	702.6960
70.83	816.6916	111.00	805.1265	205.31	714.4540
72.81	927.1773	111.76	0.0000	193.51	662.5594
72.87	927.2817	114.06	742.7433	879.38	622.9391
74.66	879.6089	116.30	0.0000	1221.41	613.2669
74.82	879.8736	116.74	744.5295	227.09	664.0576
74.97	880.1248	265.00	761.6445	227.38	647.0135
77.11	883.6733	121.12	706.1226	228.16	0.0000
1093.63	756.7036	121.22	681.4997	228.18	623.8989
79.69	785.2011	121.78	701.3888	235.69	661.6609
80.12	840.2187	122.06	722.1079	235.96	650.1335
80.19	840.3248	122.92	722.9612	238.63	603.1415
80.57	822.7568	123.07	736.0433	238.98	0.0000
81.00	868.8039	123.68	730.1868	240.99	604.3733
81.07	868.9133	125.81	741.4954	351.93	604.9012
81.75	904.5341	127.23	760.7892	244.70	554.9659
83.79	806.2088	127.91	784.2668	252.40	519.5045
84.00	806.5081	129.30	691.1674	252.80	542.8387
85.43	901.5870	946.00	720.6894	254.15	0.0000
86.55	857.9956	133.02	673.2621	256.23	511.8711
86.79	858.3468	133.52	781.8794	260.90	0.0000
86.94	858.5737	136.00	751.4985	264.66	507.3661

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	529.8765	356.01	423.7024	595.83	271.6038
265.00	529.9543	364.49	381.8149	600.60	280.3657
268.22	483.2987	366.42	0.0000	507.63	0.0000
269.46	502.3707	372.51	403.9673	604.72	302.4596
270.03	502.5993	375.05	356.0605	607.14	287.5605
271.23	537.8734	377.52	387.0012	609.32	287.8374
273.65	497.4492	383.85	391.5737	610.33	248.6582
276.40	540.0641	388.16	397.0326	614.28	224.3580
277.37	503.6238	388.63	411.2903	618.01	215.0352
103.37	503.7133	391.69	338.4774	620.36	207.4996
277.60	503.7133	400.66	348.3264	621.93	239.8001
278.00	503.8760	401.81	345.4797	630.19	0.0000
279.20	473.8786	402.40	356.9172	631.29	216.7726
264.66	467.9434	404.85	364.2346	633.25	210.4937
279.70	468.0037	711.68	268.7836	634.78	191.2274
280.46	422.8117	413.71	310.6384	635.95	183.9292
283.69	469.8787	414.70	308.3304	364.49	194.1782
284.31	443.6414	423.72	305.1472	645.85	201.8619
285.41	471.5845	427.09	296.3461	657.76	214.5188
285.90	0.0000	427.87	279.7733	657.90	0.0000
287.50	475.1982	433.94	306.9266	661.66	195.2435
290.67	438.3477	439.40	287.9015	664.57	0.0000
293.27	0.0000	453.88	302.9193	666.33	211.5274
295.22	510.3452	427.87	290.6374	666.50	206.8638
295.96	502.1960	316.51	290.2991	667.71	0.0000
298.58	530.0585	473.00	282.4980	677.62	188.9871
256.23	473.7004	475.06	286.0179	685.70	204.6931
238.63	473.7380	476.78	274.4844	695.00	228.1733
300.13	473.7530	477.60	283.1829	696.49	226.4082
301.36	458.7861	482.18	281.7092	696.51	226.4140
302.85	482.4066	487.02	265.1700	720.70	241.0886
304.50	472.1858	492.35	0.0000	697.30	241.6461
304.85	478.4868	497.08	247.0406	697.49	244.0341
306.78	465.9044	505.52	259.4113	702.65	243.7331
308.46	460.3987	507.63	0.0000	884.68	191.8049
311.90	442.1466	511.00	274.9617	711.68	204.8851
316.51	434.8456	514.00	269.2519	720.70	184.0781
319.41	448.4116	514.00	269.2537	293.27	0.0000
320.08	446.6716	520.40	247.7462	722.78	191.4063
321.04	424.5326	520.69	0.0000	722.91	191.4160
323.87	430.2582	522.65	0.0000	723.31	212.1852
325.23	454.1587	527.90	0.0000	724.19	212.2556
328.76	431.7218	528.26	249.7984	727.33	214.1078
333.37	425.2170	529.59	238.9464	733.00	155.3200
333.97	405.7008	529.87	0.0000	735.93	151.0052
334.37	425.5137	531.02	229.1948	737.46	148.2024
338.28	444.4176	537.26	239.8337	739.50	0.0000
338.32	444.4313	546.56	0.0000	453.88	192.2128
340.48	435.1862	552.55	218.1971	748.06	168.1165
1048.07	435.2063	563.25	255.9895	752.31	175.1537
344.28	395.5037	569.33	249.8273	753.82	183.0015
345.93	401.6083	569.50	249.8477	756.73	169.6252
351.06	368.1450	569.70	249.8680	756.80	169.6295
351.93	398.6511	583.19	224.9085	763.94	169.3797
355.39	0.0000	333.97	225.0179	765.81	184.7815

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.42	184.8232	996.26	113.2919	1620.50	63.0268
631.29	191.3371	1001.03	113.4527	1621.92	76.6992
667.71	0.0000	1002.74	122.6196	1678.03	0.0000
776.52	194.2874	1004.73	120.9381	1690.97	56.6919
777.92	0.0000	1021.30	0.0000	1750.46	0.0000
344.28	186.6354	1025.87	0.0000	1764.49	34.4932
685.70	178.1476	984.45	0.0000	1770.23	32.2872
785.37	167.4806	1037.84	132.7271	846.77	37.6772
792.07	196.3574	1038.76	0.0000	1791.20	0.0000
794.95	194.9196	1046.59	131.9982	1808.65	42.1517
795.86	171.0603	1048.07	119.2734	1810.72	0.0000
801.95	142.8547	1049.04	121.4367	1836.06	25.4170
810.06	146.5552	1050.41	138.5313		
810.29	139.9823	1063.66	100.5451		
810.45	139.9892	1077.00	108.4418		
810.76	123.5321	1077.34	104.1566		
815.77	144.2557	1085.87	101.1739		
818.51	125.8497	1093.63	111.0972		
832.01	119.4668	1099.45	114.5193		
834.85	162.7631	1112.07	127.9217		
835.71	156.1656	1112.84	133.3721		
911.20	156.1656	1115.54	121.1703		
836.80	0.0000	1120.29	152.1064		
846.75	0.0000	1120.55	152.1201		
846.77	138.4110	1121.30	135.8521		
856.80	125.4913	1129.67	119.8184		
860.56	136.7072	1260.41	0.0000		
871.09	138.1941	1147.95	0.0000		
1274.44	130.2157	1173.23	125.9263		
875.33	0.0000	1177.95	110.3223		
879.38	130.4802	1189.05	114.3276		
880.51	118.3854	1204.77	127.7466		
883.24	143.2310	1221.41	143.4249		
884.68	143.5413	1231.02	108.0986		
889.28	144.0939	1235.36	126.3416		
894.76	160.9542	1238.28	120.0283		
898.04	159.7674	1260.41	0.0000		
900.72	147.6833	1271.87	95.0738		
903.28	163.0938	1274.44	105.1200		
911.20	136.9378	1274.54	105.1200		
912.08	136.9771	1291.59	115.3927		
923.98	0.0000	1298.22	0.0000		
926.50	135.5481	1312.11	91.2500		
929.11	135.3184	1332.49	78.3164		
937.49	92.7378	1362.66	0.0000		
944.13	114.6124	1365.19	75.0674		
946.00	117.7796	1368.63	0.0000		
949.00	141.6726	1384.29	63.7952		
954.55	0.0000	1408.01	99.9567		
962.31	145.3662	1457.56	0.0000		
964.08	145.4448	1460.82	73.7427		
966.17	137.4549	1489.16	49.4629		
968.97	137.5712	1505.03	59.5581		
983.53	114.9521	1584.12	57.0871		
984.45	0.0000	1596.21	50.2908		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:55:13.03

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656025.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM17.CNF;467
Background date    : 20-JUN-2016 14:03:38
Sample date       : 17-MAY-2016 00:00:00 Acquisition date : 24-JUN-2016 15:52:18
Sample ID        : G398656025 Sample quantity : 1.60770E+02 GRAM
Detector name    : GAM17 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:03.63 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572236 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.56*	90	845	1.29	93.26	90	8	2.09E-03	82.1	
2	0	53.12	80	845	0.65	106.40	104	7	1.86E-03	60.9	
3	0	63.41*	117	1169	1.51	126.99	123	8	2.71E-03	66.6	
4	5	74.87*	711	1113	1.21	149.92	145	21	1.65E-02	9.5	1.11E+00
5	5	77.17*	1276	1129	1.36	154.53	145	21	2.95E-02	6.4	
6	2	84.18*	175	781	1.42	168.56	165	26	4.05E-03	31.6	1.57E+00
7	2	87.21	537	1088	1.63	174.62	165	26	1.24E-02	12.4	
8	2	90.01	387	957	1.52	180.22	165	26	8.97E-03	15.8	
9	2	92.77*	445	932	1.45	185.75	165	26	1.03E-02	17.8	
10	0	98.55	153	917	2.31	197.30	193	10	3.55E-03	37.9	
11	0	106.67	69	989	1.69	213.57	207	10	1.59E-03	86.4	
12	0	129.38	180	977	1.56	259.01	253	11	4.18E-03	34.4	
13	0	144.09*	46	642	1.12	288.46	285	8	1.06E-03	131.9	
14	0	164.79	94	758	1.44	329.88	324	10	2.17E-03	56.0	
15	0	185.81*	132	1111	1.61	371.94	367	14	3.04E-03	65.5	
16	0	199.01	158	871	1.46	398.36	393	13	3.65E-03	39.4	
17	0	209.31	117	614	0.99	418.98	415	9	2.71E-03	39.3	
18	2	238.58*	1600	479	1.39	477.56	473	17	3.70E-02	4.1	2.46E+00
19	2	241.69	343	575	1.87	483.78	473	17	7.93E-03	17.6	
20	0	269.65	165	579	1.06	539.73	535	12	3.83E-03	30.0	
21	0	276.91	148	523	1.19	554.25	549	12	3.43E-03	32.0	
22	0	295.06*	372	507	1.45	590.59	585	11	8.60E-03	15.9	
23	0	299.91	85	415	1.11	600.29	596	9	1.97E-03	44.6	
24	0	338.31*	324	602	1.53	677.14	671	15	7.51E-03	20.5	
25	0	351.93*	663	410	1.48	704.38	699	12	1.53E-02	8.9	
26	0	462.86	141	372	1.81	926.38	919	17	3.27E-03	32.4	
27	0	482.30	21	247	1.85	965.28	961	9	4.95E-04	133.8	
28	0	510.86*	116	423	2.39	1022.42	1014	17	2.69E-03	59.5	
29	0	583.26*	477	230	1.57	1167.32	1162	14	1.10E-02	9.7	
30	0	609.39*	520	331	1.56	1219.60	1212	17	1.20E-02	10.1	
31	0	617.67	26	219	3.33	1236.17	1230	12	6.07E-04	114.5	
32	0	651.60	44	125	1.57	1304.05	1301	10	1.01E-03	50.0	
33	1	658.75	53	94	2.04	1318.37	1315	33	1.22E-03	29.3	3.06E+00
34	1	661.38	88	179	2.05	1323.63	1315	33	2.03E-03	31.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	727.75	111	239	1.86	1456.44	1448	16	2.57E-03	33.0	
36	0	767.66	46	255	6.57	1536.29	1531	18	1.08E-03	81.5	
37	0	785.23	62	140	4.83	1571.44	1564	13	1.43E-03	42.2	
38	0	794.80	45	132	2.07	1590.59	1583	12	1.04E-03	53.1	
39	0	861.15	40	191	0.70	1723.36	1715	14	9.25E-04	75.8	
40	2	907.04	45	57	2.23	1815.19	1812	18	1.04E-03	26.0	3.29E+00
41	2	910.99*	247	113	1.79	1823.07	1812	18	5.71E-03	13.3	
42	0	934.80	34	103	1.41	1870.71	1864	12	7.86E-04	62.6	
43	0	946.37	34	84	1.31	1893.86	1891	9	7.95E-04	50.9	
44	1	964.22	83	125	2.23	1929.59	1921	24	1.92E-03	29.5	1.30E+00
45	1	968.60	211	98	1.91	1938.36	1921	24	4.88E-03	11.4	
46	0	1088.58	18	117	2.91	2178.39	2168	15	4.26E-04	129.7	
47	0	1119.88	159	92	1.37	2241.03	2233	16	3.69E-03	15.6	
48	0	1238.95	102	96	1.07	2479.25	2470	19	2.37E-03	25.4	
49	0	1378.03	17	51	1.45	2757.49	2753	9	3.82E-04	83.4	
50	0	1460.44*	530	111	2.16	2922.36	2913	21	1.23E-02	7.5	
51	0	1529.28	28	25	1.54	3060.07	3053	13	6.53E-04	41.6	
52	0	1593.57	38	108	5.36	3188.69	3169	27	8.71E-04	80.6	
53	0	1764.43	84	60	1.91	3530.48	3521	20	1.94E-03	25.1	
54	0	1837.78	25	15	0.51	3677.20	3670	15	5.79E-04	39.2	
55	0	1889.89	27	15	4.17	3781.44	3773	16	6.16E-04	38.7	
56	0	1907.98	20	19	3.87	3817.62	3809	15	4.67E-04	51.8	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 03:55:15

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656025.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 00:00:00 Acquisition date : 24-JUN-2016 15:52:18
Sample ID        : G398656025 Sample quantity  : 160.77 GRAM
Sample type      : SOLID Sample geometry   :
Detector name    : GAMMA17 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:03.63 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Linear Efficiencies at : Peak Energy
Abundance limit  : 75.00
    
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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	7.900E-01	2.377E+00	2.377E+00	15.08	OK
AS-73	53.44	10.30*	6.846E+00	6.136E-02	8.585E-02	121.87	OK
CD-109	88.03	3.70*	6.705E+00	8.567E-01	9.083E-01	33.65	OK
SN-126	64.28	9.60	6.715E+00	9.631E-02	9.631E-02	133.29	OK
	86.94	8.90	6.705E+00	3.562E-01	3.562E-01	33.65	OK
	87.57	37.00*	6.705E+00	8.567E-02	8.567E-02	33.65	OK
CS-135	268.22	16.00*	3.578E+00	1.327E-01	1.327E-01	60.04	OK
BA-137M	661.66	89.90*	1.588E+00	2.553E-02	2.560E-02	63.22	OK
CS-137	661.66	85.10*	1.588E+00	2.697E-02	2.704E-02	63.22	OK
CE-139	165.86	80.00*	5.378E+00	1.054E-02	1.283E-02	112.07	OK
CE-141	145.44	48.29*	5.843E+00	7.559E-04	1.733E-03	2920.53	OK
EU-155	86.55	30.70	6.705E+00	1.033E-01	1.049E-01	33.65	OK
	105.31	21.10*	6.557E+00	2.507E-02	2.546E-02	172.88	OK
TL-208	277.37	6.60	3.492E+00	2.942E-01	2.942E-01	63.93	OK
	583.19	85.00*	1.771E+00	1.339E-01	1.339E-01	19.46	OK
	860.56	12.50	1.266E+00	1.019E-01	1.019E-01	151.52	OK
PB-210	46.54	4.25*	6.817E+00	1.694E-01	1.700E-01	164.13	OK
BI-211	72.87	1.23	6.698E+00	----- Line	Not Found	-----	Absent
	351.06	12.92*	2.795E+00	5.129E-02	5.129E-02	553.60	OK
BI-212	727.33	6.67*	1.462E+00	4.679E-01	4.679E-01	66.07	OK
	785.37	1.10	1.370E+00	1.671E+00	1.671E+00	84.32	OK
	1620.50	1.47	7.133E-01	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	6.701E+00	3.810E-01	3.810E-01	29.83	OK
	77.11	17.10	6.704E+00	5.789E-01	5.789E-01	12.79	OK
	238.63	43.60*	3.997E+00	4.274E-01	4.274E-01	8.10	OK
	300.09	3.30	3.244E+00	3.607E-01	3.607E-01	89.22	OK
BI-214	609.32	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29	OK
	1120.29	14.92	1.008E+00	4.136E-01	4.136E-01	31.25	OK
	1764.49	15.30	6.536E-01	3.098E-01	3.098E-01	50.17	OK
PB-214	74.82	5.80	6.701E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	6.704E+00	1.021E+00	1.021E+00	12.79	OK
	87.09	3.41	6.705E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	3.947E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.293E+00	2.788E-01	2.788E-01	31.73	OK
	351.93	35.60*	2.795E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29	OK
	1120.29	14.92	1.008E+00	4.136E-01	4.136E-01	31.25	OK
	1764.49	15.30	6.536E-01	3.098E-01	3.098E-01	50.17	OK
RA-224	240.99	4.10*	3.951E+00	4.902E-01	4.902E-01	77.31	OK
RA-226	609.32	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29	OK
	1120.29	14.92	1.008E+00	4.136E-01	4.136E-01	31.25	OK
	1764.49	15.30	6.536E-01	3.098E-01	3.098E-01	50.17	OK
AC-228	105.21	1.10	6.557E+00	4.808E-01	4.808E-01	172.88	OK
	338.32	11.27	2.900E+00	4.450E-01	4.450E-01	41.03	OK
	794.95	4.25	1.356E+00	3.184E-01	3.184E-01	106.28	OK
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	3.176E-01	3.176E-01	26.54	OK
	968.97	15.80	1.144E+00	4.637E-01	4.637E-01	22.85	OK
RA-228	105.21	1.10	6.557E+00	4.808E-01	4.808E-01	172.88	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	338.32	11.27	2.900E+00	4.450E-01	4.450E-01	41.03	OK
	794.95	4.25	1.356E+00	3.184E-01	3.184E-01	106.28	OK
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	3.176E-01	3.176E-01	26.54	OK
	968.97	15.80	1.144E+00	4.637E-01	4.637E-01	22.85	OK
TH-228	74.82	10.28	6.701E+00	3.810E-01	3.810E-01	29.83	OK
	77.11	17.10	6.704E+00	5.789E-01	5.789E-01	12.79	OK
	238.63	43.60*	3.997E+00	4.274E-01	4.274E-01	8.10	OK
	300.09	3.30	3.244E+00	3.607E-01	3.607E-01	89.22	OK
TH-229	85.43	14.70	6.709E+00	9.145E-02	9.145E-02	63.25	OK
	88.47	24.00	6.705E+00	1.321E-01	1.321E-01	33.65	OK
	193.51	4.41*	4.774E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.449E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29	OK
	1120.29	14.92	1.008E+00	4.136E-01	4.136E-01	31.25	OK
	1764.49	15.30	6.536E-01	3.098E-01	3.098E-01	50.17	OK
PA-231	283.69	1.70	3.415E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	3.244E+00	2.225E-01	2.225E-01	89.22	OK
TH-232	105.21	1.10	6.557E+00	4.808E-01	4.808E-01	172.88	OK
	338.32	11.27	2.900E+00	4.450E-01	4.450E-01	41.03	OK
	835.71	1.61	1.299E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.206E+00	3.176E-01	3.176E-01	26.54	OK
	968.97	15.80	1.144E+00	4.637E-01	4.637E-01	22.85	OK
TH-234	63.29	3.70*	6.715E+00	2.499E-01	2.499E-01	133.29	OK
	92.59	4.23	6.685E+00	8.044E-01	8.044E-01	35.61	OK
U-234	609.32	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29	OK
	1120.29	14.92	1.008E+00	4.136E-01	4.136E-01	31.25	OK
	1764.49	15.30	6.536E-01	3.098E-01	3.098E-01	50.17	OK
U-235	89.96	3.47	6.697E+00	8.544E-01	8.544E-01	31.65	OK
	93.35	5.60	6.685E+00	6.076E-01	6.076E-01	35.61	OK
	143.76	10.96*	5.850E+00	----- Line	Not Found	-----	<<INT Reject
	163.33	5.08	5.378E+00	1.660E-01	1.660E-01	112.07	OK
	185.72	57.20	4.928E+00	2.228E-02	2.228E-02	130.98	OK
	205.31	5.01	4.549E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	6.715E+00	2.499E-01	2.499E-01	133.29	OK
	92.59	4.23	6.685E+00	8.044E-01	8.044E-01	35.61	OK
AM-243	43.53	5.90	6.544E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	6.701E+00	5.828E-02	5.828E-02	29.83	OK
ANH-511	511.00	100.00*	1.990E+00	2.500E-02	2.500E-02	118.98	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656025.CNF;1
Acquisition date : 24-JUN-2016 15:52:18 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:03.63 Half life ratio : *****
Sample date : 17-MAY-2016 00:00:00 Analyst initials: MXR1
Sample ID : G398656025 Sample Quantity : 1.6077E+02 GRAM
Batch Number : 1572236 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	2.377E+00	3.512E-01	1.987E-01
AS-73	8.585E-02	1.025E-01	1.244E-01
CD-109	9.083E-01	2.995E-01	2.547E-01
SN-126	8.567E-02	2.825E-02	2.402E-02
CS-135	1.327E-01	7.808E-02	7.639E-02
BA-137M	2.560E-02	1.586E-02	1.830E-02
CS-137	2.704E-02	1.675E-02	1.933E-02
CE-139	1.283E-02	1.408E-02	1.497E-02
CE-141	1.733E-03	4.960E-02	4.298E-02
EU-155	2.546E-02	4.313E-02	4.063E-02
TL-208	1.339E-01	2.553E-02	1.964E-02
PB-210	1.700E-01	2.734E-01	2.114E-01
BI-211	5.129E-02	2.783E-01	1.100E-01
BI-212	4.679E-01	3.030E-01	2.493E-01
PB-212	4.274E-01	3.394E-02	2.681E-02
BI-214	2.819E-01	5.604E-02	3.931E-02
PB-214	2.974E-01	5.179E-02	6.421E-02
RN-222	2.819E-01	5.604E-02	3.931E-02
RA-224	4.902E-01	3.714E-01	2.877E-01
RA-226	2.819E-01	5.604E-02	3.931E-02
AC-228	3.176E-01	8.262E-02	7.241E-02
RA-228	3.176E-01	8.262E-02	7.241E-02
TH-228	4.274E-01	3.394E-02	2.681E-02
TH-229	1.284E-01	1.792E-01	2.429E-01
TH-230	2.819E-01	5.604E-02	3.930E-02
PA-231	2.225E-01	1.945E-01	2.406E-01
TH-232	3.176E-01	8.262E-02	7.241E-02
TH-234	2.499E-01	3.264E-01	2.825E-01
U-234	2.819E-01	5.604E-02	3.930E-02
U-235	3.519E-02	9.099E-02	8.900E-02
U-238	2.499E-01	3.264E-01	2.825E-01
AM-243	5.828E-02	1.704E-02	1.548E-02
ANH-511	2.500E-02	2.915E-02	1.667E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.228E-02	1.565E-01	2.465E-01	NOT IDENT.
NA-22	6.592E-03	1.097E-02	2.103E-02	NOT IDENT.
NA-24	0.000E+00	5.839E+16	0.000E+00	SHORT HLIF
AL-26	2.024E-03	1.046E-02	1.955E-02	NOT IDENT.
SC-46	-1.327E-02	1.413E-02	2.416E-02	FAIL ABUN
V-48	-1.427E-02	5.803E-02	1.027E-01	NOT IDENT.
CR-51	-7.585E-02	1.875E-01	3.400E-01	NOT IDENT.
MN-54	9.125E-03	1.167E-02	2.194E-02	NOT IDENT.
CO-56	-1.347E-03	1.523E-02	2.742E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	3.054E-03	6.273E-03	1.127E-02	NOT IDENT.
CO-58	-1.216E-02	1.515E-02	2.635E-02	NOT IDENT.
FE-59	1.420E-02	3.615E-02	6.609E-02	NOT IDENT.
CO-60	7.577E-03	1.053E-02	2.042E-02	NOT IDENT.
ZN-65	-6.608E-03	2.933E-02	4.371E-02	NOT IDENT.
GE-68	8.292E-02	3.924E-01	6.943E-01	NOT IDENT.
AS-74	-4.563E-02	7.974E-02	1.370E-01	NOT IDENT.
SE-75	6.191E-03	1.554E-02	2.552E-02	NOT IDENT.
BR-77	0.000E+00	5.430E+03	0.000E+00	SHORT HLIF
SR-82	-1.397E-01	2.884E-01	3.535E-01	NOT IDENT.
RB-83	-1.707E-02	2.647E-02	4.586E-02	NOT IDENT.
KR-85	0.000E+00	2.732E+00	5.007E+00	NOT IDENT.
SR-85	0.000E+00	1.858E-02	3.405E-02	NOT IDENT.
RB-86	1.121E-01	5.525E-01	9.983E-01	NOT IDENT.
Y-88	4.081E-03	1.587E-02	2.576E-02	NOT IDENT.
Y-91	-2.203E+00	7.269E+00	1.260E+01	NOT IDENT.
NB-94	-1.037E-03	1.057E-02	1.921E-02	NOT IDENT.
NB-95	2.039E-02	1.756E-02	2.979E-02	NOT IDENT.
NB-95M	0.000E+00	4.999E-02	8.795E-02	NOT IDENT.
ZR-95	2.323E-02	2.772E-02	5.260E-02	NOT IDENT.
NB-97	0.000E+00	5.738E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	9.965E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.468E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	1.139E-02	8.559E-03	1.431E-02	FAIL ABUN
RH-102	8.199E-03	1.707E-02	3.210E-02	FAIL ABUN
RU-103	-5.385E-03	1.884E-02	3.329E-02	FAIL ABUN
RH-106	-3.079E-02	1.158E-01	1.814E-01	NOT IDENT.
RU-106	-3.079E-02	1.158E-01	1.814E-01	NOT IDENT.
AG-108M	-7.197E-03	9.132E-03	1.596E-02	NOT IDENT.
AG-110M	-1.919E-03	1.563E-02	2.807E-02	FAIL ABUN
SN-113	-1.345E-03	1.535E-02	2.777E-02	NOT IDENT.
CD-115	0.000E+00	5.727E+03	0.000E+00	SHORT HLIF
SN-117M	-5.488E-04	5.226E-02	8.235E-02	NOT IDENT.
TE-123M	2.695E-03	9.247E-03	1.473E-02	NOT IDENT.
SB-124	9.669E-03	3.782E-02	7.037E-02	NOT IDENT.
SB-125	3.754E-03	2.833E-02	5.140E-02	FAIL ABUN
TE-125M	-2.298E+00	3.282E+00	5.170E+00	NOT IDENT.
I-126	1.350E-01	2.365E-01	4.279E-01	NOT IDENT.
SB-126	-2.443E-01	1.900E-01	2.714E-01	NOT IDENT.
SB-127	0.000E+00	2.818E+01	0.000E+00	SHORT HLIF
I-131	-1.713E-02	2.628E-01	4.782E-01	NOT IDENT.
I-132	0.000E+00	1.422E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.241E+01	0.000E+00	SHORT HLIF
BA-133	-2.572E-03	1.359E-02	2.131E-02	FAIL ABUN
I-133	0.000E+00	3.204E+11	0.000E+00	SHORT HLIF
CS-134	1.641E-02	1.709E-02	2.374E-02	FAIL ABUN
I-135	0.000E+00	1.725E+41	0.000E+00	SHORT HLIF
CS-136	-9.319E-04	1.101E-01	1.965E-01	NOT IDENT.
BA-140	-1.187E-01	3.129E-01	5.473E-01	NOT IDENT.
LA-140	1.280E-02	1.027E-01	1.640E-01	NOT IDENT.
CE-143	0.000E+00	6.844E+06	0.000E+00	SHORT HLIF
CE-144	-2.951E-02	5.575E-02	8.719E-02	NOT IDENT.
PM-144	7.112E-03	1.134E-02	2.127E-02	FAIL ABUN
PR-144	5.381E-01	8.596E-01	1.612E+00	NOT IDENT.
PM-146	-1.886E-03	1.344E-02	2.337E-02	NOT IDENT.
ND-147	7.374E-01	7.590E-01	1.415E+00	FAIL ABUN
PM-147	-1.857E+01	1.702E+02	3.115E+02	NOT IDENT.
PM-149	0.000E+00	4.253E+04	0.000E+00	SHORT HLIF
EU-150	4.926E-03	8.949E-03	1.457E-02	FAIL ABUN
EU-152	-2.910E-02	3.528E-02	5.033E-02	FAIL ABUN
GD-153	0.000E+00	3.360E-02	3.504E-02	FAIL ABUN
EU-154	1.845E-02	3.070E-02	5.886E-02	NOT IDENT.
TB-160	3.608E-02	4.855E-02	9.151E-02	FAIL ABUN
HO-166M	6.268E-03	1.878E-02	3.483E-02	FAIL ABUN

TM-171	1.397E+00	1.669E+00	2.109E+00	FAIL ABUN
HF-172	-3.831E-03	5.041E-02	8.050E-02	FAIL ABUN
LU-172	-9.394E-03	2.225E-02	3.257E-02	FAIL ABUN
LU-176	-4.875E-03	7.627E-03	1.337E-02	FAIL ABUN
HF-181	1.035E-02	2.712E-02	3.835E-02	FAIL ABUN
TA-182	-1.220E-02	5.820E-02	1.013E-01	FAIL ABUN
RE-183	-3.305E-02	3.070E-02	4.139E-02	NOT IDENT.
RE-184	-2.412E-02	7.018E-02	1.056E-01	NOT IDENT.
W-188	1.084E+00	2.830E+00	4.619E+00	FAIL ABUN
IR-192	-5.367E-03	1.201E-02	2.176E-02	FAIL ABUN
HG-203	6.870E-03	1.730E-02	2.825E-02	NOT IDENT.
BI-207	3.885E-03	1.501E-02	2.724E-02	FAIL ABUN
PB-211	1.938E-02	2.181E-01	3.959E-01	NOT IDENT.
RN-219	7.934E-03	1.215E-01	2.206E-01	NOT IDENT.
RA-223	-2.915E-01	1.863E-01	3.242E-01	FAIL ABUN
AC-227	5.524E-02	6.752E-02	1.284E-01	FAIL ABUN
TH-227	5.524E-02	6.752E-02	1.284E-01	FAIL ABUN
TH-231	-2.915E-01	1.863E-01	3.242E-01	FAIL ABUN
PA-233	6.702E-03	1.738E-02	3.243E-02	FAIL ABUN
PA-234	9.778E-02	9.750E-02	1.660E-01	FAIL ABUN
PA-234M	-3.752E-01	1.333E+00	2.347E+00	FAIL ABUN
NP-237	6.702E-03	1.738E-02	3.243E-02	FAIL ABUN
NP-238	0.000E+00	1.430E+04	0.000E+00	SHORT HLIF
NP-239	-4.889E-03	6.023E-02	1.105E-01	FAIL ABUN
PU-239	0.000E+00	1.548E+02	1.560E+02	FAIL ABUN
AM-241	1.871E-02	1.646E-02	2.835E-02	NOT IDENT.
CM-243	1.051E-02	3.473E-02	4.125E-02	FAIL ABUN
BK-247	5.970E-03	2.445E-02	3.988E-02	FAIL ABUN
CM-247	-3.349E-03	1.118E-02	2.003E-02	FAIL ABUN
CF-249	6.373E-03	1.187E-02	2.197E-02	NOT IDENT.
CF-251	1.630E-02	3.263E-02	5.938E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	514	10.66*	7.900E-01	2.377E+00	2.377E+00	15.08
AS-73	53.44	111	10.30*	6.846E+00	6.136E-02	8.585E-02	121.87
CD-109	88.03	710	3.70*	6.705E+00	1.114E+00	1.181E+00	24.83
SN-126	64.28	160	9.60	6.715E+00	9.631E-02	9.631E-02	133.29
	86.94	710	8.90	6.705E+00	4.630E-01	4.630E-01	24.83
	87.57	710	37.00*	6.705E+00	1.114E-01	1.114E-01	24.83
CS-135	268.22	195	16.00*	3.578E+00	1.327E-01	1.327E-01	60.04
BA-137M	661.66	94	89.90*	1.588E+00	2.553E-02	2.560E-02	63.22
CS-137	661.66	94	85.10*	1.588E+00	2.697E-02	2.704E-02	63.22
CE-139	165.86	117	80.00*	5.378E+00	1.054E-02	1.283E-02	112.07
CE-141	145.44	58	48.29*	5.843E+00	7.987E-03	1.831E-02	263.84
EU-155	86.55	710	30.70	6.705E+00	1.342E-01	1.363E-01	24.83
	105.31	89	21.10*	6.557E+00	2.507E-02	2.546E-02	172.88
TL-208	277.37	174	6.60	3.492E+00	2.942E-01	2.942E-01	63.93
	583.19	518	85.00*	1.771E+00	1.339E-01	1.339E-01	19.46
	860.56	41	12.50	1.266E+00	1.019E-01	1.019E-01	151.52
PB-210	46.54	126	4.25*	6.817E+00	1.694E-01	1.700E-01	164.13
BI-211	72.87	-----	1.23	6.698E+00	-----	Line Not Found	-----
	351.06	761	12.92*	2.795E+00	8.195E-01	8.195E-01	17.77
BI-212	727.33	117	6.67*	1.462E+00	4.679E-01	4.679E-01	66.07
	785.37	65	1.10	1.370E+00	1.671E+00	1.671E+00	84.32
	1620.50	-----	1.47	7.133E-01	-----	Line Not Found	-----
PB-212	74.82	953	10.28	6.701E+00	5.383E-01	5.383E-01	18.97
	77.11	1705	17.10	6.704E+00	5.789E-01	5.789E-01	12.79
	238.63	1914	43.60*	3.997E+00	4.274E-01	4.274E-01	8.10
	300.09	99	3.30	3.244E+00	3.607E-01	3.607E-01	89.22
BI-214	609.32	562	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29
	1120.29	160	14.92	1.008E+00	4.136E-01	4.136E-01	31.25
	1764.49	80	15.30	6.536E-01	3.098E-01	3.098E-01	50.17
PB-214	74.82	953	5.80	6.701E+00	9.541E-01	9.541E-01	18.97
	77.11	1705	9.70	6.704E+00	1.021E+00	1.021E+00	12.79
	87.09	710	3.41	6.705E+00	1.208E+00	1.208E+00	24.83
	242.00	409	7.25	3.951E+00	5.560E-01	5.561E-01	35.11
	295.22	435	18.42	3.293E+00	2.788E-01	2.788E-01	31.73
	351.93	761	35.60*	2.795E+00	2.974E-01	2.974E-01	17.77
RN-222	609.32	562	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29
	1120.29	160	14.92	1.008E+00	4.136E-01	4.136E-01	31.25
	1764.49	80	15.30	6.536E-01	3.098E-01	3.098E-01	50.17
RA-224	240.99	409	4.10*	3.951E+00	9.832E-01	9.832E-01	35.11
RA-226	609.32	562	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29
	1120.29	160	14.92	1.008E+00	4.136E-01	4.136E-01	31.25
	1764.49	80	15.30	6.536E-01	3.098E-01	3.098E-01	50.17
AC-228	105.21	89	1.10	6.557E+00	4.808E-01	4.808E-01	172.88
	338.32	374	11.27	2.900E+00	4.450E-01	4.450E-01	41.03
	794.95	47	4.25	1.356E+00	3.184E-01	3.184E-01	106.28
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	254	25.80*	1.206E+00	3.176E-01	3.176E-01	26.54

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	968.97	215	15.80	1.144E+00	4.637E-01	4.637E-01	22.85
	105.21	89	1.10	6.557E+00	4.808E-01	4.808E-01	172.88
	338.32	374	11.27	2.900E+00	4.450E-01	4.450E-01	41.03
	794.95	47	4.25	1.356E+00	3.184E-01	3.184E-01	106.28
TH-228	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
	911.20	254	25.80*	1.206E+00	3.176E-01	3.176E-01	26.54
	968.97	215	15.80	1.144E+00	4.637E-01	4.637E-01	22.85
	74.82	953	10.28	6.701E+00	5.383E-01	5.383E-01	18.97
	77.11	1705	17.10	6.704E+00	5.789E-01	5.789E-01	12.79
	238.63	1914	43.60*	3.997E+00	4.274E-01	4.274E-01	8.10
TH-229	300.09	99	3.30	3.244E+00	3.607E-01	3.607E-01	89.22
	85.43	232	14.70	6.709E+00	9.145E-02	9.145E-02	63.25
	88.47	710	24.00	6.705E+00	1.717E-01	1.717E-01	24.83
	193.51	-----	4.41*	4.774E+00	-----	Line Not Found	-----
TH-230	210.85	-----	2.80	4.449E+00	-----	Line Not Found	-----
	609.32	562	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29
	1120.29	160	14.92	1.008E+00	4.136E-01	4.136E-01	31.25
	1764.49	80	15.30	6.536E-01	3.098E-01	3.098E-01	50.17
PA-231	283.69	-----	1.70	3.415E+00	-----	Line Not Found	-----
TH-232	301.36	99	5.35*	3.244E+00	2.225E-01	2.225E-01	89.22
	105.21	89	1.10	6.557E+00	4.808E-01	4.808E-01	172.88
	338.32	374	11.27	2.900E+00	4.450E-01	4.450E-01	41.03
	835.71	-----	1.61	1.299E+00	-----	Line Not Found	-----
TH-234	911.20	254	25.80*	1.206E+00	3.176E-01	3.176E-01	26.54
	968.97	215	15.80	1.144E+00	4.637E-01	4.637E-01	22.85
	63.29	160	3.70*	6.715E+00	2.499E-01	2.499E-01	133.29
	92.59	585	4.23	6.685E+00	8.044E-01	8.044E-01	35.61
U-234	609.32	562	45.49*	1.704E+00	2.819E-01	2.819E-01	20.29
	1120.29	160	14.92	1.008E+00	4.136E-01	4.136E-01	31.25
	1764.49	80	15.30	6.536E-01	3.098E-01	3.098E-01	50.17
U-235	89.96	510	3.47	6.697E+00	8.544E-01	8.544E-01	31.65
	93.35	585	5.60	6.685E+00	6.076E-01	6.076E-01	35.61
	143.76	58	10.96*	5.843E+00	3.519E-02	3.519E-02	263.84
	163.33	117	5.08	5.378E+00	1.660E-01	1.660E-01	112.07
	185.72	161	57.20	4.928E+00	2.228E-02	2.228E-02	130.98
U-238	205.31	-----	5.01	4.549E+00	-----	Line Not Found	-----
	63.29	160	3.70*	6.715E+00	2.499E-01	2.499E-01	133.29
	92.59	585	4.23	6.685E+00	8.044E-01	8.044E-01	35.61
AM-243	43.53	-----	5.90	6.544E+00	-----	Line Not Found	-----
ANH-511	74.66	953	67.20*	6.701E+00	8.235E-02	8.235E-02	18.97
	511.00	128	100.00*	1.990E+00	2.500E-02	2.500E-02	118.98

Flag: "*" = Keyline

Total number of lines in spectrum 56
Number of unidentified lines 11
Number of lines tentatively identified by NID 45 80.36%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	2.377E+00	2.377E+00	0.358E+00	15.08	
AS-73	80.30D	1.40	6.136E-02	8.585E-02	10.46E-02	121.87	
CD-109	461.40D	1.06	1.114E+00	1.181E+00	0.293E+00	24.83	
SN-126	2.30E+05Y	1.00	1.114E-01	1.114E-01	0.277E-01	24.83	
CS-135	2.30E+06Y	1.00	1.327E-01	1.327E-01	0.797E-01	60.04	
BA-137M	30.08Y	1.00	2.553E-02	2.560E-02	1.618E-02	63.22	
CS-137	30.08Y	1.00	2.697E-02	2.704E-02	1.709E-02	63.22	
CE-139	137.64D	1.22	1.054E-02	1.283E-02	1.437E-02	112.07	
CE-141	32.51D	2.29	7.987E-03	1.831E-02	4.831E-02	263.84	
EU-155	4.75Y	1.02	2.507E-02	2.546E-02	4.402E-02	172.88	
TL-208	1.41E+10Y	1.00	1.339E-01	1.339E-01	0.260E-01	19.46	
PB-210	22.20Y	1.00	1.694E-01	1.700E-01	2.790E-01	164.13	
BI-211	7.04E+08Y	1.00	8.195E-01	8.195E-01	1.456E-01	17.77	
BI-212	1.41E+10Y	1.00	4.679E-01	4.679E-01	3.092E-01	66.07	
PB-212	1.41E+10Y	1.00	4.274E-01	4.274E-01	0.346E-01	8.10	
BI-214	1600.00Y	1.00	2.819E-01	2.819E-01	0.572E-01	20.29	
PB-214	1600.00Y	1.00	2.974E-01	2.974E-01	0.529E-01	17.77	
RN-222	1600.00Y	1.00	2.819E-01	2.819E-01	0.572E-01	20.29	
RA-224	1.41E+10Y	1.00	9.832E-01	9.832E-01	3.452E-01	35.11	
RA-226	1600.00Y	1.00	2.819E-01	2.819E-01	0.572E-01	20.29	
AC-228	1.41E+10Y	1.00	3.176E-01	3.176E-01	0.843E-01	26.54	
RA-228	1.41E+10Y	1.00	3.176E-01	3.176E-01	0.843E-01	26.54	
TH-228	1.41E+10Y	1.00	4.274E-01	4.274E-01	0.346E-01	8.10	
TH-229	7340.00Y	1.00	1.717E-01	1.717E-01	0.426E-01	24.83	K
TH-230	7.54E+04Y	1.00	2.819E-01	2.819E-01	0.572E-01	20.29	
PA-231	7.04E+08Y	1.00	2.225E-01	2.225E-01	1.985E-01	89.22	
TH-232	1.41E+10Y	1.00	3.176E-01	3.176E-01	0.843E-01	26.54	
TH-234	4.47E+09Y	1.00	2.499E-01	2.499E-01	3.331E-01	133.29	
U-234	2.45E+05Y	1.00	2.819E-01	2.819E-01	0.572E-01	20.29	
U-235	7.04E+08Y	1.00	3.519E-02	3.519E-02	9.284E-02	263.84	
U-238	4.47E+09Y	1.00	2.499E-01	2.499E-01	3.331E-01	133.29	
AM-243	7370.00Y	1.00	8.235E-02	8.235E-02	1.562E-02	18.97	
ANH-511	1.00E+09Y	1.00	2.500E-02	2.500E-02	2.975E-02	118.98	

Total Activity : 1.102E+01 1.112E+01

Grand Total Activity : 1.102E+01 1.112E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	98.55	200	1197	2.31	197.30	193	10	3.55E-03	75.8	6.64E+00	T
0	129.38	229	1242	1.56	259.01	253	11	4.18E-03	68.8	6.16E+00	T
0	199.01	192	1062	1.46	398.36	393	13	3.65E-03	78.8	4.67E+00	T
0	209.31	142	744	0.99	418.98	415	9	2.71E-03	78.6	4.48E+00	
0	462.86	157	414	1.81	926.38	919	17	3.27E-03	64.7	2.17E+00	T
0	482.30	24	273	1.85	965.28	961	9	4.95E-04	****	2.10E+00	T
0	617.67	28	236	3.33	1236.17	1230	12	6.07E-04	****	1.68E+00	T
0	651.60	47	134	1.57	1304.05	1301	10	1.01E-03	****	1.61E+00	
1	658.75	56	100	2.04	1318.37	1315	33	1.22E-03	58.6	1.59E+00	T
0	767.66	49	267	6.57	1536.29	1531	18	1.08E-03	****	1.40E+00	T
2	907.04	46	58	2.23	1815.19	1812	18	1.04E-03	52.1	1.21E+00	
0	934.80	35	106	1.41	1870.71	1864	12	7.86E-04	****	1.18E+00	
0	946.37	35	86	1.31	1893.86	1891	9	7.95E-04	****	1.17E+00	T
1	964.22	85	128	2.23	1929.59	1921	24	1.92E-03	59.0	1.15E+00	T
0	1088.58	19	117	2.91	2178.39	2168	15	4.26E-04	****	1.03E+00	
0	1238.95	101	95	1.07	2479.25	2470	19	2.37E-03	50.7	9.21E-01	T
0	1378.03	16	50	1.45	2757.49	2753	9	3.82E-04	****	8.35E-01	
0	1529.28	27	24	1.54	3060.07	3053	13	6.53E-04	83.2	7.55E-01	
0	1593.57	36	104	5.36	3188.69	3169	27	8.71E-04	****	7.25E-01	
0	1837.78	24	14	0.51	3677.20	3670	15	5.79E-04	78.5	6.26E-01	
0	1889.89	25	14	4.17	3781.44	3773	16	6.16E-04	77.4	6.07E-01	
0	1907.98	19	18	3.87	3817.62	3809	15	4.67E-04	****	6.01E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656025.CNF;1  *
* Acquisition date   : 24-JUN-2016 15:52:18 Sensitivity      : 3.000          *
* Detector ID        : GAM17 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:00:03.63 Half life ratio  : *****          *
* Sample date        : 17-MAY-2016 00:00:00 Nuclide Library : SOLID         *
* Sample ID          : G398656025 Analyst initials: MXR1          *
* Batch Number       : 1572236 Sample Quantity : 1.6077E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 1-JUN-2016 09:40:09 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	9.309E-02
AS-73	6.109E-02
CD-109	1.250E-01
SN-126	1.178E-02
CS-135	3.725E-02
BA-137M	8.771E-03
CS-137	9.265E-03
CE-139	7.327E-03
CE-141	2.104E-02
EU-155	1.991E-02
TL-208	9.460E-03
PB-210	1.037E-01
BI-211	5.350E-02
BI-212	1.191E-01
PB-212	1.309E-02
BI-214	1.896E-02
PB-214	3.157E-02
RN-222	1.896E-02
RA-224	1.405E-01
RA-226	1.896E-02
AC-228	3.449E-02
RA-228	3.449E-02
TH-228	1.309E-02
TH-229	1.189E-01
TH-230	1.896E-02
PA-231	1.171E-01
TH-232	3.449E-02
TH-234	1.390E-01
U-234	1.896E-02
U-235	4.364E-02
U-238	1.390E-01
AM-243	7.614E-03
ANH-511	8.061E-03

---- Non-Identified Nuclides ----

Lc

Nuclide	(pCi/GRAM)	
BE-7	1.192E-01	NOT IDENT.
NA-22	9.906E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	8.950E-03	NOT IDENT.
SC-46	1.148E-02	FAIL ABUN
V-48	4.878E-02	NOT IDENT.
CR-51	1.652E-01	NOT IDENT.
MN-54	1.052E-02	NOT IDENT.
CO-56	1.312E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.519E-03	NOT IDENT.
CO-58	1.258E-02	NOT IDENT.
FE-59	3.136E-02	NOT IDENT.
CO-60	9.585E-03	NOT IDENT.
ZN-65	2.069E-02	NOT IDENT.
GE-68	3.297E-01	NOT IDENT.
AS-74	6.609E-02	NOT IDENT.
SE-75	1.244E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.693E-01	NOT IDENT.
RB-83	2.209E-02	NOT IDENT.
KR-85	2.441E+00	NOT IDENT.
SR-85	1.660E-02	NOT IDENT.
RB-86	4.741E-01	NOT IDENT.
Y-88	1.179E-02	NOT IDENT.
Y-91	5.958E+00	NOT IDENT.
NB-94	9.250E-03	NOT IDENT.
NB-95	1.431E-02	NOT IDENT.
NB-95M	4.315E-02	NOT IDENT.
ZR-95	2.524E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.021E-03	FAIL ABUN
RH-102	1.546E-02	FAIL ABUN
RU-103	1.607E-02	FAIL ABUN
RH-106	8.723E-02	NOT IDENT.
RU-106	8.723E-02	NOT IDENT.
AG-108M	7.719E-03	NOT IDENT.
AG-110M	1.337E-02	FAIL ABUN
SN-113	1.347E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.033E-02	NOT IDENT.
TE-123M	7.217E-03	NOT IDENT.
SB-124	3.265E-02	NOT IDENT.
SB-125	2.490E-02	FAIL ABUN
TE-125M	2.534E+00	NOT IDENT.
I-126	2.056E-01	NOT IDENT.
SB-126	1.297E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.320E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.033E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.139E-02	FAIL ABUN
I-135	0.000E+00	SHORT HLIF
CS-136	9.342E-02	NOT IDENT.
BA-140	2.640E-01	NOT IDENT.
LA-140	7.566E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	4.269E-02	NOT IDENT.
PM-144	1.025E-02	FAIL ABUN
PR-144	7.770E-01	NOT IDENT.
PM-146	1.130E-02	NOT IDENT.
ND-147	6.825E-01	FAIL ABUN
PM-147	1.526E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	7.093E-03	FAIL ABUN
EU-152	2.444E-02	FAIL ABUN
GD-153	1.720E-02	FAIL ABUN
EU-154	2.773E-02	NOT IDENT.
TB-160	4.368E-02	FAIL ABUN
HO-166M	1.675E-02	FAIL ABUN
TM-171	1.036E+00	FAIL ABUN

HF-172	3.943E-02	FAIL ABUN
LU-172	1.543E-02	FAIL ABUN
LU-176	6.502E-03	FAIL ABUN
HF-181	1.857E-02	FAIL ABUN
TA-182	4.798E-02	FAIL ABUN
RE-183	2.034E-02	NOT IDENT.
RE-184	5.031E-02	NOT IDENT.
W-188	2.249E+00	FAIL ABUN
IR-192	1.057E-02	FAIL ABUN
HG-203	1.378E-02	NOT IDENT.
BI-207	1.294E-02	FAIL ABUN
PB-211	1.921E-01	NOT IDENT.
RN-219	1.070E-01	NOT IDENT.
RA-223	1.576E-01	FAIL ABUN
AC-227	6.267E-02	FAIL ABUN
TH-227	6.267E-02	FAIL ABUN
TH-231	1.576E-01	FAIL ABUN
PA-233	1.576E-02	FAIL ABUN
PA-234	7.918E-02	FAIL ABUN
PA-234M	1.117E+00	FAIL ABUN
NP-237	1.576E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.415E-02	FAIL ABUN
PU-239	7.659E+01	FAIL ABUN
AM-241	1.394E-02	NOT IDENT.
CM-243	2.022E-02	FAIL ABUN
BK-247	1.944E-02	FAIL ABUN
CM-247	9.709E-03	FAIL ABUN
CF-249	1.066E-02	NOT IDENT.
CF-251	2.907E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656025.CNF;1
Acquisition date : 24-JUN-2016 15:52:18 Sensitivity : 3.000
Detector ID : GAM17 Energy tolerance : 1.500
Elapsed live time : 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time : 0 12:00:03.63 Half life ratio : *****
Sample date : 17-MAY-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G398656025 Analyst initials : MXR1
Batch Number : 1572236 Sample Quantity : 1.6077E+02 GRAM
Quantity Err(%) : 1.2440E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:40:09 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	2.377E+00	3.725E-01	3.725E-01
AS-73	8.585E-02	1.040E-01	1.040E-01
CD-109	9.083E-01	3.104E-01	3.104E-01
SN-126	8.567E-02	2.893E-02	2.893E-02
CS-135	1.327E-01	7.859E-02	7.859E-02
BA-137M	2.560E-02	1.590E-02	1.590E-02
CS-137	2.704E-02	1.679E-02	1.679E-02
CE-139	1.283E-02	1.432E-02	1.432E-02
CE-141	2.006E-03	4.961E-02	4.961E-02
EU-155	2.546E-02	4.317E-02	4.317E-02
TL-208	1.339E-01	2.616E-02	2.616E-02
PB-210	1.700E-01	2.738E-01	2.738E-01
BI-211	5.129E-02	2.822E-01	2.822E-01
BI-212	4.679E-01	3.039E-01	3.039E-01
PB-212	4.274E-01	4.076E-02	4.076E-02
BI-214	2.819E-01	5.733E-02	5.733E-02
PB-214	2.974E-01	5.324E-02	5.324E-02
RN-222	2.819E-01	5.733E-02	5.733E-02
RA-224	4.902E-01	3.737E-01	3.737E-01
RA-226	2.819E-01	5.733E-02	5.733E-02
AC-228	3.176E-01	8.421E-02	8.421E-02
RA-228	3.176E-01	8.421E-02	8.421E-02
TH-228	4.274E-01	4.076E-02	4.076E-02
TH-229	1.284E-01	1.793E-01	1.793E-01
TH-230	2.819E-01	5.733E-02	5.733E-02
PA-231	2.225E-01	2.002E-01	2.002E-01
TH-232	3.176E-01	8.421E-02	8.421E-02
TH-234	2.499E-01	3.311E-01	3.311E-01
U-234	2.819E-01	5.733E-02	5.733E-02
U-235	3.519E-02	9.100E-02	9.100E-02
U-238	2.499E-01	3.311E-01	3.311E-01
AM-243	5.828E-02	1.767E-02	1.767E-02
ANH-511	2.500E-02	2.917E-02	2.917E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.228E-02	1.565E-01	1.577E-01	NOT IDENT.
NA-22	6.592E-03	1.097E-02	1.136E-02	NOT IDENT.
NA-24	1.571E+15	5.839E+16	0.000E+00	SHORT HLIF
AL-26	2.024E-03	1.046E-02	1.050E-02	NOT IDENT.
SC-46	-1.327E-02	1.414E-02	1.536E-02	FAIL ABUN
V-48	-1.427E-02	5.803E-02	5.839E-02	NOT IDENT.
CR-51	-7.585E-02	1.876E-01	1.907E-01	NOT IDENT.
MN-54	9.125E-03	1.168E-02	1.238E-02	NOT IDENT.
CO-56	-1.347E-03	1.523E-02	1.524E-02	FAIL ABUN
MN-56	-1.000E+41	1.192E+42	0.000E+00	SHORT HLIF
CO-57	3.054E-03	6.275E-03	6.424E-03	NOT IDENT.
CO-58	-1.216E-02	1.515E-02	1.612E-02	NOT IDENT.
FE-59	1.420E-02	3.616E-02	3.672E-02	NOT IDENT.
CO-60	7.577E-03	1.054E-02	1.108E-02	NOT IDENT.
ZN-65	-6.608E-03	2.933E-02	2.948E-02	NOT IDENT.
GE-68	8.292E-02	3.924E-01	3.942E-01	NOT IDENT.
AS-74	-4.563E-02	7.982E-02	8.243E-02	NOT IDENT.
SE-75	6.191E-03	1.554E-02	1.579E-02	NOT IDENT.
BR-77	6.837E+04	7.703E+04	8.297E+04	SHORT HLIF
SR-82	-1.397E-01	2.884E-01	2.952E-01	NOT IDENT.
RB-83	-1.707E-02	2.657E-02	2.766E-02	NOT IDENT.
KR-85	1.070E+01	2.766E+00	5.561E+00	NOT IDENT.
SR-85	7.256E-02	1.881E-02	3.774E-02	NOT IDENT.
RB-86	1.121E-01	5.525E-01	5.548E-01	NOT IDENT.
Y-88	4.081E-03	1.587E-02	1.598E-02	NOT IDENT.
Y-91	-2.203E+00	7.270E+00	7.337E+00	NOT IDENT.
NB-94	-1.037E-03	1.057E-02	1.058E-02	NOT IDENT.
NB-95	2.039E-02	1.758E-02	1.984E-02	NOT IDENT.
NB-95M	1.304E-01	5.105E-02	7.786E-02	NOT IDENT.
ZR-95	2.323E-02	2.774E-02	2.965E-02	NOT IDENT.
NB-97	1.000E+41	5.754E+40	0.000E+00	SHORT HLIF
ZR-97	3.867E+16	1.009E+16	0.000E+00	SHORT HLIF
MO-99	2.331E+02	1.468E+03	1.472E+03	SHORT HLIF
TC-99M	1.000E+41	8.844E+41	0.000E+00	SHORT HLIF
RH-101	1.139E-02	8.798E-03	1.019E-02	FAIL ABUN
RH-102	8.199E-03	1.708E-02	1.748E-02	FAIL ABUN
RU-103	-5.385E-03	1.884E-02	1.899E-02	FAIL ABUN
RH-106	-3.079E-02	1.159E-01	1.167E-01	NOT IDENT.
RU-106	-3.079E-02	1.159E-01	1.167E-01	NOT IDENT.
AG-108M	-7.197E-03	9.137E-03	9.696E-03	NOT IDENT.
AG-110M	-1.919E-03	1.563E-02	1.565E-02	FAIL ABUN
SN-113	-1.345E-03	1.535E-02	1.536E-02	NOT IDENT.
CD-115	-5.989E+03	5.740E+03	6.343E+03	SHORT HLIF
SN-117M	-5.488E-04	5.226E-02	5.226E-02	NOT IDENT.
TE-123M	2.695E-03	9.248E-03	9.328E-03	NOT IDENT.
SB-124	9.669E-03	3.782E-02	3.807E-02	NOT IDENT.
SB-125	3.754E-03	2.833E-02	2.838E-02	FAIL ABUN
TE-125M	-2.298E+00	3.284E+00	3.444E+00	NOT IDENT.
I-126	1.350E-01	2.367E-01	2.444E-01	NOT IDENT.
SB-126	-2.443E-01	1.915E-01	2.209E-01	NOT IDENT.
SB-127	-2.054E+01	2.843E+01	2.990E+01	SHORT HLIF
I-131	-1.713E-02	2.628E-01	2.629E-01	NOT IDENT.
I-132	1.000E+41	2.782E+41	0.000E+00	SHORT HLIF
TE-132	-9.023E-01	3.241E+01	3.241E+01	SHORT HLIF
BA-133	-2.572E-03	1.359E-02	1.364E-02	FAIL ABUN
I-133	8.709E+10	3.211E+11	3.235E+11	SHORT HLIF
CS-134	1.641E-02	1.710E-02	1.864E-02	FAIL ABUN
I-135	-1.000E+41	1.937E+41	0.000E+00	SHORT HLIF
CS-136	-9.319E-04	1.101E-01	1.101E-01	NOT IDENT.
BA-140	-1.187E-01	3.129E-01	3.175E-01	NOT IDENT.
LA-140	1.280E-02	1.027E-01	1.028E-01	NOT IDENT.
CE-143	3.122E+07	7.016E+06	1.573E+07	SHORT HLIF
CE-144	-2.951E-02	5.578E-02	5.734E-02	NOT IDENT.
PM-144	7.112E-03	1.135E-02	1.179E-02	FAIL ABUN
PR-144	5.381E-01	8.600E-01	8.935E-01	NOT IDENT.
PM-146	-1.886E-03	1.344E-02	1.346E-02	NOT IDENT.
ND-147	7.374E-01	7.598E-01	8.293E-01	FAIL ABUN
PM-147	-1.857E+01	1.702E+02	1.704E+02	NOT IDENT.
PM-149	-1.225E+04	4.256E+04	4.292E+04	SHORT HLIF
EU-150	4.926E-03	8.952E-03	9.223E-03	FAIL ABUN
EU-152	-2.910E-02	3.532E-02	3.768E-02	FAIL ABUN
GD-153	4.521E-02	3.370E-02	3.938E-02	FAIL ABUN
EU-154	1.845E-02	3.071E-02	3.181E-02	NOT IDENT.
TB-160	3.608E-02	4.860E-02	5.125E-02	FAIL ABUN
HO-166M	6.268E-03	1.878E-02	1.899E-02	FAIL ABUN

TM-171	1.397E+00	1.674E+00	1.788E+00	FAIL	ABUN
HF-172	-3.831E-03	5.042E-02	5.045E-02	FAIL	ABUN
LU-172	-9.394E-03	2.227E-02	2.267E-02	FAIL	ABUN
LU-176	-4.875E-03	7.630E-03	7.940E-03	FAIL	ABUN
HF-181	1.035E-02	2.713E-02	2.752E-02	FAIL	ABUN
TA-182	-1.220E-02	5.820E-02	5.846E-02	FAIL	ABUN
RE-183	-3.305E-02	3.089E-02	3.430E-02	NOT	IDENT.
RE-184	-2.412E-02	7.021E-02	7.105E-02	NOT	IDENT.
W-188	1.084E+00	2.833E+00	2.875E+00	FAIL	ABUN
IR-192	-5.367E-03	1.201E-02	1.225E-02	FAIL	ABUN
HG-203	6.870E-03	1.730E-02	1.757E-02	NOT	IDENT.
BI-207	3.885E-03	1.501E-02	1.512E-02	FAIL	ABUN
PB-211	1.938E-02	2.181E-01	2.183E-01	NOT	IDENT.
RN-219	7.934E-03	1.215E-01	1.215E-01	NOT	IDENT.
RA-223	-2.915E-01	1.871E-01	2.286E-01	FAIL	ABUN
AC-227	5.524E-02	6.791E-02	7.234E-02	FAIL	ABUN
TH-227	5.524E-02	6.791E-02	7.234E-02	FAIL	ABUN
TH-231	-2.915E-01	1.871E-01	2.286E-01	FAIL	ABUN
PA-233	6.702E-03	1.739E-02	1.765E-02	FAIL	ABUN
PA-234	9.778E-02	1.484E-01	1.548E-01	FAIL	ABUN
PA-234M	-3.752E-01	1.333E+00	1.344E+00	FAIL	ABUN
NP-237	6.702E-03	1.739E-02	1.765E-02	FAIL	ABUN
NP-238	-9.966E+02	1.430E+04	1.430E+04	SHORT	HLIF
NP-239	-4.889E-03	6.023E-02	6.027E-02	FAIL	ABUN
PU-239	2.297E+02	1.552E+02	1.865E+02	FAIL	ABUN
AM-241	1.871E-02	1.652E-02	1.854E-02	NOT	IDENT.
CM-243	1.051E-02	3.474E-02	3.506E-02	FAIL	ABUN
BK-247	5.970E-03	2.448E-02	2.462E-02	FAIL	ABUN
CM-247	-3.349E-03	1.120E-02	1.130E-02	FAIL	ABUN
CF-249	6.373E-03	1.188E-02	1.222E-02	NOT	IDENT.
CF-251	1.630E-02	3.268E-02	3.350E-02	NOT	IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	873.6176	87.09	870.5366	136.47	762.2077
45.60	832.9122	87.57	871.0591	140.51	0.0000
46.54	884.9641	88.03	871.5552	143.76	778.1227
49.72	0.0000	88.34	871.8903	144.24	802.0881
51.35	932.8021	88.47	872.0316	145.44	694.8287
51.87	957.9641	89.96	873.6318	152.43	726.8789
52.39	934.4540	1093.63	874.3579	153.25	715.4950
52.97	944.0306	91.11	874.8574	323.87	742.0955
53.44	940.9211	92.59	876.4246	156.02	785.5891
54.07	941.9107	93.35	843.2748	158.56	737.7300
57.36	0.0000	94.56	844.4909	159.00	720.5986
57.53	1122.7291	94.65	844.5825	162.33	713.9227
57.98	1164.2830	94.67	844.6014	162.66	714.1224
59.27	1023.5527	94.87	844.8020	163.33	758.2020
59.32	1023.6330	97.43	798.2247	165.86	702.0388
59.54	1023.9865	98.43	785.4924	176.31	685.3401
60.96	1054.3293	98.44	785.5011	176.60	675.5663
61.17	1074.9540	99.53	755.0314	177.52	659.4957
62.93	1182.0800	100.11	776.0663	181.07	0.0000
63.29	1196.4202	102.03	777.7649	181.52	742.9323
63.58	1196.9451	103.18	778.7742	184.41	671.7575
64.28	1207.0222	103.37	758.3346	143.76	703.7991
66.73	1150.0579	105.21	760.9281	193.51	596.5372
67.24	1130.4469	105.31	761.0153	197.03	653.1450
125.81	1181.5842	106.12	775.5475	198.01	673.3749
67.75	1227.3958	106.47	775.8452	201.83	672.2825
69.67	1205.5251	109.28	867.8435	203.43	673.0755
70.83	1231.2477	111.00	781.3463	205.31	658.9515
72.81	1141.0396	111.76	0.0000	210.85	687.2720
72.87	1141.1361	114.06	804.7507	215.65	627.4772
74.66	1188.5068	116.30	0.0000	222.11	610.2187
74.82	1188.7667	116.74	791.3380	227.09	613.2269
74.97	1189.0129	119.76	750.8189	227.38	608.7653
77.11	1192.4644	121.12	749.7648	228.16	0.0000
78.74	1195.0632	121.22	749.8411	228.18	603.5938
79.69	1196.5677	121.78	728.1993	116.74	603.5938
80.12	1197.2426	122.06	717.1464	235.69	645.3723
80.19	1197.3519	122.92	742.0161	235.96	651.6351
80.57	1197.9492	123.07	722.2068	238.63	559.7955
81.00	882.5211	265.00	756.3420	238.98	0.0000
81.07	882.6016	125.81	747.8248	240.99	560.6683
81.75	883.3804	127.23	752.2562	242.00	561.0382
83.79	885.7034	127.91	730.7732	244.70	482.2664
84.00	885.9418	129.30	734.7329	252.40	0.0000
85.43	868.7262	131.20	678.8232	252.80	533.2615
86.55	869.9485	133.02	742.9160	254.15	0.0000
86.79	870.2081	133.52	760.2820	256.23	487.7039
86.94	870.3756	136.00	752.2742	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	463.3491	355.39	0.0000	584.27	229.5913
264.80	446.1649	356.01	352.4565	595.83	276.4284
265.00	469.7083	364.49	352.3046	427.87	250.5037
268.22	497.3054	366.42	0.0000	602.52	0.0000
269.46	475.0270	372.51	348.7183	604.72	275.8318
270.03	475.1932	375.05	344.1661	607.14	259.6053
271.23	499.7928	377.52	351.5703	609.32	245.1705
273.65	476.9143	356.01	331.6060	610.33	245.2523
276.40	468.9196	388.16	329.2773	614.28	175.9453
277.37	469.1919	388.63	323.3286	618.01	207.6311
277.60	469.2524	391.69	343.9079	620.36	173.1641
278.00	459.2225	264.66	330.2133	621.93	218.9376
279.20	489.5530	401.81	334.4304	630.19	0.0000
279.54	489.6539	402.40	345.6404	631.29	204.6246
279.70	496.0168	404.85	348.0565	633.25	221.3623
280.46	486.7581	410.95	341.9324	634.78	207.6324
283.69	453.3090	413.71	349.4758	635.95	205.8685
284.31	468.0674	414.70	311.0128	636.99	212.4056
285.41	459.3335	423.72	319.4266	645.85	213.9636
285.90	0.0000	427.09	297.4225	657.76	195.2814
287.50	491.9560	427.87	309.7946	657.90	0.0000
290.67	432.4485	433.94	327.0334	661.66	177.6561
293.27	0.0000	439.40	291.8488	664.57	0.0000
351.93	454.3057	453.88	294.1424	666.33	177.9278
295.96	454.4971	463.37	269.9500	666.50	177.9356
879.38	455.1755	468.07	267.0154	667.71	0.0000
299.98	493.9021	473.00	0.0000	677.62	183.4469
300.09	493.9335	475.06	273.5888	685.70	0.0000
300.13	469.9622	476.78	262.7631	695.00	217.4084
301.36	446.2967	477.60	266.3337	696.49	210.9160
302.85	403.4451	482.18	278.3454	696.51	210.9206
256.23	382.9874	487.02	290.0812	697.00	215.6612
304.85	375.0513	492.35	0.0000	697.30	209.0870
306.78	444.9848	497.08	265.2952	697.49	216.6357
308.46	444.2246	505.52	267.5988	702.65	225.4775
311.90	372.6653	507.63	0.0000	706.68	218.2074
316.51	407.4840	511.00	288.9961	711.68	195.8397
319.41	403.2844	514.00	252.5964	720.70	209.8050
320.08	412.1545	514.00	252.5964	721.93	0.0000
321.04	399.7587	520.40	256.0625	722.78	192.0381
323.87	484.9169	520.69	0.0000	722.91	192.0463
325.23	415.2513	522.65	0.0000	723.31	183.9324
328.76	426.7506	527.90	0.0000	724.19	169.3264
333.37	449.2861	528.26	257.9049	727.33	154.9581
333.97	400.5758	529.59	234.5825	733.00	202.4341
334.37	400.6609	529.87	0.0000	735.93	142.3394
338.28	394.6320	531.02	203.7722	333.97	159.2534
338.32	394.6370	537.26	263.0747	739.50	0.0000
311.90	356.1971	546.56	0.0000	747.24	162.5916
340.48	356.1971	552.55	265.6697	748.06	168.3730
340.55	364.3803	563.25	248.3618	752.31	181.0404
344.28	430.2420	569.33	234.8485	753.82	170.5797
345.93	452.2397	946.00	234.8644	756.73	156.3410
351.06	412.3586	569.70	222.9739	756.80	156.3443
351.93	374.7397	583.19	229.5037	884.68	168.0730

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	150.0300	1274.44	129.8965	1620.50	41.7334
766.42	143.4596	1001.03	136.1902	1621.92	44.7253
766.84	153.3728	1002.74	117.8076	1678.03	0.0000
772.60	0.0000	1004.73	125.0381	1690.97	50.2651
776.52	196.8115	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	34.5846
778.90	185.3633	1028.54	0.0000	1063.66	40.9800
783.70	0.0000	1037.84	118.7996	1771.35	35.6409
785.37	160.1757	1038.76	0.0000	1791.20	0.0000
792.07	151.1821	631.29	113.8672	1808.65	35.8484
794.95	161.2821	1048.07	124.2627	1810.72	0.0000
795.86	181.2840	1049.04	125.3278	1836.06	34.1998
810.06	168.5194	1050.41	124.3311		
810.29	175.3491	1063.66	113.2844		
344.28	180.2275	1077.00	112.5879		
810.76	178.2977	1077.34	111.4593		
815.77	149.2771	1085.87	111.0257		
1048.07	166.9678	1093.63	123.7822		
832.01	154.8594	1099.45	103.7373		
834.85	154.0007	1112.07	115.2902		
835.71	165.8092	1112.84	126.1182		
836.80	0.0000	1115.54	113.5767		
846.75	0.0000	1120.29	102.1152		
846.77	166.3147	1120.55	111.8993		
856.80	150.5600	1221.41	104.6961		
860.56	161.0136	1129.67	117.3851		
871.09	143.6400	1131.51	0.0000		
873.19	146.6962	1147.95	0.0000		
875.33	0.0000	1173.23	103.3072		
879.38	123.1120	1177.95	107.6742		
880.51	139.0373	1189.05	123.9627		
883.24	133.1767	1204.77	109.3628		
884.68	139.1911	1221.41	114.0483		
889.28	152.3027	1231.02	94.2554		
894.76	126.6047	1235.36	94.3408		
898.04	147.6658	1238.28	103.6523		
900.72	145.2750	1260.41	0.0000		
903.28	150.7221	1271.87	84.7983		
911.20	133.8721	1274.44	73.6547		
912.08	137.3354	1274.54	73.6575		
923.98	0.0000	1291.59	86.0703		
926.50	139.3804	1298.22	0.0000		
929.11	139.6651	1312.11	63.8781		
937.49	95.0358	1332.49	62.2479		
944.13	112.5054	1362.66	0.0000		
946.00	106.0638	1365.19	61.6947		
949.00	110.9107	1368.63	0.0000		
667.71	0.0000	1384.29	53.3457		
962.31	116.4976	1408.01	73.6807		
964.08	106.5466	1457.56	0.0000		
966.17	106.6022	1460.82	73.4368		
911.20	99.2749	1489.16	62.1585		
968.97	99.2749	1505.03	79.8665		
983.53	128.4738	1584.12	60.4874		
984.45	0.0000	1596.21	45.0255		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 03:56:01.67

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561386.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;250
Background date  : 20-JUN-2016 14:04:06
Sample date      : 7-JUN-2016 00:00:00. Acquisition date : 24-JUN-2016 15:52:42
Sample ID        : G1203561386. Sample quantity : 1.73990E+02 GRAM
Detector name     : GAM28. Detector geometry: CAN
Elapsed live time : 0 12:00:00.00. Elapsed real time: 0 12:00:02.17 0.0%
Energy tolerance  : 1.50000 keV. Analyst Initials : MXR1
Abundance limit   : 75.00000. Sensitivity : 3.00000
Batch ID          : 1572236. Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.72*	2	429	0.89	93.49	90	7	4.17E-05	*****	
2	6	61.62	36	167	0.86	123.30	122	10	8.27E-04	50.3	2.88E+00
3	0	93.11*	110	814	1.40	186.33	181	13	2.54E-03	73.9	
4	5	139.90*	154	411	1.97	279.98	275	20	3.56E-03	31.5	2.88E+00
5	5	144.00*	45	547	1.97	288.18	275	20	1.05E-03	142.0	
6	0	198.33*	51	463	1.18	396.93	393	9	1.18E-03	103.9	
7	0	338.13	54	211	0.89	676.75	674	7	1.25E-03	46.6	
8	0	351.72*	56	340	2.55	703.93	698	12	1.31E-03	79.8	
9	0	383.61	36	270	3.56	767.77	763	11	8.22E-04	91.1	
10	0	481.62	40	136	1.15	963.94	961	8	9.22E-04	52.9	
11	0	497.57	29	131	0.95	995.86	991	8	6.73E-04	70.8	
12	0	569.91*	47	159	2.18	1140.64	1135	12	1.09E-03	73.2	
13	0	584.72*	27	237	2.33	1170.30	1160	18	6.19E-04	170.2	
14	0	610.01	81	263	0.64	1220.90	1213	14	1.88E-03	43.6	
15	0	726.87	39	122	2.12	1454.79	1451	14	8.92E-04	62.4	
16	0	768.38	93	174	4.30	1537.89	1531	19	2.15E-03	35.4	
17	0	803.07*	5	123	1.73	1607.32	1600	12	1.10E-04	665.2	
18	1	951.97	35	27	1.72	1905.33	1902	15	8.00E-04	27.8	1.43E+00
19	1	955.61	36	36	2.06	1912.62	1902	15	8.28E-04	38.2	
20	0	968.99*	8	75	1.01	1939.40	1934	12	1.80E-04	321.5	
21	0	1121.32	37	79	2.12	2244.29	2236	12	8.64E-04	50.8	
22	1	1187.52	23	21	1.80	2376.80	2374	16	5.26E-04	35.7	1.44E+00
23	1	1191.32	25	56	2.20	2384.40	2374	16	5.75E-04	59.2	
24	0	1242.43	19	89	5.85	2486.70	2472	18	4.43E-04	118.4	
25	0	1461.62*	61	63	2.11	2925.39	2917	20	1.42E-03	46.7	
26	0	1471.32	26	41	4.60	2944.81	2936	14	5.97E-04	56.8	
27	0	1497.97	16	20	1.84	2998.14	2993	12	3.65E-04	63.1	
28	0	1596.76	16	27	1.57	3195.87	3189	12	3.74E-04	71.5	
29	3	1617.05	26	9	2.92	3236.48	3230	22	5.90E-04	35.9	5.83E-01
30	3	1621.50	26	11	2.92	3245.39	3230	22	6.12E-04	31.4	
31	0	1667.19	19	26	1.23	3336.84	3329	13	4.48E-04	58.8	
32	0	1673.69	17	32	5.90	3349.84	3341	16	3.96E-04	77.7	
33	0	1764.56*	26	16	3.35	3531.72	3523	16	6.08E-04	68.1	
34	0	1780.52	14	31	3.82	3563.67	3554	14	3.23E-04	89.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1907.70	20	10	0.61	3818.22	3812	12	4.69E-04	40.1	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 03:56:03

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561386.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 24-JUN-2016 15:52:42
Sample ID	: G1203561386	Sample quantity	: 173.99 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA28	Detector geometry	: CAN
Elapsed live time	: 0 12:00:00.00	Elapsed real time	: 0 12:00:02.17 0.0%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	60	10.66*	1.247E+00	1.628E-01	1.628E-01	93.40
RU-103	497.08	33	91.00*	2.965E+00	4.410E-03	6.051E-03	141.67
	610.33	90	5.76	2.543E+00	2.215E-01	3.039E-01	87.28
CE-141	145.44	60	48.29*	6.477E+00	6.869E-03	1.006E-02	283.91
PB-210	46.54	3	4.25*	9.311E-01	2.438E-02	2.441E-02	5432.91
BI-211	72.87	-----	1.23	4.205E+00	-----	Line Not Found	-----
	351.06	67	12.92*	3.831E+00	4.880E-02	4.880E-02	159.69
BI-212	727.33	42	6.67*	2.222E+00	1.012E-01	1.012E-01	124.77
	785.37	-----	1.10	2.090E+00	-----	Line Not Found	-----
	1620.50	25	1.47	1.143E+00	5.452E-01	5.452E-01	62.85
BI-214	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
RN-222	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
RA-226	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
TH-230	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
U-234	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561386.CNF;1
Acquisition date : 24-JUN-2016 15:52:42 Sensitivity : 3.000
Detector ID : GAM28 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:02.17 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561386 Sample Quantity : 1.7399E+02 GRAM
Batch Number : 1572236 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 27-JUL-2015 07:57:17 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.628E-01	1.490E-01	9.523E-02
RU-103	6.051E-03	8.401E-03	1.260E-02
CE-141	1.006E-02	2.800E-02	1.799E-02
PB-210	2.441E-02	1.300E+00	1.012E+00
BI-211	4.880E-02	7.637E-02	5.973E-02
BI-212	1.012E-01	1.237E-01	1.278E-01
BI-214	2.805E-02	2.399E-02	2.310E-02
RN-222	2.805E-02	2.399E-02	2.310E-02
RA-226	2.805E-02	2.399E-02	2.310E-02
TH-230	2.805E-02	2.399E-02	2.310E-02
U-234	2.805E-02	2.399E-02	2.310E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-2.771E-02	6.497E-02	1.027E-01	NOT IDENT.
NA-22	-2.875E-04	6.057E-03	1.098E-02	NOT IDENT.
NA-24	0.000E+00	2.515E+06	0.000E+00	SHORT HLIF
AL-26	2.401E-03	5.353E-03	1.051E-02	NOT IDENT.
SC-46	-3.883E-03	5.964E-03	1.070E-02	FAIL ABUN
V-48	4.107E-03	1.217E-02	2.303E-02	NOT IDENT.
CR-51	-4.571E-02	6.732E-02	1.192E-01	NOT IDENT.
MN-54	1.698E-03	6.505E-03	1.176E-02	NOT IDENT.
CO-56	-5.710E-03	7.042E-03	1.192E-02	NOT IDENT.
MN-56	0.000E+00	1.247E+41	0.000E+00	SHORT HLIF
CO-57	8.875E-04	3.708E-03	7.295E-03	NOT IDENT.
CO-58	-7.263E-03	6.176E-03	1.021E-02	NOT IDENT.
FE-59	3.596E-03	1.342E-02	2.513E-02	NOT IDENT.
CO-60	2.880E-03	6.431E-03	1.202E-02	NOT IDENT.
ZN-65	1.084E-02	1.286E-02	2.224E-02	NOT IDENT.
GE-68	1.903E-01	1.879E-01	3.687E-01	NOT IDENT.
AS-73	9.189E-02	1.315E-01	2.587E-01	NOT IDENT.
AS-74	-9.536E-03	1.902E-02	3.402E-02	NOT IDENT.
SE-75	-3.672E-03	7.399E-03	1.342E-02	NOT IDENT.

BR-77	-1.052E+00	5.074E+00	6.684E+00	NOT IDENT.
SR-82	-1.762E-02	6.260E-02	9.508E-02	NOT IDENT.
RB-83	-4.026E-03	1.158E-02	2.119E-02	NOT IDENT.
KR-85	-7.854E+00	1.967E+00	3.194E+00	NOT IDENT.
SR-85	-4.301E-02	1.073E-02	1.742E-02	NOT IDENT.
RB-86	1.260E-01	1.290E-01	2.529E-01	NOT IDENT.
Y-88	-2.069E-03	7.238E-03	1.298E-02	NOT IDENT.
Y-91	7.080E-01	2.483E+00	4.682E+00	NOT IDENT.
NB-94	2.829E-03	6.018E-03	1.112E-02	NOT IDENT.
NB-95	8.298E-03	7.283E-03	1.248E-02	NOT IDENT.
NB-95M	-5.807E-02	2.063E-02	3.474E-02	NOT IDENT.
ZR-95	5.216E-03	1.100E-02	2.056E-02	NOT IDENT.
NB-97	0.000E+00	3.963E+00	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	7.008E+06	0.000E+00	SHORT HLIF
MO-99	-1.041E+00	3.920E+00	6.985E+00	FAIL ABUN
TC-99M	0.000E+00	2.264E+19	0.000E+00	SHORT HLIF
RH-101	-3.421E-03	4.540E-03	8.636E-03	FAIL ABUN
RH-102	3.361E-03	9.021E-03	1.685E-02	NOT IDENT.
RH-106	3.543E-02	5.311E-02	1.006E-01	NOT IDENT.
RU-106	3.543E-02	5.311E-02	1.006E-01	NOT IDENT.
AG-108M	5.902E-04	4.711E-03	8.934E-03	NOT IDENT.
CD-109	-1.103E-02	1.287E-01	2.112E-01	NOT IDENT.
AG-110M	1.104E-03	7.471E-03	1.411E-02	NOT IDENT.
SN-113	4.338E-03	7.566E-03	1.396E-02	NOT IDENT.
CD-115	2.757E+00	4.359E+00	8.355E+00	NOT IDENT.
SN-117M	-2.646E-03	9.067E-03	1.723E-02	NOT IDENT.
TE-123M	-2.550E-03	4.161E-03	7.823E-03	NOT IDENT.
SB-124	-1.242E-03	1.497E-02	2.772E-02	NOT IDENT.
SB-125	-1.704E-02	2.124E-02	2.787E-02	NOT IDENT.
TE-125M	-2.978E-01	1.426E+00	2.789E+00	NOT IDENT.
I-126	-8.888E-02	4.674E-02	7.654E-02	NOT IDENT.
SB-126	1.640E-02	2.929E-02	5.012E-02	NOT IDENT.
SN-126	-1.251E-02	1.287E-02	2.028E-02	NOT IDENT.
SB-127	-8.140E-02	3.530E-01	6.341E-01	NOT IDENT.
I-131	-2.922E-02	2.540E-02	4.341E-02	NOT IDENT.
I-132	0.000E+00	1.636E+41	0.000E+00	SHORT HLIF
TE-132	-5.100E-02	2.103E-01	3.892E-01	NOT IDENT.
BA-133	1.026E-03	7.820E-03	1.245E-02	FAIL ABUN
I-133	0.000E+00	8.638E+03	0.000E+00	SHORT HLIF
CS-134	-2.578E-04	8.175E-03	1.161E-02	FAIL ABUN
CS-135	-8.406E-03	2.433E-02	4.434E-02	NOT IDENT.
I-135	0.000E+00	8.746E+17	0.000E+00	SHORT HLIF
CS-136	-2.025E-03	1.849E-02	3.383E-02	NOT IDENT.
BA-137M	-1.729E-03	9.477E-03	1.292E-02	NOT IDENT.
CS-137	-1.826E-03	1.001E-02	1.365E-02	NOT IDENT.
CE-139	-3.959E-03	4.571E-03	8.494E-03	NOT IDENT.
BA-140	-1.854E-02	5.041E-02	9.186E-02	NOT IDENT.
LA-140	1.344E-02	1.883E-02	2.962E-02	FAIL ABUN
CE-143	0.000E+00	7.938E+01	0.000E+00	SHORT HLIF
CE-144	1.631E-02	2.959E-02	5.661E-02	NOT IDENT.
PM-144	2.987E-03	6.517E-03	1.201E-02	NOT IDENT.
PR-144	2.219E-01	4.884E-01	8.995E-01	NOT IDENT.
PM-146	2.071E-03	6.638E-03	1.266E-02	NOT IDENT.
ND-147	-2.233E-02	1.074E-01	1.976E-01	NOT IDENT.
PM-147	-3.204E+01	1.067E+02	2.066E+02	NOT IDENT.
PM-149	9.852E+00	3.399E+01	6.329E+01	NOT IDENT.
EU-150	-2.467E-04	5.165E-03	8.165E-03	FAIL ABUN
EU-152	-1.308E-02	1.539E-02	2.684E-02	NOT IDENT.
GD-153	4.134E-03	1.402E-02	2.331E-02	NOT IDENT.
EU-154	-1.846E-03	1.705E-02	3.078E-02	NOT IDENT.
EU-155	4.832E-03	1.465E-02	2.919E-02	NOT IDENT.
TB-160	1.663E-03	2.201E-02	3.950E-02	FAIL ABUN
HO-166M	3.806E-03	1.048E-02	1.932E-02	NOT IDENT.
TM-171	1.854E+00	2.684E+00	5.290E+00	NOT IDENT.
HF-172	1.685E-02	2.743E-02	5.443E-02	FAIL ABUN
LU-172	8.234E-03	8.795E-03	1.730E-02	FAIL ABUN
LU-176	3.707E-03	4.444E-03	8.391E-03	NOT IDENT.
HF-181	8.973E-03	9.305E-03	1.431E-02	FAIL ABUN
TA-182	-6.772E-03	2.527E-02	4.510E-02	FAIL ABUN
RE-183	-1.121E-03	2.994E-02	5.446E-02	NOT IDENT.
RE-184	-2.600E-02	2.721E-02	3.541E-02	NOT IDENT.
W-188	-5.208E-01	1.186E+00	2.140E+00	NOT IDENT.
IR-192	6.344E-05	6.134E-03	1.118E-02	NOT IDENT.
HG-203	3.965E-03	6.272E-03	1.184E-02	NOT IDENT.
BI-207	5.720E-03	7.671E-03	1.483E-02	FAIL ABUN
TL-208	-5.482E-03	1.017E-02	1.212E-02	NOT IDENT.
PB-211	-6.932E-03	1.166E-01	2.201E-01	NOT IDENT.
PB-212	-2.771E-03	1.448E-02	1.910E-02	NOT IDENT.

PB-214	1.771E-02	2.772E-02	2.471E-02	FAIL ABUN
RN-219	2.212E-02	6.581E-02	1.263E-01	NOT IDENT.
RA-223	-9.765E-03	1.049E-01	1.904E-01	FAIL ABUN
RA-224	2.223E-02	9.844E-02	1.842E-01	NOT IDENT.
AC-227	1.114E-02	4.037E-02	7.556E-02	NOT IDENT.
TH-227	1.114E-02	4.037E-02	7.556E-02	NOT IDENT.
AC-228	-4.897E-02	4.069E-02	4.294E-02	FAIL ABUN
RA-228	-4.897E-02	4.069E-02	4.294E-02	FAIL ABUN
TH-228	-2.771E-03	1.448E-02	1.910E-02	NOT IDENT.
TH-229	2.460E-03	9.188E-02	1.526E-01	NOT IDENT.
PA-231	8.518E-03	7.865E-02	1.445E-01	NOT IDENT.
TH-231	-9.765E-03	1.049E-01	1.904E-01	FAIL ABUN
TH-232	-4.897E-02	4.069E-02	4.294E-02	FAIL ABUN
PA-233	-3.142E-03	1.117E-02	2.015E-02	NOT IDENT.
PA-234	3.272E-02	4.478E-02	8.025E-02	FAIL ABUN
PA-234M	-4.023E-01	1.080E+00	1.455E+00	NOT IDENT.
TH-234	-3.417E-01	3.045E-01	4.220E-01	FAIL ABUN
U-235	3.027E-02	8.421E-02	6.056E-02	FAIL ABUN
NP-237	-3.142E-03	1.117E-02	2.015E-02	NOT IDENT.
NP-238	-1.680E+00	7.828E+00	1.430E+01	NOT IDENT.
U-238	-3.417E-01	3.045E-01	4.220E-01	FAIL ABUN
NP-239	-7.013E-03	3.801E-02	7.406E-02	NOT IDENT.
PU-239	-1.763E+01	4.817E+01	9.265E+01	NOT IDENT.
AM-241	5.927E-03	2.344E-02	4.041E-02	NOT IDENT.
AM-243	5.011E-03	7.572E-03	1.451E-02	NOT IDENT.
CM-243	2.634E-03	1.581E-02	2.925E-02	NOT IDENT.
BK-247	-9.463E-03	1.300E-02	2.336E-02	NOT IDENT.
CM-247	1.263E-03	6.073E-03	1.159E-02	NOT IDENT.
CF-249	-7.330E-04	7.781E-03	1.211E-02	NOT IDENT.
CF-251	-6.403E-03	1.938E-02	3.646E-02	NOT IDENT.
ANH-511	-2.268E-02	1.607E-02	2.090E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	60	10.66*	1.247E+00	1.628E-01	1.628E-01	93.40
RU-103	497.08	33	91.00*	2.965E+00	4.410E-03	6.051E-03	141.67
	610.33	90	5.76	2.543E+00	2.215E-01	3.039E-01	87.28
CE-141	145.44	60	48.29*	6.477E+00	6.869E-03	1.006E-02	283.91
PB-210	46.54	3	4.25*	9.311E-01	2.438E-02	2.441E-02	5432.91
BI-211	72.87	-----	1.23	4.205E+00	-----	Line Not Found	-----
	351.06	67	12.92*	3.831E+00	4.880E-02	4.880E-02	159.69
BI-212	727.33	42	6.67*	2.222E+00	1.012E-01	1.012E-01	124.77
	785.37	-----	1.10	2.090E+00	-----	Line Not Found	-----
	1620.50	25	1.47	1.143E+00	5.452E-01	5.452E-01	62.85
BI-214	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
RN-222	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
RA-226	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
TH-230	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24
U-234	609.32	90	45.49*	2.543E+00	2.805E-02	2.805E-02	87.28
	1120.29	38	14.92	1.562E+00	5.865E-02	5.865E-02	101.52
	1764.49	25	15.30	1.066E+00	5.505E-02	5.505E-02	136.24

Flag: "*" = Keyline

Total number of lines in spectrum 35
Number of unidentified lines 12
Number of lines tentatively identified by NID 23 65.71%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.628E-01	1.628E-01	1.521E-01	93.40	
RU-103	39.26D	1.37	4.410E-03	6.051E-03	8.572E-03	141.67	
CE-141	32.51D	1.47	6.869E-03	1.006E-02	2.857E-02	283.91	
PB-210	22.20Y	1.00	2.438E-02	2.441E-02	132.6E-02	5432.91	
BI-211	7.04E+08Y	1.00	4.880E-02	4.880E-02	7.793E-02	159.69	
BI-212	1.41E+10Y	1.00	1.012E-01	1.012E-01	1.262E-01	124.77	
BI-214	1600.00Y	1.00	2.805E-02	2.805E-02	2.448E-02	87.28	
RN-222	1600.00Y	1.00	2.805E-02	2.805E-02	2.448E-02	87.28	
RA-226	1600.00Y	1.00	2.805E-02	2.805E-02	2.448E-02	87.28	
TH-230	7.54E+04Y	1.00	2.805E-02	2.805E-02	2.448E-02	87.28	
U-234	2.45E+05Y	1.00	2.805E-02	2.805E-02	2.448E-02	87.28	
Total Activity :			4.887E-01	4.936E-01			

Grand Total Activity : 4.887E-01 4.936E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	61.62	52	241	0.86	123.30	122	10	8.27E-04	****	2.81E+00	T
0	93.11	152	1129	1.40	186.33	181	13	2.54E-03	****	5.85E+00	T
5	139.90	204	545	1.97	279.98	275	20	3.56E-03	63.0	6.52E+00	T
0	198.33	65	590	1.18	396.93	393	9	1.18E-03	****	5.65E+00	T
0	338.13	65	252	0.89	676.75	674	7	1.25E-03	93.2	3.94E+00	T
0	383.61	42	317	3.56	767.77	763	11	8.22E-04	****	3.59E+00	T
0	481.62	46	156	1.15	963.94	961	8	9.22E-04	****	3.04E+00	T
0	569.91	53	178	2.18	1140.64	1135	12	1.09E-03	****	2.68E+00	T
0	584.72	30	264	2.33	1170.30	1160	18	6.19E-04	****	2.63E+00	T
0	768.38	100	187	4.30	1537.89	1531	19	2.15E-03	70.7	2.13E+00	
0	803.07	5	131	1.73	1607.32	1600	12	1.10E-04	****	2.05E+00	T
1	951.97	36	29	1.72	1905.33	1902	15	8.00E-04	55.5	1.79E+00	
1	955.61	37	37	2.06	1912.62	1902	15	8.28E-04	76.5	1.78E+00	T
0	968.99	8	78	1.01	1939.40	1934	12	1.80E-04	****	1.76E+00	T
1	1187.52	23	21	1.80	2376.80	2374	16	5.26E-04	71.3	1.49E+00	
1	1191.32	25	56	2.20	2384.40	2374	16	5.75E-04	****	1.48E+00	
0	1242.43	19	89	5.85	2486.70	2472	18	4.43E-04	****	1.43E+00	
0	1471.32	25	40	4.60	2944.81	2936	14	5.97E-04	****	1.24E+00	
0	1497.97	15	20	1.84	2998.14	2993	12	3.65E-04	****	1.22E+00	
0	1596.76	16	26	1.57	3195.87	3189	12	3.74E-04	****	1.16E+00	T
3	1617.05	25	9	2.92	3236.48	3230	22	5.90E-04	71.8	1.15E+00	
0	1667.19	19	25	1.23	3336.84	3329	13	4.48E-04	****	1.12E+00	
0	1673.69	16	31	5.90	3349.84	3341	16	3.96E-04	****	1.11E+00	
0	1780.52	13	30	3.82	3563.67	3554	14	3.23E-04	****	1.06E+00	
0	1907.70	19	9	0.61	3818.22	3812	12	4.69E-04	80.2	1.00E+00	

Flags: "T" = Tentatively associated


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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561386.CNF;1
* Acquisition date   : 24-JUN-2016 15:52:42 Sensitivity      : 3.000
* Detector ID        : GAM28 Energy tolerance: 1.500
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 12:00:02.17 Half life ratio : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203561386 Analyst initials: MXR1
* Batch Number       : 1572236 Sample Quantity : 1.7399E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                                     Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 27-JUL-2015 07:57:17 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	4.392E-02
RU-103	6.042E-03
CE-141	8.751E-03
PB-210	4.922E-01
BI-211	2.884E-02
BI-212	6.051E-02
BI-214	1.112E-02
RN-222	1.112E-02
RA-226	1.112E-02
TH-230	1.112E-02
U-234	1.112E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	4.934E-02	NOT IDENT.
NA-22	5.135E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	4.790E-03	NOT IDENT.
SC-46	5.046E-03	FAIL ABUN
V-48	1.090E-02	NOT IDENT.
CR-51	5.761E-02	NOT IDENT.
MN-54	5.620E-03	NOT IDENT.
CO-56	5.664E-03	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	3.550E-03	NOT IDENT.
CO-58	4.813E-03	NOT IDENT.
FE-59	1.184E-02	NOT IDENT.
CO-60	5.645E-03	NOT IDENT.
ZN-65	1.047E-02	NOT IDENT.
GE-68	1.744E-01	NOT IDENT.
AS-73	1.258E-01	NOT IDENT.
AS-74	1.635E-02	NOT IDENT.
SE-75	6.501E-03	NOT IDENT.
BR-77	3.260E+00	NOT IDENT.

SR-82	4.497E-02	NOT IDENT.
RB-83	1.014E-02	NOT IDENT.
KR-85	1.557E+00	NOT IDENT.
SR-85	8.489E-03	NOT IDENT.
RB-86	1.195E-01	NOT IDENT.
Y-88	5.959E-03	NOT IDENT.
Y-91	2.181E+00	NOT IDENT.
NB-94	5.339E-03	NOT IDENT.
NB-95	5.954E-03	NOT IDENT.
NB-95M	1.687E-02	NOT IDENT.
ZR-95	9.760E-03	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	3.320E+00	FAIL ABUN
TC-99M	0.000E+00	SHORT HLIF
RH-101	4.200E-03	FAIL ABUN
RH-102	8.061E-03	NOT IDENT.
RH-106	4.822E-02	NOT IDENT.
RU-106	4.822E-02	NOT IDENT.
AG-108M	4.296E-03	NOT IDENT.
CD-109	1.030E-01	NOT IDENT.
AG-110M	6.675E-03	NOT IDENT.
SN-113	6.731E-03	NOT IDENT.
CD-115	4.007E+00	NOT IDENT.
SN-117M	8.376E-03	NOT IDENT.
TE-123M	3.802E-03	NOT IDENT.
SB-124	1.272E-02	NOT IDENT.
SB-125	1.341E-02	NOT IDENT.
TE-125M	1.357E+00	NOT IDENT.
I-126	3.659E-02	NOT IDENT.
SB-126	2.392E-02	NOT IDENT.
SN-126	9.881E-03	NOT IDENT.
SB-127	3.023E-01	NOT IDENT.
I-131	2.092E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.891E-01	NOT IDENT.
BA-133	6.007E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	5.517E-03	FAIL ABUN
CS-135	2.148E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	1.595E-02	NOT IDENT.
BA-137M	6.228E-03	NOT IDENT.
CS-137	6.580E-03	NOT IDENT.
CE-139	4.132E-03	NOT IDENT.
BA-140	4.397E-02	NOT IDENT.
LA-140	1.364E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	2.755E-02	NOT IDENT.
PM-144	5.777E-03	NOT IDENT.
PR-144	4.328E-01	NOT IDENT.
PM-146	6.083E-03	NOT IDENT.
ND-147	9.459E-02	NOT IDENT.
PM-147	1.004E+02	NOT IDENT.
PM-149	3.062E+01	NOT IDENT.
EU-150	3.949E-03	FAIL ABUN
EU-152	1.293E-02	NOT IDENT.
GD-153	1.134E-02	NOT IDENT.
EU-154	1.438E-02	NOT IDENT.
EU-155	1.420E-02	NOT IDENT.
TB-160	1.872E-02	FAIL ABUN
HO-166M	9.252E-03	NOT IDENT.
TM-171	2.571E+00	NOT IDENT.
HF-172	2.650E-02	FAIL ABUN
LU-172	8.147E-03	FAIL ABUN
LU-176	4.066E-03	NOT IDENT.
HF-181	6.877E-03	FAIL ABUN
TA-182	2.115E-02	FAIL ABUN
RE-183	2.642E-02	NOT IDENT.
RE-184	1.671E-02	NOT IDENT.
W-188	1.035E+00	NOT IDENT.
IR-192	5.414E-03	NOT IDENT.
HG-203	5.736E-03	NOT IDENT.
BI-207	7.006E-03	FAIL ABUN
TL-208	5.834E-03	NOT IDENT.
PB-211	1.062E-01	NOT IDENT.
PB-212	9.315E-03	NOT IDENT.
PB-214	1.198E-02	FAIL ABUN

RN-219	6.092E-02	NOT IDENT.
RA-223	9.203E-02	FAIL ABUN
RA-224	8.958E-02	NOT IDENT.
AC-227	3.665E-02	NOT IDENT.
TH-227	3.665E-02	NOT IDENT.
AC-228	2.043E-02	FAIL ABUN
RA-228	2.043E-02	FAIL ABUN
TH-228	9.315E-03	NOT IDENT.
TH-229	7.427E-02	NOT IDENT.
PA-231	7.000E-02	NOT IDENT.
TH-231	9.203E-02	FAIL ABUN
TH-232	2.043E-02	FAIL ABUN
PA-233	9.757E-03	NOT IDENT.
PA-234	3.782E-02	FAIL ABUN
PA-234M	6.934E-01	NOT IDENT.
TH-234	2.062E-01	FAIL ABUN
U-235	2.954E-02	FAIL ABUN
NP-237	9.757E-03	NOT IDENT.
NP-238	6.753E+00	NOT IDENT.
U-238	2.062E-01	FAIL ABUN
NP-239	3.602E-02	NOT IDENT.
PU-239	4.506E+01	NOT IDENT.
AM-241	1.961E-02	NOT IDENT.
AM-243	7.075E-03	NOT IDENT.
CM-243	1.422E-02	NOT IDENT.
BK-247	1.131E-02	NOT IDENT.
CM-247	5.592E-03	NOT IDENT.
CF-249	5.836E-03	NOT IDENT.
CF-251	1.773E-02	NOT IDENT.
ANH-511	1.028E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561386.CNF;1
Acquisition date : 24-JUN-2016 15:52:42 Sensitivity : 3.000
Detector ID : GAM28 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:02.17 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561386 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.7399E+02 GRAM
Quantity Err(%) : 1.1495E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 27-JUL-2015 07:57:17 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.628E-01	1.498E-01	1.498E-01
RU-103	6.051E-03	8.417E-03	8.417E-03
CE-141	1.006E-02	2.801E-02	2.801E-02
PB-210	2.441E-02	1.300E+00	1.300E+00
BI-211	4.880E-02	7.647E-02	7.647E-02
BI-212	1.012E-01	1.241E-01	1.241E-01
BI-214	2.805E-02	2.410E-02	2.410E-02
RN-222	2.805E-02	2.410E-02	2.410E-02
RA-226	2.805E-02	2.410E-02	2.410E-02
TH-230	2.805E-02	2.410E-02	2.410E-02
U-234	2.805E-02	2.410E-02	2.410E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-2.771E-02	6.501E-02	6.619E-02	NOT IDENT.
NA-22	-2.875E-04	6.057E-03	6.059E-03	NOT IDENT.
NA-24	-6.259E+05	2.516E+06	2.531E+06	SHORT HLIF
AL-26	2.401E-03	5.356E-03	5.465E-03	NOT IDENT.
SC-46	-3.883E-03	5.984E-03	6.235E-03	FAIL ABUN
V-48	4.107E-03	1.219E-02	1.233E-02	NOT IDENT.
CR-51	-4.571E-02	6.741E-02	7.049E-02	NOT IDENT.
MN-54	1.698E-03	6.507E-03	6.552E-03	NOT IDENT.
CO-56	-5.710E-03	7.074E-03	7.528E-03	NOT IDENT.
MN-56	-1.000E+41	1.253E+41	0.000E+00	SHORT HLIF
CO-57	8.875E-04	3.709E-03	3.730E-03	NOT IDENT.
CO-58	-7.263E-03	6.228E-03	7.036E-03	NOT IDENT.
FE-59	3.596E-03	1.344E-02	1.353E-02	NOT IDENT.
CO-60	2.880E-03	6.436E-03	6.566E-03	NOT IDENT.
ZN-65	1.084E-02	1.303E-02	1.391E-02	NOT IDENT.
GE-68	1.903E-01	1.910E-01	2.094E-01	NOT IDENT.
AS-73	9.189E-02	1.329E-01	1.392E-01	NOT IDENT.
AS-74	-9.536E-03	1.905E-02	1.953E-02	NOT IDENT.
SE-75	-3.672E-03	7.404E-03	7.587E-03	NOT IDENT.

BR-77	-1.052E+00	5.103E+00	5.125E+00	NOT IDENT.
SR-82	-1.762E-02	6.263E-02	6.313E-02	NOT IDENT.
RB-83	-4.026E-03	1.160E-02	1.174E-02	NOT IDENT.
KR-85	-7.854E+00	2.071E+00	4.102E+00	NOT IDENT.
SR-85	-4.301E-02	1.130E-02	2.244E-02	NOT IDENT.
RB-86	1.260E-01	1.310E-01	1.428E-01	NOT IDENT.
Y-88	-2.069E-03	7.240E-03	7.300E-03	NOT IDENT.
Y-91	7.080E-01	2.484E+00	2.505E+00	NOT IDENT.
NB-94	2.829E-03	6.023E-03	6.157E-03	NOT IDENT.
NB-95	8.298E-03	7.331E-03	8.231E-03	NOT IDENT.
NB-95M	-5.807E-02	2.140E-02	3.381E-02	NOT IDENT.
ZR-95	5.216E-03	1.101E-02	1.126E-02	NOT IDENT.
NB-97	-1.000E+41	4.044E+40	0.000E+00	SHORT HLIF
ZR-97	-3.910E+07	7.715E+06	1.924E+07	SHORT HLIF
MO-99	-1.041E+00	3.921E+00	3.949E+00	FAIL ABUN
TC-99M	3.665E+19	2.301E+19	0.000E+00	SHORT HLIF
RH-101	-3.421E-03	4.584E-03	4.837E-03	FAIL ABUN
RH-102	3.361E-03	9.029E-03	9.155E-03	NOT IDENT.
RH-106	3.543E-02	5.321E-02	5.556E-02	NOT IDENT.
RU-106	3.543E-02	5.321E-02	5.556E-02	NOT IDENT.
AG-108M	5.902E-04	4.711E-03	4.718E-03	NOT IDENT.
CD-109	-1.103E-02	1.287E-01	1.288E-01	NOT IDENT.
AG-110M	1.104E-03	7.472E-03	7.489E-03	NOT IDENT.
SN-113	4.338E-03	7.574E-03	7.822E-03	NOT IDENT.
CD-115	2.757E+00	4.367E+00	4.540E+00	NOT IDENT.
SN-117M	-2.646E-03	9.069E-03	9.147E-03	NOT IDENT.
TE-123M	-2.550E-03	4.165E-03	4.321E-03	NOT IDENT.
SB-124	-1.242E-03	1.497E-02	1.498E-02	NOT IDENT.
SB-125	-1.704E-02	2.129E-02	2.263E-02	NOT IDENT.
TE-125M	-2.978E-01	1.426E+00	1.433E+00	NOT IDENT.
I-126	-8.888E-02	4.744E-02	6.210E-02	NOT IDENT.
SB-126	1.640E-02	2.936E-02	3.028E-02	NOT IDENT.
SN-126	-1.251E-02	1.291E-02	1.409E-02	NOT IDENT.
SB-127	-8.140E-02	3.531E-01	3.550E-01	NOT IDENT.
I-131	-2.922E-02	2.551E-02	2.871E-02	NOT IDENT.
I-132	-1.000E+41	1.971E+41	0.000E+00	SHORT HLIF
TE-132	-5.100E-02	2.104E-01	2.116E-01	NOT IDENT.
BA-133	1.026E-03	7.820E-03	7.834E-03	FAIL ABUN
I-133	3.578E+03	8.653E+03	8.802E+03	SHORT HLIF
CS-134	-2.578E-04	8.175E-03	8.176E-03	FAIL ABUN
CS-135	-8.406E-03	2.435E-02	2.464E-02	NOT IDENT.
I-135	-1.537E+18	1.085E+18	0.000E+00	SHORT HLIF
CS-136	-2.025E-03	1.849E-02	1.852E-02	NOT IDENT.
BA-137M	-1.729E-03	9.478E-03	9.510E-03	NOT IDENT.
CS-137	-1.826E-03	1.001E-02	1.005E-02	NOT IDENT.
CE-139	-3.959E-03	4.645E-03	4.976E-03	NOT IDENT.
BA-140	-1.854E-02	5.043E-02	5.112E-02	NOT IDENT.
LA-140	1.344E-02	1.886E-02	1.981E-02	FAIL ABUN
CE-143	6.084E-01	7.938E+01	7.938E+01	SHORT HLIF
CE-144	1.631E-02	2.962E-02	3.052E-02	NOT IDENT.
PM-144	2.987E-03	6.523E-03	6.660E-03	NOT IDENT.
PR-144	2.219E-01	4.888E-01	4.989E-01	NOT IDENT.
PM-146	2.071E-03	6.642E-03	6.707E-03	NOT IDENT.
ND-147	-2.233E-02	1.074E-01	1.079E-01	NOT IDENT.
PM-147	-3.204E+01	1.067E+02	1.077E+02	NOT IDENT.
PM-149	9.852E+00	3.402E+01	3.431E+01	NOT IDENT.
EU-150	-2.467E-04	5.165E-03	5.167E-03	FAIL ABUN
EU-152	-1.308E-02	1.543E-02	1.652E-02	NOT IDENT.
GD-153	4.134E-03	1.402E-02	1.414E-02	NOT IDENT.
EU-154	-1.846E-03	1.705E-02	1.707E-02	NOT IDENT.
EU-155	4.832E-03	1.465E-02	1.481E-02	NOT IDENT.
TB-160	1.663E-03	2.201E-02	2.202E-02	FAIL ABUN
HO-166M	3.806E-03	1.049E-02	1.063E-02	NOT IDENT.
TM-171	1.854E+00	2.689E+00	2.816E+00	NOT IDENT.
HF-172	1.685E-02	2.758E-02	2.861E-02	FAIL ABUN
LU-172	8.234E-03	8.957E-03	9.696E-03	FAIL ABUN
LU-176	3.707E-03	4.454E-03	4.757E-03	NOT IDENT.
HF-181	8.973E-03	9.335E-03	1.017E-02	FAIL ABUN
TA-182	-6.772E-03	2.527E-02	2.546E-02	FAIL ABUN
RE-183	-1.121E-03	2.994E-02	2.995E-02	NOT IDENT.
RE-184	-2.600E-02	2.747E-02	2.987E-02	NOT IDENT.
W-188	-5.208E-01	1.188E+00	1.211E+00	NOT IDENT.
IR-192	6.344E-05	6.134E-03	6.134E-03	NOT IDENT.
HG-203	3.965E-03	6.279E-03	6.529E-03	NOT IDENT.
BI-207	5.720E-03	7.736E-03	8.155E-03	FAIL ABUN
TL-208	-5.482E-03	1.018E-02	1.048E-02	NOT IDENT.
PB-211	-6.932E-03	1.166E-01	1.167E-01	NOT IDENT.
PB-212	-2.771E-03	1.448E-02	1.454E-02	NOT IDENT.

PB-214	1.771E-02	2.775E-02	2.888E-02	FAIL ABUN
RN-219	2.212E-02	6.589E-02	6.664E-02	NOT IDENT.
RA-223	-9.765E-03	1.049E-01	1.050E-01	FAIL ABUN
RA-224	2.223E-02	9.845E-02	9.896E-02	NOT IDENT.
AC-227	1.114E-02	4.040E-02	4.071E-02	NOT IDENT.
TH-227	1.114E-02	4.040E-02	4.071E-02	NOT IDENT.
AC-228	-4.897E-02	4.123E-02	4.677E-02	FAIL ABUN
RA-228	-4.897E-02	4.123E-02	4.677E-02	FAIL ABUN
TH-228	-2.771E-03	1.448E-02	1.454E-02	NOT IDENT.
TH-229	2.460E-03	9.188E-02	9.189E-02	NOT IDENT.
PA-231	8.518E-03	7.867E-02	7.877E-02	NOT IDENT.
TH-231	-9.765E-03	1.049E-01	1.050E-01	FAIL ABUN
TH-232	-4.897E-02	4.123E-02	4.677E-02	FAIL ABUN
PA-233	-3.142E-03	1.118E-02	1.127E-02	NOT IDENT.
PA-234	3.272E-02	5.854E-02	6.037E-02	FAIL ABUN
PA-234M	-4.023E-01	1.082E+00	1.097E+00	NOT IDENT.
TH-234	-3.417E-01	3.140E-01	3.498E-01	FAIL ABUN
U-235	3.027E-02	8.424E-02	8.533E-02	FAIL ABUN
NP-237	-3.142E-03	1.118E-02	1.127E-02	NOT IDENT.
NP-238	-1.680E+00	7.832E+00	7.868E+00	NOT IDENT.
U-238	-3.417E-01	3.140E-01	3.498E-01	FAIL ABUN
NP-239	-7.013E-03	3.801E-02	3.815E-02	NOT IDENT.
PU-239	-1.763E+01	4.818E+01	4.883E+01	NOT IDENT.
AM-241	5.927E-03	2.344E-02	2.359E-02	NOT IDENT.
AM-243	5.011E-03	7.582E-03	7.911E-03	NOT IDENT.
CM-243	2.634E-03	1.581E-02	1.585E-02	NOT IDENT.
BK-247	-9.463E-03	1.315E-02	1.383E-02	NOT IDENT.
CM-247	1.263E-03	6.078E-03	6.104E-03	NOT IDENT.
CF-249	-7.330E-04	7.782E-03	7.789E-03	NOT IDENT.
CF-251	-6.403E-03	1.940E-02	1.961E-02	NOT IDENT.
ANH-511	-2.268E-02	1.617E-02	1.913E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	395.4496	87.09	531.5583	136.47	410.1684
45.60	383.3285	87.57	540.4952	140.51	381.3513
46.54	403.0928	88.03	494.8267	143.76	382.8113
49.72	396.5931	88.34	495.0723	144.24	383.0239
51.35	418.2362	88.47	438.8266	145.44	413.0615
51.87	374.0895	89.96	539.1400	152.43	418.2220
52.39	358.5647	1093.63	493.4586	153.25	432.5601
52.97	352.6345	91.11	462.9604	323.87	427.4340
53.44	368.9968	92.59	436.5334	156.02	404.9645
54.07	351.3522	93.35	437.0489	158.56	415.4539
57.36	0.0000	94.56	437.8647	159.00	425.0119
57.53	360.4221	94.65	437.9248	162.33	402.1186
57.98	350.2068	94.67	437.9384	162.66	398.5028
59.27	348.2309	94.87	438.0721	163.33	375.2741
59.32	348.2670	97.43	396.4922	165.86	467.7662
59.54	341.9429	98.43	376.2799	176.31	423.2891
60.96	365.6894	98.44	376.2865	176.60	427.2256
61.17	365.8447	99.53	373.7711	177.52	425.7165
62.93	410.1070	100.11	358.1001	181.07	409.0368
63.29	410.3998	102.03	409.0858	181.52	503.1384
63.58	410.6352	103.18	394.6362	184.41	416.1586
64.28	431.9246	103.37	394.7448	143.76	414.7724
66.73	438.9126	105.21	395.7931	193.51	425.0813
67.24	483.7681	105.31	395.8500	197.03	424.9462
125.81	446.2944	106.12	394.5534	198.01	437.8002
67.75	446.3544	106.47	404.4002	201.83	409.6565
69.67	422.0738	109.28	431.5445	203.43	421.2221
70.83	456.1133	111.00	417.5685	205.31	420.5786
72.81	481.0427	111.76	421.5419	210.85	394.1223
72.87	474.4446	114.06	404.2533	215.65	431.4395
74.66	458.1815	116.30	426.8170	222.11	440.8538
74.82	458.3114	116.74	419.9519	227.09	354.7969
74.97	476.2362	119.76	406.4511	227.38	373.8773
77.11	492.5586	121.12	421.4949	228.16	403.1353
78.74	436.8298	121.22	421.5506	228.18	403.1445
79.69	491.3955	121.78	434.3972	116.74	403.1445
80.12	498.4928	122.06	414.8427	235.69	543.6172
80.19	498.5538	122.92	418.8934	235.96	543.7368
80.57	470.7868	123.07	428.8441	238.63	378.4332
81.00	437.3975	265.00	426.4878	238.98	378.5420
81.07	450.9435	125.81	406.9455	240.99	402.4227
81.75	482.9850	127.23	450.0687	242.00	514.0694
83.79	438.3175	127.91	431.5008	244.70	351.9189
84.00	416.9981	129.30	433.1555	252.40	355.1181
85.43	478.0168	131.20	413.3370	252.80	358.2946
86.55	506.1259	133.02	412.4455	254.15	0.0000
86.79	506.3233	133.52	404.1275	256.23	330.6048
86.94	526.8876	136.00	409.9369	260.90	335.9214

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	350.2878	355.39	0.0000	584.27	171.7103
264.80	350.3293	356.01	244.0034	595.83	221.1544
265.00	350.3812	364.49	284.5417	427.87	217.6312
268.22	333.6803	366.42	225.2510	602.52	0.0000
269.46	315.3829	372.51	254.8965	604.72	260.4784
270.03	293.7937	375.05	234.1973	607.14	244.1387
271.23	324.0899	377.52	246.0280	609.32	216.4331
273.65	325.7146	356.01	245.4657	610.33	191.2455
276.40	320.1487	388.16	243.4022	614.28	171.5703
277.37	298.5350	388.63	238.0979	618.01	186.1862
277.60	294.4261	391.69	219.6910	620.36	171.3382
278.00	303.8785	264.66	229.8393	621.93	152.3971
279.20	294.7715	401.81	233.5995	630.19	0.0000
279.54	292.7655	402.40	239.0920	631.29	147.9510
279.70	305.3037	404.85	246.6498	633.25	157.1350
280.46	292.9627	410.95	242.9666	634.78	162.2696
283.69	302.0177	413.71	230.6309	635.95	153.2728
284.31	296.9268	414.70	237.1143	636.99	146.2744
285.41	291.9334	423.72	240.1255	645.85	123.5131
285.90	281.5683	427.09	215.8686	657.76	227.8500
287.50	267.2255	427.87	224.1965	657.90	0.0000
290.67	313.0009	433.94	202.9008	661.66	123.2688
293.27	0.0000	439.40	199.8111	664.57	0.0000
351.93	315.0733	453.88	187.4221	666.33	231.6774
295.96	307.8618	463.37	203.2626	666.50	231.6941
879.38	350.6831	468.07	198.1418	667.71	0.0000
299.98	316.1363	473.00	194.8908	677.62	152.7395
300.09	316.1591	475.06	197.9078	685.70	147.0428
300.13	316.1682	476.78	211.2204	695.00	172.3329
301.36	315.3836	477.60	219.1345	696.49	196.1741
302.85	308.2950	482.18	199.5548	696.51	196.1787
256.23	337.2879	487.02	204.4368	697.00	212.7393
304.85	345.8577	492.35	176.5928	697.30	210.6937
306.78	282.5804	497.08	182.0602	697.49	213.8074
308.46	323.3247	505.52	619.8168	702.65	176.9700
311.90	321.9533	507.63	0.0000	706.68	178.2736
316.51	305.8519	511.00	221.4677	711.68	155.7605
319.41	291.4529	514.00	763.8146	720.70	126.5128
320.08	313.0214	514.00	763.8146	721.93	0.0000
321.04	290.6956	520.40	178.3484	722.78	123.3804
323.87	283.7227	520.69	180.2891	722.91	137.2889
325.23	266.7695	522.65	0.0000	723.31	137.3114
328.76	261.9992	527.90	159.7304	724.19	137.3531
333.37	318.3793	528.26	158.7964	727.33	106.1816
333.97	287.3449	529.59	160.8190	733.00	115.1213
334.37	275.2998	529.87	0.0000	735.93	106.0752
338.28	266.8854	531.02	172.4885	333.97	116.3549
338.32	266.8891	537.26	179.7516	739.50	131.1279
311.90	236.4063	546.56	0.0000	747.24	120.9746
340.48	236.4063	552.55	147.9180	748.06	131.5308
340.55	236.4162	563.25	129.9087	752.31	106.4396
344.28	261.3757	569.33	148.0471	753.82	111.7684
345.93	228.5080	946.00	148.0582	756.73	103.4383
351.06	257.0313	569.70	148.0692	756.80	103.4407
351.93	257.1711	583.19	171.6296	884.68	109.3477

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	104.1239	1274.44	111.9958	1620.50	40.4745
766.42	114.7365	1001.03	94.0915	1621.92	39.5449
766.84	112.9896	1002.74	89.3815	1678.03	0.0000
772.60	0.0000	1004.73	113.2185	1690.97	42.9299
776.52	111.6010	507.63	0.0000	1750.46	0.0000
739.50	106.3379	1025.87	87.0963	1764.49	33.8452
778.90	111.1023	1028.54	84.2868	1063.66	30.4926
783.70	91.6333	1037.84	82.5846	1771.35	20.3320
785.37	101.2808	1038.76	0.0000	1791.20	0.0000
792.07	104.7208	631.29	100.1110	1808.65	28.2657
794.95	101.6147	1048.07	94.3752	1810.72	0.0000
795.86	105.2114	1049.04	84.7666	1836.06	47.0106
810.06	120.6498	1050.41	80.9443		
810.29	120.6608	1063.66	79.3040		
344.28	124.7283	1077.00	74.7379		
810.76	123.6671	1077.34	75.7148		
815.77	113.1031	1085.87	72.9706		
1048.07	105.6586	1093.63	65.3206		
832.01	136.4559	1099.45	81.0446		
834.85	145.2572	1112.07	78.3756		
835.71	119.2732	1112.84	77.9020		
836.80	0.0000	1115.54	62.1975		
846.75	0.0000	1120.29	70.6904		
846.77	146.9114	1120.55	63.9633		
856.80	116.8196	1221.41	60.6094		
860.56	126.7985	1129.67	56.1001		
871.09	120.6455	1131.51	0.0000		
873.19	118.5311	1147.95	0.0000		
875.33	0.0000	1173.23	60.7096		
879.38	107.7665	1177.95	84.6956		
880.51	110.0049	1189.05	78.9357		
883.24	97.2551	1204.77	56.1709		
884.68	99.1340	1221.41	82.5872		
889.28	108.4692	1231.02	79.6080		
894.76	117.8620	1235.36	72.7617		
898.04	107.8451	1238.28	73.8228		
900.72	106.0882	1260.41	0.0000		
903.28	116.3280	1271.87	75.4363		
911.20	99.0281	1274.44	70.3813		
912.08	98.1285	1274.54	70.3842		
923.98	108.7068	1291.59	65.5443		
926.50	92.0532	1298.22	0.0000		
929.11	111.6675	1312.11	47.3346		
937.49	87.6928	1332.49	68.2317		
944.13	77.5862	1362.66	0.0000		
946.00	70.1462	1365.19	58.3219		
949.00	96.2863	1368.63	0.0000		
667.71	0.0000	1384.29	61.7056		
962.31	90.2227	1408.01	65.1812		
964.08	95.1054	1457.56	0.0000		
966.17	77.4208	1460.82	47.3916		
911.20	84.7485	1489.16	46.6726		
968.97	84.7485	1505.03	44.1512		
983.53	93.6182	1584.12	43.9264		
984.45	103.1034	1596.21	55.2734		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 21:40:03.32

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561387.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM22.CNF;465
Background date  : 20-JUN-2016 14:40:04
Sample date      : 17-MAY-2016 14:30:00 Acquisition date : 25-JUN-2016 09:39:24
Sample ID        : G1203561387 Sample quantity : 1.55570E+02 GRAM
Detector name     : GAM22 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:06.09 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572236 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	3	45.17	89	532	0.84	90.62	89	10	2.06E-03	35.2	1.47E+00
2	3	47.01*	138	1562	1.54	94.30	89	10	3.19E-03	57.2	
3	0	53.82*	69	1551	0.88	107.91	104	8	1.59E-03	111.5	
4	0	63.40*	261	2161	1.32	127.07	123	9	6.04E-03	38.2	
5	2	74.89*	1557	2444	1.45	150.05	143	18	3.60E-02	7.0	3.18E+00
6	2	77.22*	2420	2027	1.30	154.70	143	18	5.60E-02	4.1	
7	3	84.29*	265	2423	1.61	168.85	163	29	6.13E-03	37.5	8.21E-01
8	3	87.37*	1040	2077	1.53	175.01	163	29	2.41E-02	9.1	
9	3	90.03*	596	1522	1.09	180.33	163	29	1.38E-02	13.2	
10	3	92.82*	935	2030	1.62	185.92	163	29	2.16E-02	12.7	
11	0	98.96	270	1627	1.98	198.18	194	9	6.26E-03	27.6	
12	0	105.63	211	1418	2.27	211.54	208	8	4.89E-03	31.6	
13	0	129.48	214	1790	1.37	259.22	255	9	4.96E-03	36.3	
14	0	144.12*	58	1472	0.99	288.51	285	8	1.35E-03	130.5	
15	0	185.98*	907	1915	1.76	372.23	367	12	2.10E-02	12.0	
16	0	209.47	431	1829	1.00	419.21	413	11	9.99E-03	19.8	
17	4	238.78*	5899	1084	1.54	477.82	468	25	1.37E-01	1.9	2.34E+00
18	4	241.83	1336	1341	2.09	483.93	468	25	3.09E-02	8.0	
19	0	270.19	474	1261	1.60	540.63	535	12	1.10E-02	15.7	
20	0	277.41	160	875	1.02	555.08	551	8	3.71E-03	32.9	
21	1	295.35*	1628	939	1.69	590.96	583	24	3.77E-02	4.8	1.75E+00
22	1	300.26	387	1057	1.83	600.77	583	24	8.95E-03	17.0	
23	0	328.23	177	1008	1.41	656.73	652	10	4.10E-03	34.3	
24	0	338.52*	1343	1213	1.58	677.29	670	15	3.11E-02	6.9	
25	0	352.05*	2803	956	1.81	704.35	698	13	6.49E-02	3.2	
26	0	409.66	175	583	1.60	819.57	816	9	4.06E-03	25.9	
27	0	462.98	437	663	1.58	926.22	920	13	1.01E-02	13.0	
28	0	511.08*	443	1260	2.55	1022.42	1012	24	1.03E-02	27.3	
29	0	562.54	61	464	1.80	1125.33	1122	10	1.42E-03	67.0	
30	0	575.07	39	579	3.80	1150.38	1141	12	9.03E-04	125.9	
31	0	583.34*	1968	837	2.03	1166.94	1158	19	4.55E-02	4.5	
32	0	609.55*	2236	845	2.17	1219.35	1210	18	5.18E-02	3.9	
33	0	662.38	167	773	1.56	1325.01	1315	17	3.86E-03	39.0	
34	0	694.28	16	431	0.60	1388.80	1387	10	3.67E-04	248.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	727.51	544	552	2.27	1455.26	1448	18	1.26E-02	11.0	
36	0	754.73	148	475	1.14	1509.71	1502	17	3.42E-03	34.8	
37	0	768.24	150	434	2.22	1536.73	1532	11	3.47E-03	28.1	
38	0	773.54	83	389	1.89	1547.33	1542	12	1.91E-03	49.5	
39	0	786.23	103	396	2.06	1572.70	1566	12	2.38E-03	40.1	
40	0	795.00	231	384	2.24	1590.24	1583	14	5.35E-03	19.2	
41	0	835.84	106	381	1.86	1671.93	1667	12	2.46E-03	37.9	
42	0	840.65	43	350	1.18	1681.55	1678	10	1.00E-03	82.8	
43	0	861.08	261	391	2.54	1722.41	1716	15	6.05E-03	17.7	
44	0	911.35*	1483	466	2.73	1822.94	1813	19	3.43E-02	4.7	
45	0	952.83	21	338	0.58	1905.90	1900	15	4.95E-04	189.5	
46	4	965.19	347	503	3.73	1930.63	1921	28	8.03E-03	16.7	1.20E+00
47	4	969.37	795	365	2.26	1938.99	1921	28	1.84E-02	6.5	
48	0	1002.43*	66	385	3.53	2005.10	1996	20	1.52E-03	84.2	
49	0	1053.76	69	186	2.18	2107.76	2103	10	1.60E-03	38.7	
50	0	1093.87	70	397	7.56	2187.99	2171	21	1.63E-03	72.0	
51	0	1120.80	589	550	2.95	2241.84	2229	29	1.36E-02	12.2	
52	0	1157.53	109	391	6.66	2315.32	2305	21	2.52E-03	46.6	
53	0	1237.71	190	390	2.07	2475.68	2467	19	4.39E-03	26.0	
54	0	1267.45	54	193	3.20	2535.15	2529	14	1.25E-03	56.4	
55	0	1377.72*	130	288	2.83	2755.69	2745	25	3.00E-03	38.7	
56	0	1460.82*	3886	215	3.41	2921.90	2908	25	8.99E-02	2.0	
57	0	1589.11	211	202	6.40	3178.48	3166	27	4.88E-03	17.3	
58	0	1730.52	106	161	3.39	3461.32	3448	23	2.46E-03	28.0	
59	0	1764.77	461	185	3.58	3529.81	3515	31	1.07E-02	8.7	
60	0	1812.45	22	52	2.43	3625.19	3619	12	5.01E-04	61.7	
61	1	1846.86	53	108	3.23	3694.00	3678	34	1.23E-03	43.0	1.57E+00
62	1	1849.86	46	101	3.55	3700.01	3678	34	1.07E-03	53.5	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 21:40:05

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561387.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 17-MAY-2016 14:30:00 Acquisition date : 25-JUN-2016 09:39:24
Sample ID         : G1203561387 Sample quantity  : 155.57 GRAM
Sample type       : SOLID Sample geometry      :
Detector name     : GAMMA22 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:06.09 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.908E+00	7.436E+00	7.436E+00	4.01	OK
MN-54	834.85	99.98*	3.001E+00	1.471E-02	1.604E-02	75.72	OK
AS-73	53.44	10.30*	2.053E+00	1.759E-01	2.464E-01	222.98	OK
CD-109	88.03	3.70*	7.021E+00	1.460E+00	1.548E+00	26.14	OK
SN-126	64.28	9.60	3.747E+00	3.875E-01	3.875E-01	76.47	OK
	86.94	8.90	7.021E+00	6.068E-01	6.068E-01	26.14	OK
	87.57	37.00*	7.021E+00	1.460E-01	1.460E-01	26.14	OK
BA-137M	661.66	89.90*	3.624E+00	2.178E-02	2.184E-02	78.02	OK
CS-137	661.66	85.10*	3.624E+00	2.301E-02	2.307E-02	78.02	OK
EU-155	86.55	30.70	7.021E+00	1.759E-01	1.787E-01	26.14	OK
	105.31	21.10*	8.094E+00	6.313E-02	6.412E-02	63.21	OK
TL-208	277.37	6.60	6.289E+00	1.801E-01	1.801E-01	65.78	OK
	583.19	85.00*	3.985E+00	2.508E-01	2.508E-01	8.96	OK
	860.56	12.50	2.926E+00	2.954E-01	2.954E-01	35.32	OK
PB-210	46.54	4.25*	1.025E+00	1.732E+00	1.737E+00	114.34	OK
BI-212	727.33	6.67*	3.366E+00	1.022E+00	1.022E+00	22.07	OK
	785.37	1.10	3.159E+00	1.238E+00	1.238E+00	80.25	OK
	1620.50	1.47	1.801E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	5.595E+00	1.045E+00	1.045E+00	19.40	OK
	77.11	17.10	5.909E+00	1.258E+00	1.258E+00	8.29	OK
	238.63	43.60*	6.804E+00	9.403E-01	9.403E-01	3.89	OK
	300.09	3.30	6.024E+00	8.989E-01	8.989E-01	33.97	OK
BI-214	609.32	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86	OK
	1120.29	14.92	2.333E+00	6.794E-01	6.795E-01	24.32	OK
	1764.49	15.30	1.744E+00	6.568E-01	6.569E-01	17.40	OK
PB-214	74.82	5.80	5.585E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	5.909E+00	2.217E+00	2.217E+00	8.29	OK
	87.09	3.41	6.996E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	6.758E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	6.079E+00	6.731E-01	6.731E-01	9.51	OK
	351.93	35.60*	5.508E+00	6.503E-01	6.504E-01	6.33	OK
RN-222	609.32	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86	OK
	1120.29	14.92	2.333E+00	6.794E-01	6.795E-01	24.32	OK
	1764.49	15.30	1.744E+00	6.568E-01	6.569E-01	17.40	OK
RA-224	240.99	4.10*	6.760E+00	1.086E+00	1.086E+00	35.08	OK
RA-226	609.32	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86	OK
	1120.29	14.92	2.333E+00	6.794E-01	6.795E-01	24.32	OK
	1764.49	15.30	1.744E+00	6.568E-01	6.569E-01	17.40	OK
AC-228	105.21	1.10	8.094E+00	1.211E+00	1.211E+00	63.21	OK
	338.32	11.27	5.633E+00	9.664E-01	9.664E-01	13.88	OK
	794.95	4.25	3.130E+00	7.246E-01	7.246E-01	38.36	OK
	835.71	1.61	3.001E+00	9.135E-01	9.135E-01	75.72	OK
	911.20	25.80*	2.787E+00	8.479E-01	8.479E-01	9.47	OK
	968.97	15.80	2.643E+00	7.777E-01	7.777E-01	12.92	OK
RA-228	105.21	1.10	8.094E+00	1.211E+00	1.211E+00	63.21	OK
	338.32	11.27	5.633E+00	9.664E-01	9.664E-01	13.88	OK
	794.95	4.25	3.130E+00	7.246E-01	7.246E-01	38.36	OK
	835.71	1.61	3.001E+00	9.135E-01	9.135E-01	75.72	OK
	911.20	25.80*	2.787E+00	8.479E-01	8.479E-01	9.47	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	2.643E+00	7.777E-01	7.777E-01	12.92	OK
	74.82	10.28	5.595E+00	1.045E+00	1.045E+00	19.40	OK
	77.11	17.10	5.909E+00	1.258E+00	1.258E+00	8.29	OK
	238.63	43.60*	6.804E+00	9.403E-01	9.403E-01	3.89	OK
TH-229	300.09	3.30	6.024E+00	8.989E-01	8.989E-01	33.97	OK
	85.43	14.70	6.729E+00	1.395E-01	1.395E-01	75.10	OK
	88.47	24.00	7.021E+00	2.250E-01	2.250E-01	26.14	OK
	193.51	4.41*	7.524E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	7.257E+00	1.017E+00	1.017E+00	39.61	OK
	609.32	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86	OK
	1120.29	14.92	2.333E+00	6.794E-01	6.794E-01	24.32	OK
	1764.49	15.30	1.744E+00	6.568E-01	6.568E-01	17.40	OK
PA-231	283.69	1.70	6.214E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	6.024E+00	5.545E-01	5.545E-01	33.97	OK
	105.21	1.10	8.094E+00	1.211E+00	1.211E+00	63.21	OK
	338.32	11.27	5.633E+00	9.664E-01	9.664E-01	13.88	OK
	835.71	1.61	3.001E+00	9.135E-01	9.135E-01	75.72	OK
TH-234	911.20	25.80*	2.787E+00	8.479E-01	8.479E-01	9.47	OK
	968.97	15.80	2.643E+00	7.777E-01	7.777E-01	12.92	OK
	63.29	3.70*	3.747E+00	1.005E+00	1.005E+00	76.47	OK
	92.59	4.23	7.452E+00	1.532E+00	1.532E+00	25.43	OK
U-234	609.32	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86	OK
	1120.29	14.92	2.333E+00	6.794E-01	6.794E-01	24.32	OK
	1764.49	15.30	1.744E+00	6.568E-01	6.568E-01	17.40	OK
	89.96	3.47	7.245E+00	1.228E+00	1.228E+00	26.43	OK
U-235	93.35	5.60	7.452E+00	1.157E+00	1.157E+00	25.43	OK
	143.76	10.96*	8.301E+00	3.176E-02	3.176E-02	261.06	OK
	163.33	5.08	8.034E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	7.653E+00	1.003E-01	1.003E-01	23.91	OK
U-238	205.31	5.01	7.326E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.747E+00	1.005E+00	1.005E+00	76.47	OK
	92.59	4.23	7.452E+00	1.532E+00	1.532E+00	25.43	OK
	43.53	5.90	6.275E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	5.595E+00	1.599E-01	1.599E-01	19.40	OK
ANH-511	511.00	100.00*	4.370E+00	4.439E-02	4.439E-02	54.65	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561387.CNF;1
Acquisition date : 25-JUN-2016 09:39:24 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.09 Half life ratio : *****
Sample date : 17-MAY-2016 14:30:00 Analyst initials: MXR1
Sample ID : G1203561387 Sample Quantity : 1.5557E+02 GRAM
Batch Number : 1572236 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	7.436E+00	2.920E-01	1.326E-01
MN-54	1.604E-02	1.191E-02	1.453E-02
AS-73	2.464E-01	5.383E-01	5.330E-01
CD-109	1.548E+00	3.964E-01	3.451E-01
SN-126	1.460E-01	3.738E-02	3.271E-02
BA-137M	2.184E-02	1.670E-02	1.397E-02
CS-137	2.307E-02	1.764E-02	1.476E-02
EU-155	6.412E-02	3.972E-02	4.826E-02
TL-208	2.508E-01	2.202E-02	1.373E-02
PB-210	1.737E+00	1.947E+00	1.834E+00
BI-212	1.022E+00	2.210E-01	1.959E-01
PB-212	9.403E-01	3.586E-02	2.375E-02
BI-214	5.472E-01	4.216E-02	2.990E-02
PB-214	6.504E-01	4.037E-02	3.026E-02
RN-222	5.472E-01	4.216E-02	2.990E-02
RA-224	1.086E+00	3.733E-01	2.542E-01
RA-226	5.472E-01	4.216E-02	2.990E-02
AC-228	8.479E-01	7.868E-02	5.206E-02
RA-228	8.479E-01	7.868E-02	5.206E-02
TH-228	9.403E-01	3.586E-02	2.375E-02
TH-229	-7.196E-02	1.349E-01	2.398E-01
TH-230	5.472E-01	4.215E-02	2.990E-02
PA-231	5.545E-01	1.846E-01	1.984E-01
TH-232	8.479E-01	7.868E-02	5.206E-02
TH-234	1.005E+00	7.535E-01	6.406E-01
U-234	5.472E-01	4.215E-02	2.990E-02
U-235	3.176E-02	8.126E-02	9.079E-02
U-238	1.005E+00	7.535E-01	6.406E-01
AM-243	1.599E-01	3.041E-02	2.528E-02
ANH-511	4.439E-02	2.377E-02	1.177E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	1.542E-02	1.010E-01	1.805E-01	NOT IDENT.
NA-22	-1.209E-02	1.167E-02	1.599E-02	NOT IDENT.
NA-24	0.000E+00	6.046E+16	0.000E+00	SHORT HLIF
AL-26	-6.232E-05	8.168E-03	1.234E-02	NOT IDENT.
SC-46	-6.450E-03	1.100E-02	1.874E-02	FAIL ABUN
V-48	-9.341E-03	4.355E-02	7.699E-02	NOT IDENT.
CR-51	3.507E-02	1.633E-01	2.896E-01	NOT IDENT.
CO-56	5.145E-03	1.580E-02	2.004E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-4.839E-03	6.885E-03	1.232E-02	NOT IDENT.
CO-58	-1.437E-02	1.088E-02	1.825E-02	NOT IDENT.
FE-59	-7.154E-03	3.303E-02	4.873E-02	NOT IDENT.
CO-60	4.263E-03	8.605E-03	1.563E-02	NOT IDENT.
ZN-65	2.671E-02	2.486E-02	3.893E-02	NOT IDENT.
GE-68	-1.771E-01	3.068E-01	5.204E-01	NOT IDENT.
AS-74	-1.699E-02	5.780E-02	9.967E-02	NOT IDENT.
SE-75	-6.561E-03	1.439E-02	2.204E-02	NOT IDENT.
BR-77	0.000E+00	5.969E+03	0.000E+00	SHORT HLIF
SR-82	8.789E-02	1.833E-01	2.572E-01	NOT IDENT.
RB-83	8.960E-03	2.318E-02	3.559E-02	NOT IDENT.
KR-85	0.000E+00	2.121E+00	4.516E+00	NOT IDENT.
SR-85	0.000E+00	1.445E-02	3.076E-02	NOT IDENT.
RB-86	-2.551E-01	4.344E-01	7.496E-01	NOT IDENT.
Y-88	-2.034E-03	1.126E-02	1.668E-02	NOT IDENT.
Y-91	-5.784E+00	6.206E+00	1.042E+01	NOT IDENT.
NB-94	4.662E-03	9.070E-03	1.454E-02	NOT IDENT.
NB-95	0.000E+00	1.501E-02	2.423E-02	NOT IDENT.
NB-95M	0.000E+00	4.899E-02	9.015E-02	NOT IDENT.
ZR-95	1.509E-02	2.475E-02	3.833E-02	NOT IDENT.
NB-97	0.000E+00	1.081E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	8.770E+15	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.184E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	7.870E-03	9.703E-03	1.560E-02	NOT IDENT.
RH-102	-3.132E-03	1.263E-02	2.257E-02	FAIL ABUN
RU-103	-7.775E-03	1.373E-02	2.398E-02	FAIL ABUN
RH-106	-4.554E-03	7.731E-02	1.390E-01	NOT IDENT.
RU-106	-4.554E-03	7.731E-02	1.390E-01	NOT IDENT.
AG-108M	-1.108E-03	6.684E-03	1.196E-02	NOT IDENT.
AG-110M	5.221E-03	1.187E-02	2.099E-02	NOT IDENT.
SN-113	-1.464E-03	1.186E-02	2.145E-02	NOT IDENT.
CD-115	0.000E+00	4.417E+03	0.000E+00	SHORT HLIF
SN-117M	-2.205E-02	4.749E-02	8.342E-02	NOT IDENT.
TE-123M	-7.367E-03	8.384E-03	1.461E-02	NOT IDENT.
SB-124	4.436E-03	2.272E-02	4.042E-02	NOT IDENT.
SB-125	4.489E-03	2.103E-02	3.804E-02	FAIL ABUN
TE-125M	-3.399E+00	3.798E+00	5.950E+00	NOT IDENT.
I-126	2.111E-01	2.057E-01	3.281E-01	FAIL ABUN
SB-126	1.742E-02	1.465E-01	2.231E-01	FAIL ABUN
SB-127	0.000E+00	2.165E+01	0.000E+00	SHORT HLIF
I-131	-5.489E-02	2.056E-01	3.732E-01	NOT IDENT.
I-132	0.000E+00	1.070E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.226E+01	0.000E+00	SHORT HLIF
BA-133	1.644E-02	1.110E-02	1.832E-02	FAIL ABUN
I-133	0.000E+00	2.635E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.404E-02	1.899E-02	FAIL ABUN
CS-135	0.000E+00	4.439E-02	7.464E-02	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-2.301E-02	9.538E-02	1.415E-01	NOT IDENT.
CE-139	7.821E-03	8.140E-03	1.543E-02	NOT IDENT.
BA-140	1.070E-01	2.238E-01	3.993E-01	NOT IDENT.
LA-140	-1.072E-02	8.446E-02	1.238E-01	FAIL ABUN
CE-141	1.657E-02	4.240E-02	4.875E-02	FAIL ABUN
CE-143	0.000E+00	6.677E+06	0.000E+00	SHORT HLIF
CE-144	3.097E-02	6.096E-02	9.702E-02	NOT IDENT.
PM-144	5.974E-03	8.467E-03	1.535E-02	NOT IDENT.
PR-144	4.538E-01	6.417E-01	1.163E+00	NOT IDENT.
PM-146	3.156E-03	9.942E-03	1.755E-02	NOT IDENT.
ND-147	-4.713E-01	5.724E-01	9.849E-01	FAIL ABUN
PM-147	-1.372E+02	1.923E+02	3.442E+02	NOT IDENT.
PM-149	0.000E+00	3.901E+04	0.000E+00	SHORT HLIF
EU-150	-8.258E-03	1.217E-02	1.164E-02	FAIL ABUN
EU-152	-4.791E-03	3.131E-02	4.079E-02	FAIL ABUN
GD-153	3.204E-02	3.427E-02	4.164E-02	NOT IDENT.
EU-154	-3.418E-02	3.264E-02	4.472E-02	NOT IDENT.
TB-160	-2.337E-02	3.781E-02	6.441E-02	FAIL ABUN
HO-166M	-7.538E-03	1.390E-02	2.432E-02	FAIL ABUN
TM-171	4.006E+00	8.753E+00	9.717E+00	FAIL ABUN

HF-172	3.680E-02	5.712E-02	9.168E-02	FAIL ABUN
LU-172	1.962E-02	2.769E-02	2.564E-02	FAIL ABUN
LU-176	1.187E-03	7.042E-03	1.135E-02	FAIL ABUN
HF-181	-1.521E-02	1.502E-02	2.600E-02	NOT IDENT.
TA-182	-2.249E-02	4.822E-02	8.224E-02	FAIL ABUN
RE-183	1.460E-02	8.938E-02	1.287E-01	NOT IDENT.
RE-184	-6.791E-02	5.610E-02	7.743E-02	NOT IDENT.
W-188	9.320E-02	2.540E+00	3.908E+00	FAIL ABUN
IR-192	-6.100E-03	1.045E-02	1.820E-02	FAIL ABUN
HG-203	2.381E-02	1.513E-02	2.444E-02	NOT IDENT.
BI-207	1.580E-03	1.192E-02	2.078E-02	FAIL ABUN
BI-211	0.000E+00	1.112E-01	1.686E-01	FAIL ABUN
PB-211	2.800E-02	1.870E-01	2.925E-01	NOT IDENT.
RN-219	1.137E-02	9.476E-02	1.682E-01	FAIL ABUN
RA-223	8.736E-02	1.803E-01	2.782E-01	FAIL ABUN
AC-227	3.057E-02	6.105E-02	1.110E-01	FAIL ABUN
TH-227	3.057E-02	6.105E-02	1.110E-01	FAIL ABUN
TH-231	8.736E-02	1.803E-01	2.782E-01	FAIL ABUN
PA-233	-1.087E-05	1.538E-02	2.720E-02	FAIL ABUN
PA-234	-1.250E-02	7.316E-02	1.106E-01	FAIL ABUN
PA-234M	1.242E+00	2.050E+00	1.891E+00	FAIL ABUN
NP-237	-1.087E-05	1.538E-02	2.720E-02	FAIL ABUN
NP-238	0.000E+00	1.105E+04	0.000E+00	SHORT HLIF
NP-239	-1.475E-02	6.828E-02	1.237E-01	FAIL ABUN
PU-239	0.000E+00	1.441E+02	1.677E+02	FAIL ABUN
AM-241	5.275E-02	4.494E-02	7.778E-02	NOT IDENT.
CM-243	1.945E-02	4.044E-02	4.795E-02	FAIL ABUN
BK-247	-9.725E-03	2.247E-02	3.443E-02	FAIL ABUN
CM-247	1.487E-03	8.978E-03	1.556E-02	FAIL ABUN
CF-249	1.064E-02	1.076E-02	1.731E-02	NOT IDENT.
CF-251	2.893E-02	3.181E-02	5.991E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	3761	10.66*	1.908E+00	7.436E+00	7.436E+00	4.01
MN-54	834.85	110	99.98*	3.001E+00	1.471E-02	1.604E-02	75.72
AS-73	53.44	92	10.30*	2.053E+00	1.759E-01	2.464E-01	222.98
CD-109	88.03	1344	3.70*	7.021E+00	2.080E+00	2.206E+00	18.12
SN-126	64.28	347	9.60	3.747E+00	3.875E-01	3.875E-01	76.47
	86.94	1344	8.90	7.021E+00	8.647E-01	8.647E-01	18.12
	87.57	1344	37.00*	7.021E+00	2.080E-01	2.080E-01	18.12
BA-137M	661.66	176	89.90*	3.624E+00	2.178E-02	2.184E-02	78.02
CS-137	661.66	176	85.10*	3.624E+00	2.301E-02	2.307E-02	78.02
CE-141	145.44	72	48.29*	8.301E+00	7.209E-03	1.657E-02	261.06
EU-155	86.55	1344	30.70	7.021E+00	2.507E-01	2.546E-01	18.12
	105.31	268	21.10*	8.094E+00	6.313E-02	6.412E-02	63.21
TL-208	277.37	186	6.60	6.289E+00	1.801E-01	1.801E-01	65.78
	583.19	2112	85.00*	3.985E+00	2.508E-01	2.508E-01	8.96
	860.56	269	12.50	2.926E+00	2.954E-01	2.954E-01	35.32
PB-210	46.54	188	4.25*	1.025E+00	1.732E+00	1.737E+00	114.34
BI-211	72.87	-----	1.23	5.303E+00	-----	Line Not Found	-----
	351.06	3171	12.92*	5.508E+00	1.792E+00	1.792E+00	6.33
BI-212	727.33	570	6.67*	3.366E+00	1.022E+00	1.022E+00	22.07
	785.37	107	1.10	3.159E+00	1.238E+00	1.238E+00	80.25
	1620.50	-----	1.47	1.801E+00	-----	Line Not Found	-----
PB-212	74.82	2038	10.28	5.595E+00	1.425E+00	1.425E+00	14.01
	77.11	3160	17.10	5.909E+00	1.258E+00	1.258E+00	8.29
	238.63	6937	43.60*	6.804E+00	9.403E-01	9.403E-01	3.89
	300.09	444	3.30	6.024E+00	8.989E-01	8.989E-01	33.97
BI-214	609.32	2388	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86
	1120.29	588	14.92	2.333E+00	6.794E-01	6.795E-01	24.32
	1764.49	436	15.30	1.744E+00	6.568E-01	6.569E-01	17.40
PB-214	74.82	2038	5.80	5.595E+00	2.526E+00	2.526E+00	14.01
	77.11	3160	9.70	5.909E+00	2.217E+00	2.217E+00	8.29
	87.09	1344	3.41	7.021E+00	2.257E+00	2.257E+00	18.12
	242.00	1569	7.25	6.760E+00	1.287E+00	1.287E+00	15.98
	295.22	1874	18.42	6.079E+00	6.731E-01	6.731E-01	9.51
	351.93	3171	35.60*	5.508E+00	6.503E-01	6.504E-01	6.33
RN-222	609.32	2388	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86
	1120.29	588	14.92	2.333E+00	6.794E-01	6.795E-01	24.32
	1764.49	436	15.30	1.744E+00	6.568E-01	6.569E-01	17.40
RA-224	240.99	1569	4.10*	6.760E+00	2.276E+00	2.276E+00	15.98
RA-226	609.32	2388	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86
	1120.29	588	14.92	2.333E+00	6.794E-01	6.795E-01	24.32
	1764.49	436	15.30	1.744E+00	6.568E-01	6.569E-01	17.40
AC-228	105.21	268	1.10	8.094E+00	1.211E+00	1.211E+00	63.21
	338.32	1526	11.27	5.633E+00	9.664E-01	9.664E-01	13.88
	794.95	240	4.25	3.130E+00	7.246E-01	7.246E-01	38.36
	835.71	110	1.61	3.001E+00	9.135E-01	9.135E-01	75.72
	911.20	1516	25.80*	2.787E+00	8.479E-01	8.479E-01	9.47
	968.97	807	15.80	2.643E+00	7.777E-01	7.777E-01	12.92

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-228	105.21	268	1.10	8.094E+00	1.211E+00	1.211E+00	63.21
	338.32	1526	11.27	5.633E+00	9.664E-01	9.664E-01	13.88
	794.95	240	4.25	3.130E+00	7.246E-01	7.246E-01	38.36
	835.71	110	1.61	3.001E+00	9.135E-01	9.135E-01	75.72
	911.20	1516	25.80*	2.787E+00	8.479E-01	8.479E-01	9.47
TH-228	968.97	807	15.80	2.643E+00	7.777E-01	7.777E-01	12.92
	74.82	2038	10.28	5.595E+00	1.425E+00	1.425E+00	14.01
	77.11	3160	17.10	5.909E+00	1.258E+00	1.258E+00	8.29
	238.63	6937	43.60*	6.804E+00	9.403E-01	9.403E-01	3.89
	300.09	444	3.30	6.024E+00	8.989E-01	8.989E-01	33.97
TH-229	85.43	343	14.70	6.729E+00	1.395E-01	1.395E-01	75.10
	88.47	1344	24.00	7.021E+00	3.206E-01	3.206E-01	18.12
	193.51	-----	4.41*	7.524E+00	-----	Line Not Found	-----
	210.85	514	2.80	7.257E+00	1.017E+00	1.017E+00	39.61
TH-230	609.32	2388	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86
	1120.29	588	14.92	2.333E+00	6.794E-01	6.794E-01	24.32
	1764.49	436	15.30	1.744E+00	6.568E-01	6.568E-01	17.40
	283.69	-----	1.70	6.214E+00	-----	Line Not Found	-----
TH-232	301.36	444	5.35*	6.024E+00	5.545E-01	5.545E-01	33.97
	105.21	268	1.10	8.094E+00	1.211E+00	1.211E+00	63.21
	338.32	1526	11.27	5.633E+00	9.664E-01	9.664E-01	13.88
	835.71	110	1.61	3.001E+00	9.135E-01	9.135E-01	75.72
	911.20	1516	25.80*	2.787E+00	8.479E-01	8.479E-01	9.47
TH-234	968.97	807	15.80	2.643E+00	7.777E-01	7.777E-01	12.92
	63.29	347	3.70*	3.747E+00	1.005E+00	1.005E+00	76.47
	92.59	1200	4.23	7.452E+00	1.532E+00	1.532E+00	25.43
U-234	609.32	2388	45.49*	3.859E+00	5.472E-01	5.472E-01	7.86
	1120.29	588	14.92	2.333E+00	6.794E-01	6.794E-01	24.32
	1764.49	436	15.30	1.744E+00	6.568E-01	6.568E-01	17.40
U-235	89.96	767	3.47	7.245E+00	1.228E+00	1.228E+00	26.43
	93.35	1200	5.60	7.452E+00	1.157E+00	1.157E+00	25.43
	143.76	72	10.96*	8.301E+00	3.176E-02	3.176E-02	261.06
	163.33	-----	5.08	8.034E+00	-----	Line Not Found	-----
	185.72	1092	57.20	7.653E+00	1.003E-01	1.003E-01	23.91
U-238	205.31	-----	5.01	7.326E+00	-----	Line Not Found	-----
	63.29	347	3.70*	3.747E+00	1.005E+00	1.005E+00	76.47
	92.59	1200	4.23	7.452E+00	1.532E+00	1.532E+00	25.43
AM-243	43.53	-----	5.90	6.275E-01	-----	Line Not Found	-----
ANH-511	74.66	2038	67.20*	5.595E+00	2.180E-01	2.180E-01	14.01
	511.00	482	100.00*	4.370E+00	4.439E-02	4.439E-02	54.65

Flag: "*" = Keyline

Total number of lines in spectrum 62
Number of unidentified lines 12
Number of lines tentatively identified by NID 50 80.65%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	7.436E+00	7.436E+00	0.298E+00	4.01	
MN-54	312.05D	1.09	1.471E-02	1.604E-02	1.215E-02	75.72	
AS-73	80.30D	1.40	1.759E-01	2.464E-01	5.493E-01	222.98	
CD-109	461.40D	1.06	2.080E+00	2.206E+00	0.400E+00	18.12	
SN-126	2.30E+05Y	1.00	2.080E-01	2.080E-01	0.377E-01	18.12	
BA-137M	30.08Y	1.00	2.178E-02	2.184E-02	1.704E-02	78.02	
CS-137	30.08Y	1.00	2.301E-02	2.307E-02	1.800E-02	78.02	
CE-141	32.51D	2.30	7.209E-03	1.657E-02	4.327E-02	261.06	
EU-155	4.75Y	1.02	6.313E-02	6.412E-02	4.053E-02	63.21	
TL-208	1.41E+10Y	1.00	2.508E-01	2.508E-01	0.225E-01	8.96	
PB-210	22.20Y	1.00	1.732E+00	1.737E+00	1.986E+00	114.34	
BI-211	7.04E+08Y	1.00	1.792E+00	1.792E+00	0.114E+00	6.33	
BI-212	1.41E+10Y	1.00	1.022E+00	1.022E+00	0.226E+00	22.07	
PB-212	1.41E+10Y	1.00	9.403E-01	9.403E-01	0.366E-01	3.89	
BI-214	1600.00Y	1.00	5.472E-01	5.472E-01	0.430E-01	7.86	
PB-214	1600.00Y	1.00	6.503E-01	6.504E-01	0.412E-01	6.33	
RN-222	1600.00Y	1.00	5.472E-01	5.472E-01	0.430E-01	7.86	
RA-224	1.41E+10Y	1.00	2.276E+00	2.276E+00	0.364E+00	15.98	
RA-226	1600.00Y	1.00	5.472E-01	5.472E-01	0.430E-01	7.86	
AC-228	1.41E+10Y	1.00	8.479E-01	8.479E-01	0.803E-01	9.47	
RA-228	1.41E+10Y	1.00	8.479E-01	8.479E-01	0.803E-01	9.47	
TH-228	1.41E+10Y	1.00	9.403E-01	9.403E-01	0.366E-01	3.89	
TH-229	7340.00Y	1.00	3.206E-01	3.206E-01	0.581E-01	18.12	K
TH-230	7.54E+04Y	1.00	5.472E-01	5.472E-01	0.430E-01	7.86	
PA-231	7.04E+08Y	1.00	5.545E-01	5.545E-01	1.883E-01	33.97	
TH-232	1.41E+10Y	1.00	8.479E-01	8.479E-01	0.803E-01	9.47	
TH-234	4.47E+09Y	1.00	1.005E+00	1.005E+00	0.769E+00	76.47	
U-234	2.45E+05Y	1.00	5.472E-01	5.472E-01	0.430E-01	7.86	
U-235	7.04E+08Y	1.00	3.176E-02	3.176E-02	8.292E-02	261.06	
U-238	4.47E+09Y	1.00	1.005E+00	1.005E+00	0.769E+00	76.47	
AM-243	7370.00Y	1.00	2.180E-01	2.180E-01	0.305E-01	14.01	
ANH-511	1.00E+09Y	1.00	4.439E-02	4.439E-02	2.426E-02	54.65	

Total Activity : 2.809E+01 2.831E+01

Grand Total Activity : 2.809E+01 2.831E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
3	45.17	122	727	0.84	90.62	89	10	2.06E-03	70.3	8.02E-01	T
0	98.96	345	2077	1.98	198.18	194	9	6.26E-03	55.2	7.82E+00	T
0	129.48	267	2230	1.37	259.22	255	9	4.96E-03	72.5	8.40E+00	T
0	270.19	550	1465	1.60	540.63	535	12	1.10E-02	31.4	6.38E+00	T
0	328.23	202	1148	1.41	656.73	652	10	4.10E-03	68.7	5.73E+00	T
0	409.66	195	649	1.60	819.57	816	9	4.06E-03	51.8	5.03E+00	T
0	462.98	481	729	1.58	926.22	920	13	1.01E-02	26.1	4.66E+00	T
0	562.54	66	500	1.80	1125.33	1122	10	1.42E-03	****	4.09E+00	T
0	575.07	42	622	3.80	1150.38	1141	12	9.03E-04	****	4.03E+00	
0	694.28	17	454	0.60	1388.80	1387	10	3.67E-04	****	3.49E+00	T
0	754.73	154	496	1.14	1509.71	1502	17	3.42E-03	69.7	3.27E+00	T
0	768.24	156	452	2.22	1536.73	1532	11	3.47E-03	56.2	3.22E+00	T
0	773.54	86	405	1.89	1547.33	1542	12	1.91E-03	99.0	3.20E+00	T
0	840.65	45	361	1.18	1681.55	1678	10	1.00E-03	****	2.99E+00	
0	952.83	22	343	0.58	1905.90	1900	15	4.95E-04	****	2.68E+00	
4	965.19	352	510	3.73	1930.63	1921	28	8.03E-03	33.3	2.65E+00	T
0	1002.43	67	389	3.53	2005.10	1996	20	1.52E-03	****	2.57E+00	T
0	1053.76	70	187	2.18	2107.76	2103	10	1.60E-03	77.3	2.46E+00	
0	1093.87	70	397	7.56	2187.99	2171	21	1.63E-03	****	2.38E+00	T
0	1157.53	108	389	6.66	2315.32	2305	21	2.52E-03	93.2	2.27E+00	
0	1237.71	187	384	2.07	2475.68	2467	19	4.39E-03	52.0	2.15E+00	T
0	1267.45	53	190	3.20	2535.15	2529	14	1.25E-03	****	2.11E+00	
0	1377.72	126	281	2.83	2755.69	2745	25	3.00E-03	77.5	1.98E+00	
0	1589.11	202	194	6.40	3178.48	3166	27	4.88E-03	34.5	1.82E+00	
0	1730.52	101	153	3.39	3461.32	3448	23	2.46E-03	56.0	1.75E+00	
0	1812.45	20	49	2.43	3625.19	3619	12	5.01E-04	****	1.73E+00	
1	1846.86	50	102	3.23	3694.00	3678	34	1.23E-03	86.1	1.73E+00	
1	1849.86	44	95	3.55	3700.01	3678	34	1.07E-03	****	1.73E+00	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561387.CNF;1
Acquisition date : 25-JUN-2016 09:39:24 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:06.09 Half life ratio : *****
Sample date : 17-MAY-2016 14:30:00 Nuclide Library : SOLID
Sample ID : G1203561387 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.5557E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	6.364E-02
MN-54	7.065E-03
AS-73	2.625E-01
CD-109	1.702E-01
SN-126	1.614E-02
BA-137M	6.818E-03
CS-137	7.202E-03
EU-155	2.379E-02
TL-208	6.704E-03
PB-210	9.026E-01
BI-212	9.552E-02
PB-212	1.169E-02
BI-214	1.464E-02
PB-214	1.485E-02
RN-222	1.464E-02
RA-224	1.251E-01
RA-226	1.464E-02
AC-228	2.527E-02
RA-228	2.527E-02
TH-228	1.169E-02
TH-229	1.182E-01
TH-230	1.464E-02
PA-231	9.746E-02
TH-232	2.527E-02
TH-234	3.162E-01
U-234	1.464E-02
U-235	4.478E-02
U-238	3.162E-01
AM-243	1.249E-02
ANH-511	5.758E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	8.831E-02 NOT IDENT.

NA-22	7.732E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	5.860E-03	NOT IDENT.
SC-46	9.107E-03	FAIL ABUN
V-48	3.736E-02	NOT IDENT.
CR-51	1.422E-01	NOT IDENT.
CO-56	9.757E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	6.073E-03	NOT IDENT.
CO-58	8.865E-03	NOT IDENT.
FE-59	2.362E-02	NOT IDENT.
CO-60	7.547E-03	NOT IDENT.
ZN-65	1.895E-02	NOT IDENT.
GE-68	2.525E-01	NOT IDENT.
AS-74	4.875E-02	NOT IDENT.
SE-75	1.083E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.253E-01	NOT IDENT.
RB-83	1.741E-02	NOT IDENT.
KR-85	2.229E+00	NOT IDENT.
SR-85	1.518E-02	NOT IDENT.
RB-86	3.637E-01	NOT IDENT.
Y-88	7.935E-03	NOT IDENT.
Y-91	5.062E+00	NOT IDENT.
NB-94	7.111E-03	NOT IDENT.
NB-95	1.186E-02	NOT IDENT.
NB-95M	4.458E-02	NOT IDENT.
ZR-95	1.869E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	7.700E-03	NOT IDENT.
RH-102	1.102E-02	FAIL ABUN
RU-103	1.172E-02	FAIL ABUN
RH-106	6.793E-02	NOT IDENT.
RU-106	6.793E-02	NOT IDENT.
AG-108M	5.855E-03	NOT IDENT.
AG-110M	1.020E-02	NOT IDENT.
SN-113	1.052E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.113E-02	NOT IDENT.
TE-123M	7.200E-03	NOT IDENT.
SB-124	1.920E-02	NOT IDENT.
SB-125	1.863E-02	FAIL ABUN
TE-125M	2.934E+00	NOT IDENT.
I-126	1.603E-01	FAIL ABUN
SB-126	1.089E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	1.830E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	8.998E-03	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.285E-03	FAIL ABUN
CS-135	3.678E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.859E-02	NOT IDENT.
CE-139	7.607E-03	NOT IDENT.
BA-140	1.952E-01	NOT IDENT.
LA-140	5.930E-02	FAIL ABUN
CE-141	2.405E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	4.785E-02	NOT IDENT.
PM-144	7.503E-03	NOT IDENT.
PR-144	5.687E-01	NOT IDENT.
PM-146	8.590E-03	NOT IDENT.
ND-147	4.808E-01	FAIL ABUN
PM-147	1.697E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.718E-03	FAIL ABUN
EU-152	2.002E-02	FAIL ABUN
GD-153	2.054E-02	NOT IDENT.
EU-154	2.162E-02	NOT IDENT.
TB-160	3.129E-02	FAIL ABUN
HO-166M	1.186E-02	FAIL ABUN
TM-171	4.788E+00	FAIL ABUN
HF-172	4.522E-02	FAIL ABUN

LU-172	1.245E-02	FAIL ABUN
LU-176	5.573E-03	FAIL ABUN
HF-181	1.271E-02	NOT IDENT.
TA-182	3.995E-02	FAIL ABUN
RE-183	6.345E-02	NOT IDENT.
RE-184	3.762E-02	NOT IDENT.
W-188	1.921E+00	FAIL ABUN
IR-192	8.935E-03	FAIL ABUN
HG-203	1.203E-02	NOT IDENT.
BI-207	1.009E-02	FAIL ABUN
BI-211	8.355E-02	FAIL ABUN
PB-211	1.433E-01	NOT IDENT.
RN-219	8.246E-02	FAIL ABUN
RA-223	1.367E-01	FAIL ABUN
AC-227	5.461E-02	FAIL ABUN
TH-227	5.461E-02	FAIL ABUN
TH-231	1.367E-01	FAIL ABUN
PA-233	1.336E-02	FAIL ABUN
PA-234	5.359E-02	FAIL ABUN
PA-234M	9.201E-01	FAIL ABUN
NP-237	1.336E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	6.101E-02	FAIL ABUN
PU-239	8.279E+01	FAIL ABUN
AM-241	3.837E-02	NOT IDENT.
CM-243	2.364E-02	FAIL ABUN
BK-247	1.693E-02	FAIL ABUN
CM-247	7.630E-03	FAIL ABUN
CF-249	8.492E-03	NOT IDENT.
CF-251	2.954E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561387.CNF;1
Acquisition date : 25-JUN-2016 09:39:24 Sensitivity : 3.000
Detector ID : GAM22 Energy tolerance : 1.500
Elapsed live time : 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time : 0 12:00:06.09 Half life ratio : *****
Sample date : 17-MAY-2016 14:30:00 Nuclide Library : SOLID
Sample ID : G1203561387 Analyst initials : MXR1
Batch Number : 1572236 Sample Quantity : 1.5557E+02 GRAM
Quantity Err(%) : 1.2856E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUL-2015 09:05:06 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	7.436E+00	6.985E-01	6.985E-01
MN-54	1.604E-02	1.201E-02	1.201E-02
AS-73	2.464E-01	5.408E-01	5.408E-01
CD-109	1.548E+00	4.348E-01	4.348E-01
SN-126	1.460E-01	4.026E-02	4.026E-02
BA-137M	2.184E-02	1.680E-02	1.680E-02
CS-137	2.307E-02	1.775E-02	1.775E-02
EU-155	6.412E-02	4.010E-02	4.010E-02
TL-208	2.508E-01	3.072E-02	3.072E-02
PB-210	1.737E+00	1.953E+00	1.953E+00
BI-212	1.022E+00	2.412E-01	2.412E-01
PB-212	9.403E-01	8.166E-02	8.166E-02
BI-214	5.472E-01	6.316E-02	6.316E-02
PB-214	6.504E-01	6.476E-02	6.476E-02
RN-222	5.472E-01	6.316E-02	6.316E-02
RA-224	1.086E+00	4.037E-01	4.037E-01
RA-226	5.472E-01	6.316E-02	6.316E-02
AC-228	8.479E-01	1.189E-01	1.189E-01
RA-228	8.479E-01	1.189E-01	1.189E-01
TH-228	9.403E-01	8.166E-02	8.166E-02
TH-229	-7.196E-02	1.350E-01	1.350E-01
TH-230	5.472E-01	6.316E-02	6.316E-02
PA-231	5.545E-01	2.220E-01	2.220E-01
TH-232	8.479E-01	1.189E-01	1.189E-01
TH-234	1.005E+00	7.866E-01	7.866E-01
U-234	5.472E-01	6.316E-02	6.316E-02
U-235	3.176E-02	8.129E-02	8.129E-02
U-238	1.005E+00	7.866E-01	7.866E-01
AM-243	1.599E-01	3.377E-02	3.377E-02
ANH-511	4.439E-02	2.406E-02	2.406E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	1.542E-02	1.010E-01	1.012E-01	NOT IDENT.
NA-22	-1.209E-02	1.171E-02	1.292E-02	NOT IDENT.
NA-24	-3.542E+16	6.056E+16	0.000E+00	SHORT HLIF
AL-26	-6.232E-05	8.168E-03	8.168E-03	NOT IDENT.
SC-46	-6.450E-03	1.102E-02	1.140E-02	FAIL ABUN
V-48	-9.341E-03	4.356E-02	4.376E-02	NOT IDENT.
CR-51	3.507E-02	1.634E-01	1.641E-01	NOT IDENT.
CO-56	5.145E-03	1.580E-02	1.597E-02	FAIL ABUN
MN-56	1.000E+41	3.067E+41	0.000E+00	SHORT HLIF
CO-57	-4.839E-03	6.893E-03	7.230E-03	NOT IDENT.
CO-58	-1.437E-02	1.097E-02	1.274E-02	NOT IDENT.
FE-59	-7.154E-03	3.304E-02	3.320E-02	NOT IDENT.
CO-60	4.263E-03	8.612E-03	8.824E-03	NOT IDENT.
ZN-65	2.671E-02	2.500E-02	2.775E-02	NOT IDENT.
GE-68	-1.771E-01	3.073E-01	3.175E-01	NOT IDENT.
AS-74	-1.699E-02	5.783E-02	5.833E-02	NOT IDENT.
SE-75	-6.561E-03	1.440E-02	1.470E-02	NOT IDENT.
BR-77	1.565E+05	1.769E+05	1.904E+05	SHORT HLIF
SR-82	8.789E-02	1.835E-01	1.877E-01	NOT IDENT.
RB-83	8.960E-03	2.322E-02	2.357E-02	NOT IDENT.
KR-85	2.534E+01	2.989E+00	1.181E+01	NOT IDENT.
SR-85	1.724E-01	2.035E-02	8.033E-02	NOT IDENT.
RB-86	-2.551E-01	4.351E-01	4.501E-01	NOT IDENT.
Y-88	-2.034E-03	1.127E-02	1.130E-02	NOT IDENT.
Y-91	-5.784E+00	6.228E+00	6.752E+00	NOT IDENT.
NB-94	4.662E-03	9.080E-03	9.320E-03	NOT IDENT.
NB-95	4.065E-02	1.548E-02	2.399E-02	NOT IDENT.
NB-95M	4.045E-01	6.296E-02	1.929E-01	NOT IDENT.
ZR-95	1.509E-02	2.479E-02	2.571E-02	NOT IDENT.
NB-97	1.000E+41	1.085E+41	0.000E+00	SHORT HLIF
ZR-97	6.810E+16	1.043E+16	0.000E+00	SHORT HLIF
MO-99	2.952E+02	1.184E+03	1.191E+03	SHORT HLIF
TC-99M	-1.000E+41	1.839E+43	0.000E+00	SHORT HLIF
RH-101	7.870E-03	9.813E-03	1.043E-02	NOT IDENT.
RH-102	-3.132E-03	1.263E-02	1.271E-02	FAIL ABUN
RU-103	-7.775E-03	1.374E-02	1.418E-02	FAIL ABUN
RH-106	-4.554E-03	7.731E-02	7.734E-02	NOT IDENT.
RU-106	-4.554E-03	7.731E-02	7.734E-02	NOT IDENT.
AG-108M	-1.108E-03	6.685E-03	6.703E-03	NOT IDENT.
AG-110M	5.221E-03	1.188E-02	1.211E-02	NOT IDENT.
SN-113	-1.464E-03	1.187E-02	1.188E-02	NOT IDENT.
CD-115	-2.901E+03	4.426E+03	4.615E+03	SHORT HLIF
SN-117M	-2.205E-02	4.752E-02	4.855E-02	NOT IDENT.
TE-123M	-7.367E-03	8.400E-03	9.033E-03	NOT IDENT.
SB-124	4.436E-03	2.272E-02	2.281E-02	NOT IDENT.
SB-125	4.489E-03	2.104E-02	2.113E-02	FAIL ABUN
TE-125M	-3.399E+00	3.806E+00	4.103E+00	NOT IDENT.
I-126	2.111E-01	2.067E-01	2.276E-01	FAIL ABUN
SB-126	1.742E-02	1.465E-01	1.467E-01	FAIL ABUN
SB-127	1.996E+01	2.202E+01	2.378E+01	SHORT HLIF
I-131	-5.489E-02	2.057E-01	2.072E-01	NOT IDENT.
I-132	1.000E+41	2.628E+41	0.000E+00	SHORT HLIF
TE-132	2.284E+00	3.226E+01	3.228E+01	SHORT HLIF
BA-133	1.644E-02	1.117E-02	1.340E-02	FAIL ABUN
I-133	-1.567E+11	2.666E+11	2.758E+11	SHORT HLIF
CS-134	3.735E-02	1.448E-02	2.221E-02	FAIL ABUN
CS-135	1.389E-01	4.613E-02	7.776E-02	NOT IDENT.
I-135	-8.033E+40	2.724E+41	0.000E+00	SHORT HLIF
CS-136	-2.301E-02	9.542E-02	9.598E-02	NOT IDENT.
CE-139	7.821E-03	8.302E-03	9.020E-03	NOT IDENT.
BA-140	1.070E-01	2.239E-01	2.291E-01	NOT IDENT.
LA-140	-1.072E-02	8.446E-02	8.460E-02	FAIL ABUN
CE-141	1.657E-02	4.242E-02	4.307E-02	FAIL ABUN
CE-143	6.462E+07	8.430E+06	3.033E+07	SHORT HLIF
CE-144	3.097E-02	6.101E-02	6.258E-02	NOT IDENT.
PM-144	5.974E-03	8.484E-03	8.901E-03	NOT IDENT.
PR-144	4.538E-01	6.430E-01	6.747E-01	NOT IDENT.
PM-146	3.156E-03	9.947E-03	1.005E-02	NOT IDENT.
ND-147	-4.713E-01	5.738E-01	6.119E-01	FAIL ABUN
PM-147	-1.372E+02	1.925E+02	2.022E+02	NOT IDENT.
PM-149	-4.697E+03	3.901E+04	3.907E+04	SHORT HLIF
EU-150	-8.258E-03	1.219E-02	1.275E-02	FAIL ABUN
EU-152	-4.791E-03	3.131E-02	3.139E-02	FAIL ABUN
GD-153	3.204E-02	3.435E-02	3.726E-02	NOT IDENT.
EU-154	-3.418E-02	3.278E-02	3.622E-02	NOT IDENT.
TB-160	-2.337E-02	3.789E-02	3.933E-02	FAIL ABUN
HO-166M	-7.538E-03	1.392E-02	1.433E-02	FAIL ABUN
TM-171	4.006E+00	8.761E+00	8.945E+00	FAIL ABUN

HF-172	3.680E-02	5.746E-02	5.981E-02	FAIL ABUN
LU-172	1.962E-02	2.782E-02	2.919E-02	FAIL ABUN
LU-176	1.187E-03	7.042E-03	7.062E-03	FAIL ABUN
HF-181	-1.521E-02	1.507E-02	1.656E-02	NOT IDENT.
TA-182	-2.249E-02	4.826E-02	4.931E-02	FAIL ABUN
RE-183	1.460E-02	8.939E-02	8.964E-02	NOT IDENT.
RE-184	-6.791E-02	5.671E-02	6.444E-02	NOT IDENT.
W-188	9.320E-02	2.540E+00	2.540E+00	FAIL ABUN
IR-192	-6.100E-03	1.046E-02	1.081E-02	FAIL ABUN
HG-203	2.381E-02	1.524E-02	1.864E-02	NOT IDENT.
BI-207	1.580E-03	1.192E-02	1.194E-02	FAIL ABUN
BI-211	1.792E+00	1.808E-01	8.278E-01	FAIL ABUN
PB-211	2.800E-02	1.870E-01	1.874E-01	NOT IDENT.
RN-219	1.137E-02	9.477E-02	9.491E-02	FAIL ABUN
RA-223	8.736E-02	1.805E-01	1.847E-01	FAIL ABUN
AC-227	3.057E-02	6.121E-02	6.275E-02	FAIL ABUN
TH-227	3.057E-02	6.121E-02	6.275E-02	FAIL ABUN
TH-231	8.736E-02	1.805E-01	1.847E-01	FAIL ABUN
PA-233	-1.087E-05	1.538E-02	1.538E-02	FAIL ABUN
PA-234	-1.250E-02	7.455E-02	7.476E-02	FAIL ABUN
PA-234M	1.242E+00	2.054E+00	2.129E+00	FAIL ABUN
NP-237	-1.087E-05	1.538E-02	1.538E-02	FAIL ABUN
NP-238	5.580E+03	1.106E+04	1.134E+04	SHORT HLIF
NP-239	-1.475E-02	6.830E-02	6.862E-02	FAIL ABUN
PU-239	2.028E+02	1.448E+02	1.712E+02	FAIL ABUN
AM-241	5.275E-02	4.514E-02	5.102E-02	NOT IDENT.
CM-243	1.945E-02	4.049E-02	4.143E-02	FAIL ABUN
BK-247	-9.725E-03	2.256E-02	2.298E-02	FAIL ABUN
CM-247	1.487E-03	8.982E-03	9.007E-03	FAIL ABUN
CF-249	1.064E-02	1.082E-02	1.183E-02	NOT IDENT.
CF-251	2.893E-02	3.202E-02	3.457E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1429.3431	87.09	1709.5452	136.47	1643.1338
45.60	1340.4246	87.57	1711.4878	140.51	0.0000
46.54	1279.8501	88.03	1713.3433	143.76	1649.2538
49.72	0.0000	88.34	1714.5892	144.24	1665.8033
51.35	1267.6877	88.47	1715.1117	145.44	1537.7385
51.87	1255.8199	89.96	1721.0668	152.43	1567.6837
52.39	1282.7632	1093.63	1723.7729	153.25	1559.7692
52.97	1280.3016	91.11	1725.6353	323.87	1591.9882
53.44	1394.5446	92.59	1731.4697	156.02	1594.2705
54.07	1499.6177	93.35	1734.4438	158.56	1599.4279
57.36	0.0000	94.56	1501.4613	159.00	1620.5635
57.53	1663.7826	94.65	1481.9500	162.33	1570.5220
57.98	1578.5668	94.67	1482.0184	162.66	1582.5157
59.27	1562.6451	94.87	1482.6804	163.33	1563.9108
59.32	1535.7839	97.43	1491.0808	165.86	1494.6086
59.54	1541.8905	98.43	1494.3336	176.31	1540.2885
60.96	1627.0522	98.44	1494.3679	176.60	1500.6541
61.17	1628.0879	99.53	1456.2419	177.52	1496.1924
62.93	1714.1522	100.11	1451.6401	181.07	0.0000
63.29	1813.0795	102.03	1449.5361	181.52	1575.5295
63.58	1814.6340	103.18	1440.9430	184.41	1569.4789
64.28	1853.0328	103.37	1441.5204	143.76	1542.9502
66.73	1985.8781	105.21	1559.5361	193.51	1610.6628
67.24	2079.0210	105.31	1559.8590	197.03	1465.7125
125.81	2066.7949	106.12	1549.2675	198.01	1552.3629
67.75	2067.2036	106.47	1607.6864	201.83	1724.0292
69.67	1988.9496	109.28	1726.4285	203.43	1628.3502
70.83	1969.8888	111.00	1661.0277	205.31	1533.9861
72.81	2102.2058	111.76	0.0000	210.85	1452.0991
72.87	2102.5388	114.06	1577.2070	215.65	1431.3774
74.66	2093.9565	116.30	0.0000	222.11	1440.3694
74.82	2094.8367	116.74	1627.9264	227.09	1431.2827
74.97	2095.6660	119.76	1555.9670	227.38	1415.1628
77.11	2107.3796	121.12	1606.9889	228.16	0.0000
78.74	1831.3184	121.22	1608.3395	228.18	1430.1665
79.69	1927.5139	121.78	1635.1412	116.74	1430.1665
80.12	1929.5980	122.06	1612.9512	235.69	1387.0400
80.19	1929.9364	122.92	1617.6224	235.96	1387.4607
80.57	1931.7744	123.07	1614.1779	238.63	1225.7813
81.00	1933.8508	265.00	1593.9803	238.98	0.0000
81.07	1934.1892	125.81	1596.2710	240.99	1229.0330
81.75	1937.4576	127.23	1717.0995	242.00	1230.4169
83.79	1696.0609	127.91	1722.6027	244.70	1059.1343
84.00	1696.9249	129.30	1652.3792	252.40	0.0000
85.43	1702.7930	131.20	1620.2755	252.80	1161.6516
86.55	1707.3547	133.02	1543.4114	254.15	0.0000
86.79	1708.3193	133.52	1555.0203	256.23	1136.6852
86.94	1708.9355	136.00	1626.7826	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	1153.2552	355.39	0.0000	584.27	551.0212
264.80	1143.2440	356.01	819.2302	595.83	668.3684
265.00	1143.4908	364.49	817.4894	427.87	644.0801
268.22	1101.3428	366.42	0.0000	602.52	0.0000
269.46	1085.6941	372.51	807.8027	604.72	790.5820
270.03	1098.2668	375.05	806.6270	607.14	816.0858
271.23	1144.0107	377.52	798.8080	609.32	706.8625
273.65	1145.1208	356.01	848.9868	610.33	707.2321
276.40	1035.0200	388.16	777.0453	614.28	609.4838
277.37	1036.0260	388.63	783.9569	618.01	550.1292
277.60	1047.8590	391.69	824.7120	620.36	579.5750
278.00	1061.3180	264.66	785.4171	621.93	612.8873
279.20	1044.8002	401.81	794.9620	630.19	0.0000
279.54	1003.8341	402.40	804.8065	631.29	570.5369
279.70	1004.0002	404.85	777.1951	633.25	565.4429
280.46	975.4611	410.95	788.5491	634.78	549.8041
283.69	1126.8385	413.71	815.3707	635.95	564.3417
284.31	1080.5585	414.70	801.0595	636.99	570.3274
285.41	1030.8105	423.72	750.2153	645.85	556.7416
285.90	0.0000	427.09	743.2621	657.76	526.0995
287.50	1010.0101	427.87	721.2561	657.90	0.0000
290.67	1058.3842	433.94	708.6957	661.66	528.5637
293.27	0.0000	439.40	672.1088	664.57	0.0000
351.93	1050.0724	453.88	689.6569	666.33	514.8902
295.96	1050.8179	463.37	623.2446	666.50	514.9369
879.38	1053.4327	468.07	678.4378	667.71	0.0000
299.98	1054.8257	473.00	0.0000	677.62	498.9032
300.09	1054.9357	475.06	645.1862	685.70	0.0000
300.13	1054.9846	476.78	658.0020	695.00	585.0167
301.36	1012.9453	477.60	667.4278	696.49	580.5566
302.85	993.2192	482.18	709.8624	696.51	580.5566
256.23	1003.5756	487.02	639.0427	697.00	596.3068
304.85	1003.8998	492.35	0.0000	697.30	676.4315
306.78	978.6882	497.08	640.0753	697.49	676.4919
308.46	980.3608	505.52	608.7220	702.65	610.4199
311.90	950.4286	507.63	0.0000	706.68	586.3099
316.51	979.0344	511.00	671.4000	711.68	556.2383
319.41	947.2633	514.00	672.6370	720.70	523.3057
320.08	965.0093	514.00	672.6370	721.93	0.0000
321.04	970.9465	520.40	616.0848	722.78	516.8901
323.87	976.5371	520.69	0.0000	722.91	516.9266
325.23	1065.7761	522.65	0.0000	723.31	523.9344
328.76	987.6048	527.90	0.0000	724.19	541.4457
333.37	1080.6536	528.26	631.6495	727.33	496.9489
333.97	1113.8116	529.59	587.3738	733.00	521.0632
334.37	1058.0366	529.87	0.0000	735.93	460.8952
338.28	941.2621	531.02	607.6830	333.97	502.7873
338.32	941.2937	537.26	582.7354	739.50	0.0000
311.90	921.5517	546.56	0.0000	747.24	477.2418
340.48	921.5517	552.55	634.4174	748.06	479.1739
340.55	921.6031	563.25	624.5107	752.31	497.6067
344.28	923.6133	569.33	767.3438	753.82	506.7113
345.93	845.3175	946.00	767.4170	756.73	466.9855
351.06	932.4330	569.70	767.5049	756.80	467.0018
351.93	880.8271	583.19	550.6874	884.68	455.5716

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	465.3435	1274.44	344.8363	1620.50	161.7931
766.42	461.9461	1001.03	299.0200	1621.92	187.4579
766.84	462.0341	1002.74	295.9753	1678.03	0.0000
772.60	0.0000	1004.73	320.0558	1690.97	114.4640
776.52	429.7543	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	109.4493
778.90	432.5624	1028.54	0.0000	1063.66	121.2789
783.70	0.0000	1037.84	344.6309	1771.35	119.5769
785.37	421.5006	1038.76	0.0000	1791.20	0.0000
792.07	463.5614	631.29	338.6685	1808.65	117.0329
794.95	440.3310	1048.07	345.8232	1810.72	0.0000
795.86	435.7345	1049.04	351.1830	1836.06	133.5195
810.06	451.7167	1050.41	340.8586		
810.29	454.8352	1063.66	363.4404		
344.28	454.8661	1077.00	378.9457		
810.76	447.7394	1077.34	378.8600		
815.77	371.5006	1085.87	339.5938		
1048.07	398.7124	1093.63	313.8600		
832.01	418.8214	1099.45	341.1042		
834.85	412.0471	1112.07	358.5547		
835.71	443.0616	1112.84	363.9948		
836.80	0.0000	1115.54	376.8053		
846.75	0.0000	1120.29	353.1209		
846.77	401.2878	1120.55	353.1530		
856.80	402.9126	1221.41	353.2387		
860.56	445.7101	1129.67	330.0760		
871.09	408.5643	1131.51	0.0000		
873.19	380.2701	1147.95	0.0000		
875.33	0.0000	1173.23	303.7978		
879.38	412.8737	1177.95	334.9634		
880.51	432.0733	1189.05	353.5742		
883.24	392.3501	1204.77	420.3149		
884.68	371.4073	1221.41	406.8340		
889.28	417.6562	1231.02	383.0151		
894.76	405.7951	1235.36	403.8890		
898.04	365.8959	1238.28	380.7059		
900.72	435.2697	1260.41	0.0000		
903.28	468.1508	1271.87	301.4557		
911.20	361.3294	1274.44	339.1491		
912.08	342.4716	1274.54	339.1590		
923.98	0.0000	1291.59	307.1515		
926.50	448.7742	1298.22	0.0000		
929.11	446.3857	1312.11	254.7196		
937.49	341.0375	1332.49	234.2552		
944.13	360.9013	1362.66	0.0000		
946.00	340.3216	1365.19	195.1745		
949.00	317.0868	1368.63	0.0000		
667.71	0.0000	1384.29	184.2578		
962.31	411.8489	1408.01	221.5615		
964.08	365.2379	1457.56	0.0000		
966.17	365.5125	1460.82	188.1555		
911.20	365.8805	1489.16	216.2910		
968.97	365.8805	1505.03	232.0898		
983.53	363.1363	1584.12	111.4829		
984.45	0.0000	1596.21	175.9500		

VAX/VMS Nuclide Identification Report Generated 25-JUN-2016 11:19:30.47

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                    *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561388.CNF;1
Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;305
Background date : 20-JUN-2016 14:03:03
Sample date     : 7-JUN-2016 00:00:00. Acquisition date : 25-JUN-2016 11:03:45
Sample ID       : G1203561388. Sample quantity : 1.15000E+02 GRAM
Detector name   : GAM08. Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.91 0.4%
Energy tolerance: 1.50000 keV Analyst Initials : MXR1
Abundance limit : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572236 Detector SN# :
Matrix Spike ID : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	43.85	211	1772	1.46	87.92	86	11	2.34E-01	30.2	7.85E+00
2	4	46.49	3408	1930	1.00	93.21	86	11	3.79E+00	2.7	
3	0	59.47	11839	3316	1.09	119.19	113	12	1.32E+01	1.3	
4	0	79.14	114	811	1.38	158.54	157	6	1.26E-01	40.7	
5	2	85.57*	78	395	1.09	171.42	170	12	8.67E-02	34.3	2.02E+00
6	2	88.02	2719	850	1.09	176.31	170	12	3.02E+00	2.6	
7	5	120.01	43	267	0.76	240.32	239	10	4.78E-02	52.4	7.65E-01
8	5	122.15	344	712	1.36	244.59	239	10	3.82E-01	14.5	
9	0	374.54	93	385	1.71	749.59	747	7	1.03E-01	36.6	
10	0	386.86	49	600	1.69	774.25	771	10	5.45E-02	94.2	
11	0	451.74	72	397	0.75	904.06	901	7	8.00E-02	47.4	
12	0	498.95	26	385	0.91	998.52	996	8	2.94E-02	129.8	
13	0	577.21	56	302	3.36	1155.10	1149	11	6.24E-02	61.8	
14	0	582.17*	73	212	3.19	1165.02	1161	9	8.06E-02	38.2	
15	0	661.63	11115	502	1.57	1324.00	1315	16	1.23E+01	1.0	
16	0	735.75	71	133	2.42	1472.29	1469	7	7.91E-02	29.2	
17	0	816.51	23	329	1.40	1633.86	1626	11	2.59E-02	152.9	
18	0	1115.75	152	393	1.83	2232.52	2224	16	1.69E-01	30.3	
19	0	1173.15	7519	325	2.03	2347.36	2337	21	8.35E+00	1.3	
20	0	1227.69	10	60	1.36	2456.47	2451	11	1.09E-02	153.6	
21	0	1231.39	26	23	1.90	2463.86	2461	7	2.88E-02	35.8	
22	0	1288.41	44	139	15.86	2577.95	2545	43	4.90E-02	93.0	
23	3	1314.43	36	26	2.15	2630.00	2622	16	4.00E-02	33.1	1.86E+00
24	3	1317.15	17	10	1.57	2635.43	2622	16	1.92E-02	33.4	
25	0	1332.42	6569	67	2.14	2665.99	2656	19	7.30E+00	1.3	
26	0	1358.05	14	9	0.54	2717.25	2709	13	1.54E-02	53.3	
27	0	1409.03	18	12	4.53	2819.24	2810	16	2.03E-02	48.4	
28	0	1486.12	19	12	4.89	2973.45	2957	22	2.11E-02	50.4	
29	0	1521.70	10	9	5.12	3044.63	3034	13	1.06E-02	74.7	
30	0	1561.68	13	6	1.45	3124.60	3119	11	1.39E-02	46.0	
31	0	1891.99	10	6	2.60	3785.35	3777	11	1.13E-02	54.8	
32	0	2019.79	7	12	0.84	4040.98	4028	16	8.07E-03	112.7	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 25-JUN-2016 11:19:32

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561388.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 25-JUN-2016 11:03:45
Sample ID	: G1203561388	Sample quantity	: 115.00 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA8	Detector geometry	: CAN
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:03.91 0.4%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	360	85.60*	5.569E+00	1.972E+00	2.068E+00	29.03
	136.47	-----	10.68	5.503E+00	-----	Line Not Found	-----
CO-60	1173.23	7162	99.85	1.176E+00	1.593E+02	1.604E+02	2.60
	1332.49	6221	99.98*	1.046E+00	1.553E+02	1.563E+02	2.54
ZN-65	1115.54	145	50.60*	1.231E+00	6.091E+00	6.419E+00	60.62
CD-109	88.03	2887	3.70*	4.619E+00	4.412E+02	4.536E+02	5.25
SN-126	64.28	-----	9.60	2.266E+00	-----	Line Not Found	-----
	86.94	2887	8.90	4.619E+00	1.834E+02	1.834E+02	5.25
	87.57	2887	37.00*	4.619E+00	4.412E+01	4.412E+01	5.25
BA-137M	661.66	10855	89.90*	1.936E+00	1.629E+02	1.631E+02	2.10
CS-137	661.66	10855	85.10*	1.936E+00	1.721E+02	1.723E+02	2.10
PM-147	121.22	360	0.00*	5.569E+00	5.924E+04	6.004E+04	29.03
TL-208	277.37	-----	6.60	3.646E+00	-----	Line Not Found	-----
	583.19	71	85.00*	2.137E+00	1.024E+00	1.024E+00	76.40
	860.56	-----	12.50	1.556E+00	-----	Line Not Found	-----
PB-210	46.54	3711	4.25*	4.217E-01	5.407E+03	5.415E+03	5.42
TH-229	85.43	83	14.70	4.447E+00	3.315E+00	3.315E+00	68.68
	88.47	2887	24.00	4.619E+00	6.802E+01	6.802E+01	5.25
	193.51	-----	4.41*	4.674E+00	-----	Line Not Found	-----
	210.85	-----	2.80	4.420E+00	-----	Line Not Found	-----
AM-241	59.54	12767	35.90*	1.683E+00	5.519E+02	5.519E+02	2.69
CF-249	252.80	-----	2.50	3.896E+00	-----	Line Not Found	-----
	333.37	-----	14.60	3.196E+00	-----	Line Not Found	-----
	388.16	49	66.00*	2.875E+00	6.746E-01	6.747E-01	188.47

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561388.CNF;1
Acquisition date : 25-JUN-2016 11:03:45 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:03.91 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561388 Sample Quantity : 1.1500E+02 GRAM
Batch Number : 1572236 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	2.068E+00	5.882E-01	7.226E-01
CO-60	1.563E+02	3.889E+00	9.324E-01
ZN-65	6.419E+00	3.814E+00	3.784E+00
CD-109	4.536E+02	2.333E+01	2.211E+01
SN-126	4.412E+01	2.269E+00	2.165E+00
BA-137M	1.631E+02	3.354E+00	1.288E+00
CS-137	1.723E+02	3.543E+00	1.361E+00
PM-147	6.004E+04	1.708E+04	2.098E+04
TL-208	1.024E+00	7.665E-01	1.234E+00
PB-210	5.415E+03	2.875E+02	3.221E+02
TH-229	-6.974E+00	9.655E+00	1.667E+01
AM-241	5.519E+02	1.456E+01	8.489E+00
CF-249	6.747E-01	1.246E+00	1.624E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	-6.819E-01	8.716E+00	1.521E+01	NOT IDENT.
NA-22	9.447E-02	6.000E-01	9.290E-01	NOT IDENT.
NA-24	0.000E+00	2.555E+08	0.000E+00	SHORT HLIF
AL-26	-2.587E-01	3.140E-01	5.115E-01	NOT IDENT.
K-40	3.107E+00	2.893E+00	6.412E+00	NOT IDENT.
SC-46	-1.611E-02	1.122E+00	1.961E+00	NOT IDENT.
V-48	2.404E-01	2.295E+00	3.996E+00	NOT IDENT.
CR-51	5.600E+00	8.555E+00	1.487E+01	NOT IDENT.
MN-54	-3.267E-01	8.693E-01	1.512E+00	NOT IDENT.
CO-56	1.677E-01	1.053E+00	1.860E+00	NOT IDENT.
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-58	-4.769E-01	1.147E+00	1.711E+00	NOT IDENT.
FE-59	2.250E+00	2.663E+00	4.713E+00	NOT IDENT.
GE-68	-6.430E+00	3.476E+01	5.953E+01	NOT IDENT.
AS-73	-3.315E+01	4.090E+01	6.671E+01	NOT IDENT.
AS-74	-1.194E+00	2.242E+00	3.807E+00	NOT IDENT.
SE-75	-4.597E-02	9.309E-01	1.604E+00	FAIL ABUN

BR-77	1.360E+02	4.323E+02	7.582E+02	NOT IDENT.
SR-82	4.096E+00	8.788E+00	1.517E+01	NOT IDENT.
RB-83	-1.845E+00	1.643E+00	2.764E+00	NOT IDENT.
KR-85	9.832E+01	1.490E+02	2.655E+02	NOT IDENT.
SR-85	5.398E-01	8.178E-01	1.458E+00	NOT IDENT.
RB-86	-6.956E+00	2.442E+01	4.168E+01	NOT IDENT.
Y-88	3.720E-01	3.255E-01	7.597E-01	NOT IDENT.
Y-91	1.345E+02	3.056E+02	5.511E+02	NOT IDENT.
NB-94	-7.732E-02	6.843E-01	1.167E+00	NOT IDENT.
NB-95	3.456E-01	9.236E-01	1.593E+00	NOT IDENT.
NB-95M	-1.258E+00	2.271E+00	3.888E+00	NOT IDENT.
ZR-95	9.478E-01	1.707E+00	2.966E+00	NOT IDENT.
NB-97	0.000E+00	1.263E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	9.802E+08	0.000E+00	SHORT HLIF
MO-99	-7.195E+01	7.156E+02	1.046E+03	NOT IDENT.
TC-99M	0.000E+00	5.442E+21	0.000E+00	SHORT HLIF
RH-101	-1.712E-01	5.453E-01	9.049E-01	NOT IDENT.
RH-102	6.794E-01	1.229E+00	2.160E+00	NOT IDENT.
RU-103	8.332E-01	1.165E+00	1.821E+00	NOT IDENT.
RH-106	2.206E+00	6.887E+00	1.203E+01	NOT IDENT.
RU-106	2.206E+00	6.887E+00	1.203E+01	NOT IDENT.
AG-108M	-3.248E-02	7.438E-01	1.308E+00	NOT IDENT.
AG-110M	-1.678E-01	1.387E+00	2.418E+00	NOT IDENT.
SN-113	-7.020E-02	1.203E+00	1.856E+00	NOT IDENT.
CD-115	-3.506E+01	7.436E+02	1.294E+03	NOT IDENT.
SN-117M	-4.501E-01	1.018E+00	1.794E+00	NOT IDENT.
TE-123M	-1.858E-01	4.585E-01	8.082E-01	NOT IDENT.
SB-124	2.010E-01	7.694E-01	1.561E+00	NOT IDENT.
SB-125	1.169E+00	2.256E+00	4.029E+00	NOT IDENT.
TE-125M	-1.746E+02	1.699E+02	2.788E+02	NOT IDENT.
I-126	5.598E-02	6.350E+00	9.433E+00	NOT IDENT.
SB-126	-2.325E+00	3.711E+00	6.179E+00	NOT IDENT.
SB-127	1.587E+01	4.998E+01	8.695E+01	NOT IDENT.
I-131	-7.028E-01	3.539E+00	5.940E+00	FAIL ABUN
I-132	0.000E+00	1.918E+41	0.000E+00	SHORT HLIF
TE-132	1.204E+01	2.893E+01	5.086E+01	NOT IDENT.
BA-133	2.652E-01	9.474E-01	1.616E+00	NOT IDENT.
I-133	0.000E+00	1.938E+06	0.000E+00	SHORT HLIF
CS-134	-4.543E-01	9.501E-01	1.654E+00	NOT IDENT.
CS-135	-5.720E-01	3.035E+00	5.206E+00	NOT IDENT.
I-135	0.000E+00	3.329E+20	0.000E+00	SHORT HLIF
CS-136	1.646E+00	3.550E+00	6.229E+00	NOT IDENT.
CE-139	1.421E-01	4.937E-01	8.830E-01	NOT IDENT.
BA-140	-5.132E+00	7.009E+00	1.191E+01	NOT IDENT.
LA-140	2.715E-01	8.429E-01	1.720E+00	FAIL ABUN
CE-141	-2.501E-01	1.033E+00	1.837E+00	NOT IDENT.
CE-143	0.000E+00	1.320E+04	0.000E+00	SHORT HLIF
CE-144	-7.956E-01	3.257E+00	5.815E+00	FAIL ABUN
PM-144	2.466E-03	7.181E-01	1.231E+00	NOT IDENT.
PR-144	4.924E-01	5.384E+01	9.231E+01	NOT IDENT.
PM-146	2.428E-01	1.270E+00	1.951E+00	FAIL ABUN
ND-147	-7.522E+00	1.575E+01	2.703E+01	NOT IDENT.
PM-149	-5.233E+01	5.331E+03	9.151E+03	NOT IDENT.
EU-150	-2.325E-01	5.880E-01	9.870E-01	NOT IDENT.
EU-152	9.666E-01	2.153E+00	3.699E+00	FAIL ABUN
GD-153	7.105E-01	1.464E+00	2.521E+00	NOT IDENT.
EU-154	3.085E-01	1.700E+00	2.640E+00	FAIL ABUN
EU-155	1.622E-01	1.819E+00	3.086E+00	FAIL ABUN
TB-160	2.023E-01	3.780E+00	6.628E+00	FAIL ABUN
HO-166M	2.313E-02	1.286E+00	2.202E+00	FAIL ABUN
TM-171	-2.552E+02	8.089E+02	1.399E+03	NOT IDENT.
HF-172	1.738E+00	3.414E+00	5.526E+00	FAIL ABUN
LU-172	-9.042E-01	1.786E+00	3.018E+00	FAIL ABUN
LU-176	-2.791E-01	5.646E-01	9.509E-01	FAIL ABUN
HF-181	-8.247E-01	1.163E+00	1.994E+00	NOT IDENT.
TA-182	-5.463E-01	2.937E+00	4.325E+00	FAIL ABUN
RE-183	0.000E+00	1.829E+01	2.700E+01	FAIL ABUN
RE-184	1.086E+00	3.853E+00	6.780E+00	NOT IDENT.
W-188	-1.045E+02	1.513E+02	2.544E+02	NOT IDENT.
IR-192	-5.335E-01	7.754E-01	1.295E+00	NOT IDENT.
HG-203	3.194E-01	8.137E-01	1.414E+00	NOT IDENT.
BI-207	7.235E-02	1.408E+00	2.435E+00	NOT IDENT.
BI-211	-9.777E-01	4.476E+00	7.535E+00	NOT IDENT.
PB-211	-6.539E+00	1.627E+01	2.851E+01	NOT IDENT.
BI-212	1.050E+01	1.033E+01	1.840E+01	NOT IDENT.
PB-212	2.571E-01	1.046E+00	1.832E+00	NOT IDENT.
BI-214	3.857E-01	1.475E+00	2.574E+00	NOT IDENT.
PB-214	9.987E-01	1.613E+00	2.785E+00	FAIL ABUN

RN-219	4.358E-01	9.259E+00	1.643E+01	NOT IDENT.
RN-222	3.857E-01	1.475E+00	2.574E+00	NOT IDENT.
RA-223	-1.234E+01	1.348E+01	2.231E+01	NOT IDENT.
RA-224	4.820E+00	1.117E+01	1.961E+01	NOT IDENT.
RA-226	3.857E-01	1.475E+00	2.574E+00	NOT IDENT.
AC-227	-1.106E+00	5.116E+00	8.790E+00	FAIL ABUN
TH-227	-1.106E+00	5.116E+00	8.790E+00	FAIL ABUN
AC-228	1.752E+00	4.122E+00	7.274E+00	NOT IDENT.
RA-228	1.752E+00	4.122E+00	7.274E+00	NOT IDENT.
TH-228	2.571E-01	1.046E+00	1.832E+00	NOT IDENT.
TH-230	3.856E-01	1.475E+00	2.574E+00	NOT IDENT.
PA-231	-8.985E-01	9.576E+00	1.635E+01	NOT IDENT.
TH-231	-1.234E+01	1.348E+01	2.231E+01	NOT IDENT.
TH-232	1.752E+00	4.122E+00	7.274E+00	NOT IDENT.
PA-233	1.012E+00	1.376E+00	2.399E+00	NOT IDENT.
PA-234	-1.421E+00	9.781E+00	1.689E+01	NOT IDENT.
PA-234M	1.242E+01	1.227E+02	2.136E+02	NOT IDENT.
TH-234	-2.917E+01	2.990E+01	4.490E+01	NOT IDENT.
U-234	3.856E-01	1.475E+00	2.574E+00	NOT IDENT.
U-235	1.292E+00	3.072E+00	5.560E+00	NOT IDENT.
NP-237	1.012E+00	1.376E+00	2.399E+00	NOT IDENT.
NP-238	4.872E+02	1.741E+03	3.048E+03	NOT IDENT.
U-238	-2.917E+01	2.990E+01	4.490E+01	NOT IDENT.
NP-239	-5.108E-01	5.045E+00	7.514E+00	NOT IDENT.
PU-239	-1.871E+03	5.435E+03	9.700E+03	FAIL ABUN
AM-243	2.125E-01	9.547E-01	1.651E+00	FAIL ABUN
CM-243	2.989E-02	1.832E+00	3.105E+00	NOT IDENT.
BK-247	-1.032E-01	1.635E+00	2.815E+00	FAIL ABUN
CM-247	-4.803E-02	8.453E-01	1.496E+00	NOT IDENT.
CF-251	1.479E+00	2.107E+00	3.795E+00	NOT IDENT.
ANH-511	-4.403E-01	6.570E-01	1.133E+00	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	360	85.60*	5.569E+00	1.972E+00	2.068E+00	29.03
	136.47	-----	10.68	5.503E+00	-----	Line Not Found	-----
CO-60	1173.23	7162	99.85	1.176E+00	1.593E+02	1.604E+02	2.60
	1332.49	6221	99.98*	1.046E+00	1.553E+02	1.563E+02	2.54
ZN-65	1115.54	145	50.60*	1.231E+00	6.091E+00	6.419E+00	60.62
CD-109	88.03	2887	3.70*	4.619E+00	4.412E+02	4.536E+02	5.25
SN-126	64.28	-----	9.60	2.266E+00	-----	Line Not Found	-----
	86.94	2887	8.90	4.619E+00	1.834E+02	1.834E+02	5.25
	87.57	2887	37.00*	4.619E+00	4.412E+01	4.412E+01	5.25
BA-137M	661.66	10855	89.90*	1.936E+00	1.629E+02	1.631E+02	2.10
CS-137	661.66	10855	85.10*	1.936E+00	1.721E+02	1.723E+02	2.10
PM-147	121.22	360	0.00*	5.569E+00	5.924E+04	6.004E+04	29.03
TL-208	277.37	-----	6.60	3.646E+00	-----	Line Not Found	-----
	583.19	71	85.00*	2.137E+00	1.024E+00	1.024E+00	76.40
	860.56	-----	12.50	1.556E+00	-----	Line Not Found	-----
PB-210	46.54	3711	4.25*	4.217E-01	5.407E+03	5.415E+03	5.42
TH-229	85.43	83	14.70	4.447E+00	3.315E+00	3.315E+00	68.68
	88.47	2887	24.00	4.619E+00	6.802E+01	6.802E+01	5.25
	193.51	-----	4.41*	4.674E+00	-----	Line Not Found	-----
	210.85	-----	2.80	4.420E+00	-----	Line Not Found	-----
AM-241	59.54	12767	35.90*	1.683E+00	5.519E+02	5.519E+02	2.69
CF-249	252.80	-----	2.50	3.896E+00	-----	Line Not Found	-----
	333.37	-----	14.60	3.196E+00	-----	Line Not Found	-----
	388.16	49	66.00*	2.875E+00	6.746E-01	6.747E-01	188.47

Flag: "*" = Keyline

Total number of lines in spectrum 32
Number of unidentified lines 13
Number of lines tentatively identified by NID 19 59.38%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.05	1.972E+00	2.068E+00	0.600E+00	29.03	
CO-60	5.27Y	1.01	1.553E+02	1.563E+02	0.040E+02	2.54	
ZN-65	244.06D	1.05	6.091E+00	6.419E+00	3.891E+00	60.62	
CD-109	461.40D	1.03	4.412E+02	4.536E+02	0.238E+02	5.25	
SN-126	2.30E+05Y	1.00	4.412E+01	4.412E+01	0.232E+01	5.25	
BA-137M	30.08Y	1.00	1.629E+02	1.631E+02	0.034E+02	2.10	
CS-137	30.08Y	1.00	1.721E+02	1.723E+02	0.036E+02	2.10	
PM-147	2.62Y	1.01	5.924E+04	6.004E+04	1.743E+04	29.03	
TL-208	1.41E+10Y	1.00	1.024E+00	1.024E+00	0.782E+00	76.40	
PB-210	22.20Y	1.00	5.407E+03	5.415E+03	0.293E+03	5.42	
TH-229	7340.00Y	1.00	6.802E+01	6.802E+01	0.357E+01	5.25	K
AM-241	432.60Y	1.00	5.519E+02	5.519E+02	0.149E+02	2.69	
CF-249	351.00Y	1.00	6.746E-01	6.747E-01	12.72E-01	188.47	
Total Activity :			6.626E+04	6.707E+04			

Grand Total Activity : 6.626E+04 6.707E+04

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	43.85	230	1934	1.46	87.92	86	11	2.34E-01	60.4	2.70E-01	T
0	79.14	121	865	1.38	158.54	157	6	1.26E-01	81.3	3.91E+00	T
5	120.01	45	280	0.76	240.32	239	10	4.78E-02	****	5.56E+00	T
0	374.54	93	386	1.71	749.59	747	7	1.03E-01	73.3	2.94E+00	T
0	451.74	71	394	0.75	904.06	901	7	8.00E-02	94.8	2.57E+00	
0	498.95	26	380	0.91	998.52	996	8	2.94E-02	****	2.40E+00	
0	577.21	55	297	3.36	1155.10	1149	11	6.24E-02	****	2.15E+00	
0	735.75	69	129	2.42	1472.29	1469	7	7.91E-02	58.5	1.78E+00	T
0	816.51	23	318	1.40	1633.86	1626	11	2.59E-02	****	1.63E+00	T
0	1227.69	9	57	1.36	2456.47	2451	11	1.09E-02	****	1.13E+00	
0	1231.39	25	22	1.90	2463.86	2461	7	2.88E-02	71.5	1.12E+00	T
0	1288.41	42	132	15.86	2577.95	2545	43	4.90E-02	****	1.08E+00	
3	1314.43	34	25	2.15	2630.00	2622	16	4.00E-02	66.2	1.06E+00	
3	1317.15	16	9	1.57	2635.43	2622	16	1.92E-02	66.8	1.06E+00	
0	1358.05	13	9	0.54	2717.25	2709	13	1.54E-02	****	1.03E+00	
0	1409.03	17	11	4.53	2819.24	2810	16	2.03E-02	96.9	9.96E-01	T
0	1486.12	18	11	4.89	2973.45	2957	22	2.11E-02	****	9.51E-01	
0	1521.70	9	9	5.12	3044.63	3034	13	1.06E-02	****	9.32E-01	
0	1561.68	12	5	1.45	3124.60	3119	11	1.39E-02	92.1	9.13E-01	
0	1891.99	9	5	2.60	3785.35	3777	11	1.13E-02	****	7.98E-01	
0	2019.79	7	11	0.84	4040.98	4028	16	8.07E-03	****	7.72E-01	

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561388.CNF;1
* Acquisition date   : 25-JUN-2016 11:03:45 Sensitivity      : 3.000
* Detector ID        : GAM08 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:03.91 Half life ratio : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203561388 Analyst initials: MXR1
* Batch Number       : 1572236 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                                     Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 8-JUL-2015 05:34:49 Eff. Geometry    : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	3.536E-01
CO-60	4.325E-01
ZN-65	1.833E+00
CD-109	1.085E+01
SN-126	1.062E+00
BA-137M	6.240E-01
CS-137	6.592E-01
PM-147	1.026E+04
TL-208	5.980E-01
PB-210	1.591E+02
TH-229	8.165E+00
AM-241	4.187E+00
CF-249	7.936E-01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.436E+00	NOT IDENT.
NA-22	4.319E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.129E-01	NOT IDENT.
K-40	2.865E+00	NOT IDENT.
SC-46	9.538E-01	NOT IDENT.
V-48	1.942E+00	NOT IDENT.
CR-51	7.264E+00	NOT IDENT.
MN-54	7.335E-01	NOT IDENT.
CO-56	9.038E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	8.302E-01	NOT IDENT.
FE-59	2.291E+00	NOT IDENT.
GE-68	2.888E+01	NOT IDENT.
AS-73	3.296E+01	NOT IDENT.
AS-74	1.846E+00	NOT IDENT.
SE-75	7.843E-01	FAIL ABUN
BR-77	3.710E+02	NOT IDENT.

SR-82	7.358E+00	NOT IDENT.
RB-83	1.343E+00	NOT IDENT.
KR-85	1.293E+02	NOT IDENT.
SR-85	7.099E-01	NOT IDENT.
RB-86	2.021E+01	NOT IDENT.
Y-88	3.308E-01	NOT IDENT.
Y-91	2.610E+02	NOT IDENT.
NB-94	5.646E-01	NOT IDENT.
NB-95	7.720E-01	NOT IDENT.
NB-95M	1.902E+00	NOT IDENT.
ZR-95	1.438E+00	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	5.060E+02	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	4.431E-01	NOT IDENT.
RH-102	1.049E+00	NOT IDENT.
RU-103	8.887E-01	NOT IDENT.
RH-106	5.838E+00	NOT IDENT.
RU-106	5.838E+00	NOT IDENT.
AG-108M	6.397E-01	NOT IDENT.
AG-110M	1.176E+00	NOT IDENT.
SN-113	9.070E-01	NOT IDENT.
CD-115	6.299E+02	NOT IDENT.
SN-117M	8.769E-01	NOT IDENT.
TE-123M	3.952E-01	NOT IDENT.
SB-124	6.741E-01	NOT IDENT.
SB-125	1.970E+00	NOT IDENT.
TE-125M	1.364E+02	NOT IDENT.
I-126	4.568E+00	NOT IDENT.
SB-126	2.988E+00	NOT IDENT.
SB-127	4.207E+01	NOT IDENT.
I-131	2.900E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	2.491E+01	NOT IDENT.
BA-133	7.893E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	8.020E-01	NOT IDENT.
CS-135	2.544E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.027E+00	NOT IDENT.
CE-139	4.321E-01	NOT IDENT.
BA-140	5.785E+00	NOT IDENT.
LA-140	7.482E-01	FAIL ABUN
CE-141	8.986E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.848E+00	FAIL ABUN
PM-144	5.958E-01	NOT IDENT.
PR-144	4.469E+01	NOT IDENT.
PM-146	9.544E-01	FAIL ABUN
ND-147	1.314E+01	NOT IDENT.
PM-149	4.473E+03	NOT IDENT.
EU-150	4.821E-01	NOT IDENT.
EU-152	1.807E+00	FAIL ABUN
GD-153	1.236E+00	NOT IDENT.
EU-154	1.228E+00	FAIL ABUN
EU-155	1.512E+00	FAIL ABUN
TB-160	3.224E+00	FAIL ABUN
HO-166M	1.066E+00	FAIL ABUN
TM-171	6.910E+02	NOT IDENT.
HF-172	2.706E+00	FAIL ABUN
LU-172	1.464E+00	FAIL ABUN
LU-176	4.645E-01	FAIL ABUN
HF-181	9.731E-01	NOT IDENT.
TA-182	2.035E+00	FAIL ABUN
RE-183	1.342E+01	FAIL ABUN
RE-184	3.302E+00	NOT IDENT.
W-188	1.242E+02	NOT IDENT.
IR-192	6.325E-01	NOT IDENT.
HG-203	6.916E-01	NOT IDENT.
BI-207	1.181E+00	NOT IDENT.
BI-211	3.680E+00	NOT IDENT.
PB-211	1.392E+01	NOT IDENT.
BI-212	8.909E+00	NOT IDENT.
PB-212	8.962E-01	NOT IDENT.
BI-214	1.250E+00	NOT IDENT.
PB-214	1.361E+00	FAIL ABUN
RN-219	8.026E+00	NOT IDENT.

RN-222	1.250E+00	NOT IDENT.
RA-223	1.089E+01	NOT IDENT.
RA-224	9.592E+00	NOT IDENT.
RA-226	1.250E+00	NOT IDENT.
AC-227	4.300E+00	FAIL ABUN
TH-227	4.300E+00	FAIL ABUN
AC-228	3.546E+00	NOT IDENT.
RA-228	3.546E+00	NOT IDENT.
TH-228	8.962E-01	NOT IDENT.
TH-230	1.250E+00	NOT IDENT.
PA-231	7.984E+00	NOT IDENT.
TH-231	1.089E+01	NOT IDENT.
TH-232	3.546E+00	NOT IDENT.
PA-233	1.173E+00	NOT IDENT.
PA-234	8.242E+00	NOT IDENT.
PA-234M	1.038E+02	NOT IDENT.
TH-234	2.201E+01	NOT IDENT.
U-234	1.250E+00	NOT IDENT.
U-235	2.721E+00	NOT IDENT.
NP-237	1.173E+00	NOT IDENT.
NP-238	1.482E+03	NOT IDENT.
U-238	2.201E+01	NOT IDENT.
NP-239	3.677E+00	NOT IDENT.
PU-239	4.750E+03	FAIL ABUN
AM-243	8.106E-01	FAIL ABUN
CM-243	1.521E+00	NOT IDENT.
BK-247	1.377E+00	FAIL ABUN
CM-247	7.306E-01	NOT IDENT.
CF-251	1.857E+00	NOT IDENT.
ANH-511	5.520E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561388.CNF;1
Acquisition date : 25-JUN-2016 11:03:45 Sensitivity : 3.000
Detector ID : GAM08 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:03.91 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561388 Analyst initials: MXR1
Batch Number : 1572236 Sample Quantity : 1.1500E+02 GRAM
Quantity Err(%) : 1.7391E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 8-JUL-2015 05:34:49 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	2.068E+00	6.189E-01	6.189E-01
CO-60	1.563E+02	1.270E+01	1.270E+01
ZN-65	6.419E+00	4.015E+00	4.015E+00
CD-109	4.536E+02	4.998E+01	4.998E+01
SN-126	4.412E+01	4.263E+00	4.263E+00
BA-137M	1.631E+02	1.509E+01	1.509E+01
CS-137	1.723E+02	1.594E+01	1.594E+01
PM-147	6.004E+04	1.797E+04	1.797E+04
TL-208	1.024E+00	7.720E-01	7.720E-01
PB-210	5.415E+03	6.504E+02	6.504E+02
TH-229	-6.974E+00	9.669E+00	9.669E+00
AM-241	5.519E+02	5.691E+01	5.691E+01
CF-249	6.747E-01	1.248E+00	1.248E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-6.819E-01	8.716E+00	8.721E+00	NOT IDENT.
NA-22	9.447E-02	6.000E-01	6.015E-01	NOT IDENT.
NA-24	1.608E+08	2.559E+08	2.660E+08	SHORT HLIF
AL-26	-2.587E-01	3.146E-01	3.355E-01	NOT IDENT.
K-40	3.107E+00	2.905E+00	3.225E+00	NOT IDENT.
SC-46	-1.611E-02	1.122E+00	1.122E+00	NOT IDENT.
V-48	2.404E-01	2.295E+00	2.297E+00	NOT IDENT.
CR-51	5.600E+00	8.572E+00	8.936E+00	NOT IDENT.
MN-54	-3.267E-01	8.703E-01	8.827E-01	NOT IDENT.
CO-56	1.677E-01	1.053E+00	1.056E+00	NOT IDENT.
MN-56	1.000E+41	6.365E+41	0.000E+00	SHORT HLIF
CO-58	-4.769E-01	1.148E+00	1.168E+00	NOT IDENT.
FE-59	2.250E+00	2.702E+00	2.886E+00	NOT IDENT.
GE-68	-6.430E+00	3.478E+01	3.490E+01	NOT IDENT.
AS-73	-3.315E+01	4.154E+01	4.414E+01	NOT IDENT.
AS-74	-1.194E+00	2.246E+00	2.309E+00	NOT IDENT.
SE-75	-4.597E-02	9.309E-01	9.311E-01	FAIL ABUN

BR-77	1.360E+02	4.385E+02	4.428E+02	NOT IDENT.
SR-82	4.096E+00	8.801E+00	8.993E+00	NOT IDENT.
RB-83	-1.845E+00	1.669E+00	1.864E+00	NOT IDENT.
KR-85	9.832E+01	1.492E+02	1.557E+02	NOT IDENT.
SR-85	5.398E-01	8.191E-01	8.545E-01	NOT IDENT.
RB-86	-6.956E+00	2.445E+01	2.465E+01	NOT IDENT.
Y-88	3.720E-01	3.267E-01	3.673E-01	NOT IDENT.
Y-91	1.345E+02	3.058E+02	3.118E+02	NOT IDENT.
NB-94	-7.732E-02	6.843E-01	6.852E-01	NOT IDENT.
NB-95	3.456E-01	9.245E-01	9.375E-01	NOT IDENT.
NB-95M	-1.258E+00	2.275E+00	2.344E+00	NOT IDENT.
ZR-95	9.478E-01	1.710E+00	1.763E+00	NOT IDENT.
NB-97	1.000E+41	1.551E+40	0.000E+00	SHORT HLIF
ZR-97	-7.991E+08	9.827E+08	1.047E+09	SHORT HLIF
MO-99	-7.195E+01	7.157E+02	7.164E+02	NOT IDENT.
TC-99M	1.708E+19	5.442E+21	0.000E+00	SHORT HLIF
RH-101	-1.712E-01	5.464E-01	5.518E-01	NOT IDENT.
RH-102	6.794E-01	1.231E+00	1.268E+00	NOT IDENT.
RU-103	8.332E-01	1.168E+00	1.226E+00	NOT IDENT.
RH-106	2.206E+00	6.890E+00	6.962E+00	NOT IDENT.
RU-106	2.206E+00	6.890E+00	6.962E+00	NOT IDENT.
AG-108M	-3.248E-02	7.438E-01	7.439E-01	NOT IDENT.
AG-110M	-1.678E-01	1.387E+00	1.389E+00	NOT IDENT.
SN-113	-7.020E-02	1.203E+00	1.203E+00	NOT IDENT.
CD-115	-3.506E+01	7.436E+02	7.437E+02	NOT IDENT.
SN-117M	-4.501E-01	1.019E+00	1.039E+00	NOT IDENT.
TE-123M	-1.858E-01	4.587E-01	4.663E-01	NOT IDENT.
SB-124	2.010E-01	7.696E-01	7.749E-01	NOT IDENT.
SB-125	1.169E+00	2.258E+00	2.318E+00	NOT IDENT.
TE-125M	-1.746E+02	1.706E+02	1.879E+02	NOT IDENT.
I-126	5.598E-02	6.350E+00	6.350E+00	NOT IDENT.
SB-126	-2.325E+00	3.724E+00	3.869E+00	NOT IDENT.
SB-127	1.587E+01	5.002E+01	5.053E+01	NOT IDENT.
I-131	-7.028E-01	3.540E+00	3.554E+00	FAIL ABUN
I-132	1.000E+41	2.232E+41	0.000E+00	SHORT HLIF
TE-132	1.204E+01	2.896E+01	2.947E+01	NOT IDENT.
BA-133	2.652E-01	9.477E-01	9.552E-01	NOT IDENT.
I-133	-9.465E+05	1.943E+06	1.989E+06	SHORT HLIF
CS-134	-4.543E-01	9.516E-01	9.734E-01	NOT IDENT.
CS-135	-5.720E-01	3.036E+00	3.047E+00	NOT IDENT.
I-135	-2.692E+20	3.524E+20	0.000E+00	SHORT HLIF
CS-136	1.646E+00	3.565E+00	3.641E+00	NOT IDENT.
CE-139	1.421E-01	4.946E-01	4.987E-01	NOT IDENT.
BA-140	-5.132E+00	7.023E+00	7.395E+00	NOT IDENT.
LA-140	2.715E-01	8.431E-01	8.520E-01	FAIL ABUN
CE-141	-2.501E-01	1.033E+00	1.039E+00	NOT IDENT.
CE-143	-4.072E+03	1.321E+04	1.333E+04	SHORT HLIF
CE-144	-7.956E-01	3.257E+00	3.277E+00	FAIL ABUN
PM-144	2.466E-03	7.181E-01	7.181E-01	NOT IDENT.
PR-144	4.924E-01	5.384E+01	5.384E+01	NOT IDENT.
PM-146	2.428E-01	1.270E+00	1.275E+00	FAIL ABUN
ND-147	-7.522E+00	1.576E+01	1.612E+01	NOT IDENT.
PM-149	-5.233E+01	5.331E+03	5.331E+03	NOT IDENT.
EU-150	-2.325E-01	5.884E-01	5.977E-01	NOT IDENT.
EU-152	9.666E-01	2.155E+00	2.199E+00	FAIL ABUN
GD-153	7.105E-01	1.465E+00	1.500E+00	NOT IDENT.
EU-154	3.085E-01	1.700E+00	1.706E+00	FAIL ABUN
EU-155	1.622E-01	1.819E+00	1.821E+00	FAIL ABUN
TB-160	2.023E-01	3.780E+00	3.781E+00	FAIL ABUN
HO-166M	2.313E-02	1.286E+00	1.286E+00	FAIL ABUN
TM-171	-2.552E+02	8.095E+02	8.176E+02	NOT IDENT.
HF-172	1.738E+00	3.428E+00	3.517E+00	FAIL ABUN
LU-172	-9.042E-01	1.796E+00	1.842E+00	FAIL ABUN
LU-176	-2.791E-01	5.652E-01	5.791E-01	FAIL ABUN
HF-181	-8.247E-01	1.165E+00	1.223E+00	NOT IDENT.
TA-182	-5.463E-01	2.937E+00	2.948E+00	FAIL ABUN
RE-183	6.935E+02	8.697E+01	3.245E+02	FAIL ABUN
RE-184	1.086E+00	3.857E+00	3.888E+00	NOT IDENT.
W-188	-1.045E+02	1.521E+02	1.592E+02	NOT IDENT.
IR-192	-5.335E-01	7.770E-01	8.134E-01	NOT IDENT.
HG-203	3.194E-01	8.143E-01	8.269E-01	NOT IDENT.
BI-207	7.235E-02	1.408E+00	1.408E+00	NOT IDENT.
BI-211	-9.777E-01	4.477E+00	4.499E+00	NOT IDENT.
PB-211	-6.539E+00	1.628E+01	1.654E+01	NOT IDENT.
BI-212	1.050E+01	1.039E+01	1.142E+01	NOT IDENT.
PB-212	2.571E-01	1.047E+00	1.053E+00	NOT IDENT.
BI-214	3.857E-01	1.475E+00	1.486E+00	NOT IDENT.
PB-214	9.987E-01	1.616E+00	1.677E+00	FAIL ABUN

RN-219	4.358E-01	9.259E+00	9.261E+00	NOT IDENT.
RN-222	3.857E-01	1.475E+00	1.486E+00	NOT IDENT.
RA-223	-1.234E+01	1.354E+01	1.464E+01	NOT IDENT.
RA-224	4.820E+00	1.118E+01	1.139E+01	NOT IDENT.
RA-226	3.857E-01	1.475E+00	1.486E+00	NOT IDENT.
AC-227	-1.106E+00	5.119E+00	5.143E+00	FAIL ABUN
TH-227	-1.106E+00	5.119E+00	5.143E+00	FAIL ABUN
AC-228	1.752E+00	4.130E+00	4.205E+00	NOT IDENT.
RA-228	1.752E+00	4.130E+00	4.205E+00	NOT IDENT.
TH-228	2.571E-01	1.047E+00	1.053E+00	NOT IDENT.
TH-230	3.856E-01	1.475E+00	1.486E+00	NOT IDENT.
PA-231	-8.985E-01	9.579E+00	9.587E+00	NOT IDENT.
TH-231	-1.234E+01	1.354E+01	1.464E+01	NOT IDENT.
TH-232	1.752E+00	4.130E+00	4.205E+00	NOT IDENT.
PA-233	1.012E+00	1.379E+00	1.453E+00	NOT IDENT.
PA-234	-1.421E+00	9.917E+00	9.938E+00	NOT IDENT.
PA-234M	1.242E+01	1.227E+02	1.229E+02	NOT IDENT.
TH-234	-2.917E+01	3.064E+01	3.335E+01	NOT IDENT.
U-234	3.856E-01	1.475E+00	1.486E+00	NOT IDENT.
U-235	1.292E+00	3.074E+00	3.129E+00	NOT IDENT.
NP-237	1.012E+00	1.379E+00	1.453E+00	NOT IDENT.
NP-238	4.872E+02	1.743E+03	1.757E+03	NOT IDENT.
U-238	-2.917E+01	3.064E+01	3.335E+01	NOT IDENT.
NP-239	-5.108E-01	5.045E+00	5.050E+00	NOT IDENT.
PU-239	-1.871E+03	5.437E+03	5.502E+03	FAIL ABUN
AM-243	2.125E-01	9.549E-01	9.597E-01	FAIL ABUN
CM-243	2.989E-02	1.832E+00	1.832E+00	NOT IDENT.
BK-247	-1.032E-01	1.635E+00	1.635E+00	FAIL ABUN
CM-247	-4.803E-02	8.453E-01	8.456E-01	NOT IDENT.
CF-251	1.479E+00	2.115E+00	2.217E+00	NOT IDENT.
ANH-511	-4.403E-01	6.581E-01	6.874E-01	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2235.3596	87.09	840.3719	136.47	682.6904
45.60	2103.8123	87.57	841.1325	140.51	668.5254
46.54	2109.4893	88.03	841.8621	143.76	652.5057
49.72	1948.5504	88.34	842.3550	144.24	644.7909
51.35	2063.4224	88.47	842.5607	145.44	671.1921
51.87	2107.0215	89.96	699.2888	152.43	681.9646
52.39	2177.2314	90.64	690.1934	153.25	645.1671
52.97	2304.1360	91.11	695.7838	154.21	634.9680
53.44	2303.2888	92.59	709.3536	156.02	624.5041
54.07	2252.3621	93.35	748.7744	158.56	654.1575
57.36	0.0000	94.56	700.1608	159.00	660.9734
57.53	2421.0212	94.65	700.2725	162.33	635.0284
57.98	1654.0844	94.67	700.2980	162.66	654.7377
59.27	1659.3342	94.87	710.6057	163.33	665.4724
59.32	1659.5375	97.43	745.2675	165.86	658.2458
59.54	1660.4281	98.43	769.0616	176.31	599.6758
60.96	779.9216	98.44	769.0756	176.60	591.4044
61.17	770.9312	99.53	778.4224	177.52	608.0633
62.93	866.7999	100.11	720.5651	181.07	673.9860
63.29	867.5295	102.03	770.4616	181.52	671.4923
63.58	864.9716	103.18	752.6974	184.41	676.5554
64.28	855.3528	103.37	741.6012	185.72	704.2059
66.73	853.2930	105.21	746.1713	193.51	799.5966
67.24	874.3633	105.31	746.2948	197.03	694.7392
67.68	853.0010	106.12	692.6218	198.01	733.0957
67.75	885.9493	106.47	654.2691	201.83	737.0678
69.67	886.5450	109.28	751.1962	203.43	698.5382
70.83	848.2926	111.00	698.1727	205.31	737.8350
72.81	887.2343	111.76	644.9896	210.85	734.2751
72.87	887.3481	114.06	733.8999	215.65	754.5820
74.66	900.3871	116.30	675.3454	222.11	745.6415
74.82	901.7645	116.74	691.7995	227.09	708.5612
74.97	902.0461	119.76	667.0894	227.38	708.7625
77.11	869.8800	121.12	675.4735	228.16	714.2750
78.74	877.6566	121.22	672.9513	228.18	714.2860
79.69	986.8167	121.78	673.5233	235.69	699.4219
80.12	955.0711	122.06	673.8079	235.96	699.6029
80.19	955.2052	122.92	718.7250	238.63	641.0812
80.57	1003.2366	123.07	718.8844	238.98	641.2905
81.00	991.0385	123.68	732.1920	240.99	632.4319
81.07	991.1774	125.81	686.5826	242.00	673.3462
81.75	983.2455	127.23	741.7003	244.70	629.5640
83.79	956.5466	127.91	742.4453	252.40	637.0612
84.00	956.9333	129.30	747.4875	252.80	643.4035
85.43	988.1287	131.20	694.4820	254.15	0.0000
86.55	839.5103	133.02	755.0624	256.23	671.9384
86.79	839.8868	133.52	744.9069	260.90	661.3967
86.94	840.1312	136.00	716.2201	264.66	651.2455

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	651.3228	364.49	564.5702	600.60	354.4872
265.00	644.2348	366.42	531.9296	602.52	0.0000
268.22	624.3679	372.51	536.3818	604.72	374.5137
269.46	637.4299	375.05	517.1558	607.14	344.3705
270.03	612.9338	1093.63	559.7262	609.32	354.9158
271.23	607.3591	383.85	588.5104	610.33	340.8007
273.65	595.1431	388.16	600.7242	614.28	357.7759
276.40	667.1957	388.63	597.8989	618.01	356.3432
277.37	629.2606	391.69	605.1387	620.36	325.9733
277.60	631.4658	400.66	620.1905	621.93	331.3431
278.00	613.9832	401.81	582.3699	630.19	0.0000
279.20	612.5209	402.40	579.8609	631.29	337.9057
279.54	599.1543	404.85	598.1113	633.25	341.2953
279.70	602.3597	410.95	594.9299	634.78	334.3069
280.46	614.2188	413.71	611.5704	635.95	347.9015
283.69	613.7812	414.70	605.5206	636.99	369.7556
284.31	626.6486	423.72	628.3193	645.85	361.8915
285.41	610.4615	427.09	634.2438	657.76	349.1982
285.90	609.6631	427.87	606.7545	657.90	0.0000
287.50	590.5418	433.94	630.3778	661.66	316.3820
290.67	616.2585	439.40	644.5818	664.57	0.0000
293.27	0.0000	453.88	652.3105	666.33	310.3991
295.22	564.7068	463.37	700.0461	666.50	310.4208
295.96	552.3677	468.07	694.3456	667.71	0.0000
298.58	600.1016	473.00	634.4642	677.62	274.4068
299.98	617.7206	475.06	666.6235	685.70	280.6248
300.09	617.7740	476.78	630.0963	695.00	289.1427
300.13	617.8007	477.60	614.1741	696.49	304.1598
301.36	577.0288	482.18	587.0626	696.51	304.1598
302.85	549.0443	487.02	507.1542	697.00	299.9828
304.50	572.0847	492.35	529.7927	697.30	316.9867
304.85	577.5672	497.08	475.5740	697.49	317.0086
306.78	610.3950	505.52	457.5729	702.65	296.4443
308.46	579.1995	507.63	0.0000	706.68	274.5848
311.90	557.2194	511.00	473.9742	711.68	297.5478
316.51	611.7916	514.00	422.1964	720.70	316.8486
319.41	573.3475	514.00	422.1964	721.93	0.0000
320.08	546.7341	520.40	455.8381	722.78	286.0472
321.04	533.1281	520.69	454.9302	722.91	286.0603
323.87	594.7111	522.65	0.0000	723.31	278.6050
325.23	557.5093	527.90	436.0696	724.19	296.9297
328.76	573.0645	528.26	439.0859	727.33	257.5957
333.37	600.0187	529.59	441.3538	733.00	270.7321
333.97	605.7256	529.87	0.0000	735.93	273.5647
334.37	598.2895	531.02	430.8867	737.46	298.1597
338.28	552.0014	537.26	408.6372	739.50	291.2124
338.32	552.0168	546.56	0.0000	747.24	320.2379
340.48	638.1084	552.55	377.0869	748.06	299.7768
340.55	638.1440	563.25	338.1972	752.31	315.4608
344.28	565.3592	569.33	351.3254	753.82	340.5934
345.93	566.0284	569.50	355.2427	756.73	305.1484
351.06	582.4117	569.70	355.2773	756.80	305.1553
351.93	545.3188	583.19	315.6436	763.94	306.0060
355.39	0.0000	584.27	342.6812	765.81	298.5971
356.01	570.0912	595.83	359.7755	766.42	298.6707

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	321.6119	1002.74	360.8621	1678.03	0.0000
772.60	0.0000	1004.73	396.6021	1690.97	11.0338
776.52	325.0033	1021.30	0.0000	1750.46	0.0000
777.92	314.2286	1025.87	334.6552	1764.49	15.2673
778.90	332.9676	1028.54	347.8495	1770.23	17.3225
783.70	317.1168	1037.84	357.8022	1771.35	21.4028
785.37	319.5174	1038.76	0.0000	1791.20	0.0000
792.07	314.6400	1046.59	346.7599	1808.65	16.4252
794.95	329.6749	1048.07	361.9116	1810.72	0.0000
795.86	363.7734	1049.04	359.0146	1836.06	5.1596
801.95	344.3551	1050.41	330.1477		
810.06	354.6250	1063.66	345.5257		
810.29	372.0724	1077.00	353.9564		
810.45	372.0970	1077.34	354.9935		
810.76	368.9708	1085.87	358.9146		
815.77	358.5480	1093.63	376.9497		
818.51	363.6749	1099.45	353.2393		
832.01	326.7702	1112.07	380.7093		
834.85	360.6552	1112.84	370.3198		
835.71	358.9088	1115.54	319.1770		
836.80	0.0000	1120.29	269.5752		
846.75	0.0000	1120.55	269.5967		
846.77	385.6046	1121.30	280.1674		
856.80	420.8021	1129.67	252.8896		
860.56	379.9747	1131.51	0.0000		
871.09	405.9332	1147.95	0.0000		
873.19	390.1704	1173.23	180.3296		
875.33	0.0000	1177.95	154.7685		
879.38	413.7328	1189.05	113.4530		
880.51	407.2630	1204.77	94.0759		
883.24	398.1677	1221.41	89.9937		
884.68	418.2825	1231.02	70.3747		
889.28	415.1465	1235.36	65.0366		
894.76	434.9645	1238.28	78.7439		
898.04	424.0229	1260.41	0.0000		
900.72	443.4869	1271.87	56.5356		
903.28	445.7745	1274.44	54.7496		
911.20	468.9852	1274.54	54.7496		
912.08	489.2301	1291.59	60.4870		
923.98	484.4561	1298.22	0.0000		
926.50	479.0940	1312.11	46.0624		
929.11	450.6233	1332.49	55.0923		
937.49	530.0790	1362.66	0.0000		
944.13	511.8876	1365.19	23.5204		
946.00	551.8976	1368.63	0.0000		
949.00	561.1654	1384.29	24.3786		
954.55	0.0000	1408.01	25.4594		
962.31	509.0823	1457.56	0.0000		
964.08	459.7083	1460.82	10.5005		
966.17	470.7363	1489.16	18.4947		
968.97	455.5511	1505.03	21.2120		
983.53	387.1084	1584.12	14.7149		
984.45	395.0633	1596.21	11.8025		
996.26	431.9620	1620.50	24.7149		
1001.03	374.4645	1621.92	18.7886		

Batch# 1572406

Product: YL/BRKL

Date: 6-22-16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/MDC, error is 40% or less. If below the MDA/MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5x MDA/MDC, then RPD is 100% or less, If greater 5x MDA/MDC, then RPD 20% or less, If below the MDA/MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			NA
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.	✓		
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)			NA

Primary Review Performed By: minimution 6-22-16

Secondary Review Performed By: QE- 6/27/16

7-3-16

Gamma Spec Queue Sheet

06/06/2016

Batch #: 1572406 Analyst: MMH First Client Due Date: 07/03/2016 Internal Due Date: 06/25/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1604 Expiration Date: 4/1/38 Vol: 1.0 mL
 Initials: MS Prep Date: 6/21/16 Library: LIQUID Balance ID: N39169

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Detector	Sealing Date/Time (if Applicable)
398656026-1	37695-026	SAMPLE		BRKL007	WATER	17-MAY-16 10:00:00	2.0	16	
1203561781-1	MB	MB		QC ACCOUNT	WATER	6/21/16	2.0	25	
1203561782-1	LCS	LCS		QC ACCOUNT	WATER	6/21/16	2.0	9	
1203561783-1	LCS	LCS		QC ACCOUNT	WATER	6/21/16	2.0	43	

MS
6/21/16

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: William 6-22-16

Page 1 of 1

VAX/VMS Nuclide Identification Report Generated 22-JUN-2016 15:15:09.33

```
*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656026.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM16.CNF;425
Background date    : 20-JUN-2016 14:03:32
Sample date       : 17-MAY-2016 10:00:00 Acquisition date : 22-JUN-2016 12:14:46
Sample ID        : G398656026 Sample quantity : 2.00000E+00 LITER
Detector name    : GAM16 Detector geometry: 2LMB
Elapsed live time: 0 03:00:00.00 Elapsed real time: 0 03:00:00.61 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572406 Detector SN# :
Matrix Spike ID  : LCS ID : 1604
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.93*	21	128	1.02	93.68	90	8	1.95E-03	105.2	
2	0	54.02*	7	151	1.24	107.86	103	8	6.38E-04	332.2	
3	0	63.44*	9	136	0.76	126.68	123	7	8.62E-04	240.9	
4	2	65.79*	20	36	1.01	131.39	130	7	1.88E-03	51.1	7.99E-01
5	2	66.90*	11	137	1.12	133.61	130	7	1.06E-03	189.4	
6	0	74.57*	19	119	1.47	148.94	147	7	1.74E-03	106.6	
7	0	92.75*	23	192	1.48	185.28	182	8	2.08E-03	128.1	
8	0	139.77	64	179	1.54	279.28	276	9	5.91E-03	39.6	
9	0	185.56*	33	157	1.31	370.82	365	11	3.05E-03	87.2	
10	2	196.92	26	60	1.39	393.52	391	27	2.42E-03	44.4	1.76E+00
11	2	198.69	77	117	1.39	397.05	391	27	7.17E-03	26.8	
12	2	202.92	31	113	1.40	405.51	391	27	2.90E-03	62.6	
13	0	225.88	13	122	1.44	451.41	448	9	1.17E-03	160.3	
14	0	239.02*	1	194	1.55	477.69	474	13	1.36E-04	*****	
15	0	583.78*	20	24	2.06	1166.98	1163	8	1.85E-03	58.5	
16	0	659.38	21	12	2.51	1318.14	1312	12	1.94E-03	39.6	
17	0	947.07	14	7	2.56	1893.41	1889	9	1.30E-03	42.8	
18	0	1088.88	11	10	1.08	2177.00	2170	10	1.02E-03	61.7	
19	0	1238.44	10	3	1.26	2476.10	2473	6	9.26E-04	41.8	
20	0	1259.87	13	20	0.69	2518.97	2509	16	1.19E-03	82.5	
21	0	1288.98	10	3	1.42	2577.19	2573	7	8.83E-04	45.8	
22	0	1292.80*	3	5	1.01	2584.82	2581	7	2.89E-04	180.4	
23	0	1364.50	7	3	0.81	2728.23	2723	11	6.53E-04	59.4	
24	0	1371.19	6	4	1.31	2741.61	2735	9	5.28E-04	78.7	
25	0	1390.73	7	9	0.44	2780.70	2774	12	6.16E-04	98.5	
26	0	1460.35*	7	7	1.97	2919.94	2913	14	6.37E-04	120.8	
27	0	1514.41	7	6	0.64	3028.07	3021	10	6.27E-04	83.2	
28	0	1711.77	8	3	0.53	3422.86	3415	11	7.37E-04	54.2	
29	0	1795.17*	5	6	1.81	3589.69	3581	11	4.87E-04	110.1	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 22-JUN-2016 15:15:10

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656026.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 17-MAY-2016 10:00:00	Acquisition date	: 22-JUN-2016 12:14:46
Sample ID	: G398656026	Sample quantity	: 2.0000 LITER
Sample type	: LIQUID	Sample geometry	:
Detector name	: GAMMA16	Detector geometry	: 2LMB
Elapsed live time	: 0 03:00:00.00	Elapsed real time	: 0 03:00:00.61 0.0%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
K-40	1460.82	7	10.66*	6.122E-01	1.319E+01	1.319E+01	241.65
TL-208	277.37	-----	6.60	1.995E+00	-----	Line Not Found	-----
	583.19	20	85.00*	1.232E+00	2.387E+00	2.474E+00	116.96
	860.56	-----	12.50	9.277E-01	-----	Line Not Found	-----
PB-210	46.54	21	4.25*	2.416E-01	2.560E+02	2.568E+02	210.46
PO-210	46.54	21	4.25*	2.416E-01	2.560E+02	2.568E+02	210.46
RA-226	186.21	33	3.59*	2.461E+00	4.663E+01	4.663E+01	174.37
TH-230	67.67	11	0.38*	1.148E+00	3.274E+02	3.274E+02	378.89
TH-232	63.81	9	0.26*	9.727E-01	4.605E+02	4.605E+02	481.84
	140.88	64	0.02	2.635E+00	1.515E+04	1.515E+04	79.15
TH-234	63.29	9	3.70*	9.727E-01	3.236E+01	3.236E+01	481.84
	92.59	23	4.23	2.171E+00	3.068E+01	3.068E+01	256.29
U-234	53.20	7	0.12*	5.148E-01	1.396E+03	1.396E+03	664.31
	120.90	-----	0.04	2.593E+00	-----	Line Not Found	-----
U-238	63.29	9	3.70*	9.727E-01	3.236E+01	3.236E+01	481.84
	92.59	23	4.23	2.171E+00	3.068E+01	3.068E+01	256.29
AM-243	43.53	-----	5.90	1.476E-01	-----	Line Not Found	-----
	74.66	19	67.20*	1.516E+00	2.306E+00	2.306E+00	213.15

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656026.CNF;1
Acquisition date : 22-JUN-2016 12:14:46 Sensitivity : 3.000
Detector ID : GAM16 Energy tolerance: 1.500
Elapsed live time: 0 03:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 03:00:00.61 Half life ratio : *****
Sample date : 17-MAY-2016 10:00:00 Analyst initials: MXR1
Sample ID : G398656026 Sample Quantity : 2.0000E+00 LITER
Batch Number : 1572406 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : LIQUID.NLB;9

CALIBRATION INFORMATION

Eff. Cal. date : 1-OCT-2015 05:57:38 Eff. Geometry : 2LMB
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM16_2LMB.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
K-40	1.319E+01	3.124E+01	3.175E+01
TL-208	2.474E+00	2.836E+00	3.998E+00
PB-210	2.568E+02	5.296E+02	5.917E+02
PO-210	2.568E+02	5.296E+02	5.917E+02
RA-226	4.663E+01	7.968E+01	7.885E+01
TH-230	3.274E+02	1.216E+03	1.606E+03
TH-232	4.605E+02	2.174E+03	2.317E+03
TH-234	3.236E+01	1.528E+02	1.827E+02
U-234	1.396E+03	9.088E+03	1.099E+04
U-238	3.236E+01	1.528E+02	1.827E+02
AM-243	2.306E+00	4.818E+00	6.509E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	2.110E+01	2.684E+01	5.130E+01	NOT IDENT.
NA-22	1.131E+00	1.944E+00	4.118E+00	NOT IDENT.
NA-24	0.000E+00	5.779E+17	0.000E+00	SHORT HLIF
AL-26	-1.377E+00	2.005E+00	3.489E+00	NOT IDENT.
SC-46	-2.778E-01	2.699E+00	4.914E+00	NOT IDENT.
V-48	-1.746E+00	8.975E+00	1.621E+01	NOT IDENT.
CR-51	1.245E+01	4.390E+01	8.030E+01	NOT IDENT.
MN-52	2.354E+00	1.825E+02	3.532E+02	NOT IDENT.
MN-54	-4.690E-01	1.736E+00	3.149E+00	NOT IDENT.
CO-56	-2.052E+00	2.550E+00	4.221E+00	FAIL ABUN
CO-57	1.983E-01	2.132E+00	3.731E+00	NOT IDENT.
CO-58	-7.133E-01	2.441E+00	4.395E+00	NOT IDENT.
FE-59	5.535E+00	6.299E+00	1.341E+01	FAIL ABUN
CO-60	1.966E-01	2.041E+00	4.005E+00	NOT IDENT.
ZN-65	2.066E+00	4.202E+00	8.663E+00	NOT IDENT.
CU-67	0.000E+00	9.855E+04	0.000E+00	SHORT HLIF
GE-68	-5.339E+01	6.851E+01	1.179E+02	NOT IDENT.
AS-74	1.370E+01	1.360E+01	2.728E+01	NOT IDENT.
SE-75	-1.860E+00	3.236E+00	5.650E+00	NOT IDENT.

BR-77	0.000E+00	5.742E+05	0.000E+00	SHORT HLIF
SR-82	7.119E+00	3.130E+01	6.007E+01	NOT IDENT.
RB-83	-2.211E+00	5.209E+00	8.836E+00	NOT IDENT.
RB-84	6.188E+00	6.351E+00	1.300E+01	NOT IDENT.
KR-85	-1.871E+03	7.421E+02	1.062E+03	NOT IDENT.
SR-85	-1.226E+01	4.861E+00	6.960E+00	NOT IDENT.
RB-86	-4.762E+01	8.461E+01	1.509E+02	NOT IDENT.
Y-88	1.164E+00	2.726E+00	5.834E+00	NOT IDENT.
Y-91	1.532E+03	1.310E+03	2.850E+03	NOT IDENT.
NB-94	-1.301E+00	1.950E+00	3.352E+00	NOT IDENT.
NB-95	3.637E+00	2.776E+00	5.869E+00	NOT IDENT.
NB-95M	-5.417E+00	1.143E+01	1.759E+01	NOT IDENT.
ZR-95	-6.528E-01	5.209E+00	9.511E+00	NOT IDENT.
MO-99	0.000E+00	1.332E+05	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	7.757E+40	0.000E+00	SHORT HLIF
RH-101	-1.719E+00	2.428E+00	4.049E+00	FAIL ABUN
RH-102M	1.921E-01	1.909E+00	3.427E+00	NOT IDENT.
RU-103	-3.930E+00	4.060E+00	6.498E+00	NOT IDENT.
RH-106	2.585E+00	1.870E+01	3.544E+01	NOT IDENT.
RU-106	2.585E+00	1.870E+01	3.544E+01	NOT IDENT.
AG-108M	-1.529E-01	1.824E+00	3.242E+00	NOT IDENT.
CD-109	4.275E+01	6.348E+01	1.112E+02	NOT IDENT.
AG-110M	1.870E-01	3.263E+00	6.017E+00	NOT IDENT.
SN-113	2.486E+00	3.150E+00	6.027E+00	NOT IDENT.
IN-114M	-2.004E-01	1.987E+01	3.009E+01	NOT IDENT.
CD-115	0.000E+00	5.043E+05	0.000E+00	SHORT HLIF
SN-117M	-1.358E+00	1.192E+01	2.036E+01	NOT IDENT.
I-123	0.000E+00	1.128E+20	0.000E+00	SHORT HLIF
TE-123M	-3.248E-01	2.405E+00	4.101E+00	NOT IDENT.
SB-124	-4.496E+00	6.479E+00	1.135E+01	NOT IDENT.
SB-125	1.730E-01	5.308E+00	9.590E+00	NOT IDENT.
TE-125M	-5.477E+02	9.572E+02	1.624E+03	NOT IDENT.
I-126	-4.709E+00	3.610E+01	6.300E+01	NOT IDENT.
SB-126	-3.924E+01	2.455E+01	3.630E+01	NOT IDENT.
SN-126	-2.987E-01	5.854E+00	1.032E+01	FAIL ABUN
SB-127	3.067E+02	3.114E+03	5.895E+03	NOT IDENT.
TE-129	-2.160E+01	5.029E+01	8.574E+01	NOT IDENT.
I-131	3.736E+01	4.674E+01	8.906E+01	NOT IDENT.
I-132	0.000E+00	9.368E+40	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.368E+03	0.000E+00	SHORT HLIF
BA-133	-1.258E-01	3.015E+00	4.908E+00	NOT IDENT.
I-133	0.000E+00	7.176E+12	0.000E+00	SHORT HLIF
CS-134	7.895E-01	2.257E+00	4.362E+00	FAIL ABUN
CS-135	-1.461E+00	9.502E+00	1.709E+01	NOT IDENT.
I-135	0.000E+00	6.585E+40	0.000E+00	SHORT HLIF
CS-136	6.456E+00	1.572E+01	3.207E+01	NOT IDENT.
BA-137M	-2.966E-02	2.145E+00	3.488E+00	NOT IDENT.
CS-137	-3.134E-02	2.266E+00	3.684E+00	NOT IDENT.
CE-139	-2.997E-02	2.360E+00	4.053E+00	NOT IDENT.
BA-140	-2.513E+01	5.115E+01	8.590E+01	NOT IDENT.
LA-140	-1.098E+01	1.775E+01	3.008E+01	NOT IDENT.
CE-141	-1.096E-01	8.365E+00	1.287E+01	NOT IDENT.
CE-143	0.000E+00	3.173E+08	0.000E+00	SHORT HLIF
CE-144	1.434E+00	1.565E+01	2.731E+01	NOT IDENT.
PM-144	2.874E-01	2.052E+00	3.857E+00	NOT IDENT.
PR-144	-5.220E+01	1.632E+02	2.915E+02	NOT IDENT.
PM-146	-3.953E+00	3.367E+00	4.650E+00	NOT IDENT.
ND-147	-1.005E+01	1.349E+02	2.373E+02	NOT IDENT.
PM-147	-2.929E+04	6.069E+04	1.028E+05	NOT IDENT.
PM-149	0.000E+00	4.287E+06	0.000E+00	SHORT HLIF
EU-152	7.057E-01	6.295E+00	1.141E+01	NOT IDENT.
GD-153	-6.225E+00	7.592E+00	1.090E+01	NOT IDENT.
EU-154	3.171E+00	5.449E+00	1.154E+01	NOT IDENT.
EU-155	-1.748E+00	8.308E+00	1.442E+01	NOT IDENT.
HO-166M	-3.075E+00	3.711E+00	6.250E+00	FAIL ABUN
TM-171	1.730E+02	2.089E+03	3.219E+03	FAIL ABUN
LU-176	7.070E-02	1.783E+00	3.223E+00	FAIL ABUN
LU-177	-4.584E+02	8.028E+02	1.147E+03	NOT IDENT.
HF-181	-1.875E+00	3.915E+00	6.633E+00	NOT IDENT.
W-181	1.721E+00	2.178E+01	3.580E+01	FAIL ABUN
TA-182	-4.470E+00	8.665E+00	1.546E+01	FAIL ABUN
RE-183	-6.565E-01	2.152E+01	3.729E+01	FAIL ABUN
RE-184	-2.690E+00	9.468E+00	1.696E+01	NOT IDENT.
RE-188	5.957E+00	1.510E+01	2.657E+01	FAIL ABUN
W-188	1.356E+02	5.845E+02	1.072E+03	FAIL ABUN
OS-191	-1.417E+01	2.994E+01	5.064E+01	FAIL ABUN
IR-192	2.486E-01	2.900E+00	5.246E+00	NOT IDENT.
HG-203	1.840E+00	3.417E+00	6.396E+00	NOT IDENT.

BI-207	-5.039E-01	2.671E+00	5.019E+00	FAIL ABUN
BI-211	-4.255E+00	1.542E+01	2.496E+01	NOT IDENT.
PB-211	-1.191E+01	4.585E+01	8.012E+01	NOT IDENT.
BI-212	2.748E+01	2.800E+01	5.762E+01	NOT IDENT.
PB-212	2.016E-01	8.304E+00	8.439E+00	FAIL ABUN
BI-213	1.133E+00	6.334E+00	1.154E+01	NOT IDENT.
BI-214	2.622E+00	5.558E+00	9.438E+00	NOT IDENT.
PB-214	-2.797E+00	5.558E+00	8.822E+00	FAIL ABUN
RN-219	-9.112E+00	2.520E+01	4.372E+01	NOT IDENT.
FR-221	4.295E+00	1.327E+01	2.470E+01	NOT IDENT.
RA-223	3.679E+00	4.525E+01	8.154E+01	NOT IDENT.
RA-224	2.866E+01	4.176E+01	7.868E+01	NOT IDENT.
AC-227	-1.914E+00	1.671E+01	3.011E+01	NOT IDENT.
TH-227	-1.914E+00	1.671E+01	3.011E+01	NOT IDENT.
AC-228	-1.292E+01	9.306E+00	1.311E+01	NOT IDENT.
RA-228	-1.292E+01	9.306E+00	1.311E+01	NOT IDENT.
TH-228	2.016E-01	8.304E+00	8.439E+00	FAIL ABUN
TH-229	1.124E+01	4.158E+01	6.451E+01	NOT IDENT.
PA-231	-2.043E-01	3.204E+01	5.765E+01	NOT IDENT.
TH-231	-3.800E+00	3.587E+01	5.976E+01	NOT IDENT.
PA-233	-8.329E-01	4.444E+00	7.890E+00	NOT IDENT.
PA-234	1.701E+01	1.428E+01	3.150E+01	FAIL ABUN
PA-234M	1.214E+02	2.563E+02	4.979E+02	NOT IDENT.
U-235	-1.063E+01	1.877E+01	2.643E+01	FAIL ABUN
NP-237	-8.329E-01	4.444E+00	7.890E+00	NOT IDENT.
NP-238	0.000E+00	9.507E+05	0.000E+00	SHORT HLIF
NP-239	-1.002E+01	2.043E+01	3.470E+01	NOT IDENT.
AM-241	-6.305E+00	1.510E+01	2.265E+01	NOT IDENT.
AM-242	-4.904E+01	5.135E+01	7.568E+01	NOT IDENT.
CM-243	-2.536E-01	8.109E+00	1.425E+01	NOT IDENT.
BK-247	-4.226E+00	5.090E+00	8.723E+00	NOT IDENT.
CM-247	-2.742E-01	2.356E+00	4.175E+00	NOT IDENT.
CF-249	-2.038E+00	2.376E+00	3.935E+00	NOT IDENT.
CF-251	-3.420E+00	8.699E+00	1.454E+01	NOT IDENT.
CF-252	-3.932E+03	1.257E+04	2.182E+04	NOT IDENT.
ANH-511	-5.692E+00	3.714E+00	6.800E+00	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.93	35	128	1.02	93.68	90	8	3.28E-03	58.6	
2	0	54.02	19	151	1.24	107.86	103	8	1.79E-03	112.0	
3	0	63.44	52	136	0.76	126.68	123	7	4.83E-03	39.7	
4	2	65.79	36	36	1.01	131.39	130	7	3.38E-03	23.6	7.99E-01
5	2	66.90	28	137	1.12	133.61	130	7	2.55E-03	75.6	
6	0	74.57	29	119	1.47	148.94	147	7	2.70E-03	64.4	
7	0	92.75	143	192	1.48	185.28	182	8	1.33E-02	18.6	
8	0	139.77	64	179	1.54	279.28	276	9	5.91E-03	39.6	
9	0	185.56	120	157	1.31	370.82	365	11	1.11E-02	22.1	
10	2	196.92	26	60	1.39	393.52	391	27	2.42E-03	44.4	1.76E+00
11	2	198.69	77	117	1.39	397.05	391	27	7.17E-03	26.8	
12	2	202.92	31	113	1.40	405.51	391	27	2.90E-03	62.6	
13	0	225.88	13	122	1.44	451.41	448	9	1.17E-03	160.3	
14	0	239.02	47	194	1.55	477.69	474	13	4.33E-03	63.6	
15	0	350.97	5	71	1.73	701.50	701	8	4.97E-04	271.2	
16	0	511.37	206	65	2.38	1022.19	1016	15	1.91E-02	11.1	
17	0	583.78	31	24	2.06	1166.98	1163	8	2.91E-03	32.3	
18	0	659.38	21	12	2.51	1318.14	1312	12	1.94E-03	39.6	
19	0	947.07	14	7	2.56	1893.41	1889	9	1.30E-03	42.8	
20	0	1088.88	11	10	1.08	2177.00	2170	10	1.02E-03	61.7	
21	0	1120.48	9	9	0.92	2240.20	2233	10	8.13E-04	74.7	
22	0	1238.44	10	3	1.26	2476.10	2473	6	9.26E-04	41.8	
23	0	1259.87	13	20	0.69	2518.97	2509	16	1.19E-03	82.5	
24	0	1288.98	10	3	1.42	2577.19	2573	7	8.83E-04	45.8	
25	0	1292.80	12	5	1.01	2584.82	2581	7	1.08E-03	43.8	
26	0	1364.50	7	3	0.81	2728.23	2723	11	6.53E-04	59.4	
27	0	1371.19	6	4	1.31	2741.61	2735	9	5.28E-04	78.7	
28	0	1390.73	7	9	0.44	2780.70	2774	12	6.16E-04	98.5	
29	0	1460.35	26	7	1.97	2919.94	2913	14	2.42E-03	29.1	
30	0	1514.41	7	6	0.64	3028.07	3021	10	6.27E-04	83.2	
31	0	1711.77	8	3	0.53	3422.86	3415	11	7.37E-04	54.2	
32	0	1795.17	8	6	1.81	3589.69	3581	11	7.41E-04	67.5	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
K-40	1460.82	7	10.66*	6.122E-01	1.319E+01	1.319E+01	241.65
TL-208	277.37	-----	6.60	1.995E+00	-----	Line Not Found	-----
	583.19	20	85.00*	1.232E+00	2.387E+00	2.474E+00	116.96
	860.56	-----	12.50	9.277E-01	-----	Line Not Found	-----
PB-210	46.54	21	4.25*	2.416E-01	2.560E+02	2.568E+02	210.46
PO-210	46.54	21	4.25*	2.416E-01	2.560E+02	2.568E+02	210.46
RA-226	186.21	33	3.59*	2.461E+00	4.663E+01	4.663E+01	174.37
TH-230	67.67	11	0.38*	1.148E+00	3.274E+02	3.274E+02	378.89
TH-232	63.81	9	0.26*	9.727E-01	4.605E+02	4.605E+02	481.84
	140.88	64	0.02	2.635E+00	1.515E+04	1.515E+04	79.15
TH-234	63.29	9	3.70*	9.727E-01	3.236E+01	3.236E+01	481.84
	92.59	23	4.23	2.171E+00	3.068E+01	3.068E+01	256.29
U-234	53.20	7	0.12*	5.148E-01	1.396E+03	1.396E+03	664.31
	120.90	-----	0.04	2.593E+00	-----	Line Not Found	-----
U-238	63.29	9	3.70*	9.727E-01	3.236E+01	3.236E+01	481.84
	92.59	23	4.23	2.171E+00	3.068E+01	3.068E+01	256.29
AM-243	43.53	-----	5.90	1.476E-01	-----	Line Not Found	-----
	74.66	19	67.20*	1.516E+00	2.306E+00	2.306E+00	213.15

Flag: "*" = Keyline

Total number of lines in spectrum 29
Number of unidentified lines 9
Number of lines tentatively identified by NID 20 68.97%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.319E+01	1.319E+01	3.188E+01	241.65	
TL-208	1.91Y	1.04	2.387E+00	2.474E+00	2.894E+00	116.96	
PB-210	22.20Y	1.00	2.560E+02	2.568E+02	5.404E+02	210.46	
PO-210	22.20Y	1.00	2.560E+02	2.568E+02	5.404E+02	210.46	
RA-226	1600.00Y	1.00	4.663E+01	4.663E+01	8.131E+01	174.37	
TH-230	7.54E+04Y	1.00	3.274E+02	3.274E+02	12.41E+02	378.89	
TH-232	1.41E+10Y	1.00	4.605E+02	4.605E+02	22.19E+02	481.84	
TH-234	4.47E+09Y	1.00	3.236E+01	3.236E+01	15.59E+01	481.84	
U-234	2.45E+05Y	1.00	1.396E+03	1.396E+03	9.274E+03	664.31	
U-238	4.47E+09Y	1.00	3.236E+01	3.236E+01	15.59E+01	481.84	
AM-243	7370.00Y	1.00	2.306E+00	2.306E+00	4.916E+00	213.15	
Total Activity :			2.825E+03	2.827E+03			

Grand Total Activity : 2.825E+03 2.827E+03

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
2	65.79	20	36	1.01	131.39	130	7	1.88E-03	****	1.09E+00	T
2	196.92	26	60	1.39	393.52	391	27	2.42E-03	88.8	2.40E+00	
2	198.69	77	117	1.39	397.05	391	27	7.17E-03	53.6	2.39E+00	T
2	202.92	31	113	1.40	405.51	391	27	2.90E-03	****	2.37E+00	T
0	225.88	13	122	1.44	451.41	448	9	1.17E-03	****	2.24E+00	T
0	239.02	1	194	1.55	477.69	474	13	1.36E-04	****	2.17E+00	T
0	659.38	21	12	2.51	1318.14	1312	12	1.94E-03	79.1	1.13E+00	
0	947.07	14	7	2.56	1893.41	1889	9	1.30E-03	85.6	8.61E-01	T
0	1088.88	11	10	1.08	2177.00	2170	10	1.02E-03	****	7.71E-01	
0	1238.44	10	3	1.26	2476.10	2473	6	9.26E-04	83.7	6.96E-01	T
0	1259.87	13	20	0.69	2518.97	2509	16	1.19E-03	****	6.86E-01	T
0	1288.98	10	3	1.42	2577.19	2573	7	8.83E-04	91.7	6.74E-01	
0	1292.80	3	5	1.01	2584.82	2581	7	2.89E-04	****	6.73E-01	T
0	1364.50	7	3	0.81	2728.23	2723	11	6.53E-04	****	6.45E-01	T
0	1371.19	6	4	1.31	2741.61	2735	9	5.28E-04	****	6.42E-01	
0	1390.73	7	9	0.44	2780.70	2774	12	6.16E-04	****	6.35E-01	
0	1514.41	7	6	0.64	3028.07	3021	10	6.27E-04	****	5.96E-01	
0	1711.77	8	3	0.53	3422.86	3415	11	7.37E-04	****	5.47E-01	
0	1795.17	5	6	1.81	3589.69	3581	11	4.87E-04	****	5.31E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656026.CNF;1  *
* Acquisition date   : 22-JUN-2016 12:14:46 Sensitivity      : 3.000          *
* Detector ID        : GAM16 Energy tolerance: 1.500          *
* Elapsed live time  : 0 03:00:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 03:00:00.61 Half life ratio : *****          *
* Sample date        : 17-MAY-2016 10:00:00 Nuclide Library : LIQUID          *
* Sample ID          : G398656026 Analyst initials: MXR1          *
* Batch Number       : 1572406 Sample Quantity : 2.0000E+00 LITER          *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 1-OCT-2015 05:57:38 Eff. Geometry    : 2LMB          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM16_2LMB.CNF;16          *
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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
K-40	1.329E+01
TL-208	1.832E+00
PB-210	2.786E+02
PO-210	2.786E+02
RA-226	3.752E+01
TH-230	7.660E+02
TH-232	1.094E+03
TH-234	8.663E+01
U-234	5.203E+03
U-238	8.663E+01
AM-243	3.091E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	2.382E+01	NOT IDENT.
NA-22	1.804E+00	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	1.424E+00	NOT IDENT.
SC-46	2.205E+00	NOT IDENT.
V-48	7.134E+00	NOT IDENT.
CR-51	3.786E+01	NOT IDENT.
MN-52	1.525E+02	NOT IDENT.
MN-54	1.382E+00	NOT IDENT.
CO-56	1.862E+00	FAIL ABUN
CO-57	1.783E+00	NOT IDENT.
CO-58	1.949E+00	NOT IDENT.
FE-59	6.018E+00	FAIL ABUN
CO-60	1.742E+00	NOT IDENT.
ZN-65	3.843E+00	NOT IDENT.
CU-67	0.000E+00	SHORT HLIF
GE-68	5.156E+01	NOT IDENT.
AS-74	1.268E+01	NOT IDENT.
SE-75	2.653E+00	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF

SR-82	2.704E+01	NOT IDENT.
RB-83	4.042E+00	NOT IDENT.
RB-84	5.924E+00	NOT IDENT.
KR-85	5.020E+02	NOT IDENT.
SR-85	3.288E+00	NOT IDENT.
RB-86	6.583E+01	NOT IDENT.
Y-88	2.505E+00	NOT IDENT.
Y-91	1.285E+03	NOT IDENT.
NB-94	1.520E+00	NOT IDENT.
NB-95	2.688E+00	NOT IDENT.
NB-95M	8.336E+00	NOT IDENT.
ZR-95	4.307E+00	NOT IDENT.
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.929E+00	FAIL ABUN
RH-102M	1.586E+00	NOT IDENT.
RU-103	2.994E+00	NOT IDENT.
RH-106	1.618E+01	NOT IDENT.
RU-106	1.618E+01	NOT IDENT.
AG-108M	1.497E+00	NOT IDENT.
CD-109	5.328E+01	NOT IDENT.
AG-110M	2.726E+00	NOT IDENT.
SN-113	2.813E+00	NOT IDENT.
IN-114M	1.431E+01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	9.705E+00	NOT IDENT.
I-123	0.000E+00	SHORT HLIF
TE-123M	1.955E+00	NOT IDENT.
SB-124	4.699E+00	NOT IDENT.
SB-125	4.413E+00	NOT IDENT.
TE-125M	7.734E+02	NOT IDENT.
I-126	2.833E+01	NOT IDENT.
SB-126	1.590E+01	NOT IDENT.
SN-126	4.935E+00	FAIL ABUN
SB-127	2.668E+03	NOT IDENT.
TE-129	3.969E+01	NOT IDENT.
I-131	4.176E+01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.294E+00	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	1.974E+00	FAIL ABUN
CS-135	8.030E+00	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	1.426E+01	NOT IDENT.
BA-137M	1.577E+00	NOT IDENT.
CS-137	1.666E+00	NOT IDENT.
CE-139	1.929E+00	NOT IDENT.
BA-140	3.917E+01	NOT IDENT.
LA-140	1.283E+01	NOT IDENT.
CE-141	6.151E+00	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	1.303E+01	NOT IDENT.
PM-144	1.762E+00	NOT IDENT.
PR-144	1.331E+02	NOT IDENT.
PM-146	2.146E+00	NOT IDENT.
ND-147	1.090E+02	NOT IDENT.
PM-147	4.910E+04	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-152	5.344E+00	NOT IDENT.
GD-153	5.171E+00	NOT IDENT.
EU-154	5.057E+00	NOT IDENT.
EU-155	6.877E+00	NOT IDENT.
HO-166M	2.834E+00	FAIL ABUN
TM-171	1.526E+03	FAIL ABUN
LU-176	1.516E+00	FAIL ABUN
LU-177	5.434E+02	NOT IDENT.
HF-181	3.047E+00	NOT IDENT.
W-181	1.695E+01	FAIL ABUN
TA-182	6.622E+00	FAIL ABUN
RE-183	1.764E+01	FAIL ABUN
RE-184	7.475E+00	NOT IDENT.
RE-188	1.269E+01	FAIL ABUN
W-188	5.052E+02	FAIL ABUN
OS-191	2.409E+01	FAIL ABUN
IR-192	2.468E+00	NOT IDENT.
HG-203	3.020E+00	NOT IDENT.
BI-207	2.221E+00	FAIL ABUN

BI-211	1.172E+01	NOT IDENT.
PB-211	3.722E+01	NOT IDENT.
BI-212	2.632E+01	NOT IDENT.
PB-212	4.037E+00	FAIL ABUN
BI-213	5.334E+00	NOT IDENT.
BI-214	4.410E+00	NOT IDENT.
PB-214	4.137E+00	FAIL ABUN
RN-219	2.024E+01	NOT IDENT.
FR-221	1.170E+01	NOT IDENT.
RA-223	3.844E+01	NOT IDENT.
RA-224	3.738E+01	NOT IDENT.
AC-227	1.421E+01	NOT IDENT.
TH-227	1.421E+01	NOT IDENT.
AC-228	5.811E+00	NOT IDENT.
RA-228	5.811E+00	NOT IDENT.
TH-228	4.037E+00	FAIL ABUN
TH-229	3.068E+01	NOT IDENT.
PA-231	2.717E+01	NOT IDENT.
TH-231	2.855E+01	NOT IDENT.
PA-233	3.710E+00	NOT IDENT.
PA-234	1.412E+01	FAIL ABUN
PA-234M	2.246E+02	NOT IDENT.
U-235	1.263E+01	FAIL ABUN
NP-237	3.710E+00	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
NP-239	1.653E+01	NOT IDENT.
AM-241	1.072E+01	NOT IDENT.
AM-242	3.584E+01	NOT IDENT.
CM-243	6.789E+00	NOT IDENT.
BK-247	4.088E+00	NOT IDENT.
CM-247	1.940E+00	NOT IDENT.
CF-249	1.810E+00	NOT IDENT.
CF-251	6.885E+00	NOT IDENT.
CF-252	1.034E+04	NOT IDENT.
ANH-511	3.276E+00	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398656026.CNF;1
Acquisition date : 22-JUN-2016 12:14:46 Sensitivity : 3.000
Detector ID : GAM16 Energy tolerance: 1.500
Elapsed live time: 0 03:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 03:00:00.61 Half life ratio : *****
Sample date : 17-MAY-2016 10:00:00 Nuclide Library : LIQUID
Sample ID : G398656026 Analyst initials: MXR1
Batch Number : 1572406 Sample Quantity : 2.0000E+00 LITER
Quantity Err(%) : 5.0000E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-OCT-2015 05:57:38 Eff. Geometry : 2LMB
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM16_2LMB.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.319E+01	3.126E+01	3.126E+01
TL-208	2.474E+00	2.844E+00	2.844E+00
PB-210	2.568E+02	5.304E+02	5.304E+02
PO-210	2.568E+02	5.304E+02	5.304E+02
RA-226	4.663E+01	7.977E+01	7.977E+01
TH-230	3.274E+02	1.217E+03	1.217E+03
TH-232	4.605E+02	2.175E+03	2.175E+03
TH-234	3.236E+01	1.530E+02	1.530E+02
U-234	1.396E+03	9.090E+03	9.090E+03
U-238	3.236E+01	1.530E+02	1.530E+02
AM-243	2.306E+00	4.822E+00	4.822E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	2.110E+01	2.690E+01	2.853E+01	NOT IDENT.
NA-22	1.131E+00	1.946E+00	2.012E+00	NOT IDENT.
NA-24	4.745E+16	5.779E+17	0.000E+00	SHORT HLIF
AL-26	-1.377E+00	2.007E+00	2.101E+00	NOT IDENT.
SC-46	-2.778E-01	2.699E+00	2.702E+00	NOT IDENT.
V-48	-1.746E+00	8.978E+00	9.012E+00	NOT IDENT.
CR-51	1.245E+01	4.392E+01	4.427E+01	NOT IDENT.
MN-52	2.354E+00	1.825E+02	1.825E+02	NOT IDENT.
MN-54	-4.690E-01	1.737E+00	1.749E+00	NOT IDENT.
CO-56	-2.052E+00	2.560E+00	2.722E+00	FAIL ABUN
CO-57	1.983E-01	2.132E+00	2.134E+00	NOT IDENT.
CO-58	-7.133E-01	2.442E+00	2.463E+00	NOT IDENT.
FE-59	5.535E+00	6.360E+00	6.832E+00	FAIL ABUN
CO-60	1.966E-01	2.041E+00	2.043E+00	NOT IDENT.
ZN-65	2.066E+00	4.213E+00	4.315E+00	NOT IDENT.
CU-67	5.767E+04	9.868E+04	1.020E+05	SHORT HLIF
GE-68	-5.339E+01	6.893E+01	7.301E+01	NOT IDENT.
AS-74	1.370E+01	1.368E+01	1.501E+01	NOT IDENT.
SE-75	-1.860E+00	3.243E+00	3.349E+00	NOT IDENT.

BR-77	1.394E+04	5.742E+05	5.742E+05	SHORT HLIF
SR-82	7.119E+00	3.130E+01	3.147E+01	NOT IDENT.
RB-83	-2.211E+00	5.221E+00	5.315E+00	NOT IDENT.
RB-84	6.188E+00	6.387E+00	6.969E+00	NOT IDENT.
KR-85	-1.871E+03	7.589E+02	1.135E+03	NOT IDENT.
SR-85	-1.226E+01	4.971E+00	7.432E+00	NOT IDENT.
RB-86	-4.762E+01	8.488E+01	8.756E+01	NOT IDENT.
Y-88	1.164E+00	2.727E+00	2.777E+00	NOT IDENT.
Y-91	1.532E+03	1.316E+03	1.486E+03	NOT IDENT.
NB-94	-1.301E+00	1.953E+00	2.039E+00	NOT IDENT.
NB-95	3.637E+00	2.798E+00	3.243E+00	NOT IDENT.
NB-95M	-5.417E+00	1.144E+01	1.170E+01	NOT IDENT.
ZR-95	-6.528E-01	5.209E+00	5.217E+00	NOT IDENT.
MO-99	8.011E+04	1.335E+05	1.383E+05	SHORT HLIF
TC-99M	1.000E+41	7.850E+40	0.000E+00	SHORT HLIF
RH-101	-1.719E+00	2.451E+00	2.570E+00	FAIL ABUN
RH-102M	1.921E-01	1.909E+00	1.911E+00	NOT IDENT.
RU-103	-3.930E+00	4.075E+00	4.444E+00	NOT IDENT.
RH-106	2.585E+00	1.870E+01	1.873E+01	NOT IDENT.
RU-106	2.585E+00	1.870E+01	1.873E+01	NOT IDENT.
AG-108M	-1.529E-01	1.824E+00	1.826E+00	NOT IDENT.
CD-109	4.275E+01	6.362E+01	6.647E+01	NOT IDENT.
AG-110M	1.870E-01	3.263E+00	3.264E+00	NOT IDENT.
SN-113	2.486E+00	3.157E+00	3.350E+00	NOT IDENT.
IN-114M	-2.004E-01	3.198E+01	1.987E+01	NOT IDENT.
CD-115	-3.887E+05	5.057E+05	5.352E+05	SHORT HLIF
SN-117M	-1.358E+00	1.192E+01	1.193E+01	NOT IDENT.
I-123	-1.523E+19	1.128E+20	0.000E+00	SHORT HLIF
TE-123M	-3.248E-01	2.405E+00	2.409E+00	NOT IDENT.
SB-124	-4.496E+00	6.489E+00	6.798E+00	NOT IDENT.
SB-125	1.730E-01	5.308E+00	5.308E+00	NOT IDENT.
TE-125M	-5.477E+02	9.584E+02	9.897E+02	NOT IDENT.
I-126	-4.709E+00	3.610E+01	3.616E+01	NOT IDENT.
SB-126	-3.924E+01	2.506E+01	3.067E+01	NOT IDENT.
SN-126	-2.987E-01	5.854E+00	5.855E+00	FAIL ABUN
SB-127	3.067E+02	3.115E+03	3.118E+03	NOT IDENT.
TE-129	-2.160E+01	5.043E+01	5.136E+01	NOT IDENT.
I-131	3.736E+01	4.687E+01	4.981E+01	NOT IDENT.
I-132	-1.000E+41	2.418E+41	0.000E+00	SHORT HLIF
TE-132	-3.967E+03	5.391E+03	5.680E+03	SHORT HLIF
BA-133	-1.258E-01	3.015E+00	3.015E+00	NOT IDENT.
I-133	2.110E+12	7.193E+12	7.256E+12	SHORT HLIF
CS-134	7.895E-01	2.258E+00	2.286E+00	FAIL ABUN
CS-135	-1.461E+00	9.504E+00	9.526E+00	NOT IDENT.
I-135	4.071E+40	7.388E+40	0.000E+00	SHORT HLIF
CS-136	6.456E+00	1.575E+01	1.602E+01	NOT IDENT.
BA-137M	-2.966E-02	2.145E+00	2.145E+00	NOT IDENT.
CS-137	-3.134E-02	2.266E+00	2.266E+00	NOT IDENT.
CE-139	-2.997E-02	2.360E+00	2.360E+00	NOT IDENT.
BA-140	-2.513E+01	5.119E+01	5.243E+01	NOT IDENT.
LA-140	-1.098E+01	1.777E+01	1.845E+01	NOT IDENT.
CE-141	-1.096E-01	8.365E+00	8.365E+00	NOT IDENT.
CE-143	-2.278E+08	3.184E+08	3.346E+08	SHORT HLIF
CE-144	1.434E+00	1.565E+01	1.567E+01	NOT IDENT.
PM-144	2.874E-01	2.052E+00	2.056E+00	NOT IDENT.
PR-144	-5.220E+01	1.632E+02	1.649E+02	NOT IDENT.
PM-146	-3.953E+00	3.391E+00	3.831E+00	NOT IDENT.
ND-147	-1.005E+01	1.349E+02	1.350E+02	NOT IDENT.
PM-147	-2.929E+04	6.075E+04	6.217E+04	NOT IDENT.
PM-149	-2.148E+05	4.287E+06	4.288E+06	SHORT HLIF
EU-152	7.057E-01	6.295E+00	6.303E+00	NOT IDENT.
GD-153	-6.225E+00	7.609E+00	8.110E+00	NOT IDENT.
EU-154	3.171E+00	5.456E+00	5.640E+00	NOT IDENT.
EU-155	-1.748E+00	8.310E+00	8.347E+00	NOT IDENT.
HO-166M	-3.075E+00	3.723E+00	3.973E+00	FAIL ABUN
TM-171	1.730E+02	2.089E+03	2.090E+03	FAIL ABUN
LU-176	7.070E-02	1.783E+00	1.783E+00	FAIL ABUN
LU-177	-4.584E+02	8.038E+02	8.300E+02	NOT IDENT.
HF-181	-1.875E+00	3.918E+00	4.009E+00	NOT IDENT.
W-181	1.721E+00	2.178E+01	2.179E+01	FAIL ABUN
TA-182	-4.470E+00	8.672E+00	8.903E+00	FAIL ABUN
RE-183	-6.565E-01	2.152E+01	2.152E+01	FAIL ABUN
RE-184	-2.690E+00	9.474E+00	9.552E+00	NOT IDENT.
RE-188	5.957E+00	1.510E+01	1.534E+01	FAIL ABUN
W-188	1.356E+02	5.849E+02	5.881E+02	FAIL ABUN
OS-191	-1.417E+01	2.997E+01	3.064E+01	FAIL ABUN
IR-192	2.486E-01	2.900E+00	2.902E+00	NOT IDENT.
HG-203	1.840E+00	3.424E+00	3.523E+00	NOT IDENT.

BI-207	-5.039E-01	2.672E+00	2.682E+00	FAIL ABUN
BI-211	-4.255E+00	1.542E+01	1.554E+01	NOT IDENT.
PB-211	-1.191E+01	4.586E+01	4.617E+01	NOT IDENT.
BI-212	2.748E+01	2.813E+01	3.073E+01	NOT IDENT.
PB-212	2.016E-01	8.304E+00	8.304E+00	FAIL ABUN
BI-213	1.133E+00	6.335E+00	6.355E+00	NOT IDENT.
BI-214	2.622E+00	5.563E+00	5.687E+00	NOT IDENT.
PB-214	-2.797E+00	5.564E+00	5.705E+00	FAIL ABUN
RN-219	-9.112E+00	2.523E+01	2.556E+01	NOT IDENT.
FR-221	4.295E+00	1.328E+01	1.342E+01	NOT IDENT.
RA-223	3.679E+00	4.525E+01	4.529E+01	NOT IDENT.
RA-224	2.866E+01	4.186E+01	4.381E+01	NOT IDENT.
AC-227	-1.914E+00	1.671E+01	1.673E+01	NOT IDENT.
TH-227	-1.914E+00	1.671E+01	1.673E+01	NOT IDENT.
AC-228	-1.292E+01	9.429E+00	1.108E+01	NOT IDENT.
RA-228	-1.292E+01	9.429E+00	1.108E+01	NOT IDENT.
TH-228	2.016E-01	8.304E+00	8.304E+00	FAIL ABUN
TH-229	1.124E+01	4.159E+01	4.189E+01	NOT IDENT.
PA-231	-2.043E-01	3.204E+01	3.204E+01	NOT IDENT.
TH-231	-3.800E+00	3.588E+01	3.592E+01	NOT IDENT.
PA-233	-8.329E-01	4.445E+00	4.460E+00	NOT IDENT.
PA-234	1.701E+01	2.421E+01	2.539E+01	FAIL ABUN
PA-234M	1.214E+02	2.567E+02	2.625E+02	NOT IDENT.
U-235	-1.063E+01	1.880E+01	1.940E+01	FAIL ABUN
NP-237	-8.329E-01	4.445E+00	4.460E+00	NOT IDENT.
NP-238	1.587E+05	9.509E+05	9.536E+05	SHORT HLIF
NP-239	-1.002E+01	2.045E+01	2.094E+01	NOT IDENT.
AM-241	-6.305E+00	1.511E+01	1.538E+01	NOT IDENT.
AM-242	-4.904E+01	5.213E+01	5.663E+01	NOT IDENT.
CM-243	-2.536E-01	8.109E+00	8.110E+00	NOT IDENT.
BK-247	-4.226E+00	5.180E+00	5.519E+00	NOT IDENT.
CM-247	-2.742E-01	2.357E+00	2.360E+00	NOT IDENT.
CF-249	-2.038E+00	2.386E+00	2.557E+00	NOT IDENT.
CF-251	-3.420E+00	8.710E+00	8.845E+00	NOT IDENT.
CF-252	-3.932E+03	1.307E+04	1.319E+04	NOT IDENT.
ANH-511	-5.692E+00	3.745E+00	4.540E+00	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	102.7123	88.03	145.8946	136.47	144.6966
46.54	86.6542	88.34	140.1497	140.51	0.0000
49.72	0.0000	88.47	135.8062	140.88	177.6837
51.35	95.9439	89.96	155.2670	143.76	154.3330
52.39	96.2402	91.11	173.2504	144.24	148.0078
53.20	105.4013	91.27	0.0000	145.44	127.6401
56.28	108.1375	92.59	162.9714	152.32	157.3444
57.36	0.0000	93.31	0.0000	152.43	157.3695
57.53	103.0897	93.35	163.2197	153.25	141.2539
57.53	103.0901	94.56	125.6673	323.87	134.9161
57.98	104.3045	94.65	125.6894	155.04	139.4310
59.32	107.6866	94.67	125.6946	156.02	148.3488
59.54	109.1147	97.43	127.2689	158.56	143.3999
61.49	108.3155	98.43	131.0909	158.97	0.0000
63.00	112.8762	98.44	131.0936	159.00	144.5818
63.29	112.9615	99.53	124.4017	162.33	133.1364
63.58	93.7460	100.11	120.5544	162.66	128.7935
63.81	93.8018	100.20	120.5753	163.33	130.0120
64.28	93.9157	102.03	117.9940	165.86	128.2426
64.99	94.0869	103.18	127.2674	176.31	109.8313
65.08	94.1086	103.37	137.3373	176.60	110.9933
66.73	112.5696	105.31	149.9049	177.52	116.7355
66.98	119.5931	106.12	128.9688	181.07	0.0000
67.24	119.6705	106.47	129.0514	184.41	125.6733
67.67	140.6943	109.28	152.0035	184.58	0.0000
67.75	140.7221	111.00	131.1252	143.76	125.8766
69.67	128.7910	111.76	0.0000	186.21	129.3575
70.83	101.0764	112.95	141.7764	190.27	126.5766
72.81	110.0190	116.24	153.8727	193.51	116.7681
72.87	110.0350	116.30	0.0000	198.01	109.3349
74.66	117.5819	116.74	149.8979	201.83	109.8225
74.82	119.9875	117.23	131.5273	205.31	110.2632
74.97	120.0295	119.76	122.8053	208.37	129.2832
77.11	116.8227	99.53	145.6996	210.85	98.1094
79.69	142.1512	120.90	155.0926	218.12	100.6676
80.12	138.6530	121.12	164.4588	222.11	109.2644
80.19	138.6751	121.22	164.4863	227.09	106.9949
80.57	139.7488	121.78	158.4272	227.38	121.2983
81.00	128.3846	122.06	151.2494	228.16	0.0000
81.07	128.4044	123.07	152.5396	228.18	129.9705
83.79	138.8071	265.00	153.7323	116.74	129.9705
84.00	145.6200	127.23	157.7567	235.69	126.6751
84.21	145.6860	129.43	143.6368	235.96	119.5111
85.43	158.6414	131.20	145.0920	238.63	114.0640
86.55	173.5619	133.02	130.7459	238.98	0.0000
86.94	177.5865	133.52	140.3451	240.99	101.3129
87.09	177.6424	136.00	131.8810	242.00	88.3770
87.57	162.2739	57.53	131.9380	244.70	111.8624

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
250.62	110.5129	356.01	64.9950	618.01	36.5282
252.40	82.3439	364.49	57.3592	621.93	34.7209
252.80	88.7832	366.42	0.0000	630.19	0.0000
256.23	96.4272	356.01	42.8639	631.29	22.6242
260.90	0.0000	388.16	61.4218	155.04	38.6807
264.66	94.4328	388.63	63.4900	633.25	39.6293
265.00	95.3885	391.70	49.2601	634.78	34.9377
268.22	84.5307	264.66	39.2414	635.95	38.7358
269.46	82.7693	401.81	59.9426	636.99	41.5905
271.23	84.7696	402.40	59.9665	645.85	33.2235
273.65	86.8263	404.85	63.1743	657.76	25.4551
276.40	93.5974	410.95	57.1971	661.66	30.2828
277.37	97.4286	414.70	58.3849	664.57	0.0000
277.60	87.1421	423.72	45.1009	666.33	28.7505
278.00	87.1733	427.09	47.3037	666.50	28.7527
278.43	89.0828	427.87	44.1725	667.71	0.0000
279.20	82.5765	433.94	50.6829	677.62	26.9732
279.54	76.9701	440.45	46.6547	685.70	29.0054
280.46	81.7324	453.88	67.3720	695.00	34.9523
283.69	92.3341	459.60	61.1731	696.49	34.9752
284.31	76.3602	463.37	53.7857	696.51	42.7485
285.41	77.3792	468.07	51.7830	697.00	43.7289
285.90	0.0000	473.00	55.1852	697.49	42.7668
287.50	93.5950	475.06	49.8366	702.65	42.8646
290.67	83.4292	476.78	41.2123	706.68	31.2297
293.27	0.0000	477.60	41.2326	711.68	45.9696
351.93	75.1968	477.99	48.8390	720.70	40.2583
295.96	79.0549	482.18	52.2261	721.93	0.0000
299.98	87.9318	487.02	36.0087	722.78	32.4320
300.09	86.0284	492.35	0.0000	722.91	32.4336
300.13	86.0319	497.08	66.9561	723.31	23.5922
301.36	89.9509	511.00	53.1108	724.19	26.5518
302.85	90.0656	514.00	183.9891	727.33	22.6485
256.23	78.6780	520.40	46.7206	733.00	25.6648
304.85	76.7822	520.69	0.0000	735.93	22.7322
306.78	82.6761	522.65	0.0000	739.50	0.0000
308.46	92.4214	527.90	0.0000	744.23	27.7710
311.90	87.8605	529.59	36.8974	747.24	26.8135
316.51	82.3827	529.87	0.0000	752.31	31.8461
319.41	80.6367	531.02	44.7595	753.82	29.8748
320.08	83.5973	537.26	44.9133	756.73	32.9017
321.04	89.4998	546.56	0.0000	763.94	31.0000
323.87	88.7311	552.55	30.7951	765.80	20.0156
325.23	84.9251	563.25	46.4566	766.42	23.0236
328.76	78.3142	569.33	41.1218	766.84	30.0359
333.37	71.7257	946.00	41.1251	772.60	0.0000
334.37	75.7158	569.70	41.1295	776.52	24.1242
338.28	72.9905	583.19	40.4980	739.50	0.0000
338.32	72.9928	595.83	38.9064	778.90	25.1538
311.90	85.9619	427.87	51.0710	783.70	25.2026
340.55	83.9896	602.73	40.9009	785.37	17.1494
344.28	69.3698	604.72	63.2719	792.07	24.2766
345.93	73.4275	609.32	41.0352	795.86	25.3259
351.06	67.7406	610.33	41.0556	802.10	19.2959
351.93	69.7789	614.28	57.0281	810.29	20.3770

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
344.28	20.3784	1120.55	20.7736		
810.76	24.4570	1221.41	21.7225		
815.77	18.3788	1129.67	19.8840		
1048.07	20.4429	1131.51	0.0000		
832.01	15.4124	1173.23	23.9756		
834.85	20.5723	1189.05	13.4879		
836.80	0.0000	1204.77	13.5483		
846.77	29.9657	1221.41	17.5012		
856.80	30.0797	1231.02	17.0163		
860.56	18.6965	1235.36	10.0396		
871.09	32.3260	1238.28	15.6296		
873.19	21.9152	1260.41	0.0000		
875.33	0.0000	1274.44	10.8518		
880.51	27.2067	1274.54	10.8523		
881.60	20.9365	1291.59	13.5921		
883.24	21.9967	1298.22	0.0000		
884.68	30.3919	1312.11	19.9300		
889.28	27.2937	1332.49	14.0256		
894.76	29.4520	1365.19	12.1235		
898.04	21.0620	1368.63	0.0000		
903.28	22.1572	1384.29	12.1821		
911.20	27.5107	1408.01	16.3392		
923.98	0.0000	1434.09	13.3613		
926.36	15.9569	1457.56	0.0000		
935.54	13.8741	1460.82	8.8668		
937.49	24.5633	1489.16	13.5390		
944.13	17.8406	1596.21	18.1455		
946.00	21.4224	1620.50	16.0974		
949.00	19.6578	1678.03	0.0000		
667.71	0.0000	1690.97	14.0091		
964.08	31.2564	1764.49	12.3285		
968.97	24.8306	1063.66	25.6355		
983.53	20.6133	1771.35	19.9431		
984.45	0.0000	1791.20	0.0000		
996.26	26.1486	1808.65	12.4391		
1001.03	21.8247	1836.06	8.6588		
1274.44	28.4070				
1025.87	0.0000				
1028.54	0.0000				
1037.84	20.2472				
1038.76	0.0000				
475.06	19.3807				
1048.07	16.6201				
1050.41	21.2527				
1063.66	22.2695				
1077.00	22.3623				
1077.34	26.0928				
459.60	16.0073				
1085.87	25.6272				
1099.25	15.0111				
1111.64	14.1260				
1112.07	16.0115				
1112.84	15.0729				
1115.54	15.0853				
1120.29	18.8835				

VAX/VMS Nuclide Identification Report Generated 22-JUN-2016 14:22:39.84

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*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                    *
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Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561781.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;341
Background date  : 20-JUN-2016 14:03:55
Sample date      : 21-JUN-2016 00:00:00 Acquisition date : 22-JUN-2016 11:21:51
Sample ID        : G1203561781 Sample quantity : 2.00000E+00 LITER
Detector name     : GAM25 Detector geometry: 2LMB
Elapsed live time: 0 03:00:00.00 Elapsed real time: 0 03:00:00.69 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572406 Detector SN# :
Matrix Spike ID   : LCS ID : 1604
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.61*	22	99	1.07	92.81	89	7	2.01E-03	100.6	
2	0	66.32*	29	73	2.67	132.21	130	6	2.64E-03	61.6	
3	0	69.35	29	73	1.35	138.26	136	6	2.72E-03	49.1	
4	0	84.33*	4	127	0.89	168.21	165	8	3.61E-04	572.2	
5	0	185.71*	19	102	1.34	370.92	367	9	1.76E-03	120.0	
6	0	238.10*	2	150	2.81	475.66	469	13	1.75E-04	*****	
7	0	511.38*	50	75	2.75	1022.15	1013	21	4.60E-03	59.7	
8	0	585.41	22	55	3.15	1170.21	1158	16	2.01E-03	79.9	
9	0	597.64	7	26	1.22	1194.66	1189	7	6.55E-04	123.1	
10	0	601.55	13	41	1.00	1202.47	1197	9	1.18E-03	95.9	
11	0	707.74	9	26	0.89	1414.88	1410	9	8.11E-04	111.7	
12	0	802.43	20	17	4.45	1604.28	1597	14	1.84E-03	49.8	
13	0	918.67	10	4	1.36	1836.82	1833	8	8.90E-04	53.1	
14	0	1159.24	12	11	0.48	2318.15	2310	15	1.07E-03	69.7	
15	0	1172.73	17	13	1.29	2345.13	2337	14	1.54E-03	53.4	
16	0	1294.25	9	14	0.49	2588.30	2579	14	8.29E-04	94.7	
17	0	1509.40	17	4	1.38	3018.88	3010	16	1.61E-03	35.0	
18	0	1589.57	10	7	2.05	3179.35	3168	14	9.26E-04	64.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 22-JUN-2016 14:22:41

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561781.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 21-JUN-2016 00:00:00	Acquisition date	: 22-JUN-2016 11:21:51
Sample ID	: G1203561781	Sample quantity	: 2.0000 LITER
Sample type	: LIQUID	Sample geometry	:
Detector name	: GAMMA25	Detector geometry	: 2LMB
Elapsed live time	: 0 03:00:00.00	Elapsed real time	: 0 03:00:00.69 0.0%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
PB-210	46.54	22	4.25*	2.514E+00	2.540E+01	2.540E+01	201.12
PO-210	46.54	22	4.25*	2.514E+00	2.540E+01	2.540E+01	201.12
RA-226	186.21	19	3.59*	2.500E+00	2.644E+01	2.644E+01	240.02
TH-230	67.67	29	0.38*	3.046E+00	3.086E+02	3.086E+02	123.28
TH-231	84.21	4	6.60*	3.165E+00	2.336E+00	2.336E+00	1144.32
ANH-511	511.00	50	100.00*	1.234E+00	5.032E+00	5.032E+00	119.44

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561781.CNF;1
Acquisition date : 22-JUN-2016 11:21:51 Sensitivity : 3.000
Detector ID : GAM25 Energy tolerance: 1.500
Elapsed live time: 0 03:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 03:00:00.69 Half life ratio : *****
Sample date : 21-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561781 Sample Quantity : 2.0000E+00 LITER
Batch Number : 1572406 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : LIQUID.NLB;9

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 09:37:19 Eff. Geometry : 2LMB
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM25_2LMB.CNF;10

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
PB-210	2.540E+01	5.007E+01	4.890E+01
PO-210	2.540E+01	5.007E+01	4.890E+01
RA-226	2.644E+01	6.218E+01	7.301E+01
TH-230	3.086E+02	3.728E+02	4.034E+02
TH-231	2.336E+00	2.619E+01	3.172E+01
ANH-511	5.032E+00	5.891E+00	3.377E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	1.310E+01	1.675E+01	3.298E+01	NOT IDENT.
NA-22	1.931E-01	2.296E+00	4.501E+00	NOT IDENT.
NA-24	-6.494E+00	1.172E+01	2.067E+01	NOT IDENT.
AL-26	-2.080E+00	2.238E+00	3.622E+00	NOT IDENT.
K-40	-2.338E+01	3.296E+01	5.262E+01	NOT IDENT.
SC-46	-4.769E-01	2.267E+00	4.122E+00	NOT IDENT.
V-48	4.787E-01	2.081E+00	4.087E+00	NOT IDENT.
CR-51	-3.254E+00	1.930E+01	3.317E+01	NOT IDENT.
MN-52	-1.120E+00	3.097E+00	5.594E+00	NOT IDENT.
MN-54	-7.936E-01	2.285E+00	4.088E+00	NOT IDENT.
CO-56	1.901E+00	2.232E+00	4.567E+00	NOT IDENT.
CO-57	8.368E-01	1.443E+00	2.559E+00	NOT IDENT.
CO-58	3.655E-01	2.219E+00	4.067E+00	NOT IDENT.
FE-59	-3.562E-01	3.338E+00	6.284E+00	NOT IDENT.
CO-60	-3.749E-02	2.506E+00	4.794E+00	FAIL ABUN
ZN-65	-3.026E+00	5.174E+00	8.739E+00	NOT IDENT.
CU-67	2.946E+00	6.929E+00	1.011E+01	FAIL ABUN
GE-68	1.755E+01	6.907E+01	1.341E+02	NOT IDENT.
AS-74	8.219E-01	4.602E+00	7.303E+00	NOT IDENT.
SE-75	1.311E+00	2.684E+00	4.910E+00	NOT IDENT.
BR-77	7.452E-01	2.095E+01	2.133E+01	FAIL ABUN
SR-82	-6.400E+00	1.556E+01	2.775E+01	NOT IDENT.
RB-83	2.590E-01	4.950E+00	7.844E+00	NOT IDENT.
RB-84	2.561E+00	3.508E+00	7.045E+00	NOT IDENT.

KR-85	0.000E+00	6.424E+02	1.402E+03	NOT IDENT.
SR-85	0.000E+00	2.924E+00	6.384E+00	NOT IDENT.
RB-86	9.905E+00	2.683E+01	5.303E+01	NOT IDENT.
Y-88	4.881E-01	2.295E+00	4.836E+00	NOT IDENT.
Y-91	-1.007E+02	9.618E+02	1.819E+03	NOT IDENT.
NB-94	1.015E-01	2.800E+00	4.503E+00	NOT IDENT.
NB-95	1.092E+00	2.184E+00	4.305E+00	NOT IDENT.
NB-95M	-1.768E+00	7.446E+00	1.128E+01	NOT IDENT.
ZR-95	-3.903E+00	3.628E+00	5.933E+00	NOT IDENT.
MO-99	-9.013E+00	2.309E+01	4.173E+01	NOT IDENT.
TC-99M	2.366E+01	1.185E+02	1.967E+02	NOT IDENT.
RH-101	1.437E+00	1.741E+00	3.326E+00	NOT IDENT.
RH-102M	-1.516E+00	1.964E+00	3.320E+00	NOT IDENT.
RU-103	-1.423E-02	2.081E+00	3.792E+00	NOT IDENT.
RH-106	2.121E+00	1.933E+01	3.555E+01	NOT IDENT.
RU-106	2.121E+00	1.933E+01	3.555E+01	NOT IDENT.
AG-108M	-4.656E-01	1.978E+00	3.545E+00	NOT IDENT.
CD-109	-1.429E+01	3.771E+01	5.611E+01	NOT IDENT.
AG-110M	-2.094E-01	3.245E+00	5.983E+00	FAIL ABUN
SN-113	2.273E+00	2.569E+00	5.066E+00	NOT IDENT.
IN-114M	6.191E+00	1.065E+01	1.758E+01	NOT IDENT.
CD-115	-2.788E+00	1.171E+01	2.073E+01	NOT IDENT.
SN-117M	-4.277E-01	1.634E+00	2.905E+00	NOT IDENT.
I-123	1.010E+00	1.082E+01	1.964E+01	NOT IDENT.
TE-123M	1.763E-01	1.571E+00	2.854E+00	NOT IDENT.
SB-124	-8.488E-01	3.958E+00	7.876E+00	FAIL ABUN
SB-125	1.823E+00	6.129E+00	1.147E+01	FAIL ABUN
TE-125M	-2.355E+02	4.623E+02	7.634E+02	NOT IDENT.
I-126	-1.367E+00	6.862E+00	1.208E+01	NOT IDENT.
SB-126	1.184E+00	4.394E+00	8.442E+00	NOT IDENT.
SN-126	-2.373E+00	3.757E+00	5.463E+00	NOT IDENT.
SB-127	-1.276E+00	7.573E+00	1.397E+01	NOT IDENT.
TE-129	1.301E+00	2.797E+01	4.903E+01	FAIL ABUN
I-131	1.813E+00	2.404E+00	4.661E+00	NOT IDENT.
I-132	0.000E+00	1.379E+05	0.000E+00	SHORT HLIF
TE-132	-1.545E+00	2.469E+00	4.189E+00	NOT IDENT.
BA-133	-1.236E+00	2.902E+00	5.159E+00	NOT IDENT.
I-133	1.068E+00	7.479E+00	1.379E+01	NOT IDENT.
CS-134	-6.236E-01	2.944E+00	4.574E+00	FAIL ABUN
CS-135	-7.567E+00	1.025E+01	1.704E+01	NOT IDENT.
I-135	-3.956E+01	3.570E+02	6.860E+02	NOT IDENT.
CS-136	1.009E+00	3.348E+00	6.431E+00	NOT IDENT.
BA-137M	-7.893E-01	2.366E+00	4.094E+00	NOT IDENT.
CS-137	-8.338E-01	2.500E+00	4.324E+00	NOT IDENT.
CE-139	8.621E-01	1.658E+00	3.082E+00	NOT IDENT.
BA-140	2.949E+00	8.890E+00	1.660E+01	NOT IDENT.
LA-140	-6.300E-01	2.945E+00	5.440E+00	NOT IDENT.
CE-141	-2.607E+00	3.403E+00	5.102E+00	NOT IDENT.
CE-143	8.138E-01	8.712E+00	1.537E+01	NOT IDENT.
CE-144	1.305E+00	1.061E+01	1.950E+01	NOT IDENT.
PM-144	-1.055E+00	2.581E+00	4.602E+00	NOT IDENT.
PR-144	-7.764E+01	1.919E+02	3.422E+02	NOT IDENT.
PM-146	6.608E-01	2.955E+00	5.475E+00	NOT IDENT.
ND-147	-1.229E-01	1.674E+01	3.031E+01	NOT IDENT.
PM-147	3.125E+04	4.154E+04	7.483E+04	NOT IDENT.
PM-149	-1.392E+01	8.495E+01	1.475E+02	NOT IDENT.
EU-152	6.654E+00	6.671E+00	1.257E+01	NOT IDENT.
GD-153	2.133E+00	4.635E+00	7.702E+00	FAIL ABUN
EU-154	2.113E-01	6.688E+00	1.298E+01	NOT IDENT.
EU-155	4.288E+00	5.666E+00	1.023E+01	NOT IDENT.
HO-166M	-6.526E-01	4.372E+00	6.930E+00	FAIL ABUN
TM-171	2.800E+02	2.604E+02	4.963E+02	FAIL ABUN
LU-176	3.525E-02	1.892E+00	3.310E+00	NOT IDENT.
LU-177	-5.464E+00	1.770E+01	3.083E+01	NOT IDENT.
HF-181	-1.640E+00	2.234E+00	3.789E+00	NOT IDENT.
W-181	2.479E+00	3.919E+00	7.204E+00	FAIL ABUN
TA-182	5.825E+00	9.055E+00	1.884E+01	FAIL ABUN
RE-183	1.834E+00	3.619E+00	6.608E+00	FAIL ABUN
RE-184	3.218E+00	6.403E+00	1.256E+01	NOT IDENT.
RE-188	3.067E+00	8.515E+00	1.570E+01	NOT IDENT.
W-188	2.664E+02	4.313E+02	7.903E+02	NOT IDENT.
OS-191	2.179E+00	4.777E+00	8.949E+00	FAIL ABUN
IR-192	-1.295E-01	2.162E+00	3.758E+00	NOT IDENT.
HG-203	9.602E-01	2.016E+00	3.677E+00	FAIL ABUN
BI-207	1.144E+00	2.993E+00	5.902E+00	NOT IDENT.
TL-208	-1.382E-01	3.052E+00	4.820E+00	NOT IDENT.
BI-211	1.200E-01	1.524E+01	2.551E+01	NOT IDENT.
PB-211	3.120E+01	4.885E+01	9.354E+01	NOT IDENT.

BI-212	1.580E+01	3.326E+01	6.498E+01	NOT IDENT.
PB-212	2.526E-01	7.104E+00	7.360E+00	FAIL ABUN
BI-213	5.931E+00	7.095E+00	1.383E+01	NOT IDENT.
BI-214	6.530E-02	6.203E+00	1.073E+01	NOT IDENT.
PB-214	3.271E+00	5.618E+00	9.810E+00	NOT IDENT.
RN-219	-2.361E+01	3.163E+01	4.933E+01	NOT IDENT.
FR-221	-6.849E+00	1.307E+01	2.241E+01	NOT IDENT.
RA-223	-1.980E+01	4.852E+01	8.161E+01	FAIL ABUN
RA-224	3.792E+00	4.718E+01	7.332E+01	NOT IDENT.
AC-227	1.637E+01	1.766E+01	3.299E+01	NOT IDENT.
TH-227	1.637E+01	1.766E+01	3.299E+01	NOT IDENT.
AC-228	-1.138E+00	1.031E+01	1.624E+01	NOT IDENT.
RA-228	-1.138E+00	1.031E+01	1.624E+01	NOT IDENT.
TH-228	2.526E-01	7.104E+00	7.360E+00	FAIL ABUN
TH-229	-1.226E+01	3.394E+01	5.918E+01	FAIL ABUN
PA-231	2.374E+00	3.249E+01	5.715E+01	NOT IDENT.
TH-232	-1.054E+02	6.700E+02	1.211E+03	NOT IDENT.
PA-233	2.992E+00	4.315E+00	7.986E+00	NOT IDENT.
PA-234	-1.159E+00	2.066E+01	3.792E+01	NOT IDENT.
PA-234M	-1.740E+02	3.186E+02	5.518E+02	NOT IDENT.
TH-234	-3.872E+01	4.916E+01	8.509E+01	NOT IDENT.
U-234	1.437E+03	1.025E+03	1.985E+03	NOT IDENT.
U-235	-1.129E+01	1.482E+01	2.241E+01	FAIL ABUN
NP-237	2.992E+00	4.315E+00	7.986E+00	NOT IDENT.
NP-238	7.906E+00	1.282E+01	2.650E+01	NOT IDENT.
U-238	-3.872E+01	4.916E+01	8.509E+01	NOT IDENT.
NP-239	4.746E-01	1.373E+01	2.367E+01	NOT IDENT.
AM-241	7.169E-01	3.567E+00	6.360E+00	NOT IDENT.
AM-242	2.876E+00	3.744E+01	6.062E+01	NOT IDENT.
AM-243	-1.077E+00	2.137E+00	3.424E+00	NOT IDENT.
CM-243	-3.529E-01	5.768E+00	9.866E+00	NOT IDENT.
BK-247	1.528E+00	5.253E+00	9.470E+00	FAIL ABUN
CM-247	-2.359E+00	2.921E+00	4.536E+00	NOT IDENT.
CF-249	-2.730E+00	2.728E+00	4.599E+00	NOT IDENT.
CF-251	-1.628E+00	8.382E+00	1.484E+01	NOT IDENT.
CF-252	3.510E+03	9.315E+03	1.642E+04	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.61	130	99	1.07	92.81	89	7	1.21E-02	15.4	
2	0	63.29	146	108	0.99	126.16	123	7	1.35E-02	14.4	
3	0	66.32	49	73	2.67	132.21	130	6	4.58E-03	31.4	
4	0	69.35	29	73	1.35	138.26	136	6	2.72E-03	49.1	
5	0	84.33	24	127	0.89	168.21	165	8	2.25E-03	82.7	
6	0	92.71	200	157	0.94	184.97	181	9	1.85E-02	13.4	
7	0	185.71	110	102	1.34	370.92	367	9	1.02E-02	19.1	
8	0	238.10	31	150	2.81	475.66	469	13	2.88E-03	83.1	
9	0	511.38	269	75	2.75	1022.15	1013	21	2.49E-02	10.2	
10	0	585.41	22	55	3.15	1170.21	1158	16	2.01E-03	79.9	
11	0	597.64	7	26	1.22	1194.66	1189	7	6.55E-04	123.1	
12	0	601.55	13	41	1.00	1202.47	1197	9	1.18E-03	95.9	
13	0	707.74	9	26	0.89	1414.88	1410	9	8.11E-04	111.7	
14	0	802.43	20	17	4.45	1604.28	1597	14	1.84E-03	49.8	
15	0	918.67	10	4	1.36	1836.82	1833	8	8.90E-04	53.1	
16	0	1159.24	12	11	0.48	2318.15	2310	15	1.07E-03	69.7	
17	0	1172.73	17	13	1.29	2345.13	2337	14	1.54E-03	53.4	
18	0	1294.25	9	14	0.49	2588.30	2579	14	8.29E-04	94.7	
19	0	1509.40	17	4	1.38	3018.88	3010	16	1.61E-03	35.0	
20	0	1589.57	10	7	2.05	3179.35	3168	14	9.26E-04	64.4	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
PB-210	46.54	22	4.25*	2.514E+00	2.540E+01	2.540E+01	201.12
PO-210	46.54	22	4.25*	2.514E+00	2.540E+01	2.540E+01	201.12
RA-226	186.21	19	3.59*	2.500E+00	2.644E+01	2.644E+01	240.02
TH-230	67.67	29	0.38*	3.046E+00	3.086E+02	3.086E+02	123.28
TH-231	84.21	4	6.60*	3.165E+00	2.336E+00	2.336E+00	1144.32
ANH-511	511.00	50	100.00*	1.234E+00	5.032E+00	5.032E+00	119.44

Flag: "*" = Keyline

Total number of lines in spectrum 18
Number of unidentified lines 7
Number of lines tentatively identified by NID 11 61.11%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
PB-210	22.20Y	1.00	2.540E+01	2.540E+01	5.109E+01	201.12	
PO-210	22.20Y	1.00	2.540E+01	2.540E+01	5.109E+01	201.12	
RA-226	1600.00Y	1.00	2.644E+01	2.644E+01	6.345E+01	240.02	
TH-230	7.54E+04Y	1.00	3.086E+02	3.086E+02	3.805E+02	123.28	
TH-231	7.04E+08Y	1.00	2.336E+00	2.336E+00	26.73E+00	1144.32	
ANH-511	1.00E+09Y	1.00	5.032E+00	5.032E+00	6.011E+00	119.44	

Total Activity : 3.932E+02 3.932E+02

Grand Total Activity : 3.932E+02 3.932E+02

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	69.35	29	73	1.35	138.26	136	6	2.72E-03	98.2	3.08E+00	T
0	238.10	2	150	2.81	475.66	469	13	1.75E-04	****	2.15E+00	T
0	585.41	22	55	3.15	1170.21	1158	16	2.01E-03	****	1.11E+00	
0	597.64	7	26	1.22	1194.66	1189	7	6.55E-04	****	1.09E+00	
0	601.55	13	41	1.00	1202.47	1197	9	1.18E-03	****	1.09E+00	T
0	707.74	9	26	0.89	1414.88	1410	9	8.11E-04	****	9.56E-01	T
0	802.43	20	17	4.45	1604.28	1597	14	1.84E-03	99.7	8.66E-01	T
0	918.67	10	4	1.36	1836.82	1833	8	8.90E-04	****	7.78E-01	
0	1159.24	12	11	0.48	2318.15	2310	15	1.07E-03	****	6.48E-01	
0	1172.73	17	13	1.29	2345.13	2337	14	1.54E-03	****	6.42E-01	T
0	1294.25	9	14	0.49	2588.30	2579	14	8.29E-04	****	5.94E-01	
0	1509.40	17	4	1.38	3018.88	3010	16	1.61E-03	70.0	5.25E-01	
0	1589.57	10	7	2.05	3179.35	3168	14	9.26E-04	****	5.04E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561781.CNF;1 *
* Acquisition date   : 22-JUN-2016 11:21:51 Sensitivity      : 3.000          *
* Detector ID        : GAM25 Energy tolerance: 1.500        *
* Elapsed live time  : 0 03:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 03:00:00.69 Half life ratio  : *****      *
* Sample date        : 21-JUN-2016 00:00:00 Nuclide Library : LIQUID      *
* Sample ID          : G1203561781 Analyst initials: MXR1         *
* Batch Number       : 1572406 Sample Quantity : 2.0000E+00 LITER *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000        *
*                                     Dry Weight    : 0.00000        *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 16-JUL-2015 09:37:19 Eff. Geometry   : 2LMB          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM25_2LMB.CNF;10 *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
PB-210	2.287E+01
PO-210	2.287E+01
RA-226	3.464E+01
TH-230	1.873E+02
TH-231	1.506E+01
ANH-511	1.552E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	1.523E+01	NOT IDENT.
NA-22	1.969E+00	NOT IDENT.
NA-24	8.703E+00	NOT IDENT.
AL-26	1.438E+00	NOT IDENT.
K-40	2.338E+01	NOT IDENT.
SC-46	1.847E+00	NOT IDENT.
V-48	1.799E+00	NOT IDENT.
CR-51	1.558E+01	NOT IDENT.
MN-52	2.423E+00	NOT IDENT.
MN-54	1.843E+00	NOT IDENT.
CO-56	2.077E+00	NOT IDENT.
CO-57	1.214E+00	NOT IDENT.
CO-58	1.833E+00	NOT IDENT.
FE-59	2.689E+00	NOT IDENT.
CO-60	2.106E+00	FAIL ABUN
ZN-65	3.868E+00	NOT IDENT.
CU-67	4.847E+00	FAIL ABUN
GE-68	5.940E+01	NOT IDENT.
AS-74	3.375E+00	NOT IDENT.
SE-75	2.312E+00	NOT IDENT.
BR-77	1.014E+01	FAIL ABUN
SR-82	1.256E+01	NOT IDENT.
RB-83	3.611E+00	NOT IDENT.
RB-84	3.208E+00	NOT IDENT.
KR-85	6.695E+02	NOT IDENT.

SR-85	3.048E+00	NOT IDENT.
RB-86	2.350E+01	NOT IDENT.
Y-88	2.034E+00	NOT IDENT.
Y-91	8.044E+02	NOT IDENT.
NB-94	2.076E+00	NOT IDENT.
NB-95	1.962E+00	NOT IDENT.
NB-95M	5.321E+00	NOT IDENT.
ZR-95	2.619E+00	NOT IDENT.
MO-99	1.865E+01	NOT IDENT.
TC-99M	9.379E+01	NOT IDENT.
RH-101	1.580E+00	NOT IDENT.
RH-102M	1.524E+00	NOT IDENT.
RU-103	1.745E+00	NOT IDENT.
RH-106	1.617E+01	NOT IDENT.
RU-106	1.617E+01	NOT IDENT.
AG-108M	1.640E+00	NOT IDENT.
CD-109	2.662E+01	NOT IDENT.
AG-110M	2.701E+00	FAIL ABUN
SN-113	2.360E+00	NOT IDENT.
IN-114M	8.342E+00	NOT IDENT.
CD-115	9.545E+00	NOT IDENT.
SN-117M	1.375E+00	NOT IDENT.
I-123	9.308E+00	NOT IDENT.
TE-123M	1.353E+00	NOT IDENT.
SB-124	3.183E+00	FAIL ABUN
SB-125	5.336E+00	FAIL ABUN
TE-125M	3.612E+02	NOT IDENT.
I-126	5.485E+00	NOT IDENT.
SB-126	3.859E+00	NOT IDENT.
SN-126	2.588E+00	NOT IDENT.
SB-127	6.369E+00	NOT IDENT.
TE-129	2.283E+01	FAIL ABUN
I-131	2.183E+00	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	1.974E+00	NOT IDENT.
BA-133	2.413E+00	NOT IDENT.
I-133	6.342E+00	NOT IDENT.
CS-134	2.060E+00	FAIL ABUN
CS-135	7.993E+00	NOT IDENT.
I-135	2.960E+02	NOT IDENT.
CS-136	2.890E+00	NOT IDENT.
BA-137M	1.861E+00	NOT IDENT.
CS-137	1.966E+00	NOT IDENT.
CE-139	1.462E+00	NOT IDENT.
BA-140	7.669E+00	NOT IDENT.
LA-140	2.336E+00	NOT IDENT.
CE-141	2.424E+00	NOT IDENT.
CE-143	7.229E+00	NOT IDENT.
CE-144	9.228E+00	NOT IDENT.
PM-144	2.126E+00	NOT IDENT.
PR-144	1.581E+02	NOT IDENT.
PM-146	2.546E+00	NOT IDENT.
ND-147	1.397E+01	NOT IDENT.
PM-147	3.545E+04	NOT IDENT.
PM-149	6.913E+01	NOT IDENT.
EU-152	5.907E+00	NOT IDENT.
GD-153	3.666E+00	FAIL ABUN
EU-154	5.685E+00	NOT IDENT.
EU-155	4.857E+00	NOT IDENT.
HO-166M	3.138E+00	FAIL ABUN
TM-171	2.351E+02	FAIL ABUN
LU-176	1.556E+00	NOT IDENT.
LU-177	1.460E+01	NOT IDENT.
HF-181	1.728E+00	NOT IDENT.
W-181	3.419E+00	FAIL ABUN
TA-182	8.405E+00	FAIL ABUN
RE-183	3.132E+00	FAIL ABUN
RE-184	5.704E+00	NOT IDENT.
RE-188	7.453E+00	NOT IDENT.
W-188	3.726E+02	NOT IDENT.
OS-191	4.244E+00	FAIL ABUN
IR-192	1.763E+00	NOT IDENT.
HG-203	1.730E+00	FAIL ABUN
BI-207	2.625E+00	NOT IDENT.
TL-208	2.232E+00	NOT IDENT.
BI-211	1.196E+01	NOT IDENT.
PB-211	4.376E+01	NOT IDENT.
BI-212	2.979E+01	NOT IDENT.

PB-212	3.501E+00	FAIL ABUN
BI-213	6.448E+00	NOT IDENT.
BI-214	5.019E+00	NOT IDENT.
PB-214	4.617E+00	NOT IDENT.
RN-219	2.295E+01	NOT IDENT.
FR-221	1.056E+01	NOT IDENT.
RA-223	3.839E+01	FAIL ABUN
RA-224	3.474E+01	NOT IDENT.
AC-227	1.564E+01	NOT IDENT.
TH-227	1.564E+01	NOT IDENT.
AC-228	7.283E+00	NOT IDENT.
RA-228	7.283E+00	NOT IDENT.
TH-228	3.501E+00	FAIL ABUN
TH-229	2.803E+01	FAIL ABUN
PA-231	2.686E+01	NOT IDENT.
TH-232	5.844E+02	NOT IDENT.
PA-233	3.749E+00	NOT IDENT.
PA-234	1.711E+01	NOT IDENT.
PA-234M	2.483E+02	NOT IDENT.
TH-234	4.104E+01	NOT IDENT.
U-234	9.420E+02	NOT IDENT.
U-235	1.067E+01	FAIL ABUN
NP-237	3.749E+00	NOT IDENT.
NP-238	1.175E+01	NOT IDENT.
U-238	4.104E+01	NOT IDENT.
NP-239	1.114E+01	NOT IDENT.
AM-241	3.020E+00	NOT IDENT.
AM-242	2.883E+01	NOT IDENT.
AM-243	1.632E+00	NOT IDENT.
CM-243	4.676E+00	NOT IDENT.
BK-247	4.456E+00	FAIL ABUN
CM-247	2.111E+00	NOT IDENT.
CF-249	2.132E+00	NOT IDENT.
CF-251	7.039E+00	NOT IDENT.
CF-252	7.797E+03	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

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* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561781.CNF;1
* Acquisition date   : 22-JUN-2016 11:21:51 Sensitivity      : 3.000
* Detector ID        : GAM25 Energy tolerance: 1.500
* Elapsed live time  : 0 03:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 03:00:00.69 Half life ratio  : *****
* Sample date        : 21-JUN-2016 00:00:00 Nuclide Library : LIQUID
* Sample ID          : G1203561781 Analyst initials: MXR1
* Batch Number       : 1572406 Sample Quantity : 2.0000E+00 LITER
*                               Quantity Err(%) : 5.0000E-03 %
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000
*                               Dry Weight       : 0.00000

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CALIBRATION INFORMATION

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* Eff. Cal. date     : 16-JUL-2015 09:37:19 Eff. Geometry   : 2LMB
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM25_2LMB.CNF;10

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
PB-210	2.540E+01	5.012E+01	5.012E+01
PO-210	2.540E+01	5.012E+01	5.012E+01
RA-226	2.644E+01	6.221E+01	6.221E+01
TH-230	3.086E+02	3.766E+02	3.766E+02
TH-231	2.336E+00	2.619E+01	2.619E+01
ANH-511	5.032E+00	5.905E+00	5.905E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.310E+01	1.678E+01	1.779E+01	NOT IDENT.
NA-22	1.931E-01	2.296E+00	2.298E+00	NOT IDENT.
NA-24	-6.494E+00	1.173E+01	1.209E+01	NOT IDENT.
AL-26	-2.080E+00	2.243E+00	2.431E+00	NOT IDENT.
K-40	-2.338E+01	3.302E+01	3.466E+01	NOT IDENT.
SC-46	-4.769E-01	2.267E+00	2.277E+00	NOT IDENT.
V-48	4.787E-01	2.082E+00	2.093E+00	NOT IDENT.
CR-51	-3.254E+00	1.930E+01	1.936E+01	NOT IDENT.
MN-52	-1.120E+00	3.098E+00	3.139E+00	NOT IDENT.
MN-54	-7.936E-01	2.286E+00	2.314E+00	NOT IDENT.
CO-56	1.901E+00	2.240E+00	2.398E+00	NOT IDENT.
CO-57	8.368E-01	1.444E+00	1.493E+00	NOT IDENT.
CO-58	3.655E-01	2.219E+00	2.225E+00	NOT IDENT.
FE-59	-3.562E-01	3.339E+00	3.343E+00	NOT IDENT.
CO-60	-3.749E-02	2.506E+00	2.506E+00	FAIL ABUN
ZN-65	-3.026E+00	5.193E+00	5.369E+00	NOT IDENT.
CU-67	2.946E+00	6.933E+00	7.059E+00	FAIL ABUN
GE-68	1.755E+01	6.911E+01	6.956E+01	NOT IDENT.
AS-74	8.219E-01	4.603E+00	4.618E+00	NOT IDENT.
SE-75	1.311E+00	2.686E+00	2.750E+00	NOT IDENT.
BR-77	7.452E-01	2.095E+01	2.096E+01	FAIL ABUN
SR-82	-6.400E+00	1.557E+01	1.584E+01	NOT IDENT.
RB-83	2.590E-01	4.950E+00	4.951E+00	NOT IDENT.
RB-84	2.561E+00	3.518E+00	3.702E+00	NOT IDENT.

KR-85	2.469E+03	6.731E+02	1.301E+03	NOT IDENT.
SR-85	1.124E+01	3.064E+00	5.921E+00	NOT IDENT.
RB-86	9.905E+00	2.687E+01	2.724E+01	NOT IDENT.
Y-88	4.881E-01	2.295E+00	2.306E+00	NOT IDENT.
Y-91	-1.007E+02	9.619E+02	9.630E+02	NOT IDENT.
NB-94	1.015E-01	2.800E+00	2.801E+00	NOT IDENT.
NB-95	1.092E+00	2.186E+00	2.241E+00	NOT IDENT.
NB-95M	-1.768E+00	7.448E+00	7.490E+00	NOT IDENT.
ZR-95	-3.903E+00	3.645E+00	4.047E+00	NOT IDENT.
MO-99	-9.013E+00	2.311E+01	2.346E+01	NOT IDENT.
TC-99M	2.366E+01	1.185E+02	1.190E+02	NOT IDENT.
RH-101	1.437E+00	1.761E+00	1.877E+00	NOT IDENT.
RH-102M	-1.516E+00	1.971E+00	2.087E+00	NOT IDENT.
RU-103	-1.423E-02	2.081E+00	2.081E+00	NOT IDENT.
RH-106	2.121E+00	1.933E+01	1.936E+01	NOT IDENT.
RU-106	2.121E+00	1.933E+01	1.936E+01	NOT IDENT.
AG-108M	-4.656E-01	1.978E+00	1.989E+00	NOT IDENT.
CD-109	-1.429E+01	3.774E+01	3.828E+01	NOT IDENT.
AG-110M	-2.094E-01	3.245E+00	3.246E+00	FAIL ABUN
SN-113	2.273E+00	2.575E+00	2.771E+00	NOT IDENT.
IN-114M	6.191E+00	1.066E+01	1.102E+01	NOT IDENT.
CD-115	-2.788E+00	1.171E+01	1.178E+01	NOT IDENT.
SN-117M	-4.277E-01	1.635E+00	1.646E+00	NOT IDENT.
I-123	1.010E+00	1.082E+01	1.083E+01	NOT IDENT.
TE-123M	1.763E-01	1.571E+00	1.573E+00	NOT IDENT.
SB-124	-8.488E-01	3.958E+00	3.977E+00	FAIL ABUN
SB-125	1.823E+00	6.131E+00	6.185E+00	FAIL ABUN
TE-125M	-2.355E+02	4.627E+02	4.747E+02	NOT IDENT.
I-126	-1.367E+00	6.863E+00	6.891E+00	NOT IDENT.
SB-126	1.184E+00	4.397E+00	4.429E+00	NOT IDENT.
SN-126	-2.373E+00	3.762E+00	3.911E+00	NOT IDENT.
SB-127	-1.276E+00	7.574E+00	7.596E+00	NOT IDENT.
TE-129	1.301E+00	2.797E+01	2.797E+01	FAIL ABUN
I-131	1.813E+00	2.408E+00	2.543E+00	NOT IDENT.
I-132	-3.226E+04	1.380E+05	1.388E+05	SHORT HLIF
TE-132	-1.545E+00	2.474E+00	2.570E+00	NOT IDENT.
BA-133	-1.236E+00	2.903E+00	2.956E+00	NOT IDENT.
I-133	1.068E+00	7.480E+00	7.495E+00	NOT IDENT.
CS-134	-6.236E-01	2.945E+00	2.958E+00	FAIL ABUN
CS-135	-7.567E+00	1.027E+01	1.082E+01	NOT IDENT.
I-135	-3.956E+01	3.570E+02	3.574E+02	NOT IDENT.
CS-136	1.009E+00	3.351E+00	3.382E+00	NOT IDENT.
BA-137M	-7.893E-01	2.367E+00	2.393E+00	NOT IDENT.
CS-137	-8.338E-01	2.500E+00	2.528E+00	NOT IDENT.
CE-139	8.621E-01	1.668E+00	1.713E+00	NOT IDENT.
BA-140	2.949E+00	8.893E+00	8.992E+00	NOT IDENT.
LA-140	-6.300E-01	2.946E+00	2.959E+00	NOT IDENT.
CE-141	-2.607E+00	3.408E+00	3.604E+00	NOT IDENT.
CE-143	8.138E-01	8.712E+00	8.720E+00	NOT IDENT.
CE-144	1.305E+00	1.061E+01	1.063E+01	NOT IDENT.
PM-144	-1.055E+00	2.583E+00	2.626E+00	NOT IDENT.
PR-144	-7.764E+01	1.920E+02	1.951E+02	NOT IDENT.
PM-146	6.608E-01	2.955E+00	2.970E+00	NOT IDENT.
ND-147	-1.229E-01	1.674E+01	1.674E+01	NOT IDENT.
PM-147	3.125E+04	4.160E+04	4.392E+04	NOT IDENT.
PM-149	-1.392E+01	8.498E+01	8.521E+01	NOT IDENT.
EU-152	6.654E+00	6.695E+00	7.336E+00	NOT IDENT.
GD-153	2.133E+00	4.638E+00	4.736E+00	FAIL ABUN
EU-154	2.113E-01	6.688E+00	6.689E+00	NOT IDENT.
EU-155	4.288E+00	5.679E+00	5.999E+00	NOT IDENT.
HO-166M	-6.526E-01	4.372E+00	4.382E+00	FAIL ABUN
TM-171	2.800E+02	2.616E+02	2.905E+02	FAIL ABUN
LU-176	3.525E-02	1.892E+00	1.892E+00	NOT IDENT.
LU-177	-5.464E+00	1.771E+01	1.788E+01	NOT IDENT.
HF-181	-1.640E+00	2.238E+00	2.357E+00	NOT IDENT.
W-181	2.479E+00	3.971E+00	4.125E+00	FAIL ABUN
TA-182	5.825E+00	9.068E+00	9.441E+00	FAIL ABUN
RE-183	1.834E+00	3.624E+00	3.717E+00	FAIL ABUN
RE-184	3.218E+00	6.415E+00	6.577E+00	NOT IDENT.
RE-188	3.067E+00	8.518E+00	8.630E+00	NOT IDENT.
W-188	2.664E+02	4.326E+02	4.490E+02	NOT IDENT.
OS-191	2.179E+00	4.780E+00	4.880E+00	FAIL ABUN
IR-192	-1.295E-01	2.163E+00	2.163E+00	NOT IDENT.
HG-203	9.602E-01	2.017E+00	2.063E+00	FAIL ABUN
BI-207	1.144E+00	2.997E+00	3.042E+00	NOT IDENT.
TL-208	-1.382E-01	3.053E+00	3.053E+00	NOT IDENT.
BI-211	1.200E-01	1.524E+01	1.524E+01	NOT IDENT.
PB-211	3.120E+01	4.892E+01	5.090E+01	NOT IDENT.

BI-212	1.580E+01	3.329E+01	3.404E+01	NOT IDENT.
PB-212	2.526E-01	7.104E+00	7.105E+00	FAIL ABUN
BI-213	5.931E+00	7.111E+00	7.597E+00	NOT IDENT.
BI-214	6.530E-02	6.203E+00	6.203E+00	NOT IDENT.
PB-214	3.271E+00	5.624E+00	5.814E+00	NOT IDENT.
RN-219	-2.361E+01	3.180E+01	3.354E+01	NOT IDENT.
FR-221	-6.849E+00	1.308E+01	1.344E+01	NOT IDENT.
RA-223	-1.980E+01	4.855E+01	4.937E+01	FAIL ABUN
RA-224	3.792E+00	4.718E+01	4.721E+01	NOT IDENT.
AC-227	1.637E+01	1.782E+01	1.929E+01	NOT IDENT.
TH-227	1.637E+01	1.782E+01	1.929E+01	NOT IDENT.
AC-228	-1.138E+00	1.031E+01	1.033E+01	NOT IDENT.
RA-228	-1.138E+00	1.031E+01	1.033E+01	NOT IDENT.
TH-228	2.526E-01	7.104E+00	7.105E+00	FAIL ABUN
TH-229	-1.226E+01	3.395E+01	3.439E+01	FAIL ABUN
PA-231	2.374E+00	3.249E+01	3.251E+01	NOT IDENT.
TH-232	-1.054E+02	6.701E+02	6.718E+02	NOT IDENT.
PA-233	2.992E+00	4.321E+00	4.527E+00	NOT IDENT.
PA-234	-1.159E+00	2.070E+01	2.071E+01	NOT IDENT.
PA-234M	-1.740E+02	3.193E+02	3.288E+02	NOT IDENT.
TH-234	-3.872E+01	4.992E+01	5.289E+01	NOT IDENT.
U-234	1.437E+03	1.032E+03	1.219E+03	NOT IDENT.
U-235	-1.129E+01	1.484E+01	1.569E+01	FAIL ABUN
NP-237	2.992E+00	4.321E+00	4.527E+00	NOT IDENT.
NP-238	7.906E+00	1.286E+01	1.334E+01	NOT IDENT.
U-238	-3.872E+01	4.992E+01	5.289E+01	NOT IDENT.
NP-239	4.746E-01	1.373E+01	1.373E+01	NOT IDENT.
AM-241	7.169E-01	3.567E+00	3.582E+00	NOT IDENT.
AM-242	2.876E+00	3.744E+01	3.746E+01	NOT IDENT.
AM-243	-1.077E+00	2.139E+00	2.193E+00	NOT IDENT.
CM-243	-3.529E-01	5.769E+00	5.771E+00	NOT IDENT.
BK-247	1.528E+00	5.263E+00	5.308E+00	FAIL ABUN
CM-247	-2.359E+00	2.952E+00	3.138E+00	NOT IDENT.
CF-249	-2.730E+00	2.743E+00	3.007E+00	NOT IDENT.
CF-251	-1.628E+00	8.384E+00	8.416E+00	NOT IDENT.
CF-252	3.510E+03	9.845E+03	9.972E+03	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	68.1222	88.03	127.5897	136.47	119.9071
46.54	70.2920	88.34	139.1334	140.51	121.5764
49.72	96.1843	88.47	139.1730	140.88	125.2519
51.35	99.1620	89.96	323.0464	143.76	124.0026
52.39	78.5924	91.11	153.6875	144.24	123.1888
53.20	76.7942	91.27	154.8377	145.44	114.3413
56.28	125.8268	92.59	124.4369	152.32	108.1943
57.36	89.8732	93.31	126.8312	152.43	106.3782
57.53	96.9900	93.35	124.6358	153.25	93.6523
57.53	96.9905	94.56	179.1321	154.21	109.4153
57.98	96.1051	94.65	286.4442	155.04	105.8656
59.32	100.5381	94.67	286.4561	156.02	97.7204
59.54	112.7951	97.43	98.9938	158.56	111.9586
61.49	180.8522	98.43	112.5688	158.97	106.4692
63.00	124.6631	98.44	112.5714	159.00	106.4736
63.29	117.0605	99.53	106.1159	162.33	110.7000
63.58	90.9478	100.11	96.1744	162.66	108.8904
63.81	91.0048	100.20	107.3765	163.33	115.5140
64.28	95.7539	102.03	130.2174	165.86	97.2263
64.99	116.0530	103.18	94.5081	176.31	129.9081
65.08	215.1368	103.37	111.4259	176.60	135.6499
66.73	195.8733	105.31	97.1585	177.52	120.6186
66.98	196.0021	106.12	105.2305	181.07	111.4498
67.24	56.0388	106.47	105.3009	184.41	93.5321
67.67	56.1020	109.28	118.3833	184.58	99.6876
67.75	56.1135	111.00	101.6342	185.72	113.2727
69.67	119.0515	111.76	97.2030	186.21	113.7271
70.83	133.5427	112.95	93.9775	190.27	97.3209
72.81	135.7863	116.24	91.0810	193.51	118.2666
72.87	135.8067	116.30	88.7845	198.01	107.2263
74.66	129.0045	116.74	84.2388	201.83	127.3092
74.82	129.0547	117.23	91.2425	205.31	100.3051
74.97	133.3347	119.76	97.4527	208.37	116.4587
77.11	123.3875	120.54	91.7773	210.85	100.9603
79.69	111.7273	120.90	87.1853	218.12	102.8059
80.12	122.1235	121.12	87.2189	222.11	101.2635
80.19	122.1432	121.22	87.2339	227.09	92.7517
80.57	122.2510	121.78	96.6328	227.38	92.7812
81.00	119.1525	122.06	96.6801	228.16	106.9923
81.07	119.1717	123.07	105.0169	228.18	106.9939
83.79	119.9135	123.68	98.9946	235.69	100.9490
84.00	119.9705	127.23	96.0679	235.96	100.9778
84.21	116.7830	129.43	99.9611	238.63	93.9155
85.43	107.3437	131.20	124.2090	238.98	96.4015
86.55	123.9152	133.02	96.9941	240.99	106.4312
86.94	138.7080	133.52	100.6355	242.00	103.2656
87.09	138.7540	136.00	119.8161	244.70	84.5370
87.57	130.7294	136.28	119.8703	250.62	82.6923

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
252.40	105.6241	364.49	56.6802	621.93	32.1211
252.80	106.7028	366.42	70.4975	630.19	0.0000
256.23	84.2030	383.85	67.7148	631.29	41.9526
260.90	99.2183	388.16	76.3034	632.98	40.9112
264.66	74.4278	388.63	67.0219	633.25	40.9168
265.00	77.5986	391.70	44.7809	634.78	42.0250
268.22	95.7266	400.66	63.8488	635.95	38.8151
269.46	83.2022	401.81	66.7202	636.99	36.6770
271.23	86.5107	402.40	68.6291	645.85	32.5027
273.65	83.5385	404.85	56.5049	657.76	40.3179
276.40	92.2397	410.95	58.6396	661.66	39.3012
277.37	99.7531	414.70	59.7408	664.57	38.2625
277.60	100.8360	423.72	55.3414	666.33	36.1066
278.00	90.2554	427.09	52.5991	666.50	36.1091
278.43	81.7949	427.87	53.5835	667.71	0.0000
279.20	72.2863	433.94	55.7245	677.62	27.4988
279.54	72.3102	440.45	46.3166	685.70	38.6436
280.46	71.3081	453.88	54.5125	695.00	52.6698
283.69	86.4691	459.60	56.6668	696.49	57.3291
284.31	89.7230	463.37	51.9066	696.51	57.3291
285.41	80.1922	468.07	57.9543	697.00	50.8687
285.90	79.1580	473.00	43.3544	697.49	49.9548
287.50	86.7744	475.06	57.2219	702.65	46.0984
290.67	75.2081	476.78	51.3576	706.68	38.0872
293.27	81.8482	477.60	34.5851	711.68	33.5178
295.22	84.1509	477.99	34.5937	720.70	33.6533
295.96	84.2068	482.18	49.5471	721.93	41.1542
299.98	78.0095	487.02	50.6881	722.78	44.9121
300.09	78.0172	492.35	38.8872	722.91	42.1078
300.13	78.0205	497.08	44.9984	723.31	44.9229
301.36	80.2758	511.00	43.3548	724.19	38.3866
302.85	91.2444	514.00	43.4315	727.33	32.8146
304.50	68.5323	520.40	43.9311	733.00	32.8965
304.85	69.6416	520.69	50.6982	735.93	26.3508
306.78	81.7497	522.65	0.0000	739.50	29.2195
308.46	80.7783	527.90	49.8912	744.23	27.3905
311.90	62.4081	529.59	47.9008	747.24	33.1009
316.51	78.0452	529.87	41.7928	752.31	23.6949
319.41	82.6458	531.02	46.9198	753.82	20.8649
320.08	84.8979	537.26	42.9916	756.73	34.1851
321.04	97.1053	546.56	42.1872	763.94	24.7654
323.87	95.1254	552.55	43.3597	765.80	27.6448
325.23	91.9109	563.25	48.8061	766.42	34.3264
328.76	89.9613	569.33	45.8423	766.84	36.2396
333.37	81.3854	569.50	50.0133	772.60	0.0000
334.37	81.4522	569.70	53.1453	776.52	37.3448
338.28	70.5193	583.19	37.7851	777.92	40.2415
338.32	76.1182	595.83	45.7835	778.90	37.3821
340.48	72.8880	600.60	58.2535	783.70	33.6150
340.55	72.8919	602.73	61.8524	785.37	36.5218
344.28	57.3641	604.72	76.0671	792.07	31.8043
345.93	63.0718	609.32	47.8762	795.86	31.4396
351.06	64.2337	610.33	48.9648	801.95	29.9972
351.93	58.8459	614.28	50.1303	802.10	29.9991
356.01	79.9230	618.01	41.6755	810.29	28.4811

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
810.45	27.9650	1120.55	21.6536		
810.76	25.6378	1121.30	23.8244		
815.77	30.1656	1129.67	20.4731		
818.51	29.2242	1131.51	17.6912		
832.01	31.3405	1173.23	8.2501		
834.85	33.3366	1189.05	18.9453		
836.80	36.3059	1204.77	20.9358		
846.77	21.6715	1221.41	15.2991		
856.80	26.7006	1231.02	11.5057		
860.56	29.7101	1235.36	16.3199		
871.09	35.7957	1238.28	15.3728		
873.19	23.8828	1260.41	14.5014		
875.33	26.8901	1274.44	16.4990		
880.51	27.9408	1274.54	15.5290		
881.60	23.9590	1291.59	20.4778		
883.24	26.9703	1298.22	20.5144		
884.68	29.9835	1312.11	18.6302		
889.28	28.0325	1332.49	17.7464		
894.76	28.0900	1365.19	12.9275		
898.04	30.1331	1368.63	14.9299		
903.28	25.1597	1384.29	16.9887		
911.20	23.0125	1408.01	20.1081		
923.98	22.5981	1434.09	18.2166		
926.36	25.4646	1457.56	15.2689		
935.54	29.5292	1460.82	22.4128		
937.49	26.4930	1489.16	15.3871		
944.13	29.6201	1596.21	14.7261		
946.00	29.6396	1620.50	8.4612		
949.00	21.4858	1678.03	6.4271		
954.55	0.0000	1690.97	7.5195		
964.08	20.5717	1764.49	10.5022		
968.97	23.6977	1770.23	12.4263		
983.53	15.5328	1771.35	10.5169		
984.45	13.4660	1791.20	8.6402		
996.26	23.9209	1808.65	12.5251		
1001.03	21.8763	1836.06	7.7507		
1004.73	20.8606				
1025.87	16.8068				
1028.54	23.1297				
1037.84	20.0375				
1038.76	22.1527				
1046.59	20.0947				
1048.07	22.2202				
1050.41	18.0016				
1063.66	17.0156				
1077.00	16.0205				
1077.34	17.0898				
1083.85	22.4774				
1085.87	18.2078				
1099.25	12.9067				
1111.64	21.5942				
1112.07	16.1975				
1112.84	17.2819				
1115.54	28.1064				
1120.29	21.6520				

VAX/VMS Nuclide Identification Report Generated 22-JUN-2016 14:04:09.53

```
*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561782.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;320
Background date    : 20-JUN-2016 14:03:09
Sample date       : 21-JUN-2016 00:00:00 Acquisition date : 22-JUN-2016 13:48:41
Sample ID        : G1203561782 Sample quantity : 2.000000E+00 LITER
Detector name    : GAM09 Detector geometry: 2LMB
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:04.08 0.5%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572406 Detector SN# :
Matrix Spike ID  : LCS ID : 1604
*****
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	45.06*	285	1203	1.26	89.78	87	9	3.16E-01	21.7	1.86E+00
2	10	46.53*	1489	993	0.77	92.72	87	9	1.65E+00	4.2	
3	10	58.09	391	1548	1.74	115.85	113	11	4.34E-01	19.1	2.75E+00
4	10	59.53	5095	1015	0.80	118.73	113	11	5.66E+00	1.7	
5	0	87.96*	2342	1373	0.94	175.61	171	9	2.60E+00	3.5	
6	0	121.93	301	1198	1.00	243.58	240	9	3.34E-01	21.5	
7	0	245.05	57	526	1.31	489.92	488	6	6.32E-02	65.3	
8	0	327.01	33	506	1.44	653.91	651	8	3.70E-02	118.4	
9	0	393.19	27	335	0.90	786.33	785	6	2.98E-02	109.6	
10	0	661.31	8436	378	1.36	1322.81	1316	14	9.37E+00	1.2	
11	0	744.81	62	193	2.47	1489.88	1486	10	6.92E-02	43.8	
12	0	876.37	57	248	0.85	1753.14	1750	9	6.31E-02	51.5	
13	0	927.42	35	254	2.33	1855.30	1850	8	3.88E-02	81.1	
14	0	1114.70	167	315	1.50	2230.03	2223	14	1.86E-01	23.8	
15	0	1141.77	21	110	1.08	2284.21	2280	8	2.30E-02	91.9	
16	0	1172.58	6373	217	1.79	2345.85	2338	15	7.08E+00	1.3	
17	0	1318.29	17	17	2.36	2637.43	2633	9	1.85E-02	51.8	
18	0	1331.76	5875	34	1.91	2664.38	2657	18	6.53E+00	1.3	
19	0	1399.24	12	2	0.99	2799.40	2795	8	1.33E-02	35.4	
20	0	1562.45	11	3	1.46	3126.00	3120	11	1.26E-02	40.9	
21	0	1572.19	2	7	0.89	3145.50	3140	8	2.22E-03	229.1	
22	0	1883.21	9	0	4.15	3767.89	3762	12	1.00E-02	33.3	
23	0	1967.53	8	0	1.35	3936.63	3932	9	8.89E-03	35.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 22-JUN-2016 14:04:11

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561782.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 21-JUN-2016 00:00:00	Acquisition date	: 22-JUN-2016 13:48:41
Sample ID	: G1203561782	Sample quantity	: 2.0000 LITER
Sample type	: LIQUID	Sample geometry	:
Detector name	: GAMMA9	Detector geometry	: 2LMB
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:04.08 0.5%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Linear	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
CO-57	122.06	301	85.60*	2.448E+00	2.154E+02	2.163E+02	43.02
	136.47	-----	10.68	2.520E+00	-----	Line Not Found	-----
CO-60	1173.23	6373	99.85	6.999E-01	1.369E+04	1.370E+04	2.70
	1332.49	5875	99.98*	6.366E-01	1.386E+04	1.387E+04	2.65
ZN-65	1115.54	167	50.60*	7.262E-01	6.824E+02	6.855E+02	47.67
CD-109	88.03	2342	3.70*	1.792E+00	5.303E+04	5.315E+04	7.05
SN-113	391.70	27	64.97*	1.506E+00	4.110E+01	4.149E+01	219.12
SN-126	64.28	-----	9.60	8.059E-01	-----	Line Not Found	-----
	86.94	2342	8.90	1.792E+00	2.205E+04	2.205E+04	7.05
	87.57	2342	37.00*	1.792E+00	5.303E+03	5.303E+03	7.05
BA-137M	661.66	8436	89.90*	1.045E+00	1.348E+04	1.348E+04	2.39
CS-137	661.66	8436	85.10*	1.045E+00	1.424E+04	1.424E+04	2.39
PM-147	121.22	301	0.00*	2.448E+00	6.470E+06	6.478E+06	43.02
PB-210	46.54	1489	4.25*	1.265E-01	4.157E+05	4.158E+05	8.40
PO-210	46.54	1489	4.25*	1.265E-01	4.157E+05	4.158E+05	8.40
AM-241	59.54	5095	35.90*	5.902E-01	3.610E+04	3.610E+04	3.43

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561782.CNF;1
Acquisition date : 22-JUN-2016 13:48:41 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:04.08 Half life ratio : *****
Sample date : 21-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561782 Sample Quantity : 2.0000E+00 LITER
Batch Number : 1572406 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : LIQUID.NLB;9

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUN-2016 07:31:34 Eff. Geometry : 2LMB
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_2LMB.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
CO-57	2.163E+02	9.118E+01	9.301E+01
CO-60	1.387E+04	3.605E+02	6.430E+01
ZN-65	6.855E+02	3.203E+02	2.895E+02
CD-109	5.315E+04	3.674E+03	3.127E+03
SN-113	4.149E+01	8.911E+01	1.554E+02
SN-126	5.303E+03	3.665E+02	3.145E+02
BA-137M	1.348E+04	3.153E+02	1.255E+02
CS-137	1.424E+04	3.331E+02	1.326E+02
PM-147	6.478E+06	2.731E+06	2.739E+06
PB-210	4.158E+05	3.422E+04	4.239E+04
PO-210	4.158E+05	3.422E+04	4.239E+04
AM-241	3.610E+04	1.213E+03	1.070E+03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	1.211E+02	6.317E+02	1.098E+03	NOT IDENT.
NA-22	1.791E+01	4.313E+01	8.010E+01	NOT IDENT.
NA-24	1.259E+02	1.720E+02	3.607E+02	NOT IDENT.
AL-26	1.138E+01	2.699E+01	5.714E+01	NOT IDENT.
K-40	8.533E+01	2.591E+02	5.332E+02	NOT IDENT.
SC-46	-3.836E+00	9.011E+01	1.570E+02	NOT IDENT.
V-48	-2.838E+01	9.571E+01	1.641E+02	NOT IDENT.
CR-51	-1.355E+02	5.109E+02	8.997E+02	NOT IDENT.
MN-52	1.813E+01	2.949E+01	6.382E+01	FAIL ABUN
MN-54	2.256E+00	7.378E+01	1.302E+02	NOT IDENT.
CO-56	1.137E+01	7.862E+01	1.390E+02	NOT IDENT.
CO-58	-4.128E+01	7.503E+01	1.295E+02	NOT IDENT.
FE-59	8.026E+01	1.677E+02	2.944E+02	NOT IDENT.
CU-67	-5.230E+00	1.462E+02	2.493E+02	NOT IDENT.
GE-68	-1.502E+03	2.834E+03	4.775E+03	NOT IDENT.
AS-74	3.946E+01	1.055E+02	1.837E+02	NOT IDENT.
SE-75	-4.855E+01	9.054E+01	1.484E+02	FAIL ABUN
BR-77	1.342E+02	3.613E+02	6.119E+02	NOT IDENT.

SR-82	-7.311E+01	4.536E+02	8.004E+02	NOT IDENT.
RB-83	-2.881E+01	1.373E+02	2.384E+02	NOT IDENT.
RB-84	-3.135E+01	1.467E+02	2.200E+02	NOT IDENT.
KR-85	-9.886E+03	1.424E+04	2.391E+04	NOT IDENT.
SR-85	-4.502E+01	6.485E+01	1.089E+02	NOT IDENT.
RB-86	-4.325E+02	1.106E+03	1.876E+03	NOT IDENT.
Y-88	1.240E+01	2.503E+01	5.488E+01	NOT IDENT.
Y-91	2.282E+03	2.273E+04	4.007E+04	NOT IDENT.
NB-94	1.830E+00	6.289E+01	1.067E+02	NOT IDENT.
NB-95	-3.971E+01	6.865E+01	1.190E+02	NOT IDENT.
NB-95M	-3.368E+01	2.182E+02	3.643E+02	NOT IDENT.
ZR-95	-1.410E+01	1.208E+02	2.139E+02	NOT IDENT.
MO-99	-9.635E+01	8.876E+02	1.370E+03	NOT IDENT.
TC-99M	1.062E+03	3.865E+03	6.730E+03	NOT IDENT.
RH-101	-6.950E+00	6.892E+01	1.140E+02	NOT IDENT.
RH-102M	3.281E+01	7.029E+01	1.232E+02	NOT IDENT.
RU-103	-7.084E+01	6.915E+01	1.149E+02	NOT IDENT.
RH-106	-2.538E+02	6.315E+02	1.058E+03	NOT IDENT.
RU-106	-2.538E+02	6.315E+02	1.058E+03	NOT IDENT.
AG-108M	-1.945E+01	6.946E+01	1.197E+02	NOT IDENT.
AG-110M	-1.210E+01	1.186E+02	2.065E+02	NOT IDENT.
IN-114M	2.341E+01	3.126E+02	5.321E+02	NOT IDENT.
CD-115	1.187E+02	3.616E+02	6.306E+02	NOT IDENT.
SN-117M	-3.126E+01	5.403E+01	9.145E+01	NOT IDENT.
I-123	-1.570E+02	3.751E+02	6.376E+02	NOT IDENT.
TE-123M	-2.094E+01	5.138E+01	8.736E+01	NOT IDENT.
SB-124	3.991E+01	5.716E+01	1.252E+02	NOT IDENT.
SB-125	3.380E+01	2.068E+02	3.617E+02	NOT IDENT.
TE-125M	7.000E+03	1.809E+04	3.196E+04	NOT IDENT.
I-126	6.207E+01	2.432E+02	3.660E+02	NOT IDENT.
SB-126	-1.763E+01	1.245E+02	2.211E+02	NOT IDENT.
SB-127	6.862E-01	2.161E+02	3.673E+02	NOT IDENT.
TE-129	-9.463E+01	9.095E+02	1.568E+03	NOT IDENT.
I-131	-3.035E+00	7.538E+01	1.325E+02	NOT IDENT.
I-132	0.000E+00	6.655E+06	0.000E+00	SHORT HLIF
TE-132	-2.634E+01	8.683E+01	1.446E+02	NOT IDENT.
BA-133	5.970E+01	8.582E+01	1.543E+02	NOT IDENT.
I-133	-3.101E+01	2.484E+02	4.256E+02	FAIL ABUN
CS-134	-9.588E+00	7.915E+01	1.395E+02	NOT IDENT.
CS-135	1.117E+02	3.319E+02	5.583E+02	NOT IDENT.
I-135	-3.331E+03	8.186E+03	1.398E+04	NOT IDENT.
CS-136	3.808E+01	1.144E+02	2.010E+02	NOT IDENT.
CE-139	3.260E+01	5.642E+01	9.806E+01	NOT IDENT.
BA-140	-2.236E+02	2.656E+02	4.417E+02	NOT IDENT.
LA-140	9.359E+00	3.257E+01	6.600E+01	NOT IDENT.
CE-141	2.436E+01	9.347E+01	1.624E+02	NOT IDENT.
CE-143	-5.328E+01	2.802E+02	4.613E+02	FAIL ABUN
CE-144	-2.694E+02	4.078E+02	6.955E+02	NOT IDENT.
PM-144	-1.297E+01	6.257E+01	1.050E+02	NOT IDENT.
PR-144	-9.952E+02	4.648E+03	7.797E+03	NOT IDENT.
PM-146	-2.398E+01	1.026E+02	1.765E+02	NOT IDENT.
ND-147	-2.974E+02	5.136E+02	8.641E+02	NOT IDENT.
PM-149	1.593E+02	2.839E+03	4.720E+03	NOT IDENT.
EU-152	4.180E+01	1.987E+02	3.530E+02	FAIL ABUN
GD-153	-1.940E+01	1.827E+02	3.209E+02	NOT IDENT.
EU-154	4.719E+01	1.227E+02	2.272E+02	FAIL ABUN
EU-155	5.229E+01	2.325E+02	4.101E+02	FAIL ABUN
HO-166M	5.275E+01	1.208E+02	2.085E+02	NOT IDENT.
TM-171	-7.940E+03	1.055E+05	1.713E+05	NOT IDENT.
LU-176	-2.738E+01	5.295E+01	9.277E+01	FAIL ABUN
LU-177	-5.696E+02	5.683E+02	9.347E+02	NOT IDENT.
HF-181	-5.793E+01	7.940E+01	1.338E+02	FAIL ABUN
W-181	0.000E+00	1.311E+03	1.816E+03	FAIL ABUN
TA-182	3.976E+01	1.973E+02	3.527E+02	NOT IDENT.
RE-183	0.000E+00	1.231E+03	2.056E+03	FAIL ABUN
RE-184	1.980E+02	2.395E+02	4.300E+02	NOT IDENT.
RE-188	1.988E+01	2.850E+02	4.911E+02	NOT IDENT.
W-188	-1.883E+03	1.356E+04	2.237E+04	NOT IDENT.
OS-191	1.011E+02	1.796E+02	3.160E+02	NOT IDENT.
IR-192	-1.296E+01	6.132E+01	1.082E+02	NOT IDENT.
HG-203	4.493E+01	6.604E+01	1.121E+02	NOT IDENT.
BI-207	2.727E+01	1.170E+02	2.042E+02	NOT IDENT.
TL-208	-3.663E+01	7.277E+01	1.221E+02	NOT IDENT.
BI-211	2.634E+02	4.116E+02	7.399E+02	NOT IDENT.
PB-211	-2.894E+02	1.521E+03	2.643E+03	NOT IDENT.
BI-212	7.542E+02	9.730E+02	1.787E+03	NOT IDENT.
PB-212	3.303E+01	1.207E+02	2.038E+02	NOT IDENT.
BI-213	-1.951E+02	2.465E+02	4.174E+02	NOT IDENT.

BI-214	-2.847E+01	1.369E+02	2.318E+02	NOT IDENT.
PB-214	7.216E+01	1.476E+02	2.642E+02	FAIL ABUN
RN-219	-8.147E+00	8.790E+02	1.536E+03	NOT IDENT.
FR-221	-2.369E+02	4.509E+02	7.488E+02	NOT IDENT.
RA-223	8.969E+01	1.416E+03	2.222E+03	NOT IDENT.
RA-224	2.610E+02	1.325E+03	2.126E+03	NOT IDENT.
RA-226	-1.743E+02	1.325E+03	2.253E+03	NOT IDENT.
AC-227	1.094E+02	5.618E+02	9.430E+02	NOT IDENT.
TH-227	1.094E+02	5.618E+02	9.430E+02	NOT IDENT.
AC-228	3.627E+02	3.460E+02	6.258E+02	NOT IDENT.
RA-228	3.627E+02	3.460E+02	6.258E+02	NOT IDENT.
TH-228	3.303E+01	1.207E+02	2.038E+02	NOT IDENT.
TH-229	-2.929E+02	1.107E+03	1.866E+03	FAIL ABUN
TH-230	2.392E+03	3.002E+04	5.379E+04	NOT IDENT.
PA-231	-4.874E+02	1.011E+03	1.645E+03	NOT IDENT.
TH-231	6.376E+02	1.228E+03	1.986E+03	NOT IDENT.
TH-232	-4.007E+04	6.192E+04	9.017E+04	NOT IDENT.
PA-233	8.230E+01	1.357E+02	2.446E+02	NOT IDENT.
PA-234	9.190E+01	8.005E+02	1.394E+03	FAIL ABUN
PA-234M	-1.949E+01	1.079E+04	1.870E+04	NOT IDENT.
TH-234	-2.658E+03	4.462E+03	6.513E+03	NOT IDENT.
U-234	-3.003E+05	3.838E+05	6.128E+05	FAIL ABUN
U-235	5.146E+01	3.967E+02	6.876E+02	NOT IDENT.
NP-237	8.230E+01	1.357E+02	2.446E+02	NOT IDENT.
NP-238	-3.465E+02	5.976E+02	1.012E+03	NOT IDENT.
U-238	-2.658E+03	4.462E+03	6.513E+03	NOT IDENT.
NP-239	5.603E+02	5.893E+02	1.051E+03	NOT IDENT.
AM-242	-4.507E+02	1.428E+03	2.493E+03	FAIL ABUN
AM-243	1.413E+02	1.340E+02	2.436E+02	NOT IDENT.
CM-243	-2.007E+01	2.389E+02	4.188E+02	NOT IDENT.
BK-247	-8.587E+01	1.766E+02	2.899E+02	NOT IDENT.
CM-247	-5.205E+01	7.990E+01	1.368E+02	NOT IDENT.
CF-249	6.124E+01	8.684E+01	1.553E+02	NOT IDENT.
CF-251	1.244E+02	2.577E+02	4.456E+02	NOT IDENT.
CF-252	-2.424E+04	3.945E+05	6.929E+05	NOT IDENT.
ANH-511	-3.291E+01	6.090E+01	1.043E+02	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	45.06	286	1203	1.26	89.78	87	9	3.18E-01	21.5	1.86E+00
2	10	46.53	1490	993	0.77	92.72	87	9	1.66E+00	4.2	
3	10	58.09	391	1548	1.74	115.85	113	11	4.34E-01	19.1	2.75E+00
4	10	59.53	5095	1015	0.80	118.73	113	11	5.66E+00	1.7	
5	0	87.96	2343	1373	0.94	175.61	171	9	2.60E+00	3.5	
6	0	121.93	301	1198	1.00	243.58	240	9	3.34E-01	21.5	
7	0	245.05	57	526	1.31	489.92	488	6	6.32E-02	65.3	
8	0	327.01	33	506	1.44	653.91	651	8	3.70E-02	118.4	
9	0	393.19	27	335	0.90	786.33	785	6	2.98E-02	109.6	
10	0	661.31	8436	378	1.36	1322.81	1316	14	9.37E+00	1.2	
11	0	744.81	62	193	2.47	1489.88	1486	10	6.92E-02	43.8	
12	0	876.37	57	248	0.85	1753.14	1750	9	6.31E-02	51.5	
13	0	927.42	35	254	2.33	1855.30	1850	8	3.88E-02	81.1	
14	0	1114.70	167	315	1.50	2230.03	2223	14	1.86E-01	23.8	
15	0	1141.77	21	110	1.08	2284.21	2280	8	2.30E-02	91.9	
16	0	1172.58	6373	217	1.79	2345.85	2338	15	7.08E+00	1.3	
17	0	1318.29	17	17	2.36	2637.43	2633	9	1.85E-02	51.8	
18	0	1331.76	5875	34	1.91	2664.38	2657	18	6.53E+00	1.3	
19	0	1399.24	12	2	0.99	2799.40	2795	8	1.33E-02	35.4	
20	0	1562.45	11	3	1.46	3126.00	3120	11	1.26E-02	40.9	
21	0	1572.19	2	7	0.89	3145.50	3140	8	2.22E-03	229.1	
22	0	1883.21	9	0	4.15	3767.89	3762	12	1.00E-02	33.3	
23	0	1967.53	8	0	1.35	3936.63	3932	9	8.89E-03	35.4	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
CO-57	122.06	301	85.60*	2.448E+00	2.154E+02	2.163E+02	43.02
	136.47	-----	10.68	2.520E+00	-----	Line Not Found	-----
CO-60	1173.23	6373	99.85	6.999E-01	1.369E+04	1.370E+04	2.70
	1332.49	5875	99.98*	6.366E-01	1.386E+04	1.387E+04	2.65
ZN-65	1115.54	167	50.60*	7.262E-01	6.824E+02	6.855E+02	47.67
CD-109	88.03	2342	3.70*	1.792E+00	5.303E+04	5.315E+04	7.05
SN-113	391.70	27	64.97*	1.506E+00	4.110E+01	4.149E+01	219.12
SN-126	64.28	-----	9.60	8.059E-01	-----	Line Not Found	-----
	86.94	2342	8.90	1.792E+00	2.205E+04	2.205E+04	7.05
	87.57	2342	37.00*	1.792E+00	5.303E+03	5.303E+03	7.05
BA-137M	661.66	8436	89.90*	1.045E+00	1.348E+04	1.348E+04	2.39
CS-137	661.66	8436	85.10*	1.045E+00	1.424E+04	1.424E+04	2.39
PM-147	121.22	301	0.00*	2.448E+00	6.470E+06	6.478E+06	43.02
PB-210	46.54	1489	4.25*	1.265E-01	4.157E+05	4.158E+05	8.40
PO-210	46.54	1489	4.25*	1.265E-01	4.157E+05	4.158E+05	8.40
AM-241	59.54	5095	35.90*	5.902E-01	3.610E+04	3.610E+04	3.43

Flag: "*" = Keyline

Total number of lines in spectrum 23
Number of unidentified lines 9
Number of lines tentatively identified by NID 14 60.87%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.00	2.154E+02	2.163E+02	0.930E+02	43.02	
CO-60	1925.28D	1.00	1.386E+04	1.387E+04	0.037E+04	2.65	
ZN-65	244.06D	1.00	6.824E+02	6.855E+02	3.268E+02	47.67	
CD-109	461.40D	1.00	5.303E+04	5.315E+04	0.375E+04	7.05	
SN-113	115.09D	1.01	4.110E+01	4.149E+01	9.092E+01	219.12	
SN-126	2.30E+05Y	1.00	5.303E+03	5.303E+03	0.374E+03	7.05	
BA-137M	30.08Y	1.00	1.348E+04	1.348E+04	0.032E+04	2.39	
CS-137	30.08Y	1.00	1.424E+04	1.424E+04	0.034E+04	2.39	
PM-147	2.62Y	1.00	6.470E+06	6.478E+06	2.787E+06	43.02	
PB-210	22.20Y	1.00	4.157E+05	4.158E+05	0.349E+05	8.40	
PO-210	22.20Y	1.00	4.157E+05	4.158E+05	0.349E+05	8.40	
AM-241	432.60Y	1.00	3.610E+04	3.610E+04	0.124E+04	3.43	

Total Activity : 7.438E+06 7.446E+06

Grand Total Activity : 7.438E+06 7.446E+06

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
10	45.06	285	1203	1.26	89.78	87	9	3.16E-01	43.3	9.46E-02	
10	58.09	391	1548	1.74	115.85	113	11	4.34E-01	38.2	5.28E-01	T
0	245.05	57	526	1.31	489.92	488	6	6.32E-02	****	2.08E+00	T
0	327.01	33	506	1.44	653.91	651	8	3.70E-02	****	1.72E+00	
0	744.81	62	193	2.47	1489.88	1486	10	6.92E-02	87.5	9.63E-01	T
0	876.37	57	248	0.85	1753.14	1750	9	6.31E-02	****	8.61E-01	T
0	927.42	35	254	2.33	1855.30	1850	8	3.88E-02	****	8.27E-01	T
0	1141.77	21	110	1.08	2284.21	2280	8	2.30E-02	****	7.14E-01	
0	1318.29	17	17	2.36	2637.43	2633	9	1.85E-02	****	6.42E-01	
0	1399.24	12	2	0.99	2799.40	2795	8	1.33E-02	70.7	6.13E-01	
0	1562.45	11	3	1.46	3126.00	3120	11	1.26E-02	81.8	5.62E-01	
0	1572.19	2	7	0.89	3145.50	3140	8	2.22E-03	****	5.59E-01	
0	1883.21	9	0	4.15	3767.89	3762	12	1.00E-02	66.7	4.79E-01	
0	1967.53	8	0	1.35	3936.63	3932	9	8.89E-03	70.7	4.60E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
*
*                                     DETECTOR AND SAMPLE DATA                      *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561782.CNF;1      *
* Acquisition date   : 22-JUN-2016 13:48:41 Sensitivity      : 3.000                *
* Detector ID       : GAM09 Energy tolerance: 1.500          *
* Elapsed live time : 0 00:15:00.00 Abundance limit : 75.000    *
* Elapsed real time : 0 00:15:04.08 Half life ratio : *****          *
* Sample date       : 21-JUN-2016 00:00:00 Nuclide Library : LIQUID          *
* Sample ID         : G1203561782 Analyst initials: MXR1          *
* Batch Number      : 1572406 Sample Quantity : 2.0000E+00 LITER          *
* Wet wt corr       : 1.00000 Wet Weight      : 0.00000          *
*                                     Dry Weight      : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                      *
*
* Eff. Cal. date    : 7-JUN-2016 07:31:34 Eff. Geometry    : 2LMB          *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM09_2LMB.CNF;16          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
CO-57	4.556E+01
CO-60	2.897E+01
ZN-65	1.393E+02
CD-109	1.534E+03
SN-113	7.564E+01
SN-126	1.542E+02
BA-137M	6.064E+01
CS-137	6.406E+01
PM-147	1.341E+06
PB-210	2.083E+04
PO-210	2.083E+04
AM-241	5.258E+02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	5.343E+02	NOT IDENT.
NA-22	3.697E+01	NOT IDENT.
NA-24	1.616E+02	NOT IDENT.
AL-26	2.448E+01	NOT IDENT.
K-40	2.345E+02	NOT IDENT.
SC-46	7.612E+01	NOT IDENT.
V-48	7.933E+01	NOT IDENT.
CR-51	4.378E+02	NOT IDENT.
MN-52	2.781E+01	FAIL ABUN
MN-54	6.283E+01	NOT IDENT.
CO-56	6.718E+01	NOT IDENT.
CO-58	6.252E+01	NOT IDENT.
FE-59	1.423E+02	NOT IDENT.
CU-67	1.221E+02	NOT IDENT.
GE-68	2.304E+03	NOT IDENT.
AS-74	8.865E+01	NOT IDENT.
SE-75	7.249E+01	FAIL ABUN
BR-77	2.995E+02	NOT IDENT.
SR-82	3.854E+02	NOT IDENT.

RB-83	1.156E+02	NOT IDENT.
RB-84	1.065E+02	NOT IDENT.
KR-85	1.158E+04	NOT IDENT.
SR-85	5.274E+01	NOT IDENT.
RB-86	9.051E+02	NOT IDENT.
Y-88	2.322E+01	NOT IDENT.
Y-91	1.888E+04	NOT IDENT.
NB-94	5.134E+01	NOT IDENT.
NB-95	5.735E+01	NOT IDENT.
NB-95M	1.783E+02	NOT IDENT.
ZR-95	1.030E+02	NOT IDENT.
MO-99	6.594E+02	NOT IDENT.
TC-99M	3.296E+03	NOT IDENT.
RH-101	5.584E+01	NOT IDENT.
RH-102M	5.999E+01	NOT IDENT.
RU-103	5.570E+01	NOT IDENT.
RH-106	5.104E+02	NOT IDENT.
RU-106	5.104E+02	NOT IDENT.
AG-108M	5.826E+01	NOT IDENT.
AG-110M	1.000E+02	NOT IDENT.
IN-114M	2.606E+02	NOT IDENT.
CD-115	3.056E+02	NOT IDENT.
SN-117M	4.473E+01	NOT IDENT.
I-123	3.119E+02	NOT IDENT.
TE-123M	4.273E+01	NOT IDENT.
SB-124	5.435E+01	NOT IDENT.
SB-125	1.761E+02	NOT IDENT.
TE-125M	1.566E+04	NOT IDENT.
I-126	1.766E+02	NOT IDENT.
SB-126	1.064E+02	NOT IDENT.
SB-127	1.765E+02	NOT IDENT.
TE-129	7.641E+02	NOT IDENT.
I-131	6.450E+01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	7.084E+01	NOT IDENT.
BA-133	7.518E+01	NOT IDENT.
I-133	2.061E+02	FAIL ABUN
CS-134	6.722E+01	NOT IDENT.
CS-135	2.729E+02	NOT IDENT.
I-135	6.413E+03	NOT IDENT.
CS-136	9.691E+01	NOT IDENT.
CE-139	4.803E+01	NOT IDENT.
BA-140	2.134E+02	NOT IDENT.
LA-140	2.880E+01	NOT IDENT.
CE-141	7.950E+01	NOT IDENT.
CE-143	2.251E+02	FAIL ABUN
CE-144	3.406E+02	NOT IDENT.
PM-144	5.050E+01	NOT IDENT.
PR-144	3.750E+03	NOT IDENT.
PM-146	8.598E+01	NOT IDENT.
ND-147	4.182E+02	NOT IDENT.
PM-149	2.304E+03	NOT IDENT.
EU-152	1.720E+02	FAIL ABUN
GD-153	1.571E+02	NOT IDENT.
EU-154	1.048E+02	FAIL ABUN
EU-155	2.009E+02	FAIL ABUN
HO-166M	1.005E+02	NOT IDENT.
TM-171	8.427E+04	NOT IDENT.
LU-176	4.520E+01	FAIL ABUN
LU-177	4.574E+02	NOT IDENT.
HF-181	6.494E+01	FAIL ABUN
W-181	8.956E+02	FAIL ABUN
TA-182	1.652E+02	NOT IDENT.
RE-183	1.017E+03	FAIL ABUN
RE-184	2.086E+02	NOT IDENT.
RE-188	2.404E+02	NOT IDENT.
W-188	1.092E+04	NOT IDENT.
OS-191	1.548E+02	NOT IDENT.
IR-192	5.269E+01	NOT IDENT.
HG-203	5.476E+01	NOT IDENT.
BI-207	9.854E+01	NOT IDENT.
TL-208	5.897E+01	NOT IDENT.
BI-211	3.605E+02	NOT IDENT.
PB-211	1.286E+03	NOT IDENT.
BI-212	8.628E+02	NOT IDENT.
PB-212	9.976E+01	NOT IDENT.
BI-213	2.032E+02	NOT IDENT.
BI-214	1.119E+02	NOT IDENT.

PB-214	1.287E+02	FAIL ABUN
RN-219	7.478E+02	NOT IDENT.
FR-221	3.666E+02	NOT IDENT.
RA-223	1.082E+03	NOT IDENT.
RA-224	1.040E+03	NOT IDENT.
RA-226	1.103E+03	NOT IDENT.
AC-227	4.612E+02	NOT IDENT.
TH-227	4.612E+02	NOT IDENT.
AC-228	3.037E+02	NOT IDENT.
RA-228	3.037E+02	NOT IDENT.
TH-228	9.976E+01	NOT IDENT.
TH-229	9.140E+02	FAIL ABUN
TH-230	2.636E+04	NOT IDENT.
PA-231	8.019E+02	NOT IDENT.
TH-231	9.749E+02	NOT IDENT.
TH-232	4.411E+04	NOT IDENT.
PA-233	1.194E+02	NOT IDENT.
PA-234	6.767E+02	FAIL ABUN
PA-234M	9.045E+03	NOT IDENT.
TH-234	3.186E+03	NOT IDENT.
U-234	3.015E+05	FAIL ABUN
U-235	3.367E+02	NOT IDENT.
NP-237	1.194E+02	NOT IDENT.
NP-238	4.894E+02	NOT IDENT.
U-238	3.186E+03	NOT IDENT.
NP-239	5.151E+02	NOT IDENT.
AM-242	1.221E+03	FAIL ABUN
AM-243	1.195E+02	NOT IDENT.
CM-243	2.051E+02	NOT IDENT.
BK-247	1.416E+02	NOT IDENT.
CM-247	6.656E+01	NOT IDENT.
CF-249	7.568E+01	NOT IDENT.
CF-251	2.181E+02	NOT IDENT.
CF-252	3.393E+05	NOT IDENT.
ANH-511	5.055E+01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561782.CNF;1
Acquisition date : 22-JUN-2016 13:48:41 Sensitivity : 3.000
Detector ID : GAM09 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:04.08 Half life ratio : *****
Sample date : 21-JUN-2016 00:00:00 Nuclide Library : LIQUID
Sample ID : G1203561782 Analyst initials: MXR1
Batch Number : 1572406 Sample Quantity : 2.0000E+00 LITER
Quantity Err(%) : 5.0000E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 7-JUN-2016 07:31:34 Eff. Geometry : 2LMB
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM09_2LMB.CNF;16

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	2.163E+02	9.173E+01	9.173E+01
CO-60	1.387E+04	6.236E+02	6.236E+02
ZN-65	6.855E+02	3.213E+02	3.213E+02
CD-109	5.315E+04	5.686E+03	5.686E+03
SN-113	4.149E+01	8.912E+01	8.912E+01
SN-126	5.303E+03	4.928E+02	4.928E+02
BA-137M	1.348E+04	6.586E+02	6.586E+02
CS-137	1.424E+04	6.944E+02	6.944E+02
PM-147	6.478E+06	2.747E+06	2.747E+06
PB-210	4.158E+05	5.410E+04	5.410E+04
PO-210	4.158E+05	5.410E+04	5.410E+04
AM-241	3.610E+04	2.948E+03	2.948E+03

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	1.211E+02	6.317E+02	6.340E+02	NOT IDENT.
NA-22	1.791E+01	4.314E+01	4.389E+01	NOT IDENT.
NA-24	1.259E+02	1.721E+02	1.812E+02	NOT IDENT.
AL-26	1.138E+01	2.699E+01	2.748E+01	NOT IDENT.
K-40	8.533E+01	2.591E+02	2.620E+02	NOT IDENT.
SC-46	-3.836E+00	9.011E+01	9.012E+01	NOT IDENT.
V-48	-2.838E+01	9.572E+01	9.657E+01	NOT IDENT.
CR-51	-1.355E+02	5.109E+02	5.145E+02	NOT IDENT.
MN-52	1.813E+01	2.950E+01	3.061E+01	FAIL ABUN
MN-54	2.256E+00	7.378E+01	7.379E+01	NOT IDENT.
CO-56	1.137E+01	7.862E+01	7.879E+01	NOT IDENT.
CO-58	-4.128E+01	7.505E+01	7.733E+01	NOT IDENT.
FE-59	8.026E+01	1.678E+02	1.716E+02	NOT IDENT.
CU-67	-5.230E+00	1.462E+02	1.462E+02	NOT IDENT.
GE-68	-1.502E+03	2.835E+03	2.914E+03	NOT IDENT.
AS-74	3.946E+01	1.055E+02	1.070E+02	NOT IDENT.
SE-75	-4.855E+01	9.057E+01	9.317E+01	FAIL ABUN
BR-77	1.342E+02	3.614E+02	3.664E+02	NOT IDENT.

SR-82	-7.311E+01	4.536E+02	4.548E+02	NOT IDENT.
RB-83	2.881E+01	1.374E+02	1.380E+02	NOT IDENT.
RB-84	-3.135E+01	1.467E+02	1.474E+02	NOT IDENT.
KR-85	-9.886E+03	1.425E+04	1.493E+04	NOT IDENT.
SR-85	-4.502E+01	6.488E+01	6.798E+01	NOT IDENT.
RB-86	-4.325E+02	1.107E+03	1.124E+03	NOT IDENT.
Y-88	1.240E+01	2.504E+01	2.566E+01	NOT IDENT.
Y-91	2.282E+03	2.273E+04	2.276E+04	NOT IDENT.
NB-94	1.830E+00	6.289E+01	6.289E+01	NOT IDENT.
NB-95	-3.971E+01	6.867E+01	7.097E+01	NOT IDENT.
NB-95M	-3.368E+01	2.182E+02	2.188E+02	NOT IDENT.
ZR-95	-1.410E+01	1.208E+02	1.210E+02	NOT IDENT.
MO-99	-9.635E+01	8.876E+02	8.887E+02	NOT IDENT.
TC-99M	1.062E+03	3.867E+03	3.896E+03	NOT IDENT.
RH-101	-6.950E+00	6.893E+01	6.900E+01	NOT IDENT.
RH-102M	3.281E+01	7.035E+01	7.189E+01	NOT IDENT.
RU-103	-7.084E+01	6.923E+01	7.624E+01	NOT IDENT.
RH-106	-2.538E+02	6.317E+02	6.420E+02	NOT IDENT.
RU-106	-2.538E+02	6.317E+02	6.420E+02	NOT IDENT.
AG-108M	-1.945E+01	6.946E+01	7.001E+01	NOT IDENT.
AG-110M	-1.210E+01	1.186E+02	1.187E+02	NOT IDENT.
IN-114M	2.341E+01	3.126E+02	3.127E+02	NOT IDENT.
CD-115	1.187E+02	3.617E+02	3.656E+02	NOT IDENT.
SN-117M	-3.126E+01	5.404E+01	5.585E+01	NOT IDENT.
I-123	-1.570E+02	3.752E+02	3.818E+02	NOT IDENT.
TE-123M	-2.094E+01	5.139E+01	5.225E+01	NOT IDENT.
SB-124	3.991E+01	5.721E+01	5.997E+01	NOT IDENT.
SB-125	3.380E+01	2.068E+02	2.074E+02	NOT IDENT.
TE-125M	7.000E+03	1.809E+04	1.837E+04	NOT IDENT.
I-126	6.207E+01	2.433E+02	2.449E+02	NOT IDENT.
SB-126	-1.763E+01	1.245E+02	1.247E+02	NOT IDENT.
SB-127	6.862E-01	2.161E+02	2.161E+02	NOT IDENT.
TE-129	-9.463E+01	9.096E+02	9.106E+02	NOT IDENT.
I-131	-3.035E+00	7.538E+01	7.540E+01	NOT IDENT.
I-132	4.889E+06	6.675E+06	7.030E+06	SHORT HLIF
TE-132	-2.634E+01	8.686E+01	8.767E+01	NOT IDENT.
BA-133	5.970E+01	8.585E+01	8.997E+01	NOT IDENT.
I-133	-3.101E+01	2.484E+02	2.488E+02	FAIL ABUN
CS-134	-9.588E+00	7.915E+01	7.927E+01	NOT IDENT.
CS-135	1.117E+02	3.320E+02	3.358E+02	NOT IDENT.
I-135	-3.331E+03	8.190E+03	8.327E+03	NOT IDENT.
CS-136	3.808E+01	1.144E+02	1.157E+02	NOT IDENT.
CE-139	3.260E+01	5.680E+01	5.867E+01	NOT IDENT.
BA-140	-2.236E+02	2.658E+02	2.843E+02	NOT IDENT.
LA-140	9.359E+00	3.257E+01	3.285E+01	NOT IDENT.
CE-141	2.436E+01	9.347E+01	9.412E+01	NOT IDENT.
CE-143	-5.328E+01	2.802E+02	2.812E+02	FAIL ABUN
CE-144	-2.694E+02	4.081E+02	4.258E+02	NOT IDENT.
PM-144	-1.297E+01	6.257E+01	6.285E+01	NOT IDENT.
PR-144	-9.952E+02	4.648E+03	4.670E+03	NOT IDENT.
PM-146	-2.398E+01	1.027E+02	1.032E+02	NOT IDENT.
ND-147	-2.974E+02	5.138E+02	5.310E+02	NOT IDENT.
PM-149	1.593E+02	2.840E+03	2.840E+03	NOT IDENT.
EU-152	4.180E+01	1.988E+02	1.996E+02	FAIL ABUN
GD-153	-1.940E+01	1.827E+02	1.829E+02	NOT IDENT.
EU-154	4.719E+01	1.227E+02	1.245E+02	FAIL ABUN
EU-155	5.229E+01	2.325E+02	2.337E+02	FAIL ABUN
HO-166M	5.275E+01	1.209E+02	1.232E+02	NOT IDENT.
TM-171	-7.940E+03	1.055E+05	1.055E+05	NOT IDENT.
LU-176	-2.738E+01	5.297E+01	5.438E+01	FAIL ABUN
LU-177	-5.696E+02	5.690E+02	6.243E+02	NOT IDENT.
HF-181	-5.793E+01	7.944E+01	8.362E+01	FAIL ABUN
W-181	3.505E+03	1.589E+03	2.241E+03	FAIL ABUN
TA-182	3.976E+01	1.973E+02	1.981E+02	NOT IDENT.
RE-183	3.292E+03	1.279E+03	1.959E+03	FAIL ABUN
RE-184	1.980E+02	2.400E+02	2.560E+02	NOT IDENT.
RE-188	1.988E+01	2.850E+02	2.852E+02	NOT IDENT.
W-188	-1.883E+03	1.356E+04	1.358E+04	NOT IDENT.
OS-191	1.011E+02	1.796E+02	1.853E+02	NOT IDENT.
IR-192	-1.296E+01	6.132E+01	6.160E+01	NOT IDENT.
HG-203	4.493E+01	6.607E+01	6.910E+01	NOT IDENT.
BI-207	2.727E+01	1.170E+02	1.177E+02	NOT IDENT.
TL-208	-3.663E+01	7.279E+01	7.463E+01	NOT IDENT.
BI-211	2.634E+02	4.118E+02	4.286E+02	NOT IDENT.
PB-211	-2.894E+02	1.521E+03	1.527E+03	NOT IDENT.
BI-212	7.542E+02	9.737E+02	1.031E+03	NOT IDENT.
PB-212	3.303E+01	1.207E+02	1.216E+02	NOT IDENT.
BI-213	-1.951E+02	2.467E+02	2.619E+02	NOT IDENT.

BI-214	-2.847E+01	1.369E+02	1.375E+02	NOT IDENT.
PB-214	7.216E+01	1.476E+02	1.511E+02	FAIL ABUN
RN-219	-8.147E+00	8.790E+02	8.790E+02	NOT IDENT.
FR-221	-2.369E+02	4.512E+02	4.637E+02	NOT IDENT.
RA-223	8.969E+01	1.416E+03	1.416E+03	NOT IDENT.
RA-224	2.610E+02	1.325E+03	1.330E+03	NOT IDENT.
RA-226	-1.743E+02	1.325E+03	1.328E+03	NOT IDENT.
AC-227	1.094E+02	5.620E+02	5.642E+02	NOT IDENT.
TH-227	1.094E+02	5.620E+02	5.642E+02	NOT IDENT.
AC-228	3.627E+02	3.465E+02	3.832E+02	NOT IDENT.
RA-228	3.627E+02	3.465E+02	3.832E+02	NOT IDENT.
TH-228	3.303E+01	1.207E+02	1.216E+02	NOT IDENT.
TH-229	-2.929E+02	1.108E+03	1.115E+03	FAIL ABUN
TH-230	2.392E+03	3.002E+04	3.004E+04	NOT IDENT.
PA-231	-4.874E+02	1.016E+03	1.039E+03	NOT IDENT.
TH-231	6.376E+02	1.231E+03	1.265E+03	NOT IDENT.
TH-232	-4.007E+04	6.210E+04	6.467E+04	NOT IDENT.
PA-233	8.230E+01	1.358E+02	1.407E+02	NOT IDENT.
PA-234	9.190E+01	8.073E+02	8.084E+02	FAIL ABUN
PA-234M	-1.949E+01	1.079E+04	1.079E+04	NOT IDENT.
TH-234	-2.658E+03	4.500E+03	4.657E+03	NOT IDENT.
U-234	-3.003E+05	3.847E+05	4.078E+05	FAIL ABUN
U-235	5.146E+01	3.967E+02	3.973E+02	NOT IDENT.
NP-237	8.230E+01	1.358E+02	1.407E+02	NOT IDENT.
NP-238	-3.465E+02	5.977E+02	6.178E+02	NOT IDENT.
U-238	-2.658E+03	4.500E+03	4.657E+03	NOT IDENT.
NP-239	5.603E+02	5.901E+02	6.418E+02	NOT IDENT.
AM-242	-4.507E+02	1.430E+03	1.444E+03	FAIL ABUN
AM-243	1.413E+02	1.343E+02	1.486E+02	NOT IDENT.
CM-243	-2.007E+01	2.389E+02	2.391E+02	NOT IDENT.
BK-247	-8.587E+01	1.774E+02	1.816E+02	NOT IDENT.
CM-247	-5.205E+01	8.038E+01	8.374E+01	NOT IDENT.
CF-249	6.124E+01	8.699E+01	9.126E+01	NOT IDENT.
CF-251	1.244E+02	2.581E+02	2.641E+02	NOT IDENT.
CF-252	-2.424E+04	3.951E+05	3.953E+05	NOT IDENT.
ANH-511	-3.291E+01	6.091E+01	6.269E+01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1002.7083	88.03	845.7542	136.47	768.3909
46.54	1031.5784	88.34	846.3284	140.51	702.8654
49.72	1110.9899	88.47	846.5690	140.88	720.6613
51.35	1161.3877	89.96	712.8946	143.76	701.5904
52.39	1172.3733	91.11	735.8329	144.24	705.0259
53.20	1253.4349	91.27	713.5771	145.44	702.4341
56.28	1269.6160	92.59	760.4572	152.32	751.0599
57.36	1379.1338	93.31	698.4979	152.43	755.1172
57.53	1379.8190	93.35	698.5580	153.25	730.4364
57.53	1379.8276	94.56	696.7746	154.21	715.6976
57.98	1014.2825	94.65	719.1289	155.04	702.7581
59.32	1018.2148	94.67	719.1577	156.02	652.3663
59.54	1018.8591	97.43	726.8404	158.56	696.4442
61.49	684.6370	98.43	725.6332	158.97	679.9760
63.00	677.6218	98.44	725.6456	159.00	680.0038
63.29	702.9115	99.53	730.8375	162.33	719.1591
63.58	703.4705	100.11	726.2950	162.66	730.4661
63.81	712.1755	100.20	726.4266	163.33	718.1735
64.28	679.9986	102.03	711.9332	165.86	691.6635
64.99	711.1433	103.18	720.7773	176.31	657.8729
65.08	711.3168	103.37	732.8101	176.60	637.7791
66.73	729.4475	105.31	717.4202	177.52	656.8956
66.98	729.9287	106.12	732.1844	181.07	656.9032
67.24	735.4352	106.47	734.4961	184.41	707.0364
67.67	755.4647	109.28	718.2977	184.58	707.1904
67.75	755.6212	111.00	754.5829	185.72	719.5568
69.67	765.2788	111.76	742.7791	186.21	737.5156
70.83	798.6866	112.95	760.9982	190.27	719.5892
72.81	841.5910	116.24	743.3251	193.51	758.9092
72.87	841.7175	116.30	726.7217	198.01	754.7715
74.66	783.4243	116.74	718.0192	201.83	708.9272
74.82	763.3284	117.23	717.5388	205.31	736.1506
74.97	763.6115	119.76	798.8389	208.37	759.9936
77.11	866.7336	120.54	790.1301	210.85	733.5479
79.69	836.7955	120.90	712.1271	218.12	746.1496
80.12	847.9724	121.12	712.4023	222.11	760.2782
80.19	848.1076	121.22	712.5263	227.09	775.3278
80.57	860.0623	121.78	741.3036	227.38	775.5757
81.00	902.3325	122.06	741.6661	228.16	777.3257
81.07	902.4761	123.07	761.2601	228.18	777.3439
83.79	817.8345	123.68	745.1614	235.69	711.6791
84.00	818.2226	127.23	735.7994	235.96	688.9559
84.21	889.0008	129.43	703.6315	238.63	666.8372
85.43	930.6541	131.20	785.5923	238.98	664.8942
86.55	980.1521	133.02	742.1644	240.99	638.8715
86.94	843.7271	133.52	781.9091	242.00	667.5739
87.09	844.0068	136.00	778.3566	244.70	627.0438
87.57	844.9001	136.28	778.7036	250.62	632.0074

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
252.40	653.1559	364.49	437.7811	621.93	267.2766
252.80	591.1913	366.42	452.2436	630.19	0.0000
256.23	627.8197	383.85	503.0096	631.29	262.0288
260.90	641.9670	388.16	431.5826	632.98	262.2504
264.66	611.7565	388.63	431.3359	633.25	243.8622
265.00	611.9557	391.70	443.0258	634.78	241.8782
268.22	577.7813	400.66	441.1759	635.95	263.7197
269.46	586.3881	401.81	439.6484	636.99	267.1106
271.23	600.9725	402.40	450.2375	645.85	243.1917
273.65	535.4461	404.85	432.0714	657.76	263.2471
276.40	592.5909	410.95	425.3648	661.66	265.9356
277.37	552.1473	414.70	415.9883	664.57	237.6936
277.60	531.7788	423.72	455.0649	666.33	239.6535
278.00	525.1435	427.09	429.1634	666.50	232.6242
278.43	503.7066	427.87	443.8363	667.71	0.0000
279.20	523.4628	433.94	465.9593	677.62	213.6971
279.54	541.8839	440.45	486.4370	685.70	203.3898
280.46	558.3327	453.88	486.8152	695.00	213.1963
283.69	556.5981	459.60	489.5956	696.49	217.8099
284.31	536.2881	463.37	497.6719	696.51	217.8099
285.41	546.0171	468.07	484.3326	697.00	212.2714
285.90	545.1212	473.00	455.0989	697.49	224.6160
287.50	520.6385	475.06	433.8460	702.65	215.0625
290.67	538.2966	476.78	422.3866	706.68	251.3643
293.27	541.8900	477.60	410.6683	711.68	220.4402
295.22	487.2951	477.99	415.7421	720.70	224.0477
295.96	524.6844	482.18	400.8652	721.93	227.7844
299.98	504.4968	487.02	368.0562	722.78	240.5300
300.09	511.5251	492.35	352.1944	722.91	224.2656
300.13	511.5430	497.08	377.3575	723.31	224.3080
301.36	528.4012	511.00	336.8683	724.19	246.1082
302.85	474.3200	514.00	350.6749	727.33	226.5198
304.50	473.5566	520.40	319.3425	733.00	245.2544
304.85	507.8540	520.69	322.4515	735.93	211.9128
306.78	501.7045	522.65	0.0000	739.50	226.2162
308.46	520.8928	527.90	307.4066	744.23	203.8625
311.90	506.5994	529.59	330.2642	747.24	234.5906
316.51	477.6581	529.87	319.0388	752.31	204.5714
319.41	474.4109	531.02	327.4598	753.82	229.1504
320.08	447.1754	537.26	313.1660	756.73	230.3550
321.04	441.3287	546.56	282.7060	763.94	233.8214
323.87	451.4619	552.55	276.3744	765.80	256.1183
325.23	467.6642	563.25	263.3741	766.42	246.9709
328.76	429.0088	569.33	278.9233	766.84	256.2337
333.37	438.7241	569.50	278.9477	772.60	0.0000
334.37	444.4773	569.70	282.1266	776.52	228.5896
338.28	441.3933	583.19	289.4526	777.92	216.6842
338.32	441.4082	595.83	233.9514	778.90	204.7325
340.48	462.9415	600.60	272.9141	783.70	248.7702
340.55	481.0224	602.73	242.2613	785.37	234.0782
344.28	457.1246	604.72	257.4673	792.07	257.0857
345.93	423.2900	609.32	268.7863	795.86	233.2275
351.06	435.0328	610.33	258.2101	801.95	249.7128
351.93	427.1352	614.28	252.2836	802.10	249.7258
356.01	425.7682	618.01	258.1421	810.29	274.0209

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
810.45	274.0352	1120.55	183.1775		
810.76	277.8252	1121.30	193.6899		
815.77	284.0319	1129.67	181.5909		
818.51	297.5229	1131.51	172.2400		
832.01	302.9141	1173.23	151.0206		
834.85	253.0307	1189.05	103.6451		
836.80	257.0200	1204.77	86.9484		
846.77	272.3075	1221.41	69.0281		
856.80	275.2805	1231.02	68.1372		
860.56	285.2535	1235.36	50.8968		
871.09	314.4118	1238.28	44.4354		
873.19	306.1938	1260.41	49.0759		
875.33	296.8160	1274.44	40.5085		
880.51	294.1805	1274.54	40.5085		
881.60	315.2142	1291.59	42.1667		
883.24	342.7622	1298.22	36.7334		
884.68	318.8013	1312.11	36.3450		
889.28	337.7359	1332.49	27.8052		
894.76	320.0017	1365.19	26.1759		
898.04	337.8727	1368.63	15.9064		
903.28	304.4796	1384.29	18.7899		
911.20	299.5124	1408.01	19.8490		
923.98	357.7642	1434.09	9.5146		
926.36	350.2278	1457.56	14.3549		
935.54	348.4342	1460.82	13.4087		
937.49	342.7664	1489.16	11.5732		
944.13	358.3916	1596.21	12.8566		
946.00	353.6911	1620.50	8.9498		
949.00	385.7153	1678.03	11.0792		
954.55	0.0000	1690.97	8.0801		
964.08	323.1433	1764.49	18.4673		
968.97	328.6787	1770.23	6.1631		
983.53	297.3045	1771.35	5.1371		
984.45	306.4109	1791.20	10.3166		
996.26	290.5593	1808.65	8.2829		
1001.03	290.0250	1836.06	6.2471		
1004.73	268.2080				
1025.87	261.9934				
1028.54	266.2856				
1037.84	255.8901				
1038.76	245.7776				
1046.59	231.0651				
1048.07	226.0610				
1050.41	250.8020				
1063.66	239.5531				
1077.00	264.3250				
1077.34	271.5783				
1083.85	240.0656				
1085.87	283.7131				
1099.25	249.5508				
1111.64	243.5645				
1112.07	243.5986				
1112.84	248.8768				
1115.54	212.5072				
1120.29	197.1155				

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561783.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;135
Sample date       : 21-JUN-2016 00:00:00 Background date   : 20-JUN-2016 14:17:28
Sample ID        : G1203561783 Acquisition date      : 22-JUN-2016 14:06:47
Detector name    : GAM43 Sample quantity           : 2.000000E+00 LITER
Elapsed live time: 0 00:15:00.00 Detector geometry  : 2LMB
Energy tolerance : 1.50000 keV Elapsed real time   : 0 00:15:03.53 0.4%
Abundance limit  : 75.00000 Analyst Initials       : MXR1
Batch ID         : 1572406 Sensitivity        : 3.000000
Matrix Spike ID  : LCS ID                          : 1604
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Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.30*	964	2030	1.00	92.38	87	11	1.07E+00	9.6	6.45E-01
2	0	59.39	3970	1737	0.94	118.57	113	10	4.41E+00	2.5	
3	3	85.78	62	896	0.98	171.37	168	12	6.88E-02	76.0	
4	3	87.95	1892	808	0.97	175.71	168	12	2.10E+00	3.3	
5	0	121.94	298	982	1.09	243.70	240	8	3.31E-01	19.2	
6	0	136.39	71	706	1.32	272.60	271	6	7.88E-02	60.2	
7	0	153.32	61	1138	1.72	306.47	300	11	6.82E-02	107.6	
8	0	512.14	21	339	1.28	1024.31	1021	9	2.39E-02	155.7	
9	0	570.29	31	328	2.93	1140.64	1138	12	3.45E-02	117.3	
10	0	594.35	25	224	0.88	1188.76	1186	8	2.78E-02	105.6	
11	0	636.29	80	340	3.86	1272.66	1265	16	8.92E-02	52.6	
12	0	654.09	18	196	0.97	1308.27	1304	8	1.95E-02	140.0	
13	0	661.13	6856	381	1.58	1322.34	1314	15	7.62E+00	1.4	
14	0	1035.09	70	282	6.11	2070.37	2063	15	7.83E-02	53.5	
15	0	1114.37	144	235	1.71	2228.95	2223	12	1.60E-01	22.9	
16	0	1172.27	5079	158	2.05	2344.77	2337	15	5.64E+00	1.5	
17	0	1226.63	14	113	6.59	2453.48	2432	24	1.51E-02	209.7	
18	0	1315.91	19	14	3.25	2632.05	2627	10	2.06E-02	45.3	
19	0	1331.39	4661	28	2.28	2663.02	2651	20	5.18E+00	1.5	
20	0	1406.88*	10	6	0.61	2814.01	2806	11	1.12E-02	55.2	
21	0	1431.50	11	7	2.92	2863.24	2856	13	1.17E-02	58.8	
22	0	1444.68*	9	2	0.96	2889.60	2886	8	9.80E-03	44.7	
23	0	1577.05*	11	8	1.06	3154.35	3144	15	1.23E-02	62.2	
24	0	1711.13	8	0	1.35	3422.50	3419	8	8.89E-03	35.4	

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Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561783.CNF;1
Analyses by : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title : MXR1
Sample date : 21-JUN-2016 00:00:00 Acquisition date : 22-JUN-2016 14:06:47
Sample ID : G1203561783 Sample quantity : 2.0000 LITER
Sample type : LIQUID Sample geometry :
Detector name : GAMMA43 Detector geometry: 2LMB
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:03.53 0.4%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type : Empirical Efficiencies at : Peak Energy
Abundance limit : 75.00

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
CO-57	122.06	PM-147	121.22

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error	Status
CO-57	122.06	85.60*	2.040E+00	2.558E+02	2.568E+02	38.36	OK
	136.47	10.68	2.098E+00	4.751E+02	4.771E+02	120.36	OK
CO-60	1173.23	99.85	5.602E-01	1.363E+04	1.364E+04	3.01	OK
	1332.49	99.98*	5.047E-01	1.387E+04	1.388E+04	2.98	OK
ZN-65	1115.54	50.60*	5.840E-01	7.326E+02	7.360E+02	45.79	OK
AS-74	595.83	59.00*	9.479E-01	6.712E+01	7.142E+01	211.21	OK
	634.78	15.40	9.043E-01	----- Line	Not Found	-----	Absent
CD-109	88.03	3.70*	1.453E+00	5.284E+04	5.297E+04	6.65	OK
SN-126	64.28	9.60	5.876E-01	----- Line	Not Found	-----	Absent
	86.94	8.90	1.453E+00	2.197E+04	2.197E+04	6.65	OK
	87.57	37.00*	1.453E+00	5.284E+03	5.284E+03	6.65	OK
BA-137M	661.66	89.90*	8.780E-01	1.304E+04	1.304E+04	2.71	OK
CS-137	661.66	85.10*	8.780E-01	1.378E+04	1.378E+04	2.71	OK
PB-210	46.54	4.25*	8.359E-02	4.076E+05	4.077E+05	19.21	OK
PO-210	46.54	4.25*	8.359E-02	4.076E+05	4.077E+05	19.21	OK
TH-229	85.43	14.70	1.386E+00	4.562E+02	4.562E+02	151.95	OK
	88.47	24.00	1.453E+00	8.147E+03	8.147E+03	6.65	OK
	193.51	4.41*	1.945E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	1.865E+00	----- Line	Not Found	-----	Absent
AM-241	59.54	35.90*	4.106E-01	4.044E+04	4.045E+04	5.05	OK
ANH-511	511.00	100.00*	1.052E+00	3.068E+01	3.068E+01	311.31	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561783.CNF;1
Acquisition date : 22-JUN-2016 14:06:47 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:03.53 Half life ratio : *****
Sample date : 21-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561783 Sample Quantity : 2.0000E+00 LITER
Batch Number : 1572406 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : LIQUID.NLB;9

CALIBRATION INFORMATION

Eff. Cal. date : 11-SEP-2015 12:21:16 Eff. Geometry : 2LMB
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_2LMB.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Cnt uncert (1.96-sigma)	MDA (pCi/LITER)
CO-57	2.568E+02	9.654E+01	1.257E+02
CO-60	1.388E+04	4.049E+02	8.195E+01
ZN-65	7.360E+02	3.303E+02	3.812E+02
AS-74	7.142E+01	1.478E+02	2.434E+02
CD-109	5.297E+04	3.454E+03	4.195E+03
SN-126	5.284E+03	3.446E+02	4.224E+02
BA-137M	1.304E+04	3.470E+02	1.444E+02
CS-137	1.378E+04	3.665E+02	1.525E+02
PB-210	4.077E+05	7.673E+04	6.679E+04
PO-210	4.077E+05	7.673E+04	6.679E+04
TH-229	-6.213E+02	1.439E+03	2.427E+03
AM-241	4.045E+04	2.000E+03	1.617E+03
ANH-511	3.068E+01	9.359E+01	1.378E+02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/LITER)	
BE-7	-2.105E+02	8.282E+02	1.405E+03	NOT IDENT.
NA-22	3.780E+01	5.696E+01	1.097E+02	NOT IDENT.
NA-24	-1.758E+02	2.148E+02	3.548E+02	NOT IDENT.
AL-26	3.696E+00	3.338E+01	6.759E+01	NOT IDENT.
K-40	7.908E+01	3.442E+02	6.847E+02	NOT IDENT.
SC-46	6.426E+00	1.131E+02	1.944E+02	NOT IDENT.
V-48	-4.811E+01	1.247E+02	2.091E+02	NOT IDENT.
CR-51	5.677E+02	7.049E+02	1.262E+03	NOT IDENT.
MN-52	-1.662E+01	5.453E+01	8.139E+01	NOT IDENT.
MN-54	-2.311E+00	1.016E+02	1.753E+02	NOT IDENT.
CO-56	-1.003E+02	1.030E+02	1.708E+02	NOT IDENT.
CO-58	4.883E+01	9.870E+01	1.741E+02	NOT IDENT.
FE-59	4.453E+01	2.225E+02	3.932E+02	NOT IDENT.
CU-67	-4.840E+01	1.914E+02	3.256E+02	NOT IDENT.
GE-68	-9.021E+02	3.712E+03	6.468E+03	NOT IDENT.
SE-75	3.870E+01	1.168E+02	1.975E+02	FAIL ABUN
BR-77	1.720E+02	4.835E+02	8.212E+02	NOT IDENT.

SR-82	-1.105E+02	6.118E+02	1.057E+03	NOT IDENT.
RB-83	4.804E+01	1.786E+02	3.074E+02	NOT IDENT.
RB-84	5.150E+01	1.641E+02	2.850E+02	NOT IDENT.
KR-85	4.552E+03	2.206E+04	3.280E+04	NOT IDENT.
SR-85	2.073E+01	1.005E+02	1.494E+02	NOT IDENT.
RB-86	-3.551E+02	1.461E+03	2.547E+03	NOT IDENT.
Y-88	8.223E+00	2.822E+01	6.127E+01	NOT IDENT.
Y-91	-3.873E+03	2.879E+04	5.098E+04	NOT IDENT.
NB-94	3.178E+01	7.838E+01	1.399E+02	NOT IDENT.
NB-95	1.730E+01	8.970E+01	1.574E+02	NOT IDENT.
NB-95M	-5.460E+01	2.900E+02	4.860E+02	NOT IDENT.
ZR-95	-1.255E+02	1.605E+02	2.710E+02	NOT IDENT.
MO-99	-5.657E+02	1.015E+03	1.734E+03	NOT IDENT.
TC-99M	-2.061E+02	6.040E+03	9.201E+03	NOT IDENT.
RH-101	8.797E+00	9.040E+01	1.526E+02	NOT IDENT.
RH-102M	-1.737E+00	9.007E+01	1.539E+02	NOT IDENT.
RU-103	-6.495E+01	8.866E+01	1.477E+02	NOT IDENT.
RH-106	-7.543E+02	7.812E+02	1.331E+03	NOT IDENT.
RU-106	-7.543E+02	7.812E+02	1.331E+03	NOT IDENT.
AG-108M	-1.371E+01	9.069E+01	1.553E+02	NOT IDENT.
AG-110M	2.034E+01	1.526E+02	2.632E+02	NOT IDENT.
SN-113	1.148E+01	1.149E+02	1.997E+02	NOT IDENT.
IN-114M	-2.068E+02	4.195E+02	7.069E+02	NOT IDENT.
CD-115	-2.375E+02	4.497E+02	7.517E+02	NOT IDENT.
SN-117M	4.206E+00	7.841E+01	1.254E+02	NOT IDENT.
I-123	7.093E+01	5.291E+02	8.842E+02	NOT IDENT.
TE-123M	9.616E+00	7.133E+01	1.192E+02	NOT IDENT.
SB-124	1.811E+01	7.231E+01	1.489E+02	NOT IDENT.
SB-125	-1.785E+02	2.634E+02	4.448E+02	FAIL ABUN
TE-125M	-7.467E+03	2.362E+04	4.116E+04	NOT IDENT.
I-126	-2.038E+02	2.914E+02	4.239E+02	NOT IDENT.
SB-126	-6.732E+01	1.630E+02	2.808E+02	NOT IDENT.
SB-127	-4.529E+01	2.801E+02	4.895E+02	NOT IDENT.
TE-129	-9.380E+01	1.127E+03	1.927E+03	NOT IDENT.
I-131	-2.055E+01	9.966E+01	1.725E+02	FAIL ABUN
I-132	0.000E+00	8.849E+06	0.000E+00	SHORT HLIF
TE-132	6.814E+01	1.121E+02	1.917E+02	NOT IDENT.
BA-133	6.481E+01	1.123E+02	1.989E+02	NOT IDENT.
I-133	1.161E+02	3.025E+02	5.241E+02	NOT IDENT.
CS-134	-2.771E+01	1.055E+02	1.814E+02	FAIL ABUN
CS-135	5.390E+01	4.257E+02	7.152E+02	NOT IDENT.
I-135	-2.515E+02	1.075E+04	1.951E+04	NOT IDENT.
CS-136	-3.624E+01	1.554E+02	2.716E+02	FAIL ABUN
CE-139	3.238E+01	7.338E+01	1.274E+02	NOT IDENT.
BA-140	-4.364E+02	3.381E+02	5.469E+02	NOT IDENT.
LA-140	-2.367E+01	3.999E+01	7.103E+01	NOT IDENT.
CE-141	1.588E+01	1.216E+02	2.112E+02	NOT IDENT.
CE-143	-2.492E+02	3.384E+02	5.852E+02	NOT IDENT.
CE-144	3.529E+02	5.987E+02	9.322E+02	NOT IDENT.
PM-144	5.282E+00	7.807E+01	1.376E+02	NOT IDENT.
PR-144	3.605E+02	5.800E+03	1.022E+04	NOT IDENT.
PM-146	-2.975E+01	1.301E+02	2.216E+02	NOT IDENT.
ND-147	-1.310E+02	6.329E+02	1.071E+03	NOT IDENT.
PM-147	0.000E+00	2.891E+06	4.245E+06	FAIL ABUN
PM-149	1.358E+03	3.726E+03	6.278E+03	NOT IDENT.
EU-152	-9.030E+01	2.592E+02	4.484E+02	FAIL ABUN
GD-153	-4.630E+01	2.429E+02	4.268E+02	NOT IDENT.
EU-154	9.962E+01	1.617E+02	3.105E+02	FAIL ABUN
EU-155	8.389E+01	3.069E+02	5.425E+02	FAIL ABUN
HO-166M	5.624E+01	1.506E+02	2.679E+02	NOT IDENT.
TM-171	-1.505E+05	1.623E+05	2.678E+05	NOT IDENT.
LU-176	3.473E+00	7.108E+01	1.251E+02	FAIL ABUN
LU-177	1.319E+02	7.465E+02	1.272E+03	NOT IDENT.
HF-181	-1.722E+01	1.042E+02	1.773E+02	NOT IDENT.
W-181	0.000E+00	1.830E+03	3.103E+03	FAIL ABUN
TA-182	4.780E+01	2.501E+02	4.554E+02	FAIL ABUN
RE-183	0.000E+00	2.127E+03	3.506E+03	FAIL ABUN
RE-184	-3.129E+01	3.284E+02	5.594E+02	NOT IDENT.
RE-188	-2.340E+01	4.228E+02	6.399E+02	NOT IDENT.
W-188	-1.306E+04	1.758E+04	2.865E+04	NOT IDENT.
OS-191	-8.295E+01	2.392E+02	4.132E+02	NOT IDENT.
IR-192	-1.781E+01	8.340E+01	1.455E+02	NOT IDENT.
HG-203	5.699E+01	8.711E+01	1.482E+02	NOT IDENT.
BI-207	-5.455E+01	1.501E+02	2.609E+02	FAIL ABUN
TL-208	1.098E+00	9.100E+01	1.547E+02	NOT IDENT.
BI-211	-2.950E+02	5.400E+02	9.282E+02	NOT IDENT.
PB-211	-4.458E+02	2.023E+03	3.474E+03	NOT IDENT.
BI-212	1.810E+00	1.259E+03	2.203E+03	NOT IDENT.

PB-212	4.034E+01	1.617E+02	2.739E+02	NOT IDENT.
BI-213	-1.035E+02	3.220E+02	5.478E+02	NOT IDENT.
BI-214	-8.362E+01	1.639E+02	2.848E+02	NOT IDENT.
PB-214	-1.469E+02	1.957E+02	3.343E+02	FAIL ABUN
RN-219	9.372E+02	1.133E+03	2.009E+03	NOT IDENT.
FR-221	9.502E+01	6.084E+02	1.032E+03	NOT IDENT.
RA-223	6.011E+02	1.683E+03	2.979E+03	FAIL ABUN
RA-224	-1.138E+03	1.727E+03	2.857E+03	NOT IDENT.
RA-226	-1.284E+02	1.726E+03	2.947E+03	NOT IDENT.
AC-227	-1.151E+02	7.283E+02	1.216E+03	NOT IDENT.
TH-227	-1.151E+02	7.283E+02	1.216E+03	NOT IDENT.
AC-228	1.018E+02	4.662E+02	8.032E+02	NOT IDENT.
RA-228	1.018E+02	4.662E+02	8.032E+02	NOT IDENT.
TH-228	4.034E+01	1.617E+02	2.739E+02	NOT IDENT.
TH-230	-3.342E+04	4.682E+04	7.675E+04	NOT IDENT.
PA-231	-8.102E+02	1.260E+03	2.180E+03	NOT IDENT.
TH-231	8.449E+02	1.792E+03	2.663E+03	NOT IDENT.
TH-232	5.823E+04	9.375E+04	1.427E+05	NOT IDENT.
PA-233	8.678E+01	1.703E+02	3.032E+02	NOT IDENT.
PA-234	-3.932E+02	1.081E+03	1.816E+03	FAIL ABUN
PA-234M	-3.697E+03	1.445E+04	2.432E+04	NOT IDENT.
TH-234	6.748E+03	6.681E+03	1.031E+04	NOT IDENT.
U-234	-8.049E+04	5.836E+05	9.775E+05	FAIL ABUN
U-235	-9.087E+01	5.184E+02	8.946E+02	NOT IDENT.
NP-237	8.678E+01	1.703E+02	3.032E+02	NOT IDENT.
NP-238	2.919E+02	7.653E+02	1.324E+03	NOT IDENT.
U-238	6.748E+03	6.681E+03	1.031E+04	NOT IDENT.
NP-239	-3.784E+02	8.425E+02	1.352E+03	NOT IDENT.
AM-242	1.743E+03	1.909E+03	3.427E+03	FAIL ABUN
AM-243	-1.308E+01	2.011E+02	3.333E+02	NOT IDENT.
CM-243	-6.131E+01	3.153E+02	5.524E+02	NOT IDENT.
BK-247	7.754E+01	2.279E+02	3.853E+02	NOT IDENT.
CM-247	9.682E+00	1.048E+02	1.818E+02	NOT IDENT.
CF-249	2.291E+01	1.123E+02	1.959E+02	NOT IDENT.
CF-251	-3.870E+01	3.401E+02	5.810E+02	NOT IDENT.
CF-252	3.010E+05	5.245E+05	9.350E+05	NOT IDENT.

PEAK REPORT WITHOUT BACKGROUND SUBTRACTION

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.30	966	2030	1.00	92.38	87	11	1.07E+00	9.6	6.45E-01
2	0	59.39	3970	1737	0.94	118.57	113	10	4.41E+00	2.5	
3	3	85.78	62	896	0.98	171.37	168	12	6.88E-02	76.0	
4	3	87.95	1892	808	0.97	175.71	168	12	2.10E+00	3.3	
5	0	121.94	298	982	1.09	243.70	240	8	3.31E-01	19.2	
6	0	136.39	71	706	1.32	272.60	271	6	7.88E-02	60.2	
7	0	153.32	61	1138	1.72	306.47	300	11	6.82E-02	107.6	
8	0	512.14	21	339	1.28	1024.31	1021	9	2.39E-02	155.7	
9	0	570.29	31	328	2.93	1140.64	1138	12	3.45E-02	117.3	
10	0	594.35	25	224	0.88	1188.76	1186	8	2.78E-02	105.6	
11	0	636.29	80	340	3.86	1272.66	1265	16	8.92E-02	52.6	
12	0	654.09	18	196	0.97	1308.27	1304	8	1.95E-02	140.0	
13	0	661.13	6856	381	1.58	1322.34	1314	15	7.62E+00	1.4	
14	0	1035.09	70	282	6.11	2070.37	2063	15	7.83E-02	53.5	
15	0	1114.37	144	235	1.71	2228.95	2223	12	1.60E-01	22.9	
16	0	1172.27	5079	158	2.05	2344.77	2337	15	5.64E+00	1.5	
17	0	1226.63	14	113	6.59	2453.48	2432	24	1.51E-02	209.7	
18	0	1315.91	19	14	3.25	2632.05	2627	10	2.06E-02	45.3	
19	0	1331.39	4661	28	2.28	2663.02	2651	20	5.18E+00	1.5	
20	0	1406.88	10	6	0.61	2814.01	2806	11	1.15E-02	54.1	
21	0	1431.50	11	7	2.92	2863.24	2856	13	1.17E-02	58.8	
22	0	1444.68	9	2	0.96	2889.60	2886	8	1.04E-02	41.4	
23	0	1577.05	12	8	1.06	3154.35	3144	15	1.28E-02	59.7	
24	0	1711.13	8	0	1.35	3422.50	3419	8	8.89E-03	35.4	

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/LITER	Decay Corr pCi/LITER	2-Sigma %Error
CO-57	122.06	298	85.60*	2.040E+00	2.558E+02	2.568E+02	38.36
	136.47	71	10.68	2.098E+00	4.751E+02	4.771E+02	120.36
CO-60	1173.23	5079	99.85	5.602E-01	1.363E+04	1.364E+04	3.01
	1332.49	4661	99.98*	5.047E-01	1.387E+04	1.388E+04	2.98
ZN-65	1115.54	144	50.60*	5.840E-01	7.326E+02	7.360E+02	45.79
AS-74	595.83	25	59.00*	9.479E-01	6.712E+01	7.142E+01	211.21
	634.78	-----	15.40	9.043E-01	-----	Line Not Found	-----
CD-109	88.03	1892	3.70*	1.453E+00	5.284E+04	5.297E+04	6.65
SN-126	64.28	-----	9.60	5.876E-01	-----	Line Not Found	-----
	86.94	1892	8.90	1.453E+00	2.197E+04	2.197E+04	6.65
	87.57	1892	37.00*	1.453E+00	5.284E+03	5.284E+03	6.65
BA-137M	661.66	6856	89.90*	8.780E-01	1.304E+04	1.304E+04	2.71
CS-137	661.66	6856	85.10*	8.780E-01	1.378E+04	1.378E+04	2.71
PM-147	121.22	298	0.00*	2.040E+00	7.683E+06	7.691E+06	38.36
PB-210	46.54	964	4.25*	8.359E-02	4.076E+05	4.077E+05	19.21
PO-210	46.54	964	4.25*	8.359E-02	4.076E+05	4.077E+05	19.21
TH-229	85.43	62	14.70	1.386E+00	4.562E+02	4.562E+02	151.95
	88.47	1892	24.00	1.453E+00	8.147E+03	8.147E+03	6.65
	193.51	-----	4.41*	1.945E+00	-----	Line Not Found	-----
	210.85	-----	2.80	1.865E+00	-----	Line Not Found	-----
AM-241	59.54	3970	35.90*	4.106E-01	4.044E+04	4.045E+04	5.05
ANH-511	511.00	21	100.00*	1.052E+00	3.068E+01	3.068E+01	311.31

Flag: "*" = Keyline

Total number of lines in spectrum 24
Number of unidentified lines 8
Number of lines tentatively identified by NID 16 66.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/LITER	Decay Corr pCi/LITER	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.00	2.558E+02	2.568E+02	0.985E+02	38.36	
CO-60	1925.28D	1.00	1.387E+04	1.388E+04	0.041E+04	2.98	
ZN-65	244.06D	1.00	7.326E+02	7.360E+02	3.370E+02	45.79	
AS-74	17.77D	1.06	6.712E+01	7.142E+01	15.09E+01	211.21	
CD-109	461.40D	1.00	5.284E+04	5.297E+04	0.352E+04	6.65	
SN-126	2.30E+05Y	1.00	5.284E+03	5.284E+03	0.352E+03	6.65	
BA-137M	30.08Y	1.00	1.304E+04	1.304E+04	0.035E+04	2.71	
CS-137	30.08Y	1.00	1.378E+04	1.378E+04	0.037E+04	2.71	
PM-147	2.62Y	1.00	7.683E+06	7.691E+06	2.950E+06	38.36	
PB-210	22.20Y	1.00	4.076E+05	4.077E+05	0.783E+05	19.21	
PO-210	22.20Y	1.00	4.076E+05	4.077E+05	0.783E+05	19.21	
TH-229	7340.00Y	1.00	8.147E+03	8.147E+03	0.542E+03	6.65	K
AM-241	432.60Y	1.00	4.044E+04	4.045E+04	0.204E+04	5.05	
ANH-511	1.00E+09Y	1.00	3.068E+01	3.068E+01	9.550E+01	311.31	
Total Activity :			8.646E+06	8.656E+06			

Grand Total Activity : 8.646E+06 8.656E+06

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	153.32	61	1138	1.72	306.47	300	11	6.82E-02	****	2.09E+00	T
0	570.29	31	328	2.93	1140.64	1138	12	3.45E-02	****	9.76E-01	T
0	636.29	80	340	3.86	1272.66	1265	16	8.92E-02	****	9.03E-01	T
0	654.09	18	196	0.97	1308.27	1304	8	1.95E-02	****	8.85E-01	
0	1035.09	70	282	6.11	2070.37	2063	15	7.83E-02	****	6.20E-01	
0	1226.63	14	113	6.59	2453.48	2432	24	1.51E-02	****	5.40E-01	
0	1315.91	19	14	3.25	2632.05	2627	10	2.06E-02	90.7	5.10E-01	
0	1406.88	10	6	0.61	2814.01	2806	11	1.12E-02	****	4.83E-01	T
0	1431.50	11	7	2.92	2863.24	2856	13	1.17E-02	****	4.76E-01	
0	1444.68	9	2	0.96	2889.60	2886	8	9.80E-03	89.4	4.73E-01	
0	1577.05	11	8	1.06	3154.35	3144	15	1.23E-02	****	4.42E-01	
0	1711.13	8	0	1.35	3422.50	3419	8	8.89E-03	70.7	4.17E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561783.CNF;1 *
* Acquisition date   : 22-JUN-2016 14:06:47 Sensitivity      : 3.000          *
* Detector ID        : GAM43 Energy tolerance: 1.500          *
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000          *
* Elapsed real time  : 0 00:15:03.53 Half life ratio : *****          *
* Sample date        : 21-JUN-2016 00:00:00 Nuclide Library : LIQUID          *
* Sample ID          : G1203561783 Analyst initials: MXR1          *
* Batch Number       : 1572406 Sample Quantity : 2.0000E+00 LITER          *
* Wet wt corr        : 1.00000 Wet Weight      : 0.00000          *
*                                     Dry Weight    : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 11-SEP-2015 12:21:16 Eff. Geometry   : 2LMB          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_2LMB.CNF;3          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/LITER)
CO-57	6.172E+01
CO-60	3.696E+01
ZN-65	1.838E+02
AS-74	1.179E+02
CD-109	2.061E+03
SN-126	2.075E+02
BA-137M	6.965E+01
CS-137	7.358E+01
PB-210	3.287E+04
PO-210	3.287E+04
TH-229	1.190E+03
AM-241	7.954E+02
ANH-511	6.701E+01

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/LITER)	
BE-7	6.848E+02	NOT IDENT.
NA-22	5.099E+01	NOT IDENT.
NA-24	1.533E+02	NOT IDENT.
AL-26	2.874E+01	NOT IDENT.
K-40	3.018E+02	NOT IDENT.
SC-46	9.430E+01	NOT IDENT.
V-48	1.012E+02	NOT IDENT.
CR-51	6.168E+02	NOT IDENT.
MN-52	3.550E+01	NOT IDENT.
MN-54	8.493E+01	NOT IDENT.
CO-56	8.263E+01	NOT IDENT.
CO-58	8.435E+01	NOT IDENT.
FE-59	1.905E+02	NOT IDENT.
CU-67	1.597E+02	NOT IDENT.
GE-68	3.130E+03	NOT IDENT.
SE-75	9.667E+01	FAIL ABUN
BR-77	4.028E+02	NOT IDENT.
SR-82	5.107E+02	NOT IDENT.

RB-83	1.494E+02	NOT IDENT.
RB-84	1.383E+02	NOT IDENT.
KR-85	1.596E+04	NOT IDENT.
SR-85	7.268E+01	NOT IDENT.
RB-86	1.232E+03	NOT IDENT.
Y-88	2.545E+01	NOT IDENT.
Y-91	2.405E+04	NOT IDENT.
NB-94	6.756E+01	NOT IDENT.
NB-95	7.613E+01	NOT IDENT.
NB-95M	2.384E+02	NOT IDENT.
ZR-95	1.308E+02	NOT IDENT.
MO-99	8.365E+02	NOT IDENT.
TC-99M	4.514E+03	NOT IDENT.
RH-101	7.491E+01	NOT IDENT.
RH-102M	7.506E+01	NOT IDENT.
RU-103	7.174E+01	NOT IDENT.
RH-106	6.435E+02	NOT IDENT.
RU-106	6.435E+02	NOT IDENT.
AG-108M	7.577E+01	NOT IDENT.
AG-110M	1.277E+02	NOT IDENT.
SN-113	9.740E+01	NOT IDENT.
IN-114M	3.468E+02	NOT IDENT.
CD-115	3.643E+02	NOT IDENT.
SN-117M	6.151E+01	NOT IDENT.
I-123	4.336E+02	NOT IDENT.
TE-123M	5.846E+01	NOT IDENT.
SB-124	6.414E+01	NOT IDENT.
SB-125	2.168E+02	FAIL ABUN
TE-125M	2.019E+04	NOT IDENT.
I-126	2.044E+02	NOT IDENT.
SB-126	1.355E+02	NOT IDENT.
SB-127	2.363E+02	NOT IDENT.
TE-129	9.397E+02	NOT IDENT.
I-131	8.413E+01	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	9.410E+01	NOT IDENT.
BA-133	9.708E+01	NOT IDENT.
I-133	2.541E+02	NOT IDENT.
CS-134	8.762E+01	FAIL ABUN
CS-135	3.500E+02	NOT IDENT.
I-135	9.006E+03	NOT IDENT.
CS-136	1.314E+02	FAIL ABUN
CE-139	6.250E+01	NOT IDENT.
BA-140	2.647E+02	NOT IDENT.
LA-140	3.022E+01	NOT IDENT.
CE-141	1.036E+02	NOT IDENT.
CE-143	2.858E+02	NOT IDENT.
CE-144	4.576E+02	NOT IDENT.
PM-144	6.641E+01	NOT IDENT.
PR-144	4.933E+03	NOT IDENT.
PM-146	1.081E+02	NOT IDENT.
ND-147	5.191E+02	NOT IDENT.
PM-147	2.089E+06	FAIL ABUN
PM-149	3.071E+03	NOT IDENT.
EU-152	2.188E+02	FAIL ABUN
GD-153	2.094E+02	NOT IDENT.
EU-154	1.442E+02	FAIL ABUN
EU-155	2.662E+02	FAIL ABUN
HO-166M	1.295E+02	NOT IDENT.
TM-171	1.318E+05	NOT IDENT.
LU-176	6.112E+01	FAIL ABUN
LU-177	6.238E+02	NOT IDENT.
HF-181	8.631E+01	NOT IDENT.
W-181	1.534E+03	FAIL ABUN
TA-182	2.138E+02	FAIL ABUN
RE-183	1.737E+03	FAIL ABUN
RE-184	2.719E+02	NOT IDENT.
RE-188	3.138E+02	NOT IDENT.
W-188	1.400E+04	NOT IDENT.
OS-191	2.027E+02	NOT IDENT.
IR-192	7.107E+01	NOT IDENT.
HG-203	7.251E+01	NOT IDENT.
BI-207	1.260E+02	FAIL ABUN
TL-208	7.489E+01	NOT IDENT.
BI-211	4.528E+02	NOT IDENT.
PB-211	1.695E+03	NOT IDENT.
BI-212	1.065E+03	NOT IDENT.
PB-212	1.343E+02	NOT IDENT.

BI-213	2.673E+02	NOT IDENT.
BI-214	1.377E+02	NOT IDENT.
PB-214	1.630E+02	FAIL ABUN
RN-219	9.803E+02	NOT IDENT.
FR-221	5.068E+02	NOT IDENT.
RA-223	1.455E+03	FAIL ABUN
RA-224	1.400E+03	NOT IDENT.
RA-226	1.446E+03	NOT IDENT.
AC-227	5.957E+02	NOT IDENT.
TH-227	5.957E+02	NOT IDENT.
AC-228	3.903E+02	NOT IDENT.
RA-228	3.903E+02	NOT IDENT.
TH-228	1.343E+02	NOT IDENT.
TH-230	3.765E+04	NOT IDENT.
PA-231	1.065E+03	NOT IDENT.
TH-231	1.309E+03	NOT IDENT.
TH-232	7.003E+04	NOT IDENT.
PA-233	1.481E+02	NOT IDENT.
PA-234	8.831E+02	FAIL ABUN
PA-234M	1.179E+04	NOT IDENT.
TH-234	5.059E+03	NOT IDENT.
U-234	4.814E+05	FAIL ABUN
U-235	4.387E+02	NOT IDENT.
NP-237	1.481E+02	NOT IDENT.
NP-238	6.413E+02	NOT IDENT.
U-238	5.059E+03	NOT IDENT.
NP-239	6.637E+02	NOT IDENT.
AM-242	1.682E+03	FAIL ABUN
AM-243	1.637E+02	NOT IDENT.
CM-243	2.710E+02	NOT IDENT.
BK-247	1.886E+02	NOT IDENT.
CM-247	8.867E+01	NOT IDENT.
CF-249	9.558E+01	NOT IDENT.
CF-251	2.848E+02	NOT IDENT.
CF-252	4.588E+05	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561783.CNF;1
Acquisition date : 22-JUN-2016 14:06:47 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:03.53 Half life ratio : *****
Sample date : 21-JUN-2016 00:00:00 Nuclide Library : LIQUID
Sample ID : G1203561783 Analyst initials: MXR1
Batch Number : 1572406 Sample Quantity : 2.0000E+00 LITER
Quantity Err(%) : 5.0000E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 11-SEP-2015 12:21:16 Eff. Geometry : 2LMB
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_2LMB.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/LITER)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	2.568E+02	9.907E+01	9.907E+01
CO-60	1.388E+04	1.165E+03	1.165E+03
ZN-65	7.360E+02	3.512E+02	3.512E+02
AS-74	7.142E+01	1.480E+02	1.480E+02
CD-109	5.297E+04	6.206E+03	6.206E+03
SN-126	5.284E+03	5.522E+02	5.522E+02
BA-137M	1.304E+04	1.175E+03	1.175E+03
CS-137	1.378E+04	1.240E+03	1.240E+03
PB-210	4.077E+05	9.290E+04	9.290E+04
PO-210	4.077E+05	9.290E+04	9.290E+04
TH-229	-6.213E+02	1.440E+03	1.440E+03
AM-241	4.045E+04	4.653E+03	4.653E+03
ANH-511	3.068E+01	9.362E+01	9.362E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/LITER)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	-2.105E+02	8.284E+02	8.338E+02	NOT IDENT.
NA-22	3.780E+01	5.705E+01	5.954E+01	NOT IDENT.
NA-24	-1.758E+02	2.152E+02	2.294E+02	NOT IDENT.
AL-26	3.696E+00	3.338E+01	3.342E+01	NOT IDENT.
K-40	7.908E+01	3.443E+02	3.461E+02	NOT IDENT.
SC-46	6.426E+00	1.131E+02	1.131E+02	NOT IDENT.
V-48	-4.811E+01	1.248E+02	1.267E+02	NOT IDENT.
CR-51	5.677E+02	7.066E+02	7.515E+02	NOT IDENT.
MN-52	-1.662E+01	5.455E+01	5.506E+01	NOT IDENT.
MN-54	-2.311E+00	1.016E+02	1.016E+02	NOT IDENT.
CO-56	-1.003E+02	1.035E+02	1.129E+02	NOT IDENT.
CO-58	4.883E+01	9.882E+01	1.012E+02	NOT IDENT.
FE-59	4.453E+01	2.226E+02	2.235E+02	NOT IDENT.
CU-67	-4.840E+01	1.914E+02	1.926E+02	NOT IDENT.
GE-68	-9.021E+02	3.714E+03	3.736E+03	NOT IDENT.
SE-75	3.870E+01	1.169E+02	1.182E+02	FAIL ABUN
BR-77	1.720E+02	4.837E+02	4.899E+02	NOT IDENT.

SR-82	-1.105E+02	6.119E+02	6.139E+02	NOT IDENT.
RB-83	4.804E+01	1.787E+02	1.800E+02	NOT IDENT.
RB-84	5.150E+01	1.642E+02	1.658E+02	NOT IDENT.
KR-85	4.552E+03	2.206E+04	2.216E+04	NOT IDENT.
SR-85	2.073E+01	1.005E+02	1.009E+02	NOT IDENT.
RB-86	-3.551E+02	1.462E+03	1.471E+03	NOT IDENT.
Y-88	8.223E+00	2.823E+01	2.847E+01	NOT IDENT.
Y-91	-3.873E+03	2.879E+04	2.885E+04	NOT IDENT.
NB-94	3.178E+01	7.843E+01	7.973E+01	NOT IDENT.
NB-95	1.730E+01	8.972E+01	9.006E+01	NOT IDENT.
NB-95M	-5.460E+01	2.900E+02	2.911E+02	NOT IDENT.
ZR-95	-1.255E+02	1.609E+02	1.706E+02	NOT IDENT.
MO-99	-5.657E+02	1.016E+03	1.048E+03	NOT IDENT.
TC-99M	-2.061E+02	6.040E+03	6.041E+03	NOT IDENT.
RH-101	8.797E+00	9.042E+01	9.050E+01	NOT IDENT.
RH-102M	-1.737E+00	9.007E+01	9.007E+01	NOT IDENT.
RU-103	-6.495E+01	8.884E+01	9.354E+01	NOT IDENT.
RH-106	-7.543E+02	7.846E+02	8.551E+02	NOT IDENT.
RU-106	-7.543E+02	7.846E+02	8.551E+02	NOT IDENT.
AG-108M	-1.371E+01	9.070E+01	9.091E+01	NOT IDENT.
AG-110M	2.034E+01	1.526E+02	1.529E+02	NOT IDENT.
SN-113	1.148E+01	1.149E+02	1.150E+02	NOT IDENT.
IN-114M	-2.068E+02	4.198E+02	4.300E+02	NOT IDENT.
CD-115	-2.375E+02	4.503E+02	4.628E+02	NOT IDENT.
SN-117M	4.206E+00	7.841E+01	7.844E+01	NOT IDENT.
I-123	7.093E+01	5.292E+02	5.301E+02	NOT IDENT.
TE-123M	9.616E+00	7.133E+01	7.146E+01	NOT IDENT.
SB-124	1.811E+01	7.232E+01	7.278E+01	NOT IDENT.
SB-125	-1.785E+02	2.638E+02	2.758E+02	FAIL ABUN
TE-125M	-7.467E+03	2.362E+04	2.386E+04	NOT IDENT.
I-126	-2.038E+02	2.920E+02	3.061E+02	NOT IDENT.
SB-126	-6.732E+01	1.632E+02	1.660E+02	NOT IDENT.
SB-127	-4.529E+01	2.801E+02	2.809E+02	NOT IDENT.
TE-129	-9.380E+01	1.127E+03	1.128E+03	NOT IDENT.
I-131	-2.055E+01	9.967E+01	1.001E+02	FAIL ABUN
I-132	-2.911E+06	8.857E+06	8.954E+06	SHORT HLIF
TE-132	6.814E+01	1.123E+02	1.164E+02	NOT IDENT.
BA-133	6.481E+01	1.124E+02	1.161E+02	NOT IDENT.
I-133	1.161E+02	3.027E+02	3.072E+02	NOT IDENT.
CS-134	-2.771E+01	1.056E+02	1.063E+02	FAIL ABUN
CS-135	5.390E+01	4.258E+02	4.265E+02	NOT IDENT.
I-135	-2.515E+02	1.075E+04	1.075E+04	NOT IDENT.
CS-136	-3.624E+01	1.555E+02	1.564E+02	FAIL ABUN
CE-139	3.238E+01	7.369E+01	7.512E+01	NOT IDENT.
BA-140	-4.364E+02	3.401E+02	3.929E+02	NOT IDENT.
LA-140	-2.367E+01	4.004E+01	4.143E+01	NOT IDENT.
CE-141	1.588E+01	1.216E+02	1.219E+02	NOT IDENT.
CE-143	-2.492E+02	3.391E+02	3.572E+02	NOT IDENT.
CE-144	3.529E+02	5.995E+02	6.202E+02	NOT IDENT.
PM-144	5.282E+00	7.807E+01	7.811E+01	NOT IDENT.
PR-144	3.605E+02	5.800E+03	5.803E+03	NOT IDENT.
PM-146	-2.975E+01	1.301E+02	1.308E+02	NOT IDENT.
ND-147	-1.310E+02	6.330E+02	6.358E+02	NOT IDENT.
PM-147	7.691E+06	2.967E+06	4.563E+06	FAIL ABUN
PM-149	1.358E+03	3.732E+03	3.782E+03	NOT IDENT.
EU-152	-9.030E+01	2.594E+02	2.625E+02	FAIL ABUN
GD-153	-4.630E+01	2.430E+02	2.439E+02	NOT IDENT.
EU-154	9.962E+01	1.619E+02	1.680E+02	FAIL ABUN
EU-155	8.389E+01	3.070E+02	3.093E+02	FAIL ABUN
HO-166M	5.624E+01	1.507E+02	1.528E+02	NOT IDENT.
TM-171	-1.505E+05	1.634E+05	1.770E+05	NOT IDENT.
LU-176	3.473E+00	7.108E+01	7.110E+01	FAIL ABUN
LU-177	1.319E+02	7.466E+02	7.489E+02	NOT IDENT.
HF-181	-1.722E+01	1.042E+02	1.045E+02	NOT IDENT.
W-181	1.202E+04	3.697E+03	6.560E+03	FAIL ABUN
TA-182	4.780E+01	2.501E+02	2.510E+02	FAIL ABUN
RE-183	4.300E+04	5.814E+03	2.024E+04	FAIL ABUN
RE-184	-3.129E+01	3.284E+02	3.287E+02	NOT IDENT.
RE-188	-2.340E+01	4.228E+02	4.230E+02	NOT IDENT.
W-188	-1.306E+04	1.767E+04	1.863E+04	NOT IDENT.
OS-191	-8.295E+01	2.393E+02	2.422E+02	NOT IDENT.
IR-192	-1.781E+01	8.342E+01	8.380E+01	NOT IDENT.
HG-203	5.699E+01	8.727E+01	9.097E+01	NOT IDENT.
BI-207	-5.455E+01	1.504E+02	1.524E+02	FAIL ABUN
TL-208	1.098E+00	9.100E+01	9.100E+01	NOT IDENT.
BI-211	-2.950E+02	5.406E+02	5.567E+02	NOT IDENT.
PB-211	-4.458E+02	2.023E+03	2.033E+03	NOT IDENT.
BI-212	1.810E+00	1.259E+03	1.259E+03	NOT IDENT.

PB-212	4.034E+01	1.617E+02	1.627E+02	NOT IDENT.
BI-213	-1.035E+02	3.221E+02	3.254E+02	NOT IDENT.
BI-214	-8.362E+01	1.640E+02	1.683E+02	NOT IDENT.
PB-214	-1.469E+02	1.961E+02	2.070E+02	FAIL ABUN
RN-219	9.372E+02	1.141E+03	1.217E+03	NOT IDENT.
FR-221	9.502E+01	6.085E+02	6.100E+02	NOT IDENT.
RA-223	6.011E+02	1.685E+03	1.706E+03	FAIL ABUN
RA-224	-1.138E+03	1.730E+03	1.804E+03	NOT IDENT.
RA-226	-1.284E+02	1.726E+03	1.727E+03	NOT IDENT.
AC-227	-1.151E+02	7.285E+02	7.303E+02	NOT IDENT.
TH-227	-1.151E+02	7.285E+02	7.303E+02	NOT IDENT.
AC-228	1.018E+02	4.663E+02	4.686E+02	NOT IDENT.
RA-228	1.018E+02	4.663E+02	4.686E+02	NOT IDENT.
TH-228	4.034E+01	1.617E+02	1.627E+02	NOT IDENT.
TH-230	-3.342E+04	4.720E+04	4.954E+04	NOT IDENT.
PA-231	-8.102E+02	1.274E+03	1.325E+03	NOT IDENT.
TH-231	8.449E+02	1.796E+03	1.836E+03	NOT IDENT.
TH-232	5.823E+04	9.409E+04	9.768E+04	NOT IDENT.
PA-233	8.678E+01	1.705E+02	1.749E+02	NOT IDENT.
PA-234	-3.932E+02	1.171E+03	1.185E+03	FAIL ABUN
PA-234M	-3.697E+03	1.446E+04	1.455E+04	NOT IDENT.
TH-234	6.748E+03	6.862E+03	7.506E+03	NOT IDENT.
U-234	-8.049E+04	5.837E+05	5.848E+05	FAIL ABUN
U-235	-9.087E+01	5.184E+02	5.200E+02	NOT IDENT.
NP-237	8.678E+01	1.705E+02	1.749E+02	NOT IDENT.
NP-238	2.919E+02	7.662E+02	7.774E+02	NOT IDENT.
U-238	6.748E+03	6.862E+03	7.506E+03	NOT IDENT.
NP-239	-3.784E+02	8.432E+02	8.602E+02	NOT IDENT.
AM-242	1.743E+03	1.935E+03	2.088E+03	FAIL ABUN
AM-243	-1.308E+01	2.011E+02	2.012E+02	NOT IDENT.
CM-243	-6.131E+01	3.153E+02	3.166E+02	NOT IDENT.
BK-247	7.754E+01	2.285E+02	2.312E+02	NOT IDENT.
CM-247	9.682E+00	1.048E+02	1.049E+02	NOT IDENT.
CF-249	2.291E+01	1.124E+02	1.128E+02	NOT IDENT.
CF-251	-3.870E+01	3.401E+02	3.406E+02	NOT IDENT.
CF-252	3.010E+05	5.914E+05	6.068E+05	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1202.4683	88.03	1004.0281	136.47	919.3486
46.54	1212.1725	88.34	880.6766	140.51	881.0107
49.72	1194.8407	88.47	880.9135	140.88	884.5345
51.35	1402.9298	89.96	920.0720	143.76	850.4185
52.39	1384.0027	91.11	859.5853	144.24	858.6487
53.20	1376.6909	91.27	859.8643	145.44	836.2943
56.28	1447.0618	92.59	911.0189	152.32	846.5366
57.36	1472.3110	93.31	900.6813	152.43	846.6639
57.53	1476.2191	93.35	900.7521	153.25	847.6486
57.53	1476.2261	94.56	838.3826	154.21	833.7064
57.98	1149.5922	94.65	863.0661	155.04	836.2288
59.32	1153.7976	94.67	863.0999	156.02	832.7171
59.54	1154.4839	97.43	880.9814	158.56	846.7996
61.49	895.5747	98.43	869.4426	158.97	827.4444
63.00	791.4257	98.44	869.4576	159.00	827.4768
63.29	775.6920	99.53	842.9708	162.33	859.3038
63.58	794.2495	100.11	853.6422	162.66	879.2466
63.81	822.5203	100.20	854.6749	163.33	848.7170
64.28	865.7551	102.03	926.9524	165.86	819.1808
64.99	845.2397	103.18	885.3002	176.31	815.4634
65.08	848.7144	103.37	885.6149	176.60	792.8542
66.73	942.3127	105.31	864.6502	177.52	816.7193
66.98	942.8975	106.12	863.2438	181.07	814.3584
67.24	947.9072	106.47	884.4046	184.41	841.8788
67.67	926.9032	109.28	882.5959	184.58	842.0576
67.75	916.0768	111.00	919.6267	185.72	872.4551
69.67	924.8309	111.76	889.2013	186.21	862.8965
70.83	976.2366	112.95	860.2376	190.27	917.8130
72.81	955.2153	116.24	977.2783	193.51	889.8535
72.87	955.3505	116.30	977.3805	198.01	876.1837
74.66	980.6256	116.74	948.9151	201.83	837.9763
74.82	983.2307	117.23	929.2533	205.31	924.8397
74.97	983.5700	119.76	911.2258	208.37	850.4595
77.11	1017.6760	120.54	921.2316	210.85	859.0551
79.69	1049.6316	120.90	960.0065	218.12	904.6691
80.12	1052.8978	121.12	960.3572	222.11	940.0942
80.19	1048.5244	121.22	976.6989	227.09	877.5168
80.57	1005.1591	121.78	966.1984	227.38	876.7299
81.00	992.0333	122.06	945.4708	228.16	848.9113
81.07	1028.9824	123.07	926.5760	228.18	848.9235
83.79	1047.0703	123.68	905.3498	235.69	866.2440
84.00	1047.5411	127.23	901.8781	235.96	840.9069
84.21	1041.1510	129.43	913.9769	238.63	826.1072
85.43	1083.4086	131.20	918.4052	238.98	815.7112
86.55	1000.9315	133.02	894.9753	240.99	860.2328
86.94	1001.7510	133.52	862.6685	242.00	830.0104
87.09	1002.0656	136.00	905.5081	244.70	794.6313
87.57	1003.0668	136.28	936.0308	250.62	816.6168

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
252.40	747.6123	364.49	527.0579	621.93	325.7604
252.80	730.5643	366.42	522.0872	630.19	0.0000
256.23	741.7021	383.85	516.1457	631.29	326.7045
260.90	658.7308	388.16	513.8451	632.98	290.2847
264.66	672.0495	388.63	518.8690	633.25	272.7758
265.00	674.4580	391.70	507.3506	634.78	279.3579
268.22	665.5037	400.66	499.7532	635.95	275.7897
269.46	682.7890	401.81	476.6620	636.99	275.9282
271.23	657.4407	402.40	507.2062	645.85	289.0047
273.65	622.4305	404.85	526.6953	657.76	316.2920
276.40	689.3954	410.95	525.9235	661.66	247.3497
277.37	656.7229	414.70	506.5124	664.57	260.6311
277.60	649.0915	423.72	439.0325	666.33	273.8057
278.00	649.3325	427.09	527.6127	666.50	273.8234
278.43	642.9200	427.87	523.8939	667.71	0.0000
279.20	634.4813	433.94	544.9667	677.62	241.2928
279.54	644.6765	440.45	557.2899	685.70	262.1933
280.46	626.3049	453.88	542.7982	695.00	260.4176
283.69	680.5629	459.60	521.3538	696.49	251.0087
284.31	649.6880	463.37	519.5065	696.51	251.0087
285.41	627.9709	468.07	532.2442	697.00	257.7698
285.90	636.0704	473.00	545.1052	697.49	266.4562
287.50	624.6678	475.06	511.9319	702.65	244.9664
290.67	648.8654	476.78	508.3539	706.68	281.0096
293.27	624.6932	477.60	505.5192	711.68	261.3734
295.22	599.6121	477.99	506.6670	720.70	265.2982
295.96	572.9263	482.18	461.5734	721.93	263.5055
299.98	614.7552	487.02	441.1986	722.78	271.3525
300.09	622.0570	492.35	374.1761	722.91	266.5237
300.13	622.0738	497.08	421.9783	723.31	259.7831
301.36	645.3977	511.00	408.6050	724.19	253.0933
302.85	584.4976	514.00	411.0492	727.33	275.7664
304.50	553.5120	520.40	376.0179	733.00	269.6230
304.85	580.0411	520.69	359.2238	735.93	259.2407
306.78	589.1870	522.65	0.0000	739.50	271.3430
308.46	633.7888	527.90	351.1532	744.23	269.9299
311.90	543.2504	529.59	311.2553	747.24	242.8535
316.51	596.7352	529.87	311.2983	752.31	263.9760
319.41	545.7091	531.02	336.9278	753.82	286.7246
320.08	538.6399	537.26	363.6004	756.73	288.0582
321.04	598.9569	546.56	333.3814	763.94	280.0421
323.87	544.9218	552.55	323.7357	765.80	274.3350
325.23	570.4840	563.25	310.4859	766.42	267.4934
328.76	618.4731	569.33	329.8632	766.84	272.4792
333.37	531.4022	569.50	304.6552	772.60	0.0000
334.37	525.3076	569.70	304.6827	776.52	278.5131
338.28	554.0192	583.19	302.8205	777.92	284.6177
338.32	554.0337	595.83	313.5387	778.90	289.6950
340.48	512.8536	600.60	307.6992	783.70	286.2773
340.55	512.8870	602.73	302.5269	785.37	287.4654
344.28	548.1630	604.72	305.5752	792.07	293.2284
345.93	530.0650	609.32	301.6743	795.86	279.6867
351.06	551.0217	610.33	308.2692	801.95	284.3698
351.93	554.2177	614.28	285.8191	802.10	284.3871
356.01	502.8943	618.01	290.9610	810.29	283.2966

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
810.45	283.3138	1120.55	180.9514		
810.76	293.3961	1121.30	196.0807		
815.77	305.0466	1129.67	189.1260		
818.51	310.4125	1131.51	180.5841		
832.01	329.2582	1173.23	137.8345		
834.85	319.4733	1189.05	123.0776		
836.80	335.9496	1204.77	96.1577		
846.77	336.2103	1221.41	73.9328		
856.80	327.2526	1231.02	58.8110		
860.56	313.3773	1235.36	65.3140		
871.09	335.1727	1238.28	60.4149		
873.19	345.7207	1260.41	48.8257		
875.33	322.3100	1274.44	44.0092		
880.51	347.6821	1274.54	44.0107		
881.60	330.2734	1291.59	39.1877		
883.24	335.6389	1298.22	38.2505		
884.68	339.9506	1312.11	37.1281		
889.28	345.6946	1332.49	28.4395		
894.76	375.4189	1365.19	16.3878		
898.04	387.2820	1368.63	23.5784		
903.28	401.5415	1384.29	24.7006		
911.20	379.7295	1408.01	14.4941		
923.98	372.0162	1434.09	20.0577		
926.36	370.2291	1457.56	14.6704		
935.54	382.9954	1460.82	14.6821		
937.49	389.5795	1489.16	17.9487		
944.13	428.4674	1596.21	17.0420		
946.00	430.8521	1620.50	11.4225		
949.00	418.6150	1678.03	10.6019		
954.55	0.0000	1690.97	10.6311		
964.08	347.4641	1764.49	12.7572		
968.97	367.2012	1770.23	3.9299		
983.53	325.1523	1771.35	5.8962		
984.45	296.3639	1791.20	2.9600		
996.26	327.6057	1808.65	9.9011		
1001.03	338.8788	1836.06	5.9731		
1004.73	319.9070				
1025.87	293.4239				
1028.54	327.2752				
1037.84	307.0261				
1038.76	285.8810				
1046.59	283.5552				
1048.07	299.5982				
1050.41	295.1367				
1063.66	283.2058				
1077.00	308.9461				
1077.34	308.9803				
1083.85	302.9799				
1085.87	288.9479				
1099.25	305.3598				
1111.64	314.1519				
1112.07	335.9119				
1112.84	342.6843				
1115.54	239.2352				
1120.29	199.3671				

Method Calibration Data

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 2

Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1736
the secondary standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. Fuhler

Date: 8/18/15

Reviewed By: M. Stamp

Date: 8/31/15

Effective Date: 8/18/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.16, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+06	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.628E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.908E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.782E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-66	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laff
J. S. Laff, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty*, %			Calibration Method*
			γps/gram		Type	u _A	u _B	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.614E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.6	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytical Instrumentation Laboratory (A.I.L.)

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

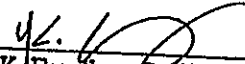
Page 1 of 2

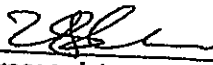
Corporate Office

Laboratory

24937 Avenue Tibblitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 2014414



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Ziegler Analytics
Description: 96405
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

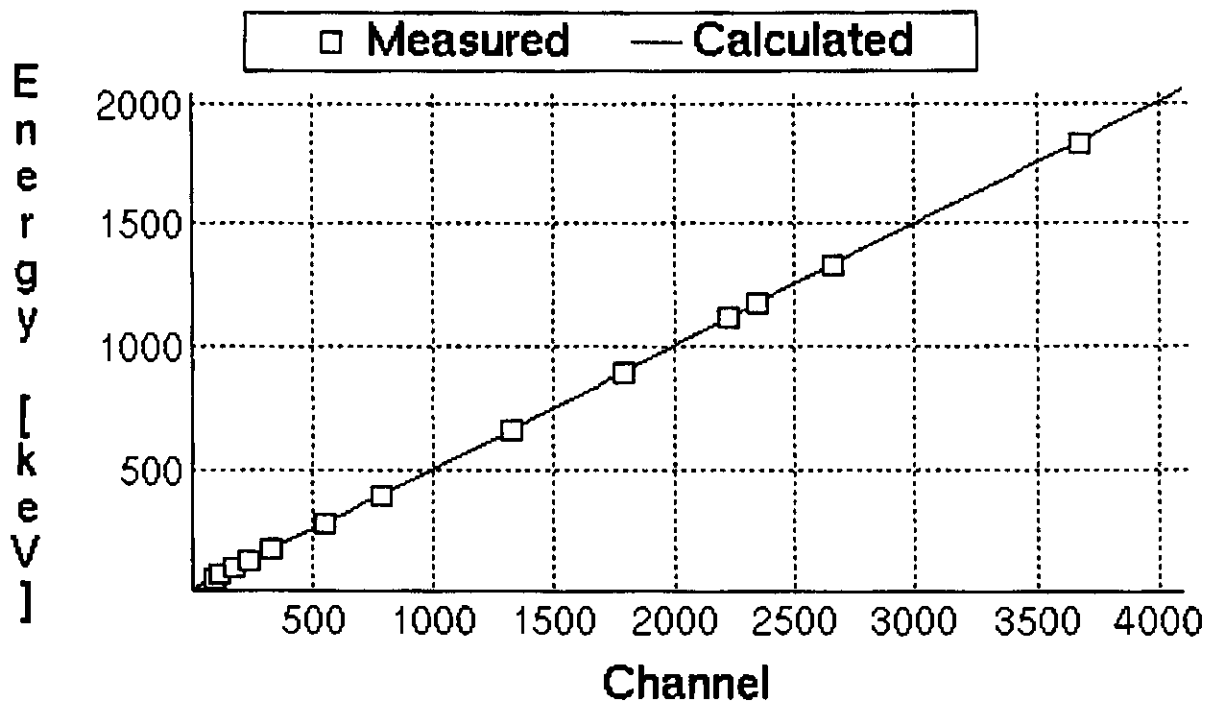
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



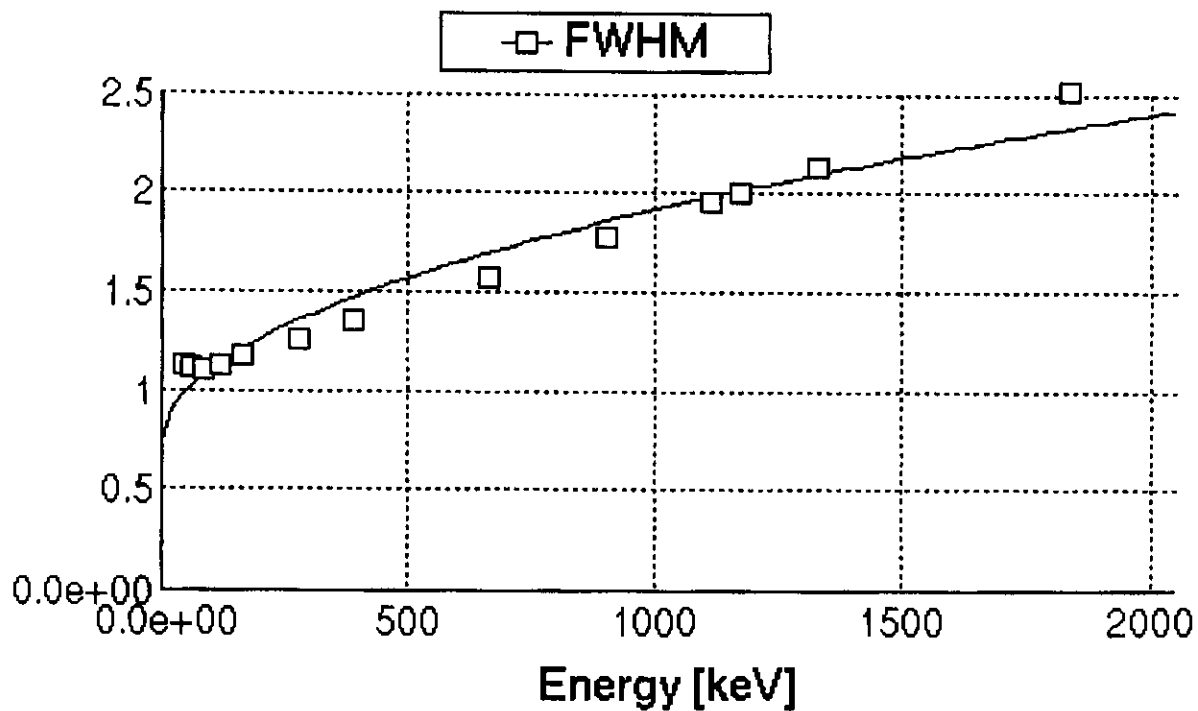
Datasource:

Energy = $1.519\text{e-}01 \text{ keV} + 5.003\text{e-}01 * \text{Ch} + -3.835\text{e-}08 * \text{Ch}^2$ [CHISQ = $5.981\text{e-}02$]

FWHM = $7.365\text{e-}01 \text{ keV} + 3.724\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $1.028\text{e-}02$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

Energy Calibration 82 8/14/15



Datasource:

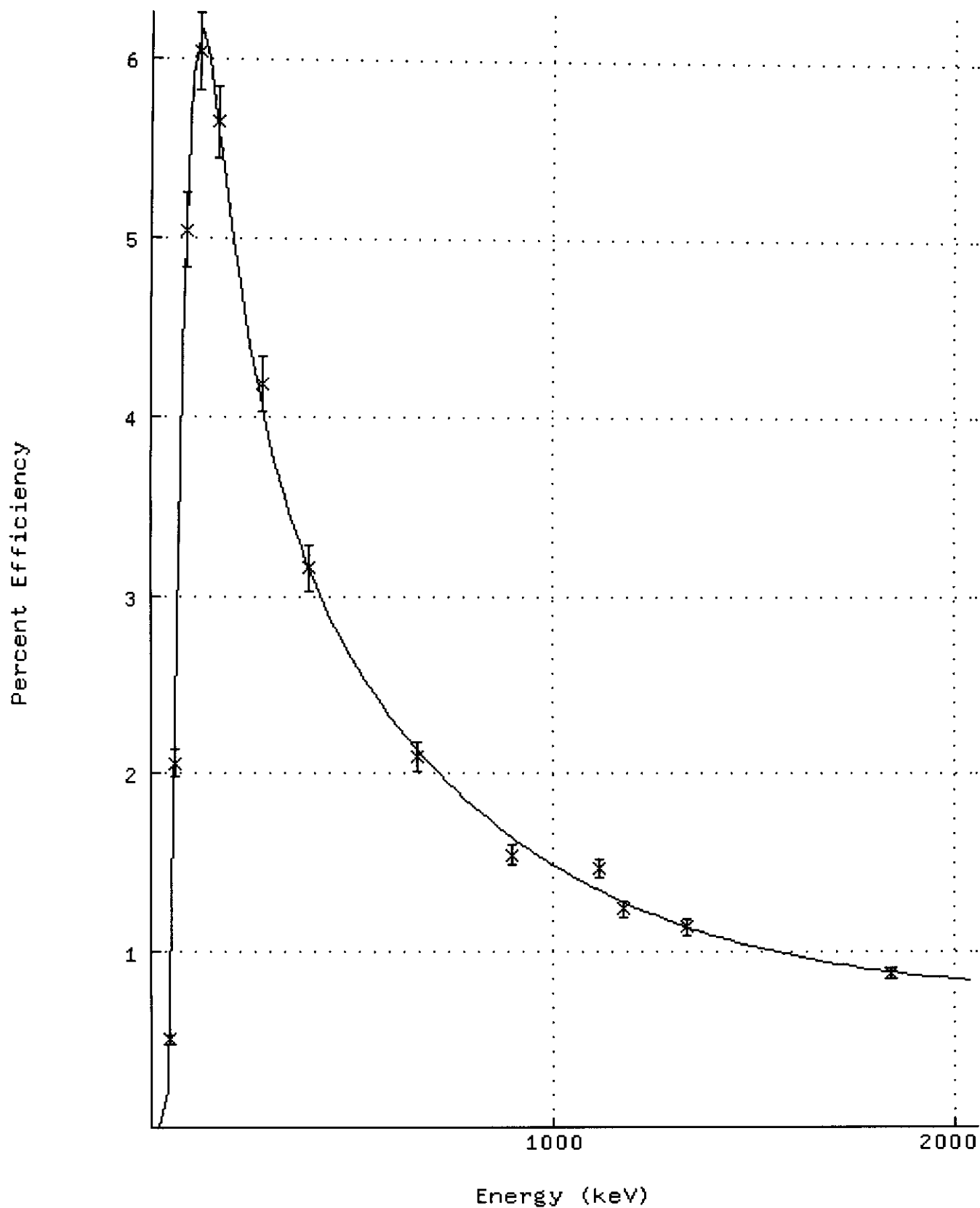
Energy = $1.519e-01 \text{ keV} + 5.003e-01 * \text{Ch} + -3.835e-08 * \text{Ch}^2$ [CHISQ = $5.981e-02$]

FWHM = $7.365e-01 \text{ keV} + 3.724e-02 * E^{1/2}$ [CHISQ = $1.028e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape Calibration 82 8/14/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM02_CAN.CNF;14
Calib Date: 18-AUG-2015 11:34
Detector : GAMMA2 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = 0.1519 + 0.5003 \cdot \text{Channel} + -3.8352\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.64	46.54	46.50	0.039
2	118.66	59.54	59.52	0.022
3	175.65	88.03	88.03	-0.002
4	243.70	122.06	122.08	-0.017
5	331.26	165.86	165.88	-0.023
6	557.79	279.20	279.22	-0.017
7	782.68	391.70	391.72	-0.019
8	1322.31	661.66	661.67	-0.007
9	1794.87	898.04	898.04	-0.004
10	2229.73	1115.60	1115.55	0.051
11	2345.07	1173.23	1173.23	-0.001
12	2663.52	1332.49	1332.50	-0.011
13	3670.50	1836.06	1836.07	-0.009

FWHM Calibration Report

$$\text{FWHM} = 0.7365 + 3.7241\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.13	0.99	0.144
2	59.54	1.13	1.02	0.104
3	88.03	1.11	1.09	0.027
4	122.06	1.14	1.15	-0.008
5	165.86	1.18	1.22	-0.040
6	279.20	1.27	1.36	-0.093
7	391.70	1.36	1.47	-0.113
8	661.66	1.57	1.69	-0.121
9	898.04	1.77	1.85	-0.080
10	1115.60	1.95	1.98	-0.031
11	1173.23	2.00	2.01	-0.008
12	1332.49	2.13	2.10	0.033
13	1836.06	2.52	2.33	0.186

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.154	0.9177	-0.1187	-0.1390	0.1847	-5.7459E-02

Average Deviation = 2.89 % Reduced Chi-Square = 1.94

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	4.99E-03	2.26E-04	5.15E-03	-0.71	-3.22
2	59.54	2.05E-02	7.71E-04	1.96E-02	1.24	4.65
3	88.03	5.03E-02	2.08E-03	5.16E-02	-0.62	-2.55
4	122.06	6.04E-02	2.14E-03	6.16E-02	-0.59	-2.10
5	165.86	5.64E-02	2.02E-03	5.65E-02	-0.03	-0.10
6	279.20	4.18E-02	1.56E-03	4.02E-02	1.00	3.72
7	391.70	3.15E-02	1.26E-03	3.16E-02	-0.05	-0.22
8	661.66	2.09E-02	8.54E-04	2.13E-02	-0.46	-1.88
9	898.04	1.54E-02	5.84E-04	1.64E-02	-1.67	-6.33
10	1115.60	1.46E-02	5.25E-04	1.34E-02	2.37	8.49
11	1173.23	1.24E-02	4.89E-04	1.28E-02	-0.86	-3.40
12	1332.49	1.14E-02	4.49E-04	1.14E-02	0.01	0.05
13	1836.06	8.71E-03	3.29E-04	8.79E-03	-0.24	-0.91

VMS Gamma Spectroscopy Report generated 18-AUG-2015 12:09:37

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM02_CAN_340565.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 340557 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 18-AUG-2015 10:48:32
 Decay time : 138 22:48:32.67 % dead time : 1.5%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:28.09

---- Detector Parameters ----

Energy cal. time : 14-AUG-2015 15:18:01 Energy cal. oper.: gamma spec user
 Detector name : GAMMA2 Counting geometry: CAN
 Effic. cal. time : 18-AUG-2015 11:34:20 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.000000 Gaussian Sens. : 10.000000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.000000 Half life ratio : 8.000000
 Abundance limit : 75.000000 WTM error limit : 3.000000
 MDA Width (FWHM) : 3.000000 MDA Confid Level : 5.000000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	5	44.78	1024	9820	1.58	89.20	86	11	5.69E-01	15.8	5.49E+00
2	5	46.40	10774	9362	1.08	92.44	86	11	5.99E+00	1.7	
3	0	59.35	28092	16734	1.16	118.32	112	11	1.56E+01	1.1	
4	0	66.62	400	11847	2.20	132.85	129	8	2.22E-01	47.3	
5	1	70.69	743	9718	1.08	140.98	138	11	4.13E-01	21.3	1.42E+00
6	1	72.79	1150	9713	0.95	145.18	138	11	6.39E-01	13.9	
7	0	87.89	80780	21243	1.17	175.37	169	13	4.49E+01	0.5	
8	5	120.20	901	10443	1.46	239.95	236	14	5.01E-01	29.9	2.08E+00
9	5	121.96	45441	7416	1.13	243.46	236	14	2.52E+01	0.6	
10	0	136.35	5989	9996	1.19	272.22	267	11	3.33E+00	3.5	
11	0	165.76	42182	11198	1.22	331.01	324	14	2.34E+01	0.7	
12	0	209.27	159	4209	0.79	417.98	416	6	8.84E-02	64.8	
13	0	254.97	1226	5861	1.28	509.33	505	10	6.81E-01	12.0	
14	0	279.03	16760	6653	1.29	557.42	551	13	9.31E+00	1.3	
15	0	391.49	28802	5287	1.40	782.22	775	14	1.60E+01	0.8	
16	0	510.79	3046	4387	2.61	1020.70	1015	14	1.69E+00	5.0	
17	0	661.35	27770	4884	1.59	1321.67	1314	15	1.54E+01	0.8	
18	0	682.05	51	2473	0.45	1363.06	1361	8	2.81E-02	170.8	
19	0	765.32	74	2391	0.56	1529.54	1524	10	4.08E-02	125.2	
20	0	813.57	582	2843	2.20	1626.00	1620	12	3.23E-01	18.8	
21	0	860.61	98	2015	0.58	1720.03	1717	8	5.44E-02	80.1	

Peak Search Report (continued)

Sample ID : 100218

Page : 2

Acquisition date : 18-AUG-2015 10:48:32

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	897.65	31600	5604	1.78	1794.09	1785	19	1.76E+01	0.8	
23	0	1018.20	117	1306	1.50	2035.09	2032	8	6.52E-02	54.1	
24	0	1047.90	69	1291	0.76	2094.48	2089	8	3.83E-02	91.3	
25	0	1115.07	26883	2787	1.95	2228.78	2219	19	1.49E+01	0.8	
26	0	1172.75	29992	1925	1.97	2344.10	2334	21	1.67E+01	0.7	
27	4	1324.69	626	1013	3.06	2647.89	2639	35	3.48E-01	12.5	4.62E+00
28	4	1331.96	27357	686	2.18	2662.45	2639	35	1.52E+01	0.6	
29	0	1474.59	19	595	0.97	2947.65	2940	11	1.05E-02	251.6	
30	0	1635.03	53	793	3.32	3268.47	3265	16	2.92E-02	120.3	
31	0	1773.46	25	174	2.93	3545.28	3539	11	1.40E-02	103.7	
32	0	1835.35	18845	376	2.55	3669.05	3657	23	1.05E+01	0.8	
33	0	1973.92	20	72	2.78	3946.18	3939	11	1.08E-02	87.0	
34	0	1999.01	63	132	7.50	3996.36	3986	21	3.51E-02	47.1	

```
*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road      *
*               Charleston, SC 29407  *
*                                     *
*****
```

```
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM02_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;434
Background date    : 15-AUG-2015 12:43:02
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 18-AUG-2015 11:37:04
Sample ID        : VER_GAM02_CAN      Sample quantity  : 1.00000E+00 SAMPLE
Detector name     : GAM02             Detector geometry: CAN
Elapsed live time : 0 00:20:00.00     Elapsed real time: 0 00:20:09.45  0.8%
Energy tolerance  : 1.50000 keV       Analyst Initials  :
Abundance limit   : 75.00000          Sensitivity       : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	45.10	915	5501	2.02	89.85	86	12	7.63E-01	16.6	1.93E+00
2	10	46.45	6736	3992	1.01	92.54	86	12	5.61E+00	2.0	
3	7	57.97	1138	4909	1.80	115.57	112	13	9.48E-01	13.0	2.49E+00
4	7	59.46	17875	3603	1.06	118.55	112	13	1.49E+01	0.9	
5	0	87.94	32473	6527	1.16	175.46	170	12	2.71E+01	0.8	
6	0	121.95	12450	3898	1.17	243.44	237	13	1.04E+01	1.4	
7	0	136.45*	1518	2429	1.08	272.43	268	10	1.26E+00	6.6	
8	0	165.80	4696	2403	1.14	331.09	326	11	3.91E+00	2.5	
9	0	250.10	126	1652	0.55	499.60	496	9	1.05E-01	58.9	
10	0	255.90	106	1866	0.94	511.19	505	10	8.80E-02	77.2	
11	0	279.44	78	1381	0.91	558.23	555	8	6.52E-02	83.1	
12	0	391.59	2199	1659	1.33	782.42	777	11	1.83E+00	4.2	
13	0	510.77*	602	1709	2.37	1020.65	1015	15	5.02E-01	15.6	
14	0	637.79	30	624	0.50	1274.58	1273	7	2.54E-02	137.2	
15	0	661.36*	18772	1478	1.57	1321.71	1313	16	1.56E+01	0.9	
16	0	887.69	157	951	1.48	1774.17	1770	9	1.31E-01	36.5	
17	0	897.66	2068	1753	1.59	1794.11	1787	15	1.72E+00	4.9	
18	0	1060.69	68	624	1.74	2120.04	2117	9	5.70E-02	66.9	
19	0	1115.11	6431	1332	1.83	2228.85	2219	19	5.36E+00	1.8	
20	0	1172.74	17898	664	2.00	2344.09	2336	17	1.49E+01	0.8	
21	0	1248.85	38	143	1.42	2496.27	2488	13	3.17E-02	66.7	
22	0	1273.25	93	339	13.44	2545.06	2526	31	7.76E-02	59.5	
23	0	1331.96	16283	261	2.07	2662.43	2651	21	1.36E+01	0.8	
24	0	1354.47	45	68	4.23	2707.45	2700	14	3.78E-02	41.7	
25	0	1379.28*	35	46	2.01	2757.05	2752	10	2.94E-02	40.3	
26	0	1420.13	36	83	4.03	2838.74	2832	15	2.96E-02	58.3	
27	0	1711.41	34	29	3.53	3421.21	3415	13	2.85E-02	36.8	
28	0	1835.33	1231	72	2.57	3669.03	3660	18	1.03E+00	3.3	
29	0	1921.99	15	32	3.73	3842.33	3832	16	1.25E-02	88.2	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2--Sigma %Error
CO-57	122.06	12450	85.60*	6.162E+00	5.316E+03	1.923E+04	2.74
	136.47	1518	10.68	6.084E+00	5.262E+03	1.903E+04	13.21
CO-60	1173.23	17898	99.85	1.278E+00	3.158E+04	3.786E+04	1.63
	1332.49	16283	99.98*	1.136E+00	3.230E+04	3.873E+04	1.64
ZN-65	1115.54	6431	50.60*	1.341E+00	2.135E+04	8.935E+04	3.69
Y-88	898.04	2068	93.70	1.640E+00	3.032E+03	8.028E+04	9.86
	1836.06	1231	99.20*	8.792E-01	3.179E+03	8.417E+04	6.55
CD-109	88.03	32473	3.70*	5.155E+00	3.834E+05	8.175E+05	1.50
SN-113	391.70	2199	64.97*	3.160E+00	2.413E+03	5.021E+04	8.34
CS-137	661.66	18772	85.10*	2.131E+00	2.331E+04	2.406E+04	1.72
CE-139	165.86	4696	80.00*	5.648E+00	2.341E+03	2.962E+04	4.99
PB-210	46.54	6736	4.25*	5.079E-01	7.028E+05	7.338E+05	3.91
AM-241	59.54	17875	35.90*	1.948E+00	5.757E+04	5.769E+04	1.85

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM02.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 15-AUG-2015 12:43:02 Acquisition date : 15-AUG-2015 12:43:02
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:02.78

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.8490E+00	-1.50	
[1.91833+/-0.04623]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: Rf Approval Date: 8 / 18 / 15

Sample ID : Bkg

Page : 1
Acquisition date : 15-AUG-2015 12:43:02

VMS Gamma Spectroscopy Report generated 16-AUG-2015 05:23:42

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM02__340361.CNF;1

----- Sample Information -----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 340361 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 15-AUG-2015 12:43:02

----- Sample Decay/Count Information -----

Sample Date : 15-AUG-2015 12:43:02 Acquisition date : 15-AUG-2015 12:43:02
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:02.78

----- Detector Parameters -----

Energy cal. time : 14-AUG-2015 15:18:01 Energy cal. oper.: gamma spec user
Detector name : GAMMA2 Counting geometry:
Effic. cal. time : 15-AUG-2015 10:50:08 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.24	771	1121	1.05	126.09	122	10	1.28E-02	8.9	
2	3	72.67	273	795	1.03	144.95	141	12	4.54E-03	17.4	1.02E+00
3	3	74.86	482	803	1.03	149.33	141	12	8.03E-03	10.5	
4	0	84.39	385	1152	1.34	168.36	164	9	6.41E-03	16.7	
5	0	92.68	1805	1600	1.17	184.94	180	12	3.01E-02	5.0	
6	0	98.84	106	740	1.17	197.26	194	7	1.77E-03	43.7	
7	0	112.50	79	1052	1.28	224.55	221	9	1.31E-03	75.3	
8	0	130.88	71	608	1.11	261.29	259	6	1.18E-03	56.8	
9	0	135.54	82	697	1.64	270.60	268	7	1.36E-03	54.7	
10	0	143.67	249	915	1.28	286.86	283	9	4.15E-03	22.8	
11	0	149.71	92	533	1.43	298.93	296	6	1.53E-03	41.3	
12	0	162.89	73	802	1.06	325.27	322	8	1.22E-03	68.1	
13	0	177.38	36	450	0.76	354.24	352	5	6.01E-04	89.7	
14	0	185.70	1107	1061	1.30	370.87	366	11	1.85E-02	6.4	
15	0	198.65	70	701	1.39	396.75	393	8	1.17E-03	66.6	
16	0	205.32	130	764	2.32	410.08	406	9	2.17E-03	39.4	
17	0	238.37	223	694	1.17	476.14	471	9	3.72E-03	22.3	
18	0	332.03	119	453	3.79	663.36	658	10	1.99E-03	34.9	
19	0	338.07	70	402	1.13	675.44	672	8	1.17E-03	50.8	

20	0	351.80	99	344	1.04	702.88	700	7	1.66E-03	32.5
21	0	417.76	49	325	1.36	834.73	831	9	8.23E-04	67.6
22	0	453.94	52	246	1.57	907.06	904	8	8.62E-04	54.6
23	0	494.05	40	208	0.87	987.23	984	8	6.58E-04	65.4
24	0	510.87	1129	693	2.61	1020.85	1012	18	1.88E-02	6.2
25	0	558.76	71	258	1.21	1116.59	1111	10	1.18E-03	44.3
26	0	583.19	116	281	1.94	1165.42	1160	11	1.93E-03	29.6
27	0	609.38	213	290	1.16	1217.79	1213	12	3.55E-03	17.4
28	0	661.27	77	196	1.17	1321.53	1318	10	1.29E-03	35.7
29	0	702.88	22	155	1.16	1404.69	1403	7	3.63E-04	97.0
30	0	767.23	122	245	4.04	1533.34	1526	17	2.04E-03	30.9
31	0	803.64	10	247	4.82	1606.15	1595	13	1.62E-04	333.9
32	0	910.63	126	180	1.32	1820.03	1812	15	2.10E-03	24.9
33	0	935.63	59	184	4.51	1870.02	1860	18	9.76E-04	56.0
34	0	970.02	70	176	2.37	1938.78	1932	16	1.17E-03	44.3
35	0	1000.87	110	107	1.58	2000.45	1994	13	1.83E-03	21.7
36	0	1120.66	108	163	2.03	2239.95	2230	21	1.80E-03	31.1
37	0	1201.19	22	124	1.12	2400.98	2390	16	3.63E-04	116.3
38	0	1378.55	52	138	3.55	2755.60	2745	22	8.68E-04	59.1
39	0	1460.54	167	70	2.08	2919.55	2912	14	2.78E-03	13.1
40	0	1486.18	18	33	0.88	2970.81	2967	8	3.03E-04	59.9
41	0	1495.45	43	38	1.47	2989.35	2982	14	7.11E-04	34.4
42	0	1764.43	118	40	2.30	3527.23	3519	18	1.97E-03	15.6
43	0	1909.14	31	45	9.34	3816.63	3802	23	5.09E-04	60.4

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 2

Calibration Date: 8/18/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.769E+04	1.98
Cs-137	661.7	0.851	735.7	2.3365E+04	2.406E+04	2.97
Co-60	1173.2	0.9985	1383	3.7435E+04	3.786E+04	1.14
Co-60	1332.5	0.9998	1385	3.7440E+04	3.873E+04	3.45

Prepared By: L. Faxon

Date: 8/18/15

Reviewed By: M. Stamps

Date: 8/31/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 2

Date Performed: 8/15/15

Performed By: RE

High Voltage Power Supply Model No. <u>310GD</u> High Voltage <u>1.91</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.759</u> Time Constant <u>4 μsec</u> Input polarity <u>positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8075S</u> Gain <u>4K</u>	
AIM Module Model No. <u>556A</u> Address <u>D7B:1</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma S

Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? the nuclide library used? the VMS certificate file?	☒		1738 1701
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included: amp, HVPS, ADC settings?	☒		

Prepared By: R. Fitch

Date: 9/18/15

Reviewed By: M. Stamp

Date: 9/18/15

Effective Date: 9/17/15

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1510843, Item 4
Reference Date: 01-Apr-2015
Product Code: MIX-8400-EG-SD
12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source yps	Uncertainty* , %			Calibration Method*
			yps/gram		Type	u _A	u _B	
Pb-210	46.5	8.109E+03	————	1.215E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.880E+05	————	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.754E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laff
J. S. Laff, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738 Open/Reference Date: 01-APR-15
Name: Mixed Gamma CAN Received: 01-APR-15
Type: Source Material Expires: 01-APR-16
Employee: Maggie Stamps Verified: 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.614E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.367E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.6	1.7	3.6	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.996E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibbitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 46.10
K. Eardley, Radiochemist

QC Approved: 286
A. Chen, Spectroscopist

Date: 2014414



Standard Logbook

Serial ID: 1701 Open/Reference Date: 01-APR-14
Name: Mixed Gamma CAN Received: 01-APR-14
Type: Source Material Expires: 01-APR-40
Employee: Maggie Stamps Verified: 28-MAY-14
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

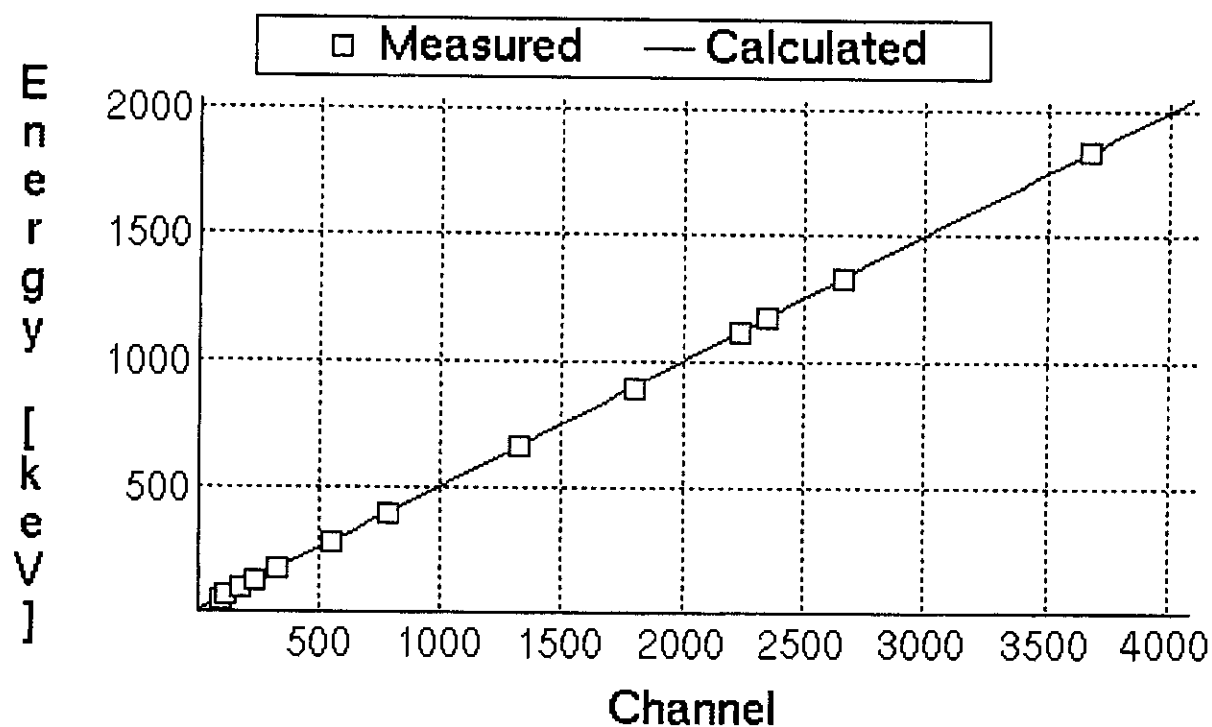
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



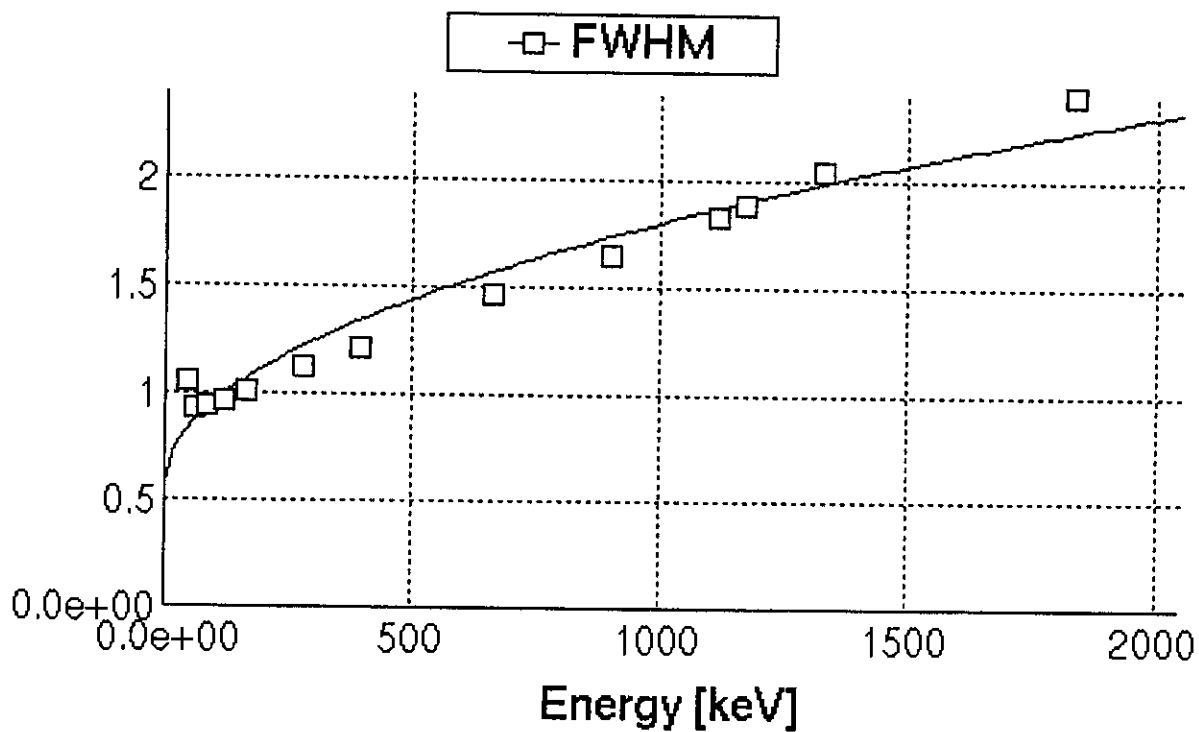
Datasource:

Energy = $6.296e-02 \text{ keV} + 5.000e-01 * \text{Ch} + -6.185e-08 * \text{Ch}^2$ [CHISQ = $2.433e-02$]

FWHM = $7.011e-01 \text{ keV} + 3.286e-02 * E^{1/2}$ [CHISQ = $1.030e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Energy calibration ⁵ 8/17/15
RF
9/17/15



Datasource:

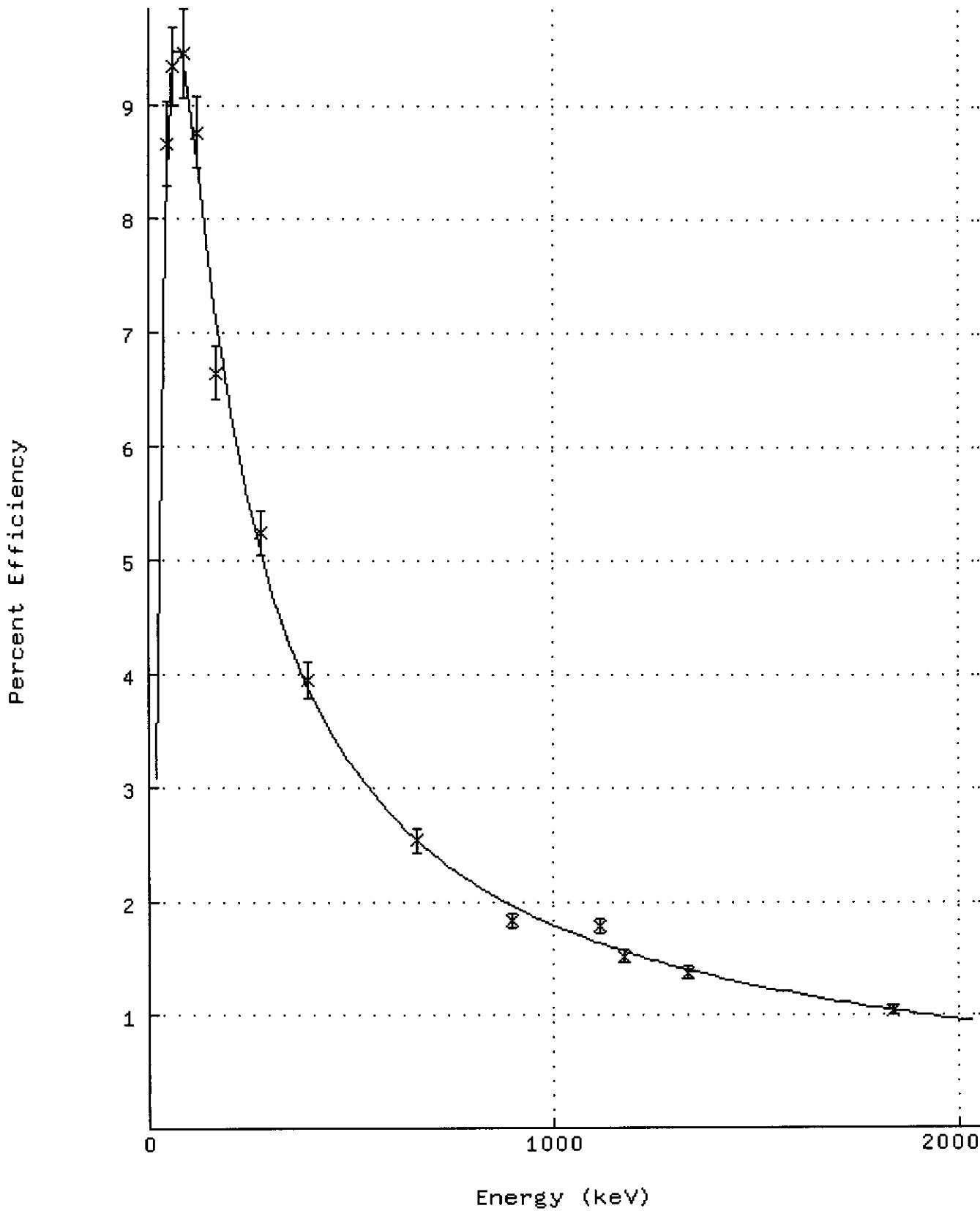
Energy = $-7.460e-01 \text{ keV} + 4.999e-01 * \text{Ch} + 3.783e-08 * \text{Ch}^2$ [CHISQ = $2.881e-02$]

FWHM = $5.660e-01 \text{ keV} + 3.913e-02 * E^{1/2}$ [CHISQ = $1.235e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Energy^{Shape} calibration 85 9/17/15
9/17/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19
Calib Date: 17-SEP-2015 12:25
Detector : GAMMA5
Geometry/Shelf: CAN/0
Fit type : 4 Deg. Empirical



$$\text{Energy} = -0.7460 + 0.4999 \cdot \text{Channel} + 3.7831\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	94.45	46.54	46.47	0.067
2	120.55	59.54	59.52	0.019
3	177.59	88.03	88.04	-0.007
4	245.68	122.06	122.08	-0.018
5	333.30	165.86	165.88	-0.025
6	560.00	279.20	279.23	-0.029
7	785.02	391.70	391.73	-0.031
8	1324.90	661.66	661.68	-0.020
9	1797.59	898.04	898.05	-0.007
10	2232.50	1115.60	1115.54	0.062
11	2347.85	1173.23	1173.22	0.006
12	2666.31	1332.49	1332.49	0.001
13	3673.15	1836.06	1836.08	-0.020

FWHM Calibration Report

$$\text{FWHM} = 0.5660 + 3.9131\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.06	0.83	0.222
2	59.54	0.93	0.87	0.065
3	88.03	0.94	0.93	0.011
4	122.06	0.97	1.00	-0.027
5	165.86	1.02	1.07	-0.055
6	279.20	1.13	1.22	-0.090
7	391.70	1.22	1.34	-0.118
8	661.66	1.46	1.57	-0.109
9	898.04	1.65	1.74	-0.085
10	1115.60	1.84	1.87	-0.036
11	1173.23	1.89	1.91	-0.014
12	1332.49	2.05	1.99	0.057
13	1836.06	2.42	2.24	0.180

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-3.967	0.8490	-4.5782E-02	2.8716E-02	-1.7147E-02	0.0000E+00

Average Deviation = 3.07 % Reduced Chi-Square = 2.19

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	8.65E-02	3.64E-03	8.64E-02	0.03	0.13
2	59.54	9.33E-02	3.38E-03	9.41E-02	-0.22	-0.80
3	88.03	9.44E-02	3.88E-03	9.34E-02	0.24	1.01
4	122.06	8.75E-02	3.10E-03	8.40E-02	1.15	4.08
5	165.86	6.64E-02	2.37E-03	7.16E-02	-2.19	-7.82
6	279.20	5.24E-02	1.99E-03	5.04E-02	1.00	3.79
7	391.70	3.94E-02	1.57E-03	3.88E-02	0.38	1.51
8	661.66	2.54E-02	1.03E-03	2.54E-02	-0.02	-0.09
9	898.04	1.84E-02	6.95E-04	1.97E-02	-1.91	-7.24
10	1115.60	1.79E-02	6.39E-04	1.64E-02	2.38	8.51
11	1173.23	1.52E-02	6.00E-04	1.57E-02	-0.77	-3.05
12	1332.49	1.38E-02	5.42E-04	1.40E-02	-0.44	-1.73
13	1836.06	1.04E-02	3.93E-04	1.04E-02	-0.04	-0.14

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM05_CAN_344241.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 344234 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 17-SEP-2015 11:31:49
 Decay time : 168 23:31:49.44 % dead time : 3.6%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:31:07.76

----- Detector Parameters -----

Energy cal. time : 17-SEP-2015 09:36:46 Energy cal. oper.: gamma spec user
 Detector name : GAMMA5 Counting geometry: CAN
 Effic. cal. time : 17-SEP-2015 12:25:23 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	20.82	349745	34747	1.31	43.15	39	17	1.94E+02	0.4	9.59E+03
2	6	21.91	1853287	33782	1.05	45.31	39	17	1.03E+03	0.1	
3	6	24.68	536878	71109	1.35	50.87	39	17	2.98E+02	0.2	
4	0	32.88	37699	42901	1.12	67.27	63	9	2.09E+01	1.1	
5	2	36.42	4504	18367	0.97	74.34	72	26	2.50E+00	4.5	1.87E+03
6	2	37.92	6272	27358	0.98	77.34	72	26	3.48E+00	4.5	
7	2	40.26	8836	27007	0.99	82.03	72	26	4.91E+00	3.3	
8	2	41.92	9152	26771	0.99	85.34	72	26	5.08E+00	3.3	
9	2	46.36	186489	25244	1.01	94.22	72	26	1.04E+02	0.3	
10	0	49.75	2058	27876	1.30	101.01	99	7	1.14E+00	13.7	
11	0	59.39	129847	36008	1.03	120.29	114	12	7.21E+01	0.4	
12	10	67.16	4978	26585	2.30	135.84	130	22	2.77E+00	6.8	2.81E+01
13	10	70.46	2332	16097	1.20	142.43	130	22	1.30E+00	9.4	
14	10	72.63	3588	25845	2.11	146.77	130	22	1.99E+00	8.8	
15	0	87.93	144725	20766	1.06	177.38	173	10	8.04E+01	0.3	
16	0	103.25	213	8037	1.16	208.01	206	6	1.18E-01	66.9	
17	0	109.07	429	9130	1.88	219.65	217	7	2.38E-01	37.3	
18	0	121.96	61693	13479	1.10	245.44	239	12	3.43E+01	0.6	
19	0	136.36	7392	10408	1.08	274.25	269	11	4.11E+00	2.9	
20	0	165.79	42725	9686	1.04	333.10	327	12	2.37E+01	0.7	
21	0	189.22	187	4212	1.40	379.98	378	6	1.04E-01	55.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	199.00	3066	7501	1.24	399.53	395	10	1.70E+00	5.6	
23	0	203.43	733	6449	1.16	408.41	405	9	4.07E-01	20.1	
24	0	255.01	1348	5810	1.21	511.56	507	10	7.49E-01	10.9	
25	0	279.14	13458	6275	1.16	559.83	554	12	7.48E+00	1.5	
26	0	311.42	217	2582	1.29	624.39	622	6	1.21E-01	37.8	
27	0	391.64	30029	5261	1.27	784.84	779	13	1.67E+01	0.8	
28	0	450.59	174	2604	1.63	902.74	900	7	9.67E-02	49.2	
29	0	471.80	117	3413	0.62	945.17	944	9	6.49E-02	90.5	
30	0	510.97	3552	5296	2.53	1023.49	1016	17	1.97E+00	5.0	
31	0	520.06	124	2437	1.60	1041.68	1040	8	6.87E-02	69.7	
32	0	602.05	125	1973	1.29	1205.65	1203	7	6.97E-02	59.4	
33	0	661.61	33659	4482	1.49	1324.77	1319	13	1.87E+01	0.7	
34	0	789.70	53	1965	1.47	1580.92	1580	8	2.97E-02	144.1	
35	0	798.90	163	2236	2.10	1599.33	1596	9	9.06E-02	52.9	
36	0	813.64	556	3025	1.53	1628.80	1623	12	3.09E-01	20.2	
37	0	897.99	30954	5499	1.67	1797.48	1790	16	1.72E+01	0.8	
38	0	957.92	126	2154	0.89	1917.32	1914	8	7.00E-02	64.4	
39	0	1115.51	30160	3031	1.84	2232.45	2224	18	1.68E+01	0.7	
40	0	1173.18	36375	2377	1.83	2347.76	2338	20	2.02E+01	0.6	
41	0	1242.35	76	417	1.39	2486.07	2482	9	4.20E-02	50.1	
42	0	1266.22	51	311	1.00	2533.79	2531	7	2.85E-02	58.9	
43	4	1325.03	675	769	2.91	2651.39	2644	49	3.75E-01	10.2	5.42E+00
44	4	1332.46	32791	679	2.06	2666.25	2644	49	1.82E+01	0.6	
45	0	1370.53	58	496	0.63	2742.37	2739	10	3.21E-02	73.2	
46	0	1802.77	40	236	8.13	3606.56	3600	21	2.24E-02	96.7	
47	0	1836.04	18364	621	2.35	3673.06	3661	24	1.02E+01	0.8	
48	0	1850.78	251	353	3.41	3702.52	3695	16	1.39E-01	17.9	
49	0	1892.95	11	107	1.08	3786.83	3779	11	6.01E-03	189.5	
50	0	2013.17	28	136	5.20	4027.18	4020	16	1.54E-02	95.8	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM05_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;405
Background date    : 14-SEP-2015 12:56:59
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 17-SEP-2015 12:31:33
Sample ID        : VER_GAM05_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM05              Detector geometry: CAN
Elapsed live time: 0 00:30:00.00      Elapsed real time: 0 00:30:39.16  2.1%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID        :                     Detector SN#       :
Matrix Spike ID :                     LCS ID            :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	5	20.70	184237	23737	1.20	42.91	40	16	1.02E+02	0.3	4.90E+03
2	5	21.94	1125905	25281	1.06	45.38	40	16	6.26E+02	0.1	
3	5	24.81*	284291	23893	1.23	51.12	40	16	1.58E+02	0.2	
4	3	31.99	5047	8565	0.84	65.48	64	7	2.80E+00	2.8	5.39E+01
5	3	33.10	4697	16760	1.05	67.71	64	7	2.61E+00	4.8	
6	2	36.42	4689	16582	0.97	74.34	71	27	2.60E+00	4.8	1.85E+03
7	2	39.92	10251	16921	0.98	81.34	71	27	5.70E+00	2.5	
8	2	43.75*	8020	14603	0.82	89.00	71	27	4.46E+00	3.0	
9	2	46.40*	180551	18673	1.01	94.30	71	27	1.00E+02	0.3	
10	0	49.71	2192	23331	1.20	100.92	99	7	1.22E+00	11.8	
11	0	59.44	131886	26931	1.06	120.39	114	12	7.33E+01	0.4	
12	9	66.02*	1144	10993	1.50	133.55	129	23	6.36E-01	17.4	1.51E+01
13	9	67.64*	2252	16266	2.09	136.78	129	23	1.25E+00	12.1	
14	0	87.98	85759	10771	1.07	177.48	173	10	4.76E+01	0.4	
15	0	122.03	24276	5446	1.07	245.58	240	11	1.35E+01	0.9	
16	0	136.49	3084	4306	1.07	274.51	270	11	1.71E+00	4.5	
17	0	165.82	7159	3691	1.05	333.16	328	11	3.98E+00	2.0	
18	0	199.08*	592	3127	1.13	399.69	396	9	3.29E-01	17.5	
19	0	254.93	170	2419	1.22	511.40	508	8	9.44E-02	50.7	
20	0	310.93	169	2291	2.49	623.41	618	9	9.36E-02	51.8	
21	0	365.34	94	1366	0.98	732.23	729	6	5.23E-02	63.1	
22	0	391.65	3421	2473	1.30	784.86	780	11	1.90E+00	3.3	
23	0	510.95*	942	2708	2.41	1023.47	1016	14	5.23E-01	12.2	
24	0	532.69	148	1581	1.96	1066.94	1063	10	8.21E-02	51.0	
25	0	558.66	80	1211	1.23	1118.88	1115	9	4.43E-02	79.7	
26	0	564.31	273	2211	6.48	1130.17	1123	17	1.52E-01	39.9	
27	0	634.00	98	1170	0.75	1269.54	1265	9	5.43E-02	64.1	
28	0	661.65	34645	2215	1.49	1324.85	1318	15	1.92E+01	0.6	
29	0	727.84*	163	931	2.71	1457.22	1454	8	9.04E-02	33.4	
30	0	898.01	2871	2331	1.82	1797.53	1791	12	1.60E+00	3.8	
31	0	911.07*	137	1055	1.19	1823.64	1821	6	7.63E-02	38.4	
32	0	979.10	145	817	1.08	1959.68	1957	6	8.04E-02	32.4	
33	0	1035.95	58	1189	0.74	2073.35	2070	10	3.20E-02	112.9	
34	0	1115.58	10637	1970	1.85	2232.58	2224	19	5.91E+00	1.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	1124.10	108	885	2.07	2249.62	2244	17	5.98E-02	51.1	2.13E+00
36	1	1127.85	106	633	1.69	2257.12	2244	17	5.90E-02	43.0	
37	0	1173.23	32071	1481	1.85	2347.86	2338	20	1.78E+01	0.6	
38	0	1268.64	90	176	2.88	2538.63	2532	14	5.01E-02	32.9	
39	3	1321.85	71	85	2.65	2645.02	2640	54	3.96E-02	33.2	1.67E+01
40	3	1324.83	90	103	1.99	2651.00	2640	54	5.01E-02	32.2	
41	3	1332.58	30148	197	2.17	2666.49	2640	54	1.67E+01	0.6	
42	0	1354.62	102	203	2.34	2710.56	2703	14	5.68E-02	31.7	
43	0	1477.37	18	143	4.53	2955.99	2945	15	9.87E-03	148.4	
44	0	1485.25	17	92	1.28	2971.74	2967	9	9.50E-03	104.0	
45	0	1501.47	71	156	3.96	3004.18	2995	19	3.97E-02	43.7	
46	0	1836.17	1822	130	2.43	3673.33	3662	20	1.01E+00	2.8	
47	0	1850.97	35	75	2.38	3702.92	3696	13	1.95E-02	53.6	
48	0	1999.09	20	47	0.83	3999.03	3994	11	1.10E-02	70.4	
49	0	2012.49	21	53	3.27	4025.82	4015	15	1.15E-02	81.2	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	24276	85.60*	8.398E+00	5.070E+03	1.980E+04	1.74
	136.47	3084	10.68	7.969E+00	5.442E+03	2.125E+04	9.02
CO-60	1173.23	32071	99.85	1.566E+00	3.079E+04	3.731E+04	1.26
	1332.49	30148	99.98*	1.400E+00	3.235E+04	3.920E+04	1.15
ZN-65	1115.54	10637	50.60*	1.637E+00	1.929E+04	8.789E+04	2.80
Y-88	898.04	2871	93.70	1.970E+00	2.335E+03	7.515E+04	7.69
	1836.06	1822	99.20*	1.039E+00	2.653E+03	8.539E+04	5.60
CD-109	88.03	85759	3.70*	9.345E+00	3.724E+05	8.307E+05	0.82
SN-113	391.70	3421	64.97*	3.884E+00	2.035E+03	5.075E+04	6.58
CS-137	661.66	34645	85.10*	2.542E+00	2.405E+04	2.487E+04	1.23
CE-139	165.86	7159	80.00*	7.164E+00	1.876E+03	2.761E+04	4.05
PB-210	46.54	180551	4.25*	8.626E+00	7.395E+05	7.740E+05	0.56
AM-241	59.54	131886	35.90*	9.406E+00	5.865E+04	5.878E+04	0.74

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM05.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 14-SEP-2015 09:22:33 Acquisition date : 14-SEP-2015 12:56:59
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.78

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5251E+00	-1.04	
[1.54669+/-0.02071]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 9 / 18 / 15

Sample ID : Bkg

Acquisition date : 14-SEP-2015 12:56:59

VMS Gamma Spectroscopy Report generated 15-SEP-2015 05:37:02

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM05__343820.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 343820 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 14-SEP-2015 09:22:33

---- Sample Decay/Count Information ----

Sample Date : 14-SEP-2015 09:22:33 Acquisition date : 14-SEP-2015 12:56:59
 Decay time : 0 03:34:26.26 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.78

---- Detector Parameters ----

Energy cal. time : 3-SEP-2014 07:46:12. Energy cal. oper.: gamma spec user
 Detector name : GAMMA5 Counting geometry:
 Effic. cal. time : 4-SEP-2014 04:50:23. Effic. cal. oper.:

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	25.71	119	979	1.40	52.79	50	7	1.98E-03	45.2	
2	6	44.53	39	355	1.04	90.43	88	12	6.45E-04	68.3	1.79E+00
3	6	46.64	880	402	0.89	94.65	88	12	1.47E-02	4.8	
4	2	51.84	38	66	0.88	105.06	104	9	6.26E-04	24.7	1.49E+00
5	2	53.54	159	558	1.30	108.45	104	9	2.65E-03	27.0	
6	0	63.45	557	743	0.84	128.29	124	9	9.29E-03	9.8	
7	0	66.56	56	503	0.79	134.51	133	6	9.27E-04	65.1	
8	0	74.27	63	635	0.70	149.92	149	6	1.06E-03	63.8	
9	0	77.33	180	523	0.96	156.04	154	6	3.00E-03	21.5	
10	0	84.46	116	666	0.63	170.31	167	7	1.94E-03	37.9	
11	3	92.73	789	560	1.06	186.84	183	12	1.31E-02	5.9	1.52E+00
12	3	94.82	63	657	1.26	191.02	183	12	1.06E-03	81.9	
13	0	112.38	52	590	1.61	226.14	224	7	8.60E-04	79.1	
14	0	139.60	131	589	1.98	280.60	278	8	2.19E-03	33.0	
15	0	143.96	99	686	1.48	289.32	286	9	1.65E-03	48.8	
16	0	185.81	360	596	1.21	373.03	369	8	6.01E-03	12.9	
17	0	198.73	79	455	0.88	398.87	396	7	1.31E-03	46.6	
18	0	205.42	70	431	1.41	412.25	410	7	1.17E-03	50.4	
19	0	238.65	283	451	1.28	478.71	475	8	4.72E-03	14.3	

20	0	338.13	68	381	1.82	677.68	672	10	1.14E-03	54.9	
21	0	351.76	101	283	1.42	704.95	702	8	1.68E-03	30.5	
22	0	412.13	11	301	0.79	825.69	820	9	1.78E-04	295.2	
23	0	511.09	1493	456	2.73	1023.61	1014	19	2.49E-02	4.3	
24	0	569.63	54	162	1.31	1140.69	1137	8	8.96E-04	43.2	
25	0	583.15	122	251	1.48	1167.72	1162	13	2.04E-03	28.1	
26	0	609.51	151	268	1.64	1220.43	1215	12	2.51E-03	23.3	
27	0	669.23	26	160	0.96	1339.87	1334	9	4.26E-04	92.3	
28	0	727.04	57	191	2.43	1455.48	1451	13	9.51E-04	51.4	
29	0	764.70	44	172	4.87	1530.79	1524	14	7.34E-04	64.9	
30	0	802.81	77	231	1.99	1607.00	1600	18	1.29E-03	47.3	
31	0	911.18	60	172	1.50	1823.73	1816	15	9.98E-04	49.5	
32	0	945.83	17	77	1.05	1893.01	1889	8	2.87E-04	91.9	
33	0	969.36	54	105	0.98	1940.06	1934	11	9.04E-04	39.3	
34	0	1001.28	57	54	2.57	2003.90	2000	8	9.53E-04	25.9	
35	0	1033.67	22	105	0.62	2068.67	2061	12	3.63E-04	96.4	
36	0	1043.22	9	81	1.40	2087.75	2086	8	1.43E-04	184.6	
37	0	1130.64	37	64	2.00	2262.57	2257	12	6.19E-04	45.8	
38	0	1228.24	44	74	5.30	2457.74	2451	14	7.32E-04	44.1	
39	0	1293.91	12	81	1.39	2589.04	2582	11	2.03E-04	147.0	
40	1	1460.74	120	54	2.45	2922.61	2915	37	1.99E-03	15.0	4.21E+00
41	1	1467.16	43	37	2.45	2935.45	2915	37	7.15E-04	36.5	
42	1	1472.96	34	16	2.45	2947.03	2915	37	5.66E-04	31.1	
43	0	1513.31	13	95	5.23	3027.72	3009	21	2.08E-04	196.5	
44	0	1668.17	25	40	1.52	3337.33	3331	14	4.22E-04	57.5	
45	0	1677.81	36	37	6.24	3356.60	3346	21	5.99E-04	45.4	
46	0	1764.77	47	40	0.99	3530.45	3525	13	7.77E-04	31.4	
47	0	1884.21	12	36	0.55	3769.24	3760	13	2.01E-04	106.1	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 5

Calibration Date: 9/17/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.878E+04	3.91
Cs-137	661.7	0.851	735.7	2.3365E+04	2.487E+04	6.44
Co-60	1173.2	0.9985	1383	3.7435E+04	3.731E+04	-0.33
Co-60	1332.5	0.9998	1385	3.7440E+04	3.920E+04	4.70

Prepared By: R. Fisher

Date: 9/18/15

Reviewed By: M. Stamp

Date: 9/18/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)558-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 5

Date Performed: 9/17/15

Performed By: RF

High Voltage Power Supply Model No. <u>310GD</u> High Voltage <u>5.00 Kv</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>5</u> Fine Gain <u>0.565</u> Time Constant <u>4 μsec</u> Input polarity <u>Negative</u> BSLR rate <u>12</u> BSLR mode <u>14</u> Threshold <u>19</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>2AC:2</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 6

Geometry: Can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the second standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. Futch

Date: 3/9/16

Reviewed By: M. J. Tammpr

Date: 3/11/16

Effective Date: 3/8/16



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	————	1.215E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	————	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Lahu
J. S. Lahu, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738 Open/Reference Date: 01-APR-15
Name: Mixed Gamma CAN Received: 01-APR-15
Type: Source Material Expires: 01-APR-16
Employee: Maggie Stamps Verified: 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte

Concentration

Analyte

Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST

Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. ---

MGS Certificate Rev 5, 1 October 2013



RC-S-065-130

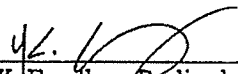
Page 1 of 2

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 2014414



Standard Logbook

Serial ID: 1701

Name: Mixed Gamma CAN

Type: Source Material

Employee: Maggie Stamps

Supplier: Eckert & Zeigler Analytics

Description: 96485

Comments: None

Open/Reference Date: 01-APR-14

Received: 01-APR-14

Expires: 01-APR-40

Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

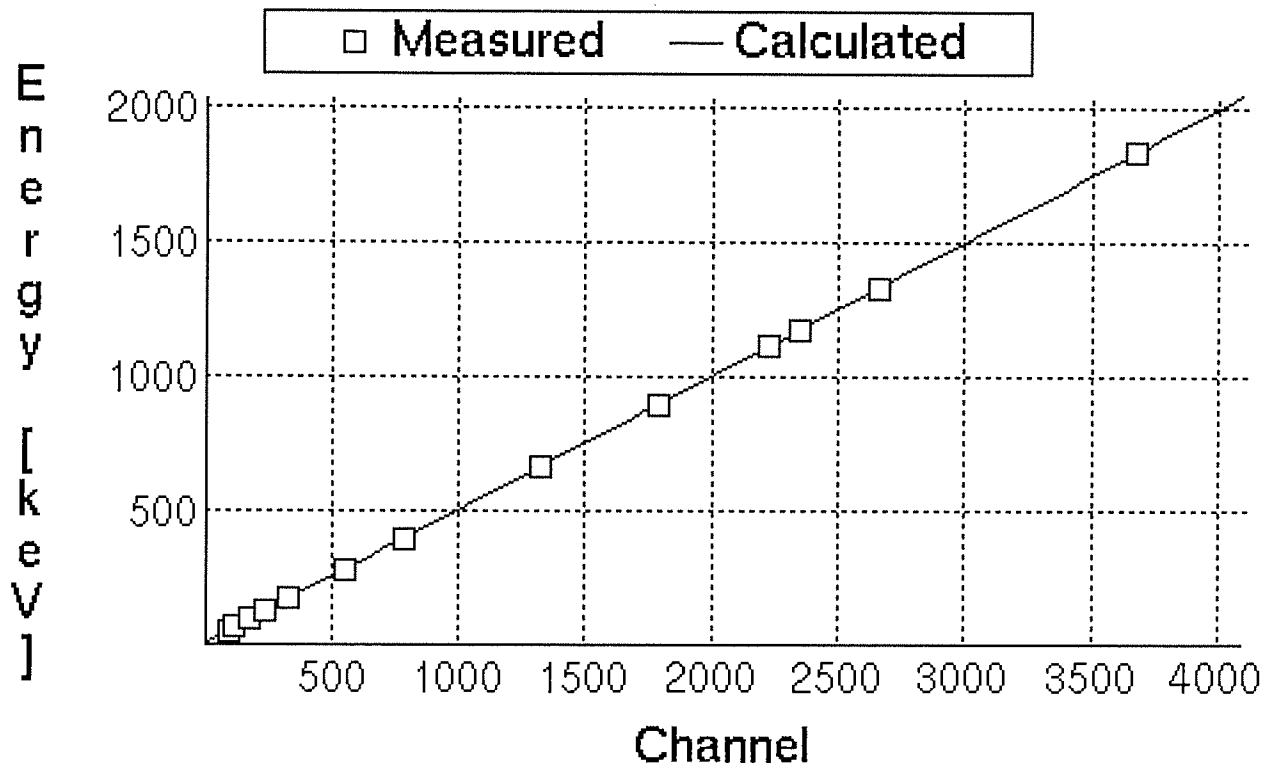
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



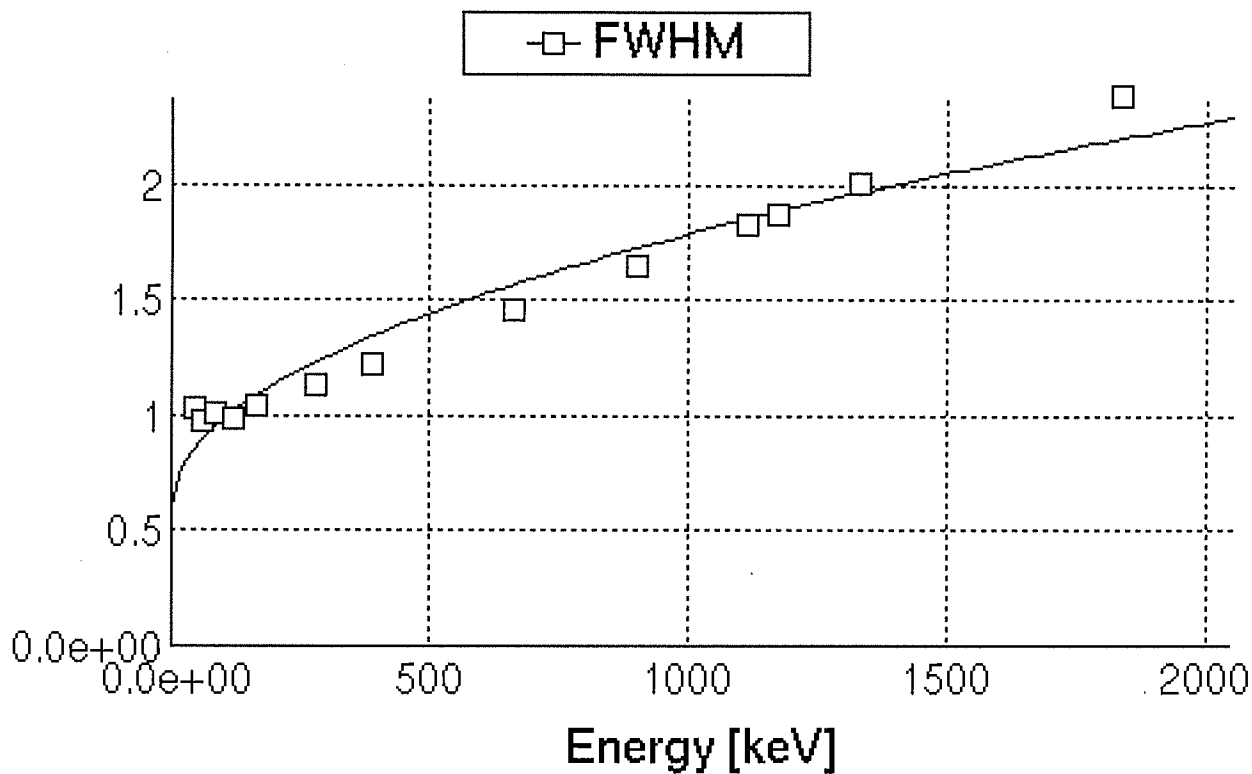
Datasource:

Energy = $9.006e-02 \text{ keV} + 5.004e-01 * \text{Ch} + -1.058e-07 * \text{Ch}^2$ [CHISQ = $3.740e-02$]

FWHM = $6.043e-01 \text{ keV} + 3.743e-02 * E^{1/2}$ [CHISQ = $1.078e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

energy calibration 86 3/4/16



Datasource:

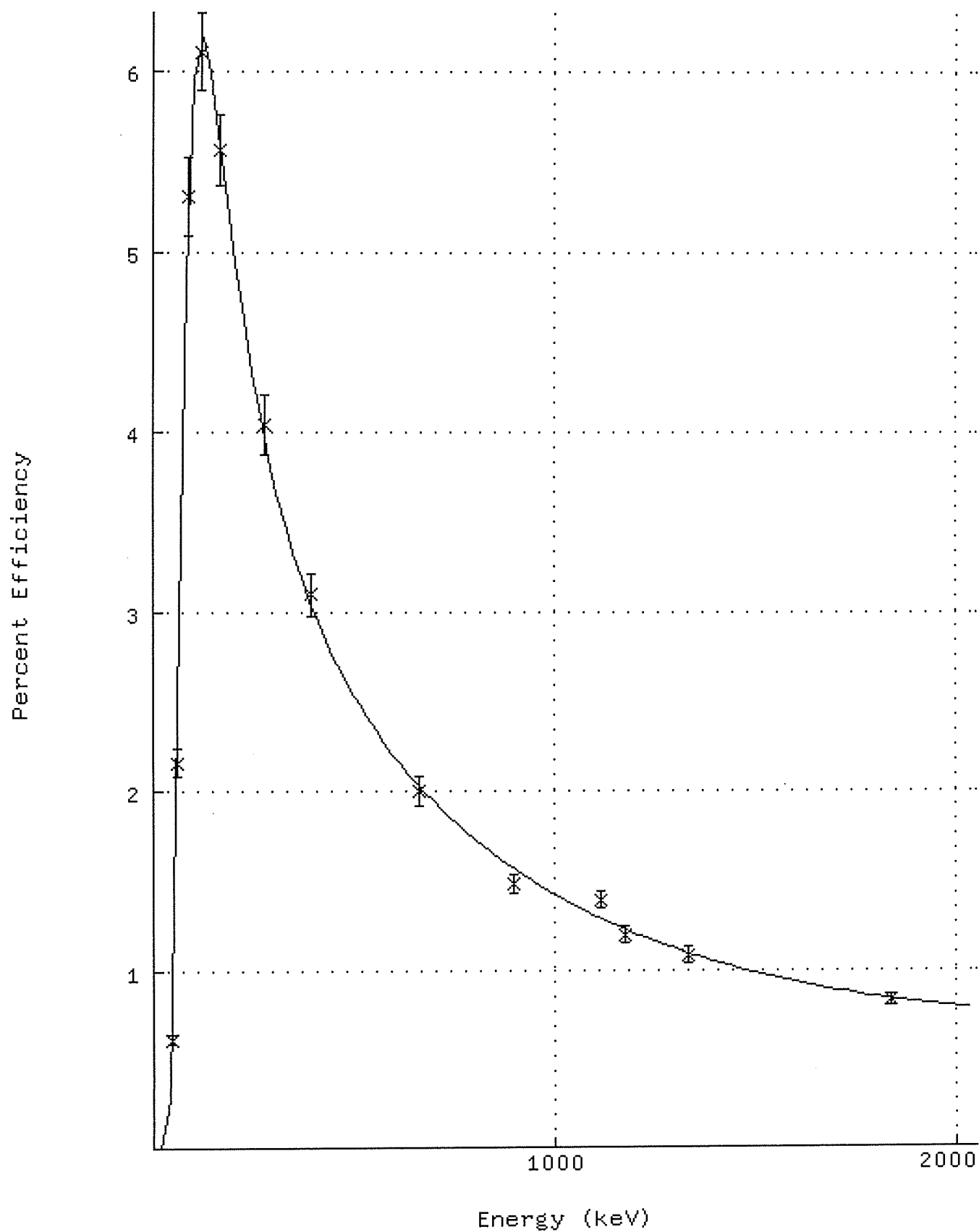
Energy = $9.006e-02 \text{ keV} + 5.004e-01 * \text{Ch} + -1.058e-07 * \text{Ch}^2$ [CHISQ = $3.740e-02$]

FWHM = $6.043e-01 \text{ keV} + 3.743e-02 * E^{1/2}$ [CHISQ = $1.078e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration 86 3/4/16

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM06_CAN.CNF;14
Calib Date: 8-MAR-2016 07:26:
Detector : GAMMA6 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = 9.0058\text{E-}02 + 0.5004*\text{Channel} + -1.0577\text{E-}07*(\text{Channel}**2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.69	46.54	46.48	0.065
2	118.74	59.54	59.51	0.027
3	175.72	88.03	88.02	0.006
4	243.77	122.06	122.08	-0.018
5	331.34	165.86	165.89	-0.034
6	557.85	279.20	279.23	-0.027
7	782.74	391.70	391.74	-0.045
8	1322.39	661.66	661.69	-0.026
9	1795.01	898.04	898.05	-0.012
10	2229.97	1115.60	1115.54	0.062
11	2345.33	1173.23	1173.22	0.015
12	2663.91	1332.49	1332.48	0.014
13	3671.59	1836.06	1836.09	-0.028

FWHM Calibration Report

$$\text{FWHM} = 0.6043 + 3.7426\text{E-}02*(\text{Energy}**1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.03	0.86	0.173
2	59.54	0.98	0.89	0.083
3	88.03	1.00	0.96	0.047
4	122.06	0.98	1.02	-0.035
5	165.86	1.04	1.09	-0.043
6	279.20	1.13	1.23	-0.103
7	391.70	1.23	1.35	-0.120
8	661.66	1.46	1.57	-0.106
9	898.04	1.65	1.73	-0.076
10	1115.60	1.83	1.85	-0.025
11	1173.23	1.87	1.89	-0.014
12	1332.49	2.01	1.97	0.040
13	1836.06	2.39	2.21	0.179

Sample ID : 100218

Acquisition date : 7-MAR-2016 07:46:45

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.200	0.8964	-0.1029	-8.2506E-02	0.1389	-4.7852E-02

Average Deviation =	2.15	%	Reduced Chi-Square =	1.27

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	6.15E-03	2.59E-04	6.20E-03	-0.21	-0.87
2	59.54	2.15E-02	7.76E-04	2.13E-02	0.29	1.04
3	88.03	5.30E-02	2.17E-03	5.26E-02	0.20	0.84
4	122.06	6.10E-02	2.14E-03	6.18E-02	-0.36	-1.26
5	165.86	5.56E-02	1.95E-03	5.62E-02	-0.33	-1.15
6	279.20	4.03E-02	1.67E-03	3.94E-02	0.57	2.37
7	391.70	3.09E-02	1.21E-03	3.05E-02	0.36	1.41
8	661.66	2.00E-02	7.99E-04	2.03E-02	-0.37	-1.50
9	898.04	1.48E-02	5.50E-04	1.56E-02	-1.50	-5.59
10	1115.60	1.39E-02	4.88E-04	1.28E-02	2.18	7.65
11	1173.23	1.19E-02	4.65E-04	1.23E-02	-0.74	-2.89
12	1332.49	1.08E-02	4.22E-04	1.09E-02	-0.22	-0.87
13	1836.06	8.30E-03	3.08E-04	8.35E-03	-0.13	-0.50

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM06_CAN_362802.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 362600 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 7-MAR-2016 07:46:45.
 Decay time : 340 19:46:45.78 % dead time : 1.3%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:53:13.41

----- Detector Parameters -----

Energy cal. time : 4-MAR-2016 08:27:17. Energy cal. oper.: gamma spec user
 Detector name : GAMMA6 Counting geometry: CAN
 Effic. cal. time : 8-MAR-2016 07:26:53. Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.000000 Gaussian Sens. : 10.000000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.000000 Half life ratio : 8.000000
 Abundance limit : 75.000000 WTM error limit : 3.000000
 MDA Width (FWHM) : 3.000000 MDA Confid Level : 5.000000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	34.85	70478	294995	1.92	69.46	68	6	1.17E+00	1.3	
2	0	40.49	1114	417513	1.30	80.74	78	7	1.86E-02	96.2	
3	0	46.37	441579	531392	1.02	92.48	87	10	7.36E+00	0.3	
4	0	49.58	3329	284069	1.37	98.90	97	6	5.55E-02	25.3	
5	6	58.05	39309	385063	1.30	115.82	112	11	6.55E-01	3.6	9.39E+01
6	6	59.49	981726	238594	0.94	118.71	112	11	1.64E+01	0.1	
7	0	67.64	18240	421983	3.10	134.99	131	11	3.04E-01	6.9	
8	0	72.78	1578	238403	0.99	145.25	143	6	2.63E-02	49.0	
9	10	76.22	5639	310761	1.99	152.12	148	33	9.40E-02	16.2	2.33E+03
10	10	77.51	8725	306204	1.37	154.70	148	33	1.45E-01	10.5	
11	10	80.05	25700	411219	1.83	159.78	148	33	4.28E-01	4.7	
12	10	83.39	76135	359952	1.67	166.46	148	33	1.27E+00	1.5	
13	10	88.00	2080676	171276	1.02	175.67	148	33	3.47E+01	0.1	
14	0	102.70	2147	137847	1.00	205.05	203	6	3.58E-02	27.4	
15	0	122.05	920066	232198	1.04	243.72	238	11	1.53E+01	0.1	
16	0	136.47	115515	162275	1.10	272.52	268	10	1.93E+00	0.7	
17	0	165.89	498354	165477	1.09	331.32	326	11	8.31E+00	0.2	
18	0	188.90	464	68214	1.32	377.32	375	5	7.73E-03	84.6	
19	0	255.14	13032	93177	1.16	509.71	506	8	2.17E-01	4.2	
20	0	279.28	26684	95960	1.16	557.94	554	9	4.45E-01	2.2	
21	0	295.16	816	59593	1.49	589.70	588	6	1.36E-02	47.4	

Sample ID : 100218

Acquisition date : 7-MAR-2016 07:46:45

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	310.62	1665	58327	0.96	620.58	619	6	2.78E-02	23.1	
23	0	338.53	426	63456	2.47	676.38	675	7	7.10E-03	98.2	
24	0	391.78	277506	103391	1.26	782.81	777	12	4.63E+00	0.3	
25	0	415.73	269	66342	0.86	830.69	826	8	4.49E-03	165.8	
26	0	452.23	1026	68217	1.85	903.65	901	8	1.71E-02	44.2	
27	0	511.08	53406	113865	2.55	1021.29	1013	17	8.90E-01	1.5	
28	0	609.86	255	45931	1.38	1218.77	1215	8	4.24E-03	145.9	
29	0	624.98	360	34474	0.84	1249.01	1246	6	6.00E-03	81.7	
30	0	635.75	168	46556	0.88	1270.54	1266	8	2.81E-03	222.0	
31	0	661.77	875137	89839	1.47	1322.56	1315	15	1.46E+01	0.1	
32	0	737.12	407	36418	1.43	1473.22	1471	7	6.79E-03	77.9	
33	0	814.08	4088	55869	1.86	1627.10	1623	10	6.81E-02	10.9	
34	0	821.79	1540	46638	2.12	1642.50	1639	8	2.57E-02	24.4	
35	0	898.18	270511	97959	1.67	1795.27	1788	14	4.51E+00	0.3	
36	0	1000.54	465	27563	1.43	1999.98	1997	6	7.74E-03	56.7	
37	0	1088.35	166	24538	1.30	2175.59	2171	6	2.77E-03	149.0	
38	0	1115.72	479292	77605	1.86	2230.33	2220	20	7.99E+00	0.2	
39	0	1173.41	894509	46005	1.89	2345.72	2336	20	1.49E+01	0.1	
40	0	1230.41	198	8584	1.03	2459.74	2457	8	3.29E-03	81.6	
41	0	1291.40	155	6827	1.54	2581.74	2580	8	2.58E-03	92.5	
42	0	1295.05	151	5160	0.77	2589.05	2587	6	2.51E-03	75.9	
43	4	1325.79	5207	15062	2.88	2650.54	2638	43	8.68E-02	5.6	8.59E+01
44	4	1332.71	807487	10179	2.04	2664.37	2638	43	1.35E+01	0.1	
45	0	1765.22	95	2898	0.57	3529.77	3522	12	1.58E-03	114.0	
46	0	1836.41	160911	6218	2.42	3672.23	3660	25	2.68E+00	0.3	
47	0	1932.25	150	1435	1.67	3864.05	3860	9	2.50E-03	46.3	

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM06_CNF;1
 Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM06.CNF;469
 Background date : 6-MAR-2016 12:02:42.
 Sample date : 1-APR-2014 12:00:00. Acquisition date : 8-MAR-2016 08:33:23.
 Sample ID : VER_GAM06_CAN Sample quantity : 1.00000E+00 SAMPLE
 Detector name : GAM06 Detector geometry: CAN
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:01:04.17 0.9%
 Energy tolerance : 1.50000 keV Analyst Initials :
 Abundance limit : 75.00000 Sensitivity : 3.00000
 Batch ID : Detector SN# :
 Matrix Spike ID : LCS ID :

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.34*	51581	51387	1.04	92.42	87	10	7.16E+00	0.9	
2	0	59.39	124331	45567	1.05	118.49	112	12	1.73E+01	0.4	
3	0	66.65*	519	20061	1.07	133.01	130	7	7.21E-02	45.4	
4	0	78.97*	192	18706	0.81	157.62	156	6	2.67E-02	112.7	
5	0	87.97	144382	31374	1.06	175.62	170	12	2.01E+01	0.4	
6	2	119.90	500	7792	1.16	239.43	237	12	6.94E-02	26.3	2.99E+00
7	2	122.04	43431	8480	1.00	243.70	237	12	6.03E+00	0.6	
8	0	136.43	5174	11144	1.09	272.45	268	9	7.19E-01	3.9	
9	0	165.88	10416	11642	1.13	331.31	326	11	1.45E+00	2.2	
10	0	223.14	341	6896	1.38	445.75	443	6	4.74E-02	38.9	
11	0	255.22	232	4748	0.86	509.87	508	5	3.22E-02	45.1	
12	0	283.73	157	5315	1.09	566.85	564	6	2.18E-02	74.0	
13	0	350.49*	134	6224	1.13	700.27	698	8	1.86E-02	102.3	
14	0	371.46	166	4474	1.31	742.20	740	6	2.31E-02	64.1	
15	0	391.88	4112	8977	1.33	783.02	778	12	5.71E-01	4.9	
16	0	445.63	219	6192	1.50	890.45	887	8	3.04E-02	62.6	
17	0	511.06*	2415	8555	2.43	1021.25	1014	15	3.35E-01	8.6	
18	0	661.87	105130	7231	1.49	1322.76	1315	16	1.46E+01	0.4	
19	0	691.78	196	2336	1.01	1382.55	1380	6	2.72E-02	39.6	
20	0	709.93	133	2718	1.27	1418.85	1416	7	1.84E-02	65.8	
21	0	821.98	149	3820	1.40	1642.89	1639	8	2.07E-02	72.4	
22	0	898.31*	3019	7072	1.56	1795.53	1790	12	4.19E-01	5.9	
23	0	948.67	114	4866	1.06	1896.23	1894	8	1.58E-02	106.5	
24	0	993.28	54	3433	0.89	1985.46	1984	8	7.45E-03	189.9	
25	0	1103.13	166	3160	1.67	2205.16	2202	8	2.31E-02	59.2	
26	0	1115.89	20275	6119	1.85	2230.67	2221	17	2.82E+00	1.1	
27	0	1173.61	93787	3756	1.88	2346.13	2337	18	1.30E+01	0.4	
28	0	1272.78	37	482	1.12	2544.50	2542	8	5.12E-03	104.3	
29	0	1332.95	84607	1418	1.98	2664.86	2654	21	1.18E+01	0.4	
30	0	1574.63	44	340	1.03	3148.39	3141	14	6.11E-03	90.1	
31	0	1683.12	16	190	1.16	3365.47	3358	10	2.21E-03	165.9	
32	0	1836.72	1873	355	2.24	3672.86	3665	20	2.60E-01	3.4	
33	0	2025.70	26	131	3.97	4051.09	4042	12	3.62E-03	90.8	
34	0	2039.08*	22	163	3.13	4077.89	4069	15	3.07E-03	128.6	

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	43431	85.60*	6.177E+00	3.083E+03	1.871E+04	1.18
	136.47	5174	10.68	6.083E+00	2.989E+03	1.814E+04	7.87
CO-60	1173.23	93787	99.85	1.226E+00	2.876E+04	3.709E+04	0.72
	1332.49	84607	99.98*	1.091E+00	2.913E+04	3.757E+04	0.72
ZN-65	1115.54	20275	50.60*	1.284E+00	1.171E+04	8.719E+04	2.25
Y-88	898.04	3019	93.70	1.564E+00	7.734E+02	7.657E+04	11.72
	1836.06	1873	99.20*	8.343E-01	8.493E+02	8.408E+04	6.74
CD-109	88.03	144382	3.70*	5.251E+00	2.789E+05	8.067E+05	0.72
SN-113	391.70	4112	64.97*	3.045E+00	7.803E+02	5.511E+04	9.73
CS-137	661.66	105130	85.10*	2.027E+00	2.288E+04	2.392E+04	0.72
CE-139	165.86	10416	80.00*	5.624E+00	8.691E+02	3.056E+04	4.47
PB-210	46.54	51581	4.25*	6.034E-01	7.551E+05	8.021E+05	1.87
AM-241	59.54	124331	35.90*	2.111E+00	6.159E+04	6.178E+04	0.89

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM06.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 6-MAR-2016 12:02:42 Acquisition date : 6-MAR-2016 12:02:42
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.19

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.2346E+00	0.91	
[1.22140+/-0.01447]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: Rf Approval Date: 3 / 9 / 16

Sample ID : Bkg

Acquisition date : 6-MAR-2016 12:02:42

VMS Gamma Spectroscopy Report generated 7-MAR-2016 04:43:06

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM06__362517.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 362517 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 6-MAR-2016 12:02:42.

---- Sample Decay/Count Information ----

Sample Date : 6-MAR-2016 12:02:42. Acquisition date : 6-MAR-2016 12:02:42.
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.19

---- Detector Parameters ----

Energy cal. time : 4-MAR-2016 08:27:17. Energy cal. oper.: gamma spec user
 Detector name : GAMMA6 Counting geometry:
 Effic. cal. time : 13-OCT-2015 04:40:40 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.72	104	412	1.50	93.19	91	6	1.74E-03	32.3	
2	0	63.10	183	572	0.98	125.92	123	8	3.04E-03	23.8	
3	0	66.32	105	482	0.78	132.34	130	7	1.76E-03	35.9	
4	0	77.86	132	592	1.26	155.40	152	8	2.20E-03	33.3	
5	0	92.90	499	757	1.16	185.46	181	10	8.32E-03	11.3	
6	0	98.72	83	479	1.32	197.10	194	8	1.39E-03	46.6	
7	0	140.47	54	482	0.98	280.53	277	7	9.02E-04	68.6	
8	0	144.12	101	577	1.85	287.83	284	9	1.69E-03	44.1	
9	0	159.99	93	478	2.38	319.54	315	8	1.55E-03	42.4	
10	0	185.99	433	570	1.19	371.50	367	10	7.21E-03	11.4	
11	0	238.84	199	478	0.91	477.13	473	9	3.31E-03	21.1	
12	0	351.70	60	309	1.33	702.71	698	9	9.97E-04	54.6	
13	0	389.42	67	197	2.21	778.10	775	9	1.11E-03	39.6	
14	0	482.90	17	195	1.43	964.96	958	10	2.89E-04	152.5	
15	0	511.26	1138	375	2.39	1021.65	1015	16	1.90E-02	4.9	
16	0	543.93	53	161	1.74	1086.96	1083	10	8.90E-04	46.4	
17	0	583.49	87	194	1.46	1166.05	1160	11	1.45E-03	32.9	
18	0	609.78	108	204	1.56	1218.61	1214	10	1.80E-03	26.7	
19	0	727.74	25	105	1.58	1454.45	1450	8	4.12E-04	75.3	

20	0	787.87	13	124	1.39	1574.69	1569	11	2.13E-04	171.0	
21	0	804.20	46	109	1.39	1607.35	1601	11	7.67E-04	46.5	
22	0	847.27	61	119	2.09	1693.46	1687	12	1.01E-03	38.3	
23	0	898.74	13	110	0.83	1796.38	1791	10	2.17E-04	153.5	
24	0	912.13	40	110	1.96	1823.17	1815	11	6.63E-04	51.2	
25	0	926.72	67	150	4.84	1852.34	1841	20	1.12E-03	47.6	
26	1	1000.87	44	77	1.97	2000.64	1995	18	7.39E-04	44.1	1.90E+00
27	1	1004.73	29	54	1.97	2008.36	1995	18	4.83E-04	53.7	
28	0	1098.33	23	68	0.97	2195.56	2189	11	3.87E-04	74.0	
29	0	1120.89	37	75	1.72	2240.67	2234	12	6.13E-04	51.2	
30	0	1141.33	49	63	4.62	2281.55	2275	14	8.17E-04	37.2	
31	0	1461.33	70	57	2.88	2921.69	2915	16	1.16E-03	26.9	
32	0	1531.10	51	88	3.89	3061.28	3045	27	8.57E-04	52.6	
33	0	1642.16	11	41	5.33	3283.51	3273	13	1.76E-04	118.6	
34	0	1965.01	30	25	6.46	3929.62	3917	20	4.92E-04	45.4	
35	0	2034.92	10	11	2.97	4069.55	4062	11	1.72E-04	69.4	
36	0	2037.58	14	5	1.87	4074.89	4072	7	2.25E-04	39.3	
37	0	2042.44	16	18	0.89	4084.62	4079	12	2.66E-04	58.8	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 6

Calibration Date: 3/8/2016

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.178E+04	9.21
Cs-137	661.7	0.851	735.7	2.3365E+04	2.392E+04	2.37
Co-60	1173.2	0.9985	1383	3.7435E+04	3.709E+04	-0.92
Co-60	1332.5	0.9998	1385	3.7440E+04	3.757E+04	0.35

Prepared By: R. Futeh

Date: 3/8/16

Reviewed By: L. J. Stamp

Date: 3/11/16

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 6

Date Performed: 3/9/16

Performed By: RF

High Voltage Power Supply Model No. <u>3105</u> High Voltage <u>3.00KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.914</u> Time Constant <u>6 μsec</u> Input polarity <u>positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>556 A1</u> Address <u>E04:2</u>	

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Detector: Gamma 8

Geometry: can

- 1) Is all calibration standard information enclosed for:
 - the primary standard certificate?
 - the secondary standard(s) documentation?
 - the nuclide library used?
 - the VMS certificate file?
- 2) Is the energy calibration graph included?
- 3) Is the detector efficiency curve printout included?
- 4) Is the efficiency calibration report included and reviewed?
- 5) Is the raw count data included for:
 - the calibration peak report?
 - the calibration verification PEAK report?
 - the calibration verification NID report?
 - the last instrument background?
- 6) Are the calibration verification calculations included?
- 7) Are the instrument settings included:
 - amp, HVPS, ADC settings?

[illegible]

Prepared By: R. Fuchs

Date: 7/10/15

Reviewed By: H. Stamp

Date: 7/14/15

Effective Date: 7/8/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1610843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.626E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.6	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytical Chemistry Laboratory, NIST

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffey
J. S. Laffey, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master	This Source	Uncertainty* , %			Calibration Method*
			Source* γ ps/gram		Type	u_A	u_B	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4 π LS
Am-241	59.5	1.580E+05	—	7.614E+02	0.1	1.6	3.2	4 π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.267E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.367E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.6	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.846E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

MGS Certificate Rev 5, 1 October 2013



RC-S-065-130

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibblits Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

A. Chen
A. Chen, Spectroscopist

Date: 20/04/14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

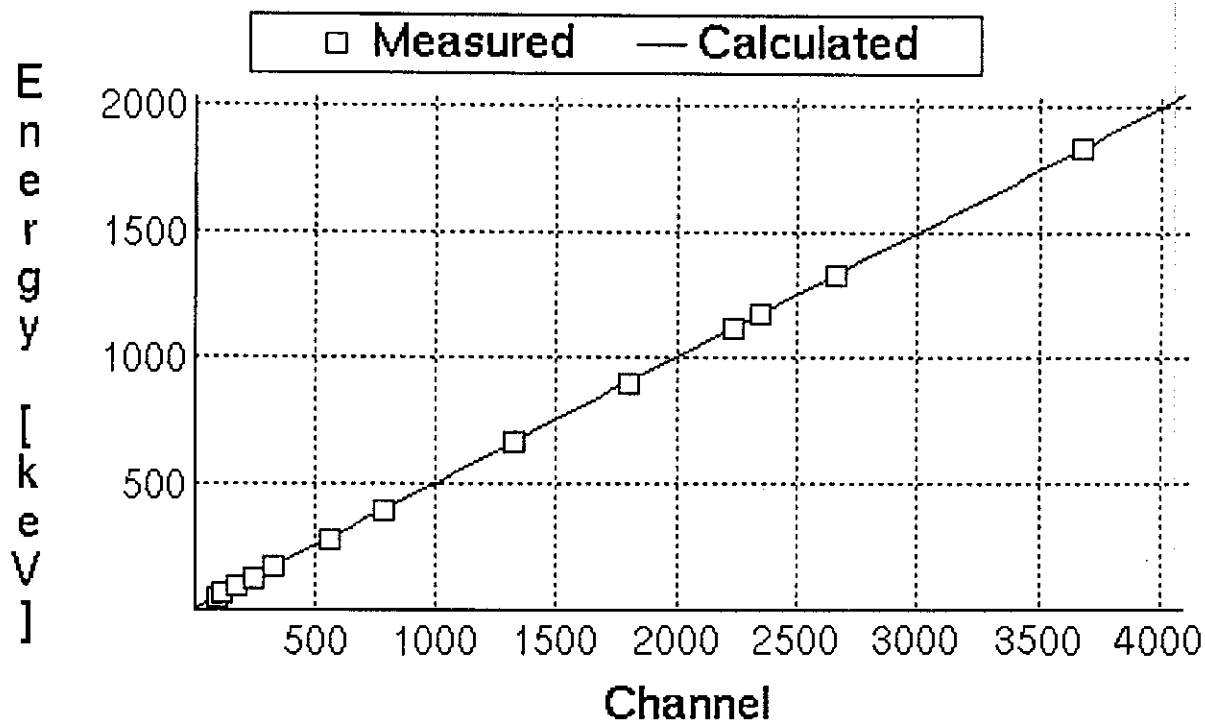
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D			514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



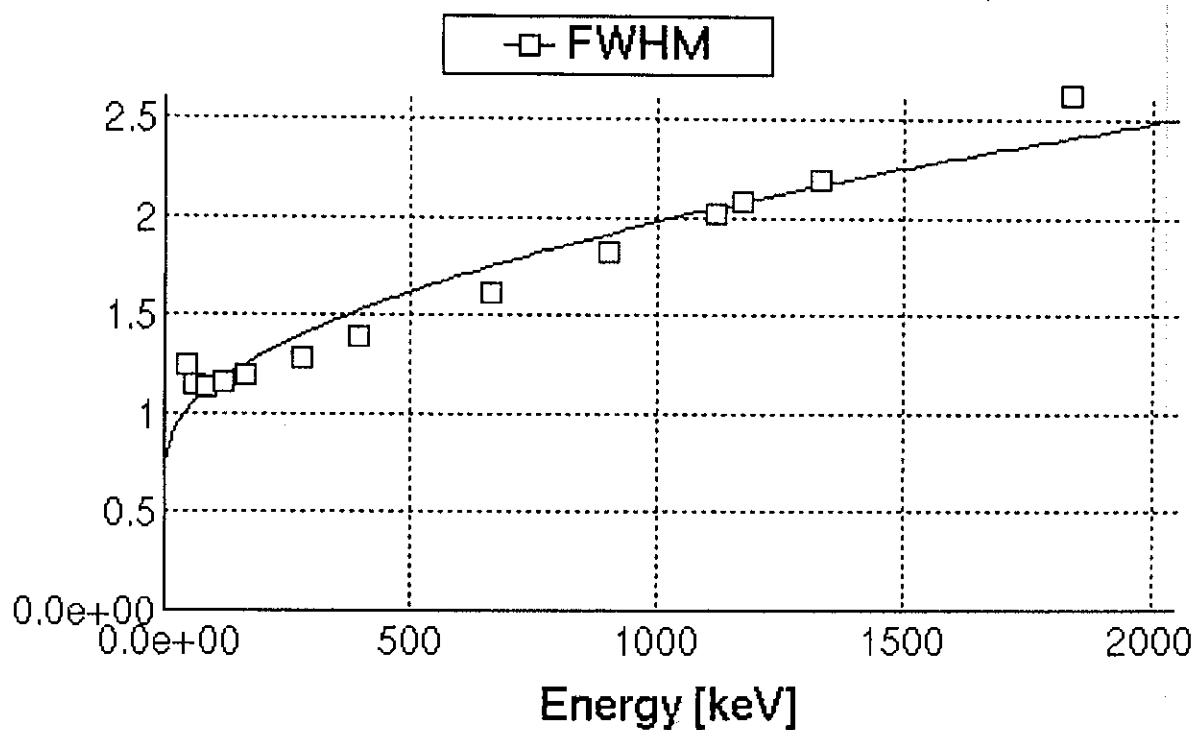
Datasource:

Energy = $-1.056\text{e-}02 \text{ keV} + 4.998\text{e-}01 * \text{Ch} + 1.385\text{e-}08 * \text{Ch}^2$ [CHISQ = $2.736\text{e-}02$]

FWHM = $7.491\text{e-}01 \text{ keV} + 3.883\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $1.488\text{e-}02$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

energy calibration Y8 3/2/15



Datasource:

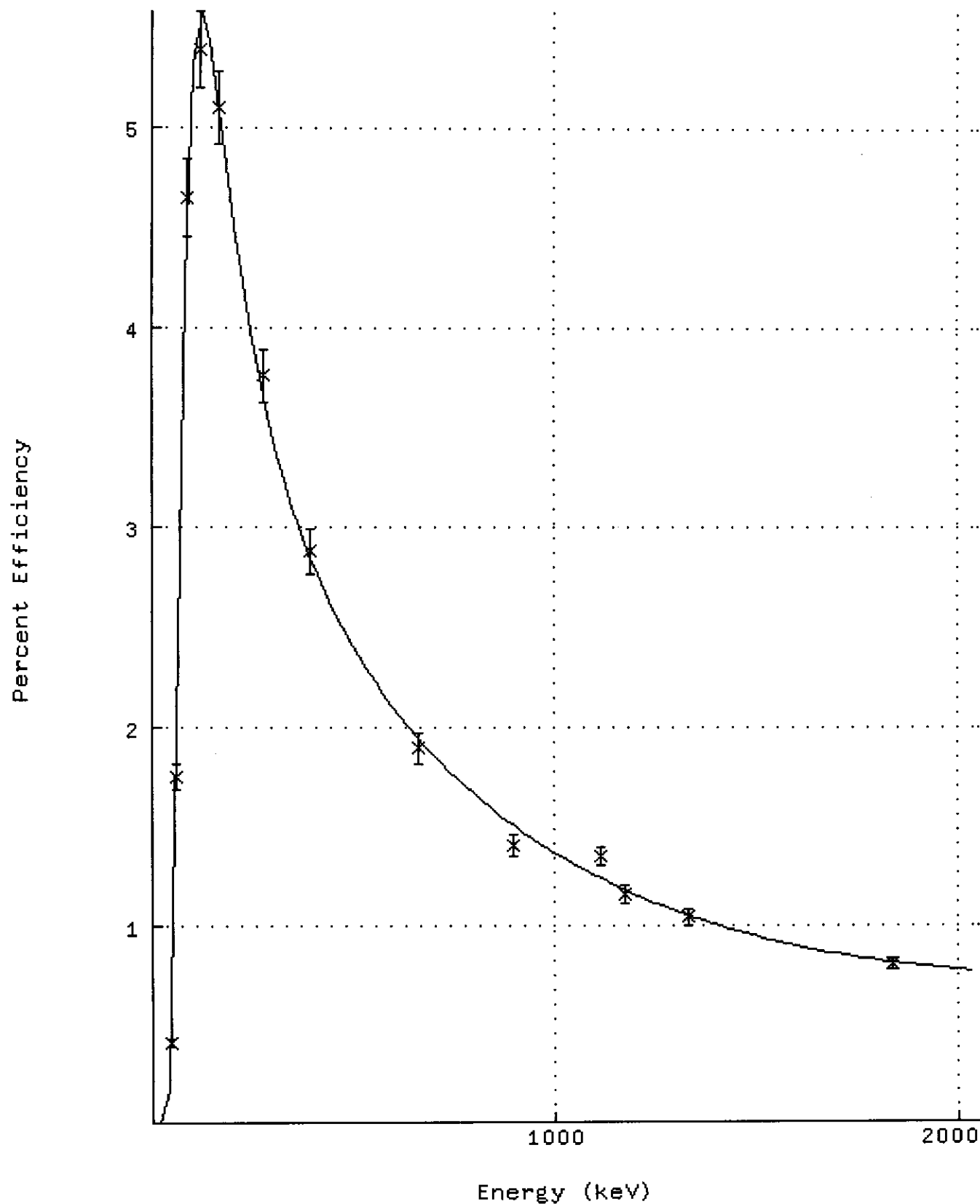
Energy = $-1.056e-02 \text{ keV} + 4.998e-01 * \text{Ch} + 1.385e-08 * \text{Ch}^2$ [CHISQ = $2.736e-02$]

FWHM = $7.491e-01 \text{ keV} + 3.883e-02 * E^{1/2}$ [CHISQ = $1.488e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration 88 3/2/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM08_CAN.CNF;13
Calib Date: 8-JUL-2015 05:34:
Detector : GAMMA8
Geometry/Shelf: CAN/0
Fit type : 5 Deg. Empirical



$$\text{Energy} = -1.0560\text{E-}02 + 0.4998*\text{Channel} + 1.3851\text{E-}08*(\text{Channel}**2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.97	46.54	46.45	0.088
2	119.09	59.54	59.51	0.032
3	176.17	88.03	88.03	-0.003
4	244.30	122.06	122.08	-0.020
5	331.99	165.86	165.91	-0.048
6	558.77	279.20	279.25	-0.046
7	783.85	391.70	391.74	-0.039
8	1323.96	661.66	661.68	-0.019
9	1796.86	898.04	898.04	0.001
10	2232.03	1115.60	1115.54	0.058
11	2347.40	1173.23	1173.21	0.019
12	2666.06	1332.49	1332.49	0.004
13	3673.56	1836.06	1836.09	-0.025

FWHM Calibration Report

$$\text{FWHM} = 0.7491 + 3.8829\text{E-}02*(\text{Energy}**1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.24	1.01	0.223
2	59.54	1.14	1.05	0.092
3	88.03	1.14	1.11	0.023
4	122.06	1.15	1.18	-0.024
5	165.86	1.19	1.25	-0.058
6	279.20	1.28	1.40	-0.118
7	391.70	1.39	1.52	-0.131
8	661.66	1.61	1.75	-0.133
9	898.04	1.83	1.91	-0.086
10	1115.60	2.01	2.05	-0.032
11	1173.23	2.09	2.08	0.007
12	1332.49	2.20	2.17	0.029
13	1836.06	2.62	2.41	0.207

Sample ID : 100218

Acquisition date : 7-JUL-2015 12:40:39

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.242	0.8951	-0.1214	-0.1258	0.1820	-5.8075E-02

Average Deviation = 2.75 % Reduced Chi-Square = 1.88

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	4.14E-03	1.99E-04	4.25E-03	-0.57	-2.72
2	59.54	1.74E-02	6.50E-04	1.69E-02	0.81	3.03
3	88.03	4.65E-02	1.91E-03	4.62E-02	0.14	0.57
4	122.06	5.38E-02	1.90E-03	5.57E-02	-0.97	-3.43
5	165.86	5.09E-02	1.80E-03	5.11E-02	-0.11	-0.38
6	279.20	3.75E-02	1.34E-03	3.63E-02	0.94	3.33
7	391.70	2.88E-02	1.13E-03	2.85E-02	0.23	0.90
8	661.66	1.89E-02	7.65E-04	1.94E-02	-0.59	-2.41
9	898.04	1.40E-02	5.22E-04	1.50E-02	-1.92	-7.16
10	1115.60	1.34E-02	4.77E-04	1.23E-02	2.38	8.44
11	1173.23	1.15E-02	4.54E-04	1.18E-02	-0.47	-1.85
12	1332.49	1.04E-02	4.09E-04	1.05E-02	-0.14	-0.56
13	1836.06	8.05E-03	3.00E-04	8.12E-03	-0.25	-0.95

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM08_CAN_335750.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 335714 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 7-JUL-2015 12:40:39.
 Decay time : 97 00:40:39.09 % dead time : 1.9%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:08.17

---- Detector Parameters ----

Energy cal. time : 2-MAR-2015 11:01:03. Energy cal. oper.: gamma spec user
 Detector name : GAMMA8 Counting geometry: CAN
 Effic. cal. time : 8-JUL-2015 05:34:49. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	23.29	4770	26658	2.03	46.62	45	6	1.32E+00	5.6	
2	0	32.30	319	22112	0.57	64.64	63	5	8.85E-02	70.3	
3	0	46.39	17815	41478	1.06	92.85	87	11	4.95E+00	2.3	
4	0	59.43	48391	41707	1.10	118.93	112	12	1.34E+01	1.0	
5	0	65.87	284	20785	1.26	131.81	130	6	7.90E-02	80.1	
6	1	70.85	1894	22266	0.97	141.79	139	11	5.26E-01	12.7	4.79E-01
7	1	72.90	3687	25608	1.17	145.90	139	11	1.02E+00	7.5	
8	0	76.95	348	18251	1.23	153.98	152	5	9.65E-02	58.6	
9	2	83.18	3258	30554	1.33	166.46	161	21	9.05E-01	9.1	2.66E+02
10	2	88.04	157270	21024	1.20	176.19	161	21	4.37E+01	0.3	
11	5	120.42	2034	20423	1.89	240.96	237	14	5.65E-01	12.9	2.27E+00
12	5	122.12	90229	17678	1.11	244.37	237	14	2.51E+01	0.4	
13	2	134.65	416	8702	0.97	269.46	268	11	1.16E-01	32.3	1.25E+00
14	2	136.52	11687	15184	1.15	273.19	268	11	3.25E+00	2.0	
15	0	165.90	93939	27084	1.21	331.98	325	14	2.61E+01	0.5	
16	0	255.32	2931	13221	1.23	510.90	506	10	8.14E-01	7.6	
17	0	279.24	56656	16355	1.30	558.75	552	14	1.57E+01	0.6	
18	0	305.17	194	6674	1.66	610.64	609	7	5.39E-02	70.1	
19	0	309.97	101	7732	0.62	620.24	618	8	2.80E-02	151.5	
20	0	326.93	133	7327	1.04	654.19	652	8	3.68E-02	112.2	
21	0	352.44	81	6240	1.31	705.21	701	7	2.26E-02	161.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	391.73	67781	13020	1.39	783.84	776	16	1.88E+01	0.5	
23	0	447.68	116	6101	1.16	895.78	892	8	3.24E-02	116.4	
24	0	511.04	6802	9778	2.81	1022.56	1016	15	1.89E+00	3.4	
25	0	612.81	262	4806	2.41	1226.18	1223	8	7.27E-02	46.3	
26	0	630.39	63	5109	1.37	1261.35	1261	8	1.74E-02	198.1	
27	0	646.84	244	5108	2.21	1294.28	1291	8	6.78E-02	51.1	
28	0	661.64	50481	10412	1.62	1323.88	1317	15	1.40E+01	0.6	
29	0	672.16	212	5280	0.86	1344.94	1343	8	5.89E-02	59.7	
30	0	723.57	91	4890	1.39	1447.78	1447	9	2.52E-02	139.0	
31	0	813.83	837	5344	1.65	1628.38	1623	10	2.33E-01	16.6	
32	0	820.11	105	4221	1.41	1640.94	1640	8	2.93E-02	107.0	
33	0	897.98	75066	11102	1.79	1796.74	1787	18	2.09E+01	0.5	
34	0	1115.46	55763	6442	1.92	2231.86	2221	22	1.55E+01	0.6	
35	0	1173.14	56598	3904	2.00	2347.26	2337	19	1.57E+01	0.5	
36	0	1307.15	65	1084	0.51	2615.37	2612	9	1.80E-02	92.5	
37	4	1324.97	1587	2437	3.17	2651.02	2640	33	4.41E-01	7.9	1.47E+01
38	4	1332.41	50898	1631	2.21	2665.91	2640	33	1.41E+01	0.5	
39	0	1364.52	74	894	0.70	2730.15	2726	8	2.05E-02	71.3	
40	0	1771.89	64	310	2.25	3545.13	3542	10	1.78E-02	52.5	
41	4	1789.44	64	131	1.57	3580.25	3578	15	1.77E-02	28.9	2.92E+00
42	4	1792.08	132	349	2.63	3585.52	3578	15	3.67E-02	31.3	
43	4	1797.70	71	298	2.08	3596.76	3592	15	1.98E-02	48.4	9.98E-01
44	4	1801.29	55	194	1.57	3603.95	3592	15	1.52E-02	43.5	
45	0	1835.96	45589	1016	2.50	3673.30	3662	22	1.27E+01	0.5	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM08_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM08.CNF;255
Background date    : 5-JUL-2015 10:55:28.
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 8-JUL-2015 06:34:35.
Sample ID        : VER_GAM08_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name     : GAM08             Detector geometry: CAN
Elapsed live time: 0 00:30:00.00      Elapsed real time: 0 00:30:15.36 0.8%
Energy tolerance  : 1.50000 keV       Analyst Initials :
Abundance limit   : 75.00000          Sensitivity       : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	22.92	2259	7060	1.19	45.88	44	6	1.25E+00	6.2	
2	0	45.86*	9023	13095	1.11	91.79	85	12	5.01E+00	2.7	
3	0	59.06	23192	9868	1.12	118.21	114	11	1.29E+01	1.1	
4	5	86.06*	1218	8871	1.78	172.22	168	15	6.77E-01	21.2	1.56E+00
5	5	87.64*	43759	5032	1.08	175.39	168	15	2.43E+01	0.5	
6	0	121.66	18233	6445	1.16	243.46	236	14	1.01E+01	1.2	
7	0	136.13	2173	3711	1.18	272.40	268	10	1.21E+00	5.7	
8	0	165.55	7850	3179	1.17	331.28	327	10	4.36E+00	1.8	
9	0	203.58	91	2140	1.51	407.37	404	7	5.05E-02	85.0	
10	0	255.24	192	1981	0.86	510.73	508	7	1.07E-01	39.2	
11	0	278.88	119	1848	1.31	558.05	556	7	6.62E-02	60.6	
12	0	295.45*	187	2033	2.78	591.18	588	9	1.04E-01	44.1	
13	0	310.49	141	1861	1.71	621.28	618	8	7.85E-02	53.7	
14	0	362.06	153	1569	1.74	724.47	722	8	8.49E-02	45.6	
15	0	366.30	92	1637	1.47	732.95	730	8	5.09E-02	77.2	
16	0	391.55	3783	2506	1.33	783.48	778	12	2.10E+00	3.1	
17	0	511.07*	1186	3361	2.96	1022.62	1013	22	6.59E-01	12.8	
18	0	560.82	82	1065	1.49	1122.15	1120	8	4.57E-02	69.4	
19	0	661.70*	25137	1978	1.58	1324.00	1317	14	1.40E+01	0.7	
20	0	898.12	3616	2843	1.71	1797.03	1789	17	2.01E+00	3.8	
21	0	1115.89	9492	1823	1.91	2232.73	2223	18	5.27E+00	1.5	
22	0	1161.02	108	702	4.85	2323.02	2316	14	5.99E-02	53.2	
23	0	1173.62	24766	1108	2.02	2348.22	2338	21	1.38E+01	0.7	
24	0	1316.37	64	237	3.13	2633.82	2626	16	3.55E-02	55.6	
25	0	1333.03	22365	412	2.13	2667.15	2657	22	1.24E+01	0.7	
26	0	1483.43	20	107	2.78	2968.04	2962	11	1.12E-02	102.8	
27	0	1521.46	71	108	5.51	3044.13	3037	16	3.93E-02	35.0	
28	0	1528.89	26	105	4.21	3058.99	3052	12	1.43E-02	81.9	
29	0	1594.23	51	74	1.40	3189.72	3186	8	2.81E-02	32.9	
30	0	1643.45	91	177	9.73	3288.19	3271	30	5.04E-02	44.3	
31	0	1695.34	8	66	1.35	3391.99	3383	10	4.35E-03	196.2	
32	0	1720.95	37	60	4.55	3443.23	3436	15	2.04E-02	47.8	
33	0	1753.38	18	22	2.31	3508.10	3504	8	9.87E-03	51.6	
34	0	1760.89	8	44	3.40	3523.13	3514	11	4.44E-03	164.4	

Sample ID : VER_GAM08_CAN

Acquisition date : 8-JUL-2015 06:34:35

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1837.06	2234	116	2.41	3675.51	3667	21	1.24E+00	2.4	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	18233	85.60*	5.569E+00	5.743E+03	1.870E+04	2.38
	136.47	2173	10.68	5.506E+00	5.548E+03	1.806E+04	11.35
CO-60	1173.23	24766	99.85	1.175E+00	3.169E+04	3.744E+04	1.44
	1332.49	22365	99.98*	1.046E+00	3.211E+04	3.793E+04	1.42
ZN-65	1115.54	9492	50.60*	1.231E+00	2.288E+04	8.516E+04	2.94
Y-88	898.04	3616	93.70	1.499E+00	3.866E+03	7.830E+04	7.52
	1836.06	2234	99.20*	8.121E-01	4.163E+03	8.431E+04	4.87
CD-109	88.03	43759	3.70*	4.593E+00	3.866E+05	7.748E+05	1.09
SN-113	391.70	3783	64.97*	2.850E+00	3.067E+03	4.980E+04	6.22
CS-137	661.66	25137	85.10*	1.935E+00	2.292E+04	2.360E+04	1.47
CE-139	165.86	7850	80.00*	5.114E+00	2.881E+03	2.963E+04	3.52
HG-203	70.83	-----	3.69	3.046E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.274E+00	-----	Line Not Found	-----
	279.20	119	81.56*	3.632E+00	6.043E+01	5.907E+04	121.21
PB-210	46.54	9023	4.25*	3.820E-01	8.345E+05	8.682E+05	5.50
AM-241	59.54	23192	35.90*	1.634E+00	5.936E+04	5.948E+04	2.16

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM08.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 5-JUL-2015 10:55:28 Acquisition date : 5-JUL-2015 10:55:28
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.80

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.4075E+00	-1.50	
[1.43016+/-0.01510]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: BF Approval Date: 7 / 10 / 15

Sample ID : Bkg

Acquisition date : 5-JUL-2015 10:55:28

VMS Gamma Spectroscopy Report generated 6-JUL-2015 03:36:09

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM08___335391.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 335391 Sptm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 5-JUL-2015 10:55:28.

---- Sample Decay/Count Information ----

Sample Date : 5-JUL-2015 10:55:28. Acquisition date : 5-JUL-2015 10:55:28.
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.80

---- Detector Parameters ----

Energy cal. time : 2-MAR-2015 11:01:03. Energy cal. oper.: gamma spec user
 Detector name : GAMMA8 Counting geometry:
 Effic. cal. time : 23-JUL-2014 07:24:34 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.61	80	451	0.71	93.28	90	6	1.33E-03	43.6	
2	2	53.07	83	464	1.13	106.21	102	10	1.39E-03	45.3	2.33E+00
3	2	54.50	57	335	0.87	109.08	102	10	9.45E-04	52.5	
4	0	63.55	295	831	0.83	127.19	122	10	4.91E-03	19.2	
5	0	77.43	104	755	1.05	154.96	151	8	1.73E-03	47.4	
6	0	84.19	91	692	1.31	168.49	165	8	1.51E-03	51.2	
7	0	87.28	61	393	1.33	174.67	173	5	1.02E-03	50.4	
8	0	92.45	1092	1115	1.26	185.01	178	14	1.82E-02	7.2	
9	0	98.19	44	478	0.97	196.49	195	6	7.40E-04	79.2	
10	0	109.44	46	618	0.82	219.00	217	7	7.72E-04	89.9	
11	0	113.19	96	660	2.24	226.51	223	8	1.60E-03	47.8	
12	0	140.69	73	688	0.67	281.53	277	8	1.22E-03	63.0	
13	0	144.10	151	610	1.40	288.35	285	8	2.52E-03	29.6	
14	0	163.74	111	618	1.46	327.65	324	9	1.85E-03	41.6	
15	0	185.83	719	858	1.24	371.86	365	13	1.20E-02	9.2	
16	0	198.31	91	685	1.72	396.83	391	10	1.52E-03	54.9	
17	0	238.68	323	608	1.12	477.60	474	10	5.38E-03	15.3	
18	0	270.08	48	305	1.54	540.43	538	7	8.04E-04	62.0	
19	0	295.71	56	389	1.54	591.71	587	9	9.26E-04	65.4	

20	0	338.12	84	290	1.39	676.58	673	8	1.39E-03	36.8	
21	0	352.08	102	302	2.05	704.51	700	9	1.70E-03	32.4	
22	0	511.07	1145	416	2.54	1022.62	1014	17	1.91E-02	5.0	
23	0	521.32	31	139	1.57	1043.12	1041	8	5.25E-04	66.8	
24	0	583.27	163	243	1.37	1167.07	1160	14	2.71E-03	21.8	
25	0	610.02	111	282	0.98	1220.59	1214	14	1.85E-03	33.5	
26	0	662.67	25	176	3.13	1325.94	1320	11	4.17E-04	105.1	
27	0	765.05	23	130	0.53	1530.79	1527	9	3.88E-04	90.3	
28	0	803.25	80	63	2.27	1607.20	1603	8	1.34E-03	20.5	
29	0	836.14	25	85	0.62	1673.02	1669	7	4.19E-04	64.1	
30	3	911.48	110	99	2.56	1823.75	1817	18	1.83E-03	20.9	9.49E-01
31	3	915.44	26	39	1.56	1831.68	1817	18	4.28E-04	49.2	
32	0	1112.00	19	69	1.70	2224.93	2219	12	3.14E-04	89.9	
33	0	1135.04	29	65	1.89	2271.03	2263	13	4.83E-04	60.2	
34	0	1258.40	27	113	7.19	2517.85	2499	23	4.43E-04	106.6	
35	0	1346.86	24	75	5.85	2694.83	2685	16	4.05E-04	82.6	
36	0	1405.61	36	69	8.20	2812.36	2802	21	6.05E-04	59.3	
37	0	1460.87	42	47	0.85	2922.90	2918	11	6.99E-04	35.2	
38	0	1489.88	23	20	1.47	2980.96	2977	9	3.86E-04	40.7	
39	0	1555.10	17	27	0.89	3111.44	3106	9	2.91E-04	58.7	
40	0	1595.78	18	32	3.34	3192.81	3183	13	2.98E-04	69.8	
41	0	1713.67	17	36	2.92	3428.66	3418	16	2.89E-04	81.0	
42	0	1766.21	67	50	1.16	3533.77	3526	21	1.12E-03	28.3	
43	0	1927.15	28	36	9.14	3855.74	3844	21	4.63E-04	57.7	
44	0	2038.33	16	20	2.25	4078.15	4073	10	2.66E-04	60.3	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 8

Calibration Date: 7/7/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.948E+04	5.15
Cs-137	661.7	0.851	735.7	2.3365E+04	2.360E+04	1.00
Co-60	1173.2	0.9985	1383	3.7435E+04	3.744E+04	0.01
Co-60	1332.5	0.9998	1385	3.7440E+04	3.793E+04	1.31

Prepared By: R. Futch

Date: 7/10/15

Reviewed By: M. Stamp

Date: 7/14/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 8

Date Performed: 7/8/15

Performed By: RF

High Voltage Power Supply Model No. <u>3106D</u> High Voltage <u>3.50KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>5</u> Fine Gain <u>1.199</u> Time Constant <u>4.000s</u> Input polarity <u>Positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>6701</u> Gain <u>4K</u>	
AIM Module Model No. <u>556A</u> Address <u>FD4:1</u>	

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gemma 9Geometry: cen

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		
the second standard(s) documentation?	☒		128
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:	☒		
amp, HVPS, ADC settings?			

Prepared By: R. FurchDate: 6/6/16Reviewed By: M. StampDate: 6/6/16Effective Date: 6/3/16

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 103141B

Source Description: 100 mL Solid in Aluminum Can

Product Code: 8403-EG-SD

Customer: GEL Laboratories, LLC

P.O. Number: GEL1613700, Item 3

This standard radionuclide source was prepared from an aliquot measured gravimetrically from a master radionuclide solution calibrated with a germanium gamma-ray spectrometer system. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using germanium gamma-ray spectrometry. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Density of solid matrix: 1.17 g/cm³ ± 3 %.

Reference Date: 01-April-2016

12:00 PM EST

MGS Mixture

Isotope	Gamma-Ray Energy, keV	Half-Life, d	Activity, Bq	Flux, s ⁻¹	Uncertainty			Calibration Method**
					u _A , %	u _B , %	U, %*	
Pb-210	46.5	8.109E+03	2.877E+04	1.223E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	2.262E+03	8.120E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	3.136E+04	1.160E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	7.785E+02	6.664E+02	0.4	1.7	3.4	HPGe
Ce-139	165.9	1.376E+02	1.086E+03	8.688E+02	0.4	1.7	3.6	HPGe
Hg-203	279.2	4.659E+01	2.635E+03	2.149E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.161E+02	1.893E+03	1.230E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	9.294E+02	7.909E+02	0.7	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	3.113E+03	2.917E+03	0.7	1.7	3.7	HPGe
Y-88	1836.1			3.089E+03	0.7	1.7	3.7	
Co-60	1173.2	1.925E+03	1.460E+03	1.458E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5			1.459E+03	0.7	1.8	3.9	

Mixed Gamma (MGS) master solution is EZA's eight isotope mixture which is calibrated quarterly and consists of Cd-109, Co-57, Ce-139, Hg-203, Sn-113, Cs-137, Y-88, and Co-60. ***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." ****Calibration Methods:** 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

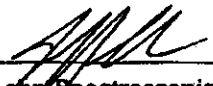
SRS Number: 103141B

This source was wipe tested in its inactive areas with leak test results < 186 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: _____


Z. Dimitrova, Radiochemist

QC Approved by: _____


J. Lahr, Spectroscopist

Date: 13-MAY-16

Standard Logbook

Serial ID: 1782 **Open/Reference Date:** 01-APR-16
Name: Mixed Gamma CAN **Received:** 01-APR-16
Type: Source Material **Expires:** 01-APR-17
Employee: Maggie Stamps **Verified:** 20-MAY-16
Supplier: Eckert & Zeigler Analytics
Description: 103141B
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.18, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty* , %			Calibration Method*
					Type			
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.880E+05	—	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.6	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.086E+02	4.189E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.6	2.439E+02	—	1.499E+03	0.1	1.7	3.8	IC
Co-60	1173.2	1.928E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.928E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laff
J. S. Laff, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738 **Open/Reference Date:** 01-APR-15
Name: Mixed Gamma CAN **Received:** 01-APR-15
Type: Source Material **Expires:** 01-APR-41
Employee: Maggie Stamps **Verified:** 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte	Concentration	Analyte	Concentration

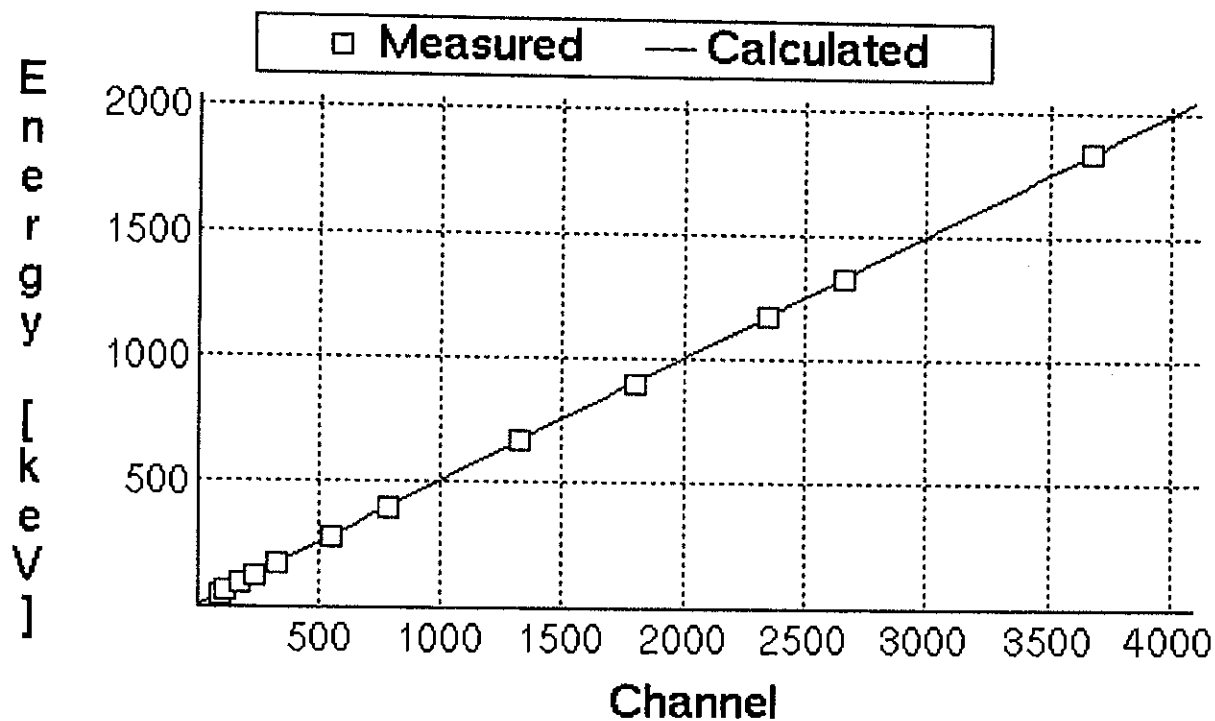
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 103141B
Quantity: 1.00

Assay date: 1-APR-2016 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1223	4.20	4.3	Yes
AM-241	432.60Y	59.5	812	3.60	35.9	Yes
CD-109	461.40D	88.0	1160	4.10	3.7	Yes
CO-57	271.74D	122.1	666	3.40	85.6	Yes
CE-139	137.64D	165.9	869	3.60	80.0	Yes
HG-203	46.59D	279.2	2149	3.50	81.6	Yes
SN-113	115.09D	391.7	1230	3.90	65.0	Yes
CS-137	30.08Y	661.7	791	4.10	85.1	Yes
Y-88	106.63D	898.0	2917	3.70	93.7	Yes
CO-60	1925.28D	1173.2	1458	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1459	3.90	100.0	Yes
Y-88	106.63D	1836.1	3089	3.70	99.2	Yes



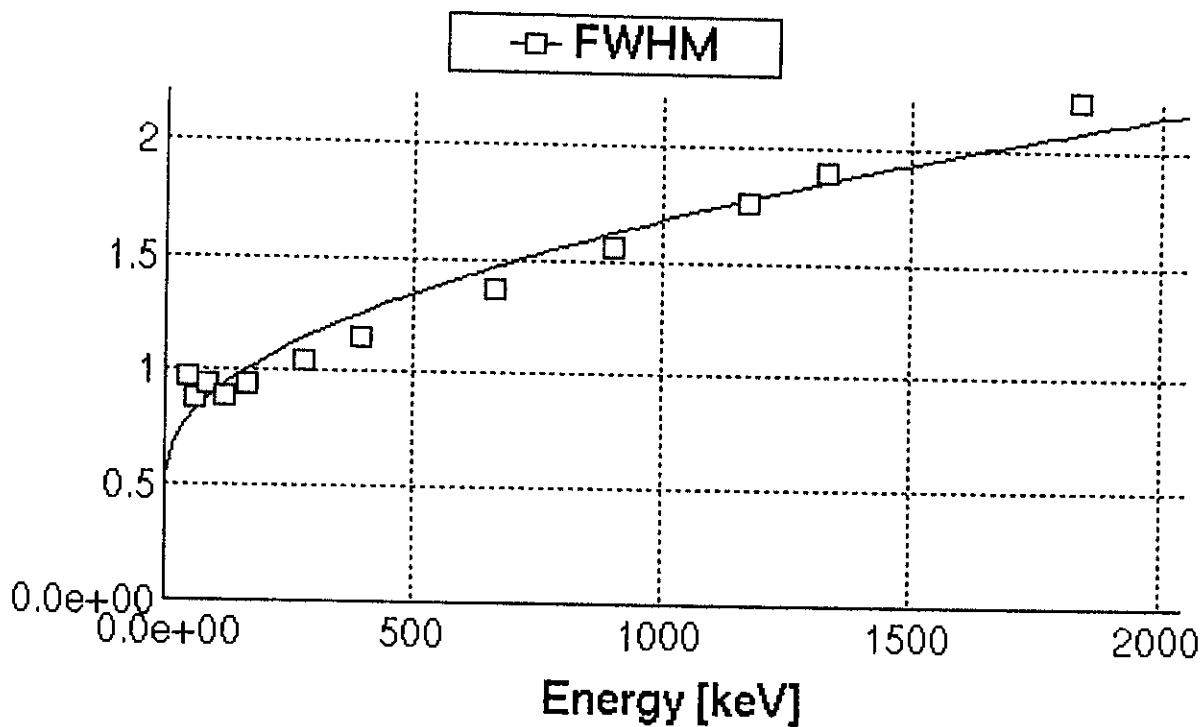
Datasource:

Energy = $1.893e-01 \text{ keV} + 4.998e-01 * \text{Ch} + -1.123e-08 * \text{Ch}^2$ [CHISQ = $1.095e-02$]

FWHM = $5.381e-01 \text{ keV} + 3.602e-02 * E^{1/2}$ [CHISQ = $1.034e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Energy calibration Y9 c/1/16



Datasource:

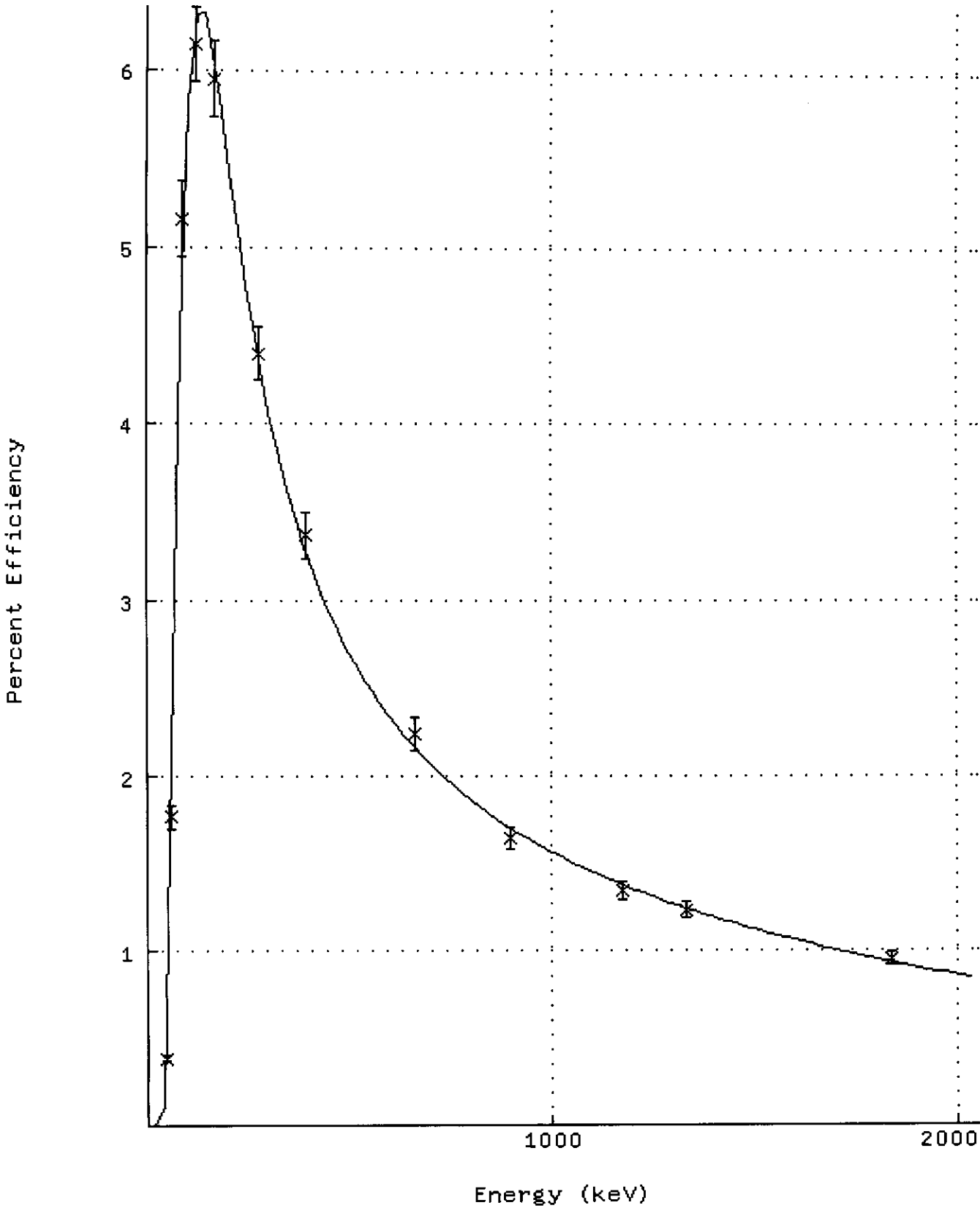
Energy = $1.893e-01 \text{ keV} + 4.998e-01 * \text{Ch} + -1.123e-08 * \text{Ch}^2$ [CHISQ = $1.095e-02$]

FWHM = $5.381e-01 \text{ keV} + 3.602e-02 * E^{1/2}$ [CHISQ = $1.034e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration re 6/1/16

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM09_CAN.CNF;16
Calib Date: 3-JUN-2016 07:32:
Detector : GAMMA9 Geometry : CAN
Fit type : 5 Deg. Linear



$$\text{Energy} = 0.1893 + 0.4998 \cdot \text{Channel} + -1.1226\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.69	46.54	46.52	0.024
2	118.73	59.54	59.53	0.010
3	175.72	88.03	88.02	0.014
4	243.86	122.06	122.07	-0.008
5	331.50	165.86	165.87	-0.012
6	558.29	279.20	279.22	-0.017
7	783.41	391.70	391.73	-0.028
8	1323.54	661.66	661.67	-0.011
9	1796.47	898.04	898.03	0.012
10	2347.12	1173.23	1173.21	0.015
11	2665.81	1332.49	1332.48	0.014
12	3673.55	1836.06	1836.07	-0.013

FWHM Calibration Report

$$\text{FWHM} = 0.5381 + 3.6018\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	0.97	0.78	0.185
2	59.54	0.88	0.82	0.059
3	88.03	0.93	0.88	0.059
4	122.06	0.89	0.94	-0.047
5	165.86	0.94	1.00	-0.065
6	279.20	1.04	1.14	-0.096
7	391.70	1.14	1.25	-0.107
8	661.66	1.37	1.46	-0.098
9	898.04	1.56	1.62	-0.059
10	1173.23	1.76	1.77	-0.010
11	1332.49	1.89	1.85	0.036
12	1836.06	2.22	2.08	0.143

$$\text{Eff} = \exp(a1 \cdot E + a2 + a3/E + a4/E^{**2} + a5/E^{**3} + a6/E^{**4} + a7/E^{**5})$$

a1	a2	a3	a4	a5	a6	a7
-1.7419E-04	-1.819	208.0	-2.1482E+04	8.0416E+05	-1.4616E+07	0.0000E+00

Reduced Chi-Square = 0.870

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	3.88E-03	1.83E-04	3.86E-03	0.09	0.42
2	59.54	1.76E-02	6.51E-04	1.79E-02	-0.34	-1.27
3	88.03	5.15E-02	2.12E-03	4.92E-02	1.08	4.43
4	122.06	6.13E-02	2.10E-03	6.29E-02	-0.74	-2.54
5	165.86	5.94E-02	2.15E-03	6.06E-02	-0.55	-1.98
6	279.20	4.39E-02	1.54E-03	4.33E-02	0.41	1.44
7	391.70	3.36E-02	1.32E-03	3.29E-02	0.60	2.34
8	661.66	2.24E-02	9.24E-04	2.16E-02	0.87	3.61
9	898.04	1.64E-02	6.10E-04	1.70E-02	-0.96	-3.58
10	1173.23	1.34E-02	5.26E-04	1.38E-02	-0.69	-2.69
11	1332.49	1.23E-02	4.82E-04	1.24E-02	-0.21	-0.82
12	1836.06	9.51E-03	3.54E-04	9.29E-03	0.60	2.22

VMS Gamma Spectroscopy Report generated 3-JUN-2016 12:57:24

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM09_CAN_372395.CNF

---- Sample Information ----

Sample Title : CAN 103141B
 Sample ID : 103141B Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 372197 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2016 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2016 12:00:00. Acquisition date : 1-JUN-2016 12:51:13.
 Decay time : 61 00:51:13.03 % dead time : 2.7%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:41.33

---- Detector Parameters ----

Energy cal. time : 1-JUN-2016 09:38:08. Energy cal. oper.: gamma spec user
 Detector name : GAMMA9 Counting geometry: CAN
 Effic. cal. time : 3-JUN-2016 07:32:22. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : LINEAR Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.52	17520	36267	0.79	92.69	88	9	4.87E+00	2.1	
2	0	59.58	52923	36729	0.79	118.83	114	9	1.47E+01	0.8	
3	0	67.40	50	21787	0.58	134.48	132	5	1.40E-02	438.7	
4	4	70.93	4116	22465	0.88	141.55	138	12	1.14E+00	5.7	5.56E-01
5	4	72.96	7754	22092	0.83	145.60	138	12	2.15E+00	3.1	
6	10	83.09	9080	50984	2.25	165.86	160	24	2.52E+00	4.7	2.49E+02
7	10	85.44	5238	31362	1.16	170.58	160	24	1.46E+00	5.8	
8	10	88.10	196250	22968	0.96	175.89	160	24	5.45E+01	0.3	
9	0	122.13	127048	34126	0.85	243.98	239	10	3.53E+01	0.4	
10	0	136.50	16463	30027	0.94	272.74	268	10	4.57E+00	2.1	
11	0	165.92	137918	29764	1.03	331.61	326	12	3.83E+01	0.4	
12	0	255.14	4940	14606	1.02	510.12	506	9	1.37E+00	4.6	
13	2	276.56	265	7478	1.13	552.98	551	14	7.37E-02	48.3	1.58E+01
14	2	279.24	137128	8243	1.06	558.34	551	14	3.81E+01	0.3	
15	0	391.71	103981	12064	1.19	783.37	777	13	2.89E+01	0.4	
16	0	510.92	1887	9593	2.96	1021.90	1016	13	5.24E-01	10.9	
17	0	661.58	63727	9674	1.39	1323.35	1318	12	1.77E+01	0.5	
18	0	691.33	116	5577	0.64	1382.88	1382	7	3.21E-02	107.5	
19	0	778.43	50	3755	0.92	1557.17	1556	8	1.39E-02	212.5	
20	0	813.68	1545	5755	1.73	1627.69	1622	12	4.29E-01	10.1	
21	0	884.37	130	3936	1.29	1769.15	1766	8	3.60E-02	84.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	897.88	116599	7751	1.58	1796.17	1789	15	3.24E+01	0.3	
23	0	926.60	216	2824	1.78	1853.65	1851	6	5.99E-02	39.6	
24	0	1042.53	125	4591	1.52	2085.61	2079	12	3.46E-02	109.3	
25	0	1064.46	175	2924	0.68	2129.50	2127	8	4.86E-02	54.1	
26	0	1172.97	69177	4849	1.75	2346.64	2338	17	1.92E+01	0.4	
27	0	1235.02	50	1523	1.27	2470.80	2467	8	1.38E-02	136.5	
28	0	1268.34	47	1599	1.03	2537.47	2535	9	1.32E-02	152.6	
29	6	1324.77	2622	3639	3.28	2650.40	2640	36	7.28E-01	6.0	8.39E+00
30	6	1332.20	63171	2178	1.93	2665.26	2640	36	1.75E+01	0.4	
31	0	1347.72	81	1399	1.27	2696.32	2693	8	2.26E-02	80.1	
32	0	1369.30	50	1388	0.93	2739.49	2737	8	1.39E-02	129.3	
33	0	1381.10	90	1526	2.94	2763.11	2759	9	2.50E-02	78.9	
34	0	1531.27	88	1845	1.66	3063.61	3060	8	2.44E-02	85.1	
35	0	1835.65	71304	1479	2.22	3672.72	3662	21	1.98E+01	0.4	
36	0	1943.55	54	202	1.84	3888.62	3885	8	1.50E-02	48.4	
37	0	1993.16	24	325	3.34	3987.91	3982	12	6.69E-03	151.5	

VAX/VMS Nuclide Identification Report Generated 3-JUN-2016 08:09:52.27

```

*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM09_CAN.CNF;1
Background file     : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09_CAN.CNF;317
Background date      : 30-MAY-2016 07:33:48
Sample date         : 1-APR-2015 12:00:00. Acquisition date : 3-JUN-2016 07:38:33.
Sample ID          : VER_GAM09_CAN          Sample quantity : 1.00000E+00 SAMPLE
Detector name      : GAM09                 Detector geometry: CAN
Elapsed live time   : 0 00:30:00.00         Elapsed real time: 0 00:30:21.82 1.2%
Energy tolerance    : 1.50000 keV           Analyst Initials :
Abundance limit     : 75.00000              Sensitivity        : 3.00000
Batch ID           :                      Detector SN#       :
Matrix Spike ID    :                      LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.53	8548	9148	0.77	92.71	88	9	4.75E+00	2.3	
2	0	59.59	25407	8704	0.76	118.85	114	9	1.41E+01	0.9	
3	0	67.61	81	4724	0.98	134.89	133	5	4.47E-02	128.4	
4	8	87.15	1599	8244	1.87	174.00	170	12	8.89E-01	15.7	1.49E+00
5	8	88.13	50785	4991	0.83	175.95	170	12	2.82E+01	0.5	
6	0	122.13	23024	5442	0.83	243.98	239	10	1.28E+01	0.9	
7	0	136.57*	2845	4100	0.90	272.88	269	9	1.58E+00	4.5	
8	0	165.91	10497	4320	1.05	331.58	326	11	5.83E+00	1.6	
9	0	255.33	344	2668	1.34	510.50	507	8	1.91E-01	26.5	
10	0	261.42	86	1954	0.56	522.69	520	6	4.75E-02	82.4	
11	0	279.06	213	2180	1.28	557.98	555	7	1.18E-01	37.0	
12	0	341.46	92	1829	1.42	682.84	682	7	5.13E-02	77.2	
13	0	374.43	82	1464	0.97	748.79	747	6	4.56E-02	74.6	
14	0	391.67	5363	2819	1.16	783.30	778	11	2.98E+00	2.4	
15	0	510.71*	1401	2721	2.73	1021.47	1015	14	7.78E-01	8.3	
16	0	535.96	143	1273	2.29	1072.00	1069	8	7.97E-02	43.9	
17	0	661.49	29897	2419	1.42	1323.17	1316	15	1.66E+01	0.7	
18	0	868.71	57	1433	1.19	1737.82	1735	8	3.19E-02	114.8	
19	0	897.75	5503	2935	1.45	1795.92	1788	16	3.06E+00	2.6	
20	0	953.85	103	1336	1.07	1908.16	1904	7	5.71E-02	60.0	
21	0	1115.14	13028	1761	1.72	2230.92	2223	16	7.24E+00	1.1	
22	0	1172.78	29795	1148	1.78	2346.25	2338	17	1.66E+01	0.6	
23	0	1213.65	53	305	1.18	2428.03	2425	9	2.96E-02	60.4	
24	0	1324.59	66	322	2.53	2650.03	2645	11	3.64E-02	54.4	
25	0	1331.99	27245	489	1.85	2664.84	2656	19	1.51E+01	0.6	
26	0	1437.52	24	202	3.34	2876.00	2871	15	1.35E-02	129.2	
27	0	1457.10	24	125	0.54	2915.18	2909	9	1.35E-02	85.6	
28	0	1474.72	42	212	4.37	2950.45	2944	16	2.35E-02	78.4	
29	0	1713.62	22	93	1.09	3428.50	3420	13	1.20E-02	95.1	
30	0	1781.89	30	44	1.31	3565.13	3561	11	1.67E-02	46.5	
31	0	1792.01	35	115	7.77	3585.37	3572	22	1.92E-02	81.0	
32	0	1835.32	3210	116	2.22	3672.04	3664	18	1.78E+00	1.9	
33	0	1881.57	14	32	1.33	3764.59	3759	9	7.83E-03	78.3	
34	0	1889.15	45	34	3.83	3779.77	3772	15	2.51E-02	31.8	

Peak Search Report (continued)

Sample ID : VER_GAM09_CAN

Page : 2

Acquisition date : 3-JUN-2016 07:38:33

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1979.80	27	50	1.96	3961.17	3956	13	1.48E-02	57.5	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	23024	85.60*	6.290E+00	6.421E+03	1.917E+04	1.78
	136.47	2845	10.68	6.345E+00	6.304E+03	1.882E+04	8.95
CO-60	1173.23	29795	99.85	1.377E+00	3.253E+04	3.797E+04	1.27
	1332.49	27245	99.98*	1.240E+00	3.300E+04	3.851E+04	1.27
ZN-65	1115.54	13028	50.60*	1.434E+00	2.695E+04	9.111E+04	2.27
Y-88	898.04	5503	93.70	1.701E+00	5.183E+03	8.419E+04	5.16
	1836.06	3210	99.20*	9.298E-01	5.226E+03	8.488E+04	3.86
CD-109	88.03	50785	3.70*	4.930E+00	4.180E+05	7.961E+05	0.99
SN-113	391.70	5363	64.97*	3.286E+00	3.772E+03	4.991E+04	4.71
CS-137	661.66	29897	85.10*	2.157E+00	2.445E+04	2.512E+04	1.36
CE-139	165.86	10497	80.00*	6.059E+00	3.252E+03	2.819E+04	3.11
HG-203	70.83	-----	3.69	3.208E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.448E+00	-----	Line Not Found	-----
	279.20	213	81.56*	4.331E+00	9.054E+01	5.341E+04	73.99
PB-210	46.54	8548	4.25*	3.855E-01	7.835E+05	8.127E+05	4.59
AM-241	59.54	25407	35.90*	1.792E+00	5.930E+04	5.941E+04	1.82

Flag: "*" = Keyline

Sample ID : Bkg Acquisition date : 30-MAY-2016 07:33:48 Page : 1

VMS Gamma Spectroscopy Report generated 31-MAY-2016 00:14:23

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM09__371849.CN

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 371849 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 30-MAY-2016 07:33:48

---- Sample Decay/Count Information ----

Sample Date : 30-MAY-2016 07:33:48 Acquisition date : 30-MAY-2016 07:33:48
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.78

---- Detector Parameters ----

Energy cal. time : 21-MAY-2015 12:48:06 Energy cal. oper.: gamma spec user
 Detector name : GAMMA9 Counting geometry:
 Effic. cal. time : 29-MAY-2015 12:18:00 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.12	307	491	0.97	126.49	123	7	5.11E-03	13.3	
2	0	66.08	49	532	1.05	132.42	131	7	8.15E-04	79.8	
3	0	71.68	83	638	1.75	143.62	140	8	1.38E-03	53.9	
4	0	74.67	67	402	0.57	149.59	148	5	1.11E-03	47.0	
5	0	84.10	105	492	1.24	168.45	165	7	1.74E-03	36.5	
6	0	92.69	905	727	1.00	185.64	181	10	1.51E-02	6.5	
7	0	98.21	72	365	0.65	196.68	194	6	1.20E-03	43.4	
8	0	105.06	60	351	1.17	210.37	208	6	1.01E-03	50.7	
9	0	112.81	82	536	1.10	225.86	222	8	1.36E-03	50.5	
10	0	137.32	91	368	0.92	274.88	272	6	1.51E-03	35.3	
11	0	142.12	245	752	4.41	284.48	278	13	4.08E-03	24.0	
12	0	185.79	638	630	1.03	371.82	368	10	1.06E-02	8.4	
13	0	198.06	84	418	0.93	396.36	393	7	1.40E-03	41.9	
14	0	205.51	62	693	2.93	411.27	405	12	1.04E-03	85.6	
15	0	210.15	46	323	1.21	420.54	418	6	7.62E-04	63.8	
16	0	238.57	167	468	1.07	477.37	473	9	2.78E-03	24.7	
17	0	292.08	40	278	1.24	584.39	581	7	6.60E-04	71.5	
18	0	338.82	50	256	1.47	677.88	675	7	8.33E-04	54.9	
19	0	351.89	53	293	1.33	704.00	701	8	8.91E-04	57.1	

20	0	377.88	26	126	1.40	755.99	754	5	4.34E-04	67.4	
21	0	449.38	22	198	1.10	898.99	897	8	3.61E-04	114.5	
22	0	491.27	27	184	0.60	982.76	978	9	4.46E-04	93.9	
23	0	511.36	1325	430	2.54	1022.95	1015	17	2.21E-02	4.5	
24	0	521.11	60	163	1.98	1042.45	1038	10	9.97E-04	41.9	
25	0	558.20	66	209	1.21	1116.63	1112	12	1.09E-03	45.7	
26	0	567.80	48	135	1.48	1135.83	1132	7	7.98E-04	42.7	
27	0	583.90	81	158	2.77	1168.04	1164	9	1.36E-03	30.1	
28	0	609.52	40	248	0.84	1219.27	1216	9	6.65E-04	72.6	
29	0	633.91	24	154	2.78	1268.05	1264	9	3.98E-04	95.7	
30	0	651.72	21	101	0.64	1303.67	1300	6	3.48E-04	79.7	
31	0	802.62	72	114	1.20	1605.48	1598	13	1.20E-03	33.0	
32	0	839.27	19	126	0.51	1678.79	1675	9	3.17E-04	108.9	
33	0	912.56	68	90	1.24	1825.36	1819	12	1.14E-03	30.6	
34	0	1002.11	83	146	1.51	2004.49	1996	17	1.39E-03	34.8	
35	0	1190.74	29	71	2.68	2381.77	2371	15	4.82E-04	66.3	
36	0	1236.15	25	44	2.20	2472.60	2468	8	4.17E-04	50.1	
37	0	1306.50	19	31	1.43	2613.31	2610	8	3.13E-04	56.9	
38	5	1461.46	79	33	2.51	2923.27	2918	27	1.31E-03	18.2	1.03E+00
39	5	1466.77	31	57	3.13	2933.89	2918	27	5.22E-04	63.7	
40	0	1503.55	42	36	4.20	3007.48	3001	12	7.02E-04	33.2	
41	0	1519.29	9	33	0.47	3038.95	3034	10	1.56E-04	115.6	
42	0	1565.13	8	41	0.82	3130.65	3125	10	1.40E-04	145.2	
43	1	1570.11	29	38	2.19	3140.60	3135	19	4.79E-04	40.0	7.05E+00
44	1	1573.93	22	21	2.19	3148.25	3135	19	3.68E-04	52.5	
45	0	1594.80	37	48	3.97	3190.00	3181	16	6.17E-04	45.0	
46	0	1618.30	31	46	0.87	3237.00	3227	18	5.11E-04	56.4	
47	0	1625.60	37	21	2.84	3251.61	3245	14	6.17E-04	31.0	
48	0	1633.21	25	35	3.41	3266.82	3260	14	4.17E-04	54.0	
49	4	1765.71	48	49	3.05	3531.87	3523	24	7.98E-04	36.7	3.11E+00
50	4	1770.95	26	29	3.05	3542.36	3523	24	4.27E-04	39.8	
51	0	1901.05	59	52	7.85	3802.61	3786	31	9.77E-04	39.3	
52	0	1927.36	21	25	4.17	3855.24	3842	17	3.50E-04	59.1	
53	0	1962.21	13	12	2.19	3924.94	3918	11	2.20E-04	60.0	

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM09.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 30-MAY-2016 07:33:48 Acquisition date : 30-MAY-2016 07:33:48
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.78

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.2853E+00	1.37	
[1.26523+/-0.01466]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 6 / 6 / 16

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 9

Calibration Date: 6/1/2016

Geometry: CAN

Manufacturer Standard Id: 100218

GEL Standard Id: 1738

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	760.8	5.7276E+04	5.941E+04	3.73
Cs-137	661.7	0.851	740.9	2.3530E+04	2.512E+04	6.76
Co-60	1173.2	0.9985	1405	3.8030E+04	3.797E+04	-0.16
Co-60	1332.5	0.9998	1407	3.8035E+04	3.851E+04	1.25

Prepared By: R. Fitch

Date: 6/6/16

Reviewed By: M. Stamp

Date: 6/6/16

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 9

Date Performed: 5/9/16

Performed By: RF

High Voltage Power Supply Model No. <u>3106 D</u> High Voltage <u>2.50 kV</u>	Spectroscopy Amplifier Model No. <u>671</u> Course Gain <u>80</u> Fine Gain <u>1.746</u> Time Constant <u>6 μsec</u> Input polarity <u>positive</u> BSLR rate <u>1 n</u> BSLR mode <u>ng</u> Threshold <u>14</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>556 A</u> Address <u>D7A:2</u>	

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gamma 9Geometry: 2LmB

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1780
the second standard(s) documentation?	☒		1742
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: P. FurchDate: 6/9/16Reviewed By: M. StampDate: 6/9/16Effective Date: 6/7/16



Eckert & Ziegler

Analytics

1780

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 103139

Source Description: 2.0 Liter Solid in 230G GA-MA Beaker

Product Code: 8403-EG-SD

Customer: GEL Laboratories, LLC

P.O. Number: GEL1613700, Item 1

This standard radionuclide source was prepared from an aliquot measured gravimetrically from a master radionuclide solution calibrated with a germanium gamma-ray spectrometer system. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using germanium gamma-ray spectrometry. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST."

Density of solid matrix: 1.17 g/cm³ ± 3 %.

Reference Date: 01-April-2016

12:00 PM EST

MGS Mixture

Isotope	Gamma-Ray Energy, keV	Half-Life, d	Activity, Bq	Flux, s ⁻¹	Uncertainty			Calibration Method**
					u _A , %	u _B , %	u _C , %	
Pb-210	46.5	8.109E+03	3.888E+04	1.528E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	2.813E+03	1.010E+03	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	3.900E+04	1.433E+03	0.6	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	9.683E+02	8.288E+02	0.4	1.7	3.4	HPGe
Ce-139	166.9	1.375E+02	1.351E+03	1.081E+03	0.4	1.7	3.6	HPGe
Hg-203	279.2	4.659E+01	3.277E+03	2.673E+03	0.3	1.7	3.6	HPGe
Sn-113	391.7	1.161E+02	2.355E+03	1.890E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.156E+03	9.837E+02	0.7	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	3.872E+03	3.628E+03	0.7	1.7	3.7	HPGe
Y-88	1836.1			3.841E+03	0.7	1.7	3.7	
Co-60	1173.2	1.928E+03	1.816E+03	1.813E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5			1.815E+03	0.7	1.8	3.9	

Mixed Gamma (MGS) master solution is EZA's eight isotope mixture which is calibrated quarterly and consists of Cd-109, Co-57, Ce-139, Hg-203, Sn-113, Cs-137, Y-88, and Co-60. *Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." **Calibration Methods: 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

EZA Certificate Program Rev. 0, 07-DEC-2015

gL-CED-297-073

Page 1 of 2

Corporate Office

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia 30318

SRS Number: 103139

This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by:



A. Herron, Radiochemist

QC Approved by:



J. Land, Spectroscopist

Date: 13-MAY-16

Standard Logbook

Serial ID: 1780 **Open/Reference Date:** 01-APR-16
Name: Mixed Gamma 2LMB **Received:** 01-APR-16
Type: Source Material **Expires:** 01-APR-17
Employee: Maggie Stamps **Verified:** 20-MAY-16
Supplier: Eckert & Zeigler Analytics
Description: 103139
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1742

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100222

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1810843, Item 8

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2018

12:00 PM EST Grams of Master Source: 0.0083827

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.18, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty* , %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.8	8.109E+03	—	1.521E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	9.525E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.362E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	7.465E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	1.035E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	2.193E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.454E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	9.277E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	3.486E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.877E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.759E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.761E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	3.691E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-Isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionisation Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Lair
J. S. Lair, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1742
Name: Mixed Gamma 2LMB
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100222
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-41
Verified: 20-MAY-15

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

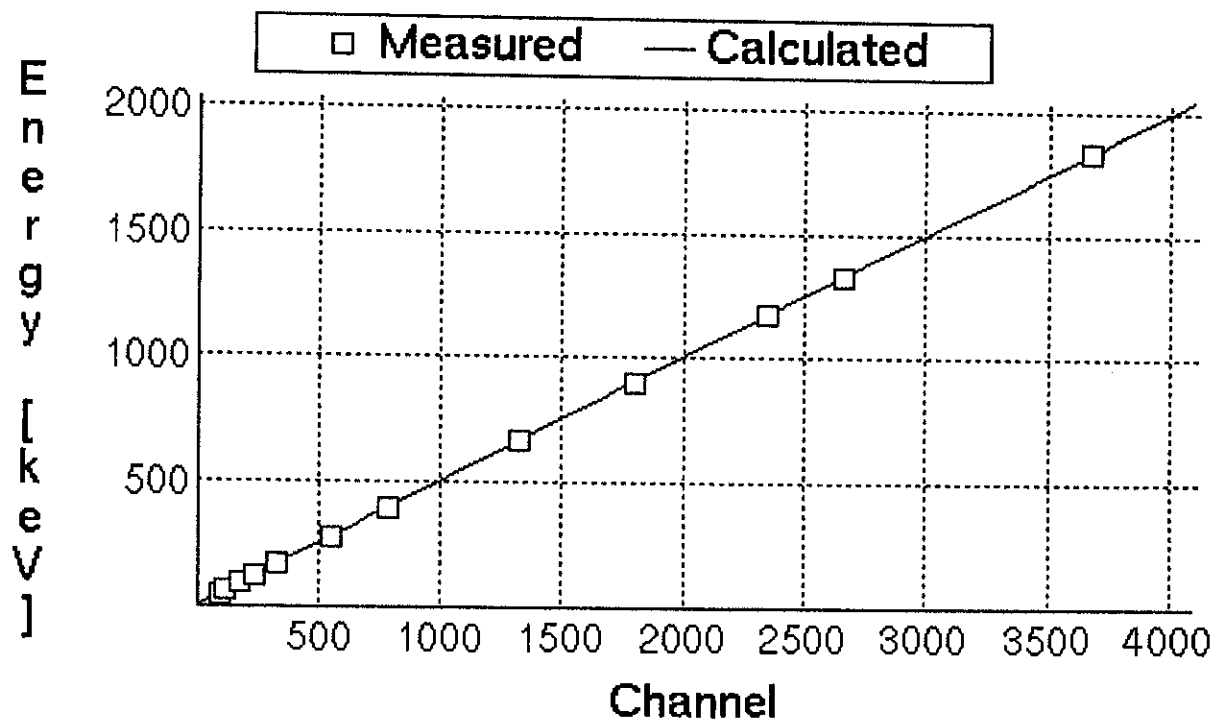
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: 2LMB 103139

Quantity: 1.00

Assay date: 1-APR-2016 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1525	4.20	4.3	Yes
AM-241	432.60Y	59.5	1010	3.60	35.9	Yes
CD-109	461.40D	88.0	1443	4.10	3.7	Yes
CO-57	271.74D	122.1	829	3.40	85.6	Yes
CE-139	137.64D	165.9	1081	3.60	80.0	Yes
HG-203	46.59D	279.2	2673	3.50	81.6	Yes
SN-113	115.09D	391.7	1530	3.90	65.0	Yes
CS-137	30.08Y	661.7	984	4.10	85.1	Yes
Y-88	106.63D	898.0	3628	3.70	93.7	Yes
CO-60	1925.28D	1173.2	1813	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1815	3.90	100.0	Yes
Y-88	106.63D	1836.1	3841	3.70	99.2	Yes



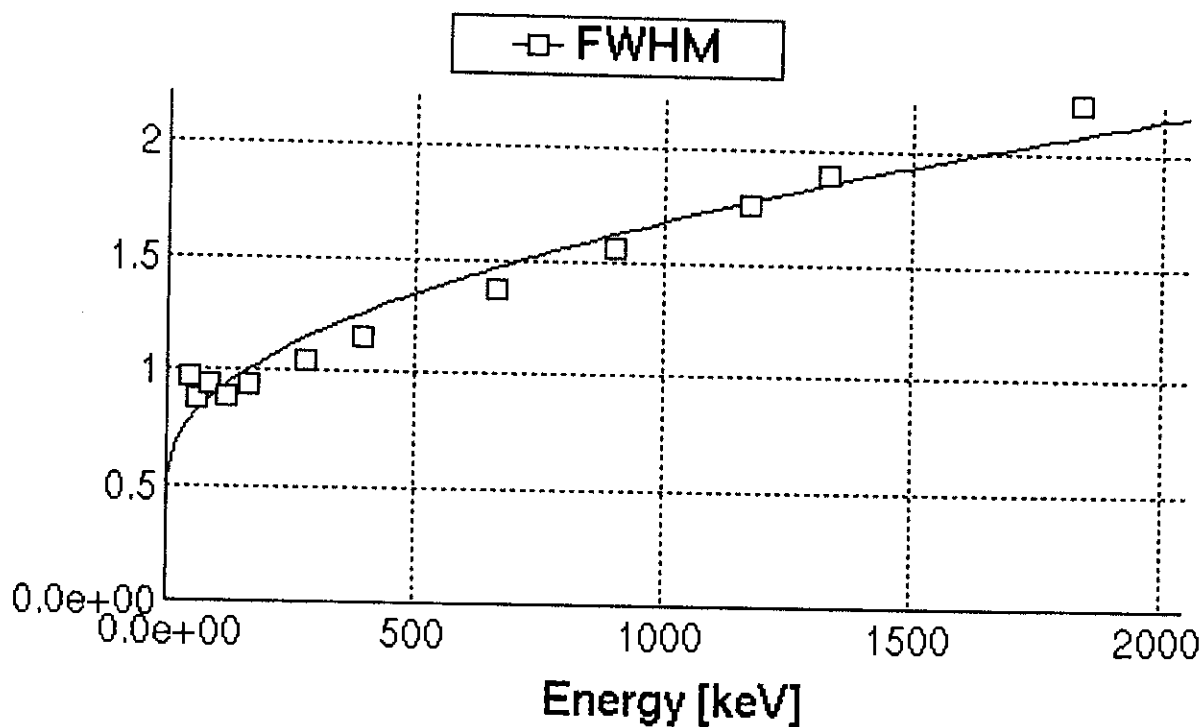
Datasource:

Energy = $1.893e-01 \text{ keV} + 4.998e-01 * \text{Ch} + -1.123e-08 * \text{Ch}^2$ [CHISQ = $1.095e-02$]

FWHM = $5.381e-01 \text{ keV} + 3.602e-02 * E^{1/2}$ [CHISQ = $1.034e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Energy calibration y9 c/1/16



Datasource:

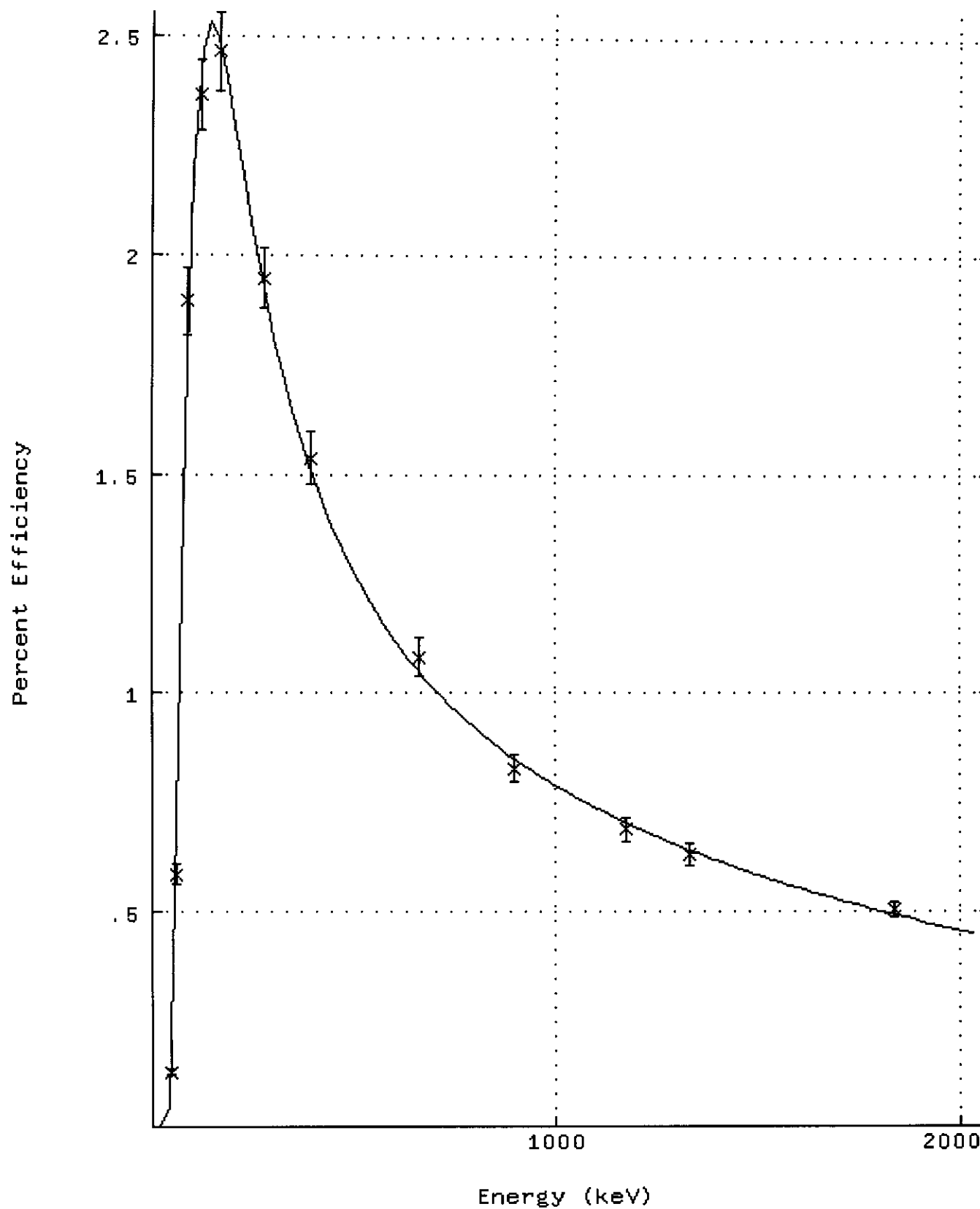
Energy = $1.893e-01 \text{ keV} + 4.998e-01 * \text{Ch} + -1.123e-08 * \text{Ch}^2$ [CHISQ = $1.095e-02$]

FWHM = $5.381e-01 \text{ keV} + 3.602e-02 * E^{1/2}$ [CHISQ = $1.034e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration re 6/1/16

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM09_2LMB.CNF;16
Calib Date: 7-JUN-2016 07:31:
Detector : GAMMA9 Geometry : 2LMB
Fit type : 5 Deg. Linear



Energy Calibration Report

Sample ID : 103139

Page : 3

Acquisition date : 6-JUN-2016 12:14:20

$$\text{Energy} = 0.1893 + 0.4998 * \text{Channel} + -1.1226\text{E-}08 * (\text{Channel} ** 2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.69	46.54	46.52	0.024
2	118.73	59.54	59.53	0.010
3	175.72	88.03	88.02	0.014
4	243.86	122.06	122.07	-0.008
5	331.50	165.86	165.87	-0.012
6	558.29	279.20	279.22	-0.017
7	783.41	391.70	391.73	-0.028
8	1323.54	661.66	661.67	-0.011
9	1796.47	898.04	898.03	0.012
10	2347.12	1173.23	1173.21	0.015
11	2665.81	1332.49	1332.48	0.014
12	3673.55	1836.06	1836.07	-0.013

FWHM Calibration Report

$$\text{FWHM} = 0.5381 + 3.6018\text{E-}02 * (\text{Energy} ** 1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	0.97	0.78	0.185
2	59.54	0.88	0.82	0.059
3	88.03	0.93	0.88	0.059
4	122.06	0.89	0.94	-0.047
5	165.86	0.94	1.00	-0.065
6	279.20	1.04	1.14	-0.096
7	391.70	1.14	1.25	-0.107
8	661.66	1.37	1.46	-0.098
9	898.04	1.56	1.62	-0.059
10	1173.23	1.76	1.77	-0.010
11	1332.49	1.89	1.85	0.036
12	1836.06	2.22	2.08	0.143

Efficiency Calibration Report

Sample ID : 103139

Page : 4

Acquisition date : 6-JUN-2016 12:14:20

$$\text{Eff} = \exp(a1 \cdot E + a2 + a3/E + a4/E^{**2} + a5/E^{**3} + a6/E^{**4} + a7/E^{**5})$$

a1	a2	a3	a4	a5	a6	a7
-1.6126E-04	-2.107	181.9	-1.9248E+04	6.7320E+05	-1.1646E+07	0.0000E+00

Reduced Chi-Square = 0.891

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	1.27E-03	6.44E-05	1.27E-03	0.10	0.52
2	59.54	5.83E-03	2.15E-04	5.91E-03	-0.38	-1.39
3	88.03	1.89E-02	7.78E-04	1.79E-02	1.25	5.14
4	122.06	2.36E-02	8.11E-04	2.45E-02	-1.09	-3.74
5	165.86	2.46E-02	8.91E-04	2.48E-02	-0.27	-0.98
6	279.20	1.94E-02	6.84E-04	1.91E-02	0.49	1.73
7	391.70	1.53E-02	6.01E-04	1.51E-02	0.39	1.52
8	661.66	1.08E-02	4.46E-04	1.05E-02	0.76	3.14
9	898.04	8.25E-03	3.06E-04	8.46E-03	-0.70	-2.60
10	1173.23	6.84E-03	2.68E-04	7.00E-03	-0.60	-2.36
11	1332.49	6.26E-03	2.45E-04	6.36E-03	-0.41	-1.60
12	1836.06	5.01E-03	1.86E-04	4.90E-03	0.62	2.30

VMS Gamma Spectroscopy Report generated 9-JUN-2016 08:37:42

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM09_2LMB_372733.CN

---- Sample Information ----

Sample Title : 2LMB 103139
 Sample ID : 103139 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 372679 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2016 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2016 12:00:00. Acquisition date : 6-JUN-2016 12:14:20.
 Decay time : 66 00:14:20.42 % dead time : 1.9%
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:02:18.59

---- Detector Parameters ----

Energy cal. time : 1-JUN-2016 09:38:08. Energy cal. oper.: gamma spec user
 Detector name : GAMMA9 Counting geometry: 2LMB
 Effic. cal. time : 7-JUN-2016 07:31:34. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : LINEAR Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.47	13981	46021	0.86	92.59	89	8	1.94E+00	2.8	
2	7	58.44	4204	45645	1.58	116.54	113	9	5.84E-01	9.7	8.78E+00
3	7	59.56	42350	31520	0.80	118.79	113	9	5.88E+00	0.8	
4	0	66.62	294	37778	1.61	132.91	132	5	4.09E-02	99.0	
5	3	70.84	3993	47095	1.00	141.36	138	11	5.55E-01	8.7	3.74E+00
6	3	72.87	6496	39010	0.84	145.43	138	11	9.02E-01	4.7	
7	10	83.14	9888	101643	2.25	165.97	159	23	1.37E+00	6.6	2.39E+02
8	10	85.56	7293	60600	1.27	170.81	159	23	1.01E+00	6.1	
9	10	88.01	177963	41723	0.96	175.72	159	23	2.47E+01	0.3	
10	0	122.04	120516	62535	0.89	243.80	239	10	1.67E+01	0.5	
11	0	136.45	15193	46627	0.98	272.64	269	8	2.11E+00	2.6	
12	0	165.83	138478	46120	1.05	331.41	327	10	1.92E+01	0.4	
13	0	255.03	4562	23444	0.95	509.90	506	8	6.34E-01	6.0	
14	0	279.11	141025	25987	1.05	558.08	552	11	1.96E+01	0.3	
15	0	391.56	114414	17831	1.16	783.07	777	13	1.59E+01	0.4	
16	0	422.48	197	6031	1.24	844.94	843	5	2.74E-02	59.6	
17	0	461.30	301	9472	1.53	922.61	919	8	4.18E-02	56.2	
18	0	510.83	2916	13386	2.34	1021.72	1016	13	4.05E-01	8.4	
19	0	591.96	88	7583	0.84	1184.06	1178	8	1.22E-02	172.3	
20	0	661.35	76724	15149	1.40	1322.90	1315	15	1.07E+01	0.5	
21	0	813.55	1781	5647	1.50	1627.44	1623	9	2.47E-01	8.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	897.59	141066	11366	1.57	1795.60	1787	17	1.96E+01	0.3	
23	0	920.88	92	4432	1.21	1842.21	1839	7	1.28E-02	119.8	
24	0	991.77	127	3117	1.35	1984.04	1981	6	1.76E-02	70.4	
25	0	1073.39	163	2840	1.34	2147.37	2145	6	2.27E-02	52.1	
26	0	1172.62	87658	5547	1.71	2345.94	2338	16	1.22E+01	0.4	
27	0	1221.29	73	1928	1.83	2443.33	2443	8	1.01E-02	105.0	
28	5	1324.31	2984	4280	2.98	2649.48	2640	33	4.14E-01	5.6	7.25E+00
29	5	1331.81	79924	2774	1.87	2664.48	2640	33	1.11E+01	0.4	
30	0	1431.42	55	1847	2.35	2863.81	2858	8	7.71E-03	135.2	
31	0	1467.10	45	1989	1.03	2935.21	2935	8	6.32E-03	170.2	
32	0	1540.33	177	2294	2.75	3081.73	3079	8	2.45E-02	47.5	
33	0	1835.13	90656	1501	2.18	3671.67	3661	21	1.26E+01	0.3	
34	1	1994.21	68	238	2.15	3990.00	3985	16	9.45E-03	45.8	2.07E+00
35	1	1996.70	72	240	2.15	3995.00	3985	16	9.99E-03	43.4	


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM09_2LMB.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM09.CNF;318
Background date    : 5-JUN-2016 12:10:30.
Sample date       : 1-APR-2015 12:00:00. Acquisition date : 7-JUN-2016 07:37:54.
Sample ID        : VER_GAM09_2LMB      Sample quantity  : 1.00000E+00 SAMPLE
Detector name     : GAM09              Detector geometry: 2LMB
Elapsed live time : 0 01:00:00.00      Elapsed real time: 0 01:00:29.86 0.8%
Energy tolerance  : 1.50000 keV        Analyst Initials :
Abundance limit   : 75.00000           Sensitivity      : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.36*	7212	13809	0.96	92.37	87	10	2.00E+00	3.3	
2	0	59.41	22005	13388	0.93	118.48	113	9	6.11E+00	1.2	
3	0	87.96	46304	18695	0.96	175.61	170	12	1.29E+01	0.8	
4	0	121.98	21815	11457	0.95	243.68	238	11	6.06E+00	1.2	
5	0	136.39	2700	6512	1.00	272.52	269	7	7.50E-01	5.3	
6	0	165.77	10659	9503	1.02	331.30	325	12	2.96E+00	2.1	
7	0	254.68	452	4697	1.17	509.19	506	8	1.26E-01	26.7	
8	0	279.16	317	3529	1.32	558.18	555	7	8.82E-02	31.6	
9	0	363.25	155	2235	1.34	726.42	724	6	4.31E-02	48.8	
10	0	391.60*	5963	3942	1.09	783.14	778	11	1.66E+00	2.4	
11	0	451.67	199	3078	2.22	903.35	900	9	5.54E-02	50.6	
12	0	472.09	108	2741	1.80	944.20	942	8	2.99E-02	84.9	
13	0	510.74*	1630	4650	2.59	1021.54	1013	17	4.53E-01	9.9	
14	0	581.14	133	1736	1.50	1162.41	1159	8	3.70E-02	54.8	
15	0	661.42	35472	3192	1.39	1323.04	1315	15	9.85E+00	0.6	
16	0	849.53	91	1767	0.81	1699.43	1696	8	2.53E-02	80.5	
17	0	897.75	6290	3387	1.56	1795.91	1790	13	1.75E+00	2.3	
18	0	921.19	65	1665	1.13	1842.83	1841	7	1.80E-02	105.3	
19	0	1102.16	41	1133	1.27	2204.94	2201	7	1.14E-02	137.4	
20	0	1106.08	154	1894	4.34	2212.78	2207	12	4.28E-02	57.1	
21	0	1115.16	15599	2552	1.65	2230.96	2223	17	4.33E+00	1.1	
22	0	1144.19	68	915	1.60	2289.05	2285	10	1.89E-02	84.1	
23	0	1172.80	37320	1515	1.76	2346.30	2338	17	1.04E+01	0.6	
24	0	1197.98	32	442	0.47	2396.69	2393	8	8.79E-03	116.8	
25	5	1324.14	191	351	2.98	2649.13	2642	36	5.31E-02	22.9	3.14E+00
26	5	1332.02	34140	301	1.87	2664.91	2642	36	9.48E+00	0.6	
27	0	1408.34	41	128	0.79	2817.62	2814	9	1.13E-02	52.9	
28	0	1434.79	50	241	3.49	2870.54	2864	16	1.40E-02	70.2	
29	0	1472.76	11	186	2.41	2946.53	2942	12	2.97E-03	258.3	
30	0	1562.21*	28	171	1.19	3125.52	3122	9	7.73E-03	87.1	
31	0	1835.40	4046	112	2.17	3672.21	3661	20	1.12E+00	1.7	
32	0	1870.25	62	61	7.60	3741.95	3729	22	1.73E-02	34.2	
33	0	1894.68	20	33	1.25	3790.83	3787	9	5.47E-03	57.7	
34	0	2018.66	22	19	2.27	4038.94	4034	9	6.00E-03	43.1	

Peak Search Report (continued)

Page : 2

Sample ID : VER_GAM09_2LMB

Acquisition date : 7-JUN-2016 07:37:54

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	2025.02	14	28	0.66	4051.67	4047	9	3.79E-03	76.1	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	21815	85.60*	2.449E+00	7.814E+03	2.357E+04	2.34
	136.47	2700	10.68	2.519E+00	7.532E+03	2.272E+04	10.63
CO-60	1173.23	37320	99.85	6.998E-01	4.009E+04	4.686E+04	1.14
	1332.49	34140	99.98*	6.365E-01	4.028E+04	4.707E+04	1.10
ZN-65	1115.54	15599	50.60*	7.259E-01	3.188E+04	1.090E+05	2.19
Y-88	898.04	6290	93.70	8.462E-01	5.956E+03	9.928E+04	4.58
	1836.06	4046	99.20*	4.899E-01	6.250E+03	1.042E+05	3.40
CD-109	88.03	46304	3.70*	1.792E+00	5.243E+05	1.005E+06	1.51
SN-113	391.70	5963	64.97*	1.511E+00	4.561E+03	6.183E+04	4.83
CS-137	661.66	35472	85.10*	1.045E+00	2.994E+04	3.077E+04	1.27
CE-139	165.86	10659	80.00*	2.484E+00	4.027E+03	3.562E+04	4.14
HG-203	70.83	-----	3.69	1.108E+00	-----	Line Not Found	-----
	72.87	-----	6.19	1.200E+00	-----	Line Not Found	-----
	279.20	317	81.56*	1.911E+00	1.529E+02	9.572E+04	63.16
PB-210	46.54	7212	4.25*	1.225E-01	1.040E+06	1.079E+06	6.54
AM-241	59.54	22005	35.90*	5.847E-01	7.870E+04	7.885E+04	2.32

Flag: "*" = Keyline

Sample ID : Bkg Acquisition date : 5-JUN-2016 12:10:30 Page : 1

VMS Gamma Spectroscopy Report generated 6-JUN-2016 04:51:02

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM09__372548.CN

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 372548 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 5-JUN-2016 12:10:30.

---- Sample Decay/Count Information ----

Sample Date : 5-JUN-2016 12:10:30. Acquisition date : 5-JUN-2016 12:10:30.
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.76

---- Detector Parameters ----

Energy cal. time : 1-JUN-2016 09:38:08. Energy cal. oper.: gamma spec user
 Detector name : GAMMA9 Counting geometry:
 Effic. cal. time : 3-JUN-2016 11:11:22. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.73	70	328	1.17	93.12	91	5	1.17E-03	40.4	
2	0	63.43	303	604	1.06	126.54	123	8	5.05E-03	15.2	
3	0	66.16	33	435	0.74	131.99	131	6	5.53E-04	101.0	
4	0	69.97	74	487	0.68	139.62	137	7	1.23E-03	51.1	
5	0	75.17	43	494	0.84	150.02	147	6	7.17E-04	83.3	
6	0	77.42	58	422	0.74	154.52	153	6	9.64E-04	58.1	
7	0	84.50	69	464	1.08	168.68	166	6	1.16E-03	50.5	
8	0	92.78	875	780	1.03	185.26	181	9	1.46E-02	6.7	
9	0	98.65	86	580	1.10	197.01	193	9	1.44E-03	51.5	
10	0	112.72	72	507	1.05	225.16	222	7	1.20E-03	53.5	
11	0	139.73	113	477	1.32	279.20	275	8	1.88E-03	34.8	
12	0	143.73	125	430	0.87	287.19	284	7	2.09E-03	28.8	
13	0	185.74	583	609	1.02	371.26	366	10	9.72E-03	8.9	
14	0	199.31	47	653	1.20	398.41	391	10	7.89E-04	102.0	
15	0	238.31	152	489	1.39	476.44	473	9	2.53E-03	27.4	
16	0	352.16	70	250	1.56	704.23	700	8	1.16E-03	41.0	
17	0	390.67	37	219	1.51	781.30	778	8	6.09E-04	72.2	
18	0	510.74	1251	524	2.42	1021.54	1014	19	2.08E-02	5.2	
19	0	558.00	71	224	1.23	1116.10	1111	12	1.18E-03	43.6	

20	0	569.99	46	156	1.99	1140.10	1136	9	7.71E-04	51.0	
21	0	582.88	70	148	1.05	1165.89	1162	9	1.17E-03	33.5	
22	0	709.16	39	117	2.39	1418.56	1415	9	6.57E-04	52.2	
23	0	719.22	34	127	1.40	1438.70	1435	10	5.64E-04	64.7	
24	2	802.85	58	130	1.84	1606.02	1599	17	9.64E-04	40.5	1.21E+00
25	2	806.29	22	52	1.46	1612.92	1599	17	3.63E-04	55.0	
26	0	825.69	48	143	4.31	1651.73	1643	15	7.92E-04	56.7	
27	0	847.10	40	107	2.34	1694.58	1690	10	6.63E-04	51.3	
28	0	910.64	51	61	1.35	1821.71	1818	7	8.51E-04	29.2	
29	0	948.26	18	85	0.80	1896.99	1893	9	2.92E-04	98.8	
30	0	1000.36	58	88	1.68	2001.24	1996	10	9.59E-04	33.2	
31	0	1040.56	25	71	1.80	2081.68	2078	8	4.10E-04	62.9	
32	0	1360.99	16	30	0.89	2722.87	2716	9	2.71E-04	66.6	
33	0	1405.27	22	46	3.26	2811.48	2804	12	3.68E-04	66.0	
34	0	1413.31	10	30	1.39	2827.56	2824	8	1.61E-04	103.4	
35	0	1448.21	11	41	0.52	2897.41	2891	9	1.78E-04	113.9	
36	0	1460.59	120	52	2.13	2922.17	2913	19	2.00E-03	17.1	
37	0	1561.24	20	97	10.31	3123.58	3102	26	3.26E-04	140.3	
38	0	1630.22	31	30	1.61	3261.61	3253	15	5.17E-04	42.5	
39	3	1696.35	20	27	2.69	3393.95	3388	28	3.32E-04	56.9	1.24E+00
40	3	1703.02	25	28	2.69	3407.30	3388	28	4.15E-04	55.8	
41	0	1723.77	34	29	3.02	3448.83	3442	13	5.66E-04	37.0	
42	0	1764.47	29	41	0.76	3530.27	3524	14	4.84E-04	50.7	
43	0	1896.96	12	37	5.65	3795.40	3782	15	2.01E-04	114.2	
44	0	1907.80	15	41	1.50	3817.10	3809	16	2.43E-04	100.7	
45	0	2033.74	16	13	4.16	4069.13	4063	13	2.67E-04	52.8	

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM09.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 5-JUN-2016 12:10:30 Acquisition date : 5-JUN-2016 12:10:30
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.76

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.2815E+00	1.11	
[1.26523+/-0.01466]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RP Approval Date: 6 / 9 / 16

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 09

Calibration Date: 6/6/2016

Geometry: 2LMB

Manufacturer Standard Id: 100222

GEL Standard Id: 1742

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	952.5	7.1708E+04	7.885E+04	9.96
Cs-137	661.7	0.851	927.7	2.9463E+04	3.077E+04	4.44
Co-60	1173.2	0.9985	1759	4.7612E+04	4.686E+04	-1.58
Co-60	1332.5	0.9998	1761	4.7604E+04	4.707E+04	-1.12

Prepared By: R. Feuch

Date: 6/9/16

Reviewed By: M. Stamp

Date: 6/9/16

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)558-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 9

Date Performed: 5/2/16

Performed By: RF

High Voltage Power Supply Model No. <u>3106D</u> High Voltage <u>2502V</u>	Spectroscopy Amplifier Model No. <u>671</u> Course Gain <u>30</u> Fine Gain <u>1.746</u> Time Constant <u>6.446</u> Input polarity <u>positive</u> BSLR rate <u>10</u> BSLR mode <u>ng</u> Threshold <u>102</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>SS6A</u> Address <u>D7A:2</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gammac II

Geometry: Coen

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the second standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:	☒		
amp, HVPS, ADC settings?			

Prepared By: R. Finch

Date: 7/20/15

Reviewed By: W. Stamp

Date: 7/24/15

Effective Date: 7/16/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MDX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.738E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffu
J. S. Laffu, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Ziegler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytixinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.896E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' B-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



RC-S-065-130

MGS Certificate Rev 5, 1 October 2013

Page 1 of 2

Corporate Office

24937 Avenue Tibblitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: Y. K. 10
K. Eardley, Radiochemist

QC Approved: 286
A. Chen, Spectroscopist

Date: 20 MAY 14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

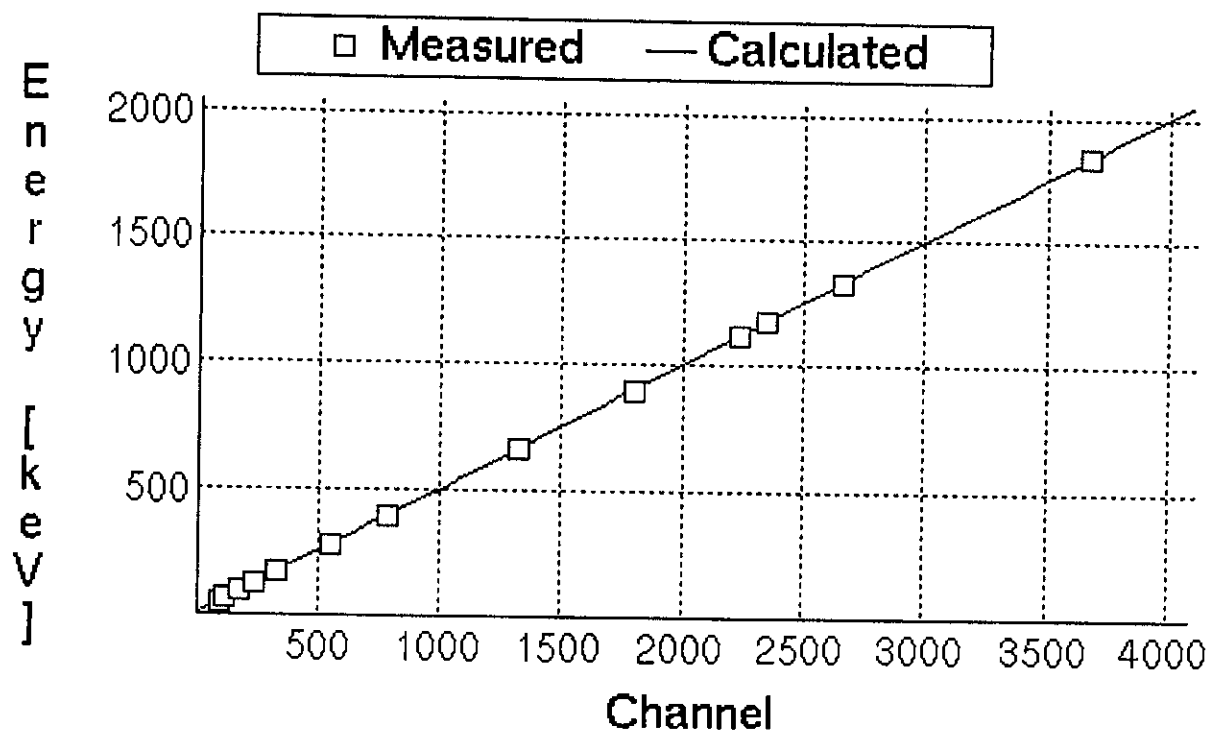
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D			514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



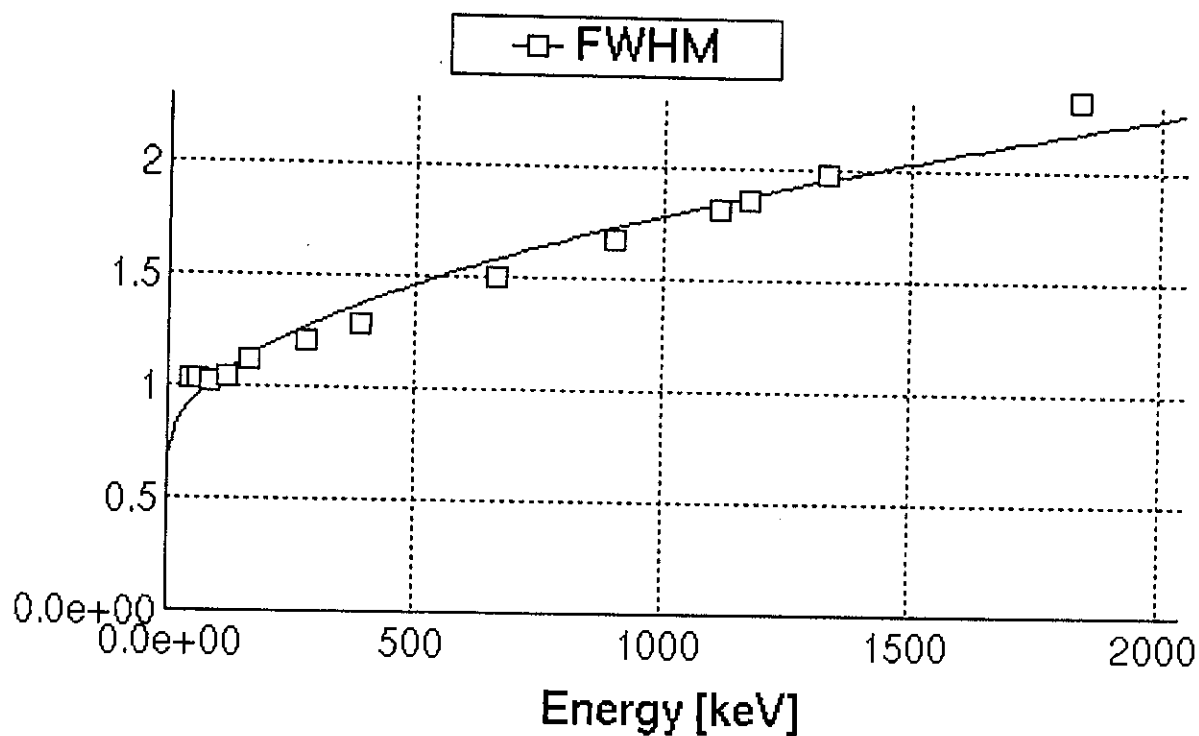
Datasource:

Energy = $1.690e-01$ keV + $4.998e-01$ *Ch + $6.449e-08$ *Ch² [CHISQ = $1.700e-02$]

FWHM = $6.848e-01$ keV + $3.488e-02$ *E^{1/2} [CHISQ = $5.595e-03$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

energy calibration Y 11 3/10/15



Datasource:

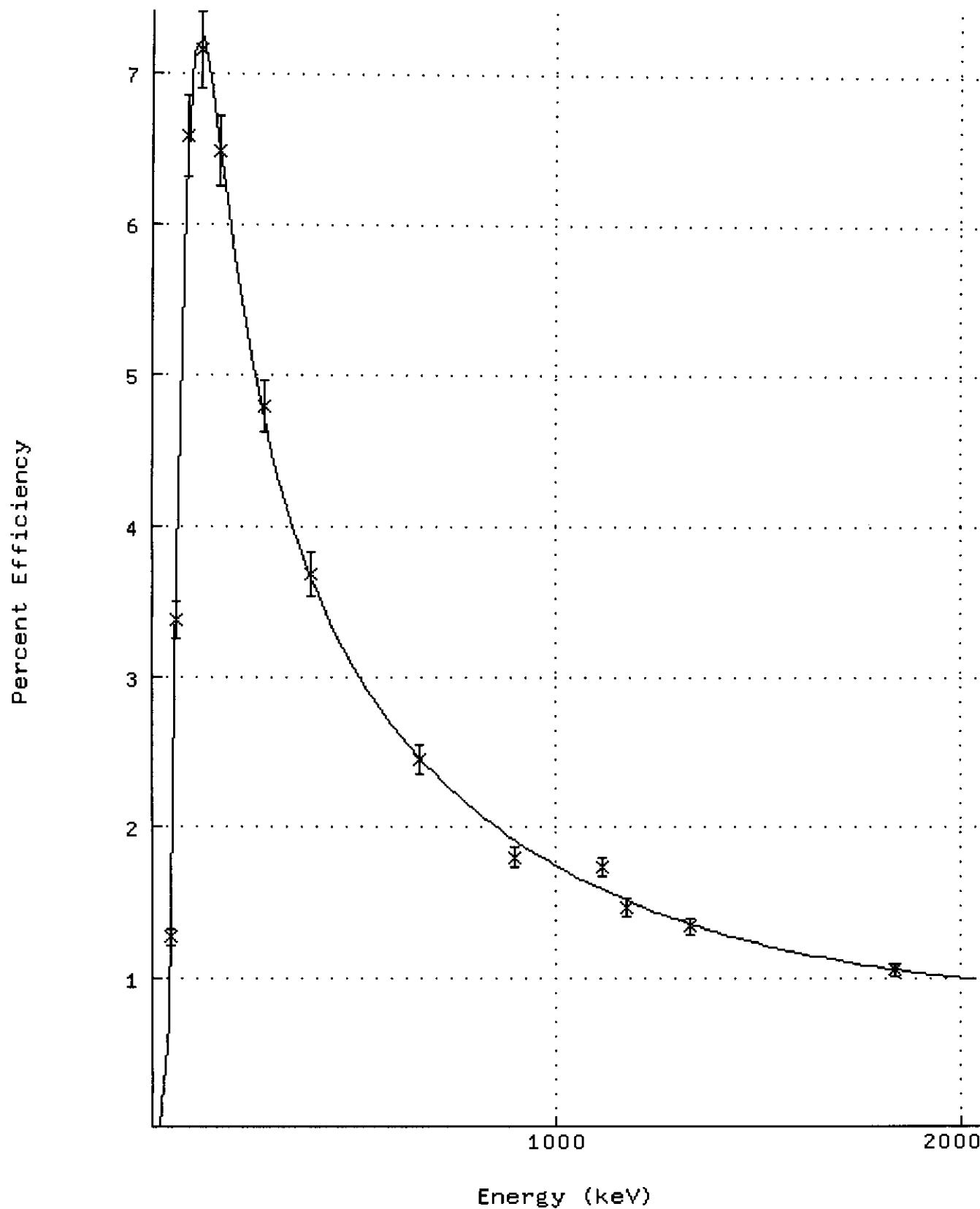
Energy = $1.690e-01 \text{ keV} + 4.998e-01 * \text{Ch} + 6.449e-08 * \text{Ch}^2$ [CHISQ = $1.700e-02$]

FWHM = $6.848e-01 \text{ keV} + 3.488e-02 * E^{1/2}$ [CHISQ = $5.595e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

shape calibration yll 3/10/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13
Calib Date: 16-JUL-2015 08:37
Detector : GAMMA11 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = 0.1690 + 0.4998 * \text{Channel} + 6.4495\text{E-}08 * (\text{Channel} ** 2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.73	46.54	46.52	0.022
2	118.79	59.54	59.54	0.000
3	175.81	88.03	88.04	-0.012
4	243.87	122.06	122.06	-0.003
5	331.52	165.86	165.88	-0.017
6	558.22	279.20	279.19	0.005
7	783.26	391.70	391.69	0.006
8	1323.25	661.66	661.66	0.000
9	1796.01	898.04	898.05	-0.010
10	2230.95	1115.60	1115.55	0.048
11	2346.32	1173.23	1173.25	-0.017
12	2664.77	1332.49	1332.52	-0.025
13	3671.40	1836.06	1836.06	0.005

FWHM Calibration Report

$$\text{FWHM} = 0.6848 + 3.4877\text{E-}02 * (\text{Energy} ** 1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.04	0.92	0.114
2	59.54	1.03	0.95	0.078
3	88.03	1.02	1.01	0.012
4	122.06	1.04	1.07	-0.030
5	165.86	1.13	1.13	-0.009
6	279.20	1.20	1.27	-0.066
7	391.70	1.29	1.38	-0.090
8	661.66	1.50	1.58	-0.079
9	898.04	1.68	1.73	-0.049
10	1115.60	1.82	1.85	-0.030
11	1173.23	1.87	1.88	-0.011
12	1332.49	1.98	1.96	0.024
13	1836.06	2.32	2.18	0.137

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-3.996	0.8606	-7.4543E-02	-8.2622E-02	0.1132	-3.7732E-02

Average Deviation = 2.21 % Reduced Chi-Square = 1.58

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	1.27E-02	5.47E-04	1.29E-02	-0.26	-1.14
2	59.54	3.37E-02	1.23E-03	3.32E-02	0.41	1.49
3	88.03	6.57E-02	2.70E-03	6.55E-02	0.09	0.36
4	122.06	7.14E-02	2.52E-03	7.24E-02	-0.38	-1.35
5	165.86	6.48E-02	2.29E-03	6.55E-02	-0.30	-1.05
6	279.20	4.79E-02	1.70E-03	4.68E-02	0.66	2.35
7	391.70	3.67E-02	1.44E-03	3.66E-02	0.09	0.34
8	661.66	2.45E-02	9.89E-04	2.46E-02	-0.14	-0.57
9	898.04	1.80E-02	6.69E-04	1.91E-02	-1.76	-6.55
10	1115.60	1.73E-02	6.13E-04	1.59E-02	2.43	8.57
11	1173.23	1.47E-02	5.77E-04	1.52E-02	-0.81	-3.20
12	1332.49	1.34E-02	5.26E-04	1.36E-02	-0.32	-1.24
13	1836.06	1.05E-02	3.91E-04	1.05E-02	-0.13	-0.47

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM11_CAN_336761.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 336743 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 16-JUL-2015 07:07:32
 Decay time : 105 19:07:32.28 % dead time : 3.0%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:50.12

----- Detector Parameters -----

Energy cal. time : 10-MAR-2015 09:04:48 Energy cal. oper.: gamma spec user
 Detector name : GAMMA11 Counting geometry: CAN
 Effic. cal. time : 16-JUL-2015 08:37:24 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	33.40	7831	24399	1.93	66.49	65	6	2.18E+00	3.3	
2	0	46.54	57598	54218	0.89	92.77	88	10	1.60E+01	0.9	
3	0	59.56	96577	55511	0.91	118.82	113	12	2.68E+01	0.6	
4	0	66.39	622	27395	1.18	132.49	131	6	1.73E-01	42.1	
5	5	70.88	2889	28224	1.08	141.47	138	12	8.03E-01	9.3	2.06E+00
6	5	72.91	4149	23294	0.84	145.53	138	12	1.15E+00	5.8	
7	7	83.03	6335	57198	1.95	165.78	160	25	1.76E+00	7.3	1.78E+02
8	7	85.59	11665	53548	1.96	170.91	160	25	3.24E+00	5.3	
9	7	88.07	219559	22482	1.03	175.87	160	25	6.10E+01	0.2	
10	0	122.13	119444	36325	0.96	244.00	238	12	3.32E+01	0.4	
11	0	136.55	14735	24613	1.04	272.85	268	10	4.09E+00	2.2	
12	0	158.04	297	11744	1.22	315.84	314	5	8.24E-02	55.1	
13	0	165.94	115149	31458	1.11	331.64	325	14	3.20E+01	0.4	
14	0	203.02	230	10524	1.20	405.83	404	6	6.40E-02	70.7	
15	0	255.22	3689	14892	1.24	510.25	506	10	1.02E+00	6.4	
16	0	268.57	235	8157	1.13	536.96	535	6	6.52E-02	61.1	
17	0	279.24	63886	18565	1.16	558.31	551	14	1.77E+01	0.6	
18	0	310.71	561	8585	1.30	621.25	618	8	1.56E-01	28.9	
19	0	391.75	82510	14401	1.24	783.38	776	14	2.29E+01	0.5	
20	0	511.04	8288	12209	2.65	1021.99	1014	16	2.30E+00	3.2	
21	0	661.73	65943	12980	1.43	1323.38	1315	16	1.83E+01	0.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	719.52	128	5734	0.89	1438.97	1437	9	3.54E-02	107.2	
23	0	807.05	69	4814	0.51	1614.03	1614	8	1.92E-02	174.2	
24	0	814.24	1145	6045	1.43	1628.40	1624	10	3.18E-01	13.0	
25	0	821.88	151	4969	2.18	1643.69	1641	8	4.19E-02	81.4	
26	0	857.11	195	5107	1.20	1714.14	1712	8	5.43E-02	63.7	
27	0	875.16	103	5462	3.53	1750.23	1749	8	2.87E-02	124.4	
28	0	898.12	91685	12798	1.63	1796.16	1787	17	2.55E+01	0.4	
29	0	928.43	150	4839	1.29	1856.76	1853	8	4.16E-02	80.9	
30	0	1115.64	70071	7587	1.75	2231.12	2222	19	1.95E+01	0.5	
31	0	1173.32	72565	4940	1.85	2346.46	2336	20	2.02E+01	0.4	
32	5	1325.30	1987	2927	3.15	2650.34	2641	34	5.52E-01	7.1	7.92E+00
33	5	1332.60	65401	1945	1.97	2664.94	2641	34	1.82E+01	0.4	
34	0	1447.94	119	1223	1.82	2895.53	2892	8	3.30E-02	51.9	
35	0	1541.82	99	1904	1.14	3083.23	3080	10	2.74E-02	83.3	
36	0	1753.17	91	429	2.18	3505.72	3501	10	2.53E-02	43.9	
37	0	1757.57	48	579	2.33	3514.51	3510	12	1.34E-02	100.6	
38	0	1836.12	56503	1277	2.22	3671.53	3660	24	1.57E+01	0.5	
39	0	1847.43	16	406	1.37	3694.13	3687	10	4.32E-03	245.5	
40	0	1866.46	39	501	0.77	3732.17	3722	15	1.09E-02	125.8	
41	0	1901.43	31	240	1.38	3802.06	3801	9	8.65E-03	90.7	
42	0	1915.18	63	330	2.49	3829.56	3824	12	1.75E-02	59.4	
43	0	2037.14	95	315	2.72	4073.31	4065	15	2.63E-02	42.1	

```
*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road      *
*               Charleston, SC 29407  *
*****
```

```
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM11_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF;450
Background date    : 11-JUL-2015 12:14:04
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 16-JUL-2015 08:45:10
Sample ID        : VER_GAM11_CAN      Sample quantity  : 1.00000E+00 SAMPLE
Detector name     : GAM11             Detector geometry: CAN
Elapsed live time : 0 01:00:00.00     Elapsed real time: 0 01:00:51.95  1.4%
Energy tolerance  : 1.50000 keV       Analyst Initials  :
Abundance limit   : 75.00000          Sensitivity       : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	33.45	5291	15782	2.00	66.58	65	6	1.47E+00	3.9	
2	1	39.75	953	21174	0.99	79.18	76	22	2.65E-01	24.1	2.85E+02
3	1	42.65	1823	17242	0.91	85.00	76	22	5.06E-01	11.2	
4	1	46.56*	60732	19205	1.02	92.82	76	22	1.69E+01	0.5	
5	0	59.59	98635	28712	0.83	118.87	114	10	2.74E+01	0.5	
6	0	66.61*	504	13482	1.49	132.93	131	6	1.40E-01	36.6	
7	0	88.09	132159	22847	0.87	175.90	171	10	3.67E+01	0.3	
8	0	122.10	48738	13138	0.90	243.95	238	12	1.35E+01	0.7	
9	0	136.53	5728	8026	0.97	272.81	269	9	1.59E+00	3.1	
10	0	165.90	19291	9449	1.09	331.58	326	12	5.36E+00	1.2	
11	0	255.19	276	4684	1.15	510.20	507	7	7.67E-02	41.6	
12	0	278.87	274	4139	1.42	557.57	555	7	7.61E-02	39.4	
13	0	319.55	83	4200	1.00	638.94	636	8	2.30E-02	136.0	
14	0	391.69	9607	6028	1.19	783.26	777	12	2.67E+00	1.9	
15	0	431.24	175	3347	1.26	862.37	860	7	4.87E-02	55.2	
16	0	450.96	211	4114	1.27	901.81	899	8	5.87E-02	53.0	
17	0	504.29	122	3139	1.50	1008.48	1005	8	3.38E-02	80.4	
18	0	510.86*	2580	5777	2.33	1021.64	1014	15	7.17E-01	6.7	
19	0	661.59*	67362	5006	1.43	1323.10	1315	16	1.87E+01	0.5	
20	0	790.78	60	2207	1.23	1581.48	1578	7	1.67E-02	130.1	
21	0	868.48	57	2965	0.81	1736.88	1735	8	1.59E-02	165.0	
22	0	873.64	110	2184	1.36	1747.20	1744	6	3.06E-02	67.7	
23	0	897.92	9108	5637	1.62	1795.75	1789	14	2.53E+00	2.0	
24	0	903.45	214	3131	2.46	1806.81	1803	8	5.93E-02	45.9	
25	0	1115.39*	25216	4129	1.75	2230.64	2221	17	7.00E+00	0.9	
26	0	1173.07*	64087	3029	1.76	2345.97	2336	20	1.78E+01	0.4	
27	0	1219.21	68	593	1.31	2438.23	2434	9	1.88E-02	66.2	
28	2	1325.04	211	643	2.36	2649.82	2641	34	5.87E-02	26.1	6.73E+00
29	2	1332.32	58181	466	1.88	2664.38	2641	34	1.62E+01	0.4	
30	0	1395.92	26	231	0.50	2791.53	2789	8	7.28E-03	101.9	
31	0	1458.52	29	368	1.77	2916.69	2907	14	8.02E-03	143.2	
32	0	1514.82	91	298	4.12	3029.25	3025	12	2.52E-02	39.3	
33	0	1579.79	23	351	2.61	3159.12	3159	11	6.45E-03	156.8	
34	0	1589.51	41	418	2.53	3178.56	3174	13	1.15E-02	102.8	

Sample ID : VER_GAM11_CAN

Acquisition date : 16-JUL-2015 08:45:10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1695.04	49	278	4.08	3389.52	3379	16	1.36E-02	77.8	
36	0	1745.47	46	142	1.31	3490.32	3485	12	1.29E-02	53.3	
37	0	1835.72	5398	306	2.21	3670.74	3662	20	1.50E+00	1.6	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	48738	85.60*	7.241E+00	5.903E+03	1.962E+04	1.31
	136.47	5728	10.68	7.086E+00	5.683E+03	1.889E+04	6.24
CO-60	1173.23	64087	99.85	1.517E+00	3.176E+04	3.763E+04	0.90
	1332.49	58181	99.98*	1.358E+00	3.217E+04	3.811E+04	0.84
ZN-65	1115.54	25216	50.60*	1.586E+00	2.359E+04	8.986E+04	1.71
Y-88	898.04	9108	93.70	1.914E+00	3.813E+03	8.139E+04	4.08
	1836.06	5398	99.20*	1.054E+00	3.875E+03	8.273E+04	3.15
CD-109	88.03	132159	3.70*	6.551E+00	4.093E+05	8.304E+05	0.70
SN-113	391.70	9607	64.97*	3.661E+00	3.033E+03	5.170E+04	3.82
CS-137	661.66	67362	85.10*	2.462E+00	2.414E+04	2.487E+04	0.90
CE-139	165.86	19291	80.00*	6.545E+00	2.766E+03	2.963E+04	2.48
PB-210	46.54	60732	4.25*	1.289E+00	8.321E+05	8.662E+05	1.10
AM-241	59.54	98635	35.90*	3.330E+00	6.194E+04	6.207E+04	0.91

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM11.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 11-JUL-2015 12:14:04 Acquisition date : 11-JUL-2015 12:14:04
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.21

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5515E+00	0.46	
[1.54507+/-0.01390]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 7 / 23 / 15

VMS Gamma Spectroscopy Report generated 12-JUL-2015 04:54:20

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM11__336196.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 336196 Sptarm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 11-JUL-2015 12:14:04

---- Sample Decay/Count Information ----

Sample Date : 11-JUL-2015 12:14:04 Acquisition date : 11-JUL-2015 12:14:04
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.21

---- Detector Parameters ----

Energy cal. time : 10-MAR-2015 09:04:48 Energy cal. oper.: gamma spec user
 Detector name : GAMMA11 Counting geometry:
 Effic. cal. time : 31-JUL-2014 10:19:09 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	44.89	50	167	0.74	89.47	88	11	8.33E-04	32.8	1.26E+00
2	4	46.66	237	674	1.35	93.01	88	11	3.95E-03	20.3	
3	3	63.41	390	494	0.82	126.53	123	14	6.50E-03	9.7	3.55E+00
4	3	66.44	101	639	1.08	132.59	123	14	1.68E-03	43.0	
5	0	77.19	38	826	1.31	154.09	151	8	6.38E-04	132.4	
6	0	84.11	147	730	1.41	167.94	164	8	2.46E-03	32.8	
7	2	89.99	71	334	0.97	179.71	178	13	1.18E-03	38.6	6.23E-01
8	2	92.73	966	533	1.03	185.19	178	13	1.61E-02	5.0	
9	0	98.25	42	522	1.10	196.22	195	6	7.06E-04	86.5	
10	0	113.33	70	492	1.77	226.40	224	6	1.17E-03	51.3	
11	0	140.11	90	660	1.41	279.98	276	8	1.50E-03	50.5	
12	0	143.71	106	667	0.99	287.18	284	8	1.77E-03	43.1	
13	0	185.89	671	620	1.04	371.57	367	9	1.12E-02	7.8	
14	0	198.38	91	827	2.16	396.55	393	11	1.52E-03	62.5	
15	0	238.72	253	646	1.11	477.25	473	9	4.22E-03	19.1	
16	0	244.32	49	369	1.48	488.45	486	6	8.23E-04	63.2	
17	0	295.88	87	421	1.73	591.59	587	9	1.45E-03	43.9	
18	0	328.44	60	295	1.28	656.73	654	7	9.98E-04	49.4	
19	0	338.88	123	448	3.38	677.61	673	11	2.04E-03	34.7	

20	0	352.45	162	486	1.15	704.75	699	12	2.71E-03	28.2	
21	0	470.91	35	247	2.76	941.72	938	9	5.81E-04	82.9	
22	0	511.51	1322	460	2.47	1022.92	1015	17	2.20E-02	4.6	
23	0	569.82	89	257	1.18	1139.56	1134	12	1.49E-03	37.3	
24	0	583.53	145	278	0.90	1166.98	1159	14	2.42E-03	25.8	
25	0	598.88	131	539	5.49	1197.69	1186	21	2.19E-03	45.1	
26	0	609.57	123	231	1.38	1219.06	1215	9	2.05E-03	24.0	
27	0	630.09	34	188	1.77	1260.10	1254	10	5.62E-04	79.3	
28	0	662.41	226	275	1.11	1324.74	1318	14	3.77E-03	16.9	
29	0	804.61	65	201	3.75	1609.14	1601	14	1.09E-03	47.9	
30	0	911.77	151	145	1.78	1823.45	1816	17	2.51E-03	20.0	
31	0	938.10	19	151	3.50	1876.11	1864	15	3.21E-04	141.8	
32	0	969.87	32	153	1.48	1939.64	1932	13	5.35E-04	81.3	
33	0	1002.17	75	119	1.81	2004.22	1999	12	1.25E-03	31.4	
34	0	1023.70	26	70	1.78	2047.27	2043	9	4.32E-04	61.4	
35	0	1029.36	15	42	0.67	2058.60	2055	6	2.50E-04	73.0	
36	0	1065.07	37	96	0.61	2130.00	2124	11	6.24E-04	53.3	
37	3	1116.69	46	76	2.46	2233.23	2227	25	7.64E-04	41.8	2.34E+00
38	3	1120.55	71	74	2.47	2240.95	2227	25	1.19E-03	30.7	
39	0	1171.72	45	84	3.49	2343.26	2335	13	7.47E-04	44.8	
40	0	1461.64	80	60	1.43	2922.93	2915	14	1.34E-03	23.2	
41	0	1569.22	28	64	4.49	3138.00	3130	18	4.69E-04	68.9	
42	0	1681.35	64	46	10.75	3362.16	3350	26	1.07E-03	31.4	
43	0	1699.47	22	27	1.88	3398.38	3394	10	3.64E-04	49.6	
44	0	1765.55	52	42	2.86	3530.47	3523	13	8.61E-04	29.4	
45	0	1778.61	29	43	0.54	3556.58	3548	17	4.75E-04	55.7	
46	0	1816.14	16	31	2.89	3631.59	3622	14	2.62E-04	79.9	
47	0	1858.42	32	65	7.65	3716.11	3700	24	5.30E-04	69.8	
48	4	1869.86	28	25	3.21	3738.96	3731	26	4.68E-04	45.2	1.32E+00
49	4	1875.94	32	25	3.21	3751.12	3731	26	5.29E-04	35.1	
50	0	1965.72	44	28	7.88	3930.56	3918	22	7.25E-04	34.3	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration VerificationInstrument: GAMMA 11Calibration Date: 7/16/2015Geometry: CANManufacturer Standard Id: 96485GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.207E+04	9.73
Cs-137	661.7	0.851	735.7	2.3365E+04	2.487E+04	6.44
Co-60	1173.2	0.9985	1383	3.7435E+04	3.763E+04	0.52
Co-60	1332.5	0.9998	1385	3.7440E+04	3.811E+04	1.79

Prepared By: R. FuterDate: 7/28/15Reviewed By: M. StampDate: 7/24/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma v1

Date Performed: 7/16/15

Performed By: RF

High Voltage Power Supply Model No. <u>TC450</u> High Voltage <u>2.8KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.779</u> Time Constant <u>6.44K</u> Input polarity <u>Positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>ND579</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>3F7:1</u>	

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gamma 12Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the secondard standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. FutchDate: 9/30/15Reviewed By: M. StampDate: 10/7/15Effective Date: 9/29/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty*, %			Calibration Method*
			yps/gram		yps	Type	u _A	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	————	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.628E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

J. S. Laff
J. S. Laff, Spectroscopist

Date:

14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item I

Product Code: MIX-8400-EG-SD

Reference Date: 01-19-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source γps	Uncertainty* , %			Calibration Method*
			γps/gram		Type			
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	————	7.614E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.6	HPGe
Zn-65	1115.6	2.439E+02	————	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

Page 1 of 2

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

A. Chen
A. Chen, Spectroscopist

Date: 20 MAY 14



Standard Logbook

Serial ID: 1701 Open/Reference Date: 01-APR-14
Name: Mixed Gamma CAN Received: 01-APR-14
Type: Source Material Expires: 01-APR-40
Employee: Maggie Stamps Verified: 28-MAY-14
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

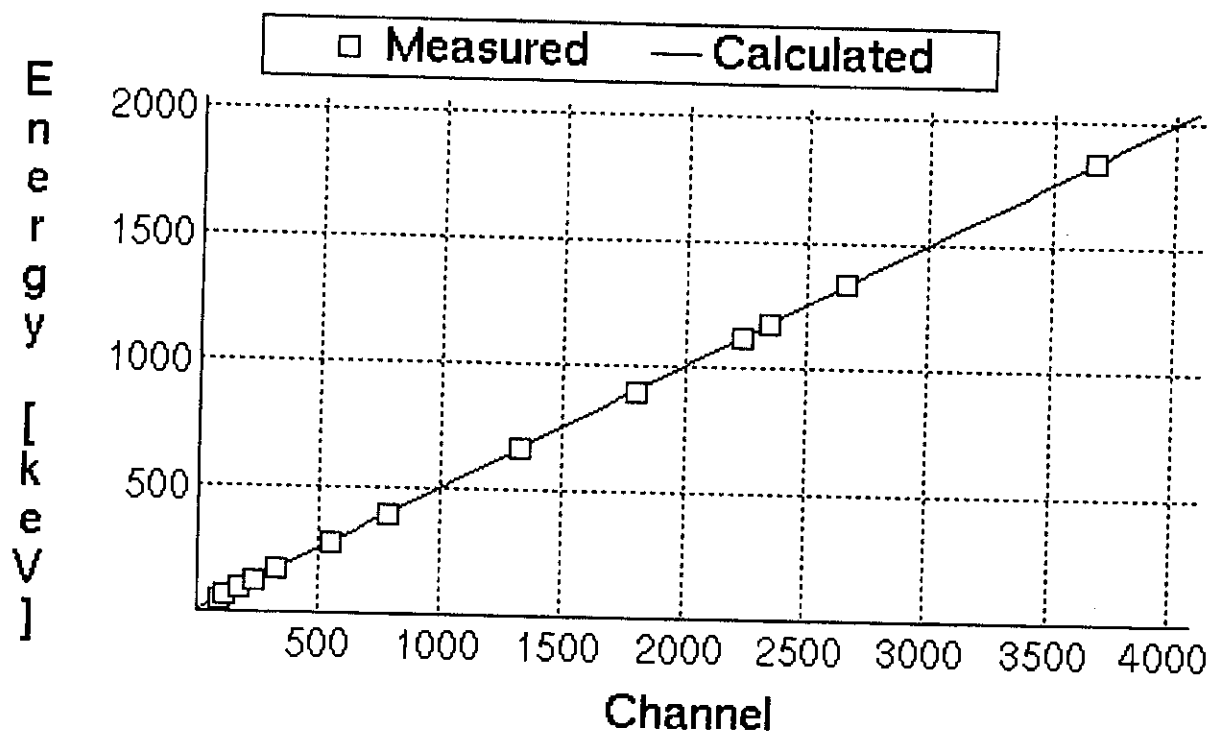
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



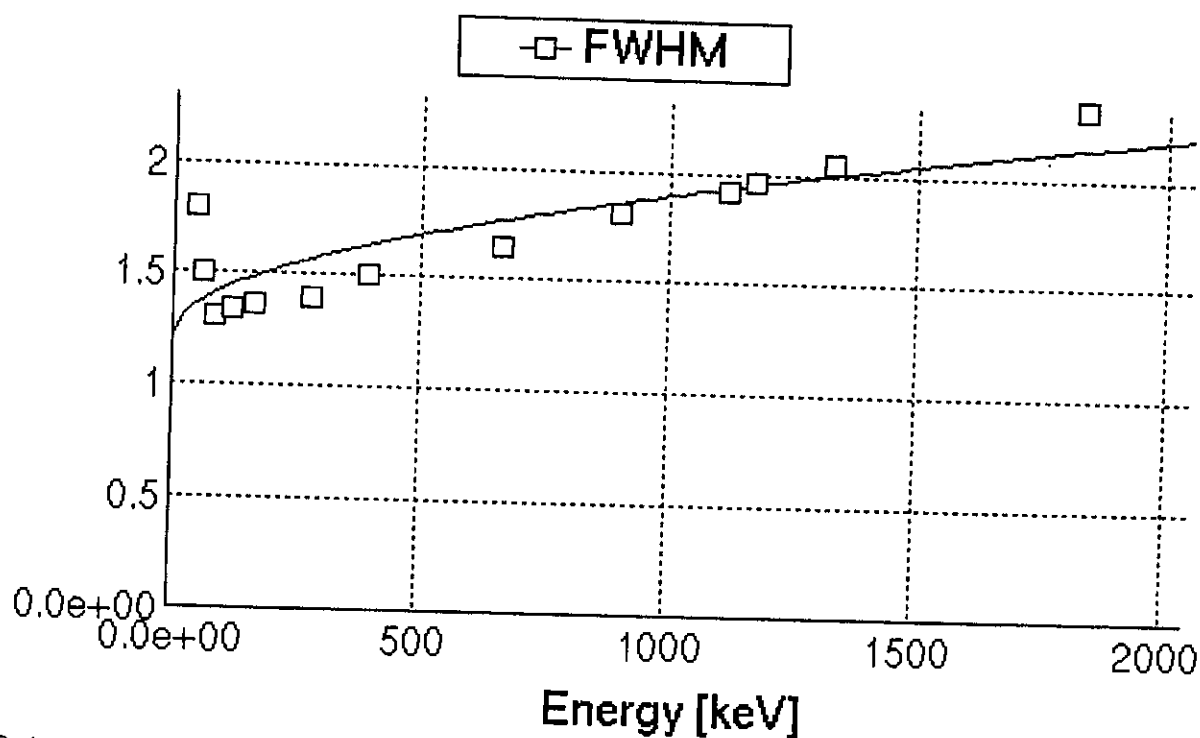
Datasource:

Energy = $3.531e-02 \text{ keV} + 5.001e-01 * \text{Ch} + -1.041e-07 * \text{Ch}^2$ [CHISQ = $2.361e-02$]

FWHM = $1.208e+00 \text{ keV} + 2.173e-02 * E^{1/2}$ [CHISQ = $3.124e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

energy calibration 812 9/28/15



Datasource:

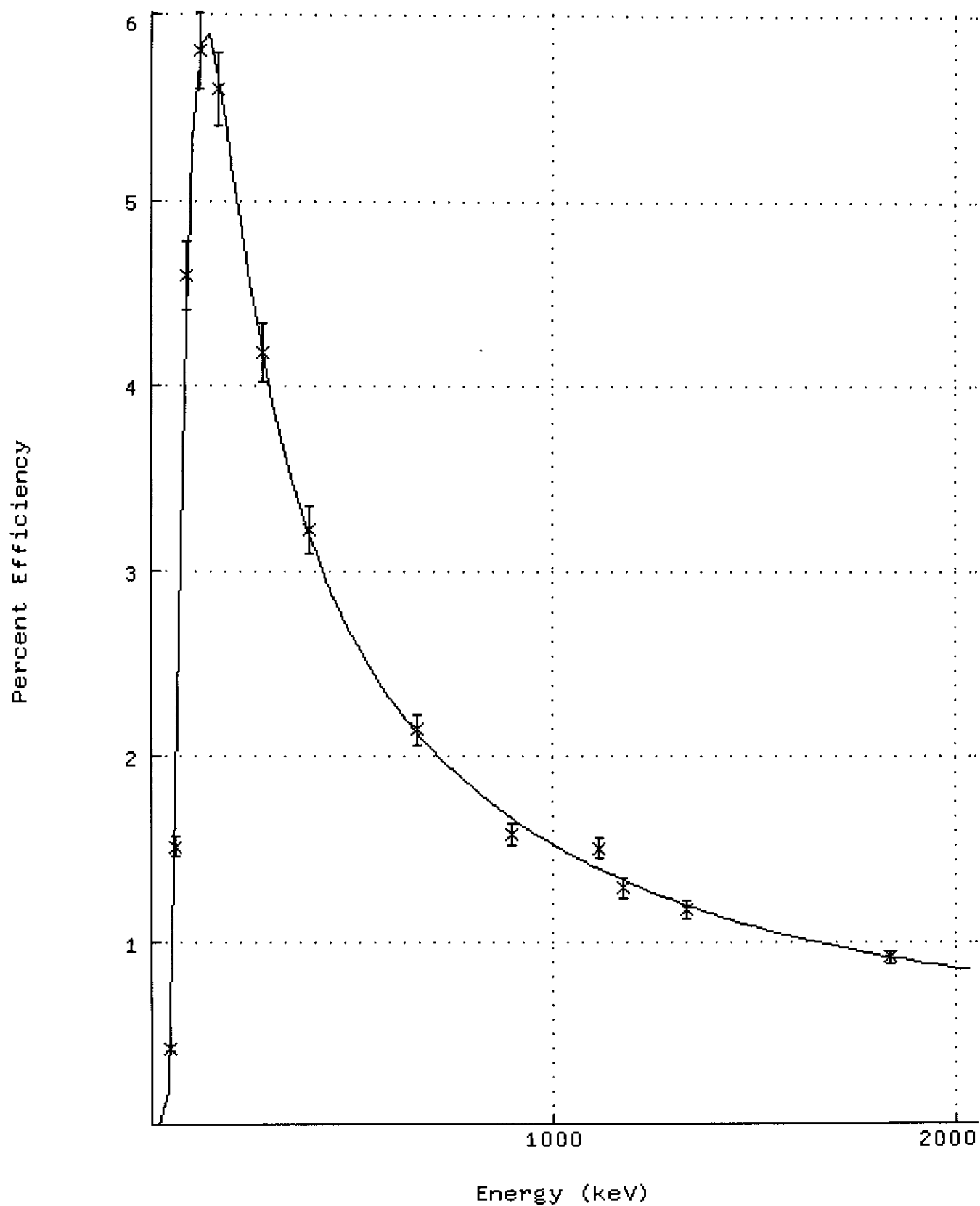
Energy = $3.531e-02 \text{ keV} + 5.001e-01 * \text{Ch} + -1.041e-07 * \text{Ch}^2$ [CHISQ = $2.361e-02$]

FWHM = $1.208e+00 \text{ keV} + 2.173e-02 * E^{1/2}$ [CHISQ = $3.124e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration 812 9/28/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM12_CAN.CNF;12
Calib Date: 29-SEP-2015 06:02
Detector : GAMMA12 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = 3.5314\text{E-}02 + 0.5001*\text{Channel} + -1.0405\text{E-}07*(\text{Channel}**2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.32	46.54	46.70	-0.161
2	119.03	59.54	59.56	-0.022
3	176.10	88.03	88.10	-0.071
4	244.02	122.06	122.06	-0.005
5	331.56	165.86	165.84	0.025
6	557.97	279.20	279.04	0.159
7	782.90	391.70	391.50	0.204
8	1323.21	661.66	661.59	0.071
9	1796.59	898.04	898.17	-0.128
10	2231.70	1115.60	1115.59	0.014
11	2347.23	1173.23	1173.31	-0.077
12	2666.06	1332.49	1332.58	-0.094
13	3673.98	1836.06	1835.98	0.084

FWHM Calibration Report

$$\text{FWHM} = 1.208 + 2.1728\text{E-}02*(\text{Energy}**1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.80	1.36	0.440
2	59.54	1.50	1.38	0.126
3	88.03	1.31	1.41	-0.102
4	122.06	1.34	1.45	-0.105
5	165.86	1.37	1.49	-0.123
6	279.20	1.40	1.57	-0.173
7	391.70	1.51	1.64	-0.131
8	661.66	1.65	1.77	-0.116
9	898.04	1.81	1.86	-0.045
10	1115.60	1.92	1.93	-0.011
11	1173.23	1.96	1.95	0.010
12	1332.49	2.05	2.00	0.049
13	1836.06	2.32	2.14	0.182

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.136	0.8252	-6.3107E-02	-2.4733E-03	6.3366E-02	-3.4068E-02

Average Deviation = 2.20 % Reduced Chi-Square = 1.27

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	4.18E-03	1.86E-04	4.14E-03	0.21	0.95
2	59.54	1.51E-02	5.64E-04	1.54E-02	-0.54	-2.03
3	88.03	4.58E-02	1.89E-03	4.44E-02	0.78	3.21
4	122.06	5.80E-02	2.05E-03	5.82E-02	-0.12	-0.43
5	165.86	5.59E-02	1.98E-03	5.68E-02	-0.46	-1.64
6	279.20	4.18E-02	1.56E-03	4.15E-02	0.19	0.71
7	391.70	3.22E-02	1.27E-03	3.20E-02	0.20	0.79
8	661.66	2.14E-02	8.64E-04	2.12E-02	0.23	0.93
9	898.04	1.58E-02	5.90E-04	1.66E-02	-1.44	-5.41
10	1115.60	1.50E-02	5.30E-04	1.39E-02	2.08	7.37
11	1173.23	1.28E-02	5.04E-04	1.33E-02	-0.87	-3.43
12	1332.49	1.17E-02	4.59E-04	1.19E-02	-0.44	-1.72
13	1836.06	9.12E-03	3.41E-04	9.12E-03	0.01	0.02

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM12_CAN_345365.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 345359 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 28-SEP-2015 11:31:22
 Decay time : 179 23:31:22.69 % dead time : 2.3%
 Elapsed live time: 0 01:20:00.00 Elapsed real time: 0 01:21:50.50

---- Detector Parameters ----

Energy cal. time : 28-SEP-2015 08:19:48 Energy cal. oper.: gamma spec user
 Detector name : GAMMA12 Counting geometry: CAN
 Effic. cal. time : 29-SEP-2015 06:02:19 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	5	36.86	20841	5298	2.16	73.63	68	30	4.34E+00	1.5	1.12E+03
2	5	46.49	24001	34142	2.18	92.90	68	30	5.00E+00	1.5	
3	0	59.46	57019	52736	1.33	118.82	111	14	1.19E+01	1.0	
4	0	67.87	904	27167	1.59	135.64	133	7	1.88E-01	30.4	
5	0	73.01	928	33014	0.95	145.93	143	8	1.93E-01	34.1	
6	0	88.03	187010	63137	1.36	175.96	168	16	3.90E+01	0.4	
7	0	102.45	386	19849	1.54	204.81	203	7	8.04E-02	60.7	
8	0	122.02	106363	42415	1.36	243.93	236	16	2.22E+01	0.5	
9	0	136.47	13740	23539	1.38	272.84	268	11	2.86E+00	2.3	
10	0	165.78	90953	31364	1.39	331.45	323	16	1.89E+01	0.5	
11	0	180.34	84	12993	0.50	360.57	358	8	1.75E-02	235.2	
12	0	212.17	260	12572	1.65	424.22	422	7	5.41E-02	71.8	
13	0	254.99	2724	14350	1.49	509.86	505	10	5.67E-01	8.5	
14	0	278.97	24333	16538	1.45	557.83	552	13	5.07E+00	1.3	
15	0	391.39	61403	14102	1.54	782.68	776	15	1.28E+01	0.6	
16	0	459.26	1630	12312	2.86	918.44	913	13	3.40E-01	14.3	
17	0	510.76	7689	11999	2.77	1021.47	1014	16	1.60E+00	3.4	
18	0	643.32	133	5907	0.56	1286.66	1283	8	2.78E-02	100.3	
19	0	646.54	276	5627	1.91	1293.12	1290	8	5.74E-02	47.6	
20	0	661.41	76104	12426	1.69	1322.85	1314	17	1.59E+01	0.5	
21	0	687.74	952	8295	2.71	1375.55	1371	11	1.98E-01	18.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	696.06	333	5656	1.22	1392.18	1389	8	6.95E-02	39.5	
23	0	813.94	656	6859	1.76	1628.05	1622	11	1.37E-01	24.7	
24	0	897.92	66122	13986	1.79	1796.10	1787	19	1.38E+01	0.6	
25	0	937.48	157	5077	0.87	1875.26	1873	8	3.27E-02	78.8	
26	0	1115.31	65242	8052	1.93	2231.16	2220	21	1.36E+01	0.5	
27	0	1173.02	81810	4376	1.99	2346.67	2339	18	1.70E+01	0.4	
28	0	1188.14	60	1311	1.45	2376.92	2372	7	1.25E-02	101.3	
29	0	1231.26	148	1148	2.15	2463.23	2460	9	3.09E-02	41.9	
30	4	1324.92	1267	2631	2.93	2650.71	2641	37	2.64E-01	9.5	3.62E+00
31	4	1332.25	74183	1582	2.07	2665.40	2641	37	1.55E+01	0.4	
32	0	1352.95	25	1084	1.60	2706.82	2704	10	5.14E-03	250.6	
33	0	1457.66	73	1379	4.31	2916.46	2911	12	1.53E-02	101.9	
34	0	1494.53	83	1662	0.61	2990.26	2985	14	1.72E-02	105.1	
35	0	1560.05	56	2244	4.28	3121.45	3117	15	1.16E-02	185.1	
36	0	1601.63	149	1564	1.83	3204.70	3200	10	3.11E-02	50.4	
37	0	1710.93	40	525	0.82	3423.56	3422	9	8.42E-03	103.3	
38	0	1835.53	40291	908	2.33	3673.08	3662	22	8.39E+00	0.5	
39	0	1879.40	55	183	0.95	3760.94	3757	10	1.15E-02	47.9	

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM12_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM12.CNF;397
Background date    : 26-SEP-2015 13:28:46
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 29-SEP-2015 07:17:58
Sample ID        : VER_GAM12_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM12              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:39.73  1.1%
Energy tolerance : 1.50000 keV        Analyst Initials  :
Abundance limit  : 75.00000           Sensitivity       : 3.00000
Batch ID         :                    Detector SN#       :
Matrix Spike ID  :                    LCS ID             :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	25.31	27	42	3.05	50.55	46	10	7.60E-03	47.5	
2	5	36.86*	10402	2230	2.16	73.63	68	31	2.89E+00	2.1	6.49E+02
3	5	40.54	4371	4848	1.35	81.00	68	31	1.21E+00	4.1	
4	5	46.78*	18188	15815	2.18	93.47	68	31	5.05E+00	1.4	
5	0	59.50	42388	23602	1.40	118.91	111	14	1.18E+01	0.9	
6	0	88.07	80351	22792	1.40	176.05	168	15	2.23E+01	0.5	
7	0	122.09	31237	13299	1.44	244.08	237	15	8.68E+00	1.0	
8	0	136.48	3823	7933	1.42	272.86	268	11	1.06E+00	4.8	
9	0	165.85	10833	8733	1.47	331.59	325	13	3.01E+00	2.0	
10	0	173.43	211	4045	1.80	346.75	344	7	5.85E-02	50.6	
11	0	183.65	97	4429	1.40	367.18	364	7	2.69E-02	114.3	
12	0	391.52	5052	5834	1.60	782.94	777	13	1.40E+00	3.4	
13	0	430.39*	17	3456	0.72	860.70	857	8	4.78E-03	592.1	
14	0	459.53	984	5885	2.81	918.98	913	13	2.73E-01	16.4	
15	0	510.83*	1719	5226	2.65	1021.61	1014	16	4.78E-01	9.7	
16	0	661.60	55177	5229	1.74	1323.23	1313	19	1.53E+01	0.5	
17	0	687.47	130	2187	1.11	1375.00	1371	9	3.60E-02	65.5	
18	0	720.03	102	1633	1.18	1440.15	1438	7	2.83E-02	66.6	
19	0	898.06	4772	4854	1.80	1796.37	1788	15	1.33E+00	3.5	
20	0	933.81	104	2579	0.61	1867.90	1865	8	2.88E-02	85.2	
21	0	1042.34	80	1531	0.67	2085.10	2080	7	2.22E-02	82.1	
22	0	1115.61	17138	3523	2.07	2231.74	2224	17	4.76E+00	1.1	
23	0	1173.30	53441	2358	2.02	2347.22	2336	22	1.48E+01	0.5	
24	0	1332.56	48260	773	2.10	2666.01	2657	19	1.34E+01	0.5	
25	0	1607.83	40	295	3.76	3217.13	3207	16	1.11E-02	97.1	
26	0	1670.68	36	70	0.85	3342.96	3339	8	1.00E-02	43.9	
27	0	1835.94	2936	112	2.27	3673.90	3665	18	8.16E-01	2.0	
28	0	1882.83	38	97	2.32	3767.82	3759	15	1.05E-02	59.0	
29	0	1947.79*	40	106	5.41	3897.91	3890	16	1.11E-02	59.3	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	31237	85.60*	5.824E+00	4.704E+03	1.893E+04	1.97
	136.47	3823	10.68	5.905E+00	4.552E+03	1.832E+04	9.59
CO-60	1173.23	53441	99.85	1.329E+00	3.024E+04	3.680E+04	0.98
	1332.49	48260	99.98*	1.192E+00	3.040E+04	3.700E+04	0.95
ZN-65	1115.54	17138	50.60*	1.387E+00	1.834E+04	8.640E+04	2.21
Y-88	898.04	4772	93.70	1.661E+00	2.302E+03	7.998E+04	6.99
	1836.06	2936	99.20*	9.116E-01	2.437E+03	8.470E+04	4.06
CD-109	88.03	80351	3.70*	4.440E+00	3.672E+05	8.338E+05	1.08
SN-113	391.70	5052	64.97*	3.198E+00	1.826E+03	4.887E+04	6.84
CS-137	661.66	55177	85.10*	2.123E+00	2.293E+04	2.373E+04	1.06
CE-139	165.86	10833	80.00*	5.680E+00	1.790E+03	2.796E+04	4.04
PB-210	46.54	18188	4.25*	4.283E-01	7.502E+05	7.860E+05	2.73
AM-241	59.54	42388	35.90*	1.536E+00	5.770E+04	5.784E+04	1.82

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM12.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 26-SEP-2015 13:28:46 Acquisition date : 26-SEP-2015 13:28:46
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.44

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.3218E+00	-1.02	
[1.34296+/-0.02082]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 9 / 30 / 15

Sample ID : Bkg

Acquisition date : 26-SEP-2015 13:28:46

VMS Gamma Spectroscopy Report generated 27-SEP-2015 06:09:11

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM12__345253.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 345253 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 26-SEP-2015 13:28:46

---- Sample Decay/Count Information ----

Sample Date : 26-SEP-2015 13:28:46 Acquisition date : 26-SEP-2015 13:28:46
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.44

---- Detector Parameters ----

Energy cal. time : 29-SEP-2014 10:24:16 Energy cal. oper.: gamma spec user
 Detector name : GAMMA12 Counting geometry:
 Effic. cal. time : 3-SEP-2014 08:34:16. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	35.85	255	115	1.28	71.50	68	17	4.25E-03	12.6	9.56E+00
2	4	38.41	261	422	2.16	76.63	68	17	4.35E-03	19.3	
3	0	45.73	69	721	1.30	91.27	87	10	1.15E-03	73.8	
4	0	63.47	153	759	1.07	126.75	122	9	2.54E-03	33.5	
5	0	84.90	106	718	1.74	169.58	166	9	1.77E-03	46.4	
6	0	92.93	808	931	1.55	185.64	180	13	1.35E-02	8.6	
7	0	143.39	65	635	1.39	286.54	283	10	1.08E-03	73.4	
8	4	159.80	61	617	1.91	319.36	312	18	1.02E-03	79.7	1.23E+00
9	4	163.29	78	353	1.06	326.34	312	18	1.31E-03	39.0	
10	0	185.81	547	744	1.30	371.37	365	13	9.12E-03	11.1	
11	0	205.57	40	507	1.30	410.89	407	9	6.75E-04	101.4	
12	0	225.38	59	356	0.86	450.51	447	8	9.82E-04	57.3	
13	0	238.28	120	559	0.72	476.30	473	9	1.99E-03	36.7	
14	0	294.72	74	380	2.90	589.17	585	10	1.23E-03	50.5	
15	0	351.79	48	299	0.86	703.30	700	9	8.04E-04	65.9	
16	0	429.24	46	320	3.80	858.22	853	12	7.73E-04	78.8	
17	0	463.00	45	121	1.78	925.74	923	7	7.52E-04	42.9	
18	0	498.69	13	292	0.48	997.11	989	13	2.16E-04	273.5	
19	0	510.97	1435	518	2.40	1021.67	1012	23	2.39E-02	4.9	

20	0	545.02	50	172	1.70	1089.78	1085	10	8.27E-04	52.5
21	0	558.69	65	230	0.92	1117.13	1110	13	1.09E-03	49.6
22	2	579.55	33	101	1.58	1158.87	1156	18	5.46E-04	51.2
23	2	583.09	103	234	2.13	1165.95	1156	18	1.72E-03	32.1
24	0	608.81	92	338	2.15	1217.40	1210	14	1.53E-03	43.7
25	0	675.86	35	120	2.83	1351.52	1346	11	5.90E-04	62.3
26	0	680.58	71	220	5.32	1360.96	1356	16	1.18E-03	47.9
27	0	693.64	57	193	1.28	1387.09	1382	11	9.51E-04	48.9
28	0	775.13	79	245	6.64	1550.12	1540	22	1.31E-03	52.1
29	0	803.43	72	113	2.13	1606.74	1602	11	1.20E-03	30.9
30	0	911.41	98	88	1.44	1822.79	1818	11	1.63E-03	21.1
31	0	918.34	75	119	5.24	1836.65	1829	16	1.24E-03	34.8
32	0	947.03	64	142	7.28	1894.04	1883	19	1.06E-03	46.7
33	0	1000.15	38	167	1.06	2000.34	1998	14	6.31E-04	73.8
34	0	1132.37	30	90	4.00	2264.92	2253	14	4.92E-04	71.9
35	3	1143.05	19	15	1.40	2286.30	2285	14	3.21E-04	28.3
36	3	1146.30	52	60	2.32	2292.80	2285	14	8.66E-04	33.2
37	0	1156.40	14	53	0.54	2313.01	2308	9	2.39E-04	97.1
38	0	1164.72	26	83	4.19	2329.67	2323	13	4.37E-04	74.7
39	0	1271.31	36	59	4.12	2543.00	2536	13	6.00E-04	46.9
40	0	1411.88	20	97	3.63	2824.34	2810	17	3.34E-04	116.9
41	0	1460.80	92	63	1.81	2922.27	2915	14	1.54E-03	21.0
42	0	1495.26	25	39	1.23	2991.24	2985	12	4.22E-04	53.1
43	0	1656.03	41	64	9.66	3313.08	3301	22	6.91E-04	52.2
44	8	1682.23	27	27	2.46	3365.55	3362	16	4.50E-04	33.1
45	8	1685.90	24	29	3.23	3372.89	3362	16	3.94E-04	51.4
46	0	1694.55	23	41	0.93	3390.21	3382	13	3.75E-04	63.0
47	0	1731.87	22	115	7.33	3464.93	3439	27	3.73E-04	134.8
48	0	1765.52	29	60	0.78	3532.31	3523	13	4.90E-04	58.9
49	0	1868.72	14	20	3.34	3738.93	3733	10	2.33E-04	65.5
50	0	1948.95	13	27	3.43	3899.60	3893	12	2.25E-04	81.6
51	0	2028.98	16	41	4.20	4059.86	4049	14	2.61E-04	93.8

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 12

Calibration Date: 9/28/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.784E+04	2.25
Cs-137	661.7	0.851	735.7	2.3365E+04	2.373E+04	1.56
Co-60	1173.2	0.9985	1383	3.7435E+04	3.680E+04	-1.70
Co-60	1332.5	0.9998	1385	3.7440E+04	3.700E+04	-1.18

Prepared By: R Fuzler

Date: 9/28/15

Reviewed By: M J Stamp

Date: 10/7/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

High Voltage Power Supply Module

Address: NI82E1:1 Type: DSA-2000 ID: 0

Limit:	4000.000	Overload latch enable	No
Voltage:	4000.000	Inhibit latch enable	No
Status:	On	Negative Output polarity	No
5V/12V inhibit:	5V	Rely on module for ramp	No

DSA-2000 HVPS Range: 5000.0

DSP Module

Address: NI82E1:1 Type: DSA-2000 ID: 0

Coarse gain:	15.0	Gain Centroid:	7680
Fine gain:	1.5465	Gain Window:	8
S-fine gain:	0.012337	Gain Spacing:	64
Pole Zero:	3166	Gain Ratio:	1.000
Coinc. mode:	Anti.	Zero Centroid:	512
Offset:	0	Zero Window:	8
LLD:	0.85	Zero Spacing:	64
Zero:	0.000	Zero Ratio:	1.000
Conv. Gain:	8192	Gain Rate div:	1
ADC Range:	8192	Zero Rate div:	1
FDisc Mode:	Auto	Gain Corr. rng:	Ge
Fast Disc.:	1.000	Zero Corr. rng:	Ge
Inp. Polarity:	Positive	Zero Mode:	Off
Inh. Polarity:	Positive	Gain Mode:	Off
Rise Time:	18.400	Preamp Type:	RC
Flat Top:	1.200	PUR Mode:	On
BLR Mode:	Auto	PUR Guard:	1.1
Live Time Trim:	250	TRP Inhibit:	Reset

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gamma 14Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the second standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: P. FiedlerDate: 10/13/15Reviewed By: M. J. TamprDate: 10/13/15Effective Date: 10/13/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty*, %			Calibration Method*
			yps/gram		Type			
				yps	u_A	u_B	U	
Pb-210	46.5	8.109E+03	————	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	————	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laff
J. S. Laff, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master	This Source	Uncertainty*, %			Calibration Method*
			Source*		Type			
			γps/gram	γps	u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.895E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibblitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

A. Chen
A. Chen, Spectroscopist

Date: 20/04/14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Ziegler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

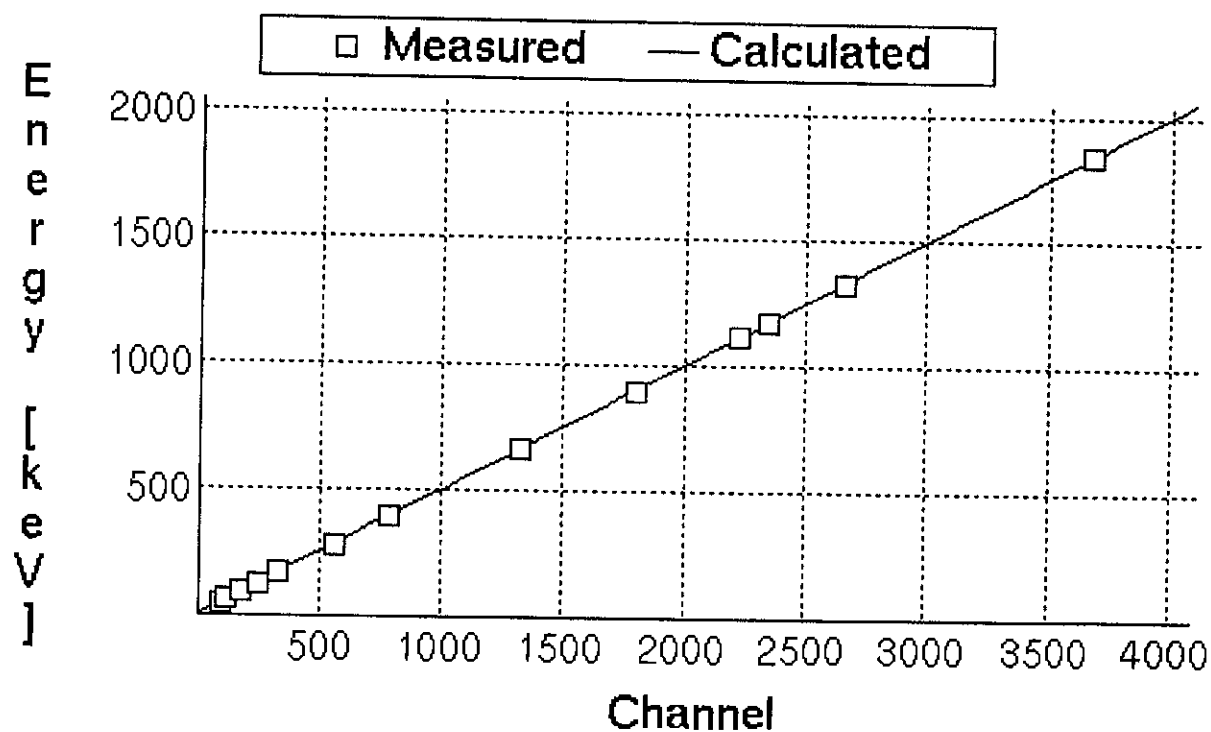
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
			*		1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D			514.00	96.00
			*		898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
			*		72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
			*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



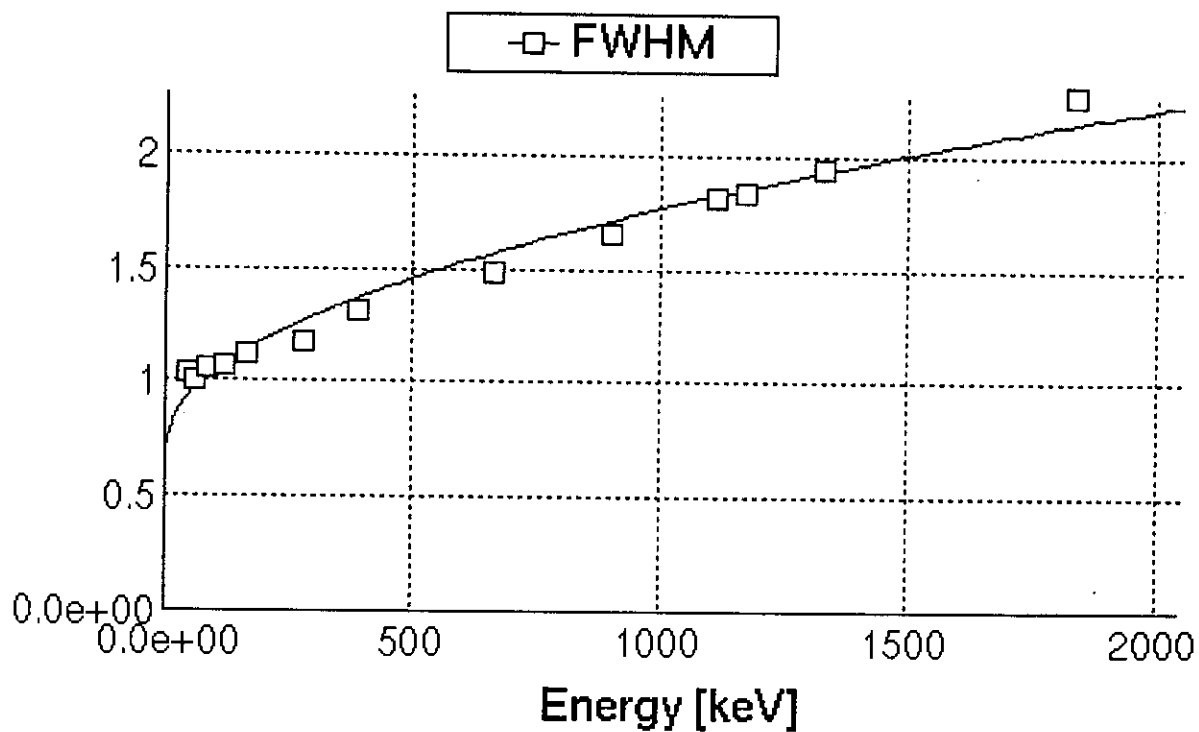
Datasource:

Energy = -2.517×10^{-1} keV + $5.002 \times 10^{-1} \cdot \text{Ch}$ + $5.024 \times 10^{-9} \cdot \text{Ch}^2$ [CHISQ = 3.582×10^{-2}]

FWHM = 7.021×10^{-1} keV + $3.375 \times 10^{-2} \cdot E^{1/2}$ [CHISQ = 4.690×10^{-3}]

Lo Tail = 0.000×10^0 keV + $0.000 \times 10^0 \cdot E$ [CHISQ = 0.000×10^0]

energy calibration 814 10/12/15



Datasource:

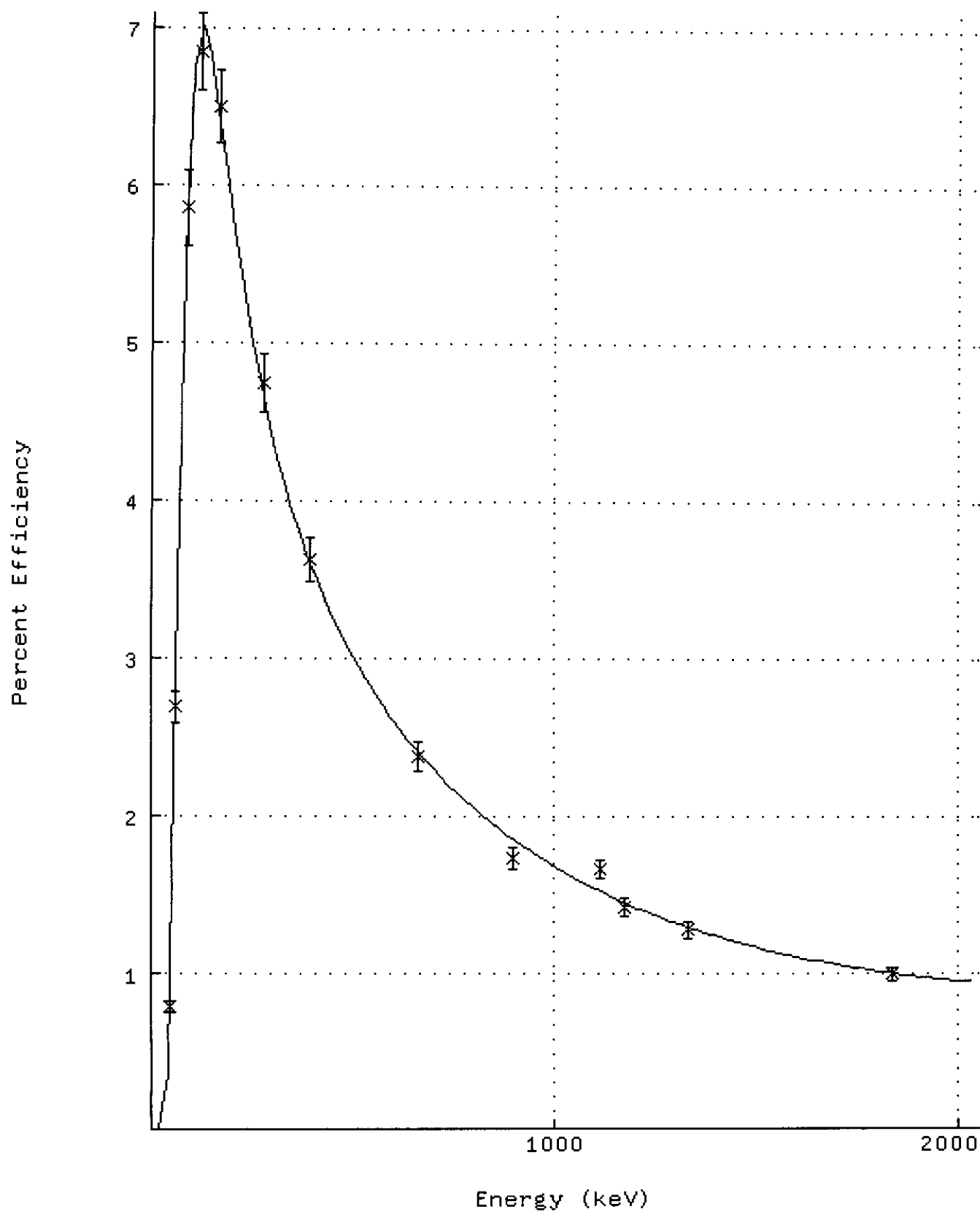
Energy = $-2.517e-01 \text{ keV} + 5.002e-01 * \text{Ch} + 5.024e-09 * \text{Ch}^2$ [CHISQ = $3.582e-02$]

FWHM = $7.021e-01 \text{ keV} + 3.375e-02 * E^{1/2}$ [CHISQ = $4.690e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration r14 10/12/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM14_CAN.CNF;14
Calib Date: 13-OCT-2015 08:09
Detector : GAMMA14 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -0.2517 + 0.5002 \cdot \text{Channel} + 5.0241\text{E-}09 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.24	46.54	46.38	0.156
2	119.59	59.54	59.56	-0.025
3	176.58	88.03	88.07	-0.036
4	244.62	122.06	122.10	-0.039
5	332.20	165.86	165.90	-0.041
6	558.78	279.20	279.23	-0.032
7	783.67	391.70	391.72	-0.015
8	1323.37	661.66	661.66	0.001
9	1795.97	898.04	898.04	-0.003
10	2230.82	1115.60	1115.54	0.056
11	2346.15	1173.23	1173.23	-0.003
12	2664.56	1332.49	1332.50	-0.005
13	3671.32	1836.06	1836.07	-0.014

FWHM Calibration Report

$$\text{FWHM} = 0.7021 + 3.3750\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.04	0.93	0.107
2	59.54	1.00	0.96	0.039
3	88.03	1.05	1.02	0.034
4	122.06	1.07	1.07	-0.002
5	165.86	1.12	1.14	-0.014
6	279.20	1.17	1.27	-0.093
7	391.70	1.32	1.37	-0.054
8	661.66	1.49	1.57	-0.079
9	898.04	1.66	1.71	-0.054
10	1115.60	1.82	1.83	-0.006
11	1173.23	1.84	1.86	-0.016
12	1332.49	1.95	1.93	0.014
13	1836.06	2.27	2.15	0.126

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.031	0.9061	-8.6989E-02	-0.1200	0.1485	-4.7179E-02

Average Deviation = 2.84 % Reduced Chi-Square = 1.90

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	7.88E-03	3.44E-04	8.10E-03	-0.64	-2.78
2	59.54	2.69E-02	9.88E-04	2.58E-02	1.16	4.25
3	88.03	5.85E-02	2.41E-03	6.00E-02	-0.64	-2.63
4	122.06	6.84E-02	2.43E-03	7.00E-02	-0.65	-2.32
5	165.86	6.50E-02	2.31E-03	6.43E-02	0.27	0.97
6	279.20	4.74E-02	1.85E-03	4.62E-02	0.63	2.48
7	391.70	3.62E-02	1.44E-03	3.61E-02	0.10	0.40
8	661.66	2.38E-02	9.64E-04	2.41E-02	-0.30	-1.20
9	898.04	1.73E-02	6.54E-04	1.85E-02	-1.86	-7.03
10	1115.60	1.66E-02	5.92E-04	1.52E-02	2.42	8.63
11	1173.23	1.42E-02	5.59E-04	1.45E-02	-0.55	-2.15
12	1332.49	1.27E-02	5.01E-04	1.29E-02	-0.36	-1.40
13	1836.06	9.95E-03	3.75E-04	1.00E-02	-0.17	-0.66

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM14_CAN_346844.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.000000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 346836 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 13-OCT-2015 07:25:39
 Decay time : 194 19:25:39.94 % dead time : 1.8%
 Elapsed live time: 0 00:42:28.96 Elapsed real time: 0 00:43:16.54

----- Detector Parameters -----

Energy cal. time : 12-OCT-2015 10:05:30 Energy cal. oper.: gamma spec user
 Detector name : GAMMA14 Counting geometry: CAN
 Effic. cal. time : 13-OCT-2015 08:09:23 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.000000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.000000 Half life ratio : 8.00000
 Abundance limit : 75.000000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.000000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	43.97	9043	7642	2.39	88.42	84	13	3.55E+00	2.2	8.20E+01
2	10	46.29	24871	9172	1.02	93.05	84	13	9.76E+00	0.9	
3	0	59.37	51941	23805	1.10	119.20	113	11	2.04E+01	0.7	
4	0	66.64	429	13062	1.80	133.73	132	6	1.68E-01	42.3	
5	0	72.85	664	13843	0.94	146.15	144	6	2.61E-01	28.3	
6	0	87.93	123373	29941	1.10	176.30	170	13	4.84E+01	0.4	
7	0	121.98	63860	15727	1.12	244.39	240	11	2.51E+01	0.6	
8	0	136.39	7801	11569	1.11	273.20	269	10	3.06E+00	2.8	
9	0	165.76	52175	13188	1.13	331.90	325	13	2.05E+01	0.6	
10	0	225.65	324	5603	2.81	451.65	449	6	1.27E-01	37.0	
11	0	245.78	178	3843	1.36	491.91	490	5	6.99E-02	52.7	
12	0	255.07	1601	7523	1.14	510.48	506	10	6.28E-01	10.5	
13	0	279.09	11746	7849	1.25	558.49	553	11	4.61E+00	1.7	
14	0	291.45	158	3050	0.93	583.21	582	5	6.18E-02	53.1	
15	0	295.07	175	3761	1.47	590.44	588	6	6.85E-02	56.1	
16	0	310.05	188	3585	1.08	620.39	618	6	7.38E-02	50.8	
17	0	391.58	33487	7633	1.30	783.39	776	14	1.31E+01	0.8	
18	0	510.81	4367	7071	2.62	1021.78	1013	17	1.71E+00	4.7	
19	0	661.51	44653	6875	1.50	1323.07	1315	16	1.75E+01	0.6	
20	0	781.98	117	2263	1.19	1563.92	1561	7	4.60E-02	68.0	
21	0	813.83	594	3300	1.39	1627.61	1623	10	2.33E-01	18.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	897.87	35075	6932	1.64	1795.63	1787	17	1.38E+01	0.8	
23	0	1115.37	36804	3898	1.80	2230.48	2222	17	1.44E+01	0.7	
24	0	1173.05	47721	2661	1.79	2345.78	2337	19	1.87E+01	0.5	
25	0	1230.16	73	551	1.00	2459.97	2457	8	2.85E-02	57.2	
26	5	1324.94	637	1227	3.11	2649.45	2642	31	2.50E-01	12.4	7.09E+00
27	5	1332.33	42661	933	1.96	2664.22	2642	31	1.67E+01	0.5	
28	0	1438.49	75	454	1.29	2876.48	2873	8	2.96E-02	50.1	
29	0	1475.59	129	933	3.28	2950.63	2944	15	5.04E-02	52.6	
30	0	1505.28	30	767	1.42	3009.99	3006	11	1.18E-02	179.9	
31	0	1530.83	60	633	1.33	3061.08	3058	9	2.37E-02	76.1	
32	0	1563.81	71	731	1.36	3127.01	3122	9	2.80E-02	69.5	
33	0	1713.39	42	409	3.20	3426.05	3420	13	1.65E-02	101.1	
34	0	1813.22	9	191	0.92	3625.64	3615	12	3.66E-03	298.9	
35	0	1835.86	21166	472	2.23	3670.91	3660	22	8.30E+00	0.7	
36	0	1983.94	15	198	4.18	3966.94	3957	16	5.85E-03	213.6	
37	0	2036.20	25	122	1.13	4071.41	4065	11	9.82E-03	88.9	

```

*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road      *
*               Charleston, SC 29407  *
*                                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM14_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM14.CNF;470
Background date    : 10-OCT-2015 11:13:27
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 13-OCT-2015 10:22:57
Sample ID        : VER_GAM14_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name     : GAM14             Detector geometry: CAN
Elapsed live time : 0 00:30:00.00     Elapsed real time: 0 00:30:18.47  1.0%
Energy tolerance  : 1.50000 keV       Analyst Initials  :
Abundance limit   : 75.00000          Sensitivity       : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	45.98*	22191	8409	1.13	92.43	85	12	1.23E+01	1.1	
2	9	58.25	1999	9670	2.00	116.96	113	16	1.11E+00	11.9	3.02E+00
3	9	59.69	35237	5789	0.98	119.84	113	16	1.96E+01	0.6	
4	0	68.17*	117	4224	1.11	136.80	135	5	6.49E-02	83.8	
5	0	88.18	51662	10514	1.02	176.80	171	12	2.87E+01	0.6	
6	0	122.20	18124	5812	1.05	244.82	239	12	1.01E+01	1.1	
7	0	136.62	2257	3907	1.05	273.66	269	10	1.25E+00	5.6	
8	0	166.01	6113	3511	1.13	332.40	327	10	3.40E+00	2.2	
9	0	209.13*	98	1692	1.40	418.63	417	5	5.45E-02	63.8	
10	0	228.12	174	1955	1.22	456.58	454	6	9.67E-02	41.0	
11	0	255.11	125	2097	1.31	510.55	507	7	6.97E-02	61.3	
12	0	391.88	2500	2473	1.37	784.00	779	10	1.39E+00	4.2	
13	0	448.61	148	1862	1.81	897.42	895	8	8.22E-02	51.1	
14	0	511.14*	1178	2974	2.46	1022.45	1014	18	6.55E-01	11.3	
15	0	563.54	59	1042	1.23	1127.20	1126	7	3.27E-02	91.9	
16	0	571.52	58	1194	1.29	1143.16	1140	9	3.25E-02	107.2	
17	0	580.01	104	1330	2.31	1160.14	1155	10	5.77E-02	66.6	
18	0	661.73	31788	1874	1.47	1323.52	1316	13	1.77E+01	0.6	
19	0	698.55	97	1335	1.70	1397.12	1392	11	5.38E-02	73.9	
20	0	713.90	46	1150	2.16	1427.82	1426	9	2.55E-02	133.8	
21	0	873.67	94	1252	1.12	1747.24	1744	8	5.21E-02	66.2	
22	0	898.14	2440	2366	1.78	1796.18	1790	13	1.36E+00	4.6	
23	0	980.00	169	964	2.90	1959.83	1956	8	9.41E-02	32.7	
24	0	1078.60	143	1060	1.32	2156.95	2153	10	7.95E-02	43.3	
25	0	1115.62	9164	1524	1.75	2230.97	2224	15	5.09E+00	1.4	
26	0	1173.24	29563	1092	1.85	2346.17	2336	19	1.64E+01	0.6	
27	0	1332.50	26878	435	1.95	2664.57	2654	20	1.49E+01	0.6	
28	0	1567.91	41	115	1.20	3135.21	3128	14	2.29E-02	57.3	
29	1	1836.07	1477	65	2.18	3671.31	3661	29	8.20E-01	2.8	2.50E+00
30	1	1840.91*	42	34	2.15	3681.00	3661	29	2.34E-02	44.2	
31	0	1884.16	27	80	4.76	3767.47	3756	20	1.51E-02	86.7	
32	4	1932.28	18	28	2.42	3863.65	3861	19	9.94E-03	42.8	9.13E+00
33	4	1934.95	42	64	2.19	3869.00	3861	19	2.35E-02	39.4	

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	18124	85.60*	7.001E+00	4.541E+03	1.894E+04	2.25
	136.47	2257	10.68	6.907E+00	4.594E+03	1.916E+04	11.19
CO-60	1173.23	29563	99.85	1.450E+00	3.066E+04	3.751E+04	1.28
	1332.49	26878	99.98*	1.291E+00	3.126E+04	3.824E+04	1.28
ZN-65	1115.54	9164	50.60*	1.519E+00	1.790E+04	8.782E+04	2.80
Y-88	898.04	2440	93.70	1.852E+00	2.112E+03	8.043E+04	9.17
	1836.06	1477	99.20*	1.001E+00	2.233E+03	8.505E+04	5.68
CD-109	88.03	51662	3.70*	6.014E+00	3.486E+05	8.085E+05	1.19
SN-113	391.70	2500	64.97*	3.609E+00	1.601E+03	4.667E+04	8.45
CS-137	661.66	31788	85.10*	2.409E+00	2.329E+04	2.412E+04	1.25
CE-139	165.86	6113	80.00*	6.431E+00	1.784E+03	2.993E+04	4.44
PB-210	46.54	22191	4.25*	7.523E-01	1.042E+06	1.093E+06	2.16
AM-241	59.54	35237	35.90*	2.599E+00	5.670E+04	5.684E+04	1.29

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM14.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 10-OCT-2015 11:13:27 Acquisition date : 10-OCT-2015 11:13:27
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.71

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.2558E+00	-0.09	
[1.25778+/-0.02266]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RP Approval Date: 10/13/15

Sample ID : Bkg

Page : 1
Acquisition date : 10-OCT-2015 11:13:27

VMS Gamma Spectroscopy Report generated 11-OCT-2015 03:53:36

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM14___346639.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 346639 Sptrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 10-OCT-2015 11:13:27

---- Sample Decay/Count Information ----

Sample Date : 10-OCT-2015 11:13:27 Acquisition date : 10-OCT-2015 11:13:27
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.71

---- Detector Parameters ----

Energy cal. time : 2-MAR-2015 16:20:30. Energy cal. oper.: gamma spec user
Detector name : GAMMA14 Counting geometry:
Effic. cal. time : 12-MAR-2015 05:56:21 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.80	227	494	1.20	93.65	90	8	3.79E-03	18.2	
2	2	62.18	53	209	1.16	124.40	123	14	8.78E-04	36.7	4.07E+00
3	2	63.89	255	474	1.16	127.83	123	14	4.24E-03	15.6	
4	2	66.78	95	451	1.17	133.59	123	14	1.59E-03	39.2	
5	0	75.08	17	566	0.54	150.20	148	6	2.81E-04	223.4	
6	0	84.66	79	544	1.65	169.36	167	7	1.32E-03	49.9	
7	0	93.18	590	670	1.18	186.40	182	8	9.84E-03	8.7	
8	0	99.25	39	631	1.55	198.54	195	9	6.54E-04	116.2	
9	0	105.43	68	440	1.71	210.90	208	7	1.14E-03	52.4	
10	0	129.81	50	400	0.62	259.68	258	6	8.40E-04	64.3	
11	0	139.88	103	544	1.66	279.80	276	8	1.72E-03	40.6	
12	0	143.92	120	599	0.87	287.88	284	9	2.00E-03	37.8	
13	0	153.91	34	471	0.52	307.86	305	7	5.59E-04	108.8	
14	0	164.08	124	563	1.45	328.20	324	9	2.06E-03	35.8	
15	0	186.32	429	614	1.17	372.69	368	10	7.14E-03	11.9	
16	0	198.74	139	600	0.85	397.53	393	10	2.31E-03	34.2	
17	0	205.60	30	458	0.71	411.24	409	7	5.06E-04	118.4	
18	0	209.66	26	355	0.83	419.37	417	6	4.36E-04	115.7	
19	0	239.07	206	441	1.10	478.19	474	8	3.43E-03	19.0	

20	0	295.55	30	313	0.85	591.14	589	7	5.08E-04	97.7
21	0	340.01	45	417	1.88	680.07	673	11	7.45E-04	89.8
22	0	352.12	88	256	1.62	704.30	701	8	1.47E-03	33.3
23	0	397.83	31	296	3.20	795.72	790	11	5.25E-04	107.0
24	0	511.89	1294	437	2.59	1023.84	1017	21	2.16E-02	5.0
25	0	584.05	47	200	1.26	1168.16	1163	10	7.82E-04	58.5
26	0	598.50	106	223	2.69	1197.07	1191	11	1.77E-03	28.9
27	0	609.78	92	262	1.49	1219.62	1214	13	1.53E-03	38.1
28	0	912.30	124	177	2.72	1824.66	1815	24	2.07E-03	29.5
29	3	963.54	39	112	2.29	1927.14	1920	25	6.53E-04	61.6
30	3	969.54	30	109	2.30	1939.13	1920	25	4.98E-04	71.5
31	0	1035.94	45	61	5.43	2071.94	2065	14	7.44E-04	40.5
32	0	1231.07	19	51	2.23	2462.19	2458	9	3.10E-04	73.4
33	0	1461.81	68	39	2.02	2923.64	2916	12	1.13E-03	22.1
34	0	1503.71	61	77	9.17	3007.45	2990	28	1.01E-03	42.8
35	0	1511.16	31	17	2.32	3022.34	3018	10	5.16E-04	31.0
36	0	1767.33	46	39	8.38	3534.66	3523	20	7.68E-04	36.7
37	1	1840.50	25	30	2.12	3681.00	3674	22	4.21E-04	46.6
38	1	1843.50	26	28	2.12	3687.00	3674	22	4.36E-04	46.4
39	0	1955.97	14	18	1.31	3911.93	3907	9	2.33E-04	64.9
40	0	1972.43	9	11	0.95	3944.84	3939	9	1.49E-04	75.4
41	0	1976.26	19	25	4.40	3952.49	3947	13	3.09E-04	61.1
42	0	2014.15	18	11	1.48	4028.28	4022	11	3.07E-04	41.8

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 14

Calibration Date: 10/13/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.684E+04	0.48
Cs-137	661.7	0.851	735.7	2.3365E+04	2.412E+04	3.23
Co-60	1173.2	0.9985	1383	3.7435E+04	3.751E+04	0.20
Co-60	1332.5	0.9998	1385	3.7440E+04	3.824E+04	2.14

Prepared By: R. Fustich

Date: 10/13/15

Reviewed By: M. J. Stamp

Date: 10/13/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 14

Date Performed: 10/12/15

Performed By: RF

High Voltage Power Supply Model No. <u>3105</u> High Voltage <u>30KV</u>	Spectroscopy Amplifier Model No. <u>671</u> Course Gain <u>20</u> Fine Gain <u>1.144</u> Time Constant <u>6 μsec</u> Input polarity <u>positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>1ce:2</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 15

Geometry: Can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the secondary standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. Futen

Date: 6/18/15

Reviewed By: M. J. Tanpr

Date: 6/19/15

Effective Date: 6/18/15

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218
100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC
P.O. No.: GEL 1510843, Item 4
Reference Date: 01-Apr-2015
Product Code: MIX-8400-EG-SD
12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.880E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.628E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

J. S. Hain
J. S. Hain, Spectroscopist

Date:

14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source yps	Uncertainty* , %			Calibration Method*
			ypg/gram		Type	u _A	u _B	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	————	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	————	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

AAA Form005 Rev. 11

MGS Certificate Rev 5, 1 October 2013



RC-S-065-130

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibbitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

A. Chen
A. Chen, Spectroscopist

Date:

20/04/14



Standard Logbook

Serial ID: 1701 Open/Reference Date: 01-APR-14
Name: Mixed Gamma CAN Received: 01-APR-14
Type: Source Material Expires: 01-APR-40
Employee: Maggie Stamps Verified: 28-MAY-14
Supplier: Eckert & Ziegler Analytics
Description: 96485
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

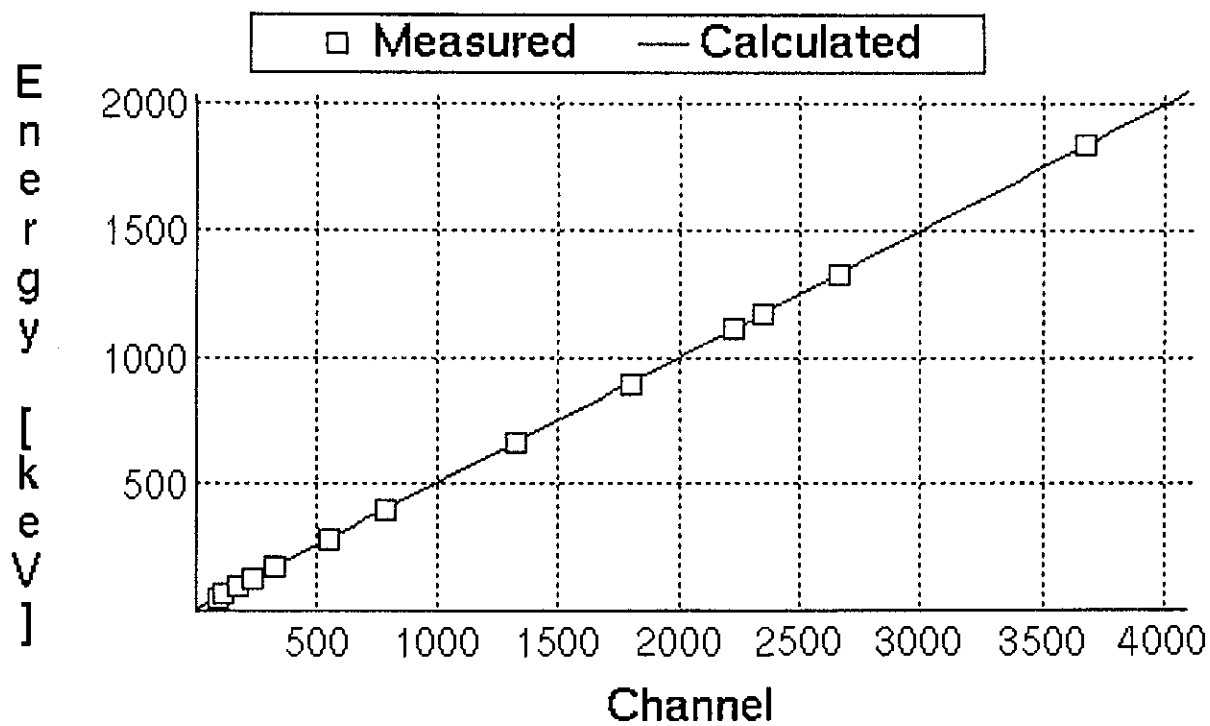
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



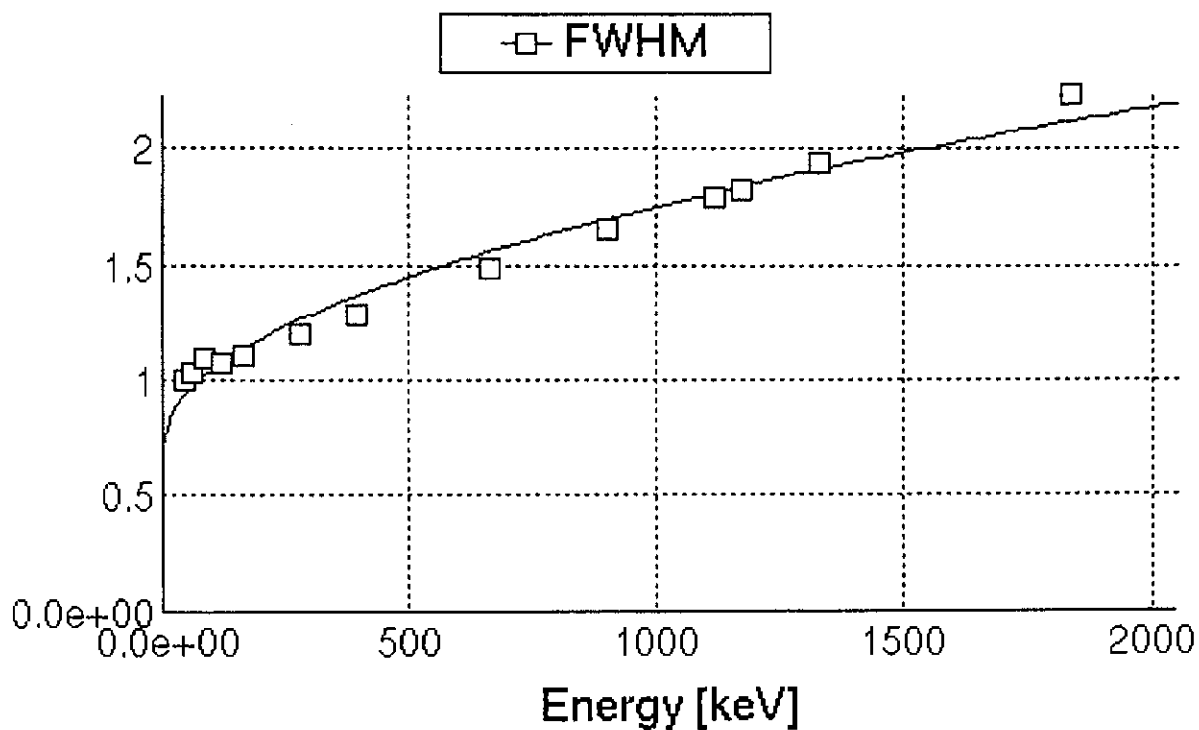
Datasource:

Energy = $-2.561e-02 \text{ keV} + 5.004e-01 * \text{Ch} + -1.260e-07 * \text{Ch}^2$ [CHISQ = $4.836e-03$]

FWHM = $7.148e-01 \text{ keV} + 3.279e-02 * \text{E}^{1/2}$ [CHISQ = $4.514e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * \text{E}$ [CHISQ = $0.000e+00$]

energy calibration RIS 6/17/15



Datasource:

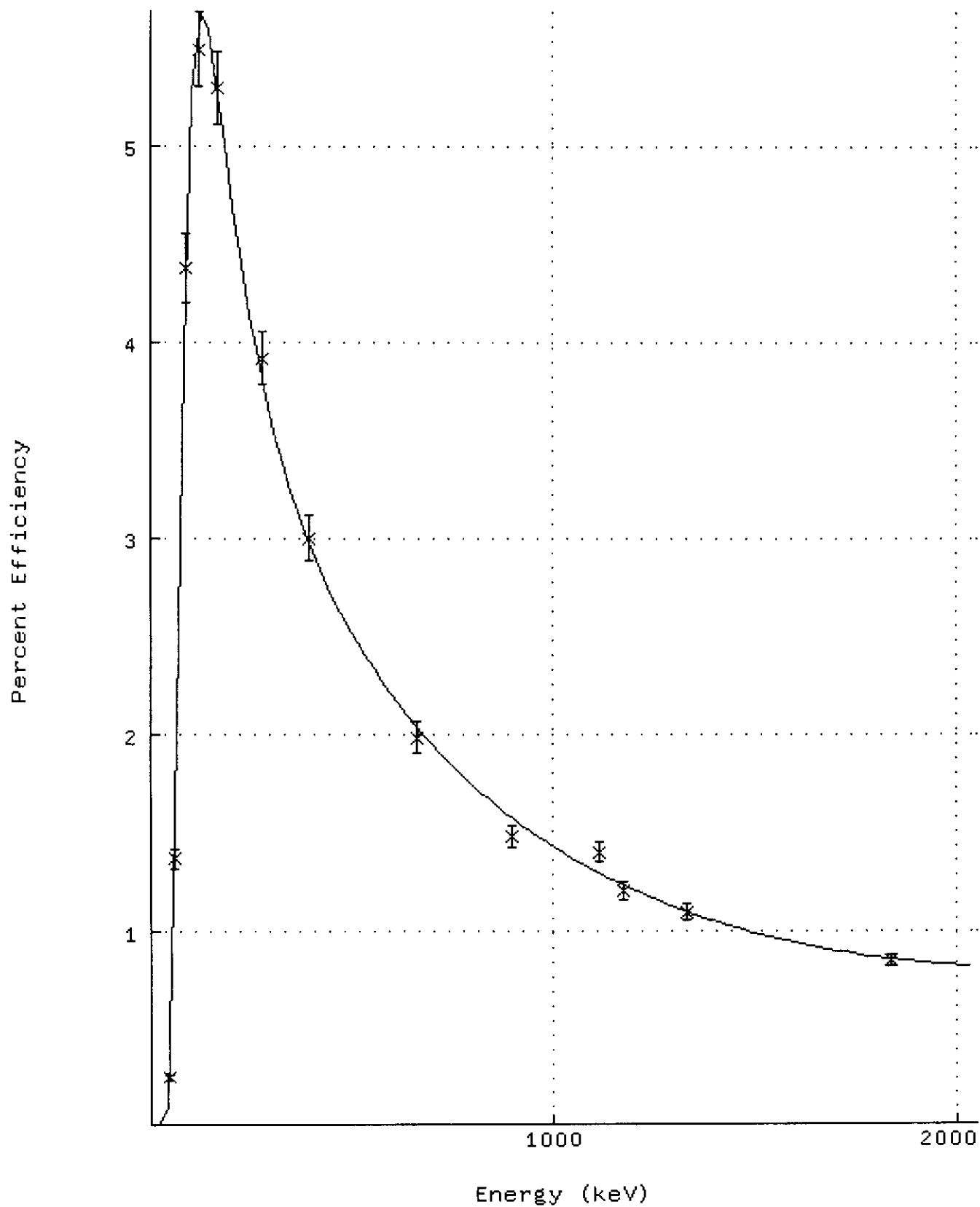
Energy = $-2.561e-02 \text{ keV} + 5.004e-01 * \text{Ch} + -1.260e-07 * \text{Ch}^2$ [CHISQ = $4.836e-03$]

FWHM = $7.148e-01 \text{ keV} + 3.279e-02 * E^{1/2}$ [CHISQ = $4.514e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration YIS 6/17/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM15_CAN.CNF;10
Calib Date: 18-JUN-2015 05:21
Detector : GAMMA15 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -2.5609\text{E-}02 + 0.5004*\text{Channel} + -1.2603\text{E-}07*(\text{Channel}**2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.95	46.54	46.49	0.052
2	118.96	59.54	59.50	0.036
3	175.94	88.03	88.02	0.013
4	243.99	122.06	122.06	-0.004
5	331.56	165.86	165.88	-0.019
6	558.13	279.20	279.23	-0.035
7	783.06	391.70	391.76	-0.059
8	1322.81	661.66	661.72	-0.060
9	1795.48	898.04	898.07	-0.029
10	2230.48	1115.60	1115.53	0.070
11	2345.86	1173.23	1173.20	0.025
12	2664.45	1332.49	1332.43	0.059
13	3672.56	1836.06	1836.11	-0.048

FWHM Calibration Report

$$\text{FWHM} = 0.7148 + 3.2792\text{E-}02*(\text{Energy}**1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.00	0.94	0.062
2	59.54	1.03	0.97	0.065
3	88.03	1.09	1.02	0.072
4	122.06	1.07	1.08	-0.009
5	165.86	1.11	1.14	-0.030
6	279.20	1.20	1.26	-0.067
7	391.70	1.28	1.36	-0.083
8	661.66	1.48	1.56	-0.077
9	898.04	1.65	1.70	-0.047
10	1115.60	1.79	1.81	-0.019
11	1173.23	1.82	1.84	-0.014
12	1332.49	1.94	1.91	0.026
13	1836.06	2.24	2.12	0.121

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.193	0.9088	-0.1358	-0.1556	0.2186	-6.8827E-02

Average Deviation = 2.65 % Reduced Chi-Square = 1.72

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	2.48E-03	1.17E-04	2.56E-03	-0.66	-3.14
2	59.54	1.36E-02	5.02E-04	1.31E-02	1.02	3.73
3	88.03	4.37E-02	1.80E-03	4.40E-02	-0.15	-0.63
4	122.06	5.48E-02	1.93E-03	5.66E-02	-0.90	-3.18
5	165.86	5.29E-02	1.86E-03	5.29E-02	-0.02	-0.07
6	279.20	3.91E-02	1.38E-03	3.78E-02	0.93	3.29
7	391.70	3.00E-02	1.17E-03	2.98E-02	0.15	0.60
8	661.66	1.99E-02	7.99E-04	2.04E-02	-0.63	-2.53
9	898.04	1.48E-02	5.50E-04	1.57E-02	-1.70	-6.32
10	1115.60	1.40E-02	4.92E-04	1.29E-02	2.22	7.80
11	1173.23	1.20E-02	4.71E-04	1.23E-02	-0.56	-2.18
12	1332.49	1.09E-02	4.28E-04	1.09E-02	-0.01	-0.03
13	1836.06	8.46E-03	3.14E-04	8.55E-03	-0.26	-0.98

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM15_CAN_333554.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 333521 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 17-JUN-2015 12:09:21
 Decay time : 77 00:09:21.18 % dead time : 2.4%
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:02:58.84

---- Detector Parameters ----

Energy cal. time : 17-JUN-2015 09:54:47 Energy cal. oper.: gamma spec user
 Detector name : GAMMA15 Counting geometry: CAN
 Effic. cal. time : 18-JUN-2015 05:21:57 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.52	21626	56383	1.02	93.01	88	10	3.00E+00	2.2	
2	0	59.54	75788	63938	1.05	119.04	113	11	1.05E+01	0.7	
3	0	67.15	515	38468	1.55	134.24	132	6	7.15E-02	60.3	
4	1	70.93	4555	46412	1.09	141.80	138	13	6.33E-01	8.1	1.37E+00
5	1	72.95	8075	39634	0.98	145.83	138	13	1.12E+00	4.1	
6	7	83.03	8650	71334	1.97	165.98	161	24	1.20E+00	5.7	6.42E+01
7	7	85.63	11963	81637	1.98	171.17	161	24	1.66E+00	6.1	
8	7	88.11	305248	41242	1.10	176.13	161	24	4.24E+01	0.2	
9	0	101.61	426	33036	1.11	203.11	201	6	5.92E-02	67.5	
10	0	122.14	196432	63678	1.09	244.14	238	12	2.73E+01	0.3	
11	0	136.57	24602	43584	1.12	272.98	269	9	3.42E+00	1.7	
12	0	165.96	216079	52795	1.14	331.71	325	13	3.00E+01	0.3	
13	0	190.83	431	16683	2.20	381.43	380	5	5.98E-02	45.3	
14	0	255.27	7591	25675	1.19	510.23	506	9	1.05E+00	4.0	
15	0	265.06	309	13662	1.36	529.80	528	5	4.29E-02	57.1	
16	0	279.32	158165	32327	1.22	558.29	552	13	2.20E+01	0.3	
17	0	391.82	159148	24980	1.31	783.19	776	14	2.21E+01	0.3	
18	0	502.68	314	11377	1.23	1004.82	1002	8	4.36E-02	59.1	
19	0	511.16	15584	22721	2.62	1021.77	1014	16	2.16E+00	2.3	
20	0	562.46	522	10249	2.50	1124.35	1121	8	7.26E-02	33.9	
21	0	632.21	157	11166	1.28	1263.81	1262	8	2.18E-02	116.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	661.77	106308	23460	1.50	1322.92	1316	15	1.48E+01	0.4	
23	0	814.02	2880	12019	1.82	1627.37	1622	11	4.00E-01	7.6	
24	0	821.08	297	10110	1.63	1641.49	1638	9	4.13E-02	61.2	
25	0	879.94	296	8741	0.85	1759.22	1757	7	4.11E-02	52.7	
26	0	898.10	181604	23148	1.65	1795.54	1787	17	2.52E+01	0.3	
27	0	1030.09	123	6485	0.65	2059.56	2059	9	1.70E-02	118.9	
28	0	1115.55	122143	13048	1.80	2230.52	2221	18	1.70E+01	0.4	
29	0	1133.46	195	4026	1.58	2266.35	2263	8	2.70E-02	57.0	
30	0	1173.22	119367	8775	1.79	2345.90	2337	18	1.66E+01	0.3	
31	0	1192.19	157	2942	2.73	2383.86	2382	8	2.18E-02	60.4	
32	6	1325.10	4180	5740	3.38	2649.78	2641	41	5.81E-01	4.4	9.02E+00
33	6	1332.44	107724	3498	1.93	2664.47	2641	41	1.50E+01	0.3	
34	0	1384.59	51	2217	0.88	2768.82	2766	8	7.02E-03	162.2	
35	0	1391.07	87	2175	1.89	2781.79	2778	8	1.21E-02	93.2	
36	0	1487.29	55	2961	1.23	2974.34	2972	9	7.70E-03	177.2	
37	0	1581.27	51	4010	1.12	3162.43	3160	9	7.15E-03	222.1	
38	0	1611.82	115	3316	1.39	3223.59	3221	9	1.59E-02	91.2	
39	0	1627.03	137	2561	1.68	3254.02	3248	9	1.90E-02	67.4	
40	0	1836.08	109809	2568	2.20	3672.51	3661	23	1.53E+01	0.3	
41	0	1946.45	68	586	3.30	3893.48	3888	14	9.38E-03	77.3	
42	0	1958.56	48	418	1.25	3917.72	3914	10	6.65E-03	81.3	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM15_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM15.CNF;420
Background date    : 14-JUN-2015 10:56:20
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 18-JUN-2015 06:39:15
Sample ID        : VER_GAM15_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM15             Detector geometry: CAN
Elapsed live time: 0 00:30:00.00      Elapsed real time: 0 00:30:18.86  1.0%
Energy tolerance : 1.50000 keV       Analyst Initials :
Abundance limit  : 75.00000          Sensitivity      : 3.00000
Batch ID        :                   Detector SN#       :
Matrix Spike ID :                   LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.54	5497	6738	1.05	93.06	88	10	3.05E+00	3.1	
2	0	59.58	19200	7849	1.00	119.12	114	11	1.07E+01	1.2	
3	0	66.12*	47	3475	0.65	132.18	131	5	2.63E-02	187.0	
4	0	88.09	45326	9131	1.04	176.10	170	12	2.52E+01	0.6	
5	0	122.13	19251	5735	1.06	244.12	238	12	1.07E+01	1.1	
6	0	136.53	2423	3853	1.00	272.89	268	10	1.35E+00	5.2	
7	0	166.00	9367	4239	1.12	331.80	326	13	5.20E+00	1.8	
8	0	232.47	86	1925	0.75	464.65	463	6	4.80E-02	81.3	
9	0	255.29	186	2387	1.55	510.26	507	8	1.04E-01	46.0	
10	0	278.93	302	2341	1.73	557.51	553	9	1.68E-01	29.5	
11	0	332.25	197	1533	1.25	664.11	661	7	1.09E-01	33.8	
12	0	391.82	4605	2351	1.26	783.18	777	11	2.56E+00	2.5	
13	0	458.70	119	1243	0.54	916.89	914	6	6.62E-02	47.9	
14	0	511.21*	1228	2946	2.36	1021.86	1014	17	6.82E-01	10.5	
15	0	661.78	26872	1942	1.47	1322.93	1316	13	1.49E+01	0.7	
16	0	674.93	54	754	1.22	1349.23	1345	6	2.99E-02	82.3	
17	0	691.80	114	1135	1.53	1382.96	1380	9	6.32E-02	54.2	
18	0	702.00	101	978	1.04	1403.35	1400	8	5.59E-02	54.6	
19	0	898.14	4292	2570	1.55	1795.62	1789	13	2.38E+00	2.9	
20	0	1001.19*	22	1261	1.42	2001.75	1995	10	1.20E-02	310.9	
21	0	1014.62	101	1201	1.59	2028.62	2023	11	5.63E-02	67.2	
22	0	1115.57	10843	1521	1.74	2230.56	2224	15	6.02E+00	1.2	
23	0	1173.22	26444	1198	1.76	2345.90	2336	20	1.47E+01	0.7	
24	0	1211.14	71	139	1.49	2421.76	2419	6	3.97E-02	28.8	
25	0	1213.64	39	226	1.41	2426.76	2425	9	2.18E-02	70.5	
26	0	1243.61	135	382	9.87	2486.73	2477	22	7.49E-02	38.1	
27	0	1286.83	25	224	3.84	2573.21	2568	13	1.39E-02	124.8	
28	0	1324.90	77	230	1.56	2649.39	2646	8	4.29E-02	35.8	
29	0	1332.45	24247	519	1.93	2664.48	2654	21	1.35E+01	0.7	
30	0	1341.58	22	110	1.29	2682.76	2680	8	1.22E-02	85.0	
31	0	1383.96	34	175	3.86	2767.57	2758	15	1.90E-02	86.3	
32	0	1461.68*	7	110	1.05	2923.10	2920	8	3.61E-03	283.8	
33	0	1470.86	18	124	0.65	2941.46	2932	12	9.92E-03	129.9	
34	0	1477.99	40	119	2.23	2955.73	2948	12	2.25E-02	57.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1487.47	23	73	0.78	2974.70	2972	7	1.25E-02	66.0	
36	0	1587.71	42	197	4.23	3175.33	3166	15	2.35E-02	74.2	
37	0	1607.62	33	241	3.75	3215.19	3209	19	1.85E-02	113.5	
38	0	1628.87	13	129	0.55	3257.72	3248	12	7.27E-03	175.9	
39	2	1677.13	56	92	2.49	3354.32	3343	41	3.09E-02	38.2	1.41E+00
40	2	1682.40	41	79	2.49	3364.86	3343	41	2.30E-02	51.0	
41	0	1764.03	24	48	1.35	3528.26	3521	13	1.32E-02	65.5	
42	0	1836.11	2770	59	2.19	3672.57	3664	18	1.54E+00	2.0	
43	0	1935.62	24	33	2.84	3871.80	3864	12	1.34E-02	51.9	
44	0	1996.74	26	43	4.62	3994.18	3985	15	1.43E-02	59.9	
45	0	2025.18	32	39	3.26	4051.13	4042	17	1.80E-02	47.2	
46	0	2037.42	13	19	1.40	4075.64	4073	8	7.13E-03	64.3	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	19251	85.60*	5.659E+00	5.967E+03	1.846E+04	2.14
	136.47	2423	10.68	5.647E+00	6.031E+03	1.866E+04	10.42
CO-60	1173.23	26444	99.85	1.230E+00	3.233E+04	3.791E+04	1.39
	1332.49	24247	99.98*	1.094E+00	3.330E+04	3.905E+04	1.37
ZN-65	1115.54	10843	50.60*	1.290E+00	2.495E+04	8.775E+04	2.49
Y-88	898.04	4292	93.70	1.575E+00	4.368E+03	7.768E+04	5.75
	1836.06	2770	99.20*	8.547E-01	4.906E+03	8.725E+04	4.01
CD-109	88.03	45326	3.70*	4.408E+00	4.173E+05	8.116E+05	1.26
SN-113	391.70	4605	64.97*	2.982E+00	3.569E+03	5.137E+04	5.03
CS-137	661.66	26872	85.10*	2.036E+00	2.328E+04	2.394E+04	1.39
CE-139	165.86	9367	80.00*	5.290E+00	3.323E+03	3.090E+04	3.55
HG-203	70.83	-----	3.69	2.653E+00	-----	Line Not Found	-----
	72.87	-----	6.19	2.894E+00	-----	Line Not Found	-----
	279.20	302	81.56*	3.786E+00	1.466E+02	1.065E+05	59.08
PB-210	46.54	5497	4.25*	2.561E-01	7.582E+05	7.875E+05	6.22
AM-241	59.54	19200	35.90*	1.318E+00	6.094E+04	6.106E+04	2.31

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM15.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 14-JUN-2015 10:56:20 Acquisition date : 14-JUN-2015 10:56:20
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.80

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5638E+00	-2.13	Investigate
[1.66107+/-0.04568]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 6 / 18 / 15

Sample ID : Bkg

Acquisition date : 14-JUN-2015 10:56:20

VMS Gamma Spectroscopy Report generated 15-JUN-2015 03:36:34

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM15__333128.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.000000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 333128 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 14-JUN-2015 10:56:20

---- Sample Decay/Count Information ----

Sample Date : 14-JUN-2015 10:56:20 Acquisition date : 14-JUN-2015 10:56:20
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.80

---- Detector Parameters ----

Energy cal. time : 2-JUN-2014 11:45:22. Energy cal. oper.: gamma spec user
 Detector name : GAMMA15 Counting geometry:
 Effic. cal. time : 2-JUN-2014 11:45:45. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	2	63.53	261	527	1.02	126.91	123	13	4.34E-03	15.3	7.80E-01
2	2	66.39	98	537	1.06	132.63	123	13	1.63E-03	39.0	
3	0	77.47	60	524	0.61	154.77	153	5	1.00E-03	58.5	
4	3	92.84	932	591	1.19	185.50	182	11	1.55E-02	5.4	5.65E-01
5	3	95.19	63	462	1.01	190.18	182	11	1.05E-03	59.3	
6	0	98.77	126	702	1.16	197.34	193	9	2.10E-03	38.9	
7	0	143.89	96	703	1.57	287.52	284	8	1.60E-03	48.9	
8	0	179.59	85	449	1.83	358.88	356	6	1.42E-03	40.9	
9	0	185.93	576	872	1.20	371.56	367	10	9.60E-03	10.5	
10	0	198.70	139	613	1.45	397.08	394	8	2.32E-03	32.0	
11	0	238.82	337	607	1.32	477.28	473	9	5.62E-03	14.2	
12	0	244.87	63	357	1.49	489.36	487	6	1.06E-03	48.9	
13	0	295.80	100	439	1.11	591.18	587	8	1.67E-03	37.6	
14	0	338.47	87	374	1.14	676.48	673	8	1.45E-03	39.8	
15	0	352.27	183	416	1.07	704.07	700	9	3.04E-03	21.5	
16	0	374.63	38	254	1.43	748.78	746	7	6.37E-04	71.1	
17	0	463.41	37	374	0.78	926.26	918	13	6.12E-04	109.8	
18	0	511.40	1289	511	2.61	1022.23	1014	19	2.15E-02	5.1	
19	0	583.23	151	326	1.54	1165.86	1159	15	2.52E-03	27.3	

20	3	597.24	87	153	1.90	1193.87	1189	39	1.45E-03	29.9	2.04E+00
21	3	600.11	70	184	1.73	1199.60	1189	39	1.17E-03	41.7	
22	3	609.55	207	259	1.91	1218.48	1189	39	3.45E-03	16.0	
23	0	656.05	8	143	0.76	1311.47	1309	8	1.31E-04	266.0	
24	0	794.62	43	229	5.35	1588.60	1577	18	7.19E-04	83.7	
25	0	803.26	60	121	2.41	1605.88	1601	10	1.01E-03	36.5	
26	0	812.54	14	166	2.61	1624.43	1621	12	2.36E-04	183.4	
27	0	836.32	43	176	3.83	1672.01	1668	12	7.19E-04	63.1	
28	0	891.99	41	97	1.15	1783.34	1779	10	6.91E-04	47.1	
29	0	911.44	116	120	2.39	1822.25	1815	14	1.93E-03	22.3	
30	0	946.60	33	57	2.21	1892.59	1888	9	5.57E-04	44.0	
31	0	967.84	93	220	7.39	1935.07	1922	22	1.55E-03	42.0	
32	0	987.24	31	91	1.40	1973.87	1966	13	5.17E-04	65.9	
33	0	1001.78	82	107	1.63	2002.98	1996	12	1.36E-03	27.7	
34	0	1090.81	42	72	1.13	2181.07	2175	12	7.00E-04	43.3	
35	0	1097.76	16	41	1.38	2194.99	2191	7	2.60E-04	73.1	
36	0	1121.99	27	116	0.94	2243.46	2235	11	4.52E-04	79.8	
37	0	1183.38	38	110	7.54	2366.28	2355	20	6.26E-04	70.3	
38	0	1195.02	13	76	0.55	2389.58	2383	11	2.13E-04	135.4	
39	0	1460.48	126	54	2.59	2920.79	2911	20	2.10E-03	16.9	
40	0	1509.81	19	36	3.87	3019.51	3014	9	3.23E-04	61.3	
41	0	1573.59	10	31	0.94	3147.18	3142	9	1.74E-04	101.3	
42	0	1603.93	8	61	4.21	3207.91	3198	14	1.38E-04	201.4	
43	0	1725.97	14	24	0.60	3452.21	3447	8	2.35E-04	67.2	
44	0	1766.39	52	111	2.84	3533.13	3522	24	8.59E-04	56.4	
45	0	1870.72	35	30	7.86	3742.00	3732	20	5.76E-04	42.5	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration VerificationInstrument: GAMMA 15Calibration Date: 6/17/2015Geometry: CANManufacturer Standard Id: 96485GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.106E+04	7.94
Cs-137	661.7	0.851	735.7	2.3365E+04	2.394E+04	2.46
Co-60	1173.2	0.9985	1383	3.7435E+04	3.791E+04	1.27
Co-60	1332.5	0.9998	1385	3.7440E+04	3.905E+04	4.30

Prepared By: B. FisherDate: 6/18/15Reviewed By: M. StampDate: 6/19/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)558-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 15

Date Performed: 6/17/15

Performed By: RT

High Voltage Power Supply Model No. <u>3106 D</u> High Voltage <u>4.01 KV</u>	Spectroscopy Amplifier Model No. <u>671</u> Course Gain <u>50</u> Fine Gain <u>0.778</u> Time Constant <u>6 μsec</u> Input polarity <u>Positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>2c1:1</u>	

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gamma 16Geometry: 2LMB

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1742
the second standard(s) documentation?	☒		1705
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. FutchDate: 10/1/15Reviewed By: M. StampDate: 10/10/15Effective Date: 10/1/15



Eckert & Ziegler

Analytics

1742

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100222

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 8

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0083827

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.16, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty* , %			Calibration Method*
					Type			
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.521E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	—	9.525E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.362E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	7.465E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	1.035E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	2.193E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.454E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	9.277E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	3.486E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.877E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.759E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.761E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	3.691E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

J. S. Lahr
J. S. Lahr, Spectroscopist

Date:

14 MAY 15

Standard Logbook

Serial ID: 1742
Name: Mixed Gamma 2LMB
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100222
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 20-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1705

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96489

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0081739

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1996, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.8	8.109E+03	—	1.511E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+06	—	9.322E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.347E+03	0.5	2.0	4.1	HPGe
Co-87	122.1	2.717E+02	8.913E+04	7.285E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	1.028E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	2.192E+03	0.3	1.7	3.6	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	9.127E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	3.510E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.829E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.716E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.718E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.846E+05	3.716E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

MGS Certificate Rev 5, 1 October 2013



RC-S-065-134

Page 1 of 2

Corporate Office

74937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 20 MAY 14



Standard Logbook

Serial ID: 1705
Name: Mixed Gamma 2LMB
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96489
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

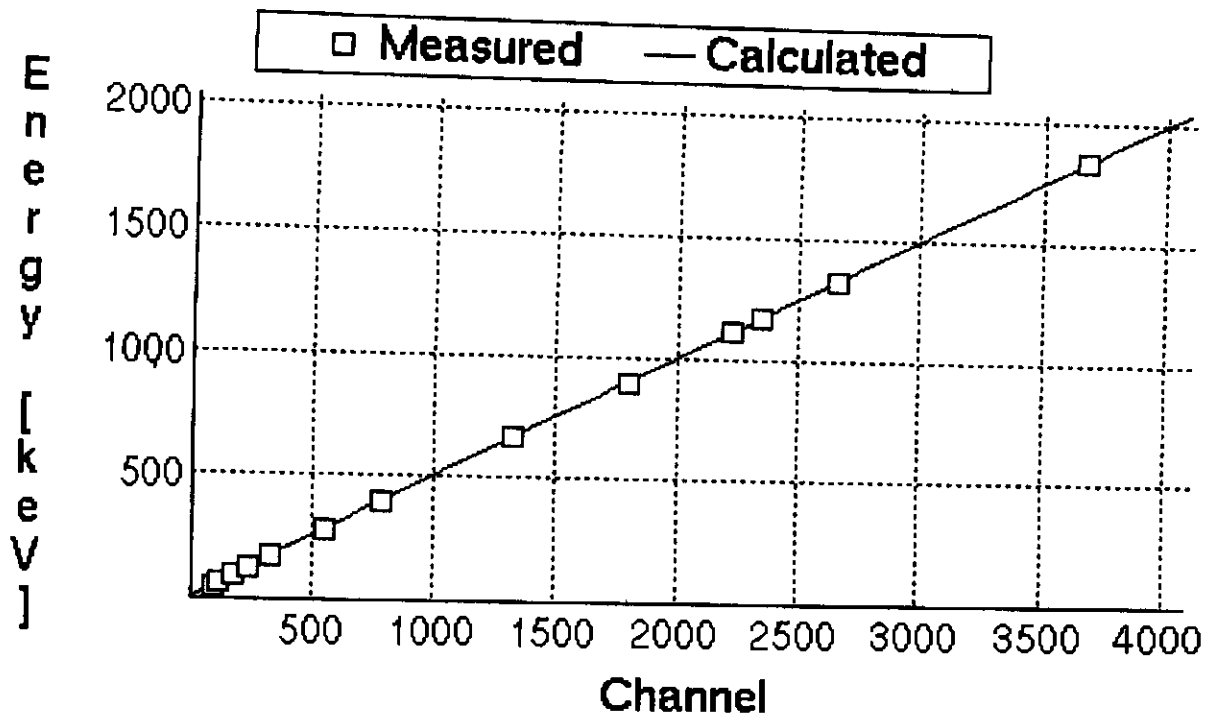
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: 2LMB 100222

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1521	4.20	4.3	Yes
AM-241	432.60Y	59.5	953	3.60	35.9	Yes
CD-109	461.40D	88.0	1362	4.10	3.7	Yes
CO-57	271.74D	122.1	747	3.50	85.6	Yes
CE-139	137.64D	165.9	1035	3.50	80.0	Yes
HG-203	46.59D	279.2	2193	3.50	81.6	Yes
SN-113	115.09D	391.7	1454	3.90	65.0	Yes
CS-137	30.08Y	661.7	928	4.00	85.1	Yes
Y-88	106.63D	898.0	3486	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1877	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1759	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1761	3.90	100.0	Yes
Y-88	106.63D	1836.1	3691	3.70	99.2	Yes



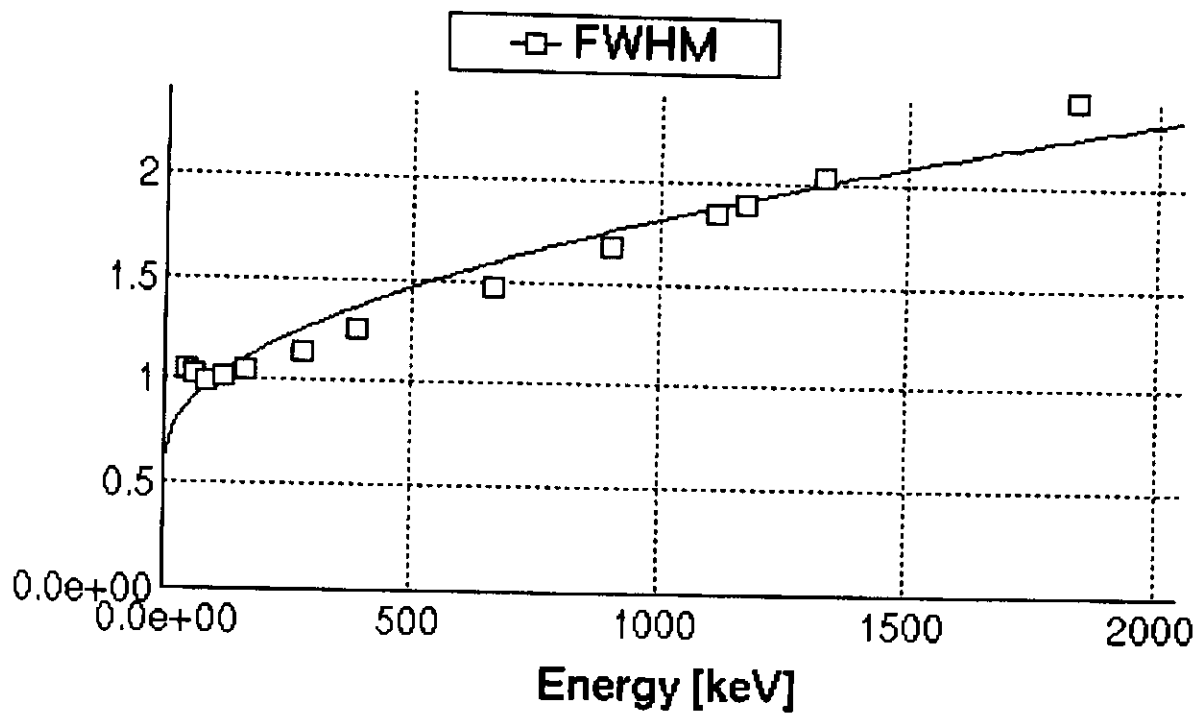
Datasource:

Energy = $6.474\text{e-}02 \text{ keV} + 5.003\text{e-}01 * \text{Ch} + -5.058\text{e-}08 * \text{Ch}^2$ [CHISQ = $2.271\text{e-}02$]

FWHM = $6.163\text{e-}01 \text{ keV} + 3.804\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $1.178\text{e-}02$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

gam16 energy calibration
9/25/15



Datasource:

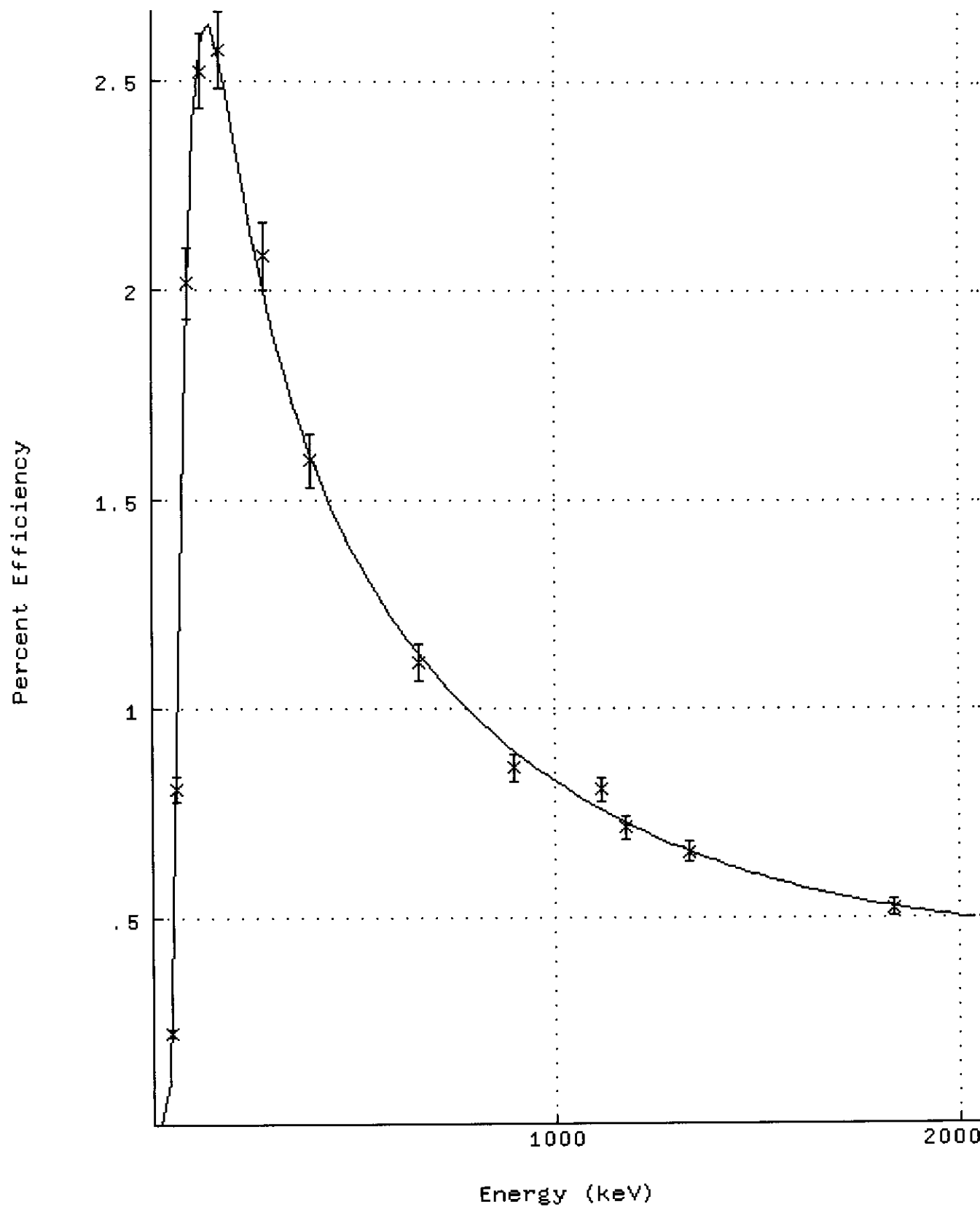
Energy = $6.474e-02 \text{ keV} + 5.003e-01 * \text{Ch} + -5.058e-08 * \text{Ch}^2$ [CHISQ = $2.271e-02$]

FWHM = $6.163e-01 \text{ keV} + 3.804e-02 * E^{1/2}$ [CHISQ = $1.178e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

gam16 Shape Calibration
9/25/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM16_2LMB.CNF;16
Calib Date: 1-OCT-2015 05:57:
Detector : GAMMA16 Geometry : 2LMB
Fit type : 5 Deg. Empirical



$$\text{Energy} = 6.4743\text{E-}02 + 0.5003 \cdot \text{Channel} + -5.0578\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.82	46.54	46.50	0.043
2	118.84	59.54	59.51	0.027
3	175.85	88.03	88.03	-0.003
4	243.90	122.06	122.07	-0.015
5	331.48	165.86	165.88	-0.022
6	558.05	279.20	279.22	-0.018
7	783.00	391.70	391.73	-0.031
8	1322.73	661.66	661.68	-0.020
9	1795.37	898.04	898.05	-0.006
10	2230.33	1115.60	1115.55	0.054
11	2345.68	1173.23	1173.23	0.003
12	2664.20	1332.49	1332.49	0.005
13	3671.52	1836.06	1836.08	-0.018

FWHM Calibration Report

$$\text{FWHM} = 0.6163 + 3.8035\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.05	0.88	0.172
2	59.54	1.03	0.91	0.116
3	88.03	1.00	0.97	0.023
4	122.06	1.01	1.04	-0.022
5	165.86	1.05	1.11	-0.058
6	279.20	1.14	1.25	-0.114
7	391.70	1.26	1.37	-0.111
8	661.66	1.48	1.59	-0.116
9	898.04	1.69	1.76	-0.068
10	1115.60	1.85	1.89	-0.034
11	1173.23	1.91	1.92	-0.014
12	1332.49	2.04	2.00	0.035
13	1836.06	2.44	2.25	0.190

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a	a6	a7
941.3	-4.750	0.7834	-7.2582E-02	-8.4443E-02	0.1125	-4.0372E-02

Average Deviation = 2.49 % Reduced Chi-Square = 1.28

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	2.23E-03	1.06E-04	2.30E-03	-0.65	-3.10
2	59.54	8.07E-03	2.99E-04	7.76E-03	1.03	3.82
3	88.03	2.01E-02	8.29E-04	2.03E-02	-0.26	-1.08
4	122.06	2.52E-02	9.04E-04	2.60E-02	-0.91	-3.25
5	165.86	2.57E-02	9.19E-04	2.56E-02	0.10	0.35
6	279.20	2.08E-02	8.07E-04	1.99E-02	1.15	4.45
7	391.70	1.59E-02	6.33E-04	1.61E-02	-0.27	-1.07
8	661.66	1.11E-02	4.48E-04	1.13E-02	-0.47	-1.90
9	898.04	8.58E-03	3.22E-04	8.98E-03	-1.22	-4.60
10	1115.60	8.06E-03	2.87E-04	7.56E-03	1.74	6.19
11	1173.23	7.14E-03	2.81E-04	7.26E-03	-0.43	-1.68
12	1332.49	6.56E-03	2.58E-04	6.57E-03	-0.04	-0.14
13	1836.06	5.19E-03	1.95E-04	5.23E-03	-0.21	-0.78

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM16_2LMB_345676.CNF;1

---- Sample Information ----

Sample Title : 2LMB 100222
 Sample ID : 100222 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 345656 Sptrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 30-SEP-2015 11:37:03
 Decay time : 181 23:37:03.96 % dead time : 1.1%
 Elapsed live time: 0 01:20:00.00 Elapsed real time: 0 01:20:54.61

---- Detector Parameters ----

Energy cal. time : 25-SEP-2015 14:04:18 Energy cal. oper.: gamma spec user
 Detector name : GAMMA16 Counting geometry: 2LMB
 Effic. cal. time : 1-OCT-2015 05:57:38. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	32.33	7373	3677	1.21	64.49	61	13	1.54E+00	2.5	1.53E+02
2	6	33.93	5185	11825	1.49	67.70	61	13	1.08E+00	4.6	
3	0	38.10	165	18090	0.66	76.02	73	6	3.45E-02	128.8	
4	0	40.05	133	15517	0.94	79.94	79	5	2.77E-02	140.5	
5	10	45.08	1667	16224	1.86	89.99	87	10	3.47E-01	11.8	3.64E+00
6	10	46.44	14789	18961	1.07	92.70	87	10	3.08E+00	1.7	
7	10	57.83	2536	25014	2.10	115.47	112	12	5.28E-01	11.4	1.70E+00
8	10	59.45	36880	22994	1.11	118.72	112	12	7.68E+00	0.9	
9	0	65.26	94	17946	1.20	130.33	129	5	1.95E-02	213.8	
10	0	72.66	442	28250	0.87	145.11	143	7	9.21E-02	63.3	
11	6	85.56	1406	18281	1.42	170.90	169	14	2.93E-01	13.2	1.34E+01
12	6	87.96	100098	26366	1.13	175.70	169	14	2.09E+01	0.4	
13	0	121.95	57230	35288	1.18	243.65	237	13	1.19E+01	0.8	
14	0	136.34	7525	22776	1.24	272.43	268	10	1.57E+00	3.9	
15	0	165.81	51484	23122	1.23	331.33	326	12	1.07E+01	0.7	
16	0	178.60	228	9974	1.26	356.89	355	6	4.75E-02	69.5	
17	0	185.95	186	10248	1.32	371.60	370	6	3.88E-02	86.4	
18	0	235.64	249	9370	1.56	470.92	468	6	5.18E-02	61.9	
19	0	255.10	1605	10616	1.42	509.85	506	8	3.34E-01	11.4	
20	0	274.24	138	6927	1.25	548.10	548	6	2.87E-02	96.0	
21	0	279.15	14923	11873	1.33	557.92	553	11	3.11E+00	1.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	309.96	189	5831	0.93	619.52	617	6	3.95E-02	64.2	
23	0	340.05	255	5891	1.64	679.67	677	7	5.30E-02	50.5	
24	0	391.66	37302	10472	1.42	782.86	776	14	7.77E+00	0.8	
25	0	510.99	5220	9358	2.73	1021.44	1013	17	1.09E+00	4.5	
26	0	604.85	164	2985	0.98	1209.11	1206	6	3.41E-02	53.5	
27	0	624.31	157	3837	0.68	1248.00	1245	8	3.27E-02	68.9	
28	0	641.11	255	3780	1.52	1281.60	1278	8	5.32E-02	42.3	
29	0	661.59	48938	7841	1.60	1322.56	1315	15	1.02E+01	0.6	
30	0	723.32	172	2999	1.62	1445.99	1444	7	3.57E-02	53.4	
31	0	785.78	215	3186	1.49	1570.87	1567	8	4.48E-02	45.9	
32	0	813.85	812	4987	2.25	1627.01	1621	12	1.69E-01	17.7	
33	0	821.49	249	3384	1.54	1642.29	1639	8	5.19E-02	40.9	
34	0	897.97	44233	7574	1.74	1795.22	1788	15	9.22E+00	0.6	
35	0	953.98	191	3986	1.10	1907.23	1904	9	3.99E-02	59.9	
36	0	993.58	74	2975	1.06	1986.41	1986	9	1.53E-02	134.2	
37	0	998.38	129	2173	1.36	1996.02	1994	7	2.70E-02	60.4	
38	0	1115.46	43696	4947	1.93	2230.16	2220	20	9.10E+00	0.6	
39	0	1173.13	56816	2733	2.00	2345.49	2336	18	1.18E+01	0.5	
40	0	1182.04	71	1084	0.60	2363.32	2361	8	1.47E-02	81.4	
41	0	1252.66	104	626	1.84	2504.54	2500	8	2.17E-02	43.2	
42	0	1281.29	82	746	1.27	2561.81	2557	9	1.71E-02	61.1	
43	6	1325.12	1007	1423	3.54	2649.46	2641	32	2.10E-01	8.9	5.18E+00
44	6	1332.41	51927	927	2.08	2664.04	2641	32	1.08E+01	0.5	
45	0	1365.51	13	845	1.31	2730.24	2726	12	2.70E-03	449.9	
46	0	1401.90	20	754	0.90	2803.03	2796	10	4.25E-03	252.9	
47	0	1478.34	19	798	2.84	2955.93	2948	10	4.02E-03	274.8	
48	0	1578.43	15	1208	1.01	3156.12	3155	11	3.22E-03	435.5	
49	0	1835.97	28317	462	2.36	3671.31	3659	23	5.90E+00	0.6	
50	0	1867.29	52	125	3.35	3733.95	3726	14	1.09E-02	47.4	
51	0	1911.93	107	144	0.72	3823.27	3813	20	2.23E-02	29.2	
52	0	1919.02	53	62	2.90	3837.44	3833	10	1.10E-02	31.1	
53	0	2007.75	23	116	1.00	4014.96	4005	13	4.73E-03	100.3	
54	0	2012.20	16	101	1.06	4023.86	4017	11	3.35E-03	123.9	

```

*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road      *
*               Charleston, SC 29407  *
*                                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM16_2LMB.CNF;2
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM16.CNF;383
Background date    : 26-SEP-2015 13:29:01
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 1-OCT-2015 06:45:16.
Sample ID        : VER_GAM16_2LMB      Sample quantity  : 1.00000E+00 SAMPLE
Detector name     : GAM16              Detector geometry: 2LMB
Elapsed live time : 0 01:00:00.00      Elapsed real time: 0 01:00:21.33 0.6%
Energy tolerance  : 1.50000 keV        Analyst Initials :
Abundance limit   : 75.00000           Sensitivity       : 3.00000
Batch ID          :                    Detector SN#       :
Matrix Spike ID   :                    LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.40*	11797	14985	1.09	92.61	87	10	3.28E+00	2.1	
2	0	50.78	342	9085	1.04	101.38	98	6	9.50E-02	44.4	
3	0	59.46	27678	15104	1.06	118.74	113	10	7.69E+00	1.0	
4	0	71.81	333	9110	0.77	143.42	141	6	9.25E-02	45.7	
5	0	88.01	43329	16404	1.10	175.80	170	12	1.20E+01	0.8	
6	0	122.06	16569	10822	1.11	243.88	238	12	4.60E+00	1.5	
7	0	136.36	1992	8149	1.11	272.45	268	10	5.53E-01	8.8	
8	0	165.88	5851	9211	1.20	331.47	324	13	1.63E+00	3.6	
9	0	191.80	298	4395	1.87	383.29	381	7	8.27E-02	37.4	
10	0	381.56	73	2576	1.44	762.66	759	8	2.03E-02	121.0	
11	0	391.69	3052	3552	1.32	782.91	778	11	8.48E-01	4.2	
12	0	404.47	70	2518	1.21	808.47	806	8	1.93E-02	125.7	
13	0	511.10*	1035	3447	2.67	1021.66	1015	14	2.87E-01	12.5	
14	0	560.86	62	1364	1.43	1121.15	1118	7	1.72E-02	100.1	
15	0	661.56	35466	2899	1.53	1322.48	1314	16	9.85E+00	0.6	
16	0	782.43	116	1282	2.37	1564.17	1562	8	3.23E-02	54.1	
17	0	786.77	115	1356	1.05	1572.86	1570	8	3.19E-02	56.3	
18	0	848.26	113	1106	1.32	1695.81	1693	6	3.14E-02	47.4	
19	0	871.62	30	2046	2.28	1742.52	1739	10	8.32E-03	283.5	
20	0	897.84	2953	2943	1.84	1794.97	1789	13	8.20E-01	4.2	
21	0	975.96	73	1198	1.48	1951.18	1948	7	2.03E-02	79.5	
22	0	1029.66	15	1366	1.06	2058.57	2057	9	4.16E-03	445.3	
23	0	1037.77	128	1267	1.26	2074.79	2071	9	3.55E-02	51.1	
24	0	1115.30	11279	2303	1.95	2229.84	2220	18	3.13E+00	1.4	
25	0	1152.64	17	662	0.81	2304.52	2301	8	4.61E-03	270.5	
26	0	1172.99	36194	1381	1.93	2345.21	2336	18	1.01E+01	0.6	
27	0	1231.61	26	313	1.19	2462.46	2456	9	7.17E-03	125.6	
28	0	1332.22	33161	463	2.03	2663.66	2654	19	9.21E+00	0.6	
29	0	1384.53	27	68	1.18	2768.29	2765	8	7.57E-03	55.3	
30	0	1419.10	27	124	1.35	2837.44	2829	13	7.53E-03	86.6	
31	0	1472.59	21	140	1.24	2944.43	2938	13	5.75E-03	120.8	
32	0	1636.81	32	131	4.88	3272.90	3262	18	8.84E-03	86.0	
33	0	1835.75	2025	93	2.28	3670.87	3662	21	5.63E-01	2.5	
34	0	1848.03	21	48	4.72	3695.43	3684	17	5.86E-03	80.1	

Sample ID : VER_GAM16_2LMB

Acquisition date : 1-OCT-2015 06:45:16

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1910.51*	2	15	1.41	3820.42	3819	5	6.04E-04	302.9	
36	0	1913.16	13	11	1.44	3825.72	3823	6	3.56E-03	49.2	
37	0	1999.62	21	38	1.17	3998.69	3989	14	5.96E-03	64.9	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	16569	85.60*	2.599E+00	5.591E+03	2.261E+04	2.96
	136.47	1992	10.68	2.636E+00	5.313E+03	2.149E+04	17.55
CO-60	1173.23	36194	99.85	7.266E-01	3.745E+04	4.562E+04	1.16
	1332.49	33161	99.98*	6.569E-01	3.790E+04	4.617E+04	1.14
ZN-65	1115.54	11279	50.60*	7.564E-01	2.212E+04	1.048E+05	2.74
Y-88	898.04	2953	93.70	8.978E-01	2.635E+03	9.276E+04	8.42
	1836.06	2025	99.20*	5.234E-01	2.928E+03	1.031E+05	5.05
CD-109	88.03	43329	3.70*	2.034E+00	4.323E+05	9.844E+05	1.53
SN-113	391.70	3052	64.97*	1.608E+00	2.193E+03	5.942E+04	8.39
CS-137	661.66	35466	85.10*	1.128E+00	2.774E+04	2.871E+04	1.26
CE-139	165.86	5851	80.00*	2.559E+00	2.146E+03	3.386E+04	7.25
PB-210	46.54	11797	4.25*	2.251E-01	9.256E+05	9.699E+05	4.30
AM-241	59.54	27678	35.90*	7.727E-01	7.491E+04	7.509E+04	2.05

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM16.QAF;2

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 26-SEP-2015 13:29:01 Acquisition date : 26-SEP-2015 13:29:01
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.25

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
{Mean+/-Stdev}			
Spectrum Background Rate	1.6229E+00	0.71	
[1.59807+/-0.03517]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 10 / 1 / 15

Sample ID : Bkg

Acquisition date : 26-SEP-2015 13:29:01

VMS Gamma Spectroscopy Report generated 27-SEP-2015 06:09:21

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM16__345256.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 345256 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 26-SEP-2015 13:29:01

---- Sample Decay/Count Information ----

Sample Date : 26-SEP-2015 13:29:01 Acquisition date : 26-SEP-2015 13:29:01
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.25

---- Detector Parameters ----

Energy cal. time : 25-SEP-2015 14:04:18 Energy cal. oper.: gamma spec user
 Detector name : GAMMA16 Counting geometry:
 Effic. cal. time : 17-JUN-2015 12:07:39 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.87	82	793	0.95	93.57	90	7	1.36E-03	58.5	
2	2	63.47	311	605	0.99	126.75	123	13	5.19E-03	13.6	1.48E+00
3	2	66.41	146	577	1.07	132.62	123	13	2.43E-03	27.6	
4	0	77.77	79	725	0.74	155.33	152	7	1.32E-03	57.6	
5	0	84.25	206	820	1.43	168.28	164	9	3.44E-03	26.0	
6	0	92.81	813	816	1.22	185.40	182	8	1.35E-02	7.0	
7	0	99.13	61	758	1.45	198.04	194	8	1.01E-03	79.6	
8	0	112.85	70	660	0.75	225.46	222	7	1.16E-03	62.1	
9	0	143.81	115	647	1.03	287.35	284	7	1.91E-03	37.9	
10	0	163.20	16	583	0.84	326.12	325	6	2.71E-04	236.7	
11	0	185.94	594	928	1.07	371.58	366	11	9.91E-03	10.8	
12	0	198.78	89	667	0.81	397.24	394	8	1.48E-03	51.5	
13	0	205.11	85	556	0.99	409.89	407	8	1.42E-03	49.2	
14	0	239.01	221	685	1.07	477.67	473	9	3.69E-03	22.4	
15	0	295.18	35	332	0.91	589.96	588	6	5.87E-04	83.5	
16	0	323.31	102	573	2.60	646.21	639	13	1.70E-03	49.4	
17	0	339.85	17	407	0.75	679.27	674	8	2.76E-04	214.1	
18	0	352.91	142	521	1.46	705.37	699	13	2.37E-03	34.2	
19	0	377.00	39	225	1.18	753.54	750	6	6.48E-04	63.6	

20	0	415.61	72	208	0.87	830.74	828	8	1.20E-03	36.6
21	0	511.71	1383	641	2.77	1022.88	1014	24	2.31E-02	5.5
22	0	542.47	17	286	3.23	1084.39	1076	12	2.80E-04	203.8
23	0	548.25	40	176	0.90	1095.94	1093	9	6.70E-04	61.7
24	0	583.85	117	217	1.85	1167.12	1162	11	1.95E-03	26.1
25	0	609.88	89	278	1.35	1219.16	1215	11	1.48E-03	37.9
26	0	777.76	35	131	1.38	1554.84	1549	10	5.85E-04	63.9
27	0	804.33	56	140	1.06	1607.97	1603	10	9.40E-04	41.4
28	0	911.81	72	157	1.54	1822.89	1815	14	1.19E-03	39.0
29	0	970.30	93	135	1.89	1939.86	1933	17	1.56E-03	30.4
30	0	988.80	28	113	2.63	1976.85	1971	11	4.63E-04	76.4
31	0	1001.92	53	93	1.57	2003.10	1999	10	8.84E-04	36.6
32	0	1052.29	32	117	2.78	2103.83	2095	13	5.37E-04	72.1
33	0	1109.08	47	135	8.76	2217.39	2205	20	7.87E-04	62.0
34	0	1134.62	21	71	0.72	2268.48	2263	10	3.58E-04	77.0
35	0	1329.00	12	58	0.79	2657.23	2649	11	2.02E-04	124.8
36	0	1456.22	21	64	4.63	2911.68	2901	15	3.56E-04	84.2
37	0	1462.20	85	85	1.21	2923.65	2916	16	1.41E-03	26.5
38	0	1481.59	29	96	0.87	2962.43	2953	20	4.90E-04	83.3
39	0	1610.39	16	55	3.16	3220.05	3206	16	2.73E-04	105.0
40	0	1623.82	19	49	2.08	3246.92	3236	15	3.25E-04	81.2
41	0	1767.13	56	75	2.19	3533.60	3522	23	9.29E-04	42.5
42	0	1820.10	32	18	2.36	3639.56	3632	12	5.30E-04	32.1
43	0	1827.26	15	29	2.24	3653.88	3648	10	2.48E-04	73.3
44	0	1874.57	24	42	5.92	3748.52	3739	16	4.08E-04	63.6
45	0	1910.32	14	25	4.63	3820.03	3811	13	2.26E-04	81.9

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 16

Calibration Date: 9/30/2015

Geometry: 2LMB

Manufacturer Standard Id: 96489

GEL Standard Id: 1705

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	932.2	7.0180E+04	7.509E+04	7.00
Cs-137	661.7	0.851	912.7	2.8987E+04	2.871E+04	-0.95
Co-60	1173.2	0.9985	1716	4.6448E+04	4.562E+04	-1.78
Co-60	1332.5	0.9998	1718	4.6442E+04	4.617E+04	-0.59

Prepared By: R. Fuxen

Date: 10/1/15

Reviewed By: M. Stamp

Date: 10/10/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 16

Date Performed: 9/28/15

Performed By: RT

High Voltage Power Supply Model No. <u>3106 D</u> High Voltage <u>3.00 Kv</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.488</u> Time Constant <u>4 μsec</u> Input polarity <u>positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>556 A</u> Address <u>504:1</u>	

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gamma 17Geometry: Can

- 1) Is all calibration standard information enclosed for:
the primary standard certificate?
the second standard(s) documentation?
the nuclide library used?
the VMS certificate file?

YES	NO	Comments
☒	☐	1782
☒	☐	1738
☒	☐	
☒	☐	

- 2) Is the energy calibration graph included?

☒	☐	

- 3) Is the detector efficiency curve printout included?

☒	☐	

- 4) Is the efficiency calibration report included and reviewed?

☒	☐	

- 5) Is the raw count data included for:
the calibration peak report?
the calibration verification PEAK report?
the calibration verification NID report?
the last instrument background?

☒	☐	
☒	☐	
☒	☐	
☒	☐	

- 6) Are the calibration verification calculations included?

☒	☐	

- 7) Are the instrument settings included:
amp, HVPS, ADC settings?

☒	☐	

Prepared By: R. FurehDate: 6/3/16Reviewed By: M. StampDate: 6/6/16Effective Date: 6/1/16

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 103141B
Source Description: 100 mL Solid in Aluminum Can
Product Code: 8403-EG-SD
Customer: GEL Laboratories, LLC
P.O. Number: GEL1613700, Item 3

This standard radionuclide source was prepared from an aliquot measured gravimetrically from a master radionuclide solution calibrated with a germanium gamma-ray spectrometer system. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using germanium gamma-ray spectrometry. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Density of solid matrix: 1.17 g/cm³ ± 3 %.

Reference Date: 01-April-2016 12:00 PM EST

MGS Mixture

Isotope	Gamma-Ray Energy, keV	Half-Life, d	Activity, Bq	Flux, s ⁻¹	Uncertainty			Calibration Method**
					u _A , %	u _B , %	U, %*	
Pb-210	46.5	8.109E+03	2.877E+04	1.223E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	2.262E+03	8.120E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	3.136E+04	1.160E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	7.785E+02	6.664E+02	0.4	1.7	3.4	HPGe
Ce-139	165.9	1.376E+02	1.086E+03	8.688E+02	0.4	1.7	3.6	HPGe
Hg-203	279.2	4.659E+01	2.635E+03	2.149E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.161E+02	1.893E+03	1.230E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	9.294E+02	7.909E+02	0.7	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	3.113E+03	2.917E+03	0.7	1.7	3.7	HPGe
Y-88	1836.1	—	—	3.089E+03	0.7	1.7	3.7	—
Co-60	1173.2	1.925E+03	1.460E+03	1.458E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	—	—	1.459E+03	0.7	1.8	3.9	—

Mixed Gamma (MGS) master solution is EZA's eight isotope mixture which is calibrated quarterly and consists of Cd-109, Co-57, Ce-139, Hg-203, Sn-113, Cs-137, Y-88, and Co-60. *Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." **Calibration Methods: 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

SRS Number: 103141B

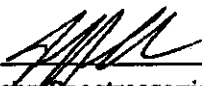
This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: _____



Z. Dimitrova, Radiochemist

QC Approved by: _____



J. Lahr, Spectroscopist

Date: 13-MAY-16

Standard Logbook

Serial ID: 1782 **Open/Reference Date:** 01-APR-16
Name: Mixed Gamma CAN **Received:** 01-APR-16
Type: Source Material **Expires:** 01-APR-17
Employee: Maggie Stamps **Verified:** 20-MAY-16
Supplier: Eckert & Zeigler Analytics
Description: 103141B
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2018

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty* , %			Calibration Method*
					Type			
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	————	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.6	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.908E+04	8.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.3	2.439E+02	————	1.499E+03	0.1	1.7	3.6	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.068E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laru
J. S. Laru, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-41
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

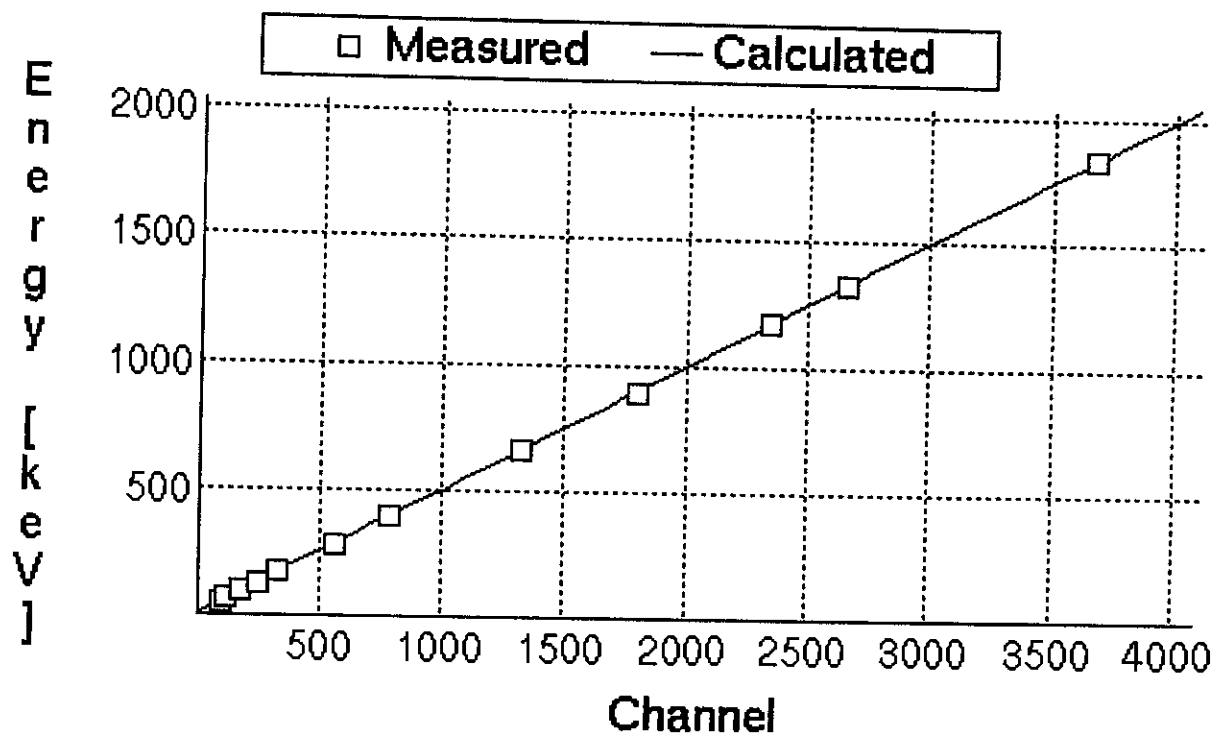
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 103141B

Quantity: 1.00

Assay date: 1-APR-2016 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1223	4.20	4.3	Yes
AM-241	432.60Y	59.5	812	3.60	35.9	Yes
CD-109	461.40D	88.0	1160	4.10	3.7	Yes
CO-57	271.74D	122.1	666	3.40	85.6	Yes
CE-139	137.64D	165.9	869	3.60	80.0	Yes
HG-203	46.59D	279.2	2149	3.50	81.6	Yes
SN-113	115.09D	391.7	1230	3.90	65.0	Yes
CS-137	30.08Y	661.7	791	4.10	85.1	Yes
Y-88	106.63D	898.0	2917	3.70	93.7	Yes
CO-60	1925.28D	1173.2	1458	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1459	3.90	100.0	Yes
Y-88	106.63D	1836.1	3089	3.70	99.2	Yes



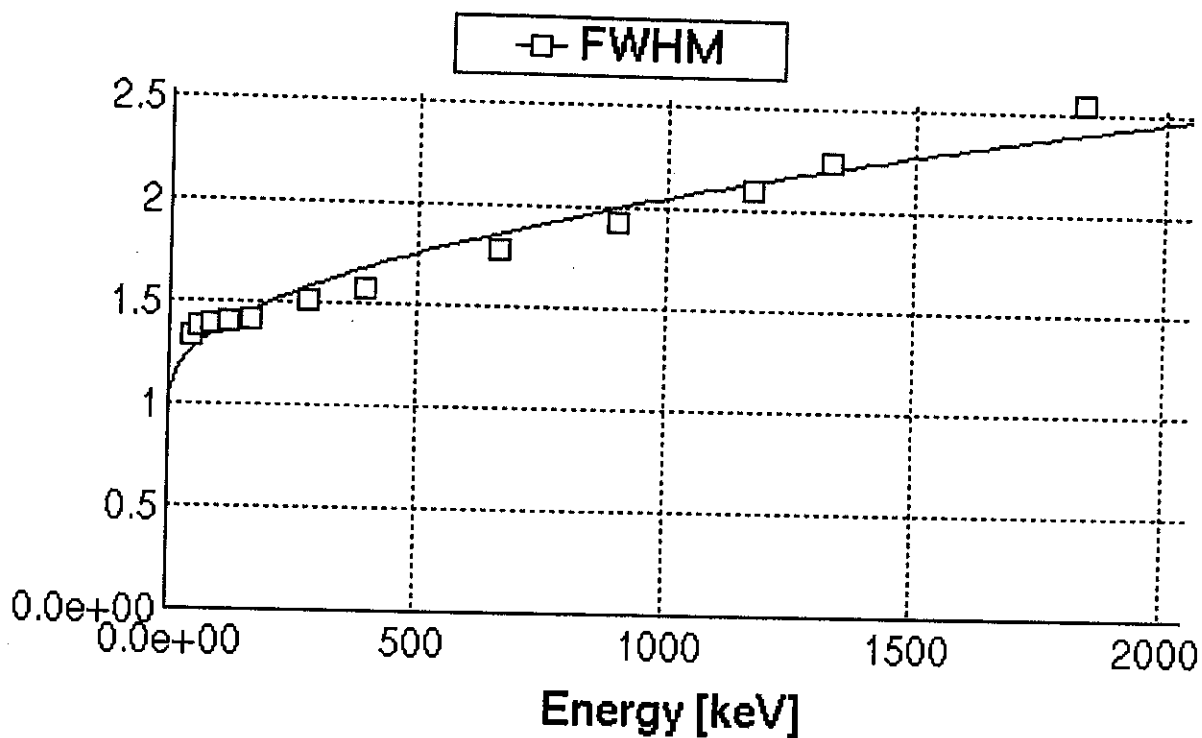
Datasource:

Energy = $-3.902e-02$ keV + $4.997e-01$ *Ch + $3.665e-08$ *Ch² [CHISQ = $3.081e-03$]

FWHM = $1.054e+00$ keV + $3.138e-02$ *E^{1/2} [CHISQ = $6.659e-03$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

gam17 Calibration (energy)
5/12/16



Datasource:

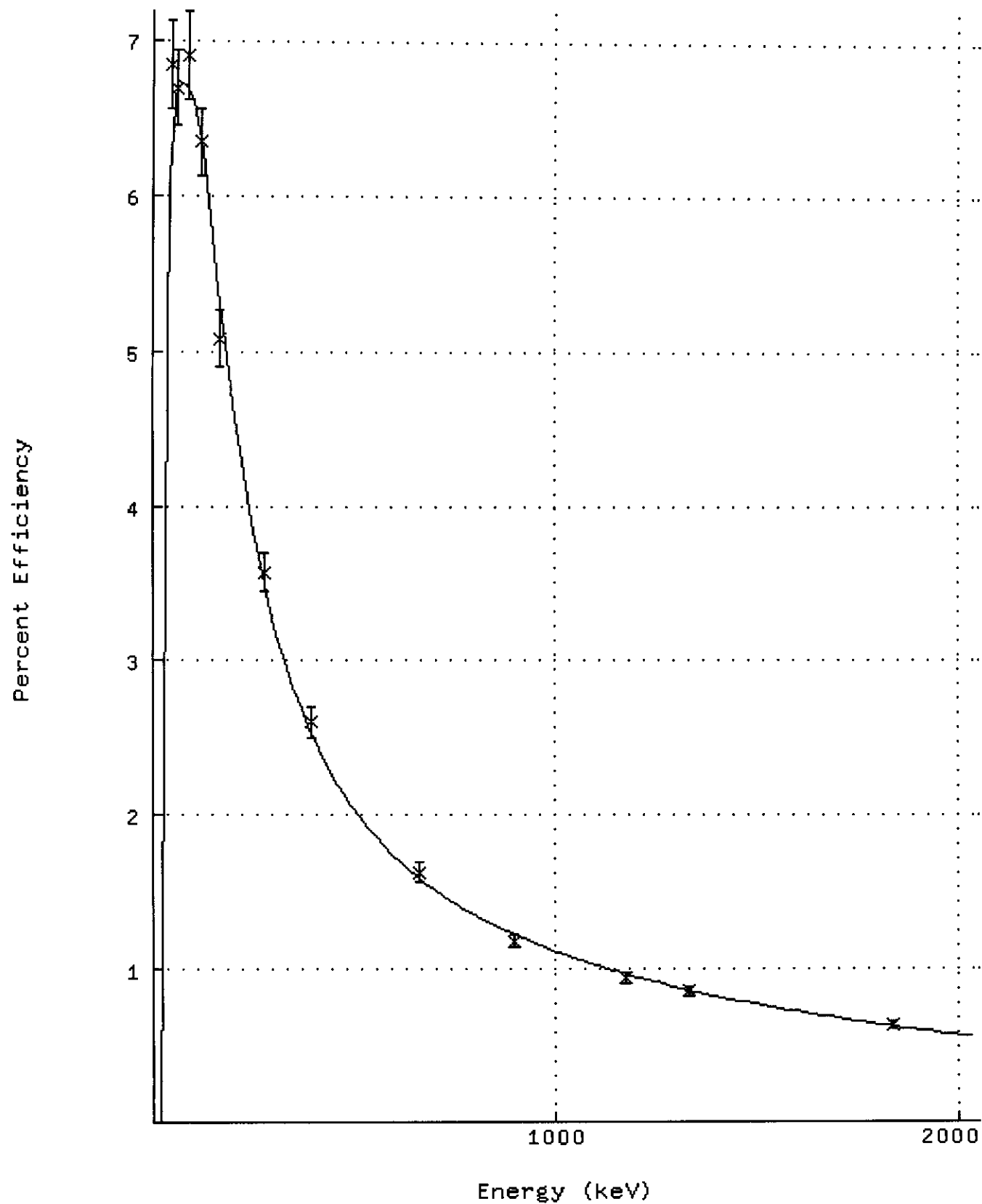
Energy = $-3.902e-02$ keV + $4.997e-01$ *Ch + $3.665e-08$ *Ch² [CHISQ = $3.081e-03$]

FWHM = $1.054e+00$ keV + $3.138e-02$ *E^{1/2} [CHISQ = $6.659e-03$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

gam17 Shape Calibration
5/12/16

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM17_CAN.CNF;14
Calib Date: 1-JUN-2016 09:40:
Detector : GAMMA17 Geometry : CAN
Fit type : 5 Deg. Linear



$$\text{Energy} = -3.9019\text{E-}02 + 0.4997 \cdot \text{Channel} + 3.6647\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.29	46.54	46.58	-0.036
2	119.30	59.54	59.57	-0.029
3	176.27	88.03	88.04	-0.008
4	244.35	122.06	122.05	0.007
5	331.98	165.86	165.84	0.023
6	558.77	279.20	279.16	0.037
7	783.92	391.70	391.67	0.027
8	1324.15	661.66	661.64	0.018
9	1797.18	898.04	898.05	-0.006
10	2347.82	1173.23	1173.26	-0.029
11	2666.45	1332.49	1332.52	-0.029
12	3673.71	1836.06	1836.04	0.024

FWHM Calibration Report

$$\text{FWHM} = 1.054 + 3.1376\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.34	1.27	0.073
2	59.54	1.38	1.30	0.086
3	88.03	1.40	1.35	0.051
4	122.06	1.41	1.40	0.005
5	165.86	1.42	1.46	-0.033
6	279.20	1.51	1.58	-0.064
7	391.70	1.57	1.67	-0.103
8	661.66	1.77	1.86	-0.086
9	898.04	1.92	1.99	-0.073
10	1173.23	2.10	2.13	-0.032
11	1332.49	2.23	2.20	0.033
12	1836.06	2.54	2.40	0.143

$$\text{Eff} = \exp(a1 \cdot E + a2 + a3/E + a4/E^2 + a5/E^3 + a6/E^4 + a7/E^5)$$

a1	a2	a3	a4	a5	a6	a7
-1.9359E-04	-1.964	226.7	-2.3286E+04	1.0342E+06	-1.6763E+07	0.0000E+00

Reduced Chi-Square = 0.989

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	6.84E-02	2.87E-03	6.82E-02	0.07	0.28
2	59.54	6.69E-02	2.42E-03	6.75E-02	-0.27	-0.97
3	88.03	6.89E-02	2.83E-03	6.70E-02	0.67	2.76
4	122.06	6.34E-02	2.17E-03	6.31E-02	0.15	0.51
5	165.86	5.07E-02	1.84E-03	5.35E-02	-1.53	-5.55
6	279.20	3.57E-02	1.26E-03	3.47E-02	0.82	2.88
7	391.70	2.60E-02	1.02E-03	2.53E-02	0.63	2.47
8	661.66	1.63E-02	6.77E-04	1.59E-02	0.62	2.59
9	898.04	1.18E-02	4.40E-04	1.22E-02	-0.90	-3.36
10	1173.23	9.44E-03	3.72E-04	9.67E-03	-0.62	-2.43
11	1332.49	8.54E-03	3.36E-04	8.61E-03	-0.22	-0.86
12	1836.06	6.41E-03	2.39E-04	6.27E-03	0.59	2.19

VMS Gamma Spectroscopy Report generated 1-JUN-2016 13:01:30

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM17_CAN_372143.CNF

---- Sample Information ----

Sample Title : CAN 103141B
 Sample ID : 103141B Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 372111 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2016 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2016 12:00:00. Acquisition date : 1-JUN-2016 08:01:56.
 Decay time : 60 20:01:56.84 % dead time : 2.8%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:44.91

---- Detector Parameters ----

Energy cal. time : 12-MAY-2016 11:34:17 Energy cal. oper.: gamma spec user
 Detector name : GAMMA17 Counting geometry: CAN
 Effic. cal. time : 1-JUN-2016 09:40:09. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : LINEAR Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	38.06	16520	58784	1.37	76.25	72	26	4.59E+00	2.7	1.41E+03
2	1	41.06	14604	58423	1.38	82.25	72	26	4.06E+00	3.1	
3	1	46.56	299373	57095	1.39	93.25	72	26	8.32E+01	0.2	
4	0	49.92	2704	49205	1.46	99.98	98	7	7.51E-01	13.7	
5	0	59.52	198797	76949	1.19	119.21	112	13	5.52E+01	0.4	
6	10	67.58	14018	83859	3.40	135.33	126	25	3.89E+00	5.1	1.36E+01
7	10	70.83	11870	34164	1.20	141.83	126	25	3.30E+00	2.8	
8	10	72.82	19335	45523	1.46	145.81	126	25	5.37E+00	2.2	
9	0	78.16	702	36937	1.20	156.51	154	7	1.95E-01	45.6	
10	10	84.14	13982	84372	3.47	168.47	160	34	3.88E+00	5.4	4.37E+01
11	10	88.05	262479	28413	1.21	176.29	160	34	7.29E+01	0.2	
12	0	122.05	132005	37605	1.22	244.35	237	13	3.67E+01	0.4	
13	0	136.48	15910	30041	1.21	273.23	268	11	4.42E+00	2.3	
14	0	165.86	117752	27296	1.28	332.03	325	13	3.27E+01	0.4	
15	0	199.14	4249	17930	1.44	398.63	394	10	1.18E+00	6.1	
16	0	203.79	737	13995	1.04	407.92	405	8	2.05E-01	28.0	
17	0	255.08	3673	13236	1.33	510.57	506	10	1.02E+00	6.1	
18	0	279.22	112386	16229	1.37	558.88	551	14	3.12E+01	0.4	
19	0	391.75	80391	12340	1.44	784.08	776	16	2.23E+01	0.5	
20	0	414.08	263	5795	2.02	828.77	825	8	7.31E-02	50.4	
21	0	510.83	1332	7918	2.38	1022.37	1016	13	3.70E-01	14.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	519.09	96	4713	1.34	1038.89	1036	8	2.66E-02	124.8	
23	0	521.75	87	4735	0.55	1044.21	1044	8	2.43E-02	136.9	
24	0	661.81	46691	10796	1.59	1324.49	1317	16	1.30E+01	0.7	
25	0	733.19	52	3754	0.63	1467.32	1464	8	1.43E-02	206.5	
26	0	814.16	1697	5037	1.92	1629.34	1623	13	4.71E-01	9.0	
27	0	898.27	84012	7690	1.77	1797.63	1789	17	2.33E+01	0.4	
28	0	929.95	64	4275	1.22	1861.02	1857	10	1.77E-02	192.1	
29	0	1062.89	137	2418	1.68	2127.01	2123	8	3.80E-02	62.9	
30	0	1114.26	53	3160	0.50	2229.79	2229	10	1.46E-02	200.5	
31	0	1173.55	48837	3953	1.96	2348.41	2341	17	1.36E+01	0.5	
32	0	1316.94	201	1493	1.37	2635.28	2631	11	5.58E-02	37.9	
33	5	1325.33	2078	3017	3.45	2652.06	2642	40	5.77E-01	7.0	3.24E+00
34	5	1332.86	44155	1744	2.06	2667.14	2642	40	1.23E+01	0.5	
35	0	1587.29	24	2036	0.91	3176.12	3172	9	6.69E-03	338.6	
36	0	1712.74	81	950	1.93	3427.07	3420	12	2.24E-02	77.2	
37	0	1836.48	48242	1199	2.32	3674.60	3664	23	1.34E+01	0.5	
38	0	1959.86	45	281	3.48	3921.39	3915	16	1.24E-02	85.1	

VAX/VMS Nuclide Identification Report Generated 1-JUN-2016 10:44:41.05

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM17_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM17_CAN.CNF;463
Sample date       : 1-APR-2015 12:00:00. Acquisition date : 31-MAY-2016 08:48:18
Sample ID        : VER_GAM17_CAN           Sample quantity : 1.00000E+00 SAMPLE
Detector name    : GAM17                  Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:50.61 1.4%
Energy tolerance : 1.50000 keV            Analyst Initials :
Abundance limit  : 75.00000              Sensitivity       : 3.00000
Batch ID        :                        Detector SN#      :
Matrix Spike ID :                        LCS ID           :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	7	38.12	11381	45874	2.43	76.36	71	27	3.16E+00	4.0	1.98E+03
2	7	40.80*	23728	46692	1.84	81.73	71	27	6.59E+00	2.0	
3	7	46.57*	302388	37382	1.40	93.27	71	27	8.40E+01	0.2	
4	0	49.98	3204	35212	1.50	100.10	98	7	8.90E-01	9.9	
5	0	59.58	189524	47333	1.18	119.32	112	13	5.26E+01	0.3	
6	10	66.95	6429	28416	2.97	134.08	127	26	1.79E+00	5.9	1.02E+01
7	10	69.71	2782	28124	2.12	139.60	127	26	7.73E-01	12.9	
8	0	79.12	355	17723	1.40	158.43	156	7	9.87E-02	62.3	
9	0	88.09	146405	25657	1.18	176.37	170	13	4.07E+01	0.3	
10	0	122.09	47602	13495	1.21	244.43	237	14	1.32E+01	0.7	
11	0	136.49	5401	7012	1.20	273.23	269	9	1.50E+00	3.1	
12	0	165.90	18316	7436	1.26	332.10	327	12	5.09E+00	1.2	
13	0	199.05*	560	5900	1.16	398.43	395	9	1.56E-01	25.1	
14	0	203.13	222	5052	1.14	406.62	404	8	6.16E-02	55.9	
15	0	254.91	251	4027	1.01	510.24	508	7	6.97E-02	42.4	
16	0	279.26	519	4428	1.66	558.96	555	9	1.44E-01	23.6	
17	0	311.23	131	3713	1.37	622.95	619	8	3.65E-02	80.9	
18	0	391.75	8443	4546	1.44	784.09	779	11	2.35E+00	1.9	
19	0	511.08*	2137	5112	2.38	1022.87	1016	16	5.94E-01	7.8	
20	0	638.53	112	2080	2.31	1277.90	1275	8	3.10E-02	71.4	
21	0	661.75	43709	4589	1.60	1324.36	1315	17	1.21E+01	0.6	
22	0	808.10	67	2171	1.45	1617.20	1616	8	1.86E-02	121.3	
23	0	898.18	7610	4999	1.70	1797.45	1791	14	2.11E+00	2.3	
24	0	976.56	57	2347	1.19	1954.27	1953	9	1.59E-02	153.5	
25	0	1024.81	35	2232	1.18	2050.81	2047	10	9.72E-03	253.0	
26	0	1077.86	19	2079	1.08	2156.96	2156	10	5.17E-03	458.5	
27	0	1115.75	18101	3788	1.84	2232.76	2223	19	5.03E+00	1.1	
28	0	1173.44	42909	1961	1.90	2348.18	2340	18	1.19E+01	0.5	
29	0	1324.93	151	475	2.17	2651.27	2646	11	4.21E-02	29.0	
30	0	1332.72	38351	725	2.01	2666.85	2657	19	1.07E+01	0.5	
31	0	1670.12	63	170	1.49	3341.82	3336	12	1.74E-02	43.5	
32	0	1745.23	38	128	4.65	3492.07	3484	17	1.06E-02	70.0	
33	0	1761.41	48	168	7.89	3524.44	3515	20	1.33E-02	68.4	
34	0	1791.39	20	97	3.83	3584.42	3575	12	5.61E-03	101.8	

Peak Search Report (continued)

Sample ID : VER_GAM17_CAN

Page : 2

Acquisition date : 1-JUN-2016 09:43:20

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1836.25	4387	106	2.23	3674.15	3664	18	1.22E+00	1.6	
36	0	1939.65*	19	71	1.56	3880.96	3876	12	5.30E-03	90.6	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	47602	85.60*	6.307E+00	6.620E+03	1.967E+04	1.38
	136.47	5401	10.68	6.011E+00	6.317E+03	1.877E+04	6.23
CO-60	1173.23	42909	99.85	9.670E-01	3.336E+04	3.890E+04	1.08
	1332.49	38351	99.98*	8.612E-01	3.344E+04	3.899E+04	1.08
ZN-65	1115.54	18101	50.60*	1.011E+00	2.655E+04	8.927E+04	2.21
Y-88	898.04	7610	93.70	1.221E+00	4.993E+03	8.010E+04	4.56
	1836.06	4387	99.20*	6.265E-01	5.300E+03	8.502E+04	3.22
CD-109	88.03	146405	3.70*	6.703E+00	4.432E+05	8.417E+05	0.69
SN-113	391.70	8443	64.97*	2.531E+00	3.854E+03	5.042E+04	3.78
CS-137	661.66	43709	85.10*	1.587E+00	2.430E+04	2.497E+04	1.19
CE-139	165.86	18316	80.00*	5.353E+00	3.211E+03	2.756E+04	2.40
HG-203	70.83	2782	3.69	6.697E+00	8.453E+03	4.847E+06	25.76
	72.87	-----	6.19	6.698E+00	-----	Line Not Found	-----
	279.20	519	81.56*	3.465E+00	1.378E+02	7.904E+04	47.16
PB-210	46.54	302388	4.25*	6.817E+00	7.836E+05	8.127E+05	0.42
AM-241	59.54	189524	35.90*	6.750E+00	5.872E+04	5.883E+04	0.66

Flag: "*" = Keyline

Sample ID : Bkg

Page : 1
Acquisition date : 31-MAY-2016 08:48:18

VMS Gamma Spectroscopy Report generated 1-JUN-2016 01:28:47

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM17__371962.CN

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 371962 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 31-MAY-2016 08:48:18

---- Sample Decay/Count Information ----

Sample Date : 31-MAY-2016 08:48:18 Acquisition date : 31-MAY-2016 08:48:18
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.68

---- Detector Parameters ----

Energy cal. time : 12-MAY-2016 11:34:17 Energy cal. oper.: gamma spec user
Detector name : GAMMA17 Counting geometry:
Effic. cal. time : 23-MAY-2016 07:50:31 Effic. cal. oper.:

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	40.23	72	514	1.00	80.60	78	6	1.20E-03	51.5	
2	0	46.57	506	847	1.00	93.29	89	9	8.44E-03	11.3	
3	0	53.10	61	488	1.12	106.35	104	6	1.01E-03	59.1	
4	0	63.41	498	815	0.95	126.98	123	9	8.30E-03	11.3	
5	0	84.31	54	786	1.01	168.81	166	8	8.97E-04	91.6	
6	0	92.73	780	823	1.24	185.66	181	10	1.30E-02	7.8	
7	0	112.63	83	576	1.95	225.48	222	8	1.38E-03	51.3	
8	0	144.37	111	567	1.19	289.01	285	9	1.84E-03	40.0	
9	0	185.57	380	615	1.24	371.47	367	10	6.33E-03	13.2	
10	0	198.48	54	387	1.14	397.30	394	7	9.08E-04	61.7	
11	0	209.26	102	543	1.24	418.88	415	10	1.70E-03	44.0	
12	0	238.40	295	486	1.52	477.19	472	9	4.92E-03	14.7	
13	0	241.81	72	427	1.11	484.03	481	8	1.19E-03	51.6	
14	0	281.65	44	438	0.83	563.75	560	10	7.28E-04	90.9	
15	0	289.07	67	275	1.62	578.60	576	7	1.11E-03	43.1	
16	0	327.21	26	393	0.83	654.92	652	9	4.26E-04	141.5	
17	0	334.10	50	205	1.30	668.70	666	6	8.37E-04	47.3	
18	0	338.61	117	365	2.54	677.73	673	11	1.95E-03	33.1	
19	0	352.23	81	406	0.74	704.99	699	11	1.35E-03	49.4	

20	0	510.99	1009	484	2.19	1022.69	1013	22	1.68E-02	6.4
21	0	557.90	35	298	1.04	1116.55	1110	14	5.76E-04	107.2
22	0	570.14	25	158	1.05	1141.05	1137	8	4.13E-04	90.1
23	0	583.31	102	219	2.13	1167.42	1162	12	1.70E-03	30.9
24	0	598.76	53	379	2.37	1198.32	1190	17	8.84E-04	85.2
25	0	608.79	92	210	1.48	1218.39	1214	10	1.53E-03	31.3
26	0	788.08	73	139	3.61	1577.15	1571	13	1.22E-03	35.3
27	0	802.70	37	107	2.09	1606.40	1604	8	6.15E-04	51.1
28	0	836.39	32	139	1.09	1673.81	1669	10	5.35E-04	71.1
29	0	840.40	22	87	0.70	1681.84	1679	7	3.68E-04	73.3
30	0	852.09	37	111	2.67	1705.23	1701	10	6.14E-04	55.8
31	0	876.84	42	160	2.89	1754.76	1743	17	6.97E-04	71.3
32	0	911.41	81	93	2.07	1823.92	1818	11	1.35E-03	25.7
33	0	1003.27	31	160	1.12	2007.71	1999	16	5.17E-04	93.0
34	0	1030.65	19	65	0.61	2062.50	2058	9	3.18E-04	79.6
35	0	1100.94	10	75	0.94	2203.13	2196	11	1.63E-04	173.6
36	0	1124.29	126	104	10.61	2249.85	2238	26	2.10E-03	23.9
37	0	1153.52	71	227	12.12	2308.33	2280	37	1.18E-03	69.8
38	0	1162.39	17	51	1.80	2326.07	2319	9	2.88E-04	78.6
39	0	1188.20	16	67	1.24	2377.72	2369	12	2.65E-04	108.9
40	0	1254.10	34	68	0.80	2509.56	2501	13	5.66E-04	54.7
41	0	1286.43	5	54	1.37	2574.25	2568	9	9.08E-05	243.1
42	0	1350.23	7	60	0.77	2701.89	2692	11	1.17E-04	216.9
43	0	1461.54	74	102	2.52	2924.56	2918	21	1.23E-03	36.5
44	0	1533.86	23	80	7.76	3069.23	3057	21	3.83E-04	99.0
45	0	1552.30	33	30	4.83	3106.12	3098	16	5.56E-04	41.4
46	0	1649.86	32	58	0.53	3301.29	3288	23	5.29E-04	64.6
47	0	1763.67	39	36	0.82	3528.97	3520	16	6.53E-04	37.8
48	0	1813.50	22	5	1.43	3628.63	3625	8	3.70E-04	28.1
49	0	1818.37	16	27	0.73	3638.37	3632	15	2.74E-04	72.3
50	0	1879.71	14	11	2.33	3761.07	3757	9	2.37E-04	49.8
51	0	1899.07	9	17	3.44	3799.79	3791	12	1.51E-04	99.0
52	0	1930.28	21	16	2.84	3862.23	3856	12	3.47E-04	45.8
53	0	1939.73	18	38	5.79	3881.13	3867	19	3.06E-04	83.9
54	0	1957.83	12	32	4.86	3917.33	3906	16	2.00E-04	109.3
55	0	2016.79	13	37	6.91	4035.27	4024	19	2.24E-04	113.0

Sample ID : Bkg

Acquisition date : 31-MAY-2016 08:48:18

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM17.QAF;1

Sample ID	: Bkg	Sample quantity	: 1.00 ea
Sample date	: 31-MAY-2016 08:48:18	Acquisition date	: 31-MAY-2016 08:48:18
Elapsed live time	: 0 16:40:00.00	Elapsed real time	: 0 16:40:03.68

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.36306+/-0.01304]	1.3679E+00	0.37	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 6 / 3 / 16

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 17

Calibration Date: 6/1/2016

Geometry: CAN

Manufacturer Standard Id: 100218

GEL Standard Id: 1738

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	760.8	5.7276E+04	5.883E+04	2.71
Cs-137	661.7	0.851	740.9	2.3530E+04	2.497E+04	6.12
Co-60	1173.2	0.9985	1405	3.8030E+04	3.890E+04	2.29
Co-60	1332.5	0.9998	1407	3.8035E+04	3.899E+04	2.51

Prepared By: R. Futer

Date: 6/3/16

Reviewed By: M. Stamp

Date: 6/6/16

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)558-8171

Gamma Spectrometer Front End Electronics Setup
Detector: Gamma 17

Date Performed: 8/12/16

Performed By: RR

High Voltage Power Supply Model No. <u>365</u> High Voltage <u>2.80 kV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.618</u> Time Constant <u>6 μsec</u> Input polarity <u>Negative</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>ND579</u> Gain <u>4K</u>	
AIM Module Model No. <u>55C A</u> Address <u>1007:2</u>	

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 18

Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the second standard(s) documentation? the nuclide library used? the VMS certificate file?	☒	☐	1738 1701
2) Is the energy calibration graph included?	☒	☐	
3) Is the detector efficiency curve printout included?	☒	☐	
4) Is the efficiency calibration report included and reviewed?	☒	☐	
5) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	☒ ☒ ☒ ☒	☐ ☐ ☐ ☐	
6) Are the calibration verification calculations included?	☒	☐	
7) Are the instrument settings included: amp, HVPS, ADC settings?	☒	☐	

Prepared By: P. Funder

Date: 6/22/15

Reviewed By: M. J. Funder

Date: 6/24/15

Effective Date: 6/22/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.6	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.6	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.056E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.6	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.086E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytical Chemistry Laboratory, NIST

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffin
J. S. Laffin, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.614E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+06	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibbitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: *K. Eardley*
K. Eardley, Radiochemist

QC Approved: *A. Chen*
A. Chen, Spectroscopist

Date: 20 MAY 14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

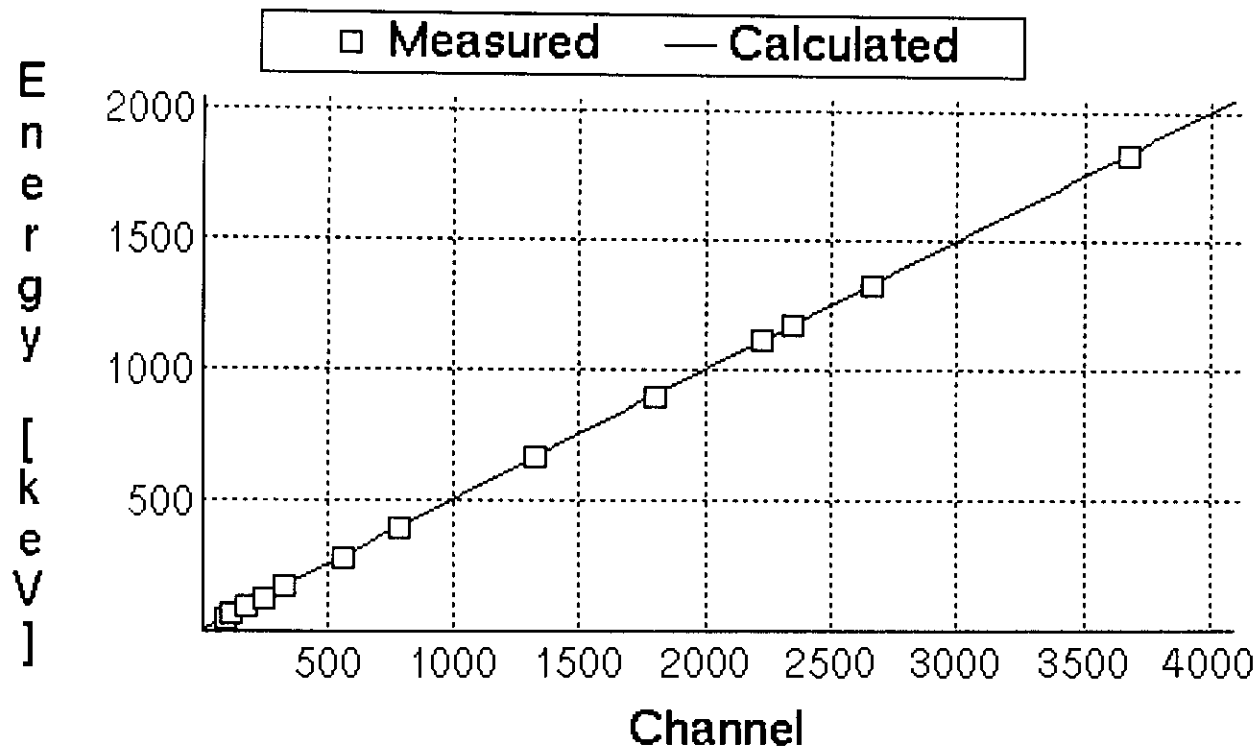
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
			*		59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



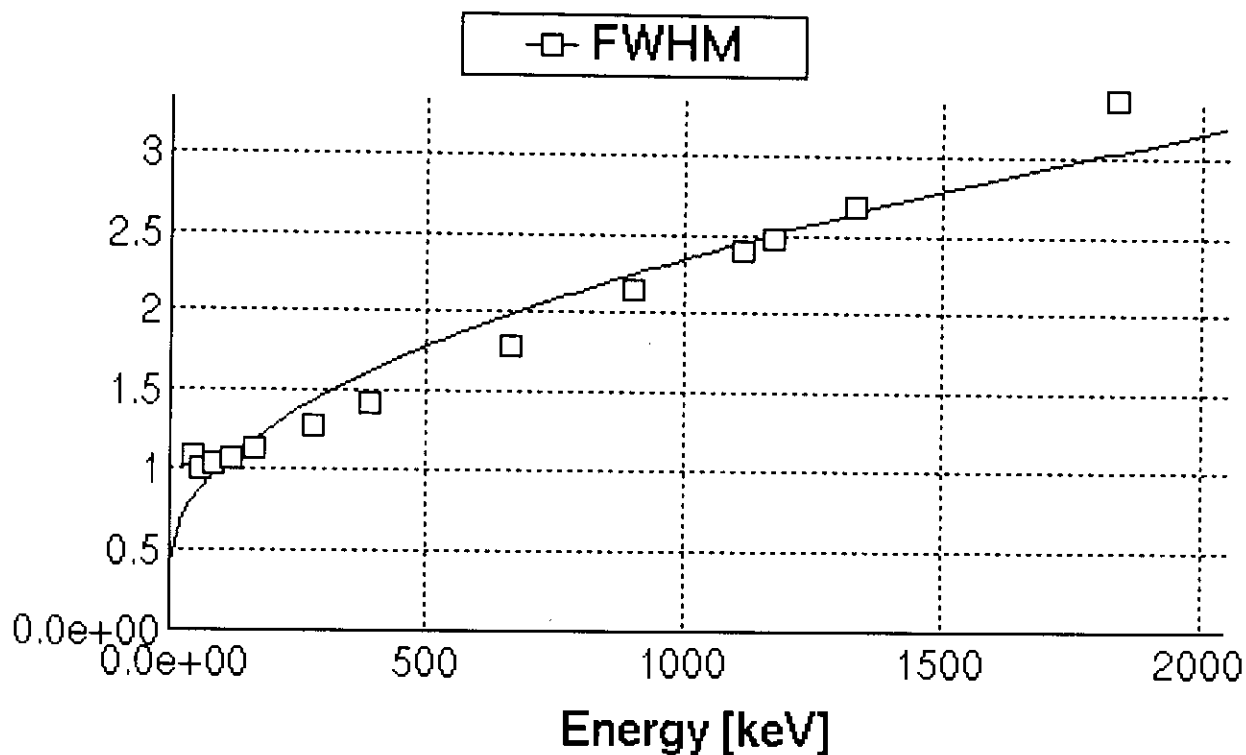
Datasource:

Energy = $-3.547\text{e-}01 \text{ keV} + 5.005\text{e-}01 * \text{Ch} + -4.896\text{e-}08 * \text{Ch}^2$ [CHISQ = $6.526\text{e-}03$]

FWHM = $3.982\text{e-}01 \text{ keV} + 6.150\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $2.835\text{e-}02$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

energy calibration 8/18 G/22/15



Datasource:

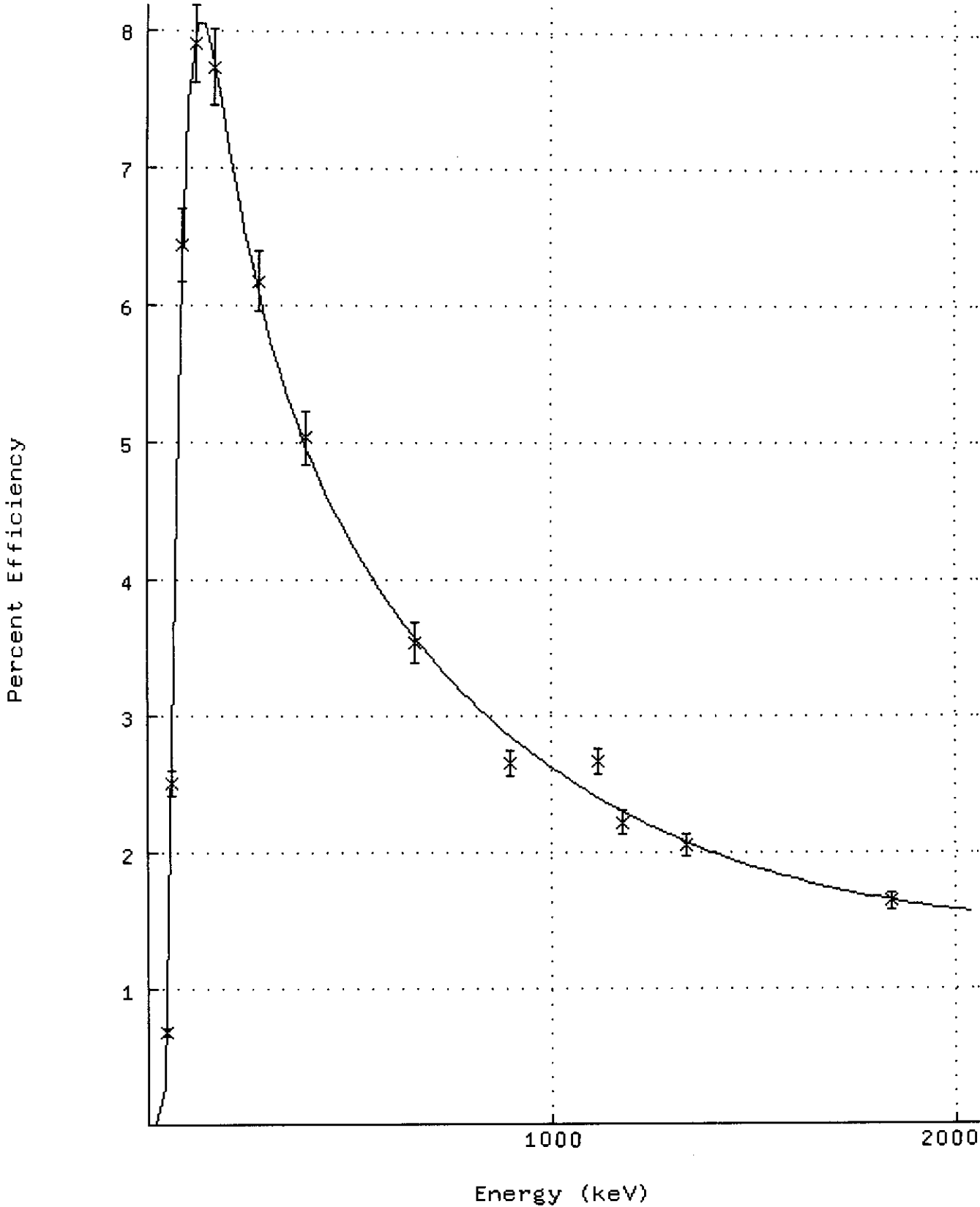
Energy = $-3.547e-01 \text{ keV} + 5.005e-01 * \text{Ch} + -4.896e-08 * \text{Ch}^2$ [CHISQ = $6.526e-03$]

FWHM = $3.982e-01 \text{ keV} + 6.150e-02 * E^{1/2}$ [CHISQ = $2.835e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration of 18 G/22/15

Spectrum : DKA100:[CANBERRA,GAMMA]EFF_GAM18_CAN.CNF;9
Calib Date: 22-JUN-2015 09:18
Detector : GAMMA18 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -0.3547 + 0.5005 \cdot \text{Channel} + -4.8958\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.60	46.54	46.49	0.048
2	119.64	59.54	59.52	0.019
3	176.59	88.03	88.03	0.004
4	244.61	122.06	122.07	-0.005
5	332.15	165.86	165.88	-0.018
6	558.66	279.20	279.23	-0.033
7	783.48	391.70	391.74	-0.036
8	1322.96	661.66	661.68	-0.022
9	1795.38	898.04	898.05	-0.012
10	2230.09	1115.60	1115.54	0.064
11	2345.41	1173.23	1173.22	0.007
12	2663.77	1332.49	1332.48	0.006
13	3670.61	1836.06	1836.08	-0.022

FWHM Calibration Report

$$\text{FWHM} = 0.3982 + 6.1496\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.08	0.82	0.261
2	59.54	1.00	0.87	0.132
3	88.03	1.03	0.98	0.054
4	122.06	1.07	1.08	-0.011
5	165.86	1.13	1.19	-0.059
6	279.20	1.28	1.43	-0.150
7	391.70	1.42	1.62	-0.195
8	661.66	1.78	1.98	-0.202
9	898.04	2.14	2.24	-0.099
10	1115.60	2.40	2.45	-0.054
11	1173.23	2.47	2.50	-0.032
12	1332.49	2.68	2.64	0.033
13	1836.06	3.36	3.03	0.322

$\text{Eff} = \exp(a_2 + a_3 \cdot x + a_4 \cdot x^2 + a_5 \cdot x^3 + a_6 \cdot x^4 + a_7 \cdot x^5)$, $x = \ln(a_1/\text{energy})$

a1	a2	a3	a4	a5	a6	a7
941.3	-3.594	0.7917	-0.1169	-0.1134	0.1527	-4.9235E-02

Average Deviation = 2.57 % Reduced Chi-Square = 2.11

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	6.83E-03	3.17E-04	6.94E-03	-0.34	-1.60
2	59.54	2.50E-02	9.35E-04	2.45E-02	0.52	1.94
3	88.03	6.43E-02	2.65E-03	6.42E-02	0.04	0.16
4	122.06	7.89E-02	2.80E-03	8.03E-02	-0.47	-1.67
5	165.86	7.72E-02	2.73E-03	7.78E-02	-0.20	-0.70
6	279.20	6.17E-02	2.18E-03	6.05E-02	0.53	1.89
7	391.70	5.03E-02	1.98E-03	4.97E-02	0.31	1.20
8	661.66	3.54E-02	1.43E-03	3.57E-02	-0.23	-0.95
9	898.04	2.65E-02	9.90E-04	2.85E-02	-2.02	-7.55
10	1115.60	2.66E-02	9.42E-04	2.40E-02	2.81	9.95
11	1173.23	2.21E-02	8.71E-04	2.30E-02	-1.02	-4.02
12	1332.49	2.05E-02	8.05E-04	2.07E-02	-0.32	-1.24
13	1836.06	1.64E-02	6.12E-04	1.65E-02	-0.15	-0.56

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM18_CAN_334157.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.000000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 334140 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 22-JUN-2015 08:37:27
 Decay time : 81 20:37:27.21 % dead time : 3.6%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:31:06.72

----- Detector Parameters -----

Energy cal. time : 22-JUN-2015 09:17:47 Energy cal. oper.: gamma spec user
 Detector name : GAMMA18 Counting geometry: CAN
 Effic. cal. time : 22-JUN-2015 09:18:06 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.000000 Gaussian Sens. : 10.000000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.000000 Half life ratio : 8.000000
 Abundance limit : 75.000000 WTM error limit : 3.000000
 MDA Width (FWHM) : 3.000000 MDA Confid Level : 5.000000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.39	14877	19951	1.05	93.40	88	10	8.26E+00	2.0	
2	0	59.48	34864	22219	1.05	119.55	114	11	1.94E+01	1.0	
3	0	66.17	434	12569	1.71	132.92	131	6	2.41E-01	40.9	
4	4	70.89	1610	13728	0.93	142.36	139	11	8.94E-01	11.8	1.96E+00
5	4	72.87	2879	11366	0.91	146.31	139	11	1.60E+00	5.9	
6	10	83.45	3976	30449	2.48	167.45	161	23	2.21E+00	8.8	1.39E+01
7	10	85.82	3302	20042	1.56	172.18	161	23	1.83E+00	10.4	
8	10	88.03	111362	11191	1.03	176.59	161	23	6.19E+01	0.3	
9	0	109.67	351	10832	0.80	219.84	218	6	1.95E-01	47.2	
10	0	122.06	69184	21457	1.13	244.59	239	13	3.84E+01	0.6	
11	0	136.44	9176	16469	1.15	273.33	268	11	5.10E+00	2.9	
12	0	165.88	76805	16551	1.16	332.15	326	13	4.27E+01	0.5	
13	0	255.16	2784	9481	1.30	510.56	506	10	1.55E+00	6.8	
14	0	279.23	57868	9812	1.29	558.66	553	12	3.21E+01	0.5	
15	0	391.72	64546	7641	1.39	783.44	777	13	3.59E+01	0.5	
16	0	431.73	81	4271	0.71	863.40	862	8	4.51E-02	140.1	
17	0	502.02	88	3341	1.21	1003.88	1002	7	4.91E-02	108.9	
18	0	510.97	6323	8233	2.68	1021.75	1014	17	3.51E+00	3.5	
19	0	588.26	77	3613	1.24	1176.21	1175	8	4.30E-02	134.9	
20	0	661.65	47071	8744	1.67	1322.89	1314	17	2.62E+01	0.6	
21	0	692.44	202	5747	2.20	1384.42	1379	11	1.12E-01	72.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	4	811.66	245	1495	1.41	1622.70	1620	14	1.36E-01	22.8	9.74E-01
23	4	813.97	564	4461	2.27	1627.32	1620	14	3.13E-01	24.2	
24	0	898.01	77697	9188	1.97	1795.29	1784	20	4.32E+01	0.5	
25	0	995.06	72	2883	0.51	1989.28	1985	10	3.99E-02	140.5	
26	0	1063.18	44	2933	0.71	2125.45	2121	12	2.46E-02	245.5	
27	0	1096.53	76	2214	0.94	2192.10	2189	9	4.21E-02	112.5	
28	0	1115.46	56944	5342	2.15	2229.94	2218	21	3.16E+01	0.5	
29	0	1173.16	54261	4167	2.21	2345.28	2333	24	3.01E+01	0.5	
30	0	1214.90	39	1172	0.59	2428.73	2422	10	2.19E-02	163.7	
31	0	1260.27	163	941	2.04	2519.42	2515	10	9.05E-02	36.1	
32	2	1325.65	1590	1951	3.19	2650.11	2638	36	8.83E-01	8.2	7.96E+01
33	2	1332.48	50380	1845	2.67	2663.77	2638	36	2.80E+01	0.5	
34	0	1466.36	79	1314	2.87	2931.41	2923	12	4.40E-02	92.5	
35	0	1835.94	50624	1232	2.80	3670.33	3656	28	2.81E+01	0.5	
36	0	1948.53	62	308	2.02	3895.45	3891	14	3.44E-02	53.2	

```

*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road      *
*               Charleston, SC 29407  *
*                                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM18_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM18.CNF;443
Background date    : 21-JUN-2015 09:14:10
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 22-JUN-2015 09:19:06
Sample ID        : VER_GAM18_CAN      Sample quantity   : 1.000000E+00 SAMPLE
Detector name     : GAM18             Detector geometry: CAN
Elapsed live time : 0 00:20:00.00     Elapsed real time: 0 00:20:19.18  1.6%
Energy tolerance  : 1.50000 keV       Analyst Initials  :
Abundance limit   : 75.00000          Sensitivity       : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.48	9377	7062	1.00	93.58	89	9	7.81E+00	1.9	
2	0	59.51	23718	7553	1.03	119.61	114	10	1.98E+01	0.9	
3	7	80.62	566	8051	1.85	161.80	155	29	4.72E-01	28.8	3.14E+01
4	7	84.04*	945	5574	1.28	168.64	155	29	7.87E-01	13.8	
5	7	88.03	44971	3143	1.03	176.60	155	29	3.75E+01	0.5	
6	0	122.05	18697	5611	1.12	244.58	238	14	1.56E+01	1.1	
7	0	136.43	2398	2797	1.14	273.32	269	9	2.00E+00	4.5	
8	0	159.06	199	2253	2.00	318.53	315	8	1.66E-01	42.0	
9	0	165.87	8210	3163	1.10	332.13	327	11	6.84E+00	1.7	
10	0	254.92	200	2041	1.46	510.07	507	8	1.67E-01	39.8	
11	0	278.41	48	1728	0.84	557.01	556	7	4.01E-02	144.0	
12	0	328.06	185	2173	2.42	656.22	652	11	1.54E-01	49.5	
13	0	369.36	86	1523	0.69	738.76	736	8	7.18E-02	79.1	
14	0	391.78	4912	2356	1.37	783.57	778	12	4.09E+00	2.4	
15	0	405.14	113	1523	1.84	810.26	806	8	9.42E-02	60.5	
16	0	413.97	57	1500	0.99	827.90	826	8	4.78E-02	117.3	
17	0	429.42	99	1315	1.64	858.79	856	7	8.27E-02	61.3	
18	0	511.09*	1382	2227	2.55	1022.00	1015	15	1.15E+00	7.9	
19	0	551.67	30	1126	0.81	1103.10	1097	8	2.50E-02	194.8	
20	0	582.34*	46	1009	1.00	1164.39	1163	8	3.83E-02	120.6	
21	0	661.67*	32303	2308	1.71	1322.93	1314	18	2.69E+01	0.7	
22	0	703.31	43	1308	0.56	1406.15	1399	11	3.61E-02	162.5	
23	0	730.26	39	1184	0.85	1460.02	1456	10	3.23E-02	167.5	
24	0	740.27	71	1484	0.75	1480.02	1477	13	5.95E-02	111.9	
25	0	815.22	62	1280	0.86	1629.82	1624	10	5.15E-02	109.4	
26	0	897.96	5127	2587	1.94	1795.19	1787	16	4.27E+00	2.6	
27	0	915.22	73	1812	0.94	1829.70	1825	12	6.07E-02	117.4	
28	0	1019.26	111	824	1.89	2037.64	2034	8	9.22E-02	46.2	
29	0	1115.46	13684	1847	2.12	2229.95	2219	19	1.14E+01	1.1	
30	0	1149.29	88	878	4.76	2297.56	2291	15	7.36E-02	74.0	
31	0	1157.40	11	608	0.98	2313.78	2307	10	8.76E-03	440.7	
32	0	1173.16	32178	1535	2.18	2345.28	2333	22	2.68E+01	0.6	
33	0	1194.61	31	453	0.99	2388.17	2380	11	2.59E-02	134.7	
34	0	1265.86	45	287	4.33	2530.59	2522	15	3.75E-02	83.7	

Sample ID : VER_GAM18_CAN

Acquisition date : 22-JUN-2015 09:19:06

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1332.41	29263	746	2.31	2663.62	2652	25	2.44E+01	0.6	
36	0	1650.83	28	212	6.86	3300.22	3285	19	2.31E-02	128.7	
37	0	1677.47	36	136	5.32	3353.48	3344	15	3.01E-02	73.6	
38	0	1835.97	3297	211	2.74	3670.39	3656	28	2.75E+00	2.0	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	18697	85.60*	8.025E+00	6.130E+03	1.917E+04	2.25
	136.47	2398	10.68	8.082E+00	6.256E+03	1.956E+04	8.94
CO-60	1173.23	32178	99.85	2.301E+00	3.155E+04	3.705E+04	1.28
	1332.49	29263	99.98*	2.074E+00	3.178E+04	3.733E+04	1.27
ZN-65	1115.54	13684	50.60*	2.398E+00	2.540E+04	9.038E+04	2.27
Y-88	898.04	5127	93.70	2.854E+00	4.319E+03	7.888E+04	5.24
	1836.06	3297	99.20*	1.651E+00	4.535E+03	8.283E+04	4.05
CD-109	88.03	44971	3.70*	6.420E+00	4.264E+05	8.344E+05	1.03
SN-113	391.70	4912	64.97*	4.973E+00	3.424E+03	5.052E+04	4.88
CS-137	661.66	32303	85.10*	3.572E+00	2.393E+04	2.462E+04	1.31
CE-139	165.86	8210	80.00*	7.778E+00	2.972E+03	2.821E+04	3.46
HG-203	70.83	-----	3.69	4.263E+00	-----	Line Not Found	-----
	72.87	-----	6.19	4.569E+00	-----	Line Not Found	-----
	279.20	48	81.56*	6.061E+00	2.192E+01	1.692E+04	288.02
PB-210	46.54	9377	4.25*	6.885E-01	7.217E+05	7.498E+05	3.84
AM-241	59.54	23718	35.90*	2.447E+00	6.081E+04	6.093E+04	1.88

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM18.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 21-JUN-2015 09:14:10 Acquisition date : 21-JUN-2015 09:14:10
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:09.53

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	2.1248E+00	-0.10	
[2.12760+/-0.02980]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: Rf Approval Date: 6 / 22 / 15

Sample ID : Bkg

Page : 1
Acquisition date : 21-JUN-2015 09:14:10

VMS Gamma Spectroscopy Report generated 22-JUN-2015 01:54:31

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM18___334079.CNF;1

----- Sample Information -----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 334079 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 21-JUN-2015 09:14:10

----- Sample Decay/Count Information -----

Sample Date : 21-JUN-2015 09:14:10 Acquisition date : 21-JUN-2015 09:14:10
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:09.53

----- Detector Parameters -----

Energy cal. time : 2-JUN-2014 15:16:47. Energy cal. oper.: gamma spec user
Detector name : GAMMA18 Counting geometry:
Effic. cal. time : 3-JUN-2014 14:34:33. Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	53.79	60	694	0.72	107.84	106	5	1.00E-03	66.9	
2	6	63.65	377	1006	1.38	127.53	123	15	6.29E-03	15.3	2.39E+00
3	6	66.44	287	1102	1.57	133.12	123	15	4.79E-03	22.2	
4	0	74.93	118	709	0.98	150.07	148	5	1.97E-03	34.9	
5	0	77.00	111	650	1.11	154.21	153	5	1.85E-03	35.9	
6	4	84.15	126	683	1.39	168.50	165	9	2.10E-03	34.2	2.63E+00
7	4	85.22	84	706	0.97	170.63	165	9	1.40E-03	51.9	
8	0	92.98	700	1090	1.18	186.14	182	9	1.17E-02	9.3	
9	0	140.57	128	890	0.81	281.23	277	8	2.14E-03	41.3	
10	0	144.05	98	883	0.98	288.18	285	8	1.63E-03	53.4	
11	0	186.04	565	901	0.94	372.08	368	9	9.42E-03	10.5	
12	0	198.86	161	742	0.92	397.69	394	8	2.68E-03	30.5	
13	0	209.87	58	411	0.88	419.68	418	5	9.74E-04	53.6	
14	0	238.97	529	1116	1.25	477.83	472	13	8.82E-03	13.7	
15	0	295.53	218	768	1.24	590.85	584	13	3.63E-03	27.2	
16	0	300.51	97	540	1.60	600.80	598	9	1.61E-03	44.4	
17	0	352.17	257	564	1.69	704.03	699	11	4.29E-03	19.0	
18	0	462.95	108	381	1.60	925.40	920	11	1.81E-03	36.2	
19	0	478.47	47	294	1.49	956.40	953	8	7.89E-04	64.6	

20	0	511.09	2078	885	2.43	1021.60	1012	22	3.46E-02	4.2	
21	0	537.91	59	349	2.22	1075.18	1068	11	9.81E-04	62.9	
22	0	583.73	173	339	1.63	1166.76	1161	11	2.89E-03	22.1	
23	0	588.47	46	288	1.47	1176.23	1172	10	7.73E-04	69.7	
24	0	609.38	293	558	1.27	1218.00	1211	14	4.89E-03	18.0	
25	0	662.25	107	304	1.57	1323.68	1318	12	1.79E-03	33.8	
26	0	706.43	68	354	4.44	1411.96	1407	13	1.13E-03	58.3	
27	0	727.07	113	281	2.20	1453.21	1447	13	1.89E-03	31.8	
28	0	803.52	154	208	1.61	1605.99	1600	12	2.57E-03	20.4	
29	1	911.51	201	213	2.36	1821.83	1815	30	3.36E-03	17.0	1.08E+00
30	1	919.31	47	206	2.37	1837.43	1815	30	7.76E-04	67.6	
31	0	936.42	49	280	0.51	1871.62	1863	17	8.13E-04	80.5	
32	0	969.68	76	242	1.87	1938.09	1933	14	1.26E-03	45.6	
33	0	1000.78	93	197	1.83	2000.25	1995	13	1.55E-03	32.7	
34	0	1079.45	6	309	8.50	2157.50	2157	21	9.35E-05	785.0	
35	0	1121.10	90	252	1.52	2240.74	2232	18	1.51E-03	42.7	
36	0	1244.04	12	161	4.95	2486.50	2478	13	2.04E-04	219.7	
37	0	1247.07	26	48	1.24	2492.54	2490	6	4.25E-04	47.3	
38	0	1301.45	11	124	1.19	2601.25	2594	11	1.90E-04	192.4	
39	0	1330.41	11	174	3.29	2659.14	2645	17	1.79E-04	284.0	
40	0	1401.13	23	105	1.46	2800.52	2791	13	3.87E-04	94.1	
41	7	1461.08	103	140	3.61	2920.36	2910	21	1.71E-03	30.2	1.19E+00
42	7	1464.74	14	42	1.37	2927.68	2910	21	2.33E-04	79.2	
43	0	1575.42	127	308	20.86	3148.94	3116	53	2.11E-03	53.8	
44	0	1593.64	36	108	6.66	3185.37	3175	16	6.06E-04	67.8	
45	0	1612.44	23	66	0.81	3222.96	3217	12	3.83E-04	73.7	
46	3	1764.71	71	89	3.00	3527.38	3521	29	1.18E-03	27.6	3.10E+00
47	3	1771.81	55	78	3.76	3541.58	3521	29	9.20E-04	43.5	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 18

Calibration Date: 6/22/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.093E+04	7.71
Cs-137	661.7	0.851	735.7	2.3365E+04	2.462E+04	5.37
Co-60	1173.2	0.9985	1383	3.7435E+04	3.705E+04	-1.03
Co-60	1332.5	0.9998	1385	3.7440E+04	3.733E+04	-0.29

Prepared By: Rebekah Fuller

Date: 6/25/15

Reviewed By: H. Stamp

Date: 6/24/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 18

Date Performed: 6/22/15

Performed By: RF

High Voltage Power Supply Model No. <u>315A</u> High Voltage <u>3.50 Kv</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.791</u> Time Constant <u>6 μsec</u> Input polarity <u>positive</u> BSLR rate <u>NA</u> BSLR mode <u>NA</u> Threshold <u>NA</u>
ADC Model No. <u>5701</u> Gain <u>4K</u>	
AIM Module Model No. <u>N0556</u> Address <u>40C:2</u>	

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 20

Geometry: Can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the second standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. F. Wether

Date: 6/4/15

Reviewed By: M. Stamp

Date: 6/4/15

Effective Date: 6/3/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty*, %			Calibration Method*
			yps/gram		yps	Type	u _A	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	————	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.628E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.499E+03	0.1	1.7	3.6	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

J. S. Lahu
J. S. Lahu, Spectroscopist

Date:

14 MAY 15

Standard Logbook

Serial ID: 1738 Open/Reference Date: 01-APR-15
Name: Mixed Gamma CAN Received: 01-APR-15
Type: Source Material Expires: 01-APR-16
Employee: Maggie Stamps Verified: 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST

Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty*, %			Calibration Method*
			γps/gram		Type	u _A	u _B	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	————	7.614E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.6	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	————	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.6	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' B-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. --

MGS Certificate Rev 5, 1 October 2013



RC-S-065-130

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Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

A. Chen
A. Chen, Spectroscopist

Date:

20/04/14



Standard Logbook

Serial ID: 1701 Open/Reference Date: 01-APR-14
Name: Mixed Gamma CAN Received: 01-APR-14
Type: Source Material Expires: 01-APR-40
Employee: Maggie Stamps Verified: 28-MAY-14
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

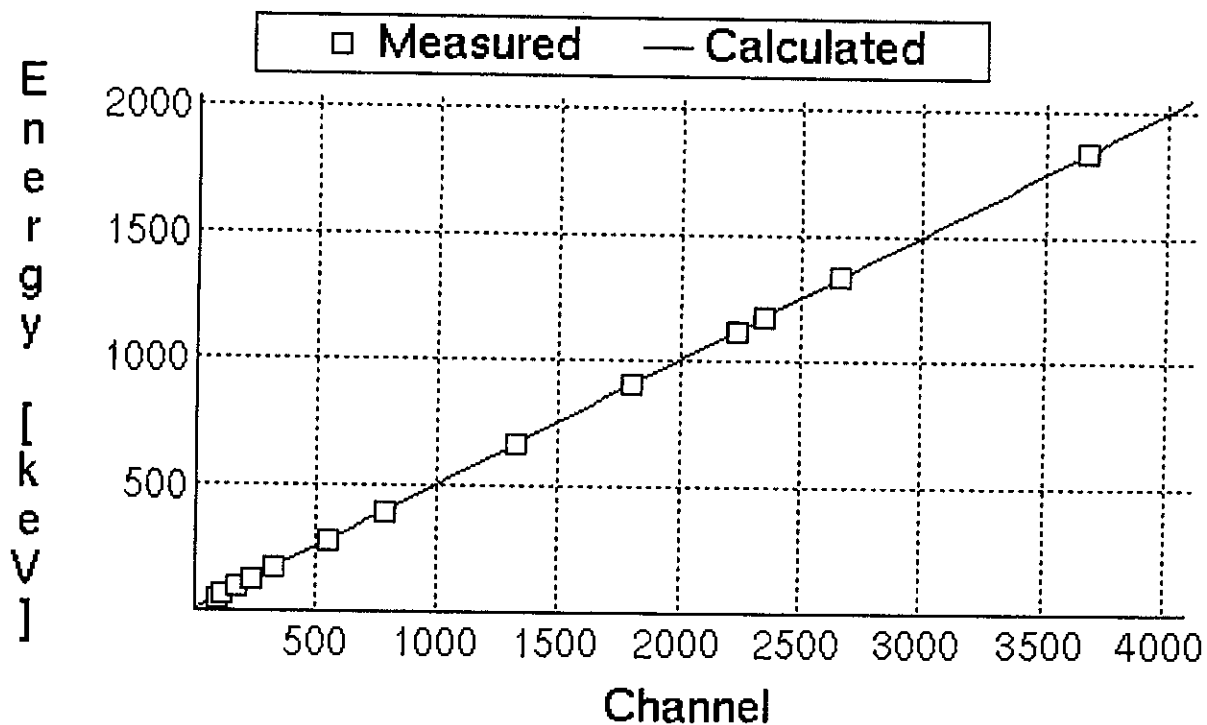
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



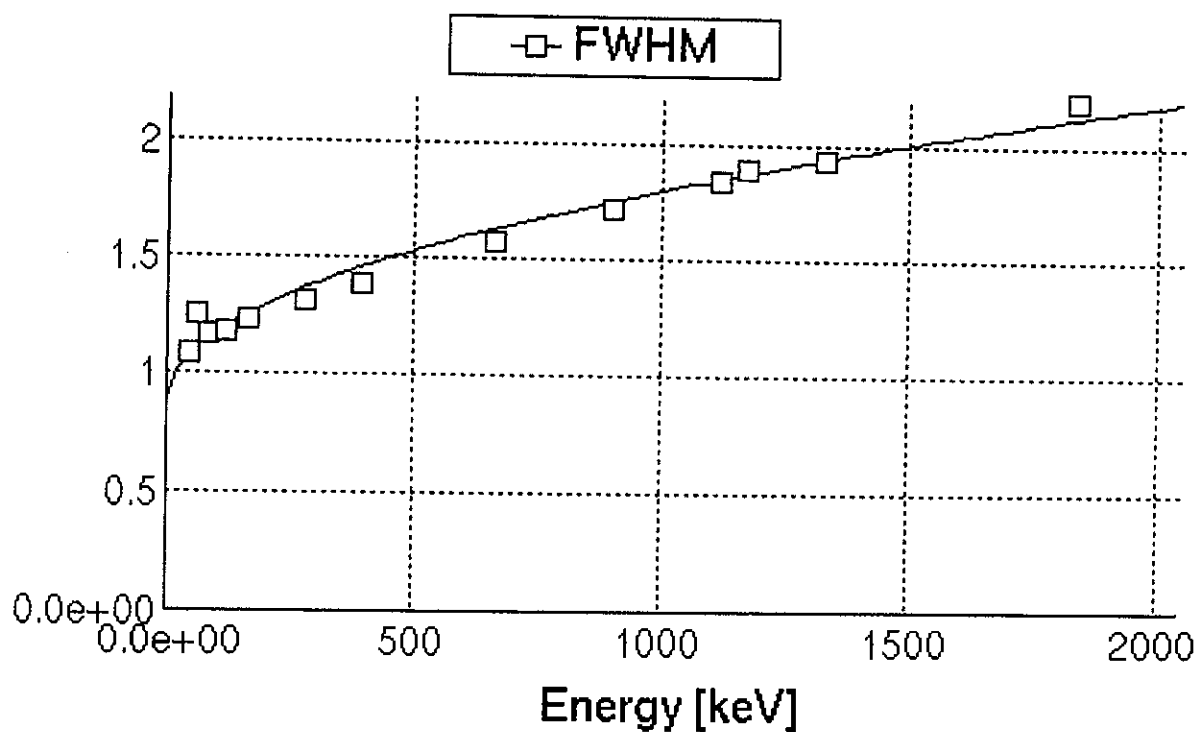
Datasource:

Energy = $-1.276e-01$ keV + $5.004e-01 \cdot \text{Ch}$ + $-1.943e-07 \cdot \text{Ch}^2$ [CHISQ = $5.274e-02$]

FWHM = $8.836e-01$ keV + $2.896e-02 \cdot E^{1/2}$ [CHISQ = $3.587e-03$]

Lo Tail = $0.000e+00$ keV + $0.000e+00 \cdot E$ [CHISQ = $0.000e+00$]

energy calibration 820 6/1/15



Datasource:

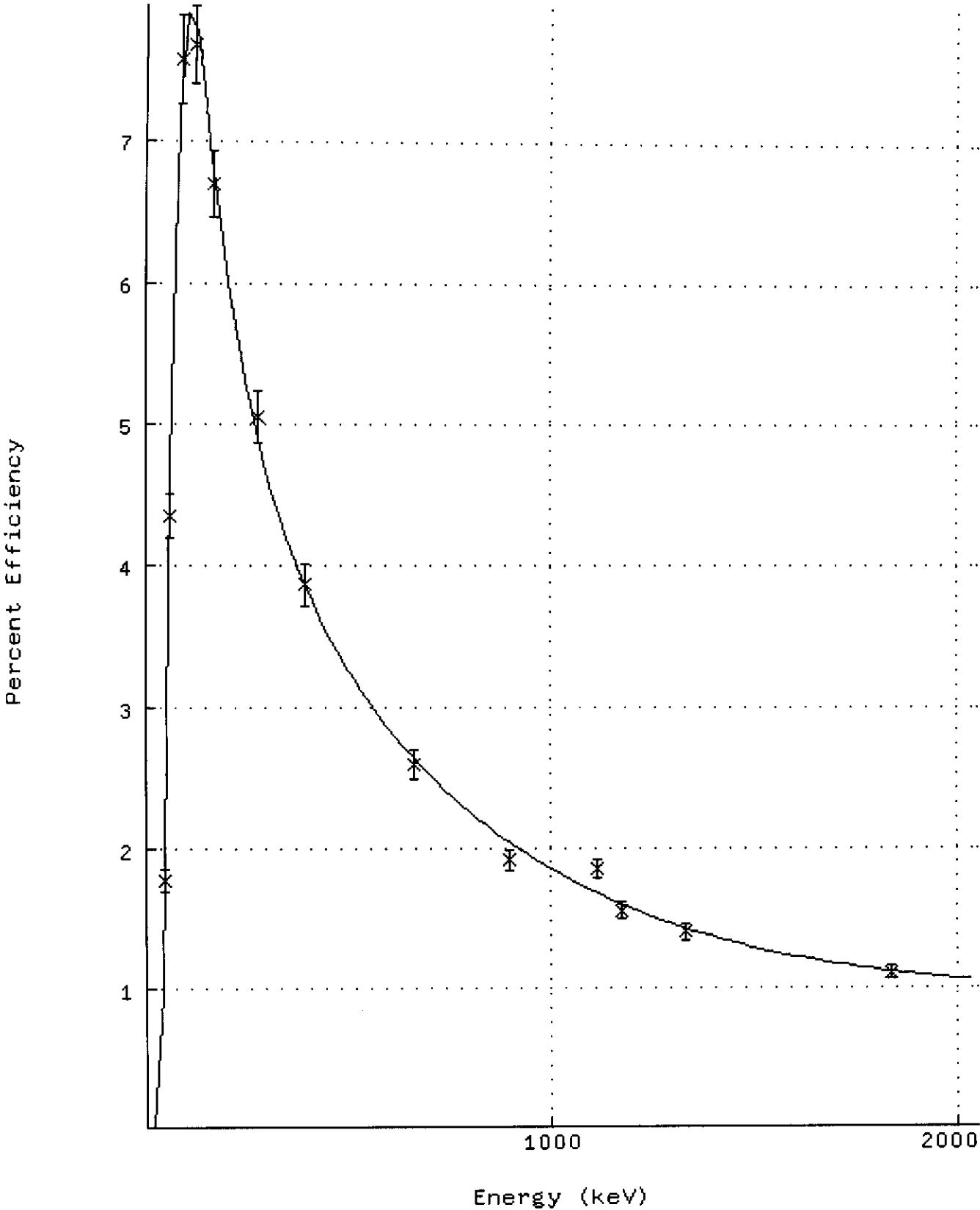
Energy = $-1.276e-01$ keV + $5.004e-01$ *Ch + $-1.943e-07$ *Ch² [CHISQ = $5.274e-02$]

FWHM = $8.836e-01$ keV + $2.896e-02$ *E^{1/2} [CHISQ = $3.587e-03$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

shape calibration 820 6/1/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM20_CAN.CNF;13
Calib Date: 3-JUN-2015 05:30;
Detector : GAMMA20 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -0.1276 + 0.5004 \cdot \text{Channel} + -1.9425\text{E-}07 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.54	46.54	46.68	-0.139
2	119.37	59.54	59.61	-0.065
3	176.27	88.03	88.07	-0.043
4	244.16	122.06	122.04	0.022
5	331.59	165.86	165.78	0.078
6	558.08	279.20	279.08	0.120
7	783.09	391.70	391.61	0.085
8	1323.07	661.66	661.61	0.054
9	1796.00	898.04	897.98	0.064
10	2231.67	1115.60	1115.65	-0.048
11	2347.16	1173.23	1173.34	-0.106
12	2666.06	1332.49	1332.60	-0.114
13	3674.45	1836.06	1835.97	0.091

FWHM Calibration Report

$$\text{FWHM} = 0.8836 + 2.8957\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.09	1.08	0.005
2	59.54	1.25	1.11	0.141
3	88.03	1.17	1.16	0.016
4	122.06	1.18	1.20	-0.020
5	165.86	1.23	1.26	-0.030
6	279.20	1.31	1.37	-0.055
7	391.70	1.39	1.46	-0.066
8	661.66	1.58	1.63	-0.052
9	898.04	1.71	1.75	-0.037
10	1115.60	1.85	1.85	-0.004
11	1173.23	1.90	1.88	0.024
12	1332.49	1.94	1.94	-0.001
13	1836.06	2.20	2.12	0.077

Sample ID : 100218

Acquisition date : 2-JUN-2015 09:03:07

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x = \ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-3.937	0.8933	-9.6530E-02	-0.1472	0.1633	-4.5731E-02

Average Deviation = 2.60 % Reduced Chi-Square = 1.95

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ Error	% Diff
1	46.54	1.77E-02	7.51E-04	1.79E-02	-0.31	-1.30
2	59.54	4.34E-02	1.58E-03	4.27E-02	0.46	1.67
3	88.03	7.56E-02	3.10E-03	7.50E-02	0.18	0.73
4	122.06	7.66E-02	2.70E-03	7.78E-02	-0.43	-1.52
5	165.86	6.69E-02	2.36E-03	6.82E-02	-0.54	-1.92
6	279.20	5.05E-02	1.78E-03	4.86E-02	1.02	3.59
7	391.70	3.86E-02	1.51E-03	3.86E-02	0.00	0.02
8	661.66	2.59E-02	1.05E-03	2.63E-02	-0.40	-1.60
9	898.04	1.91E-02	7.09E-04	2.03E-02	-1.80	-6.70
10	1115.60	1.85E-02	6.51E-04	1.67E-02	2.66	9.39
11	1173.23	1.55E-02	6.09E-04	1.60E-02	-0.77	-3.02
12	1332.49	1.40E-02	5.49E-04	1.43E-02	-0.46	-1.79
13	1836.06	1.11E-02	4.13E-04	1.12E-02	-0.14	-0.52

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM20_CAN_331552.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 331501 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 2-JUN-2015 09:03:07.
 Decay time : 61 21:03:07.64 % dead time : 6.7%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:04:19.54

----- Detector Parameters -----

Energy cal. time : 1-JUN-2015 11:47:21. Energy cal. oper.: gamma spec user
 Detector name : GAMMA20 Counting geometry: CAN
 Effic. cal. time : 3-JUN-2015 05:30:57. Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	26.61	11082	6148	0.86	53.43	51	9	3.08E+00	1.9	1.60E+02
2	4	27.71	10851	27154	1.52	55.62	51	9	3.01E+00	3.1	
3	0	33.00	2130	65470	1.23	66.21	61	10	5.92E-01	22.6	
4	9	36.45	602	32152	1.51	73.10	71	27	1.67E-01	44.5	1.32E+01
5	9	38.13	2721	70139	1.78	76.46	71	27	7.56E-01	18.8	
6	9	40.40	4502	94527	2.51	80.99	71	27	1.25E+00	15.0	
7	9	42.84	8374	93014	2.52	85.86	71	27	2.33E+00	8.2	
8	9	45.35	17226	84395	2.31	90.88	71	27	4.79E+00	4.0	
9	9	46.69	77085	41571	1.09	93.55	71	27	2.14E+01	0.6	
10	0	59.51	120009	81393	1.19	119.19	112	14	3.33E+01	0.6	
11	9	67.11	2129	27810	1.45	134.38	132	20	5.91E-01	12.0	3.98E+00
12	9	68.96	1992	39136	1.16	138.07	132	20	5.53E-01	16.9	
13	9	70.92	8757	50615	1.42	141.99	132	20	2.43E+00	4.9	
14	9	72.98	10987	39620	1.11	146.11	132	20	3.05E+00	3.2	
15	10	83.18	10194	66456	2.46	166.48	161	23	2.83E+00	4.8	3.93E+02
16	10	85.64	14126	62301	1.85	171.40	161	23	3.92E+00	4.4	
17	10	88.13	269751	36632	1.28	176.39	161	23	7.49E+01	0.2	
18	0	100.85	306	23912	0.93	201.80	200	6	8.49E-02	80.1	
19	0	122.04	142765	53574	1.18	244.16	237	14	3.97E+01	0.4	
20	0	136.38	18945	42516	1.22	272.83	266	13	5.26E+00	2.4	
21	0	147.87	346	14963	1.30	295.79	294	5	9.61E-02	53.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	156.20	469	18452	1.73	312.43	310	6	1.30E-01	46.1	
23	0	165.81	148956	41593	1.21	331.66	325	14	4.14E+01	0.4	
24	0	255.09	4941	18588	1.28	510.11	506	10	1.37E+00	5.4	
25	0	279.14	128758	24457	1.29	558.21	551	14	3.58E+01	0.4	
26	0	391.71	113102	19542	1.37	783.27	775	16	3.14E+01	0.4	
27	0	465.82	379	8127	2.02	931.48	928	8	1.05E-01	41.6	
28	0	511.06	10483	16073	2.71	1021.95	1013	18	2.91E+00	3.0	
29	0	542.61	31	6630	0.67	1085.04	1082	8	8.64E-03	453.3	
30	0	661.77	69891	17372	1.56	1323.40	1314	17	1.94E+01	0.6	
31	0	680.15	241	7856	1.44	1360.17	1357	8	6.70E-02	64.0	
32	0	692.04	422	8815	2.07	1383.95	1380	9	1.17E-01	40.4	
33	0	814.32	1718	6834	1.92	1628.61	1624	10	4.77E-01	9.3	
34	0	821.99	240	5651	1.56	1643.95	1640	8	6.68E-02	54.6	
35	0	898.21	129498	16595	1.72	1796.47	1787	18	3.60E+01	0.4	
36	0	1115.96	84517	9424	1.83	2232.30	2222	20	2.35E+01	0.4	
37	0	1173.66	77573	6261	1.84	2347.81	2338	19	2.15E+01	0.4	
38	0	1205.67	76	1510	1.05	2411.89	2409	7	2.10E-02	86.0	
39	10	1326.82	3802	4866	5.03	2654.48	2642	35	1.06E+00	5.9	2.08E+01
40	10	1333.01	69395	2325	1.92	2666.87	2642	35	1.93E+01	0.4	
41	0	1343.49	109	1026	0.86	2687.85	2685	6	3.02E-02	47.7	
42	0	1360.95	176	1666	1.32	2722.81	2718	10	4.89E-02	44.1	
43	0	1382.37	64	1420	1.36	2765.71	2763	8	1.78E-02	102.6	
44	0	1458.53	97	1567	1.34	2918.24	2915	8	2.68E-02	71.8	
45	0	1546.19	188	2771	2.61	3093.83	3090	11	5.22E-02	54.6	
46	0	1654.08	142	1778	2.72	3309.98	3307	11	3.93E-02	58.3	
47	0	1773.08	57	454	2.28	3548.41	3544	9	1.60E-02	68.2	
48	0	1781.02	66	913	3.96	3564.34	3555	17	1.83E-02	106.1	
49	0	1836.47	79686	1989	2.17	3675.46	3664	22	2.21E+01	0.4	
50	0	1903.22	44	400	0.76	3809.23	3803	12	1.23E-02	92.0	

```

*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road      *
*               Charleston, SC 29407  *
*                                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM20_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM20.CNF;444
Background date    : 31-MAY-2015 09:30:18
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 3-JUN-2015 06:28:45.
Sample ID        : VER_GAM20_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name     : GAM20             Detector geometry: CAN
Elapsed live time : 0 00:30:00.00     Elapsed real time: 0 00:30:56.39 3.0%
Energy tolerance  : 1.50000 keV       Analyst Initials :
Abundance limit   : 75.00000          Sensitivity       : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	7	26.77*	5395	1298	1.10	53.75	50	20	3.00E+00	2.7	1.31E+02
2	7	28.51*	6510	6824	2.02	57.23	50	20	3.62E+00	3.7	
3	7	30.79*	2121	7689	1.15	61.79	50	20	1.18E+00	7.8	
4	3	38.27*	542	8391	1.41	76.73	74	24	3.01E-01	23.8	2.04E+02
5	3	40.26	1763	18556	1.42	80.71	74	24	9.79E-01	14.1	
6	3	42.26	2362	18241	1.43	84.71	74	24	1.31E+00	10.7	
7	3	46.64*	42647	13144	1.20	93.47	74	24	2.37E+01	0.7	
8	0	59.56	59871	20376	1.13	119.28	112	12	3.33E+01	0.6	
9	0	67.19	370	7968	1.37	134.53	132	6	2.06E-01	38.4	
10	0	88.06	76782	17120	1.12	176.24	169	14	4.27E+01	0.5	
11	0	122.06	28094	7545	1.12	244.21	237	12	1.56E+01	0.9	
12	0	136.51*	3440	5284	1.08	273.07	268	11	1.91E+00	4.4	
13	0	165.80	12071	6232	1.15	331.62	325	14	6.71E+00	1.7	
14	0	237.79*	170	2142	1.61	475.53	473	6	9.46E-02	43.7	
15	0	254.79	220	2704	1.13	509.53	507	8	1.22E-01	41.5	
16	0	279.01	292	2535	1.24	557.95	555	8	1.62E-01	30.5	
17	0	371.33	43	2125	1.09	742.53	740	8	2.38E-02	187.0	
18	0	391.70	6325	3287	1.35	783.26	778	12	3.51E+00	2.2	
19	0	511.00*	1432	3339	2.39	1021.83	1015	16	7.96E-01	9.4	
20	0	546.39	60	1395	1.32	1092.62	1091	8	3.31E-02	108.9	
21	0	661.71*	34550	3116	1.49	1323.27	1315	16	1.92E+01	0.6	
22	0	692.57	143	1080	1.50	1385.01	1382	7	7.92E-02	39.1	
23	0	812.78	133	1462	2.39	1625.51	1622	9	7.37E-02	52.6	
24	0	898.18	6100	3047	1.61	1796.41	1790	14	3.39E+00	2.3	
25	0	1064.68	126	1096	0.97	2129.64	2126	9	7.01E-02	48.2	
26	0	1115.83	14592	2124	1.72	2232.04	2224	16	8.11E+00	1.1	
27	0	1173.52	33917	1397	1.80	2347.52	2338	18	1.88E+01	0.6	
28	0	1324.85	100	333	1.94	2650.53	2646	10	5.58E-02	35.3	
29	0	1332.81*	30922	629	1.88	2666.48	2656	20	1.72E+01	0.6	
30	0	1664.17	43	108	3.29	3330.20	3325	11	2.38E-02	50.1	
31	0	1836.23	3742	151	2.15	3674.97	3664	23	2.08E+00	1.8	
32	0	1877.70	18	72	0.49	3758.10	3753	12	1.01E-02	94.4	
33	0	1887.82	36	62	0.65	3778.36	3771	14	1.99E-02	49.9	
34	0	1920.39	26	66	1.64	3843.64	3835	12	1.44E-02	65.9	

Sample ID : VER_GAM20_CAN

Acquisition date : 3-JUN-2015 06:28:45

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	28094	85.60*	7.781E+00	6.333E+03	1.886E+04	1.71
	136.47	3440	10.68	7.505E+00	6.445E+03	1.919E+04	8.88
CO-60	1173.23	33917	99.85	1.598E+00	3.192E+04	3.724E+04	1.20
	1332.49	30922	99.98*	1.426E+00	3.257E+04	3.800E+04	1.20
ZN-65	1115.54	14592	50.60*	1.672E+00	2.589E+04	8.725E+04	2.18
Y-88	898.04	6100	93.70	2.034E+00	4.807E+03	7.754E+04	4.62
	1836.06	3742	99.20*	1.117E+00	5.070E+03	8.179E+04	3.68
CD-109	88.03	76782	3.70*	7.505E+00	4.152E+05	7.895E+05	1.02
SN-113	391.70	6325	64.97*	3.860E+00	3.786E+03	4.979E+04	4.41
CS-137	661.66	34550	85.10*	2.630E+00	2.318E+04	2.382E+04	1.30
CE-139	165.86	12071	80.00*	6.821E+00	3.322E+03	2.864E+04	3.32
HG-203	70.83	-----	3.69	6.039E+00	-----	Line Not Found	-----
	72.87	-----	6.19	6.289E+00	-----	Line Not Found	-----
	279.20	292	81.56*	4.867E+00	1.103E+02	6.406E+04	60.99
PB-210	46.54	42647	4.25*	1.813E+00	8.310E+05	8.620E+05	1.33
AM-241	59.54	59871	35.90*	4.274E+00	5.859E+04	5.870E+04	1.25

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM20.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 31-MAY-2015 09:30:18 Acquisition date : 31-MAY-2015 09:30:18
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:43:58.12

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.40579+/-0.01881]	1.4112E+00	0.29	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 6 / 4 / 15

Sample ID : Bkg

Page : 1
Acquisition date : 31-MAY-2015 09:30:18

VMS Gamma Spectroscopy Report generated 1-JUN-2015 02:14:36

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM20__331248.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 331248 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 31-MAY-2015 09:30:18

---- Sample Decay/Count Information ----

Sample Date : 31-MAY-2015 09:30:18 Acquisition date : 31-MAY-2015 09:30:18
Decay time : 0 00:00:00.00 % dead time : 0.4%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:43:58.12

---- Detector Parameters ----

Energy cal. time : 10-JUN-2014 12:44:36 Energy cal. oper.: gamma spec user
Detector name : GAMMA20 Counting geometry:
Effic. cal. time : 12-JUN-2014 13:15:21 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	26.72	350	42	1.10	53.73	50	29	5.83E-03	9.0	6.50E+00
2	6	28.20	400	168	1.84	56.67	50	29	6.67E-03	12.1	
3	6	30.03	348	314	1.84	60.32	50	29	5.79E-03	14.4	
4	6	31.95	244	398	1.71	64.16	50	29	4.07E-03	18.8	
5	6	33.68	156	453	1.54	67.62	50	29	2.59E-03	26.9	
6	6	35.34	152	645	1.87	70.94	50	29	2.54E-03	31.5	
7	6	37.73	86	439	1.07	75.71	50	29	1.44E-03	34.9	
8	0	46.80	233	741	1.23	93.84	90	10	3.89E-03	23.0	
9	0	63.25	513	1015	0.99	126.71	122	11	8.56E-03	12.8	
10	0	80.87	89	577	0.72	161.92	159	7	1.48E-03	45.8	
11	0	84.39	70	601	0.91	168.95	166	7	1.17E-03	59.3	
12	0	92.68	897	847	1.17	185.52	181	9	1.49E-02	6.7	
13	0	112.67	95	414	0.96	225.47	223	6	1.59E-03	35.4	
14	0	136.66	78	430	1.56	273.41	270	7	1.30E-03	45.7	
15	3	139.86	151	298	1.50	279.81	277	16	2.51E-03	18.5	2.48E+00
16	3	143.72	219	599	1.63	287.52	277	16	3.66E-03	21.8	
17	0	163.22	63	399	1.12	326.50	324	6	1.05E-03	51.6	
18	0	185.77	689	869	1.26	371.55	365	14	1.15E-02	9.9	
19	0	198.37	102	474	1.46	396.74	393	8	1.70E-03	38.3	

20	0	204.47	43	457	1.39	408.94	407	8	7.13E-04	87.8
21	0	214.33	43	440	1.70	428.65	427	8	7.14E-04	85.8
22	0	238.87	240	715	1.29	477.69	471	14	4.00E-03	24.5
23	0	294.93	43	398	0.64	589.74	586	9	7.19E-04	84.6
24	0	302.71	71	330	1.14	605.29	602	8	1.19E-03	45.7
25	0	338.65	49	393	1.95	677.14	673	10	8.25E-04	76.4
26	0	351.43	47	285	1.06	702.69	700	7	7.76E-04	61.8
27	0	355.98	134	443	1.28	711.78	707	11	2.23E-03	31.7
28	0	420.35	33	305	0.93	840.47	834	11	5.42E-04	105.8
29	0	510.74	1437	528	2.62	1021.21	1013	17	2.39E-02	4.5
30	0	570.45	56	201	2.00	1140.62	1135	10	9.37E-04	49.3
31	0	582.75	92	180	1.34	1165.20	1161	11	1.54E-03	30.0
32	0	661.17	43	160	0.81	1322.04	1319	9	7.10E-04	55.4
33	0	672.58	15	159	0.64	1344.86	1338	9	2.46E-04	157.7
34	0	801.84	88	165	1.38	1603.42	1596	15	1.46E-03	33.7
35	0	855.66	106	257	7.35	1711.08	1700	25	1.77E-03	41.7
36	0	911.13	76	122	1.71	1822.07	1816	12	1.26E-03	31.4
37	0	1001.15	50	99	1.20	2002.18	1996	11	8.33E-04	41.0
38	0	1042.97	31	78	0.83	2085.88	2081	10	5.22E-04	55.6
39	0	1332.94	66	48	3.50	2666.29	2658	15	1.10E-03	26.2
40	0	1422.00	14	61	1.14	2844.61	2837	11	2.42E-04	107.2
41	0	1460.90	61	59	2.11	2922.50	2916	11	1.01E-03	27.8
42	0	1502.60	42	65	6.23	3006.00	2993	20	7.05E-04	49.1
43	0	1872.78	40	38	2.96	3747.52	3738	17	6.63E-04	39.0
44	0	1985.23	43	15	3.61	3972.87	3965	15	7.23E-04	24.6
45	0	2008.61	16	51	8.82	4019.73	4003	23	2.62E-04	121.5

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 20

Calibration Date: 6/2/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.870E+04	3.77
Cs-137	661.7	0.851	735.7	2.3365E+04	2.382E+04	1.95
Co-60	1173.2	0.9985	1383	3.7435E+04	3.724E+04	-0.52
Co-60	1332.5	0.9998	1385	3.7440E+04	3.800E+04	1.50

Prepared By: R. Futen

Date: 6/4/15

Reviewed By: M. Stamp

Date: 6/4/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

High Voltage Power Supply Module

Address: NI8369:1 Type: DSA-2000 ID: 0

Limit:	4000.000	Overload latch enable	No
Voltage:	4000.000	Inhibit latch enable	No
Status:	On	Negative Output polarity	No
5V/12V inhibit:	5V	Rely on module for ramp	No

DSA-2000 HVPS Range: 5000.0

DSP Module

Address: NI8369:1 Type: DSA-2000 ID: 0

Coarse gain:	40.0	Gain Centroid:	10
Fine gain:	0.9209	Gain Window:	1
S-fine gain:	0.012813	Gain Spacing:	2
Pole Zero:	3147	Gain Ratio:	0.010
Coinc. mode:	Anti.	Zero Centroid:	10
Offset:	0	Zero Window:	1
LLD:	1.26	Zero Spacing:	2
Zero:	0.000	Zero Ratio:	0.010
Conv. Gain:	4096	Gain Rate div:	1
ADC Range:	4096	Zero Rate div:	1
FDisc Mode:	AUTO	Gain Corr. rng:	Ge
Fast Disc.:	0.000	Zero Corr. rng:	Ge
Inp. Polarity:	Positive	Zero Mode:	Off
Inh. Polarity:	Positive	Gain Mode:	Off
Rise Time:	18.400	Preamp Type:	RC
Flat Top:	1.200	PUR Mode:	ON
BLR Mode:	AUTO	PUR Guard:	1.1
Live Time Trim:	0	TRP Inhibit:	Normal

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 22

Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? the nuclide library used? the VMS certificate file?	☒	☐	1738 1701
2) Is the energy calibration graph included?	☒	☐	
3) Is the detector efficiency curve printout included?	☒	☐	
4) Is the efficiency calibration report included and reviewed?	☒	☐	
5) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	☒	☐	
6) Are the calibration verification calculations included?	☒	☐	
7) Are the instrument settings included: amp, HVPS, ADC settings?	☒	☐	

Prepared By: R. Futch

Date: 7/10/15

Reviewed By: M. Stamp

Date: 7/14/15

Effective Date: 7/7/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.626E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.906E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytical Research Corporation, Inc., 10000 Wilshire Blvd., Beverly Hills, CA 90210.

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laff
J. S. Laff, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MDX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.1S, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty* , %			Calibration Method*
			yps/gram		yps	Type	u _A	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

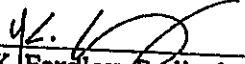
Page 1 of 2

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 201414



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

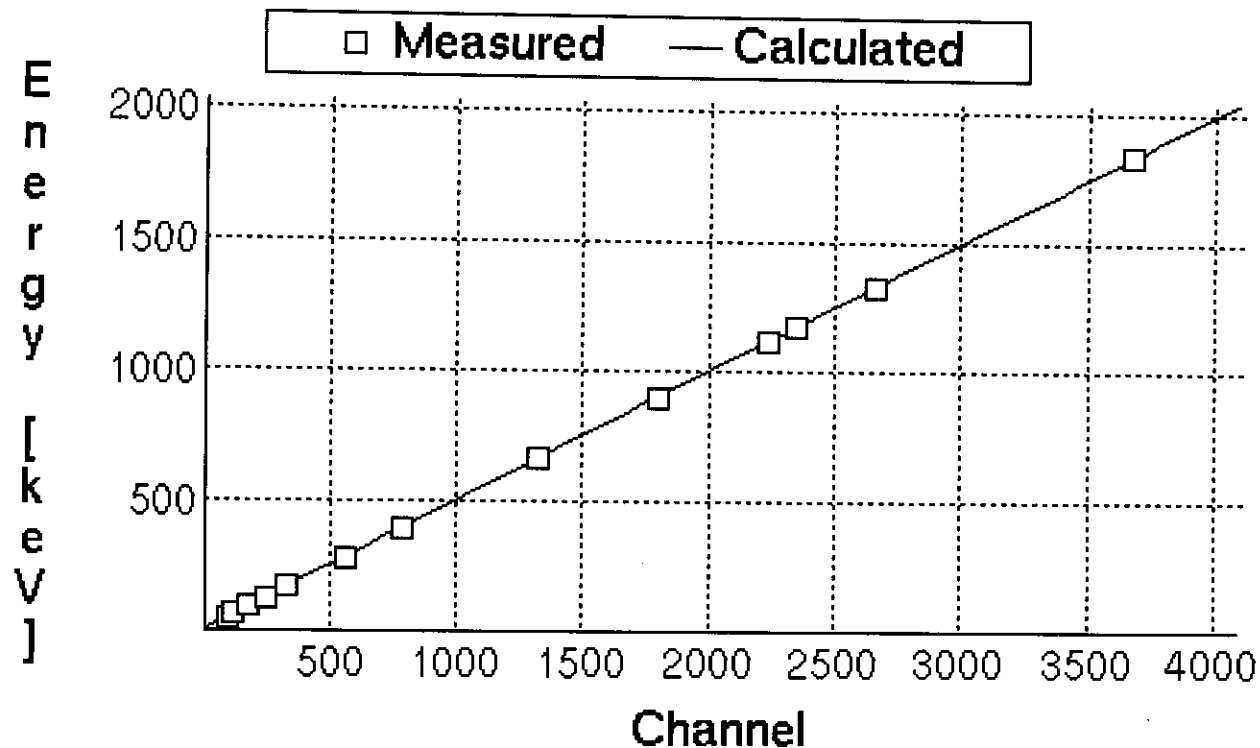
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
*ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes

*ZN-65 was Not used in the calibration curve



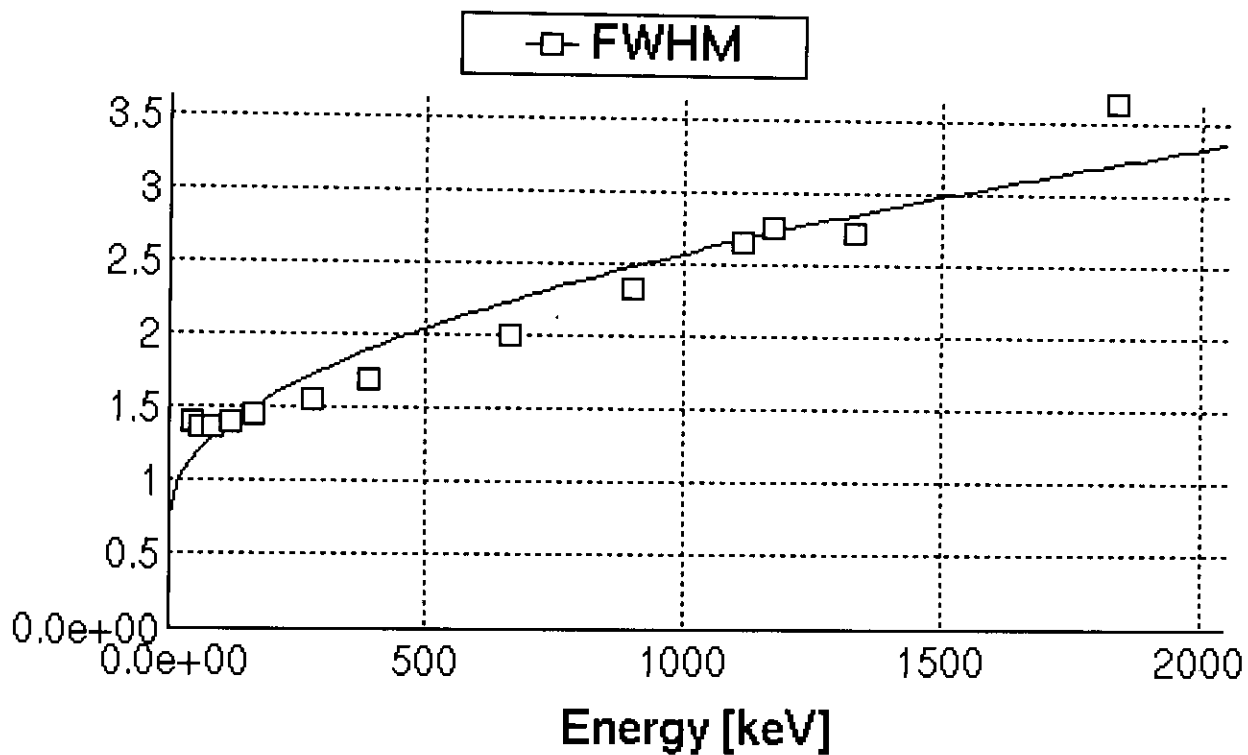
Datasource:

Energy = $-1.399\text{e-}01 \text{ keV} + 5.000\text{e-}01 * \text{Ch} + -5.934\text{e-}09 * \text{Ch}^2$ [CHISQ = $4.857\text{e-}03$]

FWHM = $7.627\text{e-}01 \text{ keV} + 5.737\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $4.034\text{e-}02$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

Energy calibration γ_{22} 7/7/13



Datasource:

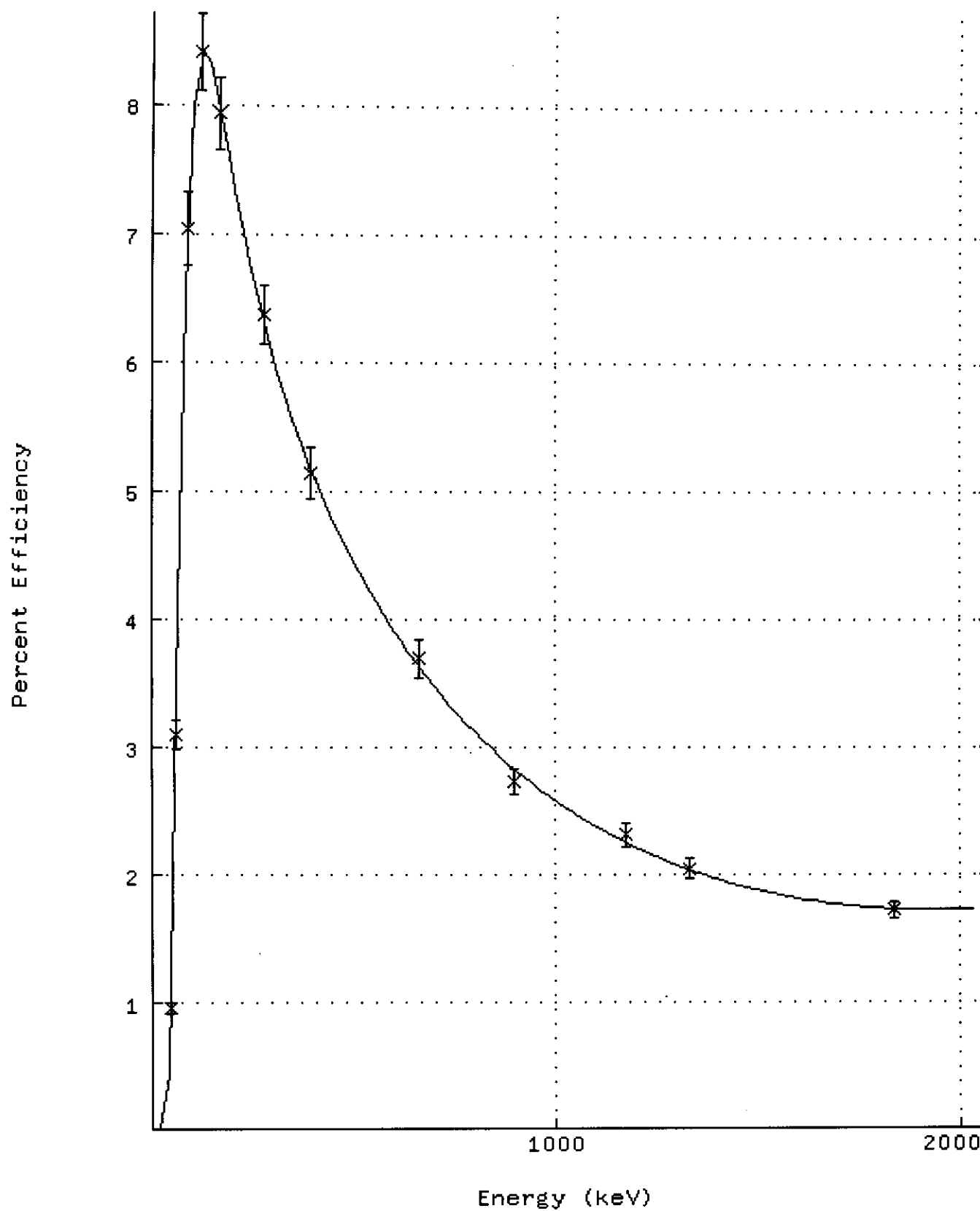
Energy = $-1.399\text{e-}01 \text{ keV} + 5.000\text{e-}01 * \text{Ch} + -5.934\text{e-}09 * \text{Ch}^2$ [CHISQ = $4.857\text{e-}03$]

FWHM = $7.627\text{e-}01 \text{ keV} + 5.737\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $4.034\text{e-}02$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

Shape calibration r22 7/21/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM22_CAN.CNF;15
Calib Date: 7-JUL-2015 09:05;
Detector : GAMMA22 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -0.1399 + 0.5000 * \text{Channel} + -5.9343\text{E-}09 * (\text{Channel} ** 2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.16	46.54	46.44	0.096
2	119.27	59.54	59.50	0.044
3	176.32	88.03	88.02	0.006
4	244.43	122.06	122.08	-0.018
5	332.08	165.86	165.91	-0.046
6	558.76	279.20	279.25	-0.048
7	783.78	391.70	391.76	-0.063
8	1323.71	661.66	661.73	-0.074
9	1796.34	898.04	898.05	-0.009
10	2231.25	1115.60	1115.50	0.100
11	2346.61	1173.23	1173.18	0.050
12	2665.22	1332.49	1332.48	0.008
13	3672.50	1836.06	1836.11	-0.046

FWHM Calibration Report

$$\text{FWHM} = 0.7627 + 5.7370\text{E-}02 * (\text{Energy} ** 1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.40	1.15	0.251
2	59.54	1.37	1.21	0.169
3	88.03	1.37	1.30	0.073
4	122.06	1.40	1.40	-0.001
5	165.86	1.45	1.50	-0.055
6	279.20	1.55	1.72	-0.171
7	391.70	1.69	1.90	-0.210
8	661.66	2.01	2.24	-0.225
9	898.04	2.34	2.48	-0.143
10	1115.60	2.65	2.68	-0.024
11	1173.23	2.76	2.73	0.030
12	1332.49	2.73	2.86	-0.122
13	1836.06	3.65	3.22	0.428

Sample ID : 100218

Acquisition date : 7-JUL-2015 07:30:36

$$\text{Eff} = \exp(a_2 + a_3 \cdot x + a_4 \cdot x^2 + a_5 \cdot x^3 + a_6 \cdot x^4 + a_7 \cdot x^5), \quad x = \ln(a_1 / \text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-3.608	0.8633	-3.0346E-02	-0.2883	0.2331	-5.9286E-02

Average Deviation = 1.24 % Reduced Chi-Square = 0.349

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	9.58E-03	4.23E-04	9.65E-03	-0.17	-0.75
2	59.54	3.09E-02	1.13E-03	3.06E-02	0.30	1.11
3	88.03	7.03E-02	2.89E-03	7.08E-02	-0.19	-0.77
4	122.06	8.40E-02	2.96E-03	8.39E-02	0.04	0.13
5	165.86	7.92E-02	2.79E-03	7.99E-02	-0.26	-0.90
6	279.20	6.36E-02	2.25E-03	6.27E-02	0.41	1.45
7	391.70	5.13E-02	2.01E-03	5.17E-02	-0.19	-0.75
8	661.66	3.69E-02	1.49E-03	3.63E-02	0.40	1.61
9	898.04	2.72E-02	1.01E-03	2.82E-02	-1.03	-3.82
10	1173.23	2.31E-02	9.03E-04	2.25E-02	0.65	2.56
11	1332.49	2.04E-02	8.00E-04	2.03E-02	0.13	0.52
12	1836.06	1.72E-02	6.39E-04	1.73E-02	-0.14	-0.51

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM22_CAN_335617.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.000000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 335592 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 7-JUL-2015 07:30:36.
 Decay time : 96 19:30:36.65 % dead time : 2.8%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:44.18

----- Detector Parameters -----

Energy cal. time : 7-JUL-2015 09:04:34. Energy cal. oper.: gamma spec user
 Detector name : GAMMA22 Counting geometry: CAN
 Effic. cal. time : 7-JUL-2015 09:05:06. Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	39.03	4240	27905	1.77	78.33	77	6	1.18E+00	6.4	
2	0	46.32	42240	66148	1.34	92.91	86	13	1.17E+01	1.3	
3	0	59.41	87144	63165	1.31	119.09	112	13	2.42E+01	0.7	
4	0	66.11	615	29400	1.24	132.50	131	6	1.71E-01	44.1	
5	6	70.82	2502	31260	1.02	141.91	139	12	6.95E-01	11.4	2.23E+00
6	6	72.80	5768	41226	1.33	145.87	139	12	1.60E+00	6.3	
7	10	84.41	25442	95058	3.33	169.09	157	27	7.07E+00	3.5	8.75E+01
8	10	88.03	238086	33377	1.34	176.34	157	27	6.61E+01	0.2	
9	3	102.96	1010	25603	1.79	206.19	203	12	2.80E-01	26.5	1.12E+00
10	3	105.38	526	25937	1.12	211.02	203	12	1.46E-01	51.0	
11	0	122.05	143519	53526	1.38	244.37	236	15	3.99E+01	0.4	
12	0	136.45	18026	36426	1.37	273.17	267	12	5.01E+00	2.2	
13	0	165.89	146539	44912	1.45	332.06	324	16	4.07E+01	0.4	
14	0	213.67	137	19157	1.27	427.60	425	8	3.81E-02	175.1	
15	0	255.21	4812	18984	1.58	510.69	506	10	1.34E+00	5.5	
16	0	262.18	174	14125	1.33	524.62	521	8	4.82E-02	118.9	
17	0	279.24	96418	29904	1.54	558.73	550	18	2.68E+01	0.5	
18	0	317.64	337	10879	0.97	635.53	632	8	9.35E-02	54.0	
19	0	391.74	121285	22481	1.67	783.73	775	18	3.37E+01	0.4	
20	0	511.08	12646	17477	2.89	1022.42	1014	18	3.51E+00	2.6	
21	0	564.71	90	8978	1.19	1129.66	1126	10	2.50E-02	197.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	604.47	284	8011	1.56	1209.18	1206	9	7.89E-02	57.1	
23	0	635.00	158	7502	0.70	1270.24	1267	8	4.40E-02	95.1	
24	0	661.70	98631	22083	1.96	1323.65	1314	21	2.74E+01	0.5	
25	0	813.74	1133	9253	1.90	1627.73	1622	12	3.15E-01	17.3	
26	0	879.30	106	8715	1.38	1758.85	1752	10	2.94E-02	165.2	
27	0	897.99	146158	22127	2.25	1796.23	1784	23	4.06E+01	0.4	
28	0	1002.95	138	5622	1.52	2006.15	2002	10	3.83E-02	102.1	
29	0	1115.42	114449	11912	2.49	2231.08	2218	24	3.18E+01	0.4	
30	0	1173.12	112569	9081	2.58	2346.49	2333	25	3.13E+01	0.4	
31	0	1217.26	55	3777	4.84	2434.78	2421	16	1.52E-02	252.6	
32	3	1325.82	4103	4593	3.79	2651.89	2638	39	1.14E+00	6.1	7.26E+01
33	3	1332.48	99942	3269	2.73	2665.22	2638	39	2.78E+01	0.3	
34	0	1836.00	96500	2678	3.30	3672.29	3657	31	2.68E+01	0.3	
35	0	1913.34	43	694	2.04	3826.98	3822	14	1.20E-02	112.0	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM22_CAN.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM22.CNF;407
Background date  : 5-JUL-2015 10:56:26.
Sample date     : 1-APR-2014 12:00:00. Acquisition date : 7-JUL-2015 09:45:48.
Sample ID      : VER_GAM22_CAN      Sample quantity  : 1.00000E+00 SAMPLE
Detector name   : GAM22             Detector geometry: CAN
Elapsed live time: 0 00:30:00.00    Elapsed real time: 0 00:30:23.57  1.3%
Energy tolerance: 1.50000 keV       Analyst Initials  :
Abundance limit : 75.00000          Sensitivity     : 3.00000
Batch ID        :                   Detector SN#       :
Matrix Spike ID :                   LCS ID            :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.36*	21054	18350	1.27	93.00	87	11	1.17E+01	1.4	
2	0	59.40	44597	20549	1.30	119.08	112	15	2.48E+01	0.9	
3	0	66.72	132	8498	0.50	133.72	132	7	7.35E-02	115.7	
4	0	87.99*	72313	16922	1.33	176.26	170	14	4.02E+01	0.5	
5	0	102.68	111	5627	1.01	205.63	204	8	6.19E-02	116.9	
6	0	110.90	217	4118	1.29	222.08	219	6	1.21E-01	47.2	
7	0	122.00	29046	10459	1.35	244.27	236	16	1.61E+01	1.0	
8	0	136.42	3497	5791	1.38	273.11	268	11	1.94E+00	4.5	
9	0	165.88	12422	6070	1.43	332.03	326	13	6.90E+00	1.6	
10	0	255.39	280	3709	1.15	511.04	507	9	1.56E-01	39.7	
11	0	280.29	247	4375	1.90	560.84	553	12	1.37E-01	53.9	
12	0	289.39	98	2922	1.03	579.04	577	8	5.44E-02	96.0	
13	0	326.33*	49	2758	0.44	652.92	649	8	2.70E-02	187.8	
14	0	391.75	7340	4089	1.72	783.75	777	14	4.08E+00	2.2	
15	0	510.94*	2141	3930	3.02	1022.12	1015	17	1.19E+00	7.1	
16	0	661.69	50280	4391	1.94	1323.63	1313	21	2.79E+01	0.6	
17	0	898.10	7338	4350	2.22	1796.45	1788	18	4.08E+00	2.4	
18	0	1055.68	208	2050	2.87	2111.60	2104	14	1.16E-01	46.7	
19	0	1115.47	20492	3758	2.45	2231.19	2218	23	1.14E+01	1.0	
20	0	1173.16	50177	2521	2.54	2346.58	2334	27	2.79E+01	0.5	
21	0	1332.44	45611	1242	2.75	2665.13	2652	24	2.53E+01	0.5	
22	0	1398.07	28	421	2.93	2796.40	2782	18	1.53E-02	176.3	
23	3	1408.41	101	177	3.88	2817.07	2812	37	5.59E-02	25.7	4.51E+00
24	3	1413.87	72	383	2.92	2828.00	2812	37	4.00E-02	64.5	
25	3	1422.87	88	142	2.93	2846.00	2812	37	4.91E-02	20.6	
26	0	1836.08	4659	380	3.26	3672.44	3657	28	2.59E+00	1.8	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	29046	85.60*	8.389E+00	6.073E+03	1.973E+04	1.96
	136.47	3497	10.68	8.371E+00	5.873E+03	1.908E+04	9.09
CO-60	1173.23	50177	99.85	2.246E+00	3.359E+04	3.967E+04	1.05
	1332.49	45611	99.98*	2.033E+00	3.370E+04	3.980E+04	1.02
ZN-65	1115.54	20492	50.60*	2.343E+00	2.596E+04	9.638E+04	2.08
Y-88	898.04	7338	93.70	2.823E+00	4.166E+03	8.390E+04	4.83
	1836.06	4659	99.20*	1.728E+00	4.080E+03	8.217E+04	3.54
CD-109	88.03	72313	3.70*	7.076E+00	4.147E+05	8.301E+05	1.08
SN-113	391.70	7340	64.97*	5.173E+00	3.279E+03	5.297E+04	4.38
CS-137	661.66	50280	85.10*	3.627E+00	2.446E+04	2.518E+04	1.11
CE-139	165.86	12422	80.00*	7.993E+00	2.917E+03	2.987E+04	3.15
HG-203	70.83	-----	3.69	4.992E+00	-----	Line Not Found	-----
	72.87	-----	6.19	5.303E+00	-----	Line Not Found	-----
	279.20	247	81.56*	6.254E+00	7.280E+01	7.026E+04	107.77
PB-210	46.54	21054	4.25*	9.430E-01	7.888E+05	8.205E+05	2.85
AM-241	59.54	44597	35.90*	3.033E+00	6.150E+04	6.162E+04	1.71

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM22.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 5-JUL-2015 10:56:26 Acquisition date : 5-JUL-2015 10:56:26
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.69

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.97656+/-0.02394]	1.9592E+00	-0.73	

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 7 / 10 / 15

Sample ID : Bkg

Page : 1
Acquisition date : 5-JUL-2015 10:56:26

VMS Gamma Spectroscopy Report generated 6-JUL-2015 03:36:55

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM22__335403.CNF;1

----- Sample Information -----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 335403 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 5-JUL-2015 10:56:26.

----- Sample Decay/Count Information -----

Sample Date : 5-JUL-2015 10:56:26. Acquisition date : 5-JUL-2015 10:56:26.
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.69

----- Detector Parameters -----

Energy cal. time : 22-JUL-2014 14:10:41 Energy cal. oper.: gamma spec user
Detector name : GAMMA22 Counting geometry:
Effic. cal. time : 29-JUL-2014 11:07:53 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.73	118	810	1.04	93.75	90	8	1.96E-03	42.9	
2	0	53.05	90	799	0.98	106.38	104	8	1.50E-03	55.5	
3	0	63.42	521	962	1.08	127.11	123	9	8.69E-03	11.6	
4	0	74.61	81	659	1.44	149.49	148	5	1.35E-03	48.9	
5	0	77.71	117	959	1.81	155.68	152	8	1.95E-03	47.4	
6	0	84.38	114	720	1.73	169.02	166	7	1.89E-03	40.3	
7	0	87.41	77	665	1.37	175.09	173	6	1.28E-03	54.0	
8	0	92.74	1429	1525	1.50	185.75	179	14	2.38E-02	6.4	
9	0	104.72	95	980	3.96	209.70	204	11	1.58E-03	64.7	
10	0	113.07	99	532	1.10	226.39	224	6	1.65E-03	38.3	
11	0	139.71	87	764	1.15	279.66	277	8	1.45E-03	55.8	
12	0	143.96	172	809	1.45	288.16	284	9	2.86E-03	30.9	
13	0	163.41	81	667	1.53	327.04	324	8	1.35E-03	56.2	
14	0	185.83	960	895	1.55	371.88	367	11	1.60E-02	6.8	
15	0	198.42	237	576	1.92	397.06	393	8	3.95E-03	18.8	
16	0	239.44	641	1097	1.48	479.07	472	15	1.07E-02	12.0	
17	0	327.45	127	784	5.69	655.05	647	15	2.11E-03	48.9	
18	0	338.54	75	623	1.43	677.23	673	10	1.25E-03	63.1	
19	0	418.39	55	484	1.01	836.89	831	12	9.12E-04	81.8	

20	0	511.57	2387	714	2.81	1023.20	1012	22	3.98E-02	3.5	
21	0	559.23	91	301	2.10	1118.51	1114	10	1.52E-03	37.3	
22	7	579.94	34	114	0.98	1159.92	1158	18	5.62E-04	46.3	2.43E+00
23	7	584.09	232	394	2.86	1168.22	1158	18	3.86E-03	19.8	
24	0	693.63	30	331	1.32	1387.25	1384	10	4.96E-04	115.4	
25	0	793.45	28	294	4.71	1586.84	1583	15	4.70E-04	133.6	
26	0	804.85	80	256	1.32	1609.64	1605	13	1.34E-03	43.1	
27	0	899.77	113	187	3.72	1799.43	1793	14	1.89E-03	27.4	
28	0	912.29	155	284	1.07	1824.47	1817	18	2.58E-03	26.7	
29	0	922.18	93	168	3.88	1844.25	1837	13	1.55E-03	30.8	
30	0	958.49	27	207	3.94	1916.85	1910	14	4.49E-04	114.7	
31	0	970.09	62	211	2.91	1940.05	1933	13	1.04E-03	49.7	
32	0	997.22	25	114	0.71	1994.29	1991	9	4.22E-04	79.2	
33	0	1001.58	116	171	2.25	2003.01	1999	12	1.94E-03	24.0	
34	0	1066.57	44	202	3.54	2132.96	2123	15	7.41E-04	71.8	
35	0	1263.41	19	167	5.06	2526.56	2512	18	3.15E-04	163.8	
36	0	1462.19	149	98	2.57	2924.04	2916	14	2.48E-03	16.3	
37	0	1766.53	45	73	0.98	3532.58	3525	14	7.45E-04	43.3	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 22

Calibration Date: 7/7/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.162E+04	8.93
Cs-137	661.7	0.851	735.7	2.3365E+04	2.518E+04	7.77
Co-60	1173.2	0.9985	1383	3.7435E+04	3.967E+04	5.97
Co-60	1332.5	0.9998	1385	3.7440E+04	3.980E+04	6.30

Prepared By: R. Fenech

Date: 7/10/15

Reviewed By: M. Stamp

Date: 7/14/15

Validated by MJSH on 3/10/11

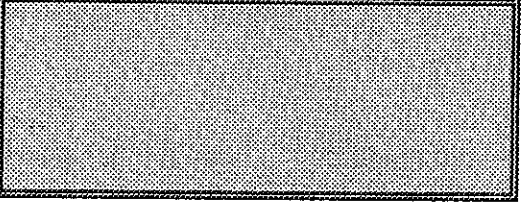
Verification results are considered acceptable if all differences are less than +/- 10%.

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 22

Date Performed: 7/8/15

Performed By: RF

High Voltage Power Supply Model No. <u>365</u> High Voltage <u>4.00KV</u>	Spectroscopy Amplifier Model No. <u>2011</u> Course Gain <u>100</u> Fine Gain <u>0.469</u> Time Constant <u>4usec</u> Input polarity <u>Positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>556 B</u> Address <u>10E0:2</u>	

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: GC mg 25

Geometry: 2LmB

- 7) Are the instrument settings included:
amp, HVPS, ADC settings?

[illegible]

Date: 7/20/15

Date: 7/24/15

Effective Date: 7/16/15



Eckert & Ziegler

Analytics

1742

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100222

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 8

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0083827

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	————	1.521E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+06	————	9.525E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.362E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	7.465E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	1.035E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	2.193E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.454E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	9.277E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	3.486E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.877E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.759E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.761E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	3.691E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' B-Isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Lahr
J. S. Lahr, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1742 Open/Reference Date: 01-APR-15
Name: Mixed Gamma 2LMB Received: 01-APR-15
Type: Source Material Expires: 01-APR-16
Employee: Maggie Stamps Verified: 20-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100222
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1705

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytcsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96489

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0081739

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.18 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master	This Source	Uncertainty*, %			Calibration Method*
			Source*		Type			
			yps/gram	yps	u _A	u _B	U	
Pb-210	46.5	8.109E+03	————	1.511E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	————	9.322E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+06	1.347E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	7.285E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	1.028E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	2.192E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+06	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	9.127E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	3.510E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	————	1.829E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.716E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.718E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.846E+05	3.716E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-134

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibbitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

A. Chen
A. Chen, Spectroscopist

Date:

20 MAY 14



Standard Logbook

Serial ID: 1705 Open/Reference Date: 01-APR-14
Name: Mixed Gamma 2LMB Received: 01-APR-14
Type: Source Material Expires: 01-APR-40
Employee: Maggie Stamps Verified: 28-MAY-14
Supplier: Eckert & Zeigler Analytics
Description: 96489
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

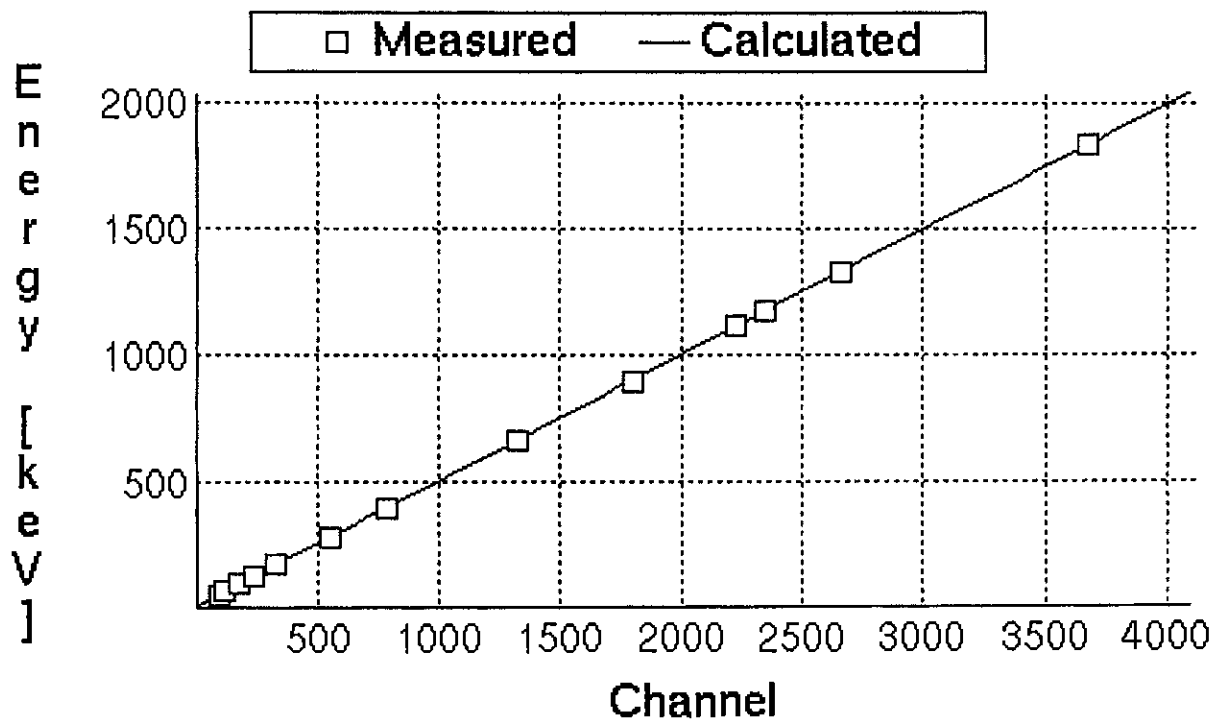
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: 2LMB 100222

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1521	4.20	4.3	Yes
AM-241	432.60Y	59.5	953	3.60	35.9	Yes
CD-109	461.40D	88.0	1362	4.10	3.7	Yes
CO-57	271.74D	122.1	747	3.50	85.6	Yes
CE-139	137.64D	165.9	1035	3.50	80.0	Yes
HG-203	46.59D	279.2	2193	3.50	81.6	Yes
SN-113	115.09D	391.7	1454	3.90	65.0	Yes
CS-137	30.08Y	661.7	928	4.00	85.1	Yes
Y-88	106.63D	898.0	3486	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1877	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1759	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1761	3.90	100.0	Yes
Y-88	106.63D	1836.1	3691	3.70	99.2	Yes



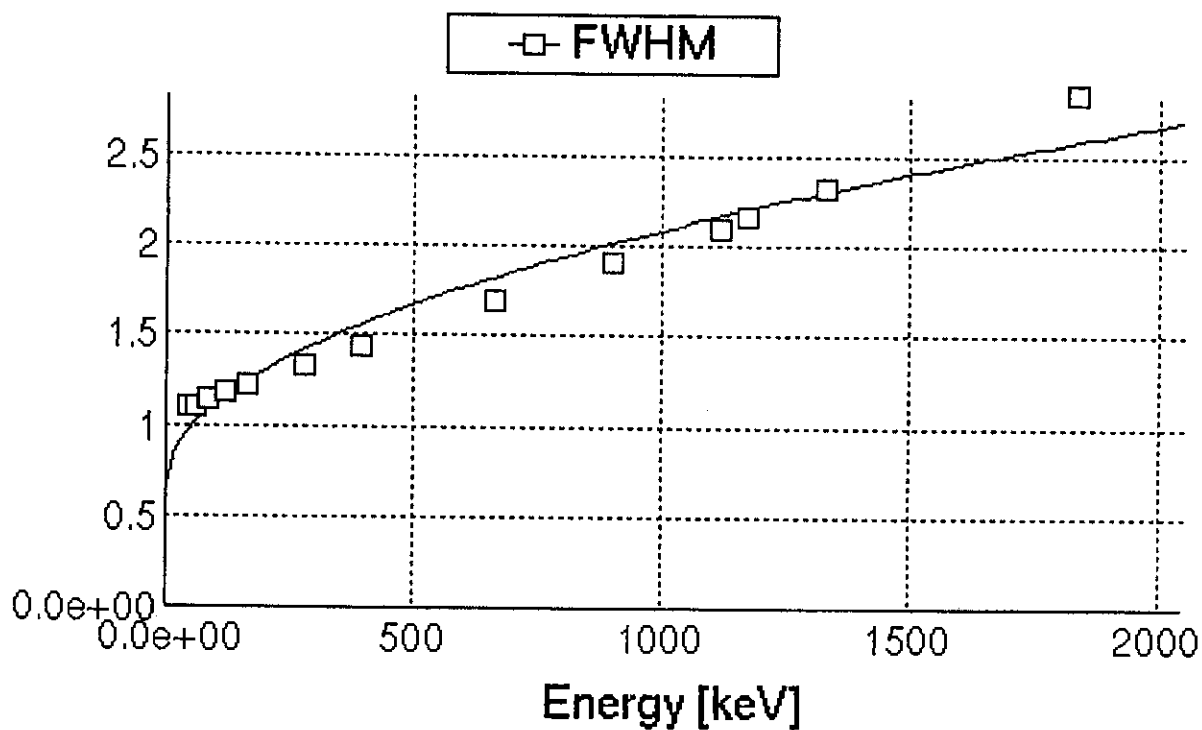
Datasource:

Energy = $1.862e-01 \text{ keV} + 5.002e-01 * \text{Ch} + -9.862e-08 * \text{Ch}^2$ [CHISQ = $3.908e-02$]

FWHM = $6.722e-01 \text{ keV} + 4.463e-02 * E^{1/2}$ [CHISQ = $1.320e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

gam25 Energy Calibration
7/10/15



Datasource:

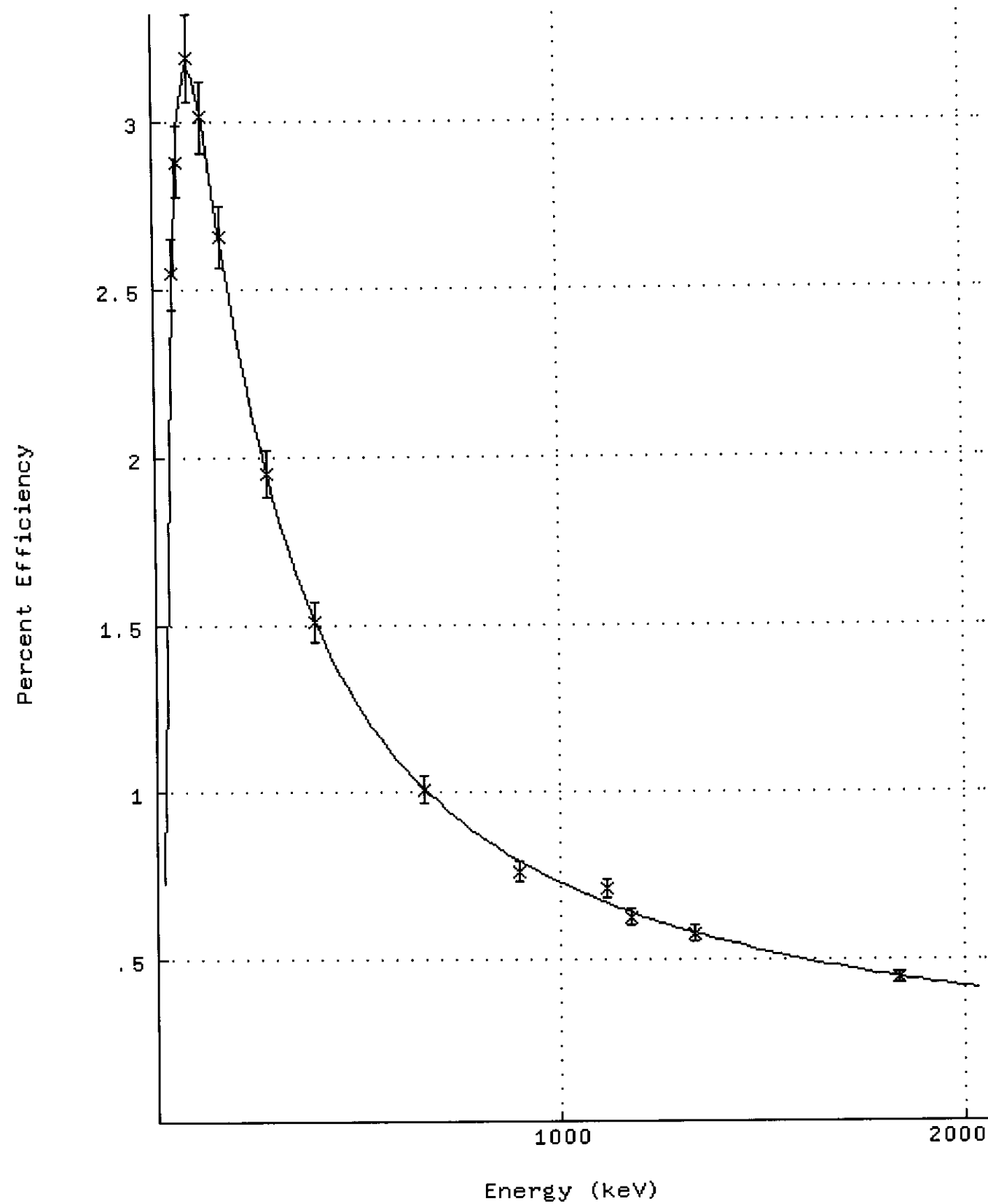
Energy = $1.862e-01 \text{ keV} + 5.002e-01 * \text{Ch} + -9.862e-08 * \text{Ch}^2$ [CHISQ = $3.908e-02$]

FWHM = $6.722e-01 \text{ keV} + 4.463e-02 * E^{1/2}$ [CHISQ = $1.320e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

gam25 Shape Calibration
7/10/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM25_2LMB.CNF;10
Calib Date: 16-JUL-2015 09:37
Detector : GAMMA25 Geometry : 2LMB
Fit type : 4 Deg. Empirical



$$\text{Energy} = 0.1862 + 0.5002 \cdot \text{Channel} + -9.8620\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.55	46.54	46.48	0.058
2	118.62	59.54	59.52	0.021
3	175.57	88.03	88.01	0.024
4	243.64	122.06	122.05	0.006
5	331.26	165.86	165.88	-0.017
6	557.93	279.20	279.24	-0.043
7	782.93	391.70	391.77	-0.065
8	1322.83	661.66	661.72	-0.061
9	1795.63	898.04	898.08	-0.042
10	2230.69	1115.60	1115.54	0.063
11	2346.08	1173.23	1173.20	0.029
12	2664.66	1332.49	1332.40	0.086
13	3672.90	1836.06	1836.12	-0.059

FWHM Calibration Report

$$\text{FWHM} = 0.6722 + 4.4633\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.10	0.98	0.124
2	59.54	1.11	1.02	0.088
3	88.03	1.15	1.09	0.055
4	122.06	1.18	1.17	0.017
5	165.86	1.22	1.25	-0.028
6	279.20	1.34	1.42	-0.080
7	391.70	1.44	1.56	-0.116
8	661.66	1.69	1.82	-0.125
9	898.04	1.90	2.01	-0.106
10	1115.60	2.09	2.16	-0.071
11	1173.23	2.16	2.20	-0.037
12	1332.49	2.33	2.30	0.027
13	1836.06	2.84	2.58	0.253

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.875	0.7899	-1.2089E-03	3.5510E-03	-1.5539E-02	0.0000E+00

Average Deviation = 1.46 % Reduced Chi-Square = 0.647

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	2.54E-02	1.07E-03	2.51E-02	0.30	1.27
2	59.54	2.88E-02	1.04E-03	2.93E-02	-0.47	-1.69
3	88.03	3.18E-02	1.31E-03	3.17E-02	0.13	0.52
4	122.06	3.01E-02	1.06E-03	3.00E-02	0.08	0.29
5	165.86	2.65E-02	9.35E-04	2.65E-02	0.00	0.02
6	279.20	1.95E-02	6.93E-04	1.94E-02	0.20	0.73
7	391.70	1.51E-02	5.92E-04	1.51E-02	-0.12	-0.46
8	661.66	1.00E-02	4.05E-04	1.01E-02	-0.10	-0.38
9	898.04	7.62E-03	2.84E-04	7.92E-03	-1.09	-4.06
10	1115.60	7.11E-03	2.51E-04	6.68E-03	1.74	6.14
11	1173.23	6.26E-03	2.46E-04	6.42E-03	-0.62	-2.44
12	1332.49	5.78E-03	2.27E-04	5.80E-03	-0.08	-0.32
13	1836.06	4.45E-03	1.66E-04	4.48E-03	-0.18	-0.68

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM25_2LMB_336788.CNF;1

---- Sample Information ----

Sample Title : 2LMB 100222
 Sample ID : 100222 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 336742 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 16-JUL-2015 07:07:06
 Decay time : 105 19:07:06.95 % dead time : 2.0%
 Elapsed live time: 0 02:00:00.00 Elapsed real time: 0 02:02:24.44

---- Detector Parameters ----

Energy cal. time : 10-JUL-2015 14:15:55 Energy cal. oper.: gamma spec user
 Detector name : GAMMA25 Counting geometry: 2LMB
 Effic. cal. time : 16-JUL-2015 09:37:19 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.40	276631	176087	0.97	92.39	86	10	3.84E+01	0.3	
2	0	49.80	5916	98169	1.31	99.19	97	7	8.22E-01	8.9	
3	0	59.43	199071	142165	0.97	118.44	112	12	2.76E+01	0.4	
4	10	66.79	12033	90897	2.46	133.15	129	23	1.67E+00	4.6	1.40E+01
5	10	68.79	6678	101263	1.64	137.15	129	23	9.28E-01	9.2	
6	10	70.76	12530	101575	1.72	141.08	129	23	1.74E+00	4.9	
7	10	72.85	10978	61135	1.08	145.26	129	23	1.52E+00	3.7	
8	8	82.85	10090	106506	2.23	165.25	160	21	1.40E+00	6.1	1.97E+02
9	8	85.08	9061	84179	1.44	169.72	160	21	1.26E+00	5.8	
10	8	88.01	266206	39923	0.91	175.57	160	21	3.70E+01	0.2	
11	0	92.30	718	40103	1.34	184.16	182	6	9.97E-02	44.3	
12	3	119.62	1252	18287	1.54	238.77	237	13	1.74E-01	14.2	2.09E+01
13	3	122.07	123426	28074	0.90	243.66	237	13	1.71E+01	0.4	
14	0	136.50	15162	44340	1.05	272.53	268	9	2.11E+00	2.6	
15	0	165.87	116722	39496	1.02	331.25	326	10	1.62E+01	0.4	
16	0	185.50	328	22843	1.41	370.49	368	7	4.56E-02	76.6	
17	0	199.14	2724	28703	1.22	397.77	394	9	3.78E-01	11.4	
18	0	203.68	865	25321	1.81	406.85	404	8	1.20E-01	32.0	
19	0	255.15	4108	19366	1.14	509.76	506	8	5.71E-01	6.1	
20	0	263.64	484	18117	3.25	526.74	524	8	6.73E-02	48.4	
21	0	279.25	64113	22912	1.07	557.95	553	11	8.90E+00	0.6	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	391.77	83963	14711	1.23	782.95	777	12	1.17E+01	0.5	
23	0	511.09	9286	17165	2.57	1021.56	1012	18	1.29E+00	3.5	
24	0	521.05	140	7486	1.63	1041.49	1037	8	1.94E-02	107.5	
25	0	574.81	161	6978	1.67	1149.00	1146	8	2.24E-02	90.1	
26	0	661.74	66947	12608	1.45	1322.86	1316	13	9.30E+00	0.5	
27	0	813.77	1538	9435	1.54	1626.96	1620	13	2.14E-01	13.3	
28	0	872.58	164	6272	0.62	1744.62	1742	8	2.28E-02	83.8	
29	0	898.09	96696	13641	1.65	1795.65	1788	16	1.34E+01	0.4	
30	0	998.01	145	4285	1.47	1995.55	1991	8	2.01E-02	78.9	
31	0	1047.74	113	3694	1.24	2095.05	2093	8	1.57E-02	93.3	
32	0	1115.55	71680	7495	1.83	2230.72	2222	18	9.96E+00	0.5	
33	0	1173.20	76628	5248	1.89	2346.08	2336	19	1.06E+01	0.4	
34	4	1324.96	2296	3027	3.36	2649.76	2639	35	3.19E-01	6.4	2.02E+01
35	4	1332.44	70556	2020	2.13	2664.72	2639	35	9.80E+00	0.4	
36	0	1410.42	54	1602	2.48	2820.78	2815	10	7.49E-03	139.6	
37	0	1641.03	109	1537	0.72	3282.37	3278	11	1.51E-02	70.3	
38	4	1690.30	199	1061	2.42	3380.98	3376	15	2.76E-02	32.4	2.86E+00
39	4	1692.84	147	923	1.65	3386.06	3376	15	2.04E-02	40.2	
40	0	1751.18	62	966	3.88	3502.86	3490	21	8.63E-03	125.9	
41	0	1797.61	9	516	0.93	3595.81	3585	13	1.28E-03	509.7	
42	0	1836.14	59663	1074	2.44	3672.93	3660	23	8.29E+00	0.4	
43	0	1976.73	46	207	1.48	3954.43	3950	11	6.36E-03	63.1	

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                    *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM25_2LMB.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM25.CNF;291
Background date    : 13-JUL-2015 08:23:11
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 16-JUL-2015 09:41:15
Sample ID        : VER_GAM25_2LMB      Sample quantity  : 1.00000E+00 SAMPLE
Detector name    : GAM25               Detector geometry: 2LMB
Elapsed live time: 0 02:00:00.00      Elapsed real time: 0 02:01:09.34  1.0%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID         :                    Detector SN#       :
Matrix Spike ID  :                    LCS ID             :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.51*	259230	112379	0.89	92.60	88	8	3.60E+01	0.3	
2	0	49.87	6959	71833	1.38	99.33	97	7	9.66E-01	6.5	
3	5	57.83	5669	56148	1.63	115.23	112	12	7.87E-01	6.4	4.83E+01
4	5	59.57	186349	34799	0.81	118.72	112	12	2.59E+01	0.3	
5	10	66.65*	5775	34280	2.16	132.87	129	20	8.02E-01	5.5	1.39E+00
6	10	68.54	4863	74165	2.44	136.65	129	20	6.75E-01	12.5	
7	10	70.99	4265	79929	2.72	141.54	129	20	5.92E-01	15.0	
8	0	88.06	149689	41494	0.93	175.68	171	11	2.08E+01	0.4	
9	7	120.44	476	11235	1.25	240.42	238	10	6.62E-02	34.2	6.70E+00
10	7	122.11	47625	10414	0.88	243.75	238	10	6.61E+00	0.6	
11	0	136.53	5716	15854	1.00	272.59	269	9	7.94E-01	4.2	
12	0	165.90	18626	14158	1.04	331.31	327	10	2.59E+00	1.4	
13	0	213.98	132	11163	0.65	427.43	425	8	1.83E-02	139.4	
14	0	255.25	440	7679	0.92	509.95	507	7	6.11E-02	33.4	
15	0	266.47	191	7815	0.66	532.38	529	8	2.66E-02	80.5	
16	0	279.71	201	7424	0.85	558.86	556	8	2.80E-02	74.4	
17	0	310.19	331	5505	1.90	619.82	617	7	4.60E-02	37.6	
18	0	381.74	23	5211	1.14	762.89	757	8	3.24E-03	536.8	
19	0	391.76	9401	6971	1.19	782.92	778	11	1.31E+00	2.0	
20	0	456.66	162	3708	1.20	912.71	910	6	2.25E-02	59.9	
21	0	510.94*	2311	7473	2.32	1021.25	1014	15	3.21E-01	8.4	
22	0	610.12*	151	2593	1.33	1219.62	1217	7	2.10E-02	56.4	
23	0	661.66	64543	5008	1.45	1322.71	1315	13	8.96E+00	0.5	
24	0	897.93	9487	6614	1.68	1795.33	1787	15	1.32E+00	2.1	
25	0	1099.69	63	2945	1.44	2198.98	2196	10	8.73E-03	162.3	
26	0	1104.17	154	2564	1.38	2207.96	2205	9	2.14E-02	59.6	
27	0	1115.38	24404	5303	1.85	2230.39	2220	20	3.39E+00	1.0	
28	0	1173.02	66212	2689	1.85	2345.71	2336	20	9.20E+00	0.4	
29	0	1332.21	59831	983	2.01	2664.27	2654	20	8.31E+00	0.4	
30	0	1380.39	46	316	1.26	2760.70	2756	12	6.35E-03	79.1	
31	0	1613.22	40	463	3.05	3226.69	3214	17	5.59E-03	124.5	
32	0	1816.78	33	115	3.79	3634.19	3625	14	4.62E-03	70.6	
33	0	1835.82	5689	186	2.37	3672.31	3660	24	7.90E-01	1.5	
34	0	1957.33	103	114	8.71	3915.58	3901	24	1.43E-02	29.2	

Sample ID : VER_GAM25_2LMB

Acquisition date : 16-JUL-2015 09:41:15

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1979.86	18	139	5.92	3960.69	3947	19	2.44E-03	161.8	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	47625	85.60*	2.999E+00	6.964E+03	2.315E+04	1.12
	136.47	5716	10.68	2.887E+00	6.958E+03	2.313E+04	8.38
CO-60	1173.23	66212	99.85	6.416E-01	3.879E+04	4.596E+04	0.87
	1332.49	59831	99.98*	5.800E-01	3.873E+04	4.588E+04	0.86
ZN-65	1115.54	24404	50.60*	6.677E-01	2.711E+04	1.033E+05	1.94
Y-88	898.04	9487	93.70	7.925E-01	4.795E+03	1.024E+05	4.27
	1836.06	5689	99.20*	4.484E-01	4.801E+03	1.025E+05	2.94
CD-109	88.03	149689	3.70*	3.166E+00	4.797E+05	9.732E+05	0.75
SN-113	391.70	9401	64.97*	1.514E+00	3.587E+03	6.117E+04	4.01
CS-137	661.66	64543	85.10*	1.008E+00	2.823E+04	2.908E+04	0.91
CE-139	165.86	18626	80.00*	2.652E+00	3.296E+03	3.532E+04	2.81
PB-210	46.54	259230	4.25*	2.509E+00	9.125E+05	9.500E+05	0.59
AM-241	59.54	186349	35.90*	2.927E+00	6.657E+04	6.671E+04	0.56

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM25.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 13-JUL-2015 08:23:11 Acquisition date : 13-JUL-2015 08:23:11
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.90

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5194E+00	15.10	Action OK
[1.32636+/-0.01279]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: R2 Approval Date: 7 / 20 / 15

Sample ID : Bkg

Acquisition date : 13-JUL-2015 08:23:11

VMS Gamma Spectroscopy Report generated 14-JUL-2015 01:03:08

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM25__336313.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 336313 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 13-JUL-2015 08:23:11

---- Sample Decay/Count Information ----

Sample Date : 13-JUL-2015 08:23:11 Acquisition date : 13-JUL-2015 08:23:11
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.90

---- Detector Parameters ----

Energy cal. time : 10-JUL-2015 14:15:55 Energy cal. oper.: gamma spec user
 Detector name : GAMMA25 Counting geometry:
 Effic. cal. time : Effic. cal. oper.:

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.52	670	910	0.93	92.63	88	10	1.12E-02	9.3	
2	0	53.74	139	727	2.88	107.06	103	9	2.32E-03	35.9	
3	0	63.24	827	964	0.77	126.05	121	10	1.38E-02	7.8	
4	0	66.22	67	515	1.49	132.02	130	6	1.12E-03	54.9	
5	0	74.36	60	776	0.92	148.29	146	7	9.99E-04	78.1	
6	0	84.30	141	883	1.21	168.16	164	9	2.35E-03	38.9	
7	0	92.82	1090	1102	0.96	185.19	180	11	1.82E-02	6.7	
8	0	99.22	114	632	0.93	197.98	194	8	1.89E-03	39.4	
9	0	140.03	62	393	0.71	279.59	278	5	1.03E-03	50.1	
10	0	143.05	71	705	0.55	285.62	283	8	1.18E-03	65.9	
11	0	163.22	94	569	1.10	325.94	323	7	1.56E-03	43.6	
12	0	185.68	578	803	0.89	370.84	366	10	9.63E-03	10.1	
13	0	189.99	55	611	1.54	379.46	377	8	9.20E-04	78.5	
14	0	204.92	60	584	0.65	409.32	406	8	9.95E-04	71.6	
15	0	217.74	74	457	1.16	434.96	432	7	1.23E-03	49.8	
16	0	231.04	9	661	0.51	461.54	454	10	1.55E-04	522.5	
17	0	238.25	119	549	1.12	475.95	473	8	1.98E-03	35.3	
18	0	283.99	41	558	1.20	567.42	564	10	6.78E-04	109.6	
19	0	337.68	80	404	2.08	674.77	672	9	1.34E-03	46.2	

20	0	426.54	32	305	0.85	852.46	847	10	5.41E-04	102.2
21	0	488.15	41	221	1.83	975.68	972	10	6.90E-04	68.8
22	0	492.19	22	225	2.23	983.77	983	9	3.67E-04	124.8
23	0	510.62	1132	562	2.76	1020.62	1012	18	1.89E-02	5.7
24	0	568.93	111	253	2.48	1137.23	1130	14	1.86E-03	32.0
25	0	583.18	49	177	1.66	1165.73	1162	9	8.12E-04	51.6
26	0	608.86	42	265	0.67	1217.10	1213	9	7.00E-04	71.6
27	0	727.15	84	166	3.92	1453.70	1447	13	1.40E-03	33.7
28	0	794.92	54	181	3.53	1589.25	1580	15	8.95E-04	56.6
29	0	842.33	41	89	1.36	1684.09	1681	7	6.90E-04	41.1
30	0	911.76	43	161	2.42	1823.00	1811	15	7.18E-04	66.0
31	0	930.92	50	228	10.38	1861.33	1845	24	8.33E-04	81.1
32	0	968.19	32	87	1.18	1935.90	1930	10	5.39E-04	55.2
33	0	998.91	17	151	1.05	1997.34	1992	15	2.90E-04	155.6
34	0	1090.24	35	132	3.25	2180.09	2167	20	5.82E-04	83.1
35	0	1162.06	38	100	2.27	2323.78	2316	15	6.39E-04	58.5
36	0	1208.50	37	235	12.36	2416.71	2386	35	6.10E-04	132.1
37	0	1384.93	11	58	0.58	2769.78	2761	12	1.91E-04	135.0
38	0	1408.84	60	63	6.11	2817.62	2809	21	1.00E-03	35.5
39	0	1460.00	59	121	2.70	2920.01	2913	18	9.87E-04	45.5
40	0	1531.39	17	52	0.64	3062.91	3055	15	2.86E-04	95.0
41	0	1603.13	23	20	1.47	3206.50	3202	9	3.82E-04	41.0
42	0	1712.13	92	23	8.93	3424.68	3411	30	1.53E-03	18.3
43	0	1765.68	21	78	1.52	3531.88	3522	20	3.49E-04	104.0
44	0	1812.81	18	11	1.80	3626.24	3622	10	3.08E-04	42.0
45	0	1846.58	40	46	6.03	3693.85	3678	27	6.69E-04	50.1
46	0	1877.09	20	10	1.26	3754.93	3749	11	3.26E-04	39.7
47	0	1893.25	23	65	8.00	3787.28	3772	26	3.77E-04	100.0
48	6	1991.00	25	12	2.81	3982.98	3979	19	4.10E-04	29.1
49	6	1996.06	18	11	3.61	3993.13	3979	19	2.93E-04	42.7

2.62E+00

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 25

Calibration Date: 7/16/2015

Geometry: 2LMB

Manufacturer Standard Id: 96489

GEL Standard Id: 1705

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	932.2	7.0180E+04	6.671E+04	-4.94
Cs-137	661.7	0.851	912.7	2.8987E+04	2.908E+04	0.32
Co-60	1173.2	0.9985	1716	4.6448E+04	4.596E+04	-1.05
Co-60	1332.5	0.9998	1718	4.6442E+04	4.588E+04	-1.21

Prepared By: R. Fahren

Date: 7/20/15

Reviewed By: M. Stamp

Date: 7/24/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)566-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 25

Date Performed: 7/6/15

Performed By: RR

High Voltage Power Supply Model No. <u>3660</u> High Voltage <u>4.50KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.987</u> Time Constant <u>6 μsec</u> Input polarity <u>Negative</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>5A3.2</u>	

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 28

Geometry: Cap

- 1) Is all calibration standard information enclosed for:
the primary standard certificate?
the secondary standard(s) documentation?
the nuclide library used?
the VMS certificate file?

YES	NO	Comments
☒		1738
☒		1701
☒		
☒		

- 2) Is the energy calibration graph included?

☒		

- 3) Is the detector efficiency curve printout included?

☒		

- 4) Is the efficiency calibration report included and reviewed?

☒		

- 5) Is the raw count data included for:
the calibration peak report?
the calibration verification PEAK report?
the calibration verification NID report?
the last instrument background?

☒		
☒		
☒		
☒		

- 6) Are the calibration verification calculations included?

☒		

- 7) Are the instrument settings included:
amp, HVPS, ADC settings?

☒		

Prepared By: R. Fisher

Date: 7/28/15

Reviewed By: M. Stamp

Date: 8/5/15

Effective Date: 7/27/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Haff
J. S. Haff, Spectroscopist

Date: 10 May 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Ziegler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MK-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* $\mu\text{ps/gram}$	This Source μps	Uncertainty*, %			Calibration Method*
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4 π LS
Am-241	59.5	1.880E+05	—	7.514E+02	0.1	1.6	3.2	4 π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.996E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

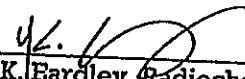
Page 1 of 2

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 2014414



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zelger Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

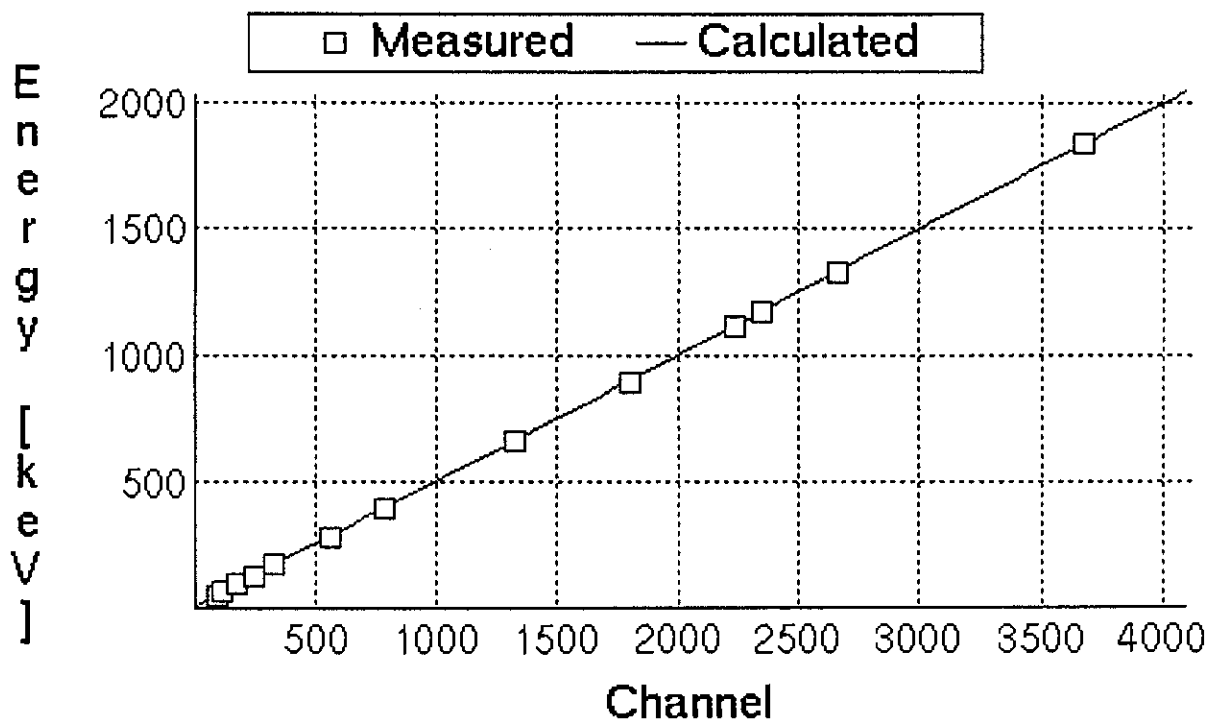
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
			*		59.54	35.90
					0.00	0.00

Title: CAN 100218
 Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



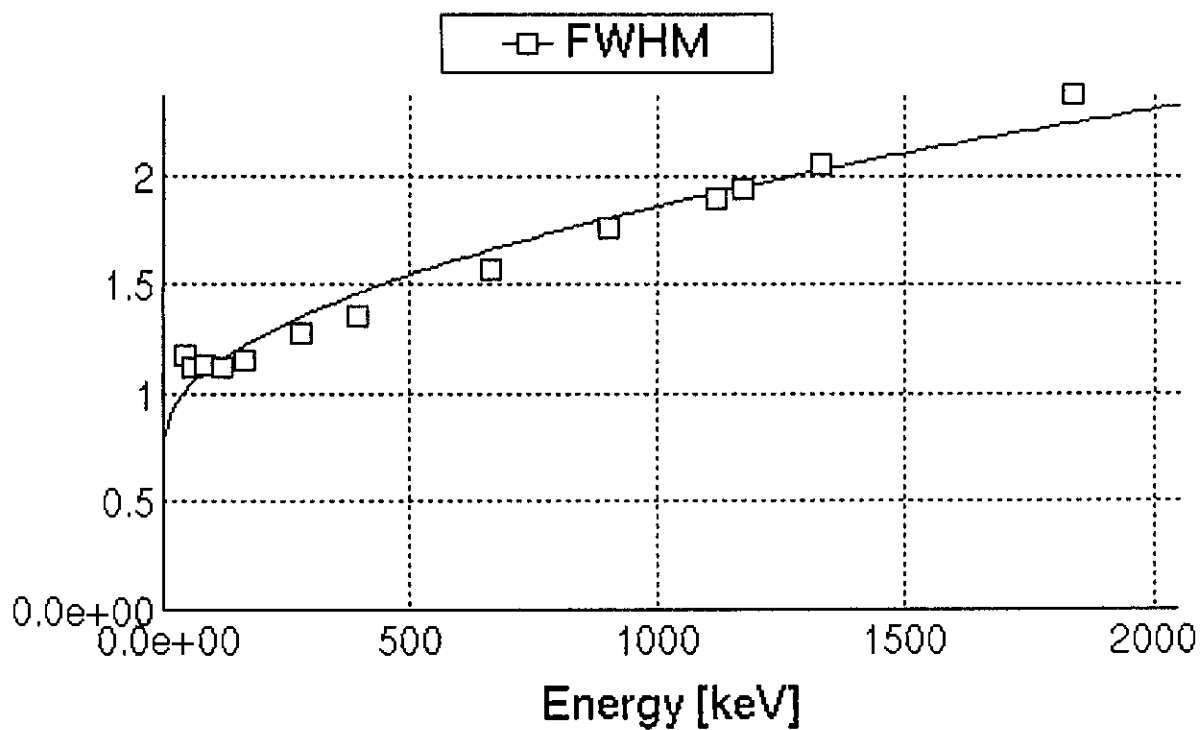
Datasource:

Energy = $-7.803\text{e-}02 \text{ keV} + 4.999\text{e-}01 * \text{Ch} + -6.354\text{e-}09 * \text{Ch}^2$ [CHISQ = $9.474\text{e-}04$]

FWHM = $7.778\text{e-}01 \text{ keV} + 3.419\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $7.637\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

energy calibration r28 8/14/15



Datasource:

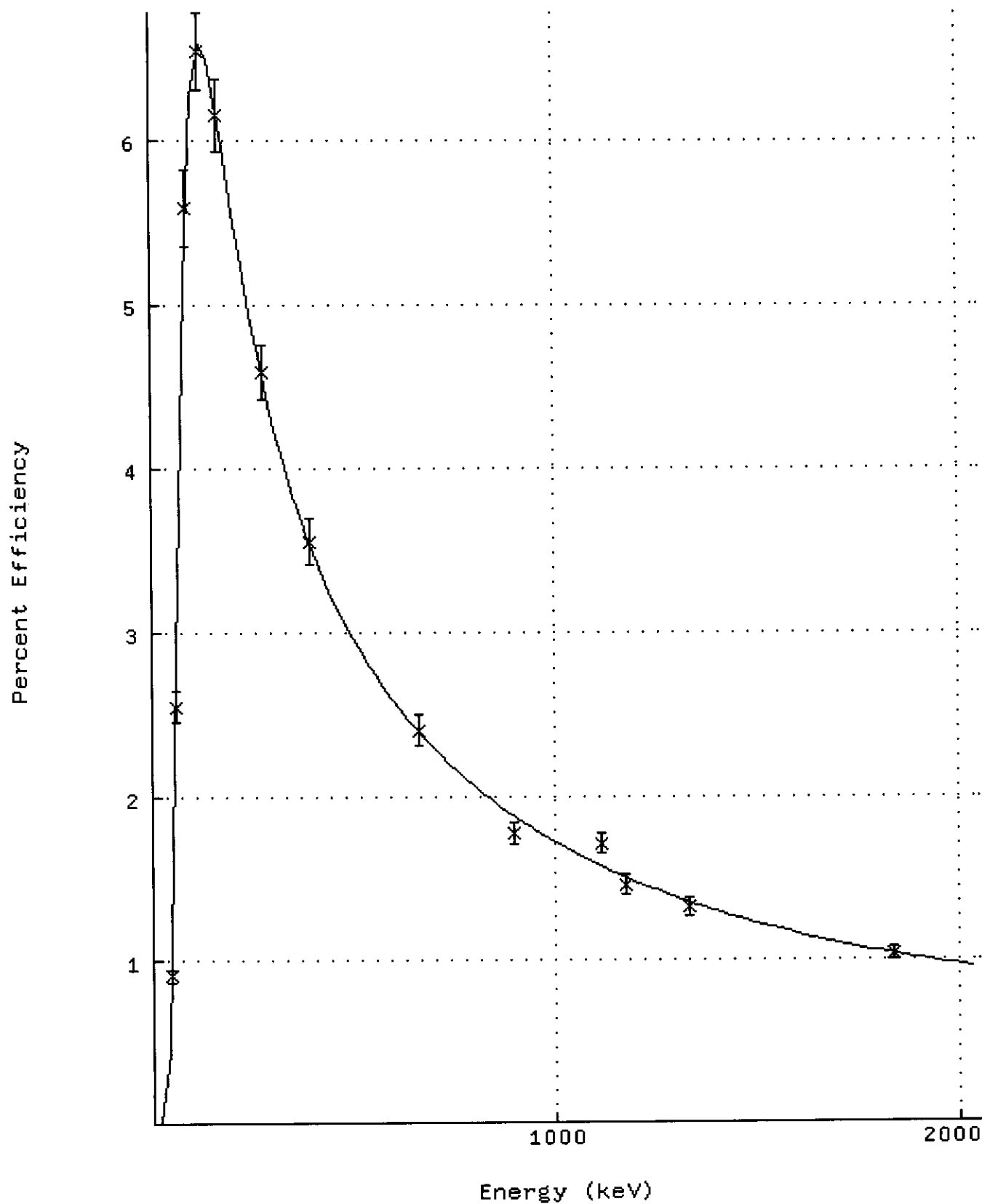
Energy = $-7.803\text{e-}02 \text{ keV} + 4.999\text{e-}01 * \text{Ch} + -6.354\text{e-}09 * \text{Ch}^2$ [CHISQ = $9.474\text{e-}04$]

FWHM = $7.778\text{e-}01 \text{ keV} + 3.419\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $7.637\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

shape calibration r28 5/14/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF; 9
Calib Date: 27-JUL-2015 07:57
Detector : GAMMA28 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -7.8032\text{E-}02 + 0.4999 \cdot \text{Channel} + -6.3544\text{E-}09 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.14	46.54	46.48	0.056
2	119.20	59.54	59.51	0.034
3	176.26	88.03	88.03	-0.002
4	244.38	122.06	122.08	-0.023
5	332.02	165.86	165.89	-0.034
6	558.74	279.20	279.23	-0.029
7	783.80	391.70	391.73	-0.029
8	1323.82	661.66	661.67	-0.013
9	1796.67	898.04	898.04	0.003
10	2231.79	1115.60	1115.54	0.064
11	2347.21	1173.23	1173.23	0.000
12	2665.84	1332.49	1332.50	-0.012
13	3673.29	1836.06	1836.07	-0.014

FWHM Calibration Report

$$\text{FWHM} = 0.7778 + 3.4188\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.17	1.01	0.163
2	59.54	1.11	1.04	0.072
3	88.03	1.13	1.10	0.029
4	122.06	1.12	1.16	-0.033
5	165.86	1.16	1.22	-0.062
6	279.20	1.27	1.35	-0.078
7	391.70	1.36	1.45	-0.097
8	661.66	1.56	1.66	-0.094
9	898.04	1.76	1.80	-0.041
10	1115.60	1.90	1.92	-0.022
11	1173.23	1.94	1.95	-0.006
12	1332.49	2.05	2.03	0.028
13	1836.06	2.38	2.24	0.139

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.014	0.8200	-7.4901E-02	-1.8143E-02	6.6255E-02	-3.0081E-02

Average Deviation = 1.86 % Reduced Chi-Square = 1.31

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	9.08E-03	3.95E-04	9.12E-03	-0.11	-0.48
2	59.54	2.54E-02	9.56E-04	2.53E-02	0.16	0.59
3	88.03	5.57E-02	2.30E-03	5.55E-02	0.10	0.42
4	122.06	6.53E-02	2.33E-03	6.57E-02	-0.18	-0.65
5	165.86	6.14E-02	2.19E-03	6.18E-02	-0.19	-0.68
6	279.20	4.58E-02	1.66E-03	4.52E-02	0.32	1.18
7	391.70	3.55E-02	1.41E-03	3.54E-02	0.08	0.31
8	661.66	2.40E-02	9.78E-04	2.39E-02	0.10	0.41
9	898.04	1.77E-02	6.67E-04	1.88E-02	-1.56	-5.89
10	1115.60	1.71E-02	6.10E-04	1.57E-02	2.30	8.20
11	1173.23	1.46E-02	5.76E-04	1.50E-02	-0.79	-3.13
12	1332.49	1.32E-02	5.22E-04	1.35E-02	-0.54	-2.13
13	1836.06	1.03E-02	3.89E-04	1.03E-02	-0.03	-0.10

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM28_CAN_338011.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 338005 Sptarm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 27-JUL-2015 07:08:18
 Decay time : 116 19:08:18.26 % dead time : 1.9%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:34.18

---- Detector Parameters ----

Energy cal. time : 14-MAY-2015 11:45:57 Energy cal. oper.: gamma spec user
 Detector name : GAMMA28 Counting geometry: CAN
 Effic. cal. time : 27-JUL-2015 07:57:17 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	36.36	4359	704	1.36	72.89	69	32	2.42E+00	3.3	3.14E+02
2	4	37.87	4566	1906	1.45	75.92	69	32	2.54E+00	3.8	
3	4	40.01	2918	2606	1.09	80.20	69	32	1.62E+00	5.0	
4	4	42.31	2723	3756	1.10	84.80	69	32	1.51E+00	5.4	
5	4	46.39	19663	10331	1.48	92.95	69	32	1.09E+01	1.1	
6	0	59.38	35881	23084	1.20	118.95	112	14	1.99E+01	1.0	
7	10	67.64	2186	18548	2.74	135.46	129	23	1.21E+00	12.9	3.73E+00
8	10	70.64	1862	13016	1.37	141.47	129	23	1.03E+00	11.0	
9	10	72.67	2362	13500	1.38	145.54	129	23	1.31E+00	8.8	
10	9	83.60	2683	29058	2.57	167.39	160	22	1.49E+00	13.9	1.28E+01
11	9	85.57	2801	20655	1.76	171.34	160	22	1.56E+00	13.3	
12	9	87.97	93859	11832	1.21	176.14	160	22	5.21E+01	0.4	
13	0	101.76	480	13322	2.10	203.73	201	10	2.67E-01	45.1	
14	0	122.03	52628	17063	1.23	244.28	238	13	2.92E+01	0.7	
15	0	136.48	6521	9878	1.17	273.18	269	9	3.62E+00	3.0	
16	0	165.86	51185	12710	1.29	331.95	326	13	2.84E+01	0.6	
17	0	255.22	1628	6869	1.28	510.72	506	10	9.05E-01	9.8	
18	0	261.83	121	5124	0.60	523.94	521	8	6.72E-02	103.0	
19	0	279.20	25518	8012	1.36	558.69	553	13	1.42E+01	1.0	
20	0	391.71	37122	7375	1.42	783.75	776	16	2.06E+01	0.7	
21	0	465.17	142	2886	1.40	930.72	928	7	7.89E-02	63.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	511.11	4210	6599	2.41	1022.61	1015	19	2.34E+00	4.9	
23	0	540.87	150	2209	1.81	1082.14	1080	7	8.34E-02	52.6	
24	0	555.32	81	2187	1.51	1111.07	1108	7	4.47E-02	97.0	
25	0	638.98	81	2746	1.25	1278.42	1277	8	4.49E-02	112.6	
26	0	661.68	32148	5973	1.61	1323.83	1317	16	1.79E+01	0.8	
27	0	698.30	113	2393	1.44	1397.09	1395	7	6.28E-02	72.5	
28	0	733.81	138	2254	1.85	1468.14	1465	8	7.65E-02	59.7	
29	0	758.70	36	2251	0.75	1517.92	1517	8	1.98E-02	231.0	
30	0	814.06	647	3285	2.09	1628.67	1623	12	3.59E-01	18.2	
31	0	831.83	75	2241	2.46	1664.23	1662	8	4.19E-02	109.0	
32	0	898.08	42207	6902	1.75	1796.76	1787	20	2.34E+01	0.7	
33	0	936.01	84	2558	0.64	1872.64	1870	9	4.66E-02	109.3	
34	0	1038.60	81	1450	1.06	2077.87	2075	8	4.52E-02	81.7	
35	0	1115.61	33583	3579	1.85	2231.93	2222	20	1.87E+01	0.7	
36	0	1173.31	35826	2376	1.97	2347.37	2338	20	1.99E+01	0.6	
37	0	1223.42	35	584	1.42	2447.62	2446	8	1.92E-02	122.4	
38	0	1280.11	45	354	1.11	2561.02	2558	6	2.49E-02	68.5	
39	0	1324.71	605	1306	2.41	2650.25	2641	15	3.36E-01	13.7	
40	0	1332.59	32517	1947	2.06	2666.01	2656	21	1.81E+01	0.7	
41	0	1443.16	63	551	0.86	2887.21	2883	9	3.50E-02	68.4	
42	0	1605.15	33	1067	0.61	3211.30	3207	11	1.82E-02	193.9	
43	0	1776.14	30	296	5.43	3553.38	3543	15	1.67E-02	126.5	
44	0	1836.19	25990	766	2.37	3673.52	3662	24	1.44E+01	0.7	
45	0	1860.66	23	130	0.89	3722.48	3719	10	1.28E-02	95.1	
46	0	1916.68	32	175	6.64	3834.55	3825	17	1.80E-02	96.2	
47	0	1996.78	38	129	1.04	3994.80	3988	13	2.09E-02	64.7	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM28_CAN.CNF;2
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;194
                   Background date      : 26-JUL-2015 10:07:00
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 28-JUL-2015 10:25:18
Sample ID        : VER_GAM28_CAN       Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM28              Detector geometry: CAN
Elapsed live time: 0 00:30:00.00      Elapsed real time: 0 00:30:16.29  0.9%
Energy tolerance : 1.50000 keV        Analyst Initials  :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID        :                     Detector SN#       :
Matrix Spike ID :                     LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	36.74	1007	4209	1.66	73.65	72	6	5.59E-01	10.5	
2	2	44.12	294	3402	1.22	88.42	87	14	1.63E-01	26.1	9.02E+00
3	2	46.51*	17151	7180	1.14	93.20	87	14	9.53E+00	1.1	
4	0	59.51	36651	12963	1.17	119.20	113	13	2.04E+01	0.8	
5	0	66.57	25	4546	1.15	133.33	132	5	1.37E-02	409.0	
6	0	79.54	208	7315	1.43	159.26	157	7	1.16E-01	68.3	
7	0	88.07	56298	12213	1.18	176.33	170	13	3.13E+01	0.6	
8	0	122.13	21389	5936	1.22	244.47	239	12	1.19E+01	1.0	
9	0	131.53	126	2398	1.00	263.27	261	6	6.99E-02	62.2	
10	0	136.54	2553	4061	1.23	273.30	269	10	1.42E+00	5.1	
11	1	165.92	8510	2436	1.20	332.07	326	13	4.73E+00	1.4	1.44E+00
12	1	167.76	287	1854	1.34	335.76	326	13	1.60E-01	31.2	
13	0	255.30	25	2578	0.67	510.87	508	8	1.40E-02	351.1	
14	0	279.00	156	2255	0.67	558.28	555	8	8.65E-02	53.4	
15	0	326.32	165	1695	1.97	652.94	650	7	9.17E-02	42.1	
16	0	391.75	4219	2847	1.45	783.84	778	12	2.34E+00	3.0	
17	0	510.93*	1212	3107	2.33	1022.25	1014	17	6.73E-01	10.9	
18	0	631.59	94	873	1.33	1263.64	1261	6	5.24E-02	50.6	
19	0	661.73*	32390	2898	1.60	1323.93	1315	18	1.80E+01	0.7	
20	0	841.16	32	1352	0.95	1682.89	1682	8	1.76E-02	2201.1	
21	0	898.08*	4088	2609	1.62	1796.76	1791	13	2.27E+00	3.0	
22	0	1115.64	11849	2240	1.83	2231.99	2223	19	6.58E+00	1.3	
23	0	1173.31*	31910	1430	1.94	2347.36	2337	21	1.77E+01	0.6	
24	0	1274.32	21	299	3.47	2549.45	2537	15	1.16E-02	181.3	
25	0	1318.84	53	242	4.51	2638.50	2632	14	2.96E-02	63.4	
26	2	1326.01	152	263	2.45	2652.85	2645	32	8.42E-02	28.3	1.10E+01
27	2	1332.58	28777	277	2.10	2666.00	2645	32	1.60E+01	0.6	
28	0	1381.94	64	159	5.34	2764.75	2757	15	3.56E-02	44.9	
29	0	1422.67	19	172	2.21	2846.24	2838	13	1.03E-02	147.1	
30	0	1484.01	13	132	1.81	2968.95	2965	9	7.19E-03	159.0	
31	0	1499.47	39	271	10.46	2999.88	2993	24	2.16E-02	113.0	
32	0	1560.75	33	202	1.07	3122.48	3114	16	1.81E-02	99.7	
33	3	1633.31	35	30	2.87	3267.63	3265	23	1.94E-02	26.7	5.47E+00
34	3	1636.71	40	87	2.38	3274.43	3265	23	2.21E-02	53.5	

Sample ID : VER_GAM28_CAN

Acquisition date : 28-JUL-2015 10:25:18

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	3	1641.99	44	32	2.16	3285.00	3265	23	2.43E-02	22.2	
36	0	1654.94	47	166	7.80	3310.92	3300	19	2.61E-02	67.4	
37	0	1836.18	2499	166	2.34	3673.51	3662	22	1.39E+00	2.4	
38	1	2026.37*	26	52	2.32	4054.00	4048	18	1.43E-02	56.2	7.47E+00
39	1	2028.87*	30	42	2.32	4059.00	4048	18	1.67E-02	53.6	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2--Sigma %Error
CO-57	122.06	21389	85.60*	6.573E+00	5.708E+03	1.957E+04	1.99
	136.47	2553	10.68	6.543E+00	5.485E+03	1.880E+04	10.15
CO-60	1173.23	31910	99.85	1.503E+00	3.193E+04	3.799E+04	1.27
	1332.49	28777	99.98*	1.349E+00	3.204E+04	3.813E+04	1.21
ZN-65	1115.54	11849	50.60*	1.568E+00	2.242E+04	8.836E+04	2.66
Y-88	898.04	4088	93.70	1.877E+00	3.489E+03	8.057E+04	6.02
	1836.06	2499	99.20*	1.033E+00	3.661E+03	8.452E+04	4.78
CD-109	88.03	56298	3.70*	5.554E+00	4.114E+05	8.498E+05	1.17
SN-113	391.70	4219	64.97*	3.539E+00	2.755E+03	5.050E+04	5.92
CS-137	661.66	32390	85.10*	2.390E+00	2.392E+04	2.466E+04	1.36
CE-139	165.86	8510	80.00*	6.182E+00	2.584E+03	2.941E+04	2.90
PB-210	46.54	17151	4.25*	9.093E-01	6.664E+05	6.945E+05	2.25
AM-241	59.54	36651	35.90*	2.524E+00	6.074E+04	6.087E+04	1.66

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM28.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 26-JUL-2015 10:07:00 Acquisition date : 26-JUL-2015 10:07:00
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.00

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5076E+00	-2.07	Investigate <i>OK</i>
[1.55950+/-0.02509]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: *RF* Approval Date: 7 / 28 / 15

Sample ID : Bkg

Acquisition date : 26-JUL-2015 10:07:00

VMS Gamma Spectroscopy Report generated 27-JUL-2015 02:47:01

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM28__337968.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 337968 Sptarm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 26-JUL-2015 10:07:00

---- Sample Decay/Count Information ----

Sample Date : 26-JUL-2015 10:07:00 Acquisition date : 26-JUL-2015 10:07:00
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.00

---- Detector Parameters ----

Energy cal. time : 14-MAY-2015 11:45:57 Energy cal. oper.: gamma spec user
 Detector name : GAMMA28 Counting geometry:
 Effic. cal. time : 23-JUL-2014 11:06:42 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.65	200	674	1.17	93.48	89	9	3.33E-03	24.6	
2	0	52.89	61	520	1.22	105.97	104	7	1.02E-03	63.1	
3	0	63.33	306	790	1.01	126.85	123	9	5.10E-03	17.5	
4	0	74.70	75	433	1.27	149.59	148	5	1.24E-03	43.6	
5	0	77.67	56	529	1.04	155.54	152	6	9.35E-04	66.2	
6	0	84.21	132	779	1.81	168.61	165	9	2.20E-03	39.0	
7	0	92.53	1073	1148	1.22	185.25	178	14	1.79E-02	7.4	
8	0	99.60	32	531	1.27	199.40	194	7	5.40E-04	119.6	
9	0	139.55	33	481	0.71	279.32	278	6	5.56E-04	105.3	
10	0	144.06	214	903	1.49	288.35	284	12	3.57E-03	29.0	
11	0	182.27	61	407	0.91	364.78	362	6	1.02E-03	54.4	
12	0	185.70	735	700	1.34	371.63	368	11	1.23E-02	7.9	
13	0	205.24	44	362	0.66	410.74	409	5	7.36E-04	66.4	
14	0	231.00	60	471	1.60	462.25	459	8	1.00E-03	63.7	
15	0	238.31	253	756	1.51	476.89	471	12	4.22E-03	22.6	
16	0	247.99	50	693	3.70	496.26	492	12	8.29E-04	106.9	
17	0	322.30	111	594	5.71	644.91	638	14	1.85E-03	47.6	
18	0	339.30	84	676	4.56	678.92	671	15	1.40E-03	68.9	
19	0	345.89	71	414	3.60	692.09	687	11	1.18E-03	57.2	

20	0	351.08	33	401	1.86	702.47	700	9	5.47E-04	111.0
21	0	386.31	14	370	3.51	772.96	769	10	2.40E-04	253.8
22	0	510.78	1394	558	2.85	1021.96	1014	18	2.32E-02	4.8
23	4	583.16	112	246	2.35	1166.76	1159	22	1.86E-03	31.6
24	4	588.74	42	85	2.35	1177.91	1159	22	7.08E-04	39.3
25	0	655.44	12	159	0.57	1311.35	1311	8	1.97E-04	185.6
26	0	661.38	147	244	1.50	1323.24	1318	12	2.45E-03	22.8
27	0	669.43	38	105	1.13	1339.33	1336	6	6.33E-04	45.6
28	5	692.80	89	251	2.70	1386.10	1377	23	1.48E-03	42.0
29	5	697.39	62	143	2.21	1395.28	1377	23	1.03E-03	37.8
30	0	701.04	40	164	1.58	1402.58	1400	8	6.72E-04	56.8
31	0	712.57	15	241	0.74	1425.63	1422	12	2.47E-04	211.8
32	0	719.43	14	155	0.47	1439.36	1436	9	2.25E-04	169.9
33	0	728.37	41	223	3.01	1457.24	1448	14	6.79E-04	79.9
34	0	765.91	24	120	1.03	1532.34	1529	8	3.92E-04	83.3
35	0	785.46	27	125	1.18	1571.46	1567	10	4.43E-04	81.2
36	0	802.48	142	134	2.24	1605.50	1599	14	2.37E-03	19.1
37	0	892.68	30	95	0.74	1785.96	1780	10	4.93E-04	64.3
38	0	898.30	33	71	0.77	1797.20	1794	8	5.57E-04	47.1
39	0	909.61	78	154	4.31	1819.81	1813	14	1.29E-03	35.8
40	0	968.53	48	70	2.23	1937.69	1934	8	7.97E-04	33.9
41	0	985.36	68	150	7.04	1971.36	1960	20	1.13E-03	45.8
42	0	1001.52	68	124	2.37	2003.69	1995	15	1.14E-03	37.5
43	0	1088.10	22	74	2.30	2176.90	2171	9	3.67E-04	74.4
44	0	1107.02	52	97	4.46	2214.74	2208	14	8.63E-04	42.9
45	0	1140.60	16	77	1.64	2281.92	2276	9	2.63E-04	104.1
46	0	1172.92	16	108	2.90	2346.58	2336	12	2.73E-04	130.7
47	0	1200.81	25	117	4.11	2402.38	2394	16	4.17E-04	98.3
48	0	1269.88	32	61	0.61	2540.55	2535	12	5.31E-04	51.9
49	0	1374.04	36	82	4.83	2748.93	2742	17	5.96E-04	60.0
50	0	1417.93	15	39	1.67	2836.74	2829	10	2.56E-04	80.6
51	0	1460.01	105	78	1.61	2920.93	2913	17	1.75E-03	21.9
52	0	1763.00	30	39	2.57	3527.10	3520	13	5.00E-04	46.6
53	0	1838.33	58	63	11.05	3677.80	3664	28	9.75E-04	40.5
54	0	1884.50	7	51	3.73	3770.18	3757	15	1.10E-04	242.4
55	0	1951.36	15	46	3.38	3903.94	3894	14	2.52E-04	98.3

Sample ID : Bkg

Acquisition date : 26-JUL-2015 10:07:00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
56	0	1962.93	37	38	4.41	3927.08	3916	19	6.17E-04	43.2	
57	1	2021.87	21	23	2.32	4045.00	4037	19	3.58E-04	53.4	2.01E+00
58	1	2024.87	30	9	2.32	4051.00	4037	19	5.00E-04	29.2	
59	0	2029.26	20	10	2.45	4059.78	4056	9	3.39E-04	34.8	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 28

Calibration Date: 7/27/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.087E+04	7.60
Cs-137	661.7	0.851	735.7	2.3365E+04	2.466E+04	5.54
Co-60	1173.2	0.9985	1383	3.7435E+04	3.799E+04	1.48
Co-60	1332.5	0.9998	1385	3.7440E+04	3.813E+04	1.84

Prepared By: R. Fuen

Date: 7/28/15

Reviewed By: M. Stamp

Date: 8/5/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 28

Date Performed: 7/28/15

Performed By: RF

High Voltage Power Supply Model No. <u>3106 D</u> High Voltage <u>3.00 kV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>20</u> Fine Gain <u>1.196</u> Time Constant <u>4 μsec</u> Input polarity <u>positive</u> BSLR rate <u>NA</u> BSLR mode <u>NA</u> Threshold <u>NA</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>2C2: 1</u>	

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gamma 31Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1782
the second standard(s) documentation?	☒		1738
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. FisherDate: 6/15/16Reviewed By: M. StampDate: 6/20/16Effective Date: 6/15/16

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 103141B

Source Description: 100 mL Solid in Aluminum Can

Product Code: 8403-EG-SD

Customer: GEL Laboratories, LLC

P.O. Number: GEL1613700, Item 3

This standard radionuclide source was prepared from an aliquot measured gravimetrically from a master radionuclide solution calibrated with a germanium gamma-ray spectrometer system. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using germanium gamma-ray spectrometry. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Density of solid matrix: 1.17 g/cm³ ± 3 %.

Reference Date: 01-April-2016

12:00 PM EST

MGS Mixture

Isotope	Gamma-Ray Energy, keV	Half-Life, d	Activity, Bq	Flux, s ⁻¹	Uncertainty			Calibration Method**
					u _A , %	u _B , %	U, %*	
Pb-210	46.5	8.109E+03	2.877E+04	1.223E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	2.262E+03	8.120E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	3.136E+04	1.160E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	7.785E+02	6.664E+02	0.4	1.7	3.4	HPGe
Ce-139	165.9	1.376E+02	1.086E+03	8.688E+02	0.4	1.7	3.6	HPGe
Hg-203	279.2	4.659E+01	2.635E+03	2.149E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.161E+02	1.893E+03	1.230E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	9.294E+02	7.909E+02	0.7	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	3.113E+03	2.917E+03	0.7	1.7	3.7	HPGe
Y-88	1836.1			3.089E+03	0.7	1.7	3.7	
Co-60	1173.2	1.925E+03	1.460E+03	1.458E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5			1.459E+03	0.7	1.8	3.9	

Mixed Gamma (MGS) master solution is EZA's eight isotope mixture which is calibrated quarterly and consists of Cd-109, Co-57, Ce-139, Hg-203, Sn-113, Cs-137, Y-88, and Co-60. ***Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." ****Calibration Methods:** 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

SRS Number: 103141B

This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by:



Z. Dimitrova, Radiochemist

QC Approved by:



J. Lahr, Spectroscopist

Date:

13-MAY-16

Standard Logbook

Serial ID: 1782 **Open/Reference Date:** 01-APR-16
Name: Mixed Gamma CAN **Received:** 01-APR-16
Type: Source Material **Expires:** 01-APR-17
Employee: Maggie Stamps **Verified:** 20-MAY-16
Supplier: Eckert & Zeigler Analytics
Description: 103141B
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2018

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.18, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty* , %			Calibration Method*
					Type			
					u _A	u _B	U	
Pb-210	46.8	8.109E+03	————	1.218E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	————	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.6	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.908E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffin
J. S. Laffin, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738 **Open/Reference Date:** 01-APR-15
Name: Mixed Gamma CAN **Received:** 01-APR-15
Type: Source Material **Expires:** 01-APR-41
Employee: Maggie Stamps **Verified:** 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

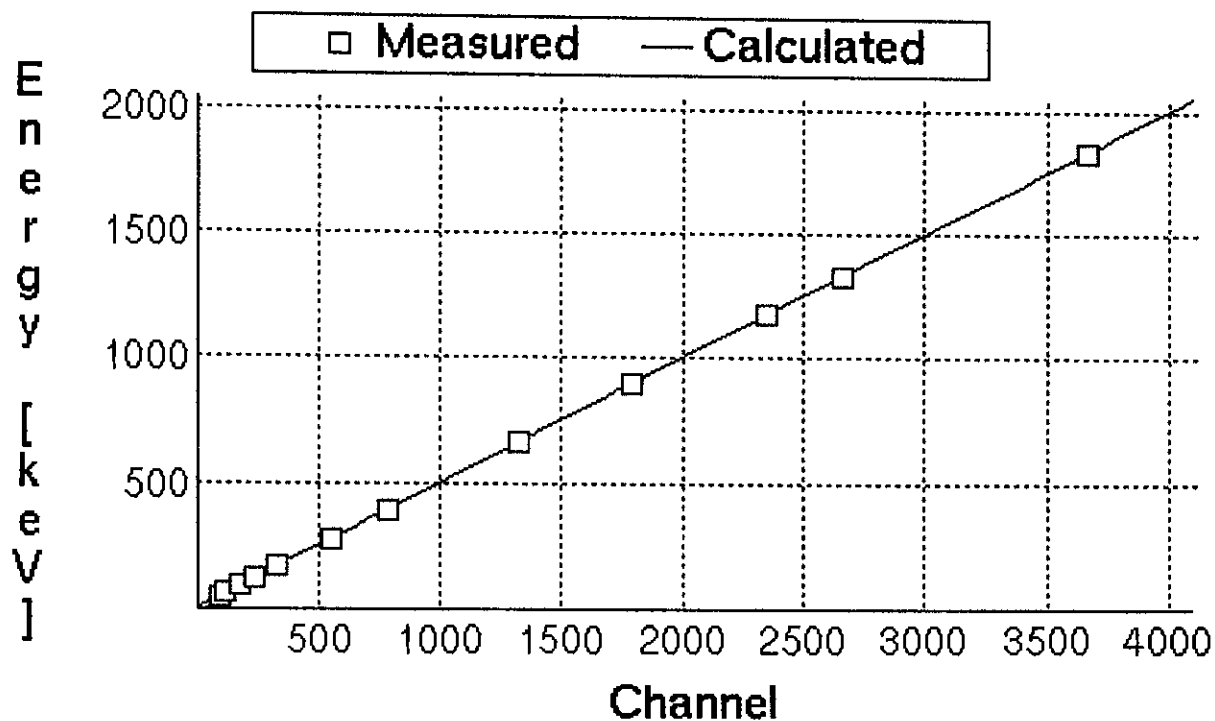
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 103141B

Quantity: 1.00

Assay date: 1-APR-2016 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1223	4.20	4.3	Yes
AM-241	432.60Y	59.5	812	3.60	35.9	Yes
CD-109	461.40D	88.0	1160	4.10	3.7	Yes
CO-57	271.74D	122.1	666	3.40	85.6	Yes
CE-139	137.64D	165.9	869	3.60	80.0	Yes
HG-203	46.59D	279.2	2149	3.50	81.6	Yes
SN-113	115.09D	391.7	1230	3.90	65.0	Yes
CS-137	30.08Y	661.7	791	4.10	85.1	Yes
Y-88	106.63D	898.0	2917	3.70	93.7	Yes
CO-60	1925.28D	1173.2	1458	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1459	3.90	100.0	Yes
Y-88	106.63D	1836.1	3089	3.70	99.2	Yes



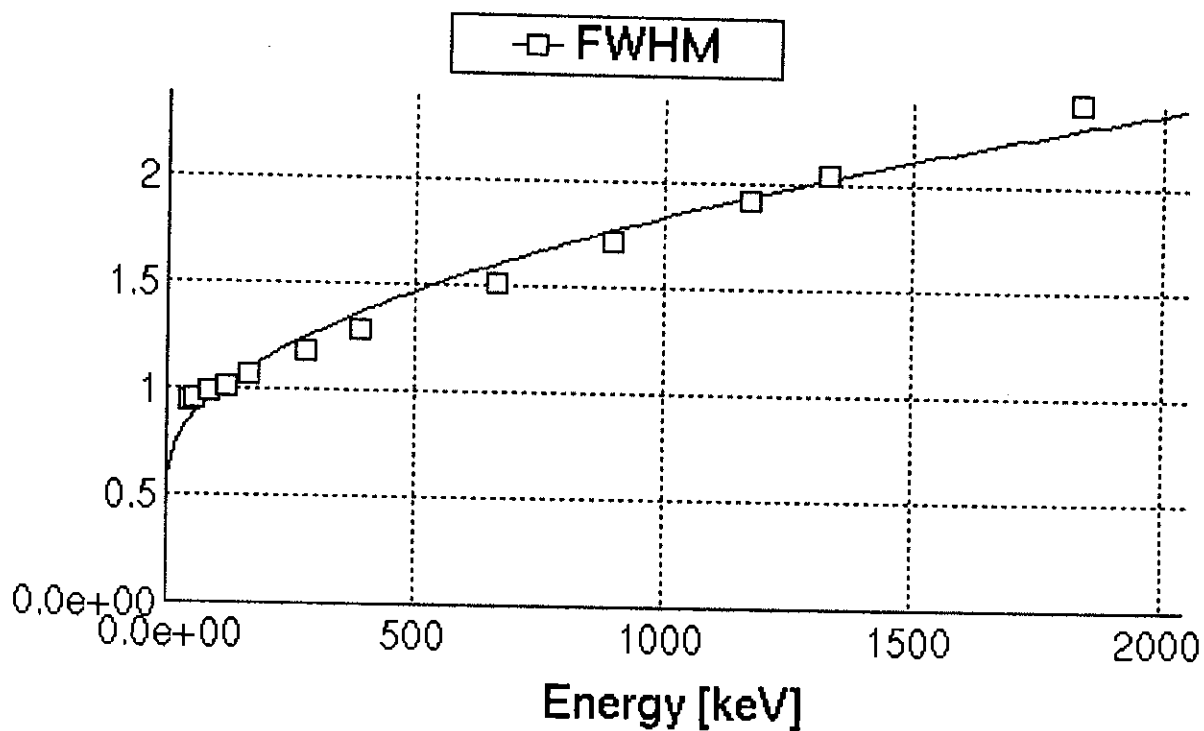
Datasource:

Energy = $1.433\text{e-}01 \text{ keV} + 5.004\text{e-}01 * \text{Ch} + -2.083\text{e-}08 * \text{Ch}^2$ [CHISQ = $2.203\text{e-}02$]

FWHM = $5.890\text{e-}01 \text{ keV} + 3.952\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $5.251\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

energy calibration r3l 6/13/16



Datasource:

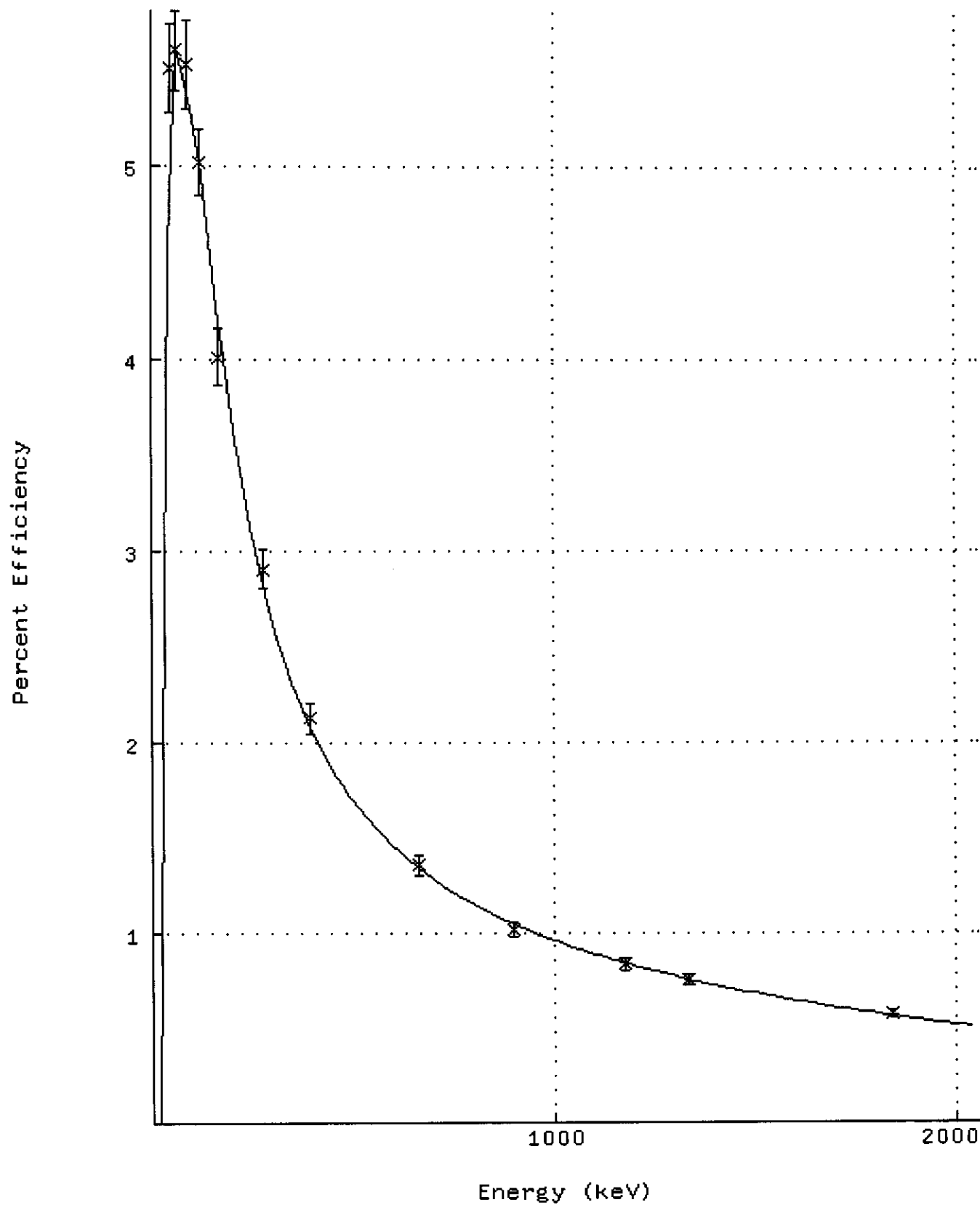
Energy = $1.433\text{e-}01 \text{ keV} + 5.004\text{e-}01 * \text{Ch} + -2.083\text{e-}08 * \text{Ch}^2$ [CHISQ = $2.203\text{e-}02$]

FWHM = $5.890\text{e-}01 \text{ keV} + 3.952\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $5.251\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

Shape calibration Y31 6/13/16

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM31_CAN.CNF;7
Calib Date: 15-JUN-2016 06:54
Detector : GAMMA31 Geometry : CAN
Fit type : 5 Deg. Linear



$$\text{Energy} = 0.1433 + 0.5004 * \text{Channel} + -2.0833\text{E-}08 * (\text{Channel} ** 2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.67	46.54	46.51	0.029
2	118.70	59.54	59.54	0.004
3	175.66	88.03	88.04	-0.007
4	243.66	122.06	122.07	-0.006
5	331.20	165.86	165.87	-0.005
6	557.71	279.20	279.20	-0.002
7	782.60	391.70	391.73	-0.027
8	1322.12	661.66	661.66	-0.002
9	1794.58	898.04	898.04	-0.001
10	2344.61	1173.23	1173.22	0.014
11	2662.96	1332.49	1332.48	0.013
12	3669.66	1836.06	1836.07	-0.011

FWHM Calibration Report

$$\text{FWHM} = 0.5890 + 3.9519\text{E-}02 * (\text{Energy} ** 1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	0.95	0.86	0.089
2	59.54	0.97	0.89	0.071
3	88.03	0.99	0.96	0.032
4	122.06	1.02	1.03	-0.009
5	165.86	1.07	1.10	-0.027
6	279.20	1.19	1.25	-0.059
7	391.70	1.29	1.37	-0.082
8	661.66	1.52	1.61	-0.087
9	898.04	1.72	1.77	-0.056
10	1173.23	1.92	1.94	-0.019
11	1332.49	2.05	2.03	0.020
12	1836.06	2.41	2.28	0.127

Efficiency Calibration Report

Sample ID : 103141B

Page : 4

Acquisition date : 13-JUN-2016 11:54:07

$$\text{Eff} = \exp(a1 \cdot E + a2 + a3/E + a4/E^{**2} + a5/E^{**3} + a6/E^{**4} + a7/E^{**5})$$

a1	a2	a3	a4	a5	a6	a7
-1.8188E-04	-2.029	214.8	-2.2333E+04	1.0321E+06	-1.7664E+07	0.0000E+00

Reduced Chi-Square = 0.837

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	5.50E-02	2.31E-03	5.49E-02	0.06	0.25
2	59.54	5.59E-02	2.02E-03	5.64E-02	-0.24	-0.85
3	88.03	5.52E-02	2.27E-03	5.38E-02	0.58	2.38
4	122.06	5.01E-02	1.72E-03	4.98E-02	0.22	0.76
5	165.86	4.00E-02	1.45E-03	4.23E-02	-1.56	-5.68
6	279.20	2.90E-02	1.02E-03	2.80E-02	0.98	3.46
7	391.70	2.12E-02	8.35E-04	2.08E-02	0.49	1.93
8	661.66	1.35E-02	5.64E-04	1.34E-02	0.23	0.96
9	898.04	1.02E-02	3.80E-04	1.05E-02	-0.77	-2.86
10	1173.23	8.34E-03	3.29E-04	8.41E-03	-0.21	-0.84
11	1332.49	7.47E-03	2.94E-04	7.54E-03	-0.25	-0.98
12	1836.06	5.68E-03	2.12E-04	5.59E-03	0.44	1.63

VMS Gamma Spectroscopy Report generated 15-JUN-2016 08:18:29

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM31_CAN_373803.CNF

---- Sample Information ----

Sample Title : CAN 103141B
 Sample ID : 103141B Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 373612 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2016 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2016 12:00:00. Acquisition date : 13-JUN-2016 11:54:07
 Decay time : 72 23:54:07.78 % dead time : 1.8%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:06.61

---- Detector Parameters ----

Energy cal. time : 13-JUN-2016 09:25:47 Energy cal. oper.: gamma spec user
 Detector name : GAMMA31 Counting geometry: CAN
 Effic. cal. time : 15-JUN-2016 06:54:07 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : LINEAR Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	33.18	74396	71711	1.09	66.03	63	8	2.07E+01	0.7	
2	10	36.82	4992	38099	1.24	73.29	71	28	1.39E+00	6.3	1.78E+02
3	10	37.80	24020	68395	1.77	75.26	71	28	6.67E+00	2.1	
4	10	40.43	21917	98120	2.18	80.52	71	28	6.09E+00	3.1	
5	10	42.61	22491	97560	2.19	84.88	71	28	6.25E+00	3.1	
6	10	44.88	26998	96204	2.21	89.42	71	28	7.50E+00	3.1	
7	10	46.52	240596	43824	0.93	92.69	71	28	6.68E+01	0.3	
8	0	49.81	1286	32419	0.62	99.26	98	5	3.57E-01	21.3	
9	0	59.54	166964	60136	1.00	118.70	113	12	4.64E+01	0.4	
10	10	66.49	7060	46108	2.36	132.59	127	26	1.96E+00	6.4	5.53E+00
11	10	68.57	6069	54789	2.37	136.75	127	26	1.69E+00	8.6	
12	10	70.82	10526	31904	1.33	141.25	127	26	2.92E+00	3.2	
13	10	72.86	11961	24466	1.01	145.32	127	26	3.32E+00	2.3	
14	10	74.38	1462	37295	1.42	148.37	127	26	4.06E-01	24.7	
15	0	78.16	535	33644	0.62	155.93	152	8	1.49E-01	59.5	
16	8	82.63	7075	48980	2.03	164.86	159	24	1.97E+00	6.1	1.82E+02
17	8	85.02	4326	31584	1.27	169.63	159	24	1.20E+00	7.2	
18	8	88.03	206406	19329	0.99	175.63	159	24	5.73E+01	0.2	
19	0	102.60	394	15589	1.06	204.76	203	6	1.10E-01	50.3	
20	0	112.64	223	14811	1.39	224.83	224	6	6.20E-02	86.4	
21	4	119.57	470	9898	1.36	238.68	237	17	1.31E-01	29.3	6.48E+01

Peak Search Report (continued)

Sample ID : 103141B

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Acquisition date : 13-JUN-2016 11:54:07

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	4	122.07	100289	12968	1.03	243.68	237	17	2.79E+01	0.4	
23	0	136.49	12640	20195	1.10	272.49	268	10	3.51E+00	2.3	
24	0	165.87	87650	19763	1.06	331.22	325	12	2.43E+01	0.5	
25	0	187.51	190	6546	0.88	374.45	373	5	5.28E-02	64.3	
26	0	199.14	3328	13674	1.18	397.70	393	10	9.24E-01	6.8	
27	0	203.64	641	9364	1.38	406.69	403	7	1.78E-01	25.4	
28	0	255.06	2842	9504	1.19	509.47	505	10	7.89E-01	6.7	
29	0	268.84	236	5169	1.09	537.01	535	6	6.54E-02	48.7	
30	0	279.20	76432	11695	1.19	557.71	551	14	2.12E+01	0.5	
31	0	375.40	140	4490	1.60	749.98	748	8	3.90E-02	83.0	
32	0	391.67	61183	8759	1.28	782.49	775	14	1.70E+01	0.5	
33	0	412.16	96	4385	0.66	823.44	823	8	2.67E-02	120.0	
34	0	425.64	74	4306	1.32	850.39	849	8	2.06E-02	153.9	
35	0	511.00	1103	5935	2.33	1020.99	1015	13	3.06E-01	14.7	
36	0	548.88	235	2770	0.81	1096.70	1094	7	6.54E-02	37.7	
37	0	661.54	38820	7875	1.48	1321.88	1314	15	1.08E+01	0.7	
38	0	683.41	199	4096	0.96	1365.59	1363	8	5.52E-02	56.2	
39	0	718.79	157	3089	1.31	1436.31	1433	9	4.36E-02	64.4	
40	0	813.79	1255	3878	1.63	1626.18	1619	14	3.49E-01	10.9	
41	0	845.41	84	3034	1.37	1689.38	1683	11	2.34E-02	127.3	
42	0	879.89	131	1975	1.09	1758.30	1756	7	3.63E-02	57.1	
43	0	897.84	67365	6314	1.66	1794.19	1785	18	1.87E+01	0.5	
44	0	912.25	509	3834	2.46	1822.98	1818	11	1.41E-01	24.0	
45	0	918.70	149	2709	1.51	1835.87	1833	8	4.15E-02	61.0	
46	0	951.19	132	3007	1.04	1900.82	1898	9	3.66E-02	75.5	
47	0	957.20	101	2736	0.97	1912.82	1909	8	2.81E-02	90.0	
48	0	960.72	229	2833	1.37	1919.87	1916	9	6.35E-02	42.6	
49	0	1172.94	43093	3012	1.85	2344.06	2334	19	1.20E+01	0.6	
50	0	1208.41	101	1126	1.32	2414.95	2412	10	2.82E-02	62.7	
51	0	1261.53	27	627	1.16	2521.14	2520	7	7.48E-03	155.8	
52	0	1274.14	100	859	0.89	2546.36	2542	10	2.76E-02	56.0	
53	4	1324.83	1362	1968	2.97	2647.68	2638	33	3.78E-01	8.2	1.13E+01
54	4	1332.19	38197	1357	2.08	2662.38	2638	33	1.06E+01	0.5	
55	0	1678.78	104	632	2.78	3355.23	3351	9	2.89E-02	44.9	
56	0	1694.79	22	699	2.98	3387.22	3381	11	5.99E-03	239.5	
57	0	1730.02	70	716	4.57	3457.65	3450	21	1.94E-02	96.8	
58	0	1774.60	88	227	5.55	3546.77	3540	14	2.45E-02	37.8	
59	0	1835.64	39522	898	2.26	3668.80	3657	24	1.10E+01	0.5	
60	0	1850.13	254	487	1.98	3697.76	3691	14	7.05E-02	19.5	
61	0	1856.96	79	350	2.81	3711.41	3705	13	2.20E-02	50.4	
62	0	1903.06	40	223	3.07	3803.58	3800	20	1.10E-02	93.4	
63	0	1978.56	28	120	1.11	3954.51	3946	13	7.64E-03	85.2	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM31_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM31_CAN.CNF;290
Background date    : 12-JUN-2016 11:27:40
Sample date       : 1-APR-2015 12:00:00. Acquisition date : 15-JUN-2016 07:03:08
Sample ID        : VER_GAM31_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM31              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:35.85  1.0%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID         :                    Detector SN#       :
Matrix Spike ID  :                    LCS ID            :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	32.67	15998	33114	2.02	65.01	62	8	4.44E+00	2.1	
2	10	37.29	9399	34280	1.95	74.24	70	27	2.61E+00	3.7	1.28E+03
3	10	40.69	28876	56611	2.18	81.03	70	27	8.02E+00	1.9	
4	10	44.03	16870	31132	1.24	87.72	70	27	4.69E+00	2.1	
5	10	46.45*	267824	27793	1.07	92.55	70	27	7.44E+01	0.2	
6	0	49.84	2282	33401	0.96	99.32	97	7	6.34E-01	13.5	
7	0	59.50	161466	36735	1.01	118.62	113	12	4.49E+01	0.3	
8	9	66.86*	3508	20845	2.15	133.34	128	19	9.74E-01	8.3	3.85E+00
9	9	69.01	1410	17773	1.48	137.63	128	19	3.92E-01	17.7	
10	9	70.93	984	20424	1.71	141.46	128	19	2.73E-01	27.4	
11	0	88.02	116550	15183	1.04	175.61	172	10	3.24E+01	0.4	
12	0	98.16	146	5436	1.13	195.88	195	6	4.06E-02	80.3	
13	0	122.03*	36773	9081	1.07	243.60	238	12	1.02E+01	0.7	
14	0	136.49	4593	6138	1.07	272.49	268	10	1.28E+00	3.5	
15	0	165.82	13235	5723	0.98	331.11	326	11	3.68E+00	1.4	
16	0	198.85*	464	5219	1.30	397.12	393	10	1.29E-01	29.5	
17	0	229.14	122	3083	1.00	457.66	456	6	3.38E-02	72.5	
18	0	254.93	255	3024	0.90	509.20	506	7	7.09E-02	36.2	
19	0	279.43	234	2728	1.06	558.16	555	7	6.50E-02	37.7	
20	0	310.25	177	2425	1.55	619.77	617	7	4.93E-02	46.6	
21	0	378.55	119	2134	0.79	756.27	754	7	3.31E-02	65.0	
22	0	382.51	170	1878	1.35	764.19	761	6	4.71E-02	41.1	
23	0	391.73	6467	2871	1.22	782.61	778	9	1.80E+00	1.9	
24	0	511.08*	1527	4257	2.27	1021.15	1015	17	4.24E-01	10.2	
25	0	523.11	113	1781	0.98	1045.20	1042	8	3.15E-02	65.2	
26	0	613.42	105	1707	2.79	1225.69	1222	9	2.92E-02	71.5	
27	0	661.78	36197	3346	1.44	1322.35	1315	15	1.01E+01	0.6	
28	0	705.53	67	1778	1.33	1409.79	1406	9	1.86E-02	114.1	
29	0	814.22	109	1693	0.88	1627.04	1625	8	3.02E-02	66.4	
30	0	898.18	5981	3251	1.59	1794.85	1789	12	1.66E+00	2.3	
31	0	991.18	63	1448	2.61	1980.74	1980	8	1.76E-02	105.1	
32	0	1115.70	15073	2844	1.82	2229.65	2220	19	4.19E+00	1.2	
33	0	1173.39*	37209	1660	1.79	2344.97	2335	20	1.03E+01	0.6	
34	0	1192.74	41	538	1.26	2383.65	2380	8	1.14E-02	99.1	

Peak Search Report (continued)

Page : 2

Sample ID : VER_GAM31_CAN

Acquisition date : 15-JUN-2016 07:03:08

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	2	1325.92	103	275	2.45	2649.85	2644	33	2.87E-02	32.8	1.16E+01
36	2	1332.70	33517	300	2.00	2663.41	2644	33	9.31E+00	0.6	
37	1	1351.51	68	206	2.04	2701.00	2690	23	1.88E-02	45.0	1.72E+00
38	1	1354.01	90	182	2.04	2706.00	2690	23	2.51E-02	34.2	
39	0	1432.79	23	83	1.65	2863.48	2860	7	6.36E-03	69.1	
40	0	1540.01	17	201	0.91	3077.81	3068	12	4.82E-03	165.0	
41	0	1671.86	15	110	1.32	3341.39	3338	9	4.25E-03	121.8	
42	5	1765.35*	20	11	2.30	3528.29	3525	17	5.69E-03	36.4	4.78E+00
43	5	1768.21	38	36	2.25	3534.00	3525	17	1.05E-02	36.7	
44	0	1836.37	3701	94	2.14	3670.26	3659	20	1.03E+00	1.8	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	36773	85.60*	4.977E+00	6.480E+03	1.995E+04	1.47
	136.47	4593	10.68	4.737E+00	6.816E+03	2.098E+04	7.04
CO-60	1173.23	37209	99.85	8.407E-01	3.328E+04	3.900E+04	1.17
	1332.49	33517	99.98*	7.538E-01	3.339E+04	3.913E+04	1.11
ZN-65	1115.54	15073	50.60*	8.770E-01	2.550E+04	8.918E+04	2.35
Y-88	898.04	5981	93.70	1.047E+00	4.575E+03	8.033E+04	4.60
	1836.06	3701	99.20*	5.586E-01	5.015E+03	8.805E+04	3.52
CD-109	88.03	116550	3.70*	5.385E+00	4.392E+05	8.516E+05	0.72
SN-113	391.70	6467	64.97*	2.082E+00	3.589E+03	5.105E+04	3.89
CS-137	661.66	36197	85.10*	1.341E+00	2.382E+04	2.449E+04	1.26
CE-139	165.86	13235	80.00*	4.231E+00	2.936E+03	2.703E+04	2.82
HG-203	70.83	984	3.69	5.506E+00	3.636E+03	2.564E+06	54.77
	72.87	-----	6.19	5.491E+00	-----	Line Not Found	-----
	279.20	234	81.56*	2.798E+00	7.694E+01	5.424E+04	75.32
PB-210	46.54	267824	4.25*	5.477E+00	8.638E+05	8.970E+05	0.43
AM-241	59.54	161466	35.90*	5.640E+00	5.987E+04	5.999E+04	0.69

Flag: "*" = Keyline

VMS Gamma Spectroscopy Report generated 13-JUN-2016 04:09:17

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM31__373483.CN

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 373483 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 12-JUN-2016 11:27:40

---- Sample Decay/Count Information ----

Sample Date : 12-JUN-2016 11:27:40 Acquisition date : 12-JUN-2016 11:27:40
 Decay time : 0 00:00:00.00 % dead time : 0.2%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:41:44.11

---- Detector Parameters ----

Energy cal. time : 1-JUN-2015 09:59:40. Energy cal. oper.: gamma spec user
 Detector name : GAMMA31 Counting geometry:
 Effic. cal. time : 2-JUN-2015 03:05:30. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.44	523	2551	0.89	92.54	89	7	8.72E-03	16.6	
2	0	53.58	238	3205	1.55	106.81	103	8	3.96E-03	41.7	
3	0	63.39	1042	2804	0.99	126.42	122	9	1.74E-02	9.7	
4	0	66.61	89	1475	1.26	132.87	131	6	1.49E-03	68.9	
5	0	77.24	119	891	0.81	154.11	153	6	1.98E-03	41.4	
6	4	89.75	79	816	1.23	179.13	175	15	1.32E-03	58.8	3.37E+00
7	4	92.65	1272	729	1.09	184.92	175	15	2.12E-02	4.5	
8	0	112.99	83	740	1.36	225.57	222	8	1.38E-03	58.2	
9	0	121.40	70	479	0.65	242.38	241	6	1.17E-03	50.7	
10	0	139.77	64	584	1.44	279.10	276	7	1.06E-03	64.2	
11	0	143.44	108	687	1.16	286.45	283	8	1.80E-03	43.0	
12	0	185.82	592	627	0.95	371.15	367	9	9.86E-03	8.7	
13	0	198.62	81	532	1.03	396.74	393	7	1.34E-03	49.1	
14	0	238.82	304	683	1.04	477.10	473	10	5.06E-03	17.1	
15	0	270.79	75	459	1.77	541.00	536	9	1.25E-03	53.1	
16	0	295.03	87	326	1.00	589.46	587	7	1.45E-03	35.9	
17	0	338.20	88	298	1.68	675.75	673	7	1.47E-03	34.4	
18	0	351.85	155	315	1.20	703.05	700	8	2.59E-03	21.2	
19	0	510.76	1244	407	2.44	1020.70	1012	17	2.07E-02	4.7	

20	0	582.99	108	246	1.90	1165.10	1160	10	1.79E-03	29.1	
21	3	596.59	65	231	2.02	1192.29	1187	18	1.08E-03	46.8	1.72E+00
22	3	600.48	52	294	1.85	1200.05	1187	18	8.66E-04	64.2	
23	0	609.14	129	283	1.53	1217.36	1213	10	2.15E-03	25.9	
24	0	693.20	30	176	1.39	1385.42	1382	8	5.02E-04	78.7	
25	0	784.34	50	177	3.98	1567.62	1560	14	8.38E-04	58.0	
26	1	798.37	36	113	1.92	1595.66	1592	19	5.95E-04	54.4	1.85E+00
27	1	803.09	49	187	1.92	1605.11	1592	19	8.08E-04	57.0	
28	0	820.75	45	199	3.20	1640.41	1632	16	7.50E-04	71.8	
29	0	840.44	27	137	1.27	1679.77	1678	9	4.47E-04	80.7	
30	0	905.68	49	101	1.35	1810.19	1805	11	8.10E-04	43.0	
31	0	911.57	91	126	1.44	1821.96	1815	12	1.52E-03	26.8	
32	0	988.60	16	202	3.55	1975.96	1963	18	2.59E-04	216.6	
33	0	1120.41	44	120	1.71	2239.48	2231	12	7.39E-04	51.7	
34	0	1154.66	9	66	1.02	2307.97	2301	8	1.43E-04	170.5	
35	0	1173.23	43	55	0.94	2345.10	2340	11	7.15E-04	37.4	
36	0	1254.04	21	89	4.23	2506.65	2498	14	3.43E-04	100.5	
37	0	1369.43	19	82	3.70	2737.36	2728	13	3.19E-04	99.9	
38	0	1460.71	90	85	1.85	2919.87	2910	18	1.50E-03	26.2	
39	0	1571.99	13	46	2.22	3142.35	3138	10	2.22E-04	98.3	
40	0	1669.04	19	61	7.22	3336.42	3323	20	3.15E-04	106.4	
41	0	1748.34	17	19	1.54	3494.97	3487	11	2.86E-04	54.9	
42	0	1764.23	39	42	1.85	3526.75	3520	13	6.42E-04	38.3	
43	0	1936.48	13	17	0.65	3871.16	3864	11	2.18E-04	69.6	
44	0	1991.49	12	41	3.42	3981.17	3966	18	2.05E-04	124.7	

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM31.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 12-JUN-2016 11:27:40 Acquisition date : 12-JUN-2016 11:27:40
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:41:44.11

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	2.0054E+00	0.86	
[1.98998+/-0.01794]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: R.F Approval Date: 6, 15, 16

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 31

Calibration Date: 6/13/2016

Geometry: CAN

Manufacturer Standard Id: 100218

GEL Standard Id: 1738

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	760.8	5.7276E+04	5.999E+04	4.74
Cs-137	661.7	0.851	740.9	2.3530E+04	2.449E+04	4.08
Co-60	1173.2	0.9985	1405	3.8030E+04	3.900E+04	2.55
Co-60	1332.5	0.9998	1407	3.8035E+04	3.913E+04	2.88

Prepared By: R. Furr

Date: 6/15/16

Reviewed By: M. Stamp

Date: 6/20/16

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)568-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 81

Date Performed: 6/13/16

Performed By: RE

High Voltage Power Supply Model No. <u>306D</u> High Voltage <u>3.50KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>10</u> Fine Gain <u>1.019</u> Time Constant <u>4µsec</u> Input polarity <u>Negative</u> BSLR rate <u>nc</u> BSLR mode <u>ng</u> Threshold <u>nc</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>NDSSG</u> Address <u>3A3:1</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 32

Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1758
the secondary standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. F. Welch

Date: 8/6/15

Reviewed By: M. Stamp

Date: 8/14/15

Effective Date: 8/6/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.8	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.880E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.626E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.736E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.169E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.926E+03	2.098E+05	1.406E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.926E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytical Reference

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Iqbal
J. S. Iqbal, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zelger Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty*, %			Calibration Method*
			γps/gram		γps	Type	u _A	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



RC-S-065-130

MGS Certificate Rev 5, 1 October 2013

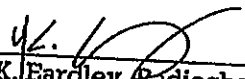
Page 1 of 2

Corporate Office

24937 Avenue Tibblitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 201414



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Ziegler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

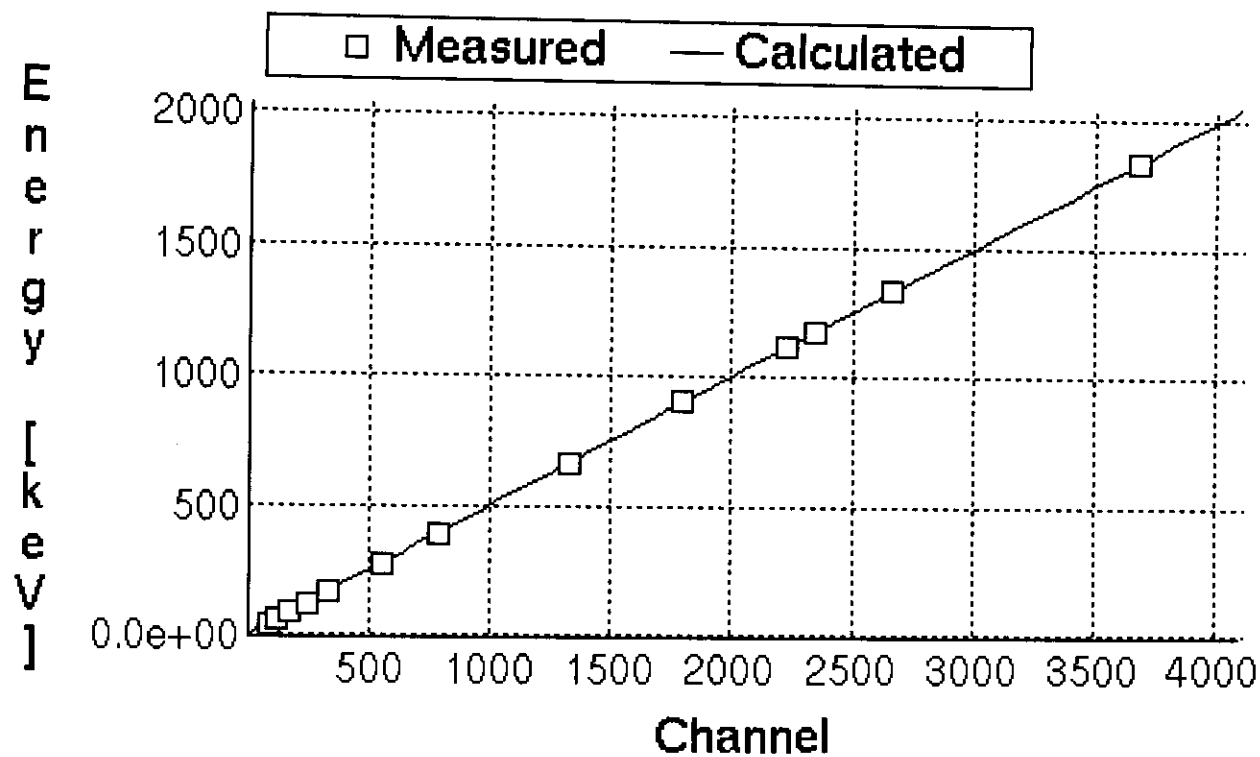
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D			514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



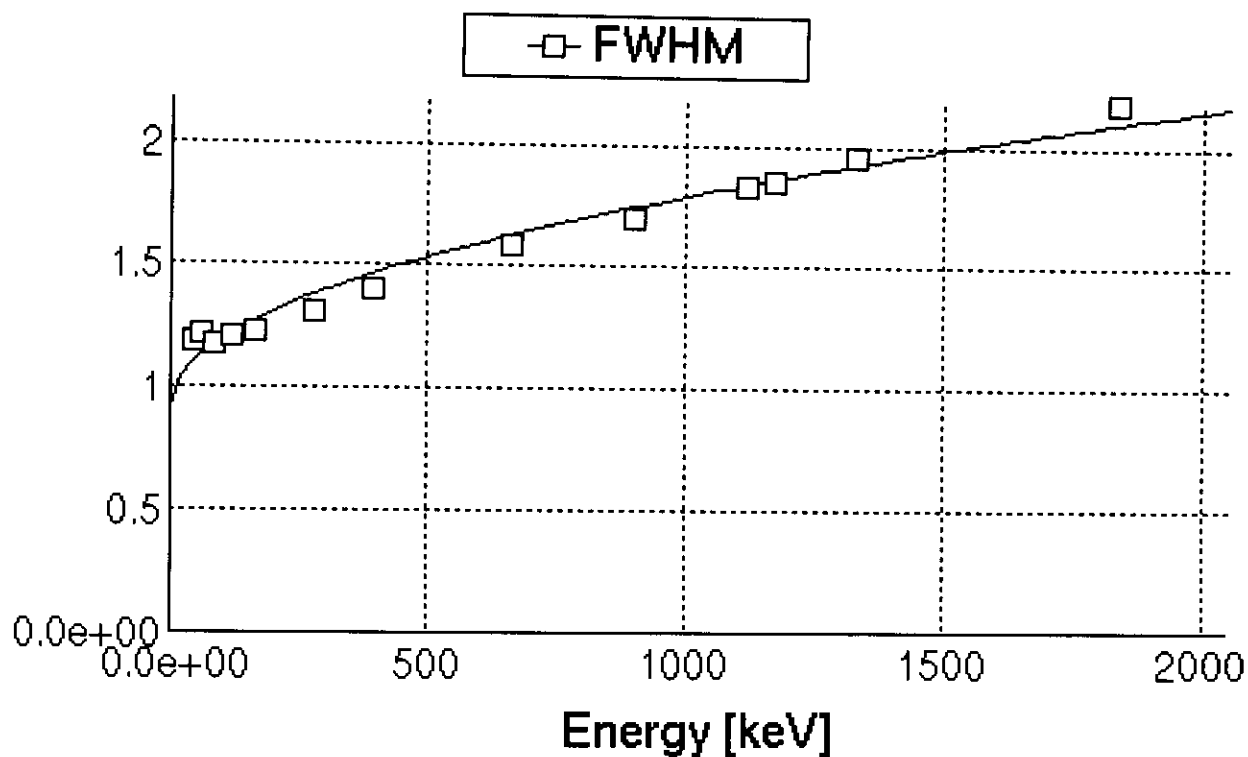
Datasource:

Energy = $-5.331e-01 \text{ keV} + 4.999e-01 * \text{Ch} + -9.566e-09 * \text{Ch}^2$ [CHISQ = $1.976e-02$]

FWHM = $9.115e-01 \text{ keV} + 2.787e-02 * E^{1/2}$ [CHISQ = $3.376e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

energy calibration 832 8/6/15



Datasource:

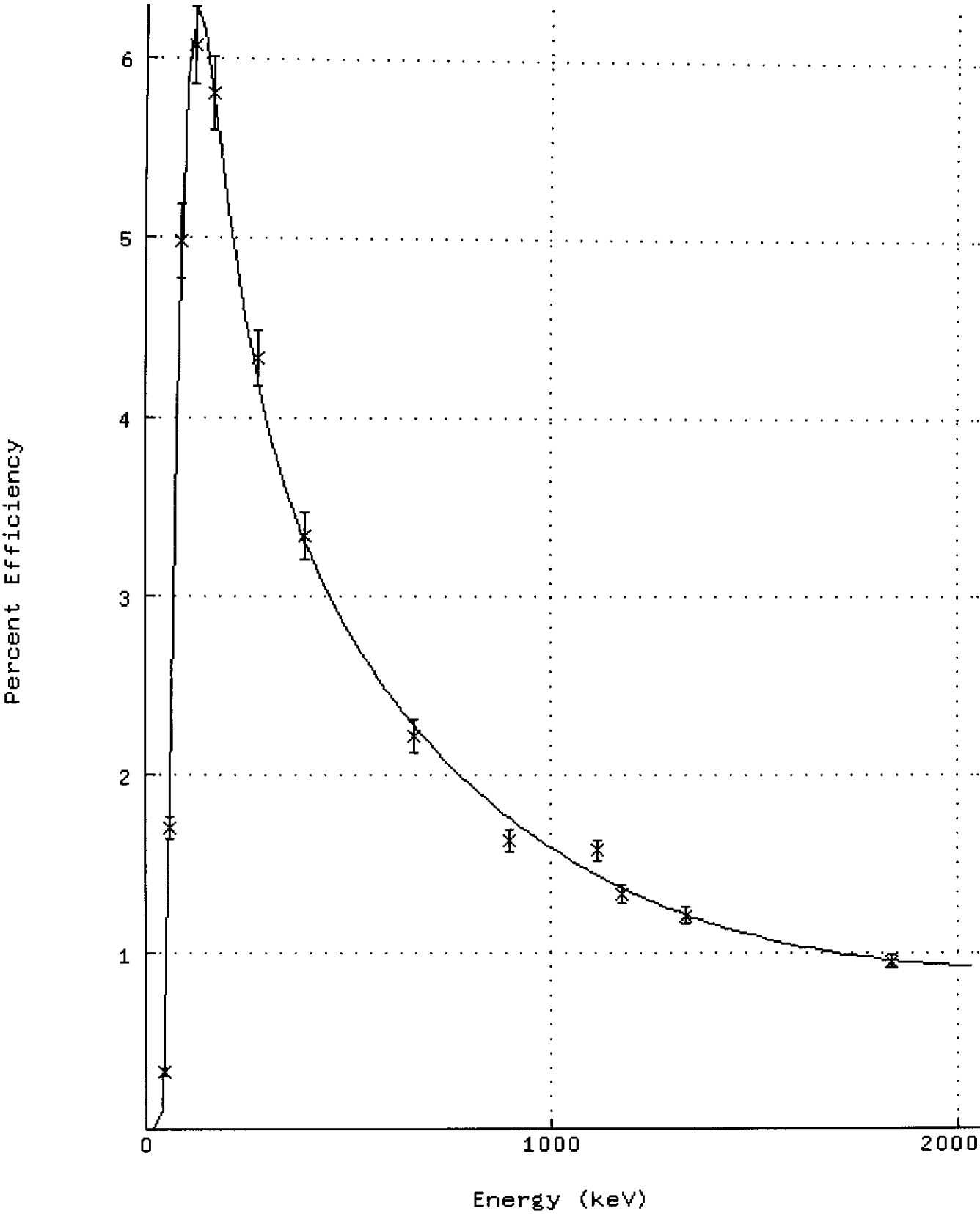
Energy = $-5.331e-01 \text{ keV} + 4.999e-01 * \text{Ch} + -9.566e-09 * \text{Ch}^2$ [CHISQ = $1.976e-02$]

FWHM = $9.115e-01 \text{ keV} + 2.787e-02 * E^{1/2}$ [CHISQ = $3.376e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Shape calibration 832 8/6/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM32_CAN.CNF;10
Calib Date: 6-AUG-2015 09:24:
Detector : GAMMA32 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -0.5331 + 0.4999 \cdot \text{Channel} + -9.5658\text{E-}09 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	94.03	46.54	46.47	0.068
2	120.12	59.54	59.51	0.027
3	177.16	88.03	88.03	0.002
4	245.31	122.06	122.09	-0.034
5	332.95	165.86	165.90	-0.041
6	559.66	279.20	279.23	-0.029
7	784.71	391.70	391.72	-0.023
8	1324.72	661.66	661.66	0.005
9	1797.63	898.04	898.04	-0.002
10	2232.78	1115.60	1115.55	0.055
11	2348.19	1173.23	1173.23	-0.005
12	2666.83	1332.49	1332.50	-0.010
13	3674.33	1836.06	1836.07	-0.011

FWHM Calibration Report

$$\text{FWHM} = 0.9115 + 2.7869\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.19	1.10	0.087
2	59.54	1.21	1.13	0.087
3	88.03	1.17	1.17	0.002
4	122.06	1.20	1.22	-0.020
5	165.86	1.23	1.27	-0.043
6	279.20	1.31	1.38	-0.067
7	391.70	1.41	1.46	-0.057
8	661.66	1.59	1.63	-0.042
9	898.04	1.71	1.75	-0.041
10	1115.60	1.84	1.84	-0.006
11	1173.23	1.85	1.87	-0.014
12	1332.49	1.96	1.93	0.029
13	1836.06	2.19	2.11	0.087

Sample ID : 100218

Acquisition date : 6-AUG-2015 07:23:06

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.088	0.9218	-0.1311	-0.1933	0.2380	-7.0680E-02

Average Deviation = 3.05 % Reduced Chi-Square = 2.22

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	3.30E-03	1.60E-04	3.43E-03	-0.77	-3.76
2	59.54	1.70E-02	6.37E-04	1.62E-02	1.19	4.47
3	88.03	4.97E-02	2.04E-03	5.03E-02	-0.30	-1.22
4	122.06	6.07E-02	2.15E-03	6.27E-02	-0.92	-3.27
5	165.86	5.80E-02	2.05E-03	5.80E-02	0.00	-0.01
6	279.20	4.33E-02	1.55E-03	4.17E-02	1.01	3.62
7	391.70	3.33E-02	1.31E-03	3.31E-02	0.16	0.62
8	661.66	2.21E-02	8.93E-04	2.27E-02	-0.64	-2.60
9	898.04	1.63E-02	6.08E-04	1.75E-02	-1.97	-7.34
10	1115.60	1.57E-02	5.56E-04	1.43E-02	2.54	8.97
11	1173.23	1.33E-02	5.23E-04	1.36E-02	-0.60	-2.34
12	1332.49	1.21E-02	4.74E-04	1.21E-02	-0.11	-0.44
13	1836.06	9.48E-03	3.54E-04	9.58E-03	-0.28	-1.03

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM32_CAN_339129.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 339100 Spectrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 6-AUG-2015 07:23:06.
 Decay time : 126 19:23:06.15 % dead time : 2.2%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:22.56

----- Detector Parameters -----

Energy cal. time : 6-AUG-2015 09:23:43. Energy cal. oper.: gamma spec user
 Detector name : GAMMA32 Counting geometry: CAN
 Effic. cal. time : 6-AUG-2015 09:24:00. Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	33.23	10542	14025	1.87	67.55	64	9	2.93E+00	2.3	
2	0	46.40	14243	30606	1.18	93.89	89	10	3.96E+00	2.4	
3	0	59.40	47159	40736	1.14	119.89	113	14	1.31E+01	1.0	
4	0	66.26	184	18584	0.67	133.62	132	6	5.12E-02	116.9	
5	8	70.79	1275	16467	1.14	142.69	140	11	3.54E-01	15.4	4.06E+00
6	8	72.89	2233	19898	1.01	146.88	140	11	6.20E-01	10.2	
7	5	83.66	5913	37824	1.88	168.42	160	24	1.64E+00	6.3	2.24E+02
8	5	88.03	160990	23064	1.26	177.17	160	24	4.47E+01	0.3	
9	0	122.06	95382	32875	1.20	245.25	238	14	2.65E+01	0.5	
10	0	136.50	11770	20337	1.19	274.13	270	10	3.27E+00	2.4	
11	0	165.88	91899	23368	1.24	332.91	327	13	2.55E+01	0.5	
12	0	255.14	2890	12954	1.34	511.46	507	10	8.03E-01	7.6	
13	0	279.21	41614	13640	1.29	559.62	553	12	1.16E+01	0.7	
14	0	359.20	163	7225	1.31	719.65	717	8	4.53E-02	90.6	
15	0	391.70	65453	12756	1.41	784.67	777	15	1.82E+01	0.5	
16	0	449.04	25	5502	0.71	899.38	896	7	6.96E-03	491.3	
17	0	510.98	6924	12227	2.59	1023.28	1014	18	1.92E+00	3.9	
18	0	643.42	140	5457	1.48	1288.23	1286	8	3.88E-02	91.8	
19	0	661.63	58845	8839	1.56	1324.68	1318	13	1.63E+01	0.5	
20	0	677.81	242	4608	1.38	1357.04	1354	7	6.73E-02	46.9	
21	0	738.26	159	3832	1.02	1477.97	1475	7	4.42E-02	65.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	810.36	106	6303	0.92	1622.21	1614	12	2.95E-02	149.7	
23	0	814.17	909	5413	1.56	1629.83	1625	10	2.52E-01	15.5	
24	0	898.03	71955	9323	1.70	1797.61	1791	14	2.00E+01	0.5	
25	0	933.92	133	4348	1.02	1869.40	1866	8	3.70E-02	86.1	
26	0	956.56	160	3107	1.46	1914.70	1912	6	4.45E-02	55.6	
27	0	1083.31	132	2715	1.39	2168.29	2165	8	3.66E-02	69.2	
28	0	1115.54	59501	5585	1.82	2232.76	2226	17	1.65E+01	0.5	
29	0	1173.22	64995	3923	1.85	2348.17	2338	19	1.81E+01	0.5	
30	0	1246.37	52	1089	1.37	2494.52	2493	9	1.44E-02	115.2	
31	0	1293.37	81	923	1.70	2588.55	2586	8	2.25E-02	65.8	
32	0	1311.25	101	655	1.45	2624.32	2622	6	2.81E-02	41.2	
33	0	1314.93	61	1107	1.27	2631.68	2629	9	1.69E-02	99.3	
34	6	1325.18	1698	2131	3.41	2652.19	2643	33	4.72E-01	7.1	5.18E+00
35	6	1332.50	58428	1595	1.96	2666.83	2643	33	1.62E+01	0.4	
36	0	1481.29	104	968	1.79	2964.51	2962	8	2.89E-02	52.7	
37	0	1765.61	36	568	5.17	3533.35	3524	14	1.00E-02	141.1	
38	0	1836.07	44418	817	2.16	3674.32	3663	23	1.23E+01	0.5	
39	0	1977.39	16	174	0.79	3957.07	3952	9	4.35E-03	158.6	

```

*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road       *
*               Charleston, SC 29407   *
*                                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM32_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM32.CNF;213
                   Background date   : 2-AUG-2015 12:47:18.
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 6-AUG-2015 09:24:29.
Sample ID        : VER_GAM32_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM32              Detector geometry: CAN
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:39.50  1.1%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID         :                    Detector SN#       :
Matrix Spike ID  :                    LCS ID            :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	32.80	4017	1846	1.18	66.69	64	9	1.12E+00	2.8	6.32E+01
2	4	33.96	2438	7863	1.49	69.00	64	9	6.77E-01	6.5	
3	0	37.80	109	11032	0.53	76.68	76	6	3.04E-02	152.3	
4	0	46.39	15284	17227	1.10	93.87	88	10	4.25E+00	1.8	
5	9	57.98	3196	14984	2.64	117.05	113	12	8.88E-01	8.4	1.57E+01
6	9	59.55	43640	9510	1.08	120.19	113	12	1.21E+01	0.6	
7	0	88.03	92970	21627	1.16	177.17	171	13	2.58E+01	0.5	
8	0	122.08	37966	12671	1.19	245.28	239	13	1.05E+01	0.8	
9	0	136.48	4646	8777	1.20	274.09	269	11	1.29E+00	4.2	
10	0	165.89	15294	7727	1.24	332.92	327	11	4.25E+00	1.4	
11	0	177.79	160	3822	1.36	356.73	354	6	4.43E-02	61.9	
12	0	245.21	135	5127	1.36	491.61	488	8	3.74E-02	92.5	
13	0	254.70	129	4487	0.80	510.59	509	7	3.59E-02	86.4	
14	0	278.47*	147	4536	0.58	558.14	556	8	4.10E-02	79.5	
15	0	310.59	148	3646	1.34	622.40	620	7	4.10E-02	68.4	
16	0	322.34	78	3968	1.12	645.91	643	8	2.17E-02	140.3	
17	0	391.66	7773	5799	1.33	784.58	778	13	2.16E+00	2.3	
18	0	432.98	123	3620	1.29	867.25	865	8	3.41E-02	85.3	
19	0	495.03	228	3330	2.07	991.39	988	9	6.33E-02	46.2	
20	0	510.97*	2296	4896	2.57	1023.26	1016	14	6.38E-01	6.8	
21	0	646.70	140	2240	1.67	1294.80	1292	8	3.88E-02	59.1	
22	0	661.64*	59519	4689	1.55	1324.68	1316	16	1.65E+01	0.5	
23	0	691.66	83	2235	1.39	1384.74	1382	8	2.30E-02	99.3	
24	0	870.16	193	2610	2.96	1741.86	1739	8	5.35E-02	46.4	
25	0	881.42	156	2593	1.55	1764.39	1761	8	4.34E-02	57.0	
26	0	898.08	6836	5418	1.73	1797.70	1791	14	1.90E+00	2.6	
27	0	946.90	135	2922	1.32	1895.38	1892	8	3.74E-02	70.1	
28	0	1017.83	158	2136	0.89	2037.27	2034	9	4.38E-02	53.4	
29	0	1064.03	57	1853	0.96	2129.72	2129	8	1.58E-02	131.7	
30	0	1115.53	21191	3594	1.79	2232.74	2224	17	5.89E+00	0.9	
31	0	1173.21	57613	2474	1.87	2348.15	2338	19	1.60E+01	0.5	
32	0	1238.29	81	327	2.15	2478.34	2475	7	2.26E-02	38.7	
33	0	1276.48	61	348	3.05	2554.75	2551	9	1.70E-02	56.6	
34	2	1324.99	187	505	2.33	2651.81	2641	35	5.20E-02	28.0	5.57E+00

Peak Search Report (continued)

Page : 2

Sample ID : VER_GAM32_CAN

Acquisition date : 6-AUG-2015 09:24:29

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	2	1332.48	52212	486	1.93	2666.79	2641	35	1.45E+01	0.4	
36	0	1482.86	37	220	0.68	2967.66	2965	10	1.03E-02	76.0	
37	0	1574.16	9	268	0.61	3150.31	3146	10	2.57E-03	332.3	
38	0	1596.15	42	324	1.03	3194.31	3189	13	1.18E-02	88.5	
39	0	1618.36	50	232	1.28	3238.74	3233	12	1.38E-02	63.7	
40	0	1836.05	4251	248	2.16	3674.29	3665	21	1.18E+00	1.8	
41	0	1925.35	97	232	13.52	3852.96	3829	33	2.70E-02	48.7	
42	0	1939.39	125	281	14.42	3881.04	3862	43	3.48E-02	46.6	
43	0	1961.53	33	132	4.54	3925.34	3923	15	9.24E-03	76.3	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	37966	85.60*	6.267E+00	5.313E+03	1.863E+04	1.60
	136.47	4646	10.68	6.220E+00	5.251E+03	1.842E+04	8.35
CO-60	1173.23	57613	99.85	1.364E+00	3.176E+04	3.791E+04	0.93
	1332.49	52212	99.98*	1.213E+00	3.233E+04	3.859E+04	0.89
ZN-65	1115.54	21191	50.60*	1.430E+00	2.198E+04	8.888E+04	1.89
Y-88	898.04	6836	93.70	1.751E+00	3.128E+03	7.657E+04	5.17
	1836.06	4251	99.20*	9.581E-01	3.358E+03	8.218E+04	3.59
CD-109	88.03	92970	3.70*	5.034E+00	3.747E+05	7.846E+05	0.93
SN-113	391.70	7773	64.97*	3.315E+00	2.710E+03	5.243E+04	4.63
CS-137	661.66	59519	85.10*	2.272E+00	2.311E+04	2.384E+04	0.97
CE-139	165.86	15294	80.00*	5.801E+00	2.474E+03	2.946E+04	2.75
PB-210	46.54	15284	4.25*	3.337E-01	8.091E+05	8.438E+05	3.60
AM-241	59.54	43640	35.90*	1.626E+00	5.614E+04	5.626E+04	1.22

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM32.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 2-AUG-2015 12:47:18 Acquisition date : 2-AUG-2015 12:47:18
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:05.01

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.4089E+00	-0.04	
[1.40960+/-0.01668]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 6 / 6 / 15

Page : 1
Sample ID : Bkg Acquisition date : 2-AUG-2015 12:47:18
VMS Gamma Spectroscopy Report generated 3-AUG-2015 05:27:20
Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM32___338739.CNF;1

----- Sample Information -----
Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 338739 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user
----- Sample Deposition Information -----
Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 2-AUG-2015 12:47:18.

----- Sample Decay/Count Information -----
Sample Date : 2-AUG-2015 12:47:18. Acquisition date : 2-AUG-2015 12:47:18.
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:05.01

----- Detector Parameters -----
Energy cal. time : 19-AUG-2013 08:53:09 Energy cal. oper.: gamma spec user
Detector name : GAMMA32 Counting geometry:
Effic. cal. time : 7-AUG-2014 07:44:09. Effic. cal. oper.: gamma spec user

----- Processing Parameters -----
Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.08	93	947	1.12	127.69	123	11	1.55E-03	64.9	
2	0	92.67	572	786	1.33	186.86	183	9	9.54E-03	9.8	
3	0	162.80	127	633	0.68	327.10	324	9	2.11E-03	36.8	
4	0	171.86	38	450	0.88	345.21	343	6	6.42E-04	88.9	
5	0	185.78	499	675	1.11	373.06	369	9	8.31E-03	10.4	
6	0	197.51	64	672	1.73	396.51	394	9	1.06E-03	74.5	
7	0	215.19	40	345	1.29	431.87	430	6	6.67E-04	75.2	
8	0	238.71	198	584	1.17	478.89	474	9	3.30E-03	23.1	
9	0	279.36	83	414	0.69	560.18	557	8	1.38E-03	44.1	
10	0	352.50	86	379	1.46	706.44	701	10	1.44E-03	43.5	
11	0	402.82	97	364	2.28	807.07	801	13	1.62E-03	41.8	
12	0	415.48	21	243	1.31	832.37	831	8	3.43E-04	133.6	
13	0	452.66	47	206	3.76	906.74	903	9	7.91E-04	56.3	
14	0	511.22	1141	510	2.38	1023.84	1017	18	1.90E-02	5.6	
15	0	570.49	33	207	1.01	1142.36	1136	9	5.52E-04	80.5	
16	0	573.23	30	158	1.08	1147.84	1144	8	5.04E-04	74.5	
17	0	583.20	66	182	1.16	1167.76	1164	9	1.10E-03	38.9	
18	0	609.44	99	327	1.19	1220.23	1213	13	1.64E-03	39.2	
19	0	641.85	54	110	0.89	1285.05	1281	8	8.97E-04	36.6	

20	0	661.73	51	96	2.25	1324.81	1321	8	8.44E-04	36.4
21	0	803.94	49	175	3.23	1609.19	1602	13	8.11E-04	58.3
22	0	850.02	37	86	1.80	1701.33	1698	8	6.18E-04	46.6
23	0	863.94	10	99	1.06	1729.18	1727	8	1.63E-04	180.6
24	0	911.52	94	121	2.05	1824.32	1818	16	1.57E-03	28.0
25	0	969.99	39	150	0.73	1941.24	1934	15	6.52E-04	71.4
26	0	1001.39	38	89	1.09	2004.03	2000	9	6.26E-04	48.3
27	0	1054.16	39	101	1.51	2109.56	2102	13	6.57E-04	55.5
28	0	1409.62	13	38	0.78	2820.39	2815	9	2.09E-04	93.3
29	0	1425.13	15	52	2.33	2851.41	2843	11	2.47E-04	98.1
30	0	1461.85	68	82	1.84	2924.84	2920	14	1.13E-03	30.1
31	0	1721.52	14	15	1.44	3444.14	3441	6	2.39E-04	50.1
32	0	1738.33	15	36	3.20	3477.74	3468	12	2.46E-04	87.9
33	0	1766.00	42	34	1.65	3533.07	3527	14	7.03E-04	33.4
34	0	1821.63	11	19	1.26	3644.31	3640	8	1.82E-04	76.8
35	0	1954.09	22	25	3.68	3909.21	3896	16	3.67E-04	54.3
36	0	1978.18	15	28	0.86	3957.40	3951	11	2.51E-04	74.7

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 32

Calibration Date: 8/6/2015

Geometry: CAN

Manufacturer Standard Id: 1701

GEL Standard Id: 96485

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.626E+04	-0.55
Cs-137	661.7	0.851	735.7	2.3365E+04	2.384E+04	2.03
Co-60	1173.2	0.9985	1383	3.7435E+04	3.791E+04	1.27
Co-60	1332.5	0.9998	1385	3.7440E+04	3.859E+04	3.07

Prepared By: R. Furey

Date: 8/6/15

Reviewed By: M. J. Tampr

Date: 8/14/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 32

Date Performed: 8/6/15

Performed By: RF

High Voltage Power Supply Model No. <u>31060</u> High Voltage <u>4.85</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>5</u> Fine Gain <u>0.918</u> Time Constant <u>6.448</u> Input polarity <u>Positive</u> BSLR rate <u>no</u> BSLR mode <u>no</u> Threshold <u>no</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>10556</u> Address <u>226:1</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamme 33

Geometry: Can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1782
the secondard standard(s) documentation?	☒		1738
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. Futen

Date: 6/10/16

Reviewed By: M. Stamp

Date: 6/10/16

Effective Date: 6/10/16

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 103141B
Source Description: 100 mL Solid in Aluminum Can
Product Code: 8403-EG-SD
Customer: GEL Laboratories, LLC
P.O. Number: GEL1613700, Item 3

This standard radionuclide source was prepared from an aliquot measured gravimetrically from a master radionuclide solution calibrated with a germanium gamma-ray spectrometer system. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using germanium gamma-ray spectrometry. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Density of solid matrix: 1.17 g/cm³ ± 3 %.

Reference Date: 01-April-2016 12:00 PM EST

MGS Mixture

Isotope	Gamma-Ray Energy, keV	Half-Life, d	Activity, Bq	Flux, s ⁻¹	Uncertainty			Calibration Method**
					u _A , %	u _B , %	U, %*	
Pb-210	46.5	8.109E+03	2.877E+04	1.223E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	2.262E+03	8.120E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	3.136E+04	1.160E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	7.785E+02	6.664E+02	0.4	1.7	3.4	HPGe
Ce-139	165.9	1.376E+02	1.086E+03	8.688E+02	0.4	1.7	3.6	HPGe
Hg-203	279.2	4.659E+01	2.635E+03	2.149E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.161E+02	1.893E+03	1.230E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	9.294E+02	7.909E+02	0.7	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	3.113E+03	2.917E+03	0.7	1.7	3.7	HPGe
Y-88	1836.1			3.089E+03	0.7	1.7	3.7	
Co-60	1173.2	1.925E+03	1.460E+03	1.458E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5			1.459E+03	0.7	1.8	3.9	

Mixed Gamma (MGS) master solution is EZA's eight isotope mixture which is calibrated quarterly and consists of Cd-109, Co-57, Ce-139, Hg-203, Sn-113, Cs-137, Y-88, and Co-60. *Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." **Calibration Methods: 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

SRS Number: 103141B

This source was wipe tested in its inactive areas with leak test results $< 185 \text{ Bq}$ (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by: 
Z. Dimitrova, Radiochemist

QC Approved by:  Date: 13-MAY-16
J. Lahr, Spectroscopist

Standard Logbook

Serial ID: 1782 **Open/Reference Date:** 01-APR-16
Name: Mixed Gamma CAN **Received:** 01-APR-16
Type: Source Material **Expires:** 01-APR-17
Employee: Maggie Stamps **Verified:** 20-MAY-16
Supplier: Eckert & Zeigler Analytics
Description: 103141B
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2018

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty* , %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.6	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.253E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.161E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-66	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffin
J. S. Laffin, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738 **Open/Reference Date:** 01-APR-15
Name: Mixed Gamma CAN **Received:** 01-APR-15
Type: Source Material **Expires:** 01-APR-41
Employee: Maggie Stamps **Verified:** 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte	Concentration	Analyte	Concentration

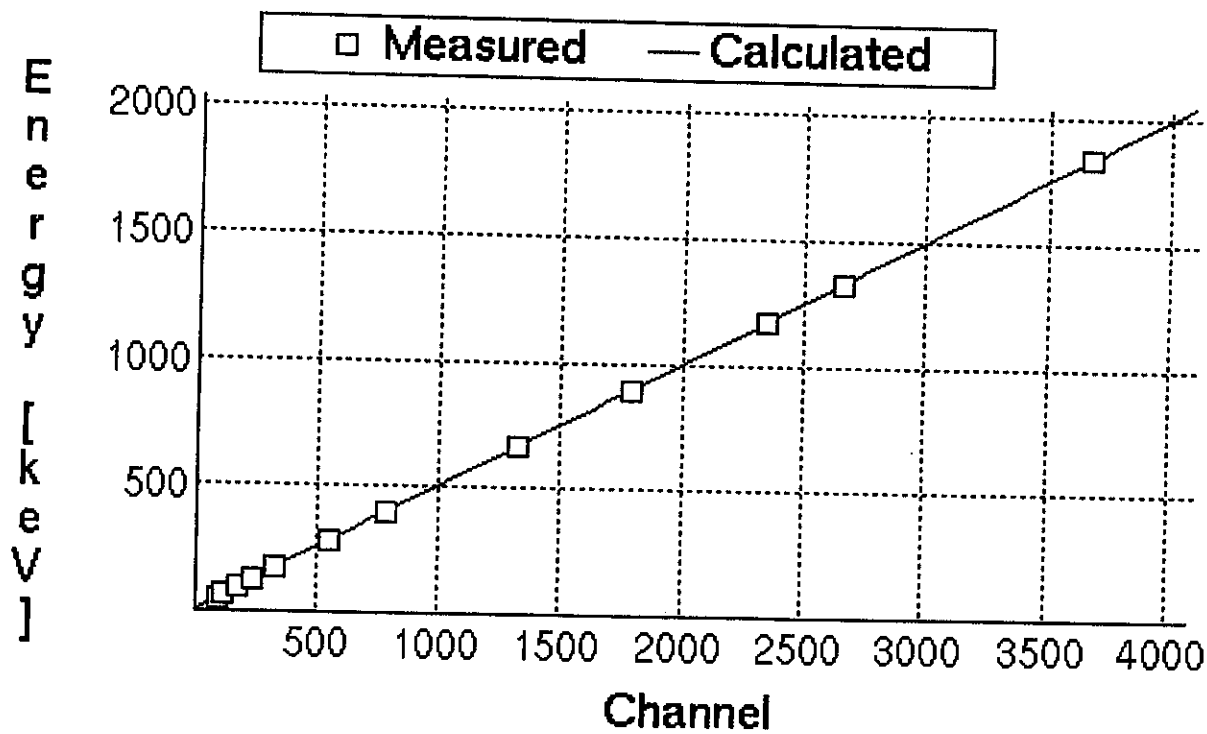
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 103141B
Quantity: 1.00

Assay date: 1-APR-2016 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1223	4.20	4.3	Yes
AM-241	432.60Y	59.5	812	3.60	35.9	Yes
CD-109	461.40D	88.0	1160	4.10	3.7	Yes
CO-57	271.74D	122.1	666	3.40	85.6	Yes
CE-139	137.64D	165.9	869	3.60	80.0	Yes
HG-203	46.59D	279.2	2149	3.50	81.6	Yes
SN-113	115.09D	391.7	1230	3.90	65.0	Yes
CS-137	30.08Y	661.7	791	4.10	85.1	Yes
Y-88	106.63D	898.0	2917	3.70	93.7	Yes
CO-60	1925.28D	1173.2	1458	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1459	3.90	100.0	Yes
Y-88	106.63D	1836.1	3089	3.70	99.2	Yes



Datasource:

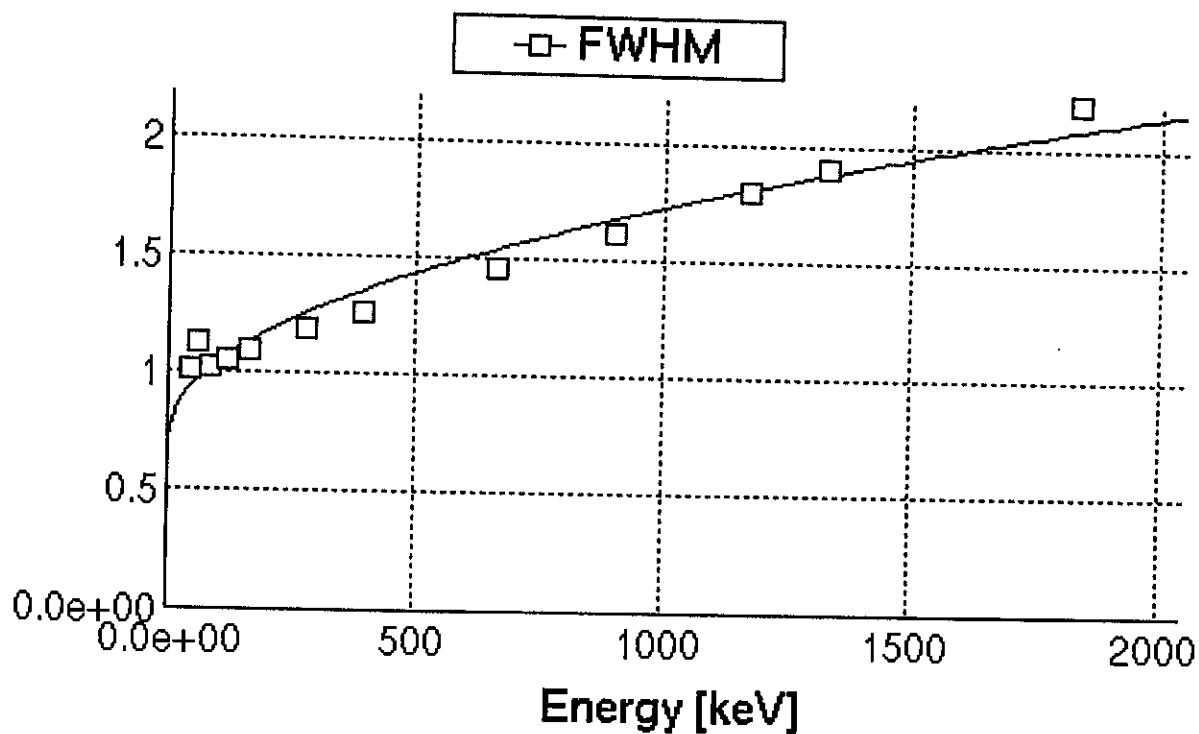
Energy = $-1.465e-01$ keV + $5.007e-01$ *Ch + $-2.012e-07$ *Ch² [CHISQ = $3.246e-02$]

FWHM = $7.274e-01$ keV + $3.174e-02$ *E^{1/2} [CHISQ = $6.656e-03$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

gam33 Energy Calibration

5/11/16

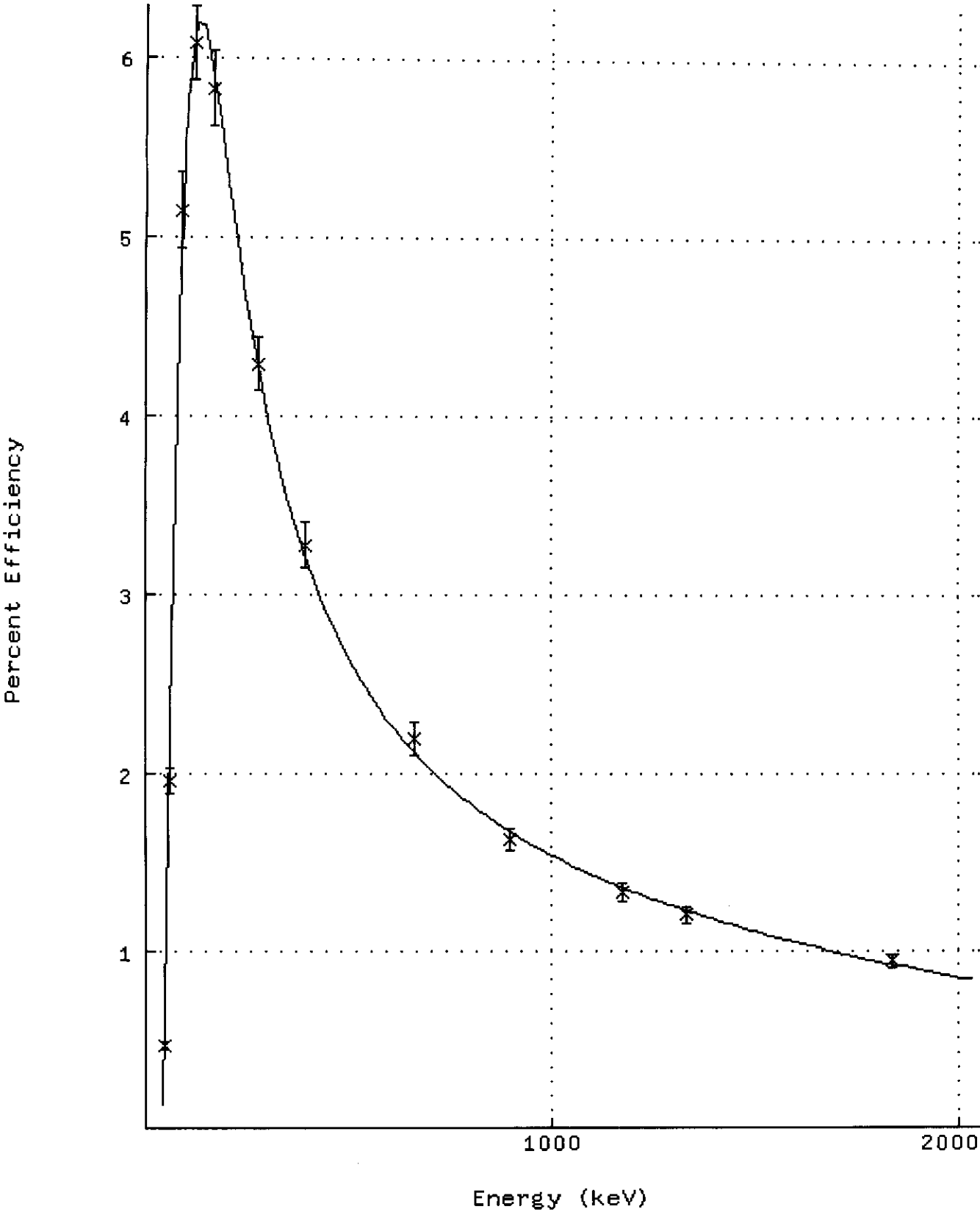


Datasource:

Energy = $-1.465e-01 \text{ keV} + 5.007e-01 * \text{Ch} + -2.012e-07 * \text{Ch}^2$ [CHISQ = $3.246e-02$]
 FWHM = $7.274e-01 \text{ keV} + 3.174e-02 * E^{1/2}$ [CHISQ = $6.656e-03$]
 Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

gam33 Shape Calibration
 5/11/16

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM33_CAN.CNF; 8
Calib Date: 10-JUN-2016 07:00
Detector : GAMMA33 Geometry : CAN
Fit type : 5 Deg. Linear



$$\text{Energy} = -0.1465 + 0.5007 * \text{Channel} + -2.0121\text{E-}07 * (\text{Channel} ** 2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.33	46.54	46.59	-0.048
2	119.25	59.54	59.57	-0.026
3	176.17	88.03	88.06	-0.035
4	244.05	122.06	122.05	0.012
5	331.48	165.86	165.82	0.043
6	557.87	279.20	279.14	0.059
7	782.79	391.70	391.71	-0.006
8	1322.27	661.66	661.62	0.044
9	1794.91	898.04	897.99	0.050
10	2345.63	1173.23	1173.30	-0.068
11	2664.32	1332.49	1332.56	-0.071
12	3672.31	1836.06	1836.01	0.046

FWHM Calibration Report

$$\text{FWHM} = 0.7274 + 3.1739\text{E-}02 * (\text{Energy} ** 1/2)$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.01	0.94	0.066
2	59.54	1.13	0.97	0.153
3	88.03	1.02	1.03	-0.001
4	122.06	1.05	1.08	-0.023
5	165.86	1.09	1.14	-0.042
6	279.20	1.19	1.26	-0.066
7	391.70	1.27	1.36	-0.086
8	661.66	1.46	1.54	-0.081
9	898.04	1.62	1.68	-0.057
10	1173.23	1.81	1.81	-0.006
11	1332.49	1.91	1.89	0.023
12	1836.06	2.21	2.09	0.120

Efficiency Calibration Report

Sample ID : 103141B

Page : 4

Acquisition date : 9-JUN-2016 13:21:16

$$\text{Eff} = \exp(a1 \cdot E + a2 + a3/E + a4/E^{**2} + a5/E^{**3} + a6/E^{**4} + a7/E^{**5})$$

a1	a2	a3	a4	a5	a6	a7
-1.6717E-04	-1.836	211.8	-2.2363E+04	8.8655E+05	-1.6437E+07	0.0000E+00

Reduced Chi-Square = 0.623

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	4.73E-03	2.14E-04	4.72E-03	0.07	0.31
2	59.54	1.95E-02	7.23E-04	1.97E-02	-0.28	-1.02
3	88.03	5.14E-02	2.11E-03	4.96E-02	0.85	3.49
4	122.06	6.07E-02	2.08E-03	6.18E-02	-0.53	-1.82
5	165.86	5.82E-02	2.10E-03	5.93E-02	-0.50	-1.82
6	279.20	4.29E-02	1.51E-03	4.24E-02	0.32	1.14
7	391.70	3.28E-02	1.28E-03	3.22E-02	0.46	1.82
8	661.66	2.19E-02	9.06E-04	2.11E-02	0.84	3.46
9	898.04	1.63E-02	6.04E-04	1.67E-02	-0.75	-2.80
10	1173.23	1.33E-02	5.23E-04	1.36E-02	-0.47	-1.83
11	1332.49	1.20E-02	4.71E-04	1.22E-02	-0.49	-1.90
12	1836.06	9.45E-03	3.52E-04	9.24E-03	0.60	2.23

VMS Gamma Spectroscopy Report generated 10-JUN-2016 11:12:18

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM33_CAN_373196.CNF

---- Sample Information ----

Sample Title : CAN 103141B
 Sample ID : 103141B Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 373173 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2016 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2016 12:00:00. Acquisition date : 9-JUN-2016 13:21:16.
 Decay time : 69 01:21:16.66 % dead time : 4.7%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:02:58.81

---- Detector Parameters ----

Energy cal. time : 11-MAY-2016 13:17:27 Energy cal. oper.: gamma spec user
 Detector name : GAMMA33 Counting geometry: CAN
 Effic. cal. time : 10-JUN-2016 07:00:49 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : LINEAR Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.53	20265	31550	1.09	93.21	88	9	5.63E+00	1.7	
2	0	59.54	57231	43033	1.09	119.19	113	12	1.59E+01	0.8	
3	0	66.47	632	23001	1.13	133.04	131	6	1.76E-01	38.0	
4	4	69.91	1038	20207	1.45	139.92	138	12	2.88E-01	21.4	1.56E+02
5	4	72.87	7992	28288	1.20	145.83	138	12	2.22E+00	3.7	
6	8	83.07	7512	55914	2.18	166.19	160	23	2.09E+00	6.4	1.57E+02
7	8	85.76	7702	44933	1.81	171.57	160	23	2.14E+00	7.0	
8	8	88.10	193448	24604	1.13	176.24	160	23	5.37E+01	0.3	
9	0	102.62	461	19361	1.80	205.24	203	6	1.28E-01	47.9	
10	0	122.07	123176	37155	1.08	244.10	238	12	3.42E+01	0.4	
11	0	136.46	15528	24946	1.08	272.84	268	9	4.31E+00	2.0	
12	0	144.04	363	15432	0.91	287.97	286	6	1.01E-01	54.4	
13	3	162.81	771	4952	1.37	325.47	324	16	2.14E-01	11.1	1.59E+01
14	3	165.86	128585	15366	1.11	331.57	324	16	3.57E+01	0.3	
15	0	255.14	4319	13290	1.25	509.92	506	9	1.20E+00	5.0	
16	0	279.21	119640	16173	1.23	558.02	551	13	3.32E+01	0.4	
17	0	305.71	177	5878	1.06	610.95	609	6	4.91E-02	69.1	
18	0	391.81	96431	12357	1.31	783.00	776	14	2.68E+01	0.4	
19	0	412.48	157	5413	1.54	824.30	821	7	4.36E-02	78.1	
20	0	511.20	1602	9110	2.45	1021.60	1015	13	4.45E-01	12.5	
21	0	567.77	103	4926	1.57	1134.66	1133	8	2.87E-02	118.1	

Peak Search Report (continued)

Sample ID : 103141B

Page : 2

Acquisition date : 9-JUN-2016 13:21:16

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	661.80	62563	10684	1.49	1322.63	1315	15	1.74E+01	0.5	
23	0	731.42	229	4014	1.92	1461.82	1459	8	6.36E-02	48.4	
24	0	814.36	1627	5456	1.68	1627.67	1622	13	4.52E-01	9.7	
25	0	898.25	109614	7998	1.64	1795.44	1787	17	3.04E+01	0.4	
26	0	1094.63	99	2947	1.14	2188.24	2184	8	2.75E-02	95.4	
27	0	1173.65	68699	3792	1.84	2346.33	2338	17	1.91E+01	0.4	
28	0	1268.08	60	1232	0.65	2535.27	2532	8	1.65E-02	103.2	
29	0	1292.33	89	1166	1.63	2583.82	2581	8	2.46E-02	67.5	
30	0	1296.99	132	1310	1.36	2593.13	2589	9	3.66E-02	50.4	
31	5	1325.41	2162	3022	2.96	2650.01	2640	35	6.01E-01	6.2	1.70E+00
32	5	1332.96	61546	1776	1.90	2665.12	2640	35	1.71E+01	0.4	
33	0	1836.57	67523	885	2.17	3673.43	3662	23	1.88E+01	0.4	

VAX/VMS Nuclide Identification Report Generated 10-JUN-2016 07:56:24.07

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM33_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM33_CAN.CNF;217
Background date    : 5-JUN-2016 12:12:18.
Sample date       : 1-APR-2015 12:00:00. Acquisition date : 10-JUN-2016 07:25:16
Sample ID        : VER_GAM33_CAN      Sample quantity  : 1.00000E+00 SAMPLE
Detector name    : GAM33              Detector geometry: CAN
Elapsed live time: 0 00:30:00.00      Elapsed real time: 0 00:30:36.89 2.0%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID        :                     Detector SN#      :
Matrix Spike ID :                     LCS ID           :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.54	9511	8915	1.10	93.24	88	10	5.28E+00	2.1	
2	0	59.58	26247	9790	1.09	119.28	114	11	1.46E+01	1.0	
3	0	79.13	131	4927	0.89	158.34	156	5	7.25E-02	81.0	
4	0	88.10	51612	9823	1.06	176.25	171	11	2.87E+01	0.6	
5	0	122.10	21833	6304	1.06	244.15	238	12	1.21E+01	1.0	
6	0	136.47	2931	4407	1.08	272.87	267	11	1.63E+00	4.8	
7	0	165.90	9554	4162	1.14	331.64	326	11	5.31E+00	1.7	
8	0	255.32	242	2246	1.17	510.28	507	7	1.35E-01	33.1	
9	0	279.54*	152	1772	1.16	558.68	556	6	8.44E-02	44.6	
10	0	337.79*	126	1671	0.85	675.06	673	7	7.01E-02	54.3	
11	0	391.92	5084	2593	1.28	783.22	778	11	2.82E+00	2.4	
12	0	510.96*	1117	3163	2.62	1021.12	1014	17	6.21E-01	11.9	
13	0	661.95	28653	2120	1.49	1322.95	1316	14	1.59E+01	0.7	
14	0	805.51	72	1158	1.21	1609.97	1606	8	4.02E-02	82.5	
15	0	821.41	130	1408	0.85	1641.77	1639	9	7.20E-02	52.9	
16	0	864.29	37	1747	0.83	1727.52	1722	10	2.03E-02	214.9	
17	0	898.44	4986	2201	1.63	1795.82	1790	12	2.77E+00	2.4	
18	0	1002.66*	94	835	0.88	2004.26	2002	7	5.20E-02	52.3	
19	0	1006.42	120	977	1.93	2011.78	2009	8	6.69E-02	45.8	
20	0	1116.19	12610	1745	1.76	2231.37	2224	17	7.01E+00	1.2	
21	0	1173.89	29241	785	1.76	2346.82	2340	14	1.62E+01	0.6	
22	0	1221.25	60	383	3.55	2441.57	2436	15	3.32E-02	72.9	
23	0	1325.20	38	265	1.45	2649.59	2645	10	2.11E-02	81.8	
24	0	1333.24	26348	393	1.86	2665.68	2657	17	1.46E+01	0.6	
25	0	1384.57	53	243	5.47	2768.42	2756	22	2.94E-02	76.9	
26	0	1444.20	23	179	5.76	2887.77	2881	16	1.28E-02	131.4	
27	0	1745.43	38	120	6.38	3490.89	3471	24	2.13E-02	77.2	
28	0	1836.95	2973	103	2.16	3674.18	3664	19	1.65E+00	2.0	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	21833	85.60*	6.184E+00	6.193E+03	1.882E+04	1.99
	136.47	2931	10.68	6.221E+00	6.624E+03	2.013E+04	9.52
CO-60	1173.23	29241	99.85	1.356E+00	3.242E+04	3.793E+04	1.24
	1332.49	26348	99.98*	1.224E+00	3.234E+04	3.783E+04	1.28
ZN-65	1115.54	12610	50.60*	1.412E+00	2.651E+04	9.140E+04	2.35
Y-88	898.04	4986	93.70	1.671E+00	4.782E+03	8.128E+04	4.71
	1836.06	2973	99.20*	9.238E-01	4.871E+03	8.279E+04	4.02
CD-109	88.03	51612	3.70*	4.965E+00	4.219E+05	8.119E+05	1.16
SN-113	391.70	5084	64.97*	3.215E+00	3.654E+03	5.043E+04	4.79
CS-137	661.66	28653	85.10*	2.114E+00	2.391E+04	2.458E+04	1.36
CE-139	165.86	9554	80.00*	5.927E+00	3.025E+03	2.716E+04	3.32
HG-203	70.83	-----	3.69	3.364E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.591E+00	-----	Line Not Found	-----
	279.20	152	81.56*	4.232E+00	6.609E+01	4.326E+04	89.20
PB-210	46.54	9511	4.25*	4.721E-01	7.118E+05	7.388E+05	4.25
AM-241	59.54	26247	35.90*	1.980E+00	5.544E+04	5.554E+04	1.92

Flag: "*" = Keyline

Sample ID : Bkg Acquisition date : 5-JUN-2016 12:12:18 Page : 1

VMS Gamma Spectroscopy Report generated 6-JUN-2016 04:52:57

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM33__372568.CN

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 372568 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 5-JUN-2016 12:12:18.

---- Sample Decay/Count Information ----

Sample Date : 5-JUN-2016 12:12:18. Acquisition date : 5-JUN-2016 12:12:18.
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:10.88

---- Detector Parameters ----

Energy cal. time : 11-MAY-2016 13:17:27 Energy cal. oper.: gamma spec user
Detector name : GAMMA33 Counting geometry:
Effic. cal. time : 18-AUG-2015 11:56:25 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.31	331	708	1.06	126.73	123	8	5.52E-03	14.9	
2	0	74.02	106	839	1.98	148.12	144	9	1.76E-03	50.3	
3	0	84.20	221	701	2.10	168.45	164	9	3.69E-03	22.6	
4	0	92.91	1311	1049	1.20	185.85	181	12	2.19E-02	5.7	
5	0	98.44	82	530	0.93	196.89	194	7	1.37E-03	47.8	
6	0	112.90	85	570	1.46	225.77	223	7	1.41E-03	48.1	
7	0	143.79	154	643	1.03	287.47	284	8	2.57E-03	29.7	
8	0	185.80	994	860	1.19	371.40	365	13	1.66E-02	6.9	
9	0	197.26	284	932	2.56	394.30	387	14	4.73E-03	23.6	
10	0	205.01	81	390	0.78	409.77	407	6	1.36E-03	39.9	
11	0	238.58	290	561	1.23	476.83	473	9	4.84E-03	15.8	
12	0	278.81	102	359	2.20	557.22	553	8	1.70E-03	33.7	
13	0	294.70	68	343	2.17	588.95	586	8	1.14E-03	48.6	
14	0	339.17	28	375	0.60	677.81	673	8	4.72E-04	119.9	
15	0	351.93	66	304	1.01	703.30	700	8	1.10E-03	47.7	
16	0	361.89	61	304	1.84	723.21	719	9	1.01E-03	53.1	
17	0	511.22	1377	464	2.63	1021.63	1014	18	2.30E-02	4.6	
18	0	547.04	48	137	0.69	1093.23	1090	7	7.97E-04	43.4	
19	0	550.36	40	145	1.39	1099.88	1096	8	6.62E-04	55.0	

20	0	558.34	57	176	1.14	1115.82	1111	10	9.48E-04	45.5
21	0	583.29	119	208	1.48	1165.69	1160	10	1.98E-03	24.6
22	0	587.22	34	138	0.53	1173.55	1170	8	5.71E-04	61.8
23	0	610.08	95	248	2.49	1219.24	1214	11	1.59E-03	34.0
24	0	767.59	47	156	1.68	1534.14	1527	11	7.77E-04	54.0
25	0	803.03	46	90	1.53	1605.01	1602	7	7.68E-04	37.1
26	0	841.44	22	73	0.93	1681.83	1679	6	3.70E-04	64.5
27	0	911.83	48	143	1.55	1822.59	1817	12	7.92E-04	52.5
28	0	964.06	34	160	0.67	1927.06	1917	16	5.67E-04	84.9
29	0	970.51	87	113	3.20	1939.96	1933	14	1.45E-03	28.2
30	0	1002.11	78	164	1.52	2003.16	1995	17	1.31E-03	39.2
31	0	1017.05	15	83	1.51	2033.04	2026	9	2.46E-04	117.3
32	0	1046.14	94	186	7.50	2091.24	2078	26	1.56E-03	41.4
33	0	1067.92	51	176	9.00	2134.81	2123	22	8.51E-04	68.6
34	0	1238.18	23	49	3.33	2475.46	2469	10	3.91E-04	59.9
35	0	1461.47	124	59	1.72	2922.34	2915	13	2.06E-03	15.6
36	0	1517.77	23	60	3.16	3035.04	3025	15	3.83E-04	76.3
37	0	1567.09	19	40	0.75	3133.78	3128	11	3.15E-04	69.5
38	0	1613.59	22	16	1.31	3226.89	3221	9	3.69E-04	38.7
39	0	1829.60	76	63	8.17	3659.46	3639	36	1.27E-03	34.8
40	0	1946.10	28	11	2.00	3892.82	3887	11	4.67E-04	29.7
41	0	2033.63	21	107	11.82	4068.18	4039	33	3.56E-04	153.8

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM33.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 5-JUN-2016 12:12:18 Acquisition date : 5-JUN-2016 12:12:18
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:10.88

Out-of-range Test: N-SIGMA

Parameter Description [Mean+/-Stdev]	Value	Deviation	Flag
*Spectrum Background Rate [1.38624+/-0.01253]	1.4639E+00	6.20	Action

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 6 / 10 / 16

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 33

Calibration Date: 6/9/2016

Geometry: CAN

Manufacturer Standard Id: 100218

GEL Standard Id: 1738

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	760.8	5.7276E+04	5.554E+04	-3.03
Cs-137	661.7	0.851	740.9	2.3530E+04	2.458E+04	4.46
Co-60	1173.2	0.9985	1405	3.8030E+04	3.793E+04	-0.26
Co-60	1332.5	0.9998	1407	3.8035E+04	3.783E+04	-0.54

Prepared By: R. F. W. H.

Date: 6/10/16

Reviewed By: M. Stamp

Date: 6/10/16

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

High Voltage Power Supply Module

Address: NI82E4:1 Type: DSA-2000 ID: 0

Limit:	4500.000	Overload latch enable	No
Voltage:	4500.000	Inhibit latch enable	No
Status:	On	Negative Output polarity	No
5V/12V inhibit:	5V	Rely on module for ramp	No

DSA-2000 HVPS Range: 5000.0

DSP Module

Address: NI82E4:1 Type: DSA-2000 ID: 0

Coarse gain:	15.0	Gain Centroid:	7680
Fine gain:	0.6736	Gain Window:	8
S-fine gain:	0.000278	Gain Spacing:	64
Pole Zero:	3249	Gain Ratio:	1.000
Coinc. mode:	Anti.	Zero Centroid:	512
Offset:	0	Zero Window:	8
LLD:	1.57	Zero Spacing:	64
Zero:	0.000	Zero Ratio:	1.000
Conv. Gain:	4096	Gain Rate div:	1
ADC Range:	4096	Zero Rate div:	1
FDisc Mode:	AUTO	Gain Corr. rng:	Ge
Fast Disc.:	0.000	Zero Corr. rng:	Ge
Inp. Polarity:	Positive	Zero Mode:	Off
Inh. Polarity:	Positive	Gain Mode:	Off
Rise Time:	18.400	Preamp Type:	RC
Flat Top:	1.200	PUR Mode:	On
BLR Mode:	AUTO	PUR Guard:	1.1
Live Time Trim:	0	TRP Inhibit:	Normal

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 43

Geometry: Coax

	YES	NO	Comments
1) Is all calibration standard information enclosed (or: the primary standard certificate? the second standard standard(s) documentation? the nuclide library used? the VMS certificate file?	☒		1738
	☒		1701
	☒		
	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	☒		
	☒		
	☒		
	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included: amp, HVPS, ADC settings?	☒		

Prepared By: R. Fawcett

Date: 9/16/15

Reviewed By: M. Stamp

Date: 9/18/15

Effective Date: 9/10/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.151E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.408E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytical Instrumentation Laboratory (A.I.L.)

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffin
J. S. Laffin, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsInc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	1.6	3.2	4 π LS
Am-241	59.5	1.580E+05	————	7.514E+02	0.1	1.6	3.2	4 π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1116.6	2.439E+02	————	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



RC-S-065-130

MGS Certificate Rev 5, 1 October 2013

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibblitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: A. Chen
A. Chen, Spectroscopist

Date: 2014/4/14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

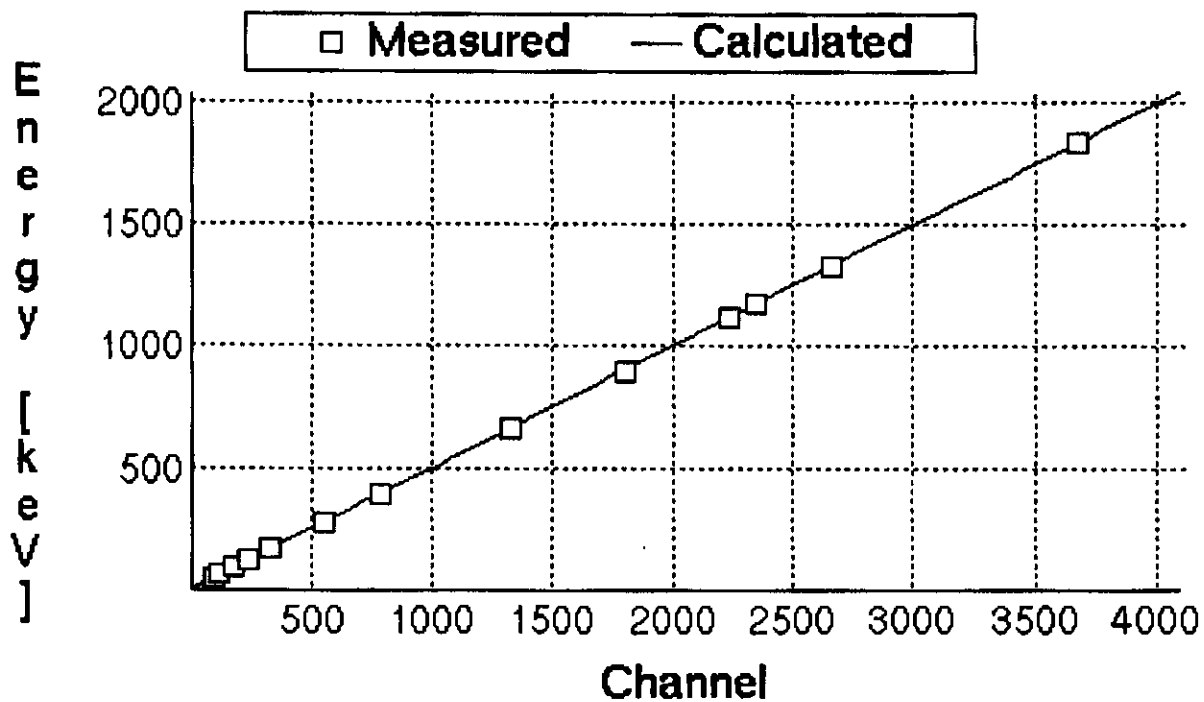
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



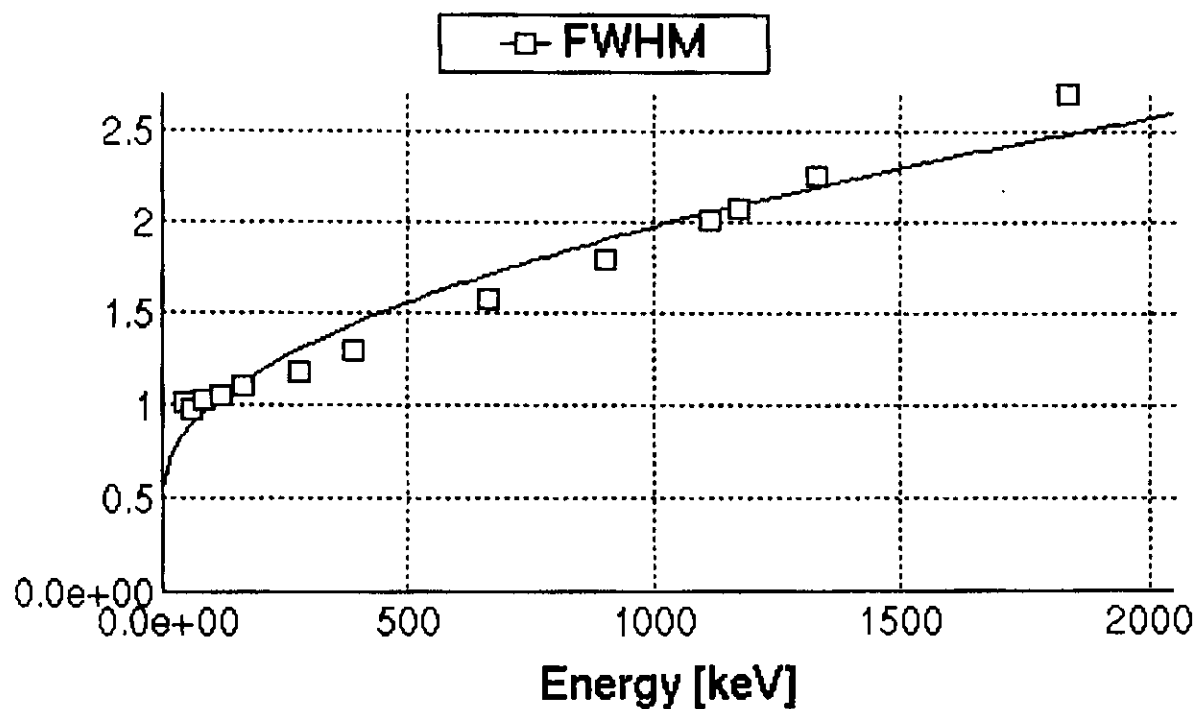
Datasource:

Energy = $2.545e-01 \text{ keV} + 4.999e-01 * \text{Ch} + 1.585e-08 * \text{Ch}^2$ [CHISQ = $1.242e-03$]

FWHM = $5.473e-01 \text{ keV} + 4.537e-02 * E^{1/2}$ [CHISQ = $1.423e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

energy calibration 843 3/3/15



Datasource:

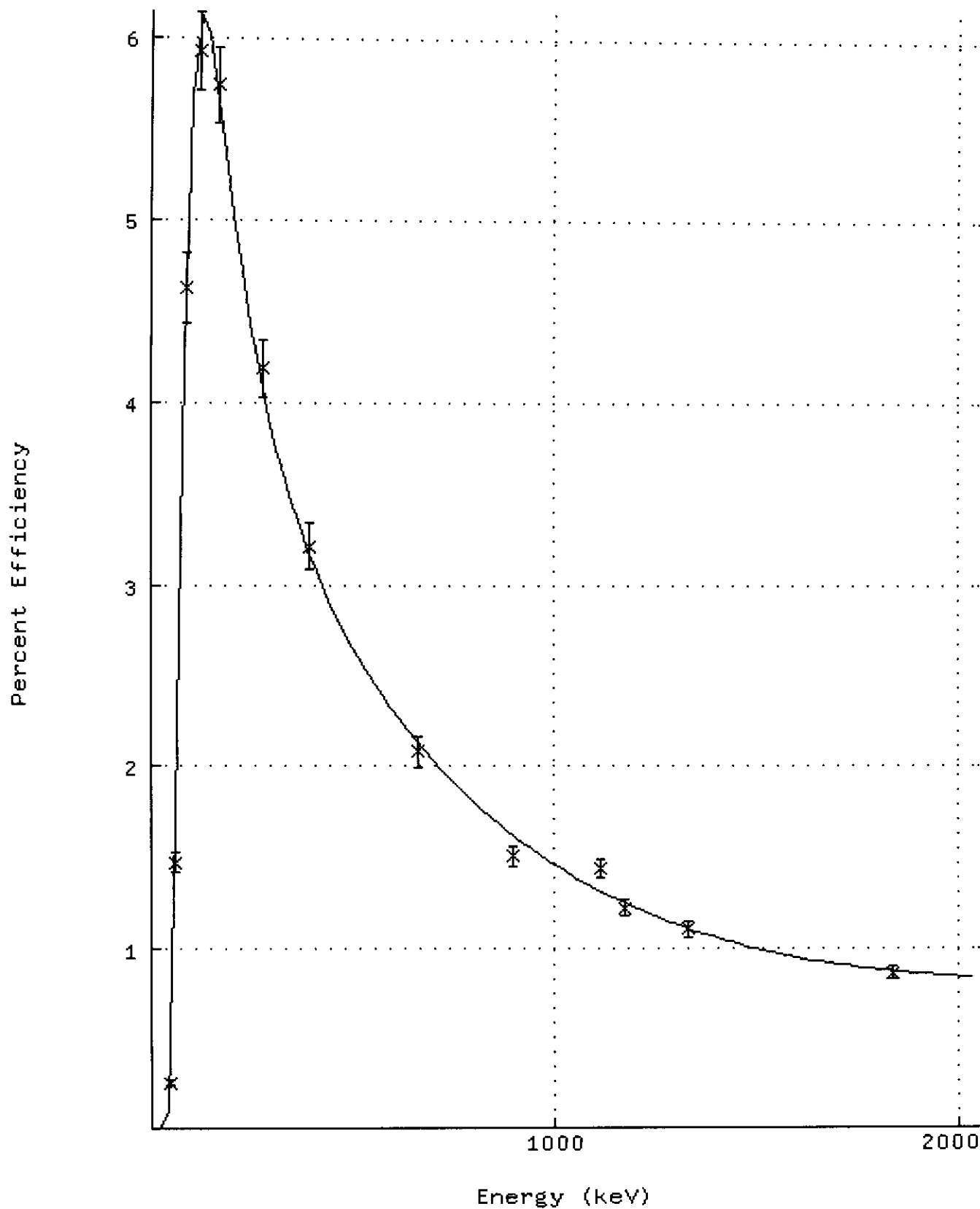
Energy = $2.545e-01$ keV + $4.999e-01$ *Ch + $1.585e-08$ *Ch² [CHISQ = $1.242e-03$]

FWHM = $5.473e-01$ keV + $4.537e-02$ *E^{1/2} [CHISQ = $1.423e-02$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

Shape calibration Y43 3/3/15

Spectrum : DKA100:[CANBERRA,GAMMA]EFF_GAM43_CAN.CNF;6
Calib Date: 10-SEP-2015 10:32
Detector : GAMMA43 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = 0.2545 + 0.4999 \cdot \text{Channel} + 1.5847\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.45	46.54	46.47	0.071
2	118.55	59.54	59.52	0.023
3	175.61	88.03	88.04	-0.008
4	243.71	122.06	122.08	-0.018
5	331.36	165.86	165.89	-0.035
6	558.08	279.20	279.23	-0.029
7	783.13	391.70	391.73	-0.032
8	1323.11	661.66	661.67	-0.015
9	1795.92	898.04	898.04	-0.004
10	2230.97	1115.60	1115.54	0.056
11	2346.35	1173.23	1173.23	0.005
12	2664.89	1332.49	1332.48	0.005
13	3672.13	1836.06	1836.08	-0.020

FWHM Calibration Report

$$\text{FWHM} = 0.5473 + 4.5371\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.02	0.86	0.162
2	59.54	0.98	0.90	0.086
3	88.03	1.04	0.97	0.062
4	122.06	1.05	1.05	0.003
5	165.86	1.10	1.13	-0.027
6	279.20	1.19	1.31	-0.118
7	391.70	1.30	1.45	-0.141
8	661.66	1.58	1.71	-0.131
9	898.04	1.80	1.91	-0.108
10	1115.60	2.02	2.06	-0.042
11	1173.23	2.08	2.10	-0.025
12	1332.49	2.26	2.20	0.055
13	1836.06	2.72	2.49	0.224

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.170	0.9619	-0.1200	-0.2025	0.2426	-7.2808E-02

Average Deviation = 3.19 % Reduced Chi-Square = 2.22

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	2.55E-03	1.21E-04	2.65E-03	-0.84	-3.98
2	59.54	1.47E-02	5.52E-04	1.39E-02	1.38	5.17
3	88.03	4.62E-02	1.90E-03	4.74E-02	-0.61	-2.49
4	122.06	5.92E-02	2.09E-03	6.10E-02	-0.85	-3.01
5	165.86	5.73E-02	2.03E-03	5.69E-02	0.18	0.65
6	279.20	4.18E-02	1.56E-03	4.05E-02	0.84	3.12
7	391.70	3.21E-02	1.27E-03	3.18E-02	0.24	0.94
8	661.66	2.08E-02	8.41E-04	2.12E-02	-0.59	-2.38
9	898.04	1.50E-02	5.65E-04	1.62E-02	-1.99	-7.48
10	1115.60	1.43E-02	5.10E-04	1.31E-02	2.46	8.75
11	1173.23	1.22E-02	4.80E-04	1.25E-02	-0.54	-2.14
12	1332.49	1.10E-02	4.32E-04	1.10E-02	-0.08	-0.31
13	1836.06	8.58E-03	3.22E-04	8.67E-03	-0.28	-1.05

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM43_CAN_343430.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.000000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 343376 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 10-SEP-2015 07:43:55
 Decay time : 161 19:43:55.02 % dead time : 2.0%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:12.13

----- Detector Parameters -----

Energy cal. time : 3-MAR-2015 06:03:47. Energy cal. oper.: gamma spec user
 Detector name : GAMMA43 Counting geometry: CAN
 Effic. cal. time : 10-SEP-2015 10:32:19 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	38.12	3106	16099	1.39	75.75	74	6	8.63E-01	6.6	
2	8	45.01	1450	13056	1.70	89.54	87	11	4.03E-01	11.3	1.66E+00
3	8	46.61	10984	18611	0.94	92.74	87	11	3.05E+00	2.2	
4	0	59.57	41431	35154	1.01	118.66	113	12	1.15E+01	1.0	
5	0	66.04	240	17730	1.37	131.60	130	6	6.66E-02	87.8	
6	3	70.84	658	15636	0.86	141.20	138	12	1.83E-01	28.8	1.79E+00
7	3	72.96	1158	15797	0.91	145.44	138	12	3.22E-01	16.5	
8	10	83.63	4555	37910	2.49	166.80	161	24	1.27E+00	8.0	9.26E+01
9	10	85.65	7159	36400	1.88	170.83	161	24	1.99E+00	6.0	
10	10	88.14	141938	16539	1.06	175.81	161	24	3.94E+01	0.3	
11	0	122.20	85761	27442	1.02	243.95	238	12	2.38E+01	0.5	
12	0	136.62	11037	18099	1.08	272.80	268	10	3.07E+00	2.5	
13	0	166.04	76656	23356	1.14	331.64	325	14	2.13E+01	0.6	
14	0	174.06	210	8137	1.29	347.70	345	6	5.84E-02	68.3	
15	0	255.31	2647	11782	1.22	510.23	506	10	7.35E-01	7.9	
16	0	279.37	24224	15252	1.22	558.36	551	14	6.73E+00	1.3	
17	0	391.88	51148	13372	1.32	783.43	775	16	1.42E+01	0.7	
18	0	439.84	236	5781	1.63	879.37	877	8	6.56E-02	56.1	
19	0	511.16	6123	13075	2.71	1022.03	1013	21	1.70E+00	4.8	
20	0	567.22	129	4643	1.62	1134.16	1132	8	3.58E-02	92.0	
21	0	593.20	207	4384	1.62	1186.14	1183	8	5.76E-02	55.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	661.82	55459	11712	1.59	1323.40	1314	18	1.54E+01	0.6	
23	0	683.50	172	4093	1.70	1366.77	1363	7	4.77E-02	62.3	
24	0	744.80	200	3918	1.91	1489.38	1486	8	5.54E-02	54.8	
25	0	813.92	960	5393	1.98	1627.66	1623	11	2.67E-01	15.2	
26	0	898.20	53217	11335	1.83	1796.23	1787	18	1.48E+01	0.6	
27	0	911.71	178	3616	1.00	1823.25	1820	7	4.95E-02	56.5	
28	0	1060.30	201	3186	1.54	2120.47	2116	10	5.57E-02	53.1	
29	0	1115.71	49474	6883	2.06	2231.30	2221	21	1.37E+01	0.6	
30	0	1173.38	58621	4550	2.12	2346.66	2337	20	1.63E+01	0.5	
31	5	1326.02	1099	2197	3.54	2651.96	2640	37	3.05E-01	12.2	1.04E+01
32	5	1332.68	52576	1573	2.27	2665.29	2640	37	1.46E+01	0.5	
33	0	1405.50	53	940	1.27	2810.93	2808	10	1.46E-02	109.9	
34	0	1467.52	43	1291	4.07	2934.97	2932	12	1.20E-02	167.1	
35	0	1624.08	83	779	1.38	3248.12	3244	8	2.31E-02	59.3	
36	0	1690.71	41	729	1.86	3381.39	3372	11	1.13E-02	130.2	
37	0	1836.26	31973	956	2.75	3672.49	3660	26	8.88E+00	0.6	

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM43_CAN.CNF;4
 Background file : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;89
 Background date : 7-SEP-2015 11:12:23.
 Sample date : 1-APR-2014 12:00:00. Acquisition date : 11-SEP-2015 06:51:19
 Sample ID : VER_GAM43_CAN Sample quantity : 1.00000E+00 SAMPLE
 Detector name : GAM43 Detector geometry: CAN
 Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:09.20 1.0%
 Energy tolerance : 1.50000 keV Analyst Initials :
 Abundance limit : 75.00000 Sensitivity : 3.00000
 Batch ID : Detector SN# :
 Matrix Spike ID : LCS ID :

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.41	2909	4800	1.03	92.34	87	10	3.23E+00	4.8	
2	0	59.55	10193	4669	1.02	118.63	114	11	1.13E+01	1.7	
3	0	88.07	21032	4946	1.03	175.66	170	12	2.34E+01	1.0	
4	0	122.12	8642	2776	1.02	243.78	238	12	9.60E+00	1.6	
5	0	136.59	1221	1655	1.06	272.73	269	9	1.36E+00	6.7	
6	0	165.98	3280	2065	1.11	331.53	326	12	3.64E+00	3.3	
7	0	180.96	82	938	1.14	361.50	360	6	9.11E-02	60.0	
8	0	201.70	69	764	1.26	402.98	401	5	7.61E-02	61.7	
9	0	233.36	123	1114	0.88	466.32	464	7	1.37E-01	45.9	
10	0	262.66	72	1143	2.06	524.93	521	8	8.03E-02	81.7	
11	0	384.39	90	884	2.32	768.45	765	8	9.98E-02	58.3	
12	0	391.76	1582	1569	1.20	783.18	776	14	1.76E+00	5.9	
13	0	511.33*	351	1244	2.47	1022.37	1016	13	3.90E-01	21.4	
14	0	527.73	32	1048	3.69	1055.18	1051	13	3.52E-02	211.3	
15	0	661.97	13924	1168	1.55	1323.69	1317	16	1.55E+01	1.0	
16	1	813.10	79	657	1.84	1626.00	1621	14	8.76E-02	58.9	2.17E+00
17	1	815.59	90	642	1.84	1631.00	1621	14	9.98E-02	52.3	
18	0	898.44	1286	1241	1.90	1796.71	1790	13	1.43E+00	6.3	
19	0	1065.82	52	599	1.51	2131.51	2128	11	5.81E-02	91.6	
20	0	1090.37	114	369	1.97	2180.62	2177	8	1.26E-01	30.7	
21	0	1116.06	4230	1093	1.97	2232.00	2221	18	4.70E+00	2.4	
22	0	1143.61	33	331	1.08	2287.12	2282	10	3.64E-02	105.5	
23	0	1173.74	13029	641	2.07	2347.37	2336	22	1.45E+01	1.0	
24	0	1265.88	35	55	0.98	2531.67	2528	8	3.94E-02	40.1	
25	0	1333.03	11609	252	2.24	2665.98	2654	24	1.29E+01	1.0	
26	0	1373.99	24	102	2.98	2747.91	2734	20	2.62E-02	108.1	
27	0	1450.80	16	79	1.36	2901.54	2891	15	1.83E-02	119.8	
28	0	1585.68	46	93	3.48	3171.31	3159	21	5.08E-02	55.2	
29	0	1626.50	37	52	7.67	3252.97	3243	18	4.13E-02	49.0	
30	0	1836.83	773	54	2.32	3673.63	3662	22	8.58E-01	4.3	
31	0	1901.24	22	10	3.87	3802.45	3794	14	2.43E-02	37.9	
32	0	1928.24	52	17	2.13	3856.46	3847	22	5.78E-02	24.3	
33	0	1945.70	23	23	6.19	3891.38	3883	16	2.58E-02	51.4	

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	8642	85.60*	6.095E+00	4.974E+03	1.911E+04	3.26
	136.47	1221	10.68	6.080E+00	5.645E+03	2.169E+04	13.31
CO-60	1173.23	13029	99.85	1.246E+00	3.146E+04	3.804E+04	2.01
	1332.49	11609	99.98*	1.103E+00	3.160E+04	3.822E+04	1.99
ZN-65	1115.54	4230	50.60*	1.309E+00	1.918E+04	8.589E+04	4.75
Y-88	898.04	1286	93.70	1.615E+00	2.552E+03	7.887E+04	12.59
	1836.06	773	99.20*	8.668E-01	2.698E+03	8.339E+04	8.70
CD-109	88.03	21032	3.70*	4.739E+00	3.602E+05	7.959E+05	1.93
SN-113	391.70	1582	64.97*	3.175E+00	2.303E+03	5.532E+04	11.75
CS-137	661.66	13924	85.10*	2.124E+00	2.313E+04	2.391E+04	2.03
CE-139	165.86	3280	80.00*	5.691E+00	2.164E+03	3.087E+04	6.55
PB-210	46.54	2909	4.25*	2.585E-01	7.952E+05	8.319E+05	9.67
AM-241	59.54	10193	35.90*	1.394E+00	6.114E+04	6.129E+04	3.31

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM43.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 7-SEP-2015 11:12:23 Acquisition date : 7-SEP-2015 11:12:23
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.42

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.0893E+00	-0.95	
[1.10118+/-0.01248]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RR Approval Date: 9 / 11 / 15

Sample ID : Bkg

Page : 1
Acquisition date : 7-SEP-2015 11:12:23

VMS Gamma Spectroscopy Report generated 8-SEP-2015 03:52:51

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM43__342965.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 342965 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 7-SEP-2015 11:12:23.

---- Sample Decay/Count Information ----

Sample Date : 7-SEP-2015 11:12:23. Acquisition date : 7-SEP-2015 11:12:23.
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.42

---- Detector Parameters ----

Energy cal. time : 3-MAR-2015 06:03:47. Energy cal. oper.: gamma spec user
Detector name : GAMMA43 Counting geometry:
Effic. cal. time : 13-MAR-2015 12:42:22 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.17	107	474	0.99	125.86	123	7	1.78E-03	35.1	
2	0	77.68	90	381	1.54	154.88	152	6	1.49E-03	36.3	
3	0	84.65	54	411	1.24	168.83	166	6	8.93E-04	61.3	
4	0	92.91	611	678	1.11	185.36	180	12	1.02E-02	9.5	
5	4	142.62	55	195	1.01	284.80	283	8	9.11E-04	38.7	2.25E+00
6	4	143.90	113	339	1.17	287.35	283	8	1.89E-03	29.1	
7	0	186.05	361	495	1.10	371.67	368	9	6.02E-03	12.2	
8	0	191.86	29	287	1.37	383.29	382	6	4.83E-04	94.6	
9	0	197.90	84	489	1.99	395.38	392	9	1.40E-03	48.5	
10	0	205.36	104	383	1.40	410.30	407	8	1.74E-03	33.9	
11	0	238.33	243	451	1.03	476.26	471	11	4.05E-03	18.0	
12	0	282.46	79	854	9.18	564.55	553	22	1.32E-03	95.1	
13	0	295.33	32	417	1.14	590.28	585	10	5.29E-04	121.8	
14	0	329.44	39	347	2.27	658.52	651	11	6.42E-04	95.8	
15	0	339.15	71	249	1.55	677.94	674	8	1.19E-03	40.4	
16	0	352.10	44	224	1.19	703.84	701	7	7.29E-04	58.6	
17	0	416.08	56	285	3.08	831.84	823	12	9.26E-04	62.4	
18	0	423.62	16	214	2.17	846.92	843	10	2.61E-04	177.5	
19	0	511.36	1115	416	2.80	1022.44	1013	21	1.86E-02	5.5	

20	0	570.31	57	140	2.92	1140.35	1136	10	9.42E-04	41.4
21	0	640.82	60	184	3.66	1281.39	1273	16	9.99E-04	52.2
22	0	679.67	48	83	2.06	1359.10	1354	9	8.06E-04	36.9
23	0	728.34	2	139	0.78	1456.46	1452	10	3.75E-05	985.6
24	0	795.59	37	125	3.52	1590.98	1583	14	6.11E-04	67.0
25	0	911.45	43	99	0.72	1822.75	1817	13	7.14E-04	50.6
26	0	970.11	46	93	1.15	1940.07	1935	11	7.75E-04	43.6
27	0	1159.37	29	94	6.48	2318.63	2304	21	4.76E-04	89.0
28	0	1222.14	86	85	11.13	2444.19	2432	26	1.44E-03	31.1
29	0	1447.09	40	87	10.94	2894.13	2877	29	6.58E-04	69.6
30	0	1461.76	82	62	1.94	2923.47	2913	19	1.37E-03	25.4
31	0	1533.58	42	56	7.97	3067.12	3057	22	6.95E-04	48.0
32	0	1580.41	19	35	2.76	3160.77	3151	14	3.24E-04	68.4
33	0	1767.50	13	39	1.25	3534.96	3526	13	2.13E-04	107.7
34	0	1801.35	18	26	0.54	3602.67	3596	13	2.96E-04	63.8
35	0	1939.88	13	15	2.80	3879.73	3875	10	2.17E-04	62.3

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 43

Calibration Date: 9/10/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.129E+04	8.35
Cs-137	661.7	0.851	735.7	2.3365E+04	2.391E+04	2.33
Co-60	1173.2	0.9985	1383	3.7435E+04	3.804E+04	1.62
Co-60	1332.5	0.9998	1385	3.7440E+04	3.822E+04	2.08

Prepared By: R. F. Allen

Date: 9/11/15

Reviewed By: M. Stamp

Date: 9/18/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gammac 43

Date Performed: 9/9/15

Performed By: RF

High Voltage Power Supply Model No. <u>3105</u> High Voltage <u>2.00KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>20</u> Fine Gain <u>1.321</u> Time Constant <u>6 μsec</u> Input polarity <u>Positive</u> BSLR rate <u>no</u> BSLR mode <u>no</u> Threshold <u>no</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>356B</u> Address <u>1117.2</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 43

Geometry: 2LMB

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? the nuclide library used? the VMS certificate file?	☒	☐	1742 1703
2) Is the energy calibration graph included?	☒	☐	
3) Is the detector efficiency curve printout included?	☒	☐	
4) Is the efficiency calibration report included and reviewed?	☒	☐	
5) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	☒ ☒ ☒ ☒	☐ ☐ ☐ ☐	
6) Are the calibration verification calculations included?	☒	☐	
7) Are the instrument settings included: amp, HVPS, ADC settings?	☒	☐	

Prepared By: R. F. Allen

Date: 9/16/15

Reviewed By: M. J. Tamm

Date: 9/18/15

Effective Date: 9/11/15



Eckert & Ziegler

Analytics

1742

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100222

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 8

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0083827

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, % Type			Calibration Method*
					u _A	u _B	U	
Pb-210	46.6	8.109E+03	—	1.521E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	—	9.525E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.362E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	7.465E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	1.035E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	2.193E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.454E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	9.277E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	3.486E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.877E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.759E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.761E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	3.691E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

J. S. Mahr
J. S. Mahr, Spectroscopist

Date:

14 MAY 15

Standard Logbook

Serial ID: 1742
Name: Mixed Gamma 2LMB
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100222
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 20-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1705

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96489

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0081739

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.511E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	9.322E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.347E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	7.285E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	1.028E+03	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	2.192E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	9.127E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	3.510E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.829E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.716E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.718E+03	0.7	1.8	3.9	HPGe
Y-88	1838.1	1.066E+02	4.546E+05	3.716E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' B-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-134

Page 1 of 2

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: A. Chen
A. Chen, Spectroscopist

Date: 20 MAY 14



Standard Logbook

Serial ID: 1705
Name: Mixed Gamma 2LMB
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96489
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

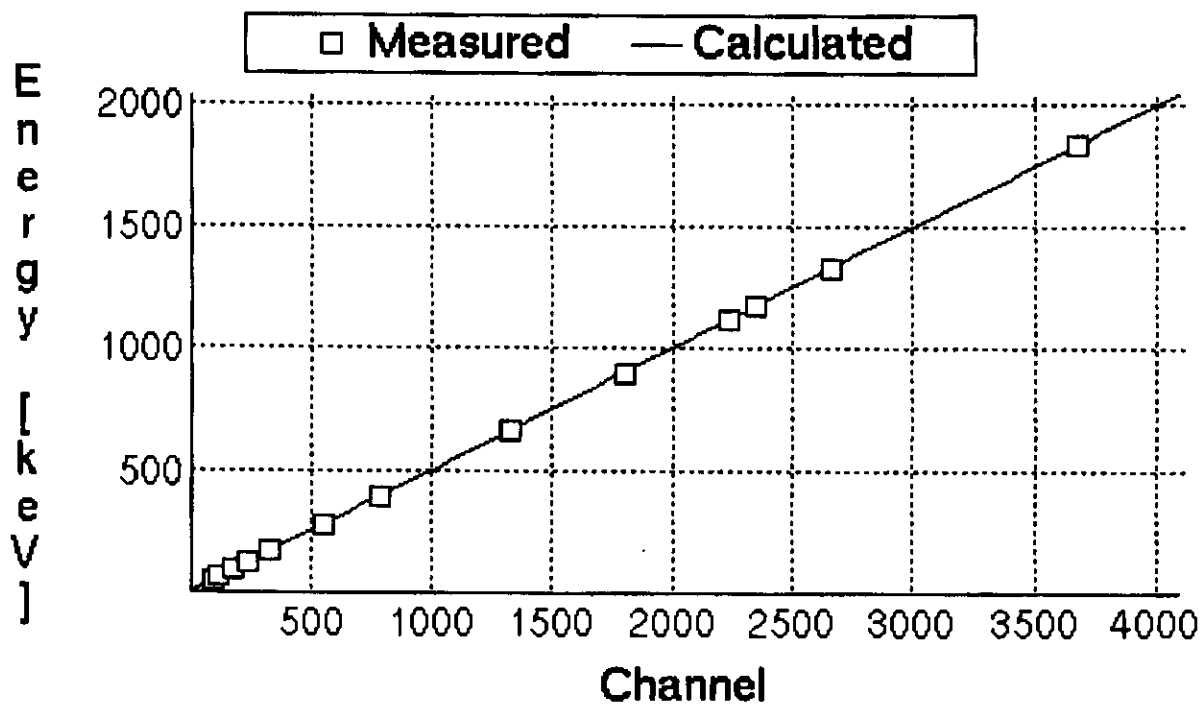
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: 2LMB 100222

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1521	4.20	4.3	Yes
AM-241	432.60Y	59.5	953	3.60	35.9	Yes
CD-109	461.40D	88.0	1362	4.10	3.7	Yes
CO-57	271.74D	122.1	747	3.50	85.6	Yes
CE-139	137.64D	165.9	1035	3.50	80.0	Yes
HG-203	46.59D	279.2	2193	3.50	81.6	Yes
SN-113	115.09D	391.7	1454	3.90	65.0	Yes
CS-137	30.08Y	661.7	928	4.00	85.1	Yes
Y-88	106.63D	898.0	3486	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1877	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1759	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1761	3.90	100.0	Yes
Y-88	106.63D	1836.1	3691	3.70	99.2	Yes



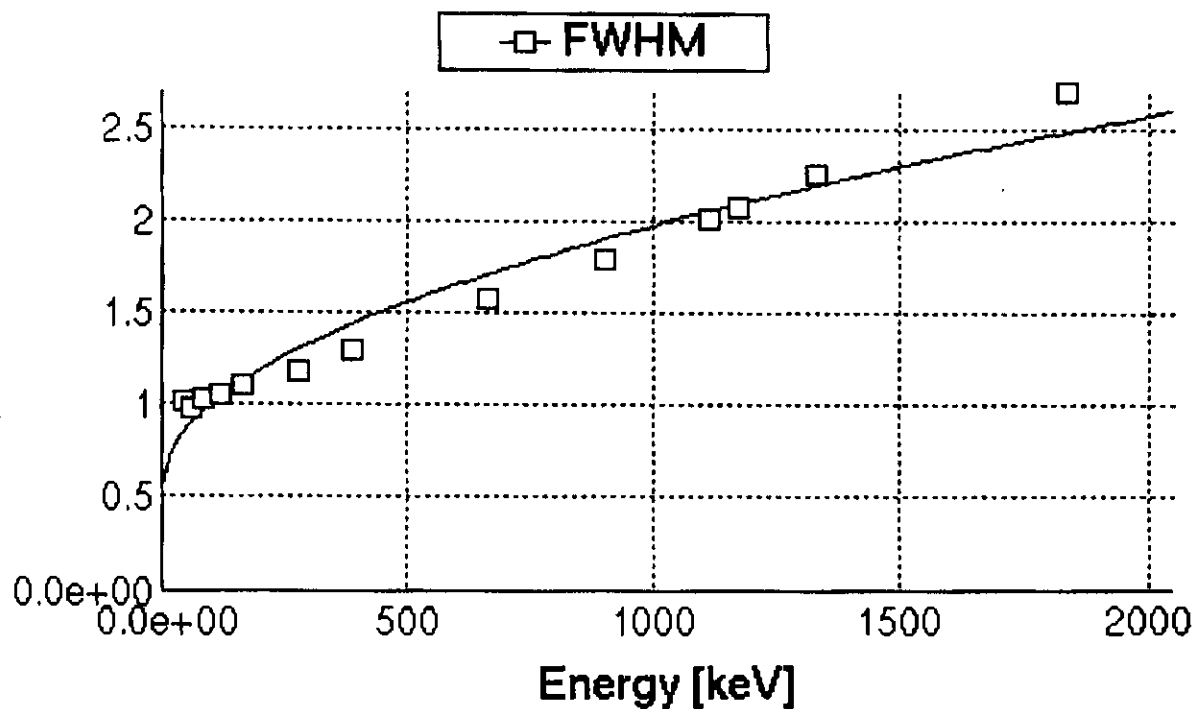
Datasource:

Energy = $2.545e-01$ keV + $4.999e-01$ *Ch + $1.585e-08$ *Ch² [CHISQ = $1.242e-03$]

FWHM = $5.473e-01$ keV + $4.537e-02$ *E^{1/2} [CHISQ = $1.423e-02$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

energy calibration 843 3/3/15



Datasource:

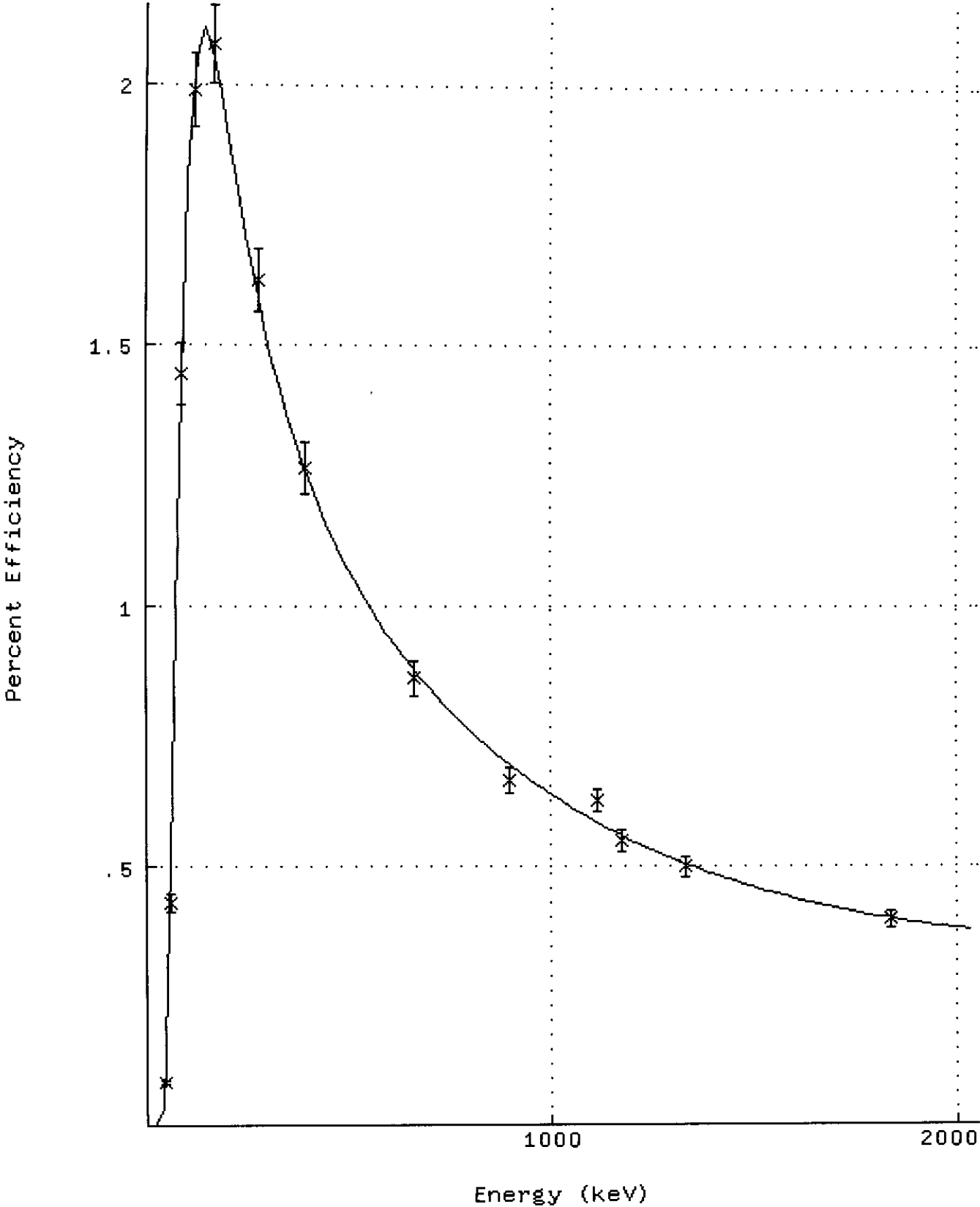
Energy = $2.545e-01$ keV + $4.999e-01$ *Ch + $1.585e-08$ *Ch² [CHISQ = $1.242e-03$]

FWHM = $5.473e-01$ keV + $4.537e-02$ *E^{1/2} [CHISQ = $1.423e-02$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

Shape calibration 843 3/3/15

Spectrum : DKA100:[CANBERRA,GAMMA]EFF_GAM43_2LMB.CNF; 3
Calib Date: 11-SEP-2015 12:21
Detector : GAMMA43 Geometry : 2LMB
Fit type : 5 Deg. Empirical



$$\text{Energy} = 0.2545 + 0.4999 \cdot \text{Channel} + 1.5847\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.45	46.54	46.47	0.071
2	118.55	59.54	59.52	0.023
3	175.61	88.03	88.04	-0.008
4	243.71	122.06	122.08	-0.018
5	331.36	165.86	165.89	-0.035
6	558.08	279.20	279.23	-0.029
7	783.13	391.70	391.73	-0.032
8	1323.11	661.66	661.67	-0.015
9	1795.92	898.04	898.04	-0.004
10	2230.97	1115.60	1115.54	0.056
11	2346.35	1173.23	1173.23	0.005
12	2664.89	1332.49	1332.48	0.005
13	3672.13	1836.06	1836.08	-0.020

FWHM Calibration Report

$$\text{FWHM} = 0.5473 + 4.5371\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.02	0.86	0.162
2	59.54	0.98	0.90	0.086
3	88.03	1.04	0.97	0.062
4	122.06	1.05	1.05	0.003
5	165.86	1.10	1.13	-0.027
6	279.20	1.19	1.31	-0.118
7	391.70	1.30	1.45	-0.141
8	661.66	1.58	1.71	-0.131
9	898.04	1.80	1.91	-0.108
10	1115.60	2.02	2.06	-0.042
11	1173.23	2.08	2.10	-0.025
12	1332.49	2.26	2.20	0.055
13	1836.06	2.72	2.49	0.224

Sample ID : 100222

Acquisition date : 11-SEP-2015 09:29:51

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a	a6	a7
941.3	-5.006	0.8012	-8.8985E-02	-7.5646E-02	0.1295	-4.9545E-02

Average Deviation = 2.34 % Reduced Chi-Square = 1.18

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	8.43E-04	4.63E-05	8.71E-04	-0.61	-3.34
2	59.54	4.30E-03	1.63E-04	4.16E-03	0.85	3.24
3	88.03	1.44E-02	5.95E-04	1.45E-02	-0.19	-0.79
4	122.06	1.98E-02	7.05E-04	2.04E-02	-0.80	-2.83
5	165.86	2.07E-02	7.36E-04	2.06E-02	0.20	0.71
6	279.20	1.62E-02	5.95E-04	1.58E-02	0.70	2.58
7	391.70	1.26E-02	4.97E-04	1.26E-02	-0.01	-0.04
8	661.66	8.61E-03	3.47E-04	8.77E-03	-0.48	-1.93
9	898.04	6.67E-03	2.49E-04	6.96E-03	-1.16	-4.35
10	1115.60	6.27E-03	2.22E-04	5.84E-03	1.94	6.87
11	1173.23	5.48E-03	2.15E-04	5.60E-03	-0.57	-2.22
12	1332.49	4.99E-03	1.96E-04	5.04E-03	-0.27	-1.04
13	1836.06	3.96E-03	1.48E-04	3.98E-03	-0.13	-0.50

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM43_2LMB_343661.CNF;1

---- Sample Information ----

Sample Title : 2LMB 100222
 Sample ID : 100222 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 343620 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 11-SEP-2015 09:29:51
 Decay time : 162 21:29:51.30 % dead time : 1.2%
 Elapsed live time: 0 02:48:39.56 Elapsed real time: 0 02:50:45.97

---- Detector Parameters ----

Energy cal. time : 3-MAR-2015 06:03:47. Energy cal. oper.: gamma spec user
 Detector name : GAMMA43 Counting geometry: 2LMB
 Effic. cal. time : 11-SEP-2015 12:21:16 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	38.14	5733	26769	1.36	75.79	74	6	5.66E-01	4.7	
2	0	46.48	12378	55159	0.98	92.46	87	10	1.22E+00	3.7	
3	0	49.38	154	39080	1.62	98.27	97	7	1.52E-02	212.7	
4	0	59.57	42027	59116	0.98	118.66	114	10	4.15E+00	1.2	
5	0	67.35	190	26680	0.54	134.22	132	4	1.88E-02	121.7	
6	0	72.84	676	42916	0.86	145.20	143	6	6.68E-02	48.6	
7	0	88.12	159521	84610	0.99	175.77	170	12	1.58E+01	0.4	
8	0	122.16	101170	65354	0.97	243.87	238	12	1.00E+01	0.6	
9	0	136.53	13479	47195	1.05	272.61	268	10	1.33E+00	3.1	
10	0	165.99	96909	54016	1.12	331.55	325	13	9.58E+00	0.6	
11	0	255.21	2827	21956	1.14	510.04	507	8	2.79E-01	9.3	
12	0	279.36	32364	24761	1.19	558.34	553	11	3.20E+00	1.1	
13	0	391.86	70344	17841	1.28	783.39	778	12	6.95E+00	0.5	
14	0	511.14	9196	18784	2.73	1021.99	1014	17	9.09E-01	3.6	
15	0	545.98	162	8046	0.85	1091.69	1088	8	1.60E-02	96.4	
16	0	661.80	80866	17809	1.57	1323.37	1314	17	7.99E+00	0.5	
17	0	814.04	1223	8390	1.60	1627.89	1623	10	1.21E-01	14.3	
18	0	836.54	302	6645	1.70	1672.90	1670	8	2.99E-02	47.0	
19	0	898.18	82521	18337	1.78	1796.19	1786	19	8.15E+00	0.5	
20	0	930.59	122	6647	1.45	1861.02	1859	8	1.20E-02	116.1	
21	0	1115.70	75842	10608	2.00	2231.29	2220	22	7.49E+00	0.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	1173.39	92641	7330	2.03	2346.67	2336	22	9.15E+00	0.4	
23	0	1217.02	63	2304	0.79	2433.94	2425	11	6.22E-03	148.3	
24	0	1233.11	52	1829	0.97	2466.13	2459	10	5.18E-03	153.3	
25	0	1252.36	32	2122	0.55	2504.64	2496	12	3.17E-03	288.4	
26	5	1325.98	1686	2993	3.54	2651.88	2643	32	1.67E-01	8.0	1.98E+01
27	5	1332.69	83889	2306	2.20	2665.31	2643	32	8.29E+00	0.4	
28	0	1394.67	110	1261	1.37	2789.27	2786	9	1.09E-02	58.9	
29	0	1558.34	71	1792	1.81	3116.63	3112	9	6.98E-03	108.8	
30	0	1734.73	74	508	1.74	3469.43	3464	10	7.29E-03	58.4	
31	0	1801.99	35	292	1.08	3603.95	3600	8	3.50E-03	85.1	
32	0	1836.28	51539	1150	2.64	3672.53	3660	25	5.09E+00	0.5	
33	0	2003.34	51	142	1.74	4006.65	4002	10	5.09E-03	45.8	

```
*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road       *
*               Charleston, SC 29407   *
*****
```

```
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM43_2LMB.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;89
Background date    : 7-SEP-2015 11:12:23.
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 11-SEP-2015 12:25:01
Sample ID        : VER_GAM43_2LMB      Sample quantity  : 1.00000E+00 SAMPLE
Detector name     : GAM43              Detector geometry: 2LMB
Elapsed live time : 0 01:30:00.00      Elapsed real time: 0 01:30:33.30 0.6%
Energy tolerance  : 1.50000 keV        Analyst Initials :
Abundance limit   : 75.00000           Sensitivity       : 3.00000
Batch ID          :                    Detector SN#       :
Matrix Spike ID   :                    LCS ID            :
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	38.20	1758	7548	1.19	75.92	74	6	3.26E-01	8.1	
2	0	46.44	6677	16093	0.99	92.39	87	10	1.24E+00	3.8	
3	0	59.53	22514	18494	0.96	118.59	113	11	4.17E+00	1.4	
4	0	88.11	48858	21250	0.97	175.75	170	12	9.05E+00	0.8	
5	0	122.15	20981	14805	0.99	243.85	238	12	3.89E+00	1.4	
6	0	136.56	2866	9707	1.05	272.68	269	9	5.31E-01	6.5	
7	0	165.99	8311	9447	1.10	331.55	327	10	1.54E+00	2.5	
8	0	171.12	100	5265	1.26	341.80	339	6	1.85E-02	115.5	
9	0	196.75*	121	5331	0.77	393.08	391	6	2.24E-02	95.9	
10	0	357.83	119	3570	1.45	715.30	712	8	2.19E-02	87.8	
11	0	391.82	4128	4356	1.31	783.31	778	10	7.64E-01	3.4	
12	0	460.01	178	2917	1.54	919.72	917	7	3.29E-02	51.0	
13	0	511.04*	1403	5825	2.59	1021.79	1013	18	2.60E-01	13.1	
14	0	605.27	108	1978	1.37	1210.28	1207	8	2.00E-02	71.8	
15	0	661.80	41701	4077	1.53	1323.37	1315	16	7.72E+00	0.6	
16	0	698.68	112	1717	1.33	1397.13	1394	8	2.08E-02	64.7	
17	0	767.20	48	1850	0.57	1534.19	1530	8	8.95E-03	155.0	
18	0	821.98	224	2170	1.77	1643.77	1640	9	4.15E-02	38.1	
19	0	898.16	4136	3918	1.70	1796.15	1790	13	7.66E-01	3.5	
20	0	1115.71	13578	3354	2.01	2231.30	2220	19	2.51E+00	1.3	
21	0	1173.40	42383	1986	2.01	2346.70	2336	20	7.85E+00	0.5	
22	0	1238.91	12	494	2.31	2477.72	2474	11	2.14E-03	374.1	
23	0	1288.33	46	370	3.85	2576.58	2569	13	8.57E-03	87.8	
24	0	1332.68	38755	725	2.18	2665.28	2654	21	7.18E+00	0.5	
25	0	1424.28	41	137	2.92	2848.51	2845	11	7.60E-03	57.1	
26	0	1506.34	35	101	1.42	3012.64	3008	8	6.55E-03	52.5	
27	0	1528.18	23	178	3.20	3056.31	3045	14	4.32E-03	123.1	
28	2	1645.02	60	108	2.39	3290.00	3284	19	1.12E-02	35.3	3.18E+00
29	2	1648.11	65	103	2.89	3296.18	3284	19	1.19E-02	35.7	
30	0	1806.42	20	46	1.46	3612.80	3606	11	3.64E-03	72.3	
31	0	1836.35	2508	130	2.88	3672.67	3663	22	4.64E-01	2.3	
32	0	1936.05	54	61	10.22	3872.07	3858	25	1.00E-02	41.5	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	20981	85.60*	2.042E+00	6.008E+03	2.311E+04	2.71
	136.47	2866	10.68	2.099E+00	6.401E+03	2.462E+04	12.96
CO-60	1173.23	42383	99.85	5.597E-01	3.795E+04	4.590E+04	1.10
	1332.49	38755	99.98*	5.043E-01	3.847E+04	4.652E+04	1.07
ZN-65	1115.54	13578	50.60*	5.835E-01	2.302E+04	1.031E+05	2.66
Y-88	898.04	4136	93.70	6.955E-01	3.177E+03	9.834E+04	6.96
	1836.06	2508	99.20*	3.983E-01	3.178E+03	9.837E+04	4.60
CD-109	88.03	48858	3.70*	1.457E+00	4.535E+05	1.003E+06	1.51
SN-113	391.70	4128	64.97*	1.263E+00	2.518E+03	6.058E+04	6.75
CS-137	661.66	41701	85.10*	8.773E-01	2.795E+04	2.890E+04	1.19
CE-139	165.86	8311	80.00*	2.058E+00	2.527E+03	3.609E+04	4.90
PB-210	46.54	6677	4.25*	8.557E-02	9.189E+05	9.614E+05	7.52
AM-241	59.54	22514	35.90*	4.155E-01	7.555E+04	7.572E+04	2.70

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM43.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 7-SEP-2015 11:12:23 Acquisition date : 7-SEP-2015 11:12:23
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.42

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.0893E+00	-0.95	
[1.10118+/-0.01248]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 9 / 15 / 15

Sample ID : Bkg

Page : 1
Acquisition date : 7-SEP-2015 11:12:23

VMS Gamma Spectroscopy Report generated 8-SEP-2015 03:52:51

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM43___342965.CNF;1

----- Sample Information -----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 342965 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 7-SEP-2015 11:12:23.

----- Sample Decay/Count Information -----

Sample Date : 7-SEP-2015 11:12:23. Acquisition date : 7-SEP-2015 11:12:23.
Decay time : 0 00:00:00.00 % dead time : 0.0%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.42

----- Detector Parameters -----

Energy cal. time : 3-MAR-2015 06:03:47. Energy cal. oper.: gamma spec user
Detector name : GAMMA43 Counting geometry:
Effic. cal. time : 13-MAR-2015 12:42:22 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.17	107	474	0.99	125.86	123	7	1.78E-03	35.1	
2	0	77.68	90	381	1.54	154.88	152	6	1.49E-03	36.3	
3	0	84.65	54	411	1.24	168.83	166	6	8.93E-04	61.3	
4	0	92.91	611	678	1.11	185.36	180	12	1.02E-02	9.5	
5	4	142.62	55	195	1.01	284.80	283	8	9.11E-04	38.7	2.25E+00
6	4	143.90	113	339	1.17	287.35	283	8	1.89E-03	29.1	
7	0	186.05	361	495	1.10	371.67	368	9	6.02E-03	12.2	
8	0	191.86	29	287	1.37	383.29	382	6	4.83E-04	94.6	
9	0	197.90	84	489	1.99	395.38	392	9	1.40E-03	48.5	
10	0	205.36	104	383	1.40	410.30	407	8	1.74E-03	33.9	
11	0	238.33	243	451	1.03	476.26	471	11	4.05E-03	18.0	
12	0	282.46	79	854	9.18	564.55	553	22	1.32E-03	95.1	
13	0	295.33	32	417	1.14	590.28	585	10	5.29E-04	121.8	
14	0	329.44	39	347	2.27	658.52	651	11	6.42E-04	95.8	
15	0	339.15	71	249	1.55	677.94	674	8	1.19E-03	40.4	
16	0	352.10	44	224	1.19	703.84	701	7	7.29E-04	58.6	
17	0	416.08	56	285	3.08	831.84	823	12	9.26E-04	62.4	
18	0	423.62	16	214	2.17	846.92	843	10	2.61E-04	177.5	
19	0	511.36	1115	416	2.80	1022.44	1013	21	1.86E-02	5.5	

20	0	570.31	57	140	2.92	1140.35	1136	10	9.42E-04	41.4
21	0	640.82	60	184	3.66	1281.39	1273	16	9.99E-04	52.2
22	0	679.67	48	83	2.06	1359.10	1354	9	8.06E-04	36.9
23	0	728.34	2	139	0.78	1456.46	1452	10	3.75E-05	985.6
24	0	795.59	37	125	3.52	1590.98	1583	14	6.11E-04	67.0
25	0	911.45	43	99	0.72	1822.75	1817	13	7.14E-04	50.6
26	0	970.11	46	93	1.15	1940.07	1935	11	7.75E-04	43.6
27	0	1159.37	29	94	6.48	2318.63	2304	21	4.76E-04	89.0
28	0	1222.14	86	85	11.13	2444.19	2432	26	1.44E-03	31.1
29	0	1447.09	40	87	10.94	2894.13	2877	29	6.58E-04	69.6
30	0	1461.76	82	62	1.94	2923.47	2913	19	1.37E-03	25.4
31	0	1533.58	42	56	7.97	3067.12	3057	22	6.95E-04	48.0
32	0	1580.41	19	35	2.76	3160.77	3151	14	3.24E-04	68.4
33	0	1767.50	13	39	1.25	3534.96	3526	13	2.13E-04	107.7
34	0	1801.35	18	26	0.54	3602.67	3596	13	2.96E-04	63.8
35	0	1939.88	13	15	2.80	3879.73	3875	10	2.17E-04	62.3

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 43

Calibration Date: 9/11/2015

Geometry: 2LMB

Manufacturer Standard Id: 96489

GEL Standard Id: 1705

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	932.2	7.0180E+04	7.572E+04	7.89
Cs-137	661.7	0.851	912.7	2.8987E+04	2.890E+04	-0.30
Co-60	1173.2	0.9985	1716	4.6448E+04	4.590E+04	-1.18
Co-60	1332.5	0.9998	1718	4.6442E+04	4.652E+04	0.17

Prepared By: R. Fureh

Date: 9/18/15

Reviewed By: M. Stamp

Date: 9/18/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gemma 43

Date Performed: 9/9/15

Performed By: RF

High Voltage Power Supply Model No. <u>3105</u> High Voltage <u>2.00kV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>20</u> Fine Gain <u>1.321</u> Time Constant <u>6 μsec</u> Input polarity <u>Positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>556B</u> Address <u>1117.2</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 44

Geometry: can

YES NO Comments

- 1) Is all calibration standard information enclosed for:

the primary standard certificate?
the second standard(s) documentation?
the nuclide library used?
the VMS certificate file?

☒	☐	1738
☒	☐	1701
☒	☐	
☒	☐	

- 2) Is the energy calibration graph included?

☒	☐	

- 3) Is the detector efficiency curve printout included?

☒	☐	

- 4) Is the efficiency calibration report included and reviewed?

☒	☐	

- 5) Is the raw count data included for:

the calibration peak report?
the calibration verification PEAK report?
the calibration verification NID report?
the last instrument background?

☒	☐	
☒	☐	
☒	☐	
☒	☐	

- 6) Are the calibration verification calculations included?

☒	☐	

- 7) Are the instrument settings included:
amp, HVPS, ADC settings?

☒	☐	

Prepared By: R. F. Fitch

Date: 9/14/15

Reviewed By: M. J. Tampr

Date: 9/26/15

Effective Date: 9/9/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type			
					u _A	u _B	U	
Pb-210	46.8	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytical & isotope mixture.

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Iqbal
J. S. Iqbal, Spectroscopist

Date: 14 MAY 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source	Uncertainty*, %			Calibration Method*
			γps/gram		Type	u _A	u _B	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	————	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	————	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.996E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-0 65-130

Page 1 of 2

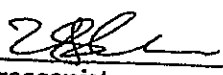
Corporate Office

Laboratory

24937 Avenue Tibbitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 20 MAY 14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

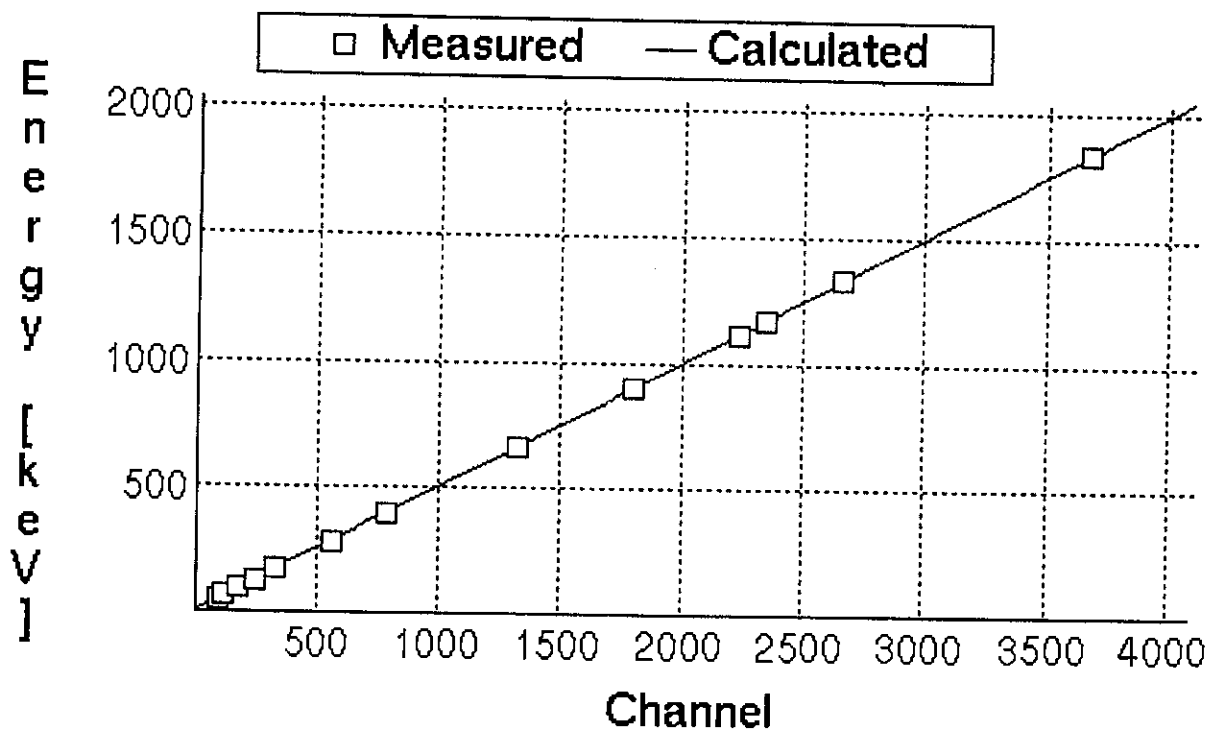
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



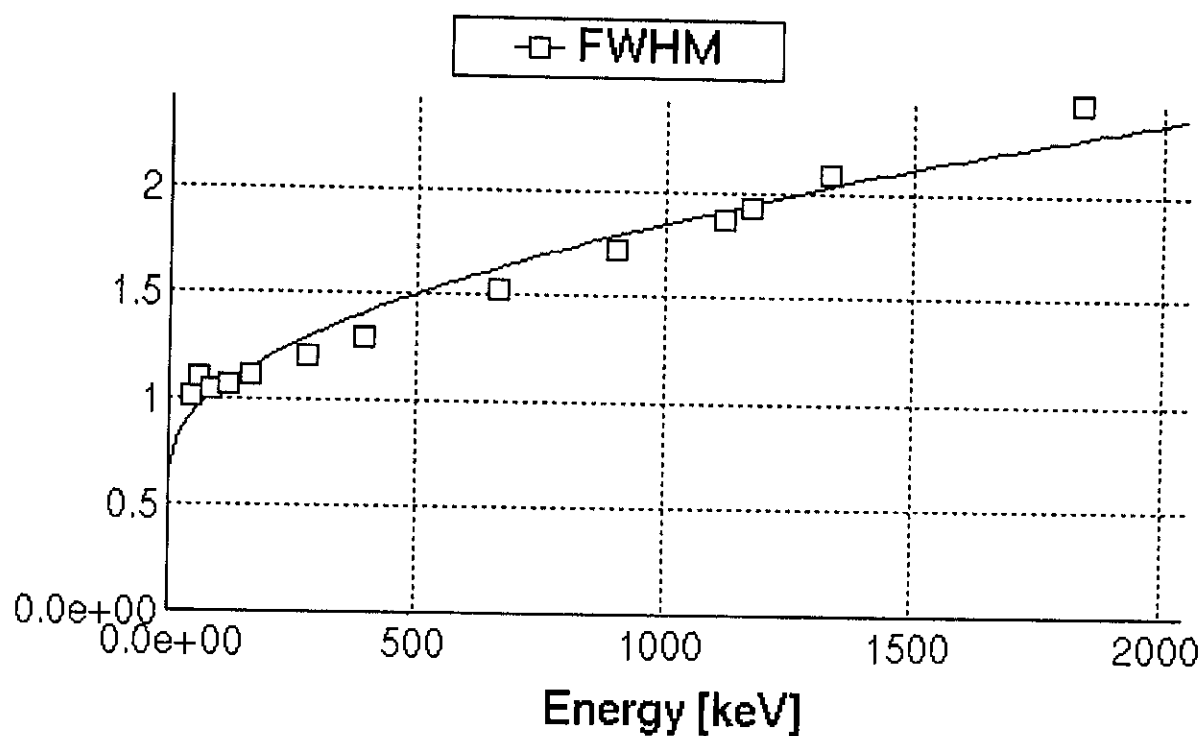
Datasource:

Energy = $-1.439\text{e-}01 \text{ keV} + 4.999\text{e-}01 * \text{Ch} + -6.073\text{e-}08 * \text{Ch}^2$ [CHISQ = $1.099\text{e-}02$]

FWHM = $6.624\text{e-}01 \text{ keV} + 3.761\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $9.542\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

energy calibration 844 9/8/15



Datasource:

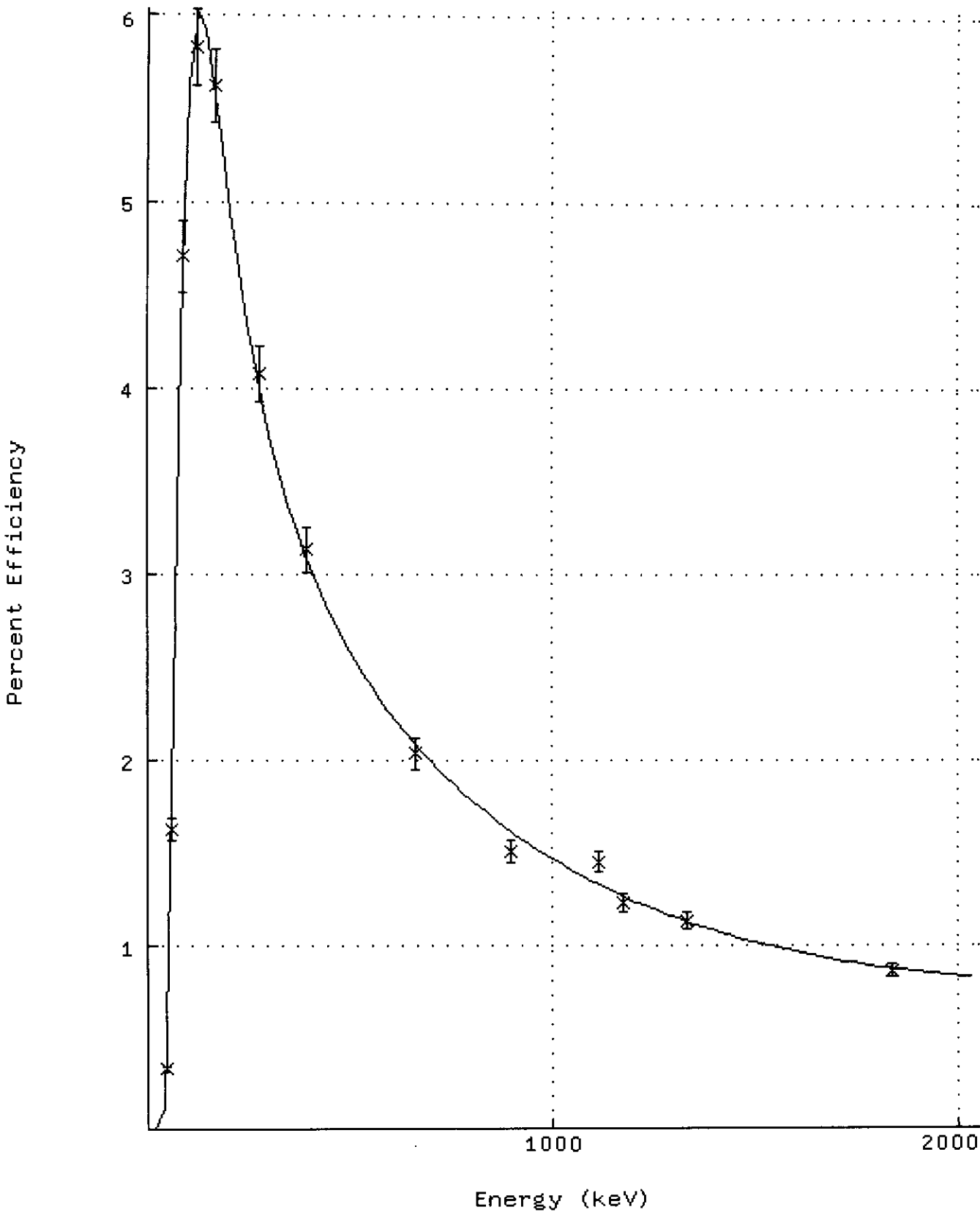
Energy = $-1.439\text{e-}01 \text{ keV} + 4.999\text{e-}01 * \text{Ch} + -6.073\text{e-}08 * \text{Ch}^2$ [CHISQ = $1.099\text{e-}02$]

FWHM = $6.624\text{e-}01 \text{ keV} + 3.761\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $9.542\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

Shape calibration 844 9/8/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM44_CAN.CNF;2
Calib Date: 9-SEP-2015 08:01;
Detector : GAMMA44 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -0.1439 + 0.4999 \cdot \text{Channel} + -6.0728\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.32	46.54	46.51	0.034
2	119.33	59.54	59.51	0.033
3	176.40	88.03	88.03	-0.004
4	244.49	122.06	122.07	-0.008
5	332.14	165.86	165.88	-0.020
6	558.90	279.20	279.22	-0.023
7	784.01	391.70	391.73	-0.032
8	1324.18	661.66	661.68	-0.020
9	1797.20	898.04	898.05	-0.008
10	2232.49	1115.60	1115.53	0.069
11	2347.96	1173.23	1173.22	0.008
12	2666.79	1332.49	1332.50	-0.014
13	3674.95	1836.06	1836.07	-0.015

FWHM Calibration Report

$$\text{FWHM} = 0.6624 + 3.7614\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.01	0.92	0.095
2	59.54	1.10	0.95	0.145
3	88.03	1.05	1.02	0.031
4	122.06	1.06	1.08	-0.013
5	165.86	1.11	1.15	-0.040
6	279.20	1.20	1.29	-0.088
7	391.70	1.29	1.41	-0.115
8	661.66	1.52	1.63	-0.106
9	898.04	1.72	1.79	-0.069
10	1115.60	1.87	1.92	-0.045
11	1173.23	1.93	1.95	-0.024
12	1332.49	2.10	2.04	0.062
13	1836.06	2.44	2.27	0.169

Sample ID : 100218

Acquisition date : 9-SEP-2015 06:51:05

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.172	0.8939	-0.1128	-0.1164	0.1783	-5.9303E-02

Average Deviation = 2.98 % Reduced Chi-Square = 1.98

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	3.33E-03	1.57E-04	3.44E-03	-0.69	-3.25
2	59.54	1.62E-02	6.02E-04	1.55E-02	1.11	4.12
3	88.03	4.70E-02	1.93E-03	4.76E-02	-0.31	-1.28
4	122.06	5.82E-02	2.06E-03	6.00E-02	-0.87	-3.09
5	165.86	5.61E-02	1.99E-03	5.59E-02	0.13	0.46
6	279.20	4.07E-02	1.50E-03	3.96E-02	0.72	2.66
7	391.70	3.13E-02	1.24E-03	3.09E-02	0.33	1.30
8	661.66	2.03E-02	8.23E-04	2.08E-02	-0.57	-2.30
9	898.04	1.50E-02	5.65E-04	1.61E-02	-1.87	-7.01
10	1115.60	1.45E-02	5.14E-04	1.32E-02	2.40	8.55
11	1173.23	1.22E-02	4.81E-04	1.26E-02	-0.81	-3.20
12	1332.49	1.13E-02	4.43E-04	1.12E-02	0.12	0.47
13	1836.06	8.64E-03	3.24E-04	8.73E-03	-0.28	-1.07

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM44_CAN_343193.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 343173 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 9-SEP-2015 06:51:05.
 Decay time : 160 18:51:05.61 % dead time : 1.6%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:00:58.99

---- Detector Parameters ----

Energy cal. time : 8-SEP-2015 12:17:59. Energy cal. oper.: gamma spec user
 Detector name : GAMMA44 Counting geometry: CAN
 Effic. cal. time : 9-SEP-2015 08:01:56. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	44.97	598	11171	1.35	90.24	88	9	1.66E-01	25.3	1.64E+00
2	6	46.37	13898	15991	0.99	93.05	88	9	3.86E+00	1.7	
3	0	59.35	45043	33048	1.03	119.01	113	12	1.25E+01	0.9	
4	0	66.05	364	17102	2.55	132.42	131	6	1.01E-01	56.9	
5	0	72.55	906	18098	0.98	145.43	144	6	2.52E-01	23.7	
6	6	82.59	2200	29348	1.50	165.51	161	27	6.11E-01	13.7	4.79E+01
7	6	84.32	3127	35122	1.78	168.98	161	27	8.69E-01	11.7	
8	6	86.11	4461	33489	1.79	172.56	161	27	1.24E+00	11.5	
9	6	87.92	144509	16829	1.05	176.16	161	27	4.01E+01	0.3	
10	0	102.71	171	11416	0.95	205.77	204	5	4.75E-02	94.0	
11	0	121.98	84172	29721	1.12	244.32	238	13	2.34E+01	0.5	
12	0	136.36	10259	20335	1.08	273.09	268	11	2.85E+00	2.9	
13	0	165.84	75188	20454	1.14	332.06	327	12	2.09E+01	0.5	
14	0	255.30	2081	10516	1.08	511.04	507	9	5.78E-01	9.2	
15	0	279.26	23731	12679	1.21	558.98	554	12	6.59E+00	1.1	
16	0	324.79	256	6060	1.66	650.08	648	7	7.10E-02	50.9	
17	0	391.82	50229	11395	1.29	784.19	778	13	1.40E+01	0.6	
18	0	511.31	6044	9772	2.80	1023.27	1016	16	1.68E+00	3.9	
19	0	661.94	54136	10329	1.50	1324.70	1319	14	1.50E+01	0.6	
20	0	779.34	178	3695	1.81	1559.64	1557	8	4.94E-02	59.7	
21	0	807.60	158	3369	1.05	1616.19	1614	7	4.40E-02	61.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	814.37	787	5713	1.55	1629.75	1625	11	2.19E-01	18.9	
23	0	831.30	128	3503	0.55	1663.62	1661	7	3.56E-02	77.0	
24	0	898.46	53891	11951	1.70	1798.02	1790	18	1.50E+01	0.6	
25	0	1079.18	177	2522	1.78	2159.74	2156	8	4.93E-02	49.5	
26	0	1091.97	145	2933	1.68	2185.32	2182	9	4.02E-02	68.1	
27	0	1116.10	50330	7275	1.88	2233.63	2224	20	1.40E+01	0.6	
28	0	1173.81	59062	5258	1.89	2349.13	2340	19	1.64E+01	0.5	
29	5	1325.76	1143	2233	3.27	2653.28	2642	51	3.17E-01	10.7	1.87E+01
30	5	1333.18	53991	1367	2.07	2668.15	2642	51	1.50E+01	0.5	
31	0	1640.40	9	1014	2.71	3283.19	3280	11	2.57E-03	668.0	
32	0	1837.12	32639	1419	2.38	3677.05	3666	24	9.07E+00	0.6	
33	0	1878.23	47	248	2.65	3759.36	3750	14	1.31E-02	72.9	
34	0	1894.92	66	121	2.83	3792.78	3789	10	1.82E-02	33.6	


```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM44_CAN.CNF;2
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM44.CNF;51
                   Background date      : 7-SEP-2015 11:12:28.
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 11-SEP-2015 09:30:25
Sample ID        : VER_GAM44_CAN       Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM44              Detector geometry: CAN
Elapsed live time: 0 00:20:00.00      Elapsed real time: 0 00:20:10.02  0.8%
Energy tolerance : 1.50000 keV        Analyst Initials  :
Abundance limit  : 75.00000           Sensitivity       : 3.00000
Batch ID         :                    Detector SN#       :
Matrix Spike ID  :                    LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	8	45.21	620	3163	1.70	90.73	88	11	5.16E-01	16.7	3.82E+00
2	8	46.58	4705	3113	0.96	93.47	88	11	3.92E+00	2.4	
3	10	58.24	646	3179	1.85	116.80	114	11	5.38E-01	14.3	1.94E+00
4	10	59.60	14507	3136	0.98	119.52	114	11	1.21E+01	1.0	
5	0	66.94*	90	3742	1.08	134.20	130	8	7.51E-02	117.8	
6	0	88.11	28804	6739	1.11	176.55	171	12	2.40E+01	0.8	
7	0	122.15	11158	3657	1.09	244.66	240	11	9.30E+00	1.4	
8	0	136.60	1480	2471	1.12	273.56	269	10	1.23E+00	6.8	
9	0	165.99	3970	2398	1.09	332.35	328	10	3.31E+00	2.8	
10	0	285.32	90	990	1.34	571.11	568	6	7.54E-02	56.0	
11	0	309.92	95	954	1.35	620.32	618	6	7.95E-02	52.1	
12	0	391.82	2046	2220	1.33	784.18	776	15	1.70E+00	5.5	
13	0	511.37*	605	2161	2.30	1023.40	1017	18	5.04E-01	18.5	
14	0	570.34	100	781	1.11	1141.40	1139	9	8.37E-02	51.0	
15	0	639.55	52	592	0.51	1279.90	1277	7	4.31E-02	79.4	
16	0	642.94	122	630	2.53	1286.67	1283	8	1.02E-01	36.7	
17	0	646.95	51	704	1.71	1294.71	1290	8	4.25E-02	91.2	
18	0	661.82	18670	1460	1.46	1324.46	1319	13	1.56E+01	0.8	
19	0	672.56	91	607	2.65	1345.95	1343	8	7.62E-02	47.9	
20	0	677.73	97	1156	5.08	1356.29	1350	14	8.11E-02	74.7	
21	0	710.34	48	625	1.50	1421.54	1418	8	3.97E-02	92.1	
22	0	898.24*	1937	1524	1.68	1797.58	1792	14	1.61E+00	4.8	
23	0	1055.07	73	451	1.55	2111.47	2109	7	6.12E-02	49.5	
24	0	1102.44	68	470	1.92	2206.28	2204	7	5.63E-02	54.6	
25	0	1115.79	6006	1268	1.83	2233.01	2225	17	5.01E+00	1.9	
26	7	1136.36	44	179	1.03	2274.18	2272	12	3.65E-02	43.9	1.53E+00
27	7	1139.20	86	313	1.61	2279.85	2272	12	7.17E-02	37.9	
28	0	1173.46*	17558	1046	1.88	2348.44	2339	19	1.46E+01	0.9	
29	0	1326.09	31	180	0.93	2653.96	2647	11	2.60E-02	85.5	
30	0	1332.75	15930	496	2.00	2667.29	2657	21	1.33E+01	0.9	
31	0	1416.57	28	62	1.30	2835.08	2827	13	2.36E-02	61.2	
32	1	1836.41	1058	30	2.42	3675.62	3664	25	8.82E-01	3.3	1.80E+00
33	1	1841.37	38	14	2.50	3685.54	3664	25	3.19E-02	20.8	
34	0	1912.56	14	29	0.75	3828.09	3819	13	1.14E-02	85.6	

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	11158	85.60*	5.998E+00	4.895E+03	1.882E+04	2.84
	136.47	1480	10.68	5.973E+00	5.227E+03	2.009E+04	13.63
CO-60	1173.23	17558	99.85	1.262E+00	3.138E+04	3.795E+04	1.75
	1332.49	15930	99.98*	1.124E+00	3.193E+04	3.861E+04	1.73
ZN-65	1115.54	6006	50.60*	1.322E+00	2.023E+04	9.058E+04	3.75
Y-88	898.04	1937	93.70	1.608E+00	2.895E+03	8.953E+04	9.65
	1836.06	1058	99.20*	8.728E-01	2.752E+03	8.510E+04	6.55
CD-109	88.03	28804	3.70*	4.764E+00	3.681E+05	8.134E+05	1.65
SN-113	391.70	2046	64.97*	3.085E+00	2.299E+03	5.525E+04	10.97
CS-137	661.66	18670	85.10*	2.079E+00	2.377E+04	2.458E+04	1.69
CE-139	165.86	3970	80.00*	5.585E+00	2.001E+03	2.856E+04	5.61
PB-210	46.54	4705	4.25*	3.465E-01	7.195E+05	7.527E+05	4.81
AM-241	59.54	14507	35.90*	1.558E+00	5.843E+04	5.856E+04	2.09

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM44.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 7-SEP-2015 11:12:28 Acquisition date : 7-SEP-2015 11:12:28
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:09.11

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.3589E+00	-1.16	
[1.41924+/-0.05215]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: R. Fatch Approval Date: 9 / 11 / 15

Sample ID : Bkg

Acquisition date : 7-SEP-2015 11:12:28

VMS Gamma Spectroscopy Report generated 8-SEP-2015 03:52:33

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM44__342966.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 342966 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 7-SEP-2015 11:12:28.

---- Sample Decay/Count Information ----

Sample Date : 7-SEP-2015 11:12:28. Acquisition date : 7-SEP-2015 11:12:28.
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:09.11

---- Detector Parameters ----

Energy cal. time : 30-SEP-2014 09:43:27 Energy cal. oper.: gamma spec user
 Detector name : GAMMA44 Counting geometry:
 Effic. cal. time : 8-OCT-2014 07:50:55. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.50	139	475	1.15	127.13	124	6	2.32E-03	26.2	
2	0	66.48	87	497	0.93	133.10	131	6	1.45E-03	42.1	
3	0	70.47	58	580	2.31	141.07	139	7	9.70E-04	69.9	
4	0	92.84	601	639	1.30	185.82	182	9	1.00E-02	8.6	
5	0	98.71	71	457	1.22	197.55	195	6	1.18E-03	49.3	
6	0	140.47	119	552	1.12	281.06	277	8	1.98E-03	35.5	
7	0	143.76	69	422	1.67	287.64	285	6	1.15E-03	48.7	
8	0	186.00	353	639	1.43	372.13	367	10	5.89E-03	14.4	
9	3	197.18	70	308	1.09	394.47	392	10	1.17E-03	38.8	4.06E+00
10	3	198.68	111	530	1.54	397.47	392	10	1.85E-03	39.3	
11	0	239.02	150	466	1.32	478.16	474	8	2.49E-03	26.3	
12	0	338.39	73	256	1.50	676.90	673	8	1.22E-03	39.7	
13	0	353.06	84	370	2.86	706.24	700	11	1.39E-03	46.0	
14	0	511.28	1234	411	2.61	1022.70	1014	18	2.06E-02	4.8	
15	0	564.44	110	509	11.81	1129.04	1117	29	1.83E-03	59.6	
16	0	583.58	76	201	1.25	1167.34	1161	12	1.26E-03	39.1	
17	0	610.48	129	236	2.21	1221.13	1217	13	2.15E-03	26.4	
18	0	728.64	13	176	2.26	1457.51	1451	11	2.19E-04	198.5	
19	0	740.84	31	51	1.64	1481.90	1479	6	5.17E-04	40.6	

20	0	802.22	10	149	0.81	1604.70	1603	10	1.64E-04	233.8
21	0	837.96	36	200	4.67	1676.19	1670	16	6.00E-04	89.4
22	0	872.92	20	139	0.69	1746.14	1737	14	3.31E-04	128.1
23	0	879.03	21	83	1.27	1758.38	1753	9	3.47E-04	82.6
24	0	898.38	30	79	1.64	1797.07	1793	8	4.93E-04	55.5
25	0	911.18	127	145	3.22	1822.68	1813	20	2.12E-03	24.8
26	0	962.60	47	91	0.78	1925.57	1919	11	7.88E-04	41.6
27	0	1002.90	13	93	0.76	2006.20	2000	9	2.10E-04	141.9
28	0	1172.00	26	34	2.04	2344.53	2340	8	4.27E-04	45.6
29	0	1307.67	22	63	1.00	2616.01	2607	15	3.72E-04	80.6
30	0	1412.22	11	48	2.96	2825.21	2817	11	1.85E-04	125.7
31	0	1461.07	66	42	2.07	2922.98	2918	10	1.09E-03	22.7
32	0	1654.31	28	24	1.35	3309.71	3303	12	4.71E-04	39.4
33	0	1766.10	30	59	1.05	3533.45	3522	18	5.04E-04	62.1
34	0	1773.15	20	43	4.40	3547.56	3539	19	3.27E-04	83.2
35	1	1799.34	22	30	2.44	3599.99	3594	53	3.67E-04	50.3
36	1	1816.34	27	18	2.22	3634.00	3594	53	4.46E-04	41.1
37	0	1955.76	24	35	3.73	3913.07	3903	18	3.96E-04	62.6
38	0	2015.68	10	32	4.88	4033.02	4024	14	1.68E-04	122.1

1.87E+00

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 44

Calibration Date: 9/9/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.856E+04	3.52
Cs-137	661.7	0.851	735.7	2.3365E+04	2.458E+04	5.20
Co-60	1173.2	0.9985	1383	3.7435E+04	3.795E+04	1.38
Co-60	1332.5	0.9998	1385	3.7440E+04	3.861E+04	3.13

Prepared By: R. Faren

Date: 9/14/15

Reviewed By: M. Stamp

Date: 9/26/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 42

Date Performed: 9/8/15

Performed By: RF

High Voltage Power Supply Model No. <u>3105</u> High Voltage <u>3.00 kV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>1.040</u> Time Constant <u>4 μsec</u> Input polarity <u>positive</u> BSLR rate <u>ng</u> BSLR mode <u>ng</u> Threshold <u>ng</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>1CB.1</u>	

Continuing Calibration Data

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
 16-JUN-2016 11:33:16.90

Run Date	Detector	Parameter	Flag
16-JUN-2016	GAM01	All Parameters Passed	
16-JUN-2016	GAM02	All Parameters Passed	
16-JUN-2016	GAM03	Cal Check PSFWHM-59	Investigate <i>OK</i>
16-JUN-2016	GAM05	All Parameters Passed	
16-JUN-2016	GAM06	Cal Check NLACTVTY-662	Investigate <i>OK</i>
7-JUN-2016	GAM07	Cal Check may not have run since 16-JUN-2016	
7-JUN-2016	GAM07	Bkg Check may not have run since 16-JUN-2016	
16-JUN-2016	GAM08	All Parameters Passed	
16-JUN-2016	GAM09	All Parameters Passed	
16-JUN-2016	GAM10	All Parameters Passed	
16-JUN-2016	GAM11	All Parameters Passed	
16-JUN-2016	GAM12	Cal Check PSFWHM-662	Investigate
16-JUN-2016	GAM12	Cal Check NLACTVTY-662	Investigate
16-JUN-2016	GAM12	Cal Check PSFWHM-59	Investigate <i>OK</i>
-----	GAM13	Cal Check may not have run since 16-JUN-2016	
12-JUN-2016	GAM13	Bkg Check may not have run since 16-JUN-2016	
16-JUN-2016	GAM14	Cal Check NLACTVTY-662	Investigate <i>OK</i>
13-JUN-2016	GAM15	Cal Check may not have run since 16-JUN-2016	
12-JUN-2016	GAM15	Bkg Check may not have run since 16-JUN-2016	
16-JUN-2016	GAM16	All Parameters Passed	
16-JUN-2016	GAM17	Cal Check PSFWHM-59	Action <i>below - OK</i>
16-JUN-2016	GAM18	All Parameters Passed	
15-JUN-2016	GAM19	Cal Check may not have run since 16-JUN-2016	
12-JUN-2016	GAM19	Bkg Check may not have run since 16-JUN-2016	
16-JUN-2016	GAM20	Cal Check PSFWHM-1332	Investigate <i>OK</i>
16-JUN-2016	GAM22	All Parameters Passed	
15-JUN-2016	GAM24	Cal Check may not have run since 16-JUN-2016	
12-JUN-2016	GAM24	Bkg Check may not have run since 16-JUN-2016	
16-JUN-2016	GAM25	All Parameters Passed	

16-JUN-2016	GAM26	All Parameters Passed		
16-JUN-2016	GAM27	Cal Check	PSFWHM-662	Investigate <i>OK</i>
16-JUN-2016	GAM28	Cal Check	PSFWHM-662	Investigate <i>OK</i>
16-JUN-2016	GAM29	Cal Check	PSFWHM-662	Investigate <i>OK</i>
16-JUN-2016	GAM29	Cal Check	NLACTVTY-59	Investigate <i>OK</i>
16-JUN-2016	GAM30	All Parameters Passed		
15-JUN-2016	GAM31	Cal Check may not have run since 16-JUN-2016		
12-JUN-2016	GAM31	Bkg Check may not have run since 16-JUN-2016		
16-JUN-2016	GAM32	Cal Check	PSFWHM-59	Investigate <i>OK</i>
16-JUN-2016	GAM32	Cal Check	PSFWHM-1332	Investigate <i>OK</i>
16-JUN-2016	GAM33	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
16-JUN-2016	GAM36	All Parameters Passed		
16-JUN-2016	GAM41	Bkg Check	BACKRATE	Investigate <i>OK</i>
16-JUN-2016	GAM43	Cal Check	NLACTVTY-1332	Investigate <i>OK</i>
16-JUN-2016	GAM44	All Parameters Passed		
16-JUN-2016	WELL	All Parameters Passed		
16-JUN-2016	XRAY1	Cal Check	PSFWHM-59	Action <i>Lacked out</i>
16-JUN-2016	XRAY1	Cal Check	PSFWHM-109	Action <i>Lacked out</i>
16-JUN-2016	XRAY1	Cal Check	PSFWHM-46	Action <i>Lacked out</i>
16-JUN-2016	XRAY2	Cal Check	PSFWHM-59	Investigate <i>OK</i>
16-JUN-2016	XRAY2	Cal Check	PSFWHM-109	Investigate <i>OK</i>
16-JUN-2016	XRAY3	Cal Check	NLACTVTY-210	Investigate <i>OK</i>
15-JUN-2016	XRAY4	Cal Check may not have run since 16-JUN-2016		
12-JUN-2016	XRAY4	Bkg Check may not have run since 16-JUN-2016		
16-JUN-2016	XRAY5	All Parameters Passed		
16-JUN-2016	XRAY6	Cal Check	NLACTVTY-109	Investigate <i>OK</i>

APPROVAL DATE: 6/16/16

APPROVAL TIME: 12:18

APPROVED BY: *U8fampv*

PROCEDURE # GL-RAD-I-001

Report completed at 16-JUN-2016 11:36:54.58

★ = Locked Out

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
22-JUN-2016 12:19:03.13

Run Date	Detector	Parameter	Flag
22-JUN-2016	GAM01	Cal Check PSFWHM-1332	Investigate GK
22-JUN-2016	GAM02	All Parameters Passed	
22-JUN-2016	GAM03	Cal Check PSENERGY-662	missing
22-JUN-2016	GAM03	Cal Check PSENERGY-1332	missing
22-JUN-2016	GAM03	Cal Check PSENERGY-59	missing
22-JUN-2016	GAM03	Cal Check PSFWHM-662	missing
22-JUN-2016	GAM03	Cal Check PSFWHM-1332	missing ★
22-JUN-2016	GAM03	Cal Check NLACTVTY-662	missing
22-JUN-2016	GAM03	Cal Check NLACTVTY-1332	missing
22-JUN-2016	GAM03	Cal Check NLACTVTY-59	missing
22-JUN-2016	GAM03	Cal Check PSFWHM-59	missing
22-JUN-2016	GAM05	Bkg Check BACKRATE	Investigate OK
22-JUN-2016	GAM06	All Parameters Passed	
7-JUN-2016	GAM07	Cal Check may not have run since 22-JUN-2016	★
7-JUN-2016	GAM07	Bkg Check may not have run since 22-JUN-2016	★
22-JUN-2016	GAM08	Bkg Check BACKCOUNTS	Investigate OK
22-JUN-2016	GAM09	Cal Check PSFWHM-59	Investigate OK
22-JUN-2016	GAM09	Cal Check NLACTVTY-59	Investigate OK
22-JUN-2016	GAM10	All Parameters Passed	
22-JUN-2016	GAM11	All Parameters Passed	
22-JUN-2016	GAM12	Cal Check NLACTVTY-1332	Investigate OK
-----	GAM13	Cal Check may not have run since 22-JUN-2016	★
12-JUN-2016	GAM13	Bkg Check may not have run since 22-JUN-2016	★
22-JUN-2016	GAM14	Cal Check NLACTVTY-1332	Investigate OK
22-JUN-2016	GAM15	Cal Check PSFWHM-59	Action
22-JUN-2016	GAM15	Cal Check PSFWHM-662	Action ★
12-JUN-2016	GAM15	Bkg Check may not have run since 22-JUN-2016	
22-JUN-2016	GAM16	All Parameters Passed	
22-JUN-2016	GAM17	Cal Check PSFWHM-662	Investigate OK
22-JUN-2016	GAM17	Cal Check PSFWHM-59	Action below, OK
22-JUN-2016	GAM18	All Parameters Passed	
22-JUN-2016	GAM19	Cal Check NLACTVTY-662	Investigate OK

22-JUN-2016	GAM20	All Parameters Passed		
22-JUN-2016	GAM22	Cal Check	PSFWHM-662	Investigate OK
22-JUN-2016	GAM24	All Parameters Passed		
22-JUN-2016	GAM25	All Parameters Passed		
22-JUN-2016	GAM26	All Parameters Passed		
22-JUN-2016	GAM27	All Parameters Passed		
22-JUN-2016	GAM28	Cal Check	PSFWHM-59	Investigate OK
22-JUN-2016	GAM29	Bkg Check	BACKRATE	Investigate OK
22-JUN-2016	GAM30	All Parameters Passed		
22-JUN-2016	GAM31	Cal Check	PSFWHM-662	Investigate OK
22-JUN-2016	GAM32	All Parameters Passed		
22-JUN-2016	GAM33	Cal Check	PSFWHM-662	Investigate OK
22-JUN-2016	GAM36	All Parameters Passed		
22-JUN-2016	GAM41	All Parameters Passed		
22-JUN-2016	GAM43	All Parameters Passed		
22-JUN-2016	GAM44	All Parameters Passed		
22-JUN-2016	WELL	Cal Check	PSFWHM-1332	Investigate OK
22-JUN-2016	XRAY1	Cal Check	NLACTVTY-59	Investigate OK
22-JUN-2016	XRAY2	Bkg Check	BACKRATE	Action Below, OK
22-JUN-2016	XRAY3	All Parameters Passed		
22-JUN-2016	XRAY4	All Parameters Passed		
Weekly Background check completed on 22-JUN-2016. No daily Bkg Check necessary.				
22-JUN-2016	XRAY5	All Parameters Passed		
22-JUN-2016	XRAY6	Bkg Check	BACKRATE	Investigate OK

APPROVAL DATE: 6/22/16

APPROVAL TIME: 13:11

APPROVED BY: RF

PROCEDURE # GL-RAD-I-001

Report completed at 22-JUN-2016 12:23:32.59

☆ = locked out

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
23-JUN-2016 12:01:22.32

Run Date	Detector	Parameter		Flag
23-JUN-2016	GAM01	All Parameters Passed		
23-JUN-2016	GAM02	All Parameters Passed		
23-JUN-2016	GAM03	Cal Check	PSFWHM-662	Action ☆
23-JUN-2016	GAM03	Cal Check	PSFWHM-59	Action ☆
23-JUN-2016	GAM05	All Parameters Passed		
23-JUN-2016	GAM06	All Parameters Passed		
7-JUN-2016	GAM07	Cal Check may not have run since 23-JUN-2016		☆
7-JUN-2016	GAM07	Bkg Check may not have run since 23-JUN-2016		☆
23-JUN-2016	GAM08	Cal Check	NLACTVTY-662	Investigate OK
23-JUN-2016	GAM09	Cal Check	NLACTVTY-662	Investigate OK
23-JUN-2016	GAM10	All Parameters Passed		
23-JUN-2016	GAM11	Bkg Check	BACKRATE	Investigate OK
23-JUN-2016	GAM12	Cal Check	PSFWHM-662	Investigate OK
23-JUN-2016	GAM12	Cal Check	PSFWHM-59	Investigate OK
-----	GAM13	Cal Check may not have run since 23-JUN-2016		☆
12-JUN-2016	GAM13	Bkg Check may not have run since 23-JUN-2016		☆
23-JUN-2016	GAM14	All Parameters Passed		
23-JUN-2016	GAM15	All Parameters Passed		
		Weekly Background check completed on 23-JUN-2016. No daily Bkg Check necessary.		
23-JUN-2016	GAM16	All Parameters Passed		
23-JUN-2016	GAM17	All Parameters Passed		
23-JUN-2016	GAM18	Cal Check	PSFWHM-662	Investigate OK
23-JUN-2016	GAM19	All Parameters Passed		
23-JUN-2016	GAM20	Cal Check	PSFWHM-662	Investigate OK
23-JUN-2016	GAM22	All Parameters Passed		
23-JUN-2016	GAM24	Cal Check	PSFWHM-662	Investigate OK
23-JUN-2016	GAM25	Cal Check	PSFWHM-662	Investigate OK

23-JUN-2016	GAM26	Cal Check	NLACTVTY-1332	Investigate OK
23-JUN-2016	GAM27	Cal Check	PSFWHM-59	Investigate OK
23-JUN-2016	GAM27	Cal Check	NLACTVTY-59	Investigate OK
23-JUN-2016	GAM28	Cal Check	PSFWHM-59	Action Below OK
23-JUN-2016	GAM28	Cal Check	PSFWHM-662	Investigate OK
23-JUN-2016	GAM29	All Parameters Passed		
23-JUN-2016	GAM30	All Parameters Passed		
23-JUN-2016	GAM31	Cal Check	PSFWHM-1332	Action Below OK
23-JUN-2016	GAM32	All Parameters Passed		
23-JUN-2016	GAM33	Cal Check	NLACTVTY-662	Investigate OK
23-JUN-2016	GAM36	All Parameters Passed		
23-JUN-2016	GAM41	Bkg Check	BACKRATE	Investigate OK
23-JUN-2016	GAM43	All Parameters Passed		
23-JUN-2016	GAM44	All Parameters Passed		
23-JUN-2016	WELL	Cal Check	PSFWHM-59	Investigate OK
23-JUN-2016	XRAY1	All Parameters Passed		
23-JUN-2016	XRAY2	Cal Check	PSENERGY-59	missing
23-JUN-2016	XRAY2	Cal Check	PSENERGY-109	missing
23-JUN-2016	XRAY2	Cal Check	PSFWHM-59	missing
23-JUN-2016	XRAY2	Cal Check	PSFWHM-109	missing
23-JUN-2016	XRAY2	Cal Check	NLACTVTY-59	missing
23-JUN-2016	XRAY2	Cal Check	NLACTVTY-109	missing
23-JUN-2016	XRAY2	Cal Check	PSFWHM-210	Action
23-JUN-2016	XRAY2	Cal Check	NLACTVTY-210	Action
23-JUN-2016	XRAY2	Bkg Check	BACKRATE	Action
23-JUN-2016	XRAY3	All Parameters Passed		
23-JUN-2016	XRAY4	All Parameters Passed		
23-JUN-2016	XRAY5	All Parameters Passed		
23-JUN-2016	XRAY6	All Parameters Passed		

APPROVAL DATE: 6/23/16

APPROVAL TIME: 12:36

APPROVED BY: [Signature]

PROCEDURE # GL-RAD-I-001

Report completed at 23-JUN-2016 12:06:46.08

★ = Locked out

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
24-JUN-2016 10:38:30.07

Run Date	Detector	Parameter		Flag
24-JUN-2016	GAM01	All Parameters Passed		
24-JUN-2016	GAM02	All Parameters Passed		
24-JUN-2016	GAM03	Cal Check	PSFWHM-662	Investigate
24-JUN-2016	GAM03	Cal Check	PSFWHM-59	Action
24-JUN-2016	GAM05	All Parameters Passed		
24-JUN-2016	GAM06	All Parameters Passed		
7-JUN-2016	GAM07	Cal Check may not have run since 24-JUN-2016		★
7-JUN-2016	GAM07	Bkg Check may not have run since 24-JUN-2016		★
24-JUN-2016	GAM08	Cal Check	NLACTVTY-59	Investigate OK
24-JUN-2016	GAM09	Bkg Check	BACKRATE	Investigate OK
24-JUN-2016	GAM10	All Parameters Passed		
24-JUN-2016	GAM11	All Parameters Passed		
24-JUN-2016	GAM12	All Parameters Passed		
-----	GAM13	Cal Check may not have run since 24-JUN-2016		★
12-JUN-2016	GAM13	Bkg Check may not have run since 24-JUN-2016		★
24-JUN-2016	GAM14	All Parameters Passed		
24-JUN-2016	GAM15	All Parameters Passed		
24-JUN-2016	GAM16	All Parameters Passed		
24-JUN-2016	GAM17	Cal Check	PSFWHM-662	Investigate OK
24-JUN-2016	GAM17	Cal Check	PSFWHM-1332	Investigate OK
24-JUN-2016	GAM17	Cal Check	PSFWHM-59	Action Below, OK
24-JUN-2016	GAM18	All Parameters Passed		
24-JUN-2016	GAM19	Cal Check	PSFWHM-662	Action Below, OK
24-JUN-2016	GAM20	All Parameters Passed		
24-JUN-2016	GAM22	All Parameters Passed		
24-JUN-2016	GAM24	All Parameters Passed		
24-JUN-2016	GAM25	Cal Check	NLACTVTY-662	Investigate OK
24-JUN-2016	GAM26	Bkg Check	BACKRATE	Investigate OK

24-JUN-2016	GAM27	All Parameters Passed		
24-JUN-2016	GAM28	All Parameters Passed		
24-JUN-2016	GAM29	Cal Check	PSFWHM-662	Investigate OK
24-JUN-2016	GAM29	Cal Check	NLACTVTY-59	Investigate OK
24-JUN-2016	GAM29	Cal Check	NLACTVTY-662	Investigate OK
24-JUN-2016	GAM30	All Parameters Passed		
24-JUN-2016	GAM31	All Parameters Passed		
24-JUN-2016	GAM32	Cal Check	PSFWHM-1332	Investigate OK
24-JUN-2016	GAM33	Bkg Check	BACKRATE	Investigate OK
24-JUN-2016	GAM36	Cal Check	PSFWHM-1332	Investigate OK
24-JUN-2016	GAM41	Cal Check	PSFWHM-662	Investigate OK
24-JUN-2016	GAM41	Bkg Check	BACKRATE	Investigate OK
24-JUN-2016	GAM43	All Parameters Passed		
24-JUN-2016	GAM44	All Parameters Passed		
24-JUN-2016	WELL	Cal Check	PSFWHM-1332	Investigate ★
24-JUN-2016	WELL	Cal Check	PSFWHM-59	Action
24-JUN-2016	XRAY1	All Parameters Passed		
24-JUN-2016	XRAY2	Cal Check	NLACTVTY-59	Action ★
24-JUN-2016	XRAY3	Cal Check	NLACTVTY-109	Investigate ★
24-JUN-2016	XRAY3	Cal Check	NLACTVTY-210	Action
24-JUN-2016	XRAY4	Cal Check	PSFWHM-109	Investigate OK
24-JUN-2016	XRAY4	Cal Check	PSFWHM-210	Investigate OK
24-JUN-2016	XRAY5	Cal Check	NLACTVTY-59	Investigate OK
24-JUN-2016	XRAY6	All Parameters Passed		

APPROVAL DATE: 6/24/16

APPROVAL TIME: 11:49

APPROVED BY: RF

PROCEDURE # GL-RAD-I-001

Report completed at 24-JUN-2016 10:42:45.12

★ = locked out

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
25-JUN-2016 10:00:43.64

Run Date	Detector	Parameter	Flag
25-JUN-2016	GAM01	Cal Check PSFWHM-1332	Investigate OK
25-JUN-2016	GAM02	All Parameters Passed	
24-JUN-2016	GAM03	Cal Check may not have run since 25-JUN-2016	★
25-JUN-2016	GAM05	All Parameters Passed	
25-JUN-2016	GAM06	Cal Check NLACTVTY-1332	Investigate OK
7-JUN-2016	GAM07	Cal Check may not have run since 25-JUN-2016	★
7-JUN-2016	GAM07	Bkg Check may not have run since 25-JUN-2016	★
25-JUN-2016	GAM08	Cal Check NLACTVTY-59	Investigate OK
25-JUN-2016	GAM09	All Parameters Passed	
25-JUN-2016	GAM10	All Parameters Passed	
25-JUN-2016	GAM11	Cal Check NLACTVTY-662	Investigate OK
25-JUN-2016	GAM12	Cal Check PSFWHM-662	Investigate OK
25-JUN-2016	GAM12	Cal Check PSFWHM-59	Action Below, OK
-----	GAM13	Cal Check may not have run since 25-JUN-2016	★
12-JUN-2016	GAM13	Bkg Check may not have run since 25-JUN-2016	★
25-JUN-2016	GAM14	Cal Check PSFWHM-1332	Investigate OK
25-JUN-2016	GAM15	Cal Check PSFWHM-59	Investigate OK
25-JUN-2016	GAM15	Cal Check PSFWHM-662	Investigate OK
25-JUN-2016	GAM16	Cal Check NLACTVTY-59	Investigate OK
25-JUN-2016	GAM17	Cal Check PSFWHM-662	Investigate OK
25-JUN-2016	GAM17	Cal Check PSFWHM-59	Action Below, OK
25-JUN-2016	GAM18	Cal Check PSFWHM-662	Investigate OK
25-JUN-2016	GAM19	All Parameters Passed	
25-JUN-2016	GAM20	All Parameters Passed	
25-JUN-2016	GAM22	All Parameters Passed	
25-JUN-2016	GAM24	Cal Check NLACTVTY-662	Investigate OK
25-JUN-2016	GAM25	All Parameters Passed	
25-JUN-2016	GAM26	Cal Check PSFWHM-1332	Investigate OK

25-JUN-2016	GAM26	Cal Check	NLACTVTY-1332	Investigate OK
25-JUN-2016	GAM27	All Parameters Passed		
25-JUN-2016	GAM28	All Parameters Passed		
25-JUN-2016	GAM29	All Parameters Passed		
25-JUN-2016	GAM30	All Parameters Passed		
25-JUN-2016	GAM31	Cal Check	PSFWHM-662	Action Below OK
25-JUN-2016	GAM32	Cal Check	PSFWHM-59	Investigate OK
25-JUN-2016	GAM32	Cal Check	NLACTVTY-59	Investigate OK
25-JUN-2016	GAM32	Cal Check	NLACTVTY-662	Investigate OK
25-JUN-2016	GAM33	Cal Check	PSFWHM-1332	Investigate OK
25-JUN-2016	GAM33	Bkg Check	BACKRATE	Investigate OK
25-JUN-2016	GAM36	Cal Check	NLACTVTY-662	Investigate OK
-----	GAM40	Cal Check may not have run since 25-JUN-2016 ★		
26-MAR-2016	GAM40	Bkg Check may not have run since 25-JUN-2016 ★		
25-JUN-2016	GAM41	Cal Check	PSFWHM-1332	Investigate OK
25-JUN-2016	GAM41	Bkg Check	BACKRATE	Investigate OK
25-JUN-2016	GAM43	Cal Check	NLACTVTY-1332	Investigate OK
25-JUN-2016	GAM44	All Parameters Passed		
25-JUN-2016	WELL	Cal Check	PSFWHM-59	Investigate OK
25-JUN-2016	XRAY1	All Parameters Passed		
25-JUN-2016	XRAY2	All Parameters Passed		
25-JUN-2016	XRAY3	Cal Check	NLACTVTY-210	Action ★
25-JUN-2016	XRAY4	Cal Check	PSFWHM-59	Investigate OK
25-JUN-2016	XRAY5	All Parameters Passed		
25-JUN-2016	XRAY6	Bkg Check	BACKRATE	Investigate OK

APPROVAL DATE: 6/25/16

APPROVAL TIME: 11:02

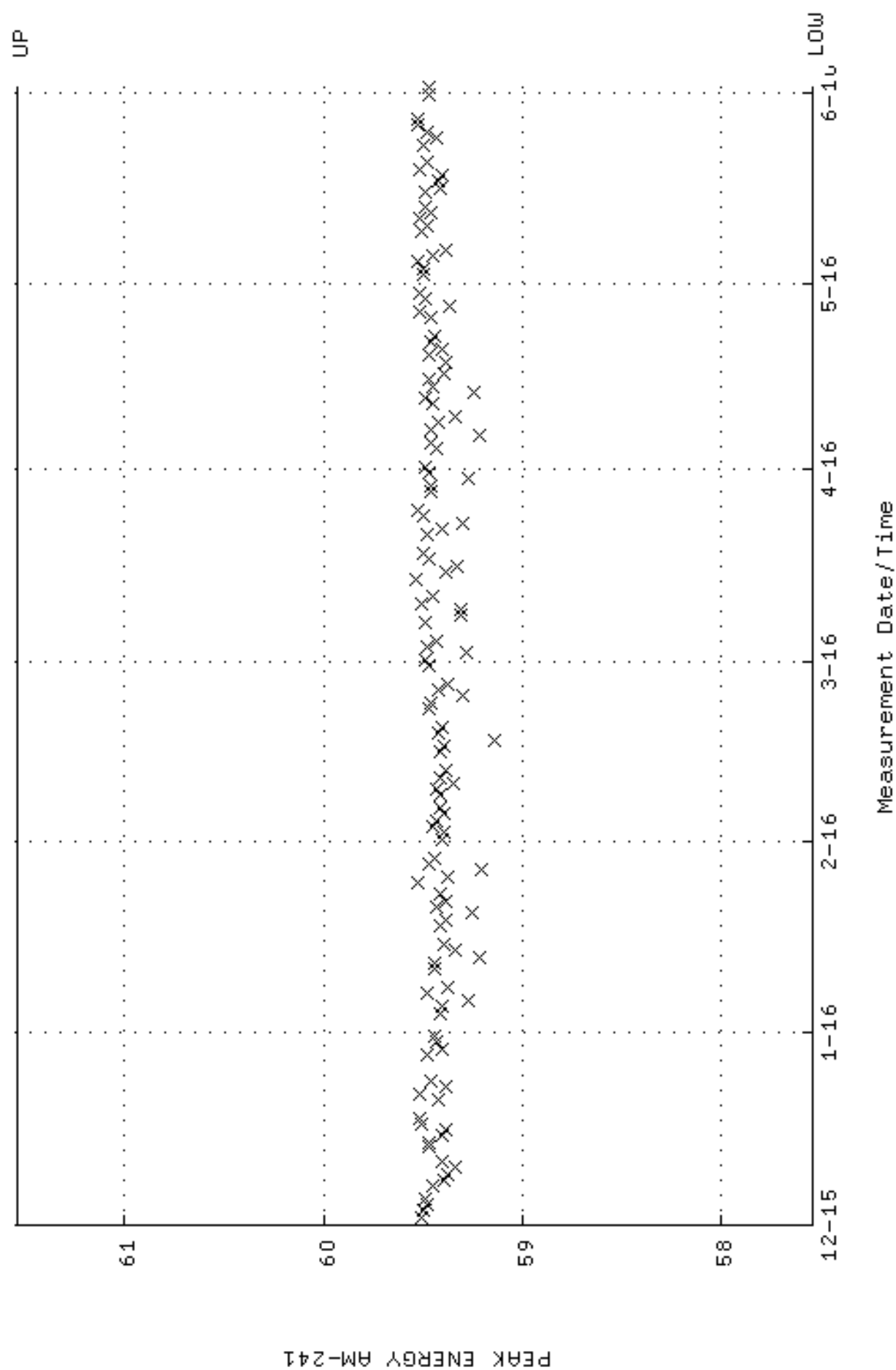
APPROVED BY: RF

PROCEDURE # GL-RAD-I-001

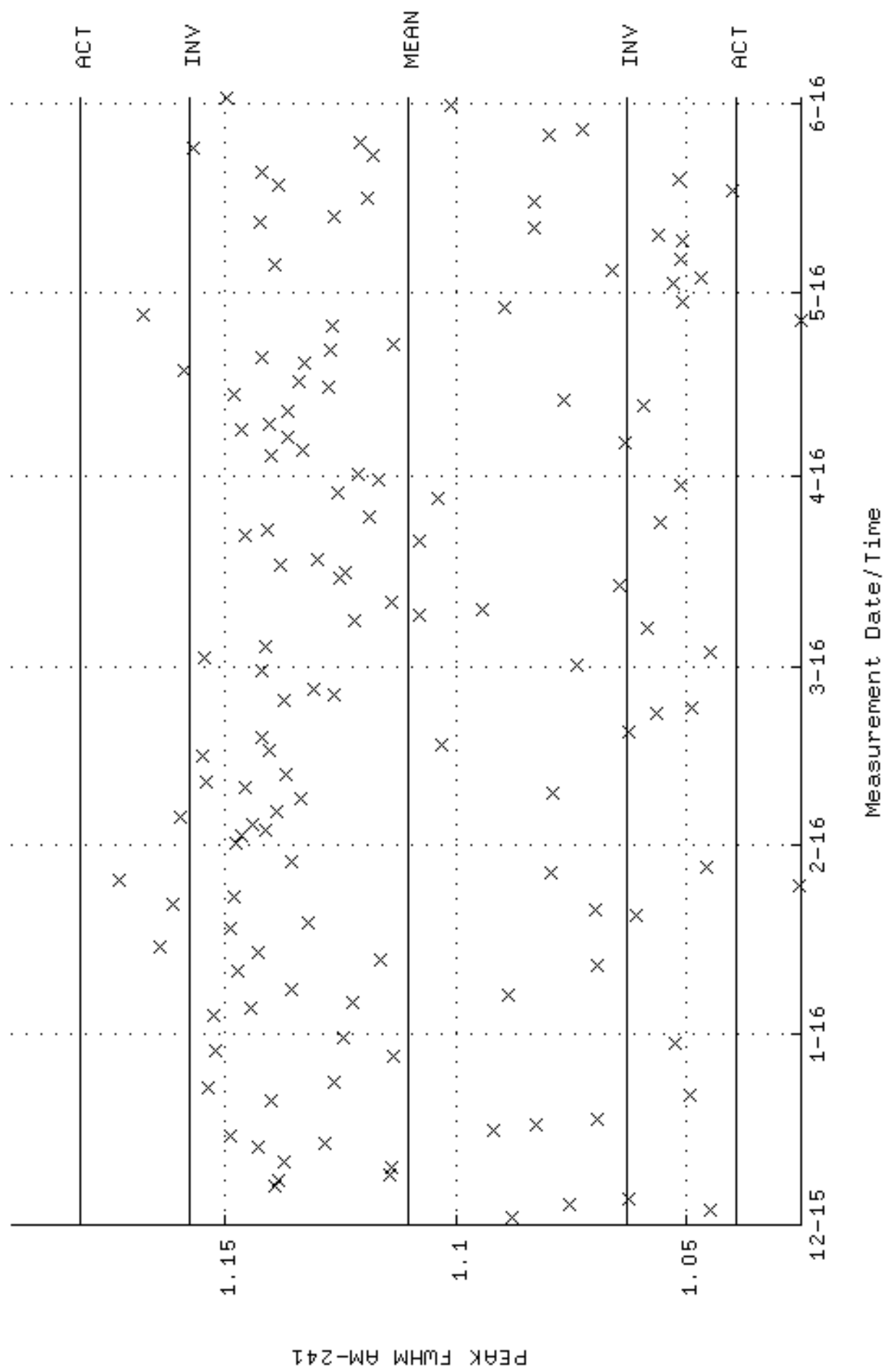
Report completed at 25-JUN-2016 10:05:10.46

Background and Efficiency Data

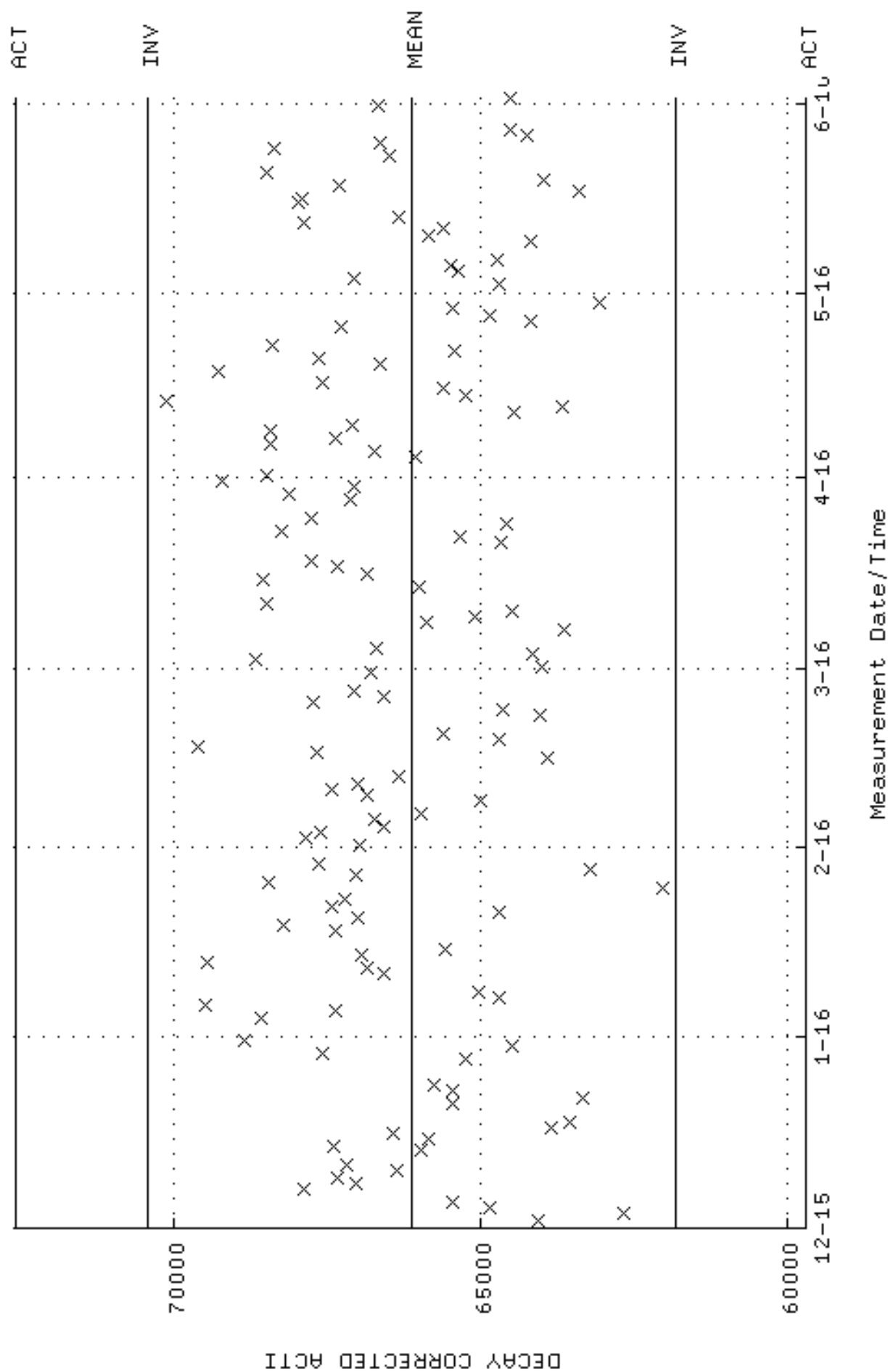
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM02_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:17 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



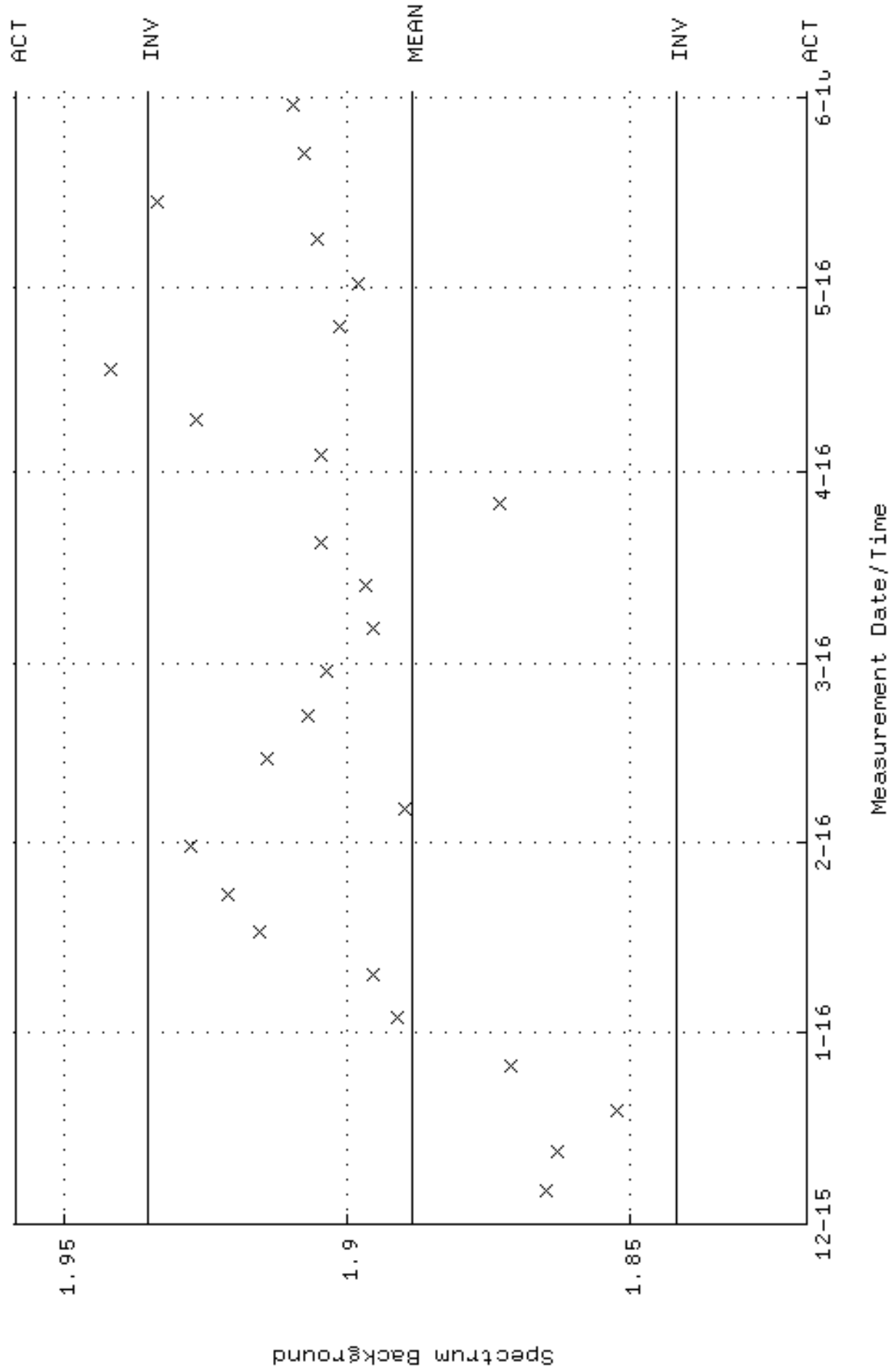
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM02_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:28:17 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.11049 +- 2.374426E-02 (2.14 %)



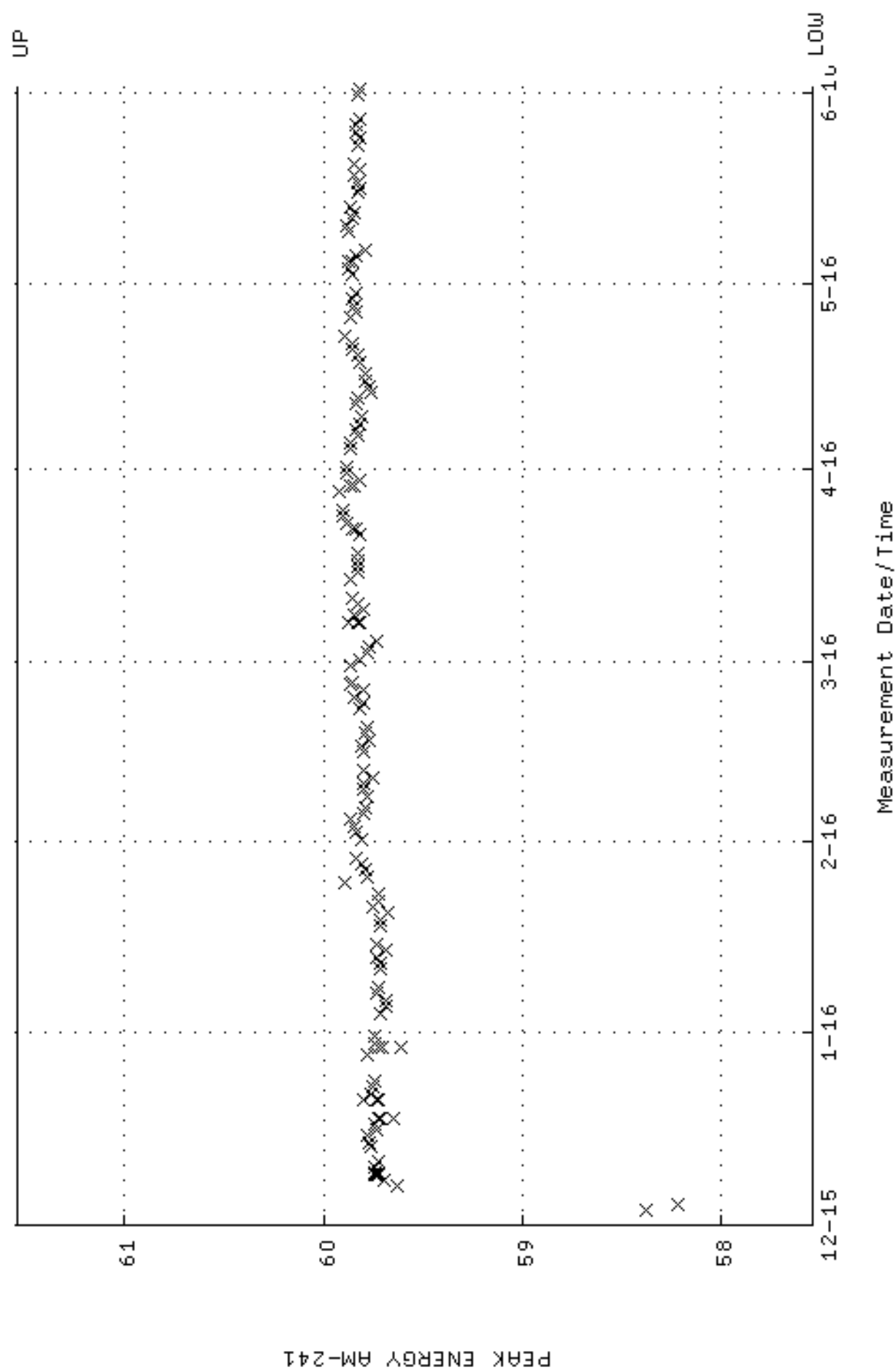
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM02_CAN.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:17 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 66144.6 +- 2145.25 (3.24 %)



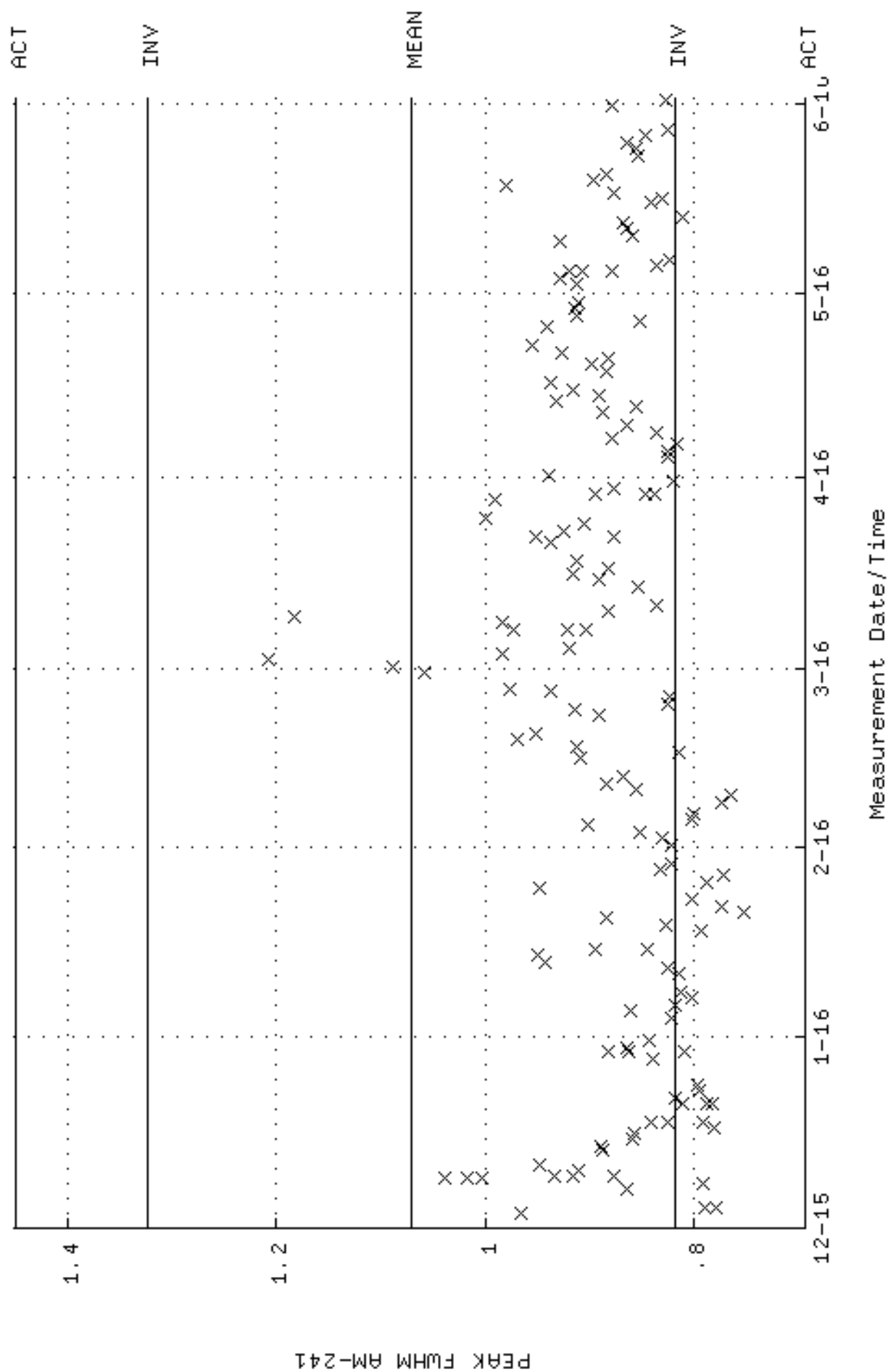
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM02.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:47:36 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.88858 +- 2.335306E-02 (1.24 %)



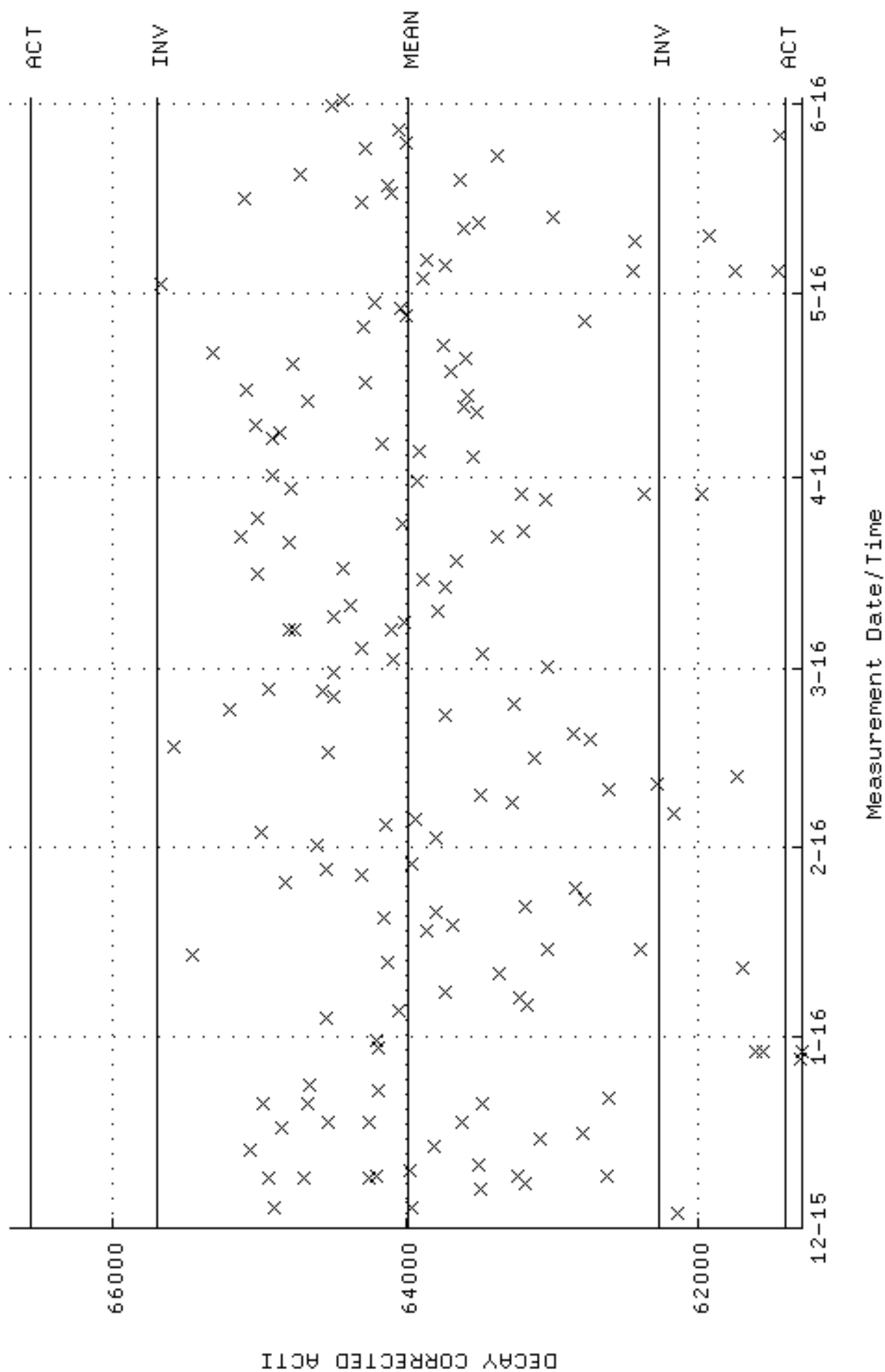
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_GAM05_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 3-DEC-2015 13:02:43 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



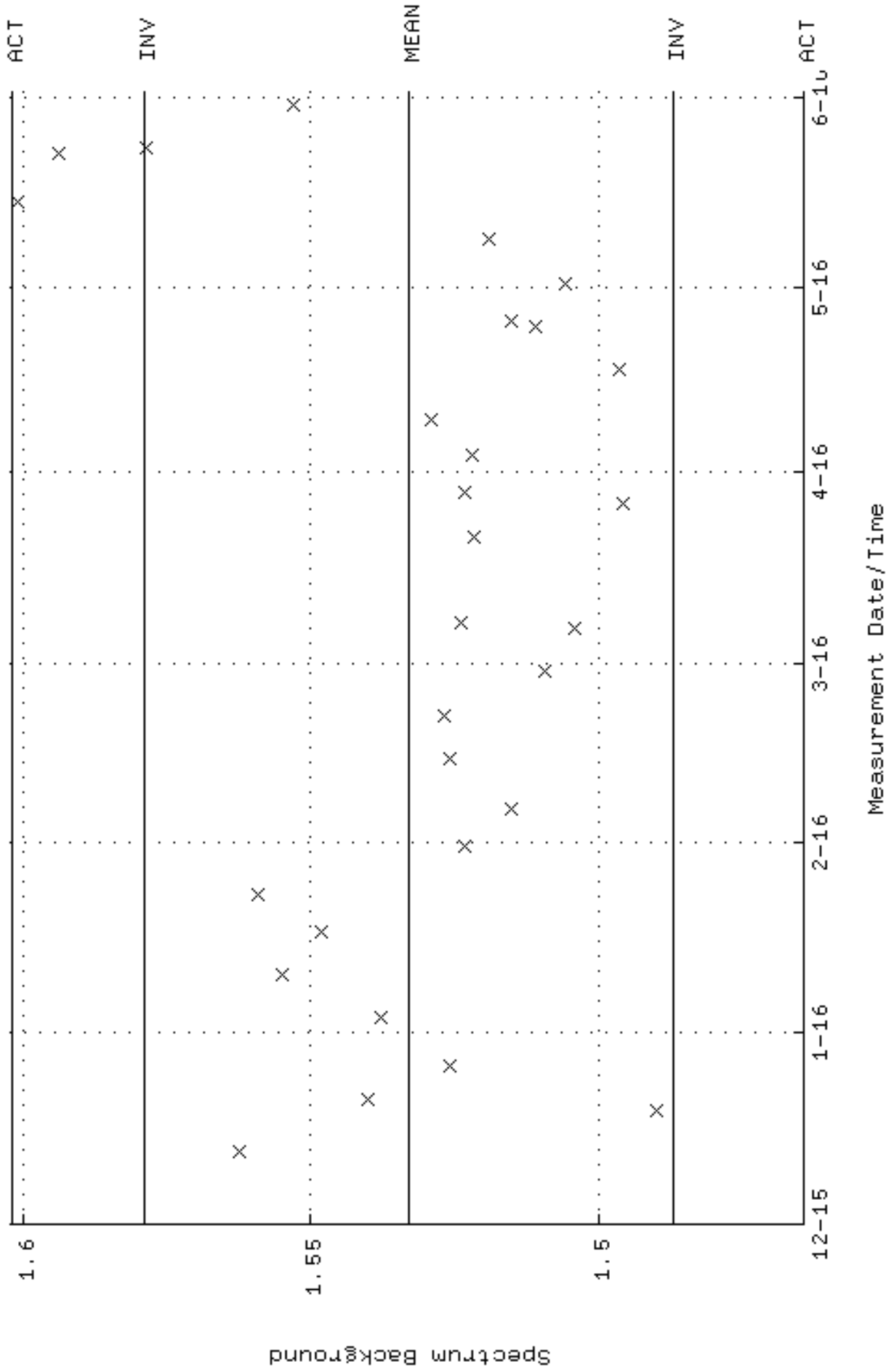
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM05_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 3-DEC-2015 13:02:43 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.07179 +- 0.125868 (11.74 %)



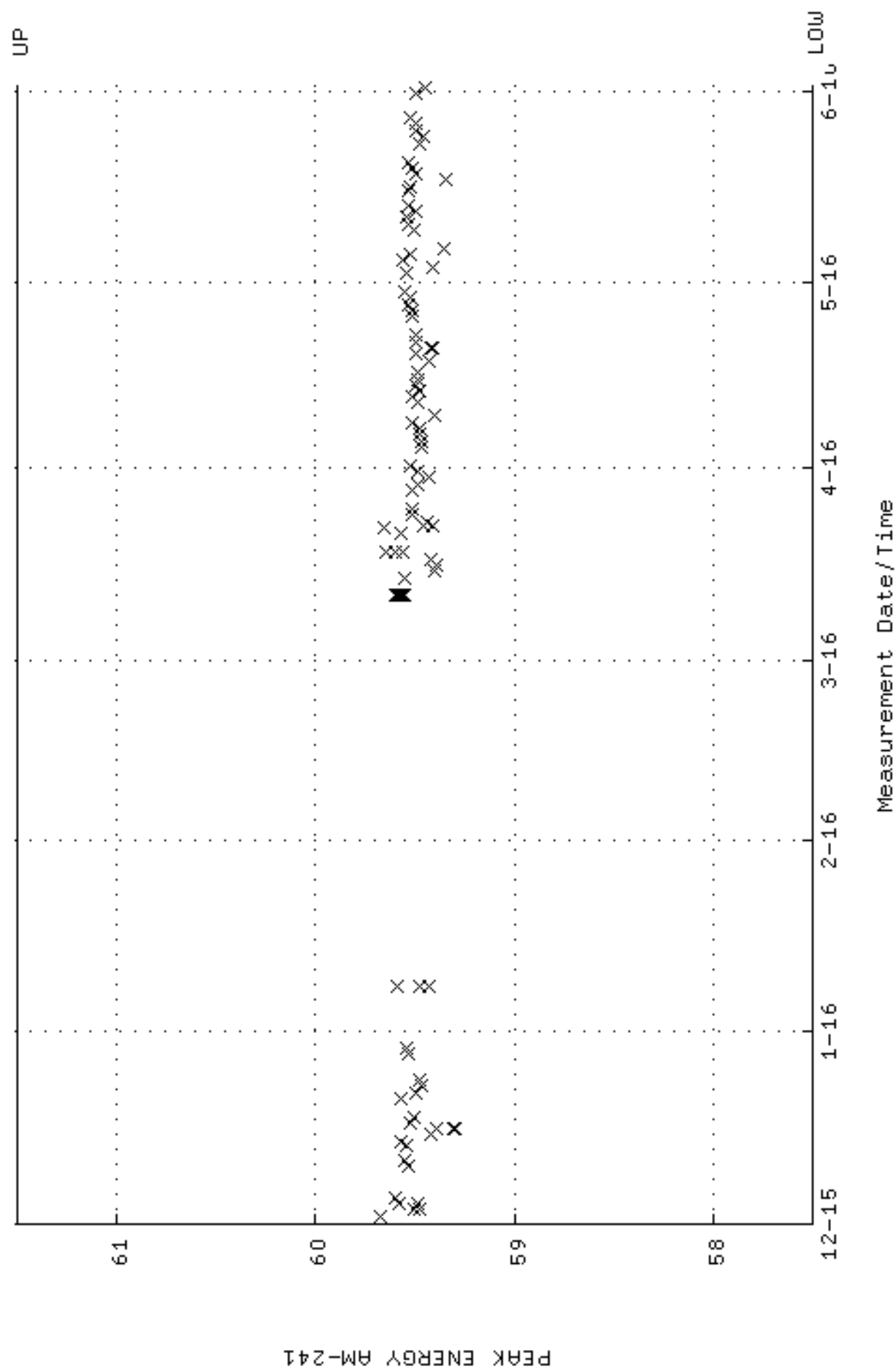
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM05_CAN.QAF;1
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 Start/End Dates : 3-DEC-2015 13:02:43 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 63988.9 +- 858.690 (1.34 %)



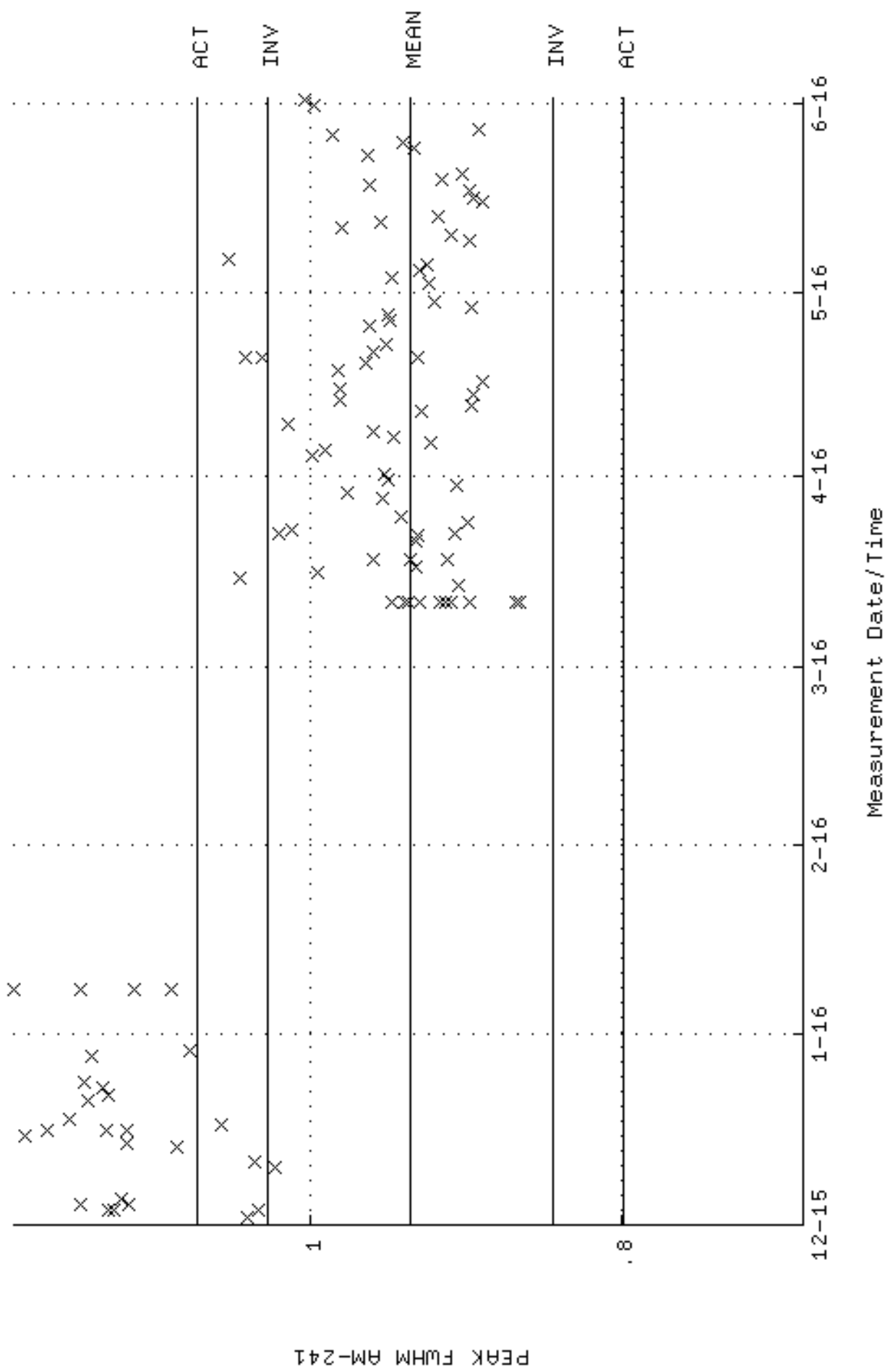
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM05.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 12-DEC-2015 16:35:39 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.53310 +- 2.296009E-02 (1.50 %)



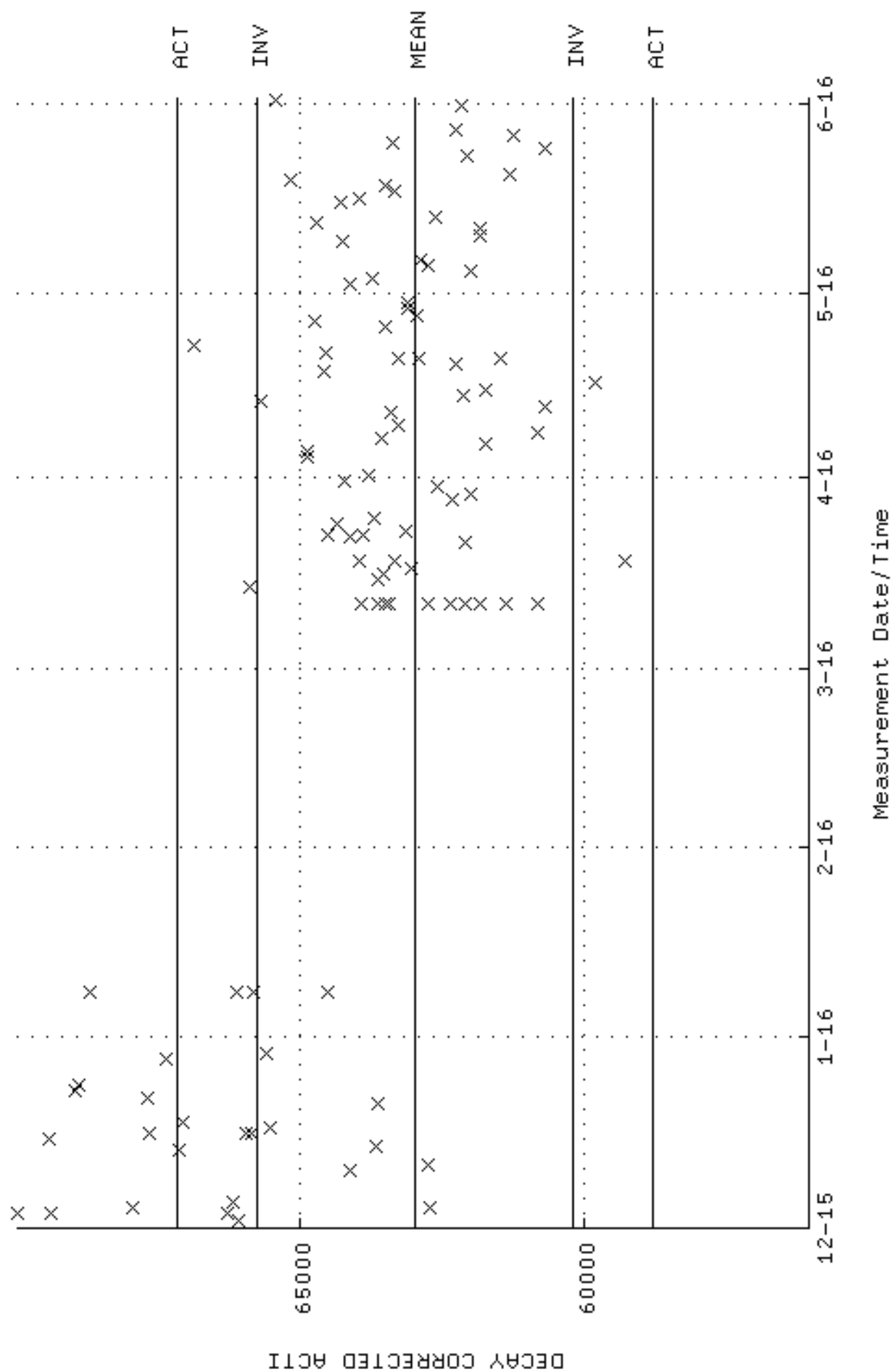
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM06_500MLMB.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:38 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



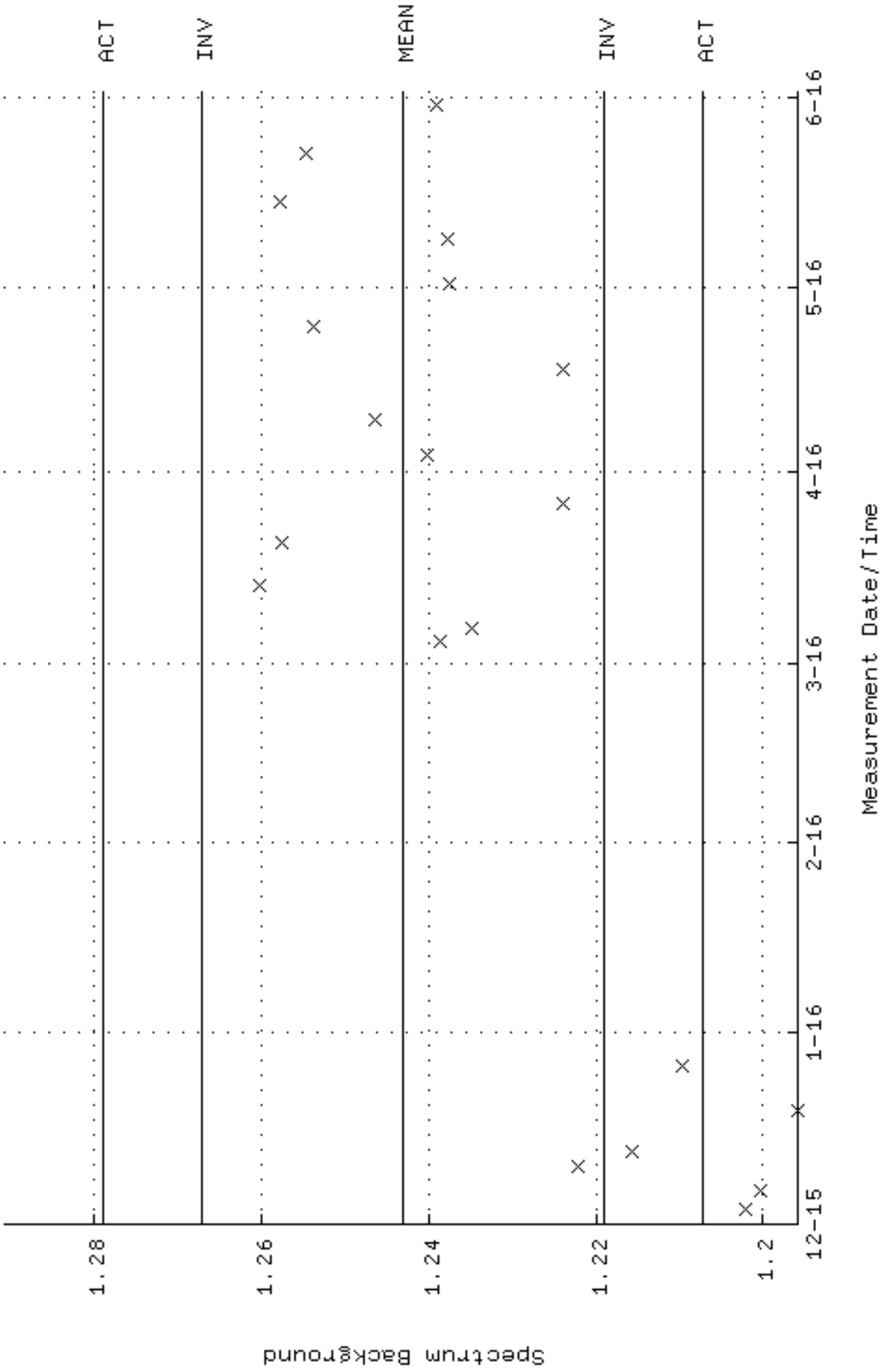
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 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:28:38 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 0.936438 +- 4.566342E-02 (4.88 %)



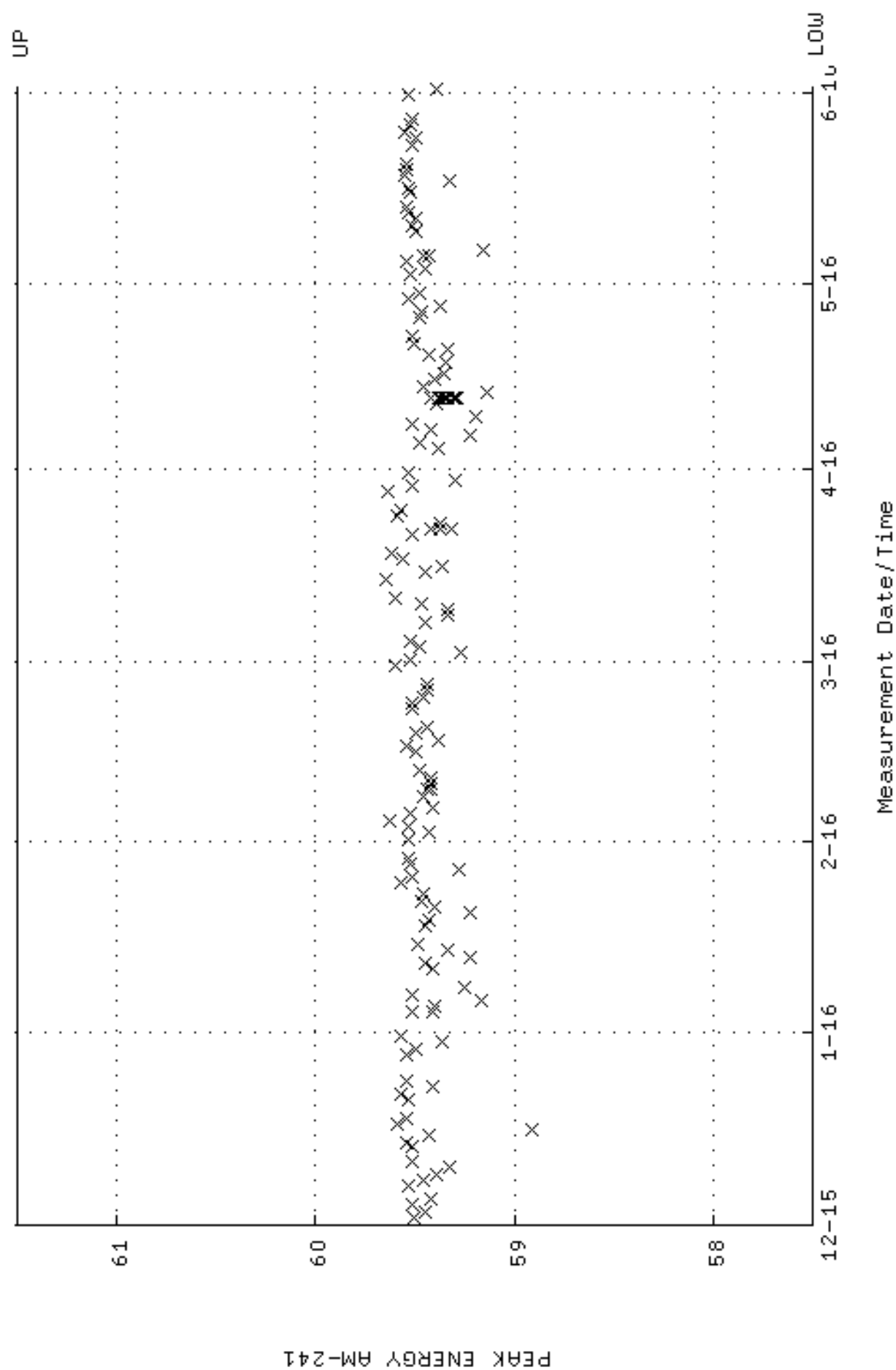
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM06_500MLMB.QAF;1
 Parameter Name : NLACTVY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:38 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 62995.7 +- 1389.67 (2.21 %)



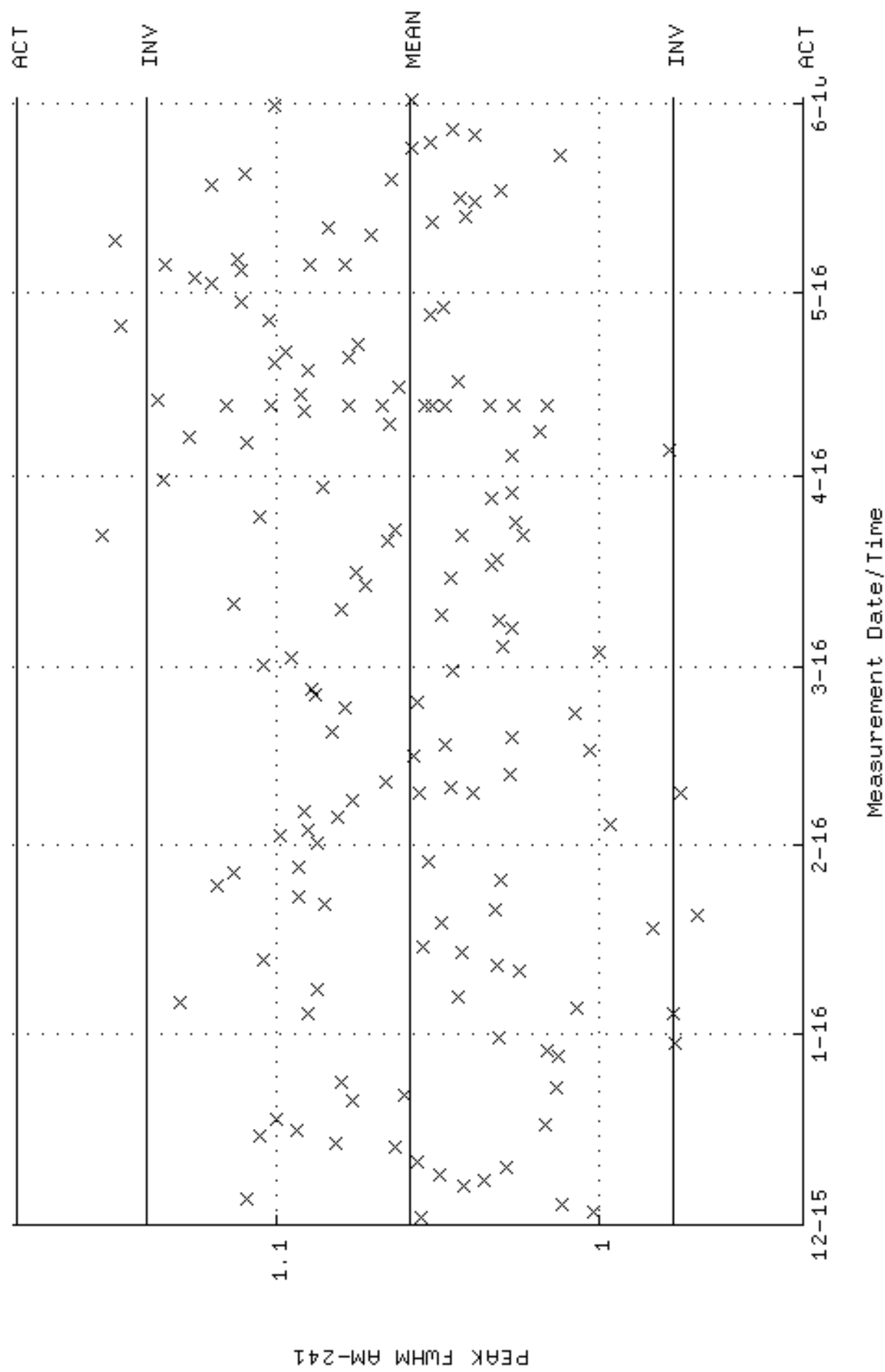
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM06.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 3-DEC-2015 13:20:05 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.24317 +- 1.196123E-02 (0.96 %)



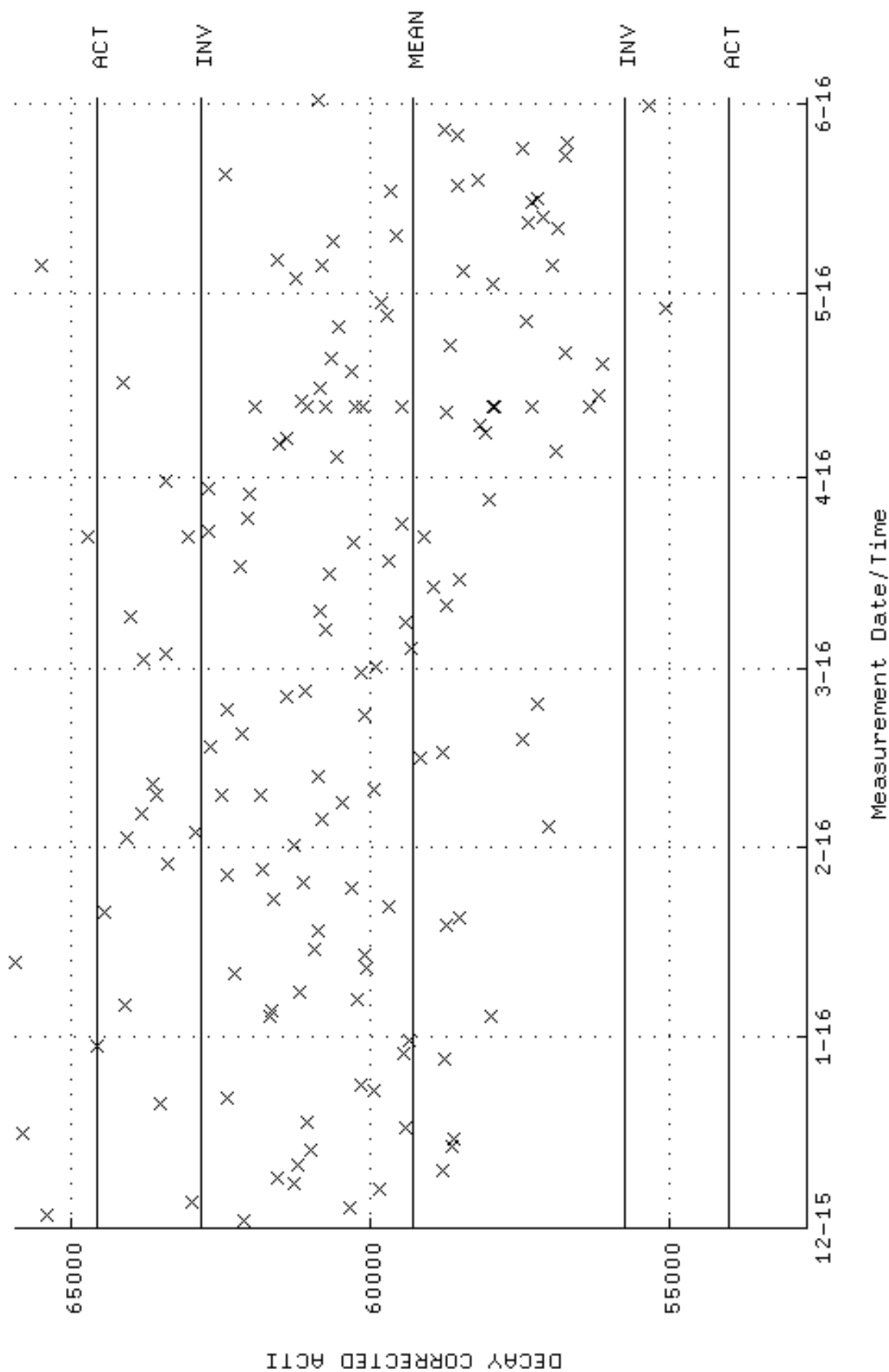
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM08_JAR.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:48 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



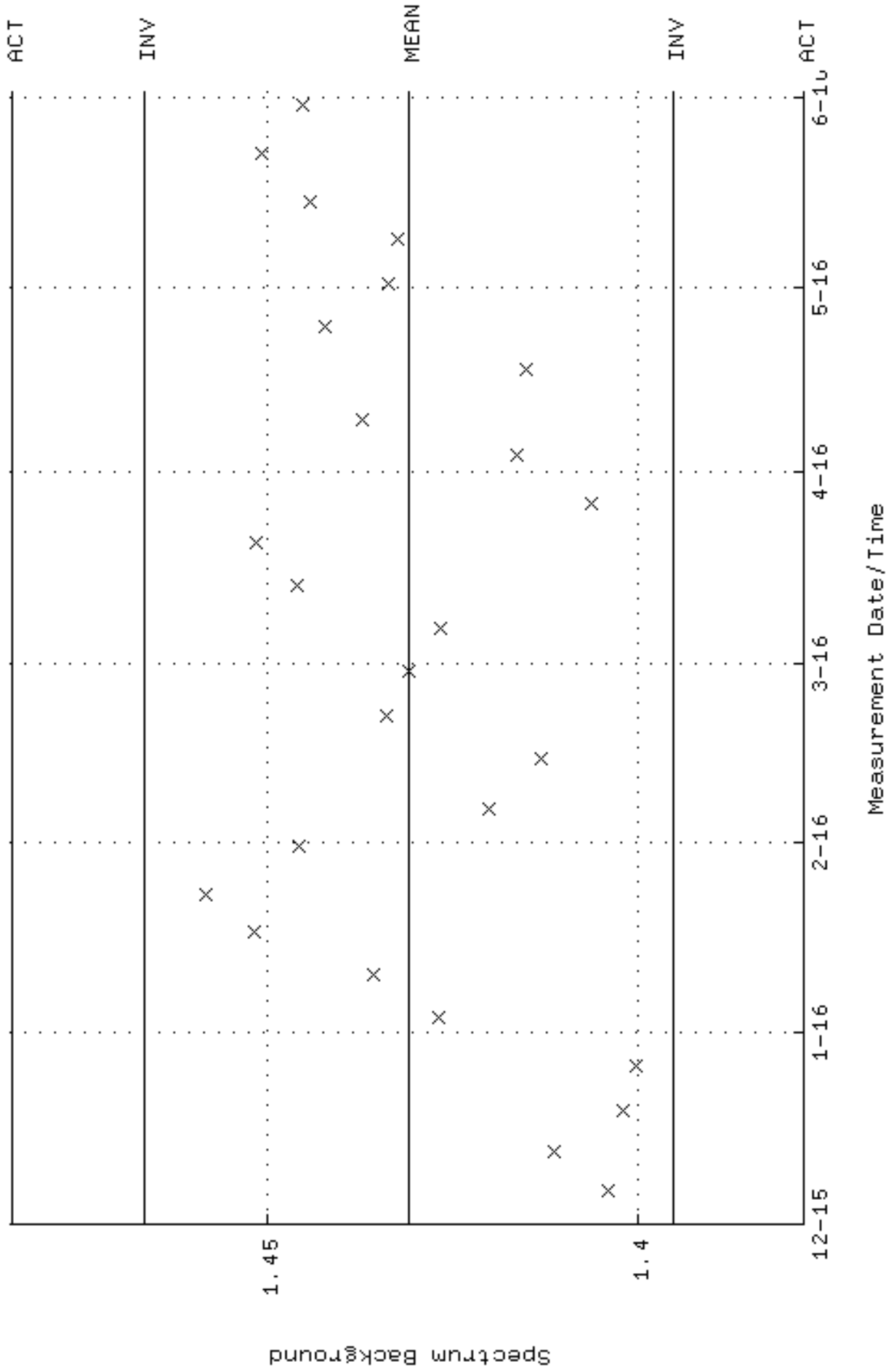
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 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:28:48 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.05888 +- 4.079878E-02 (3.85 %)



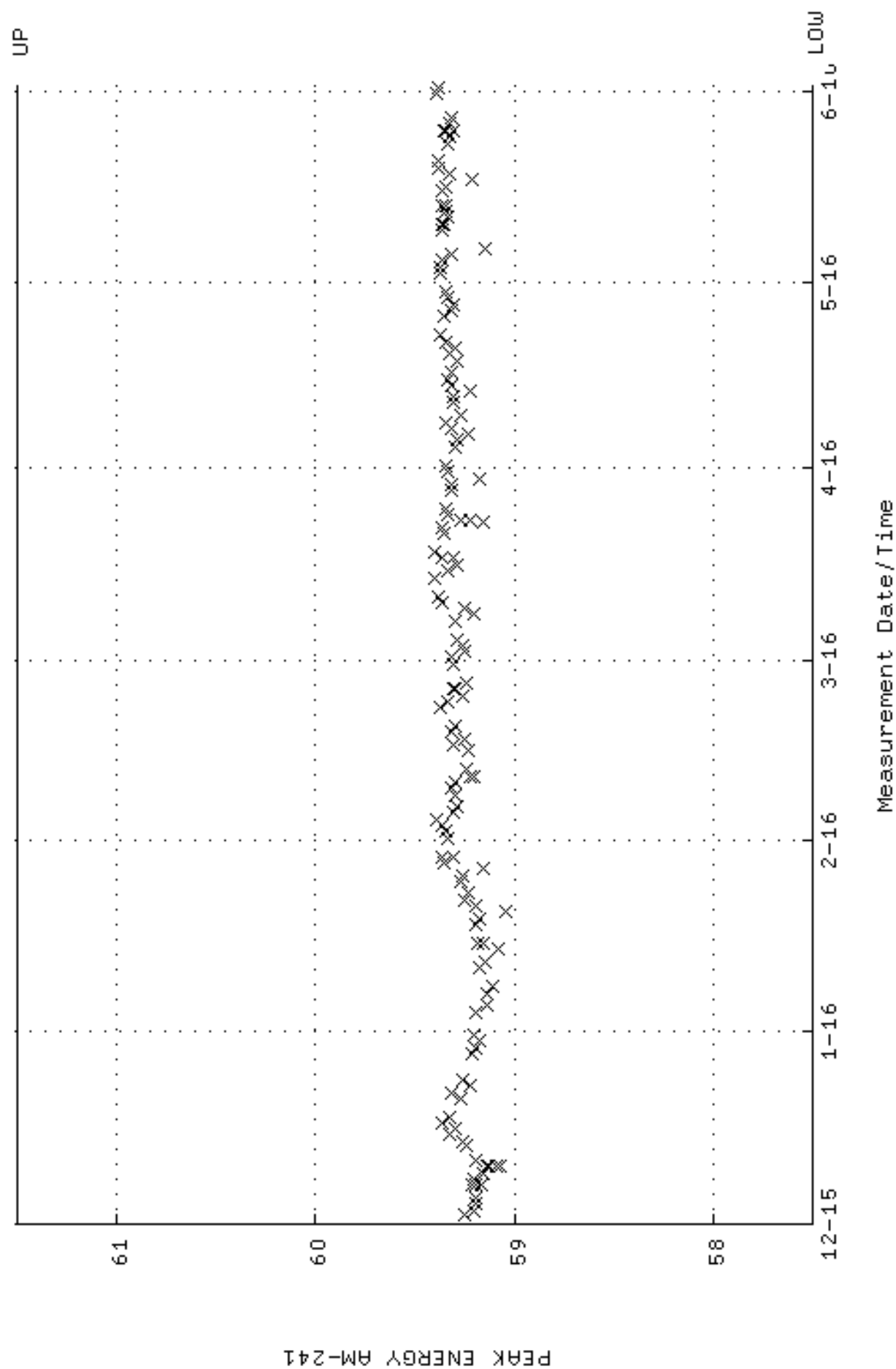
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM08_JAR.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:48 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 59300.8 +- 1761.17 (2.97 %)



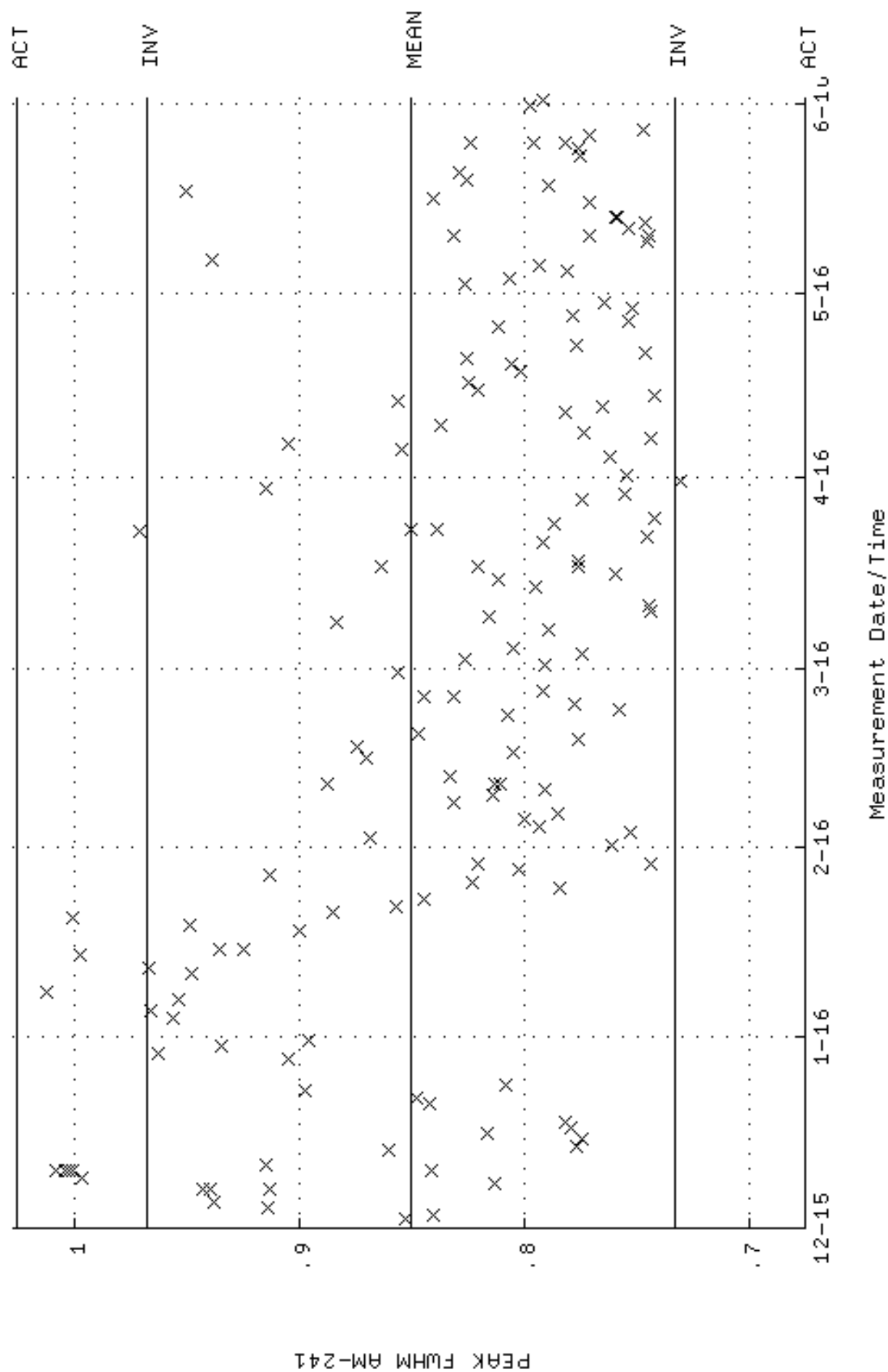
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM08.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 6-DEC-2015 13:48:04 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.43104 +- 1.778290E-02 (1.24 %)



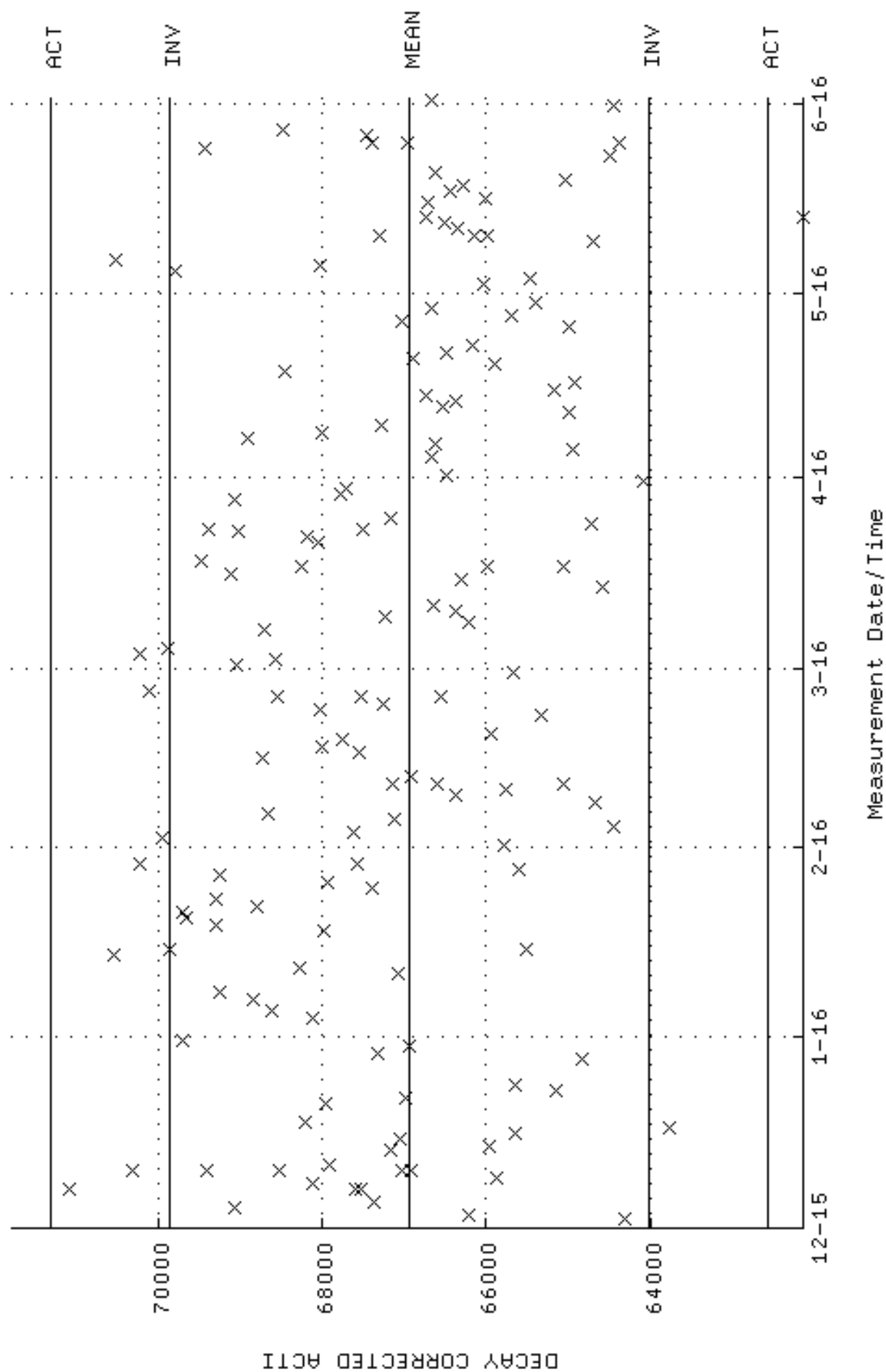
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM09_500MLMB.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:43:18 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



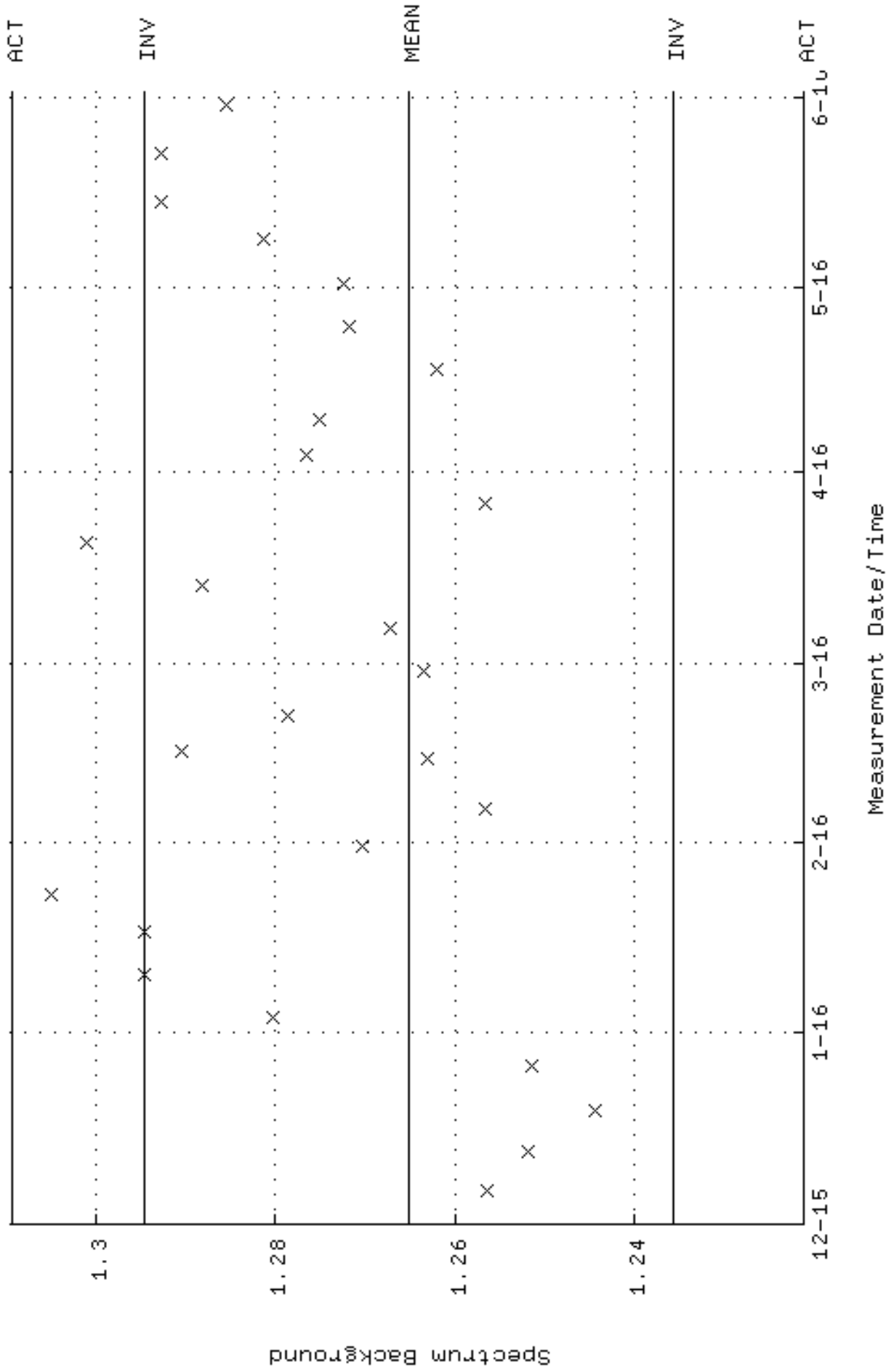
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM09_500MLMB.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:43:18 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 0.850646 +- 5.862589E-02 (6.89 %)



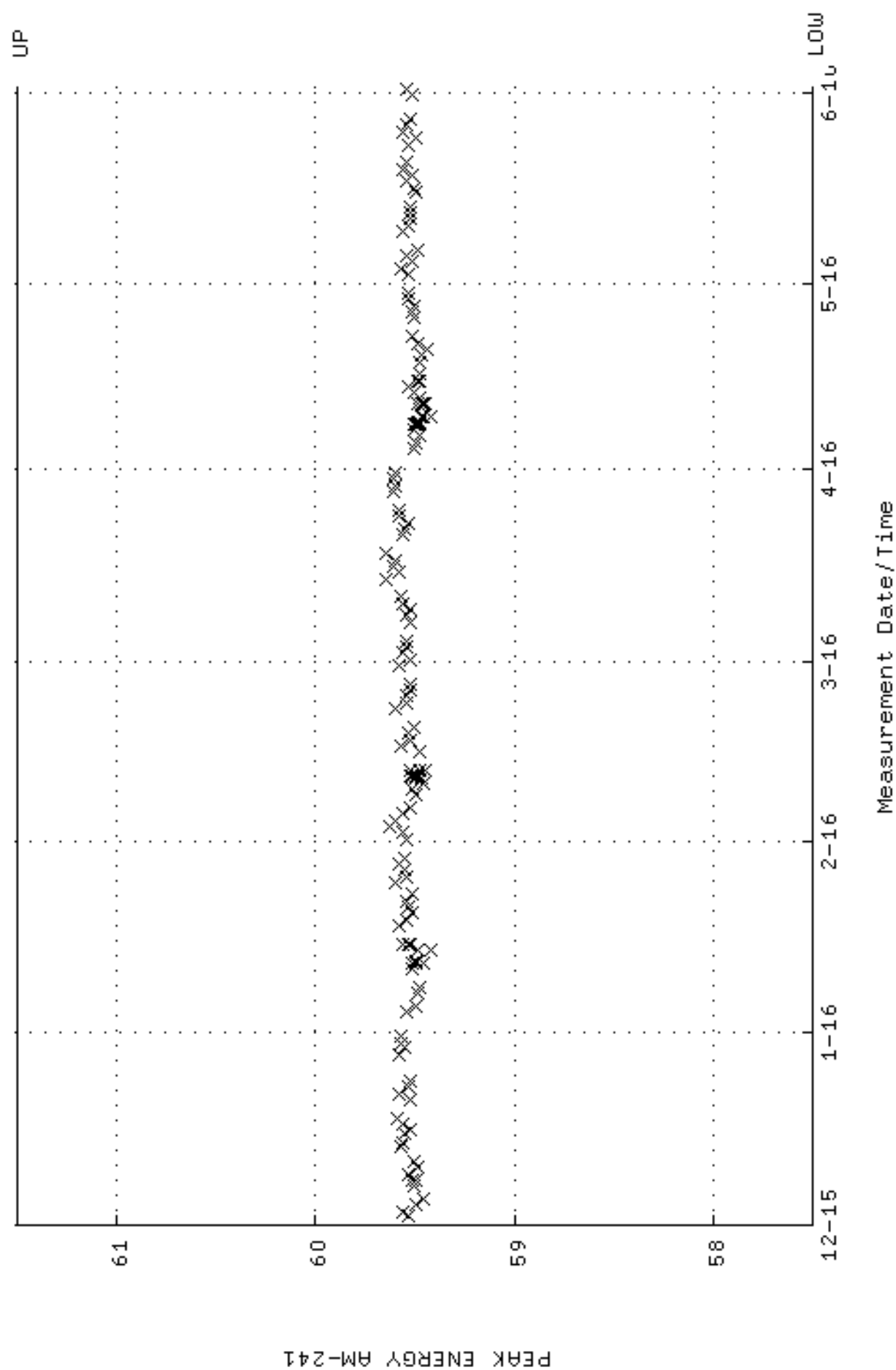
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM09_500MLMB.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:43:18 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 66950.1 +- 1456.03 (2.17 %)



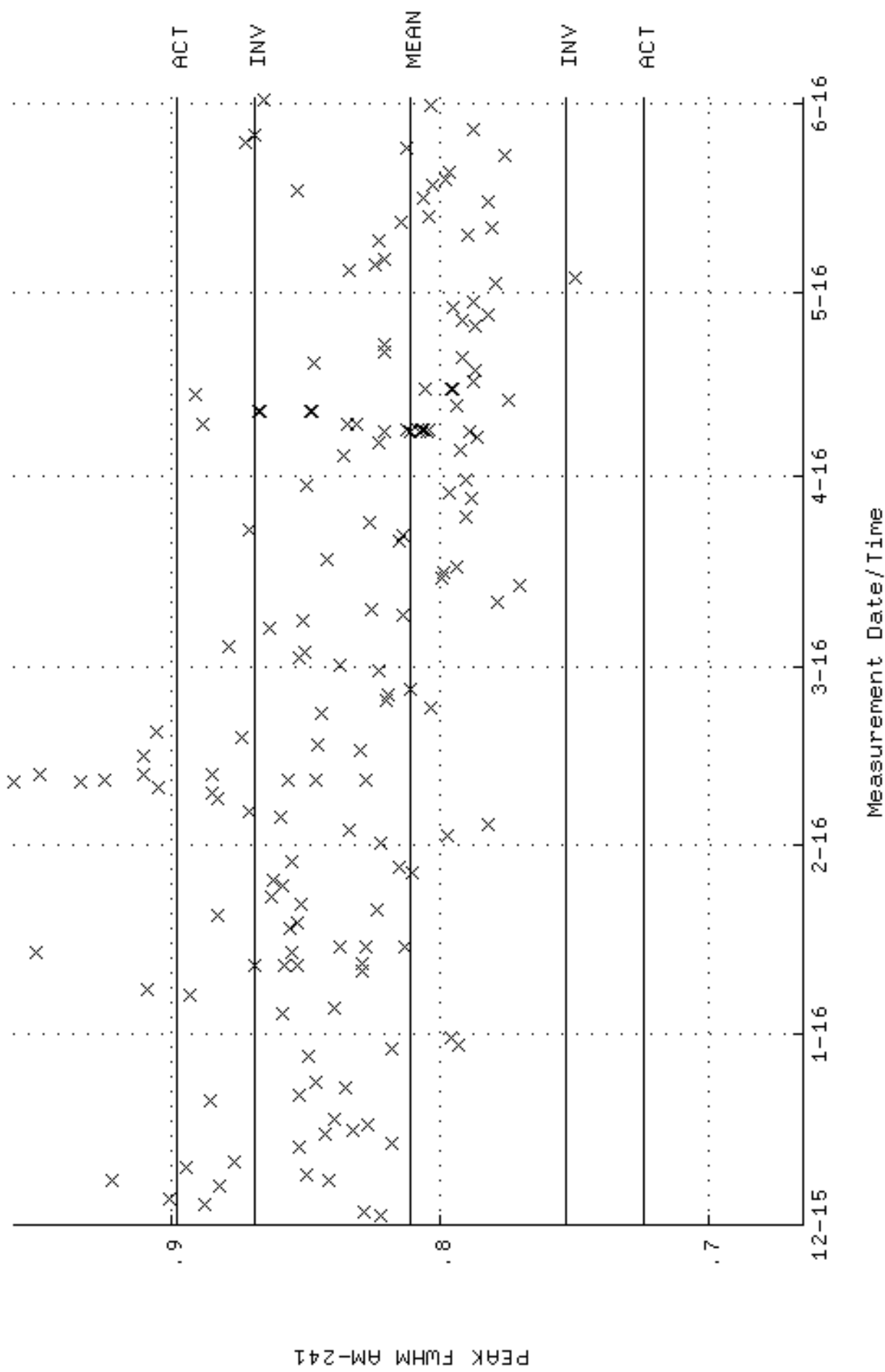
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM09.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 6-DEC-2015 13:48:10 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.26523 +- 1.466291E-02 (1.16 %)



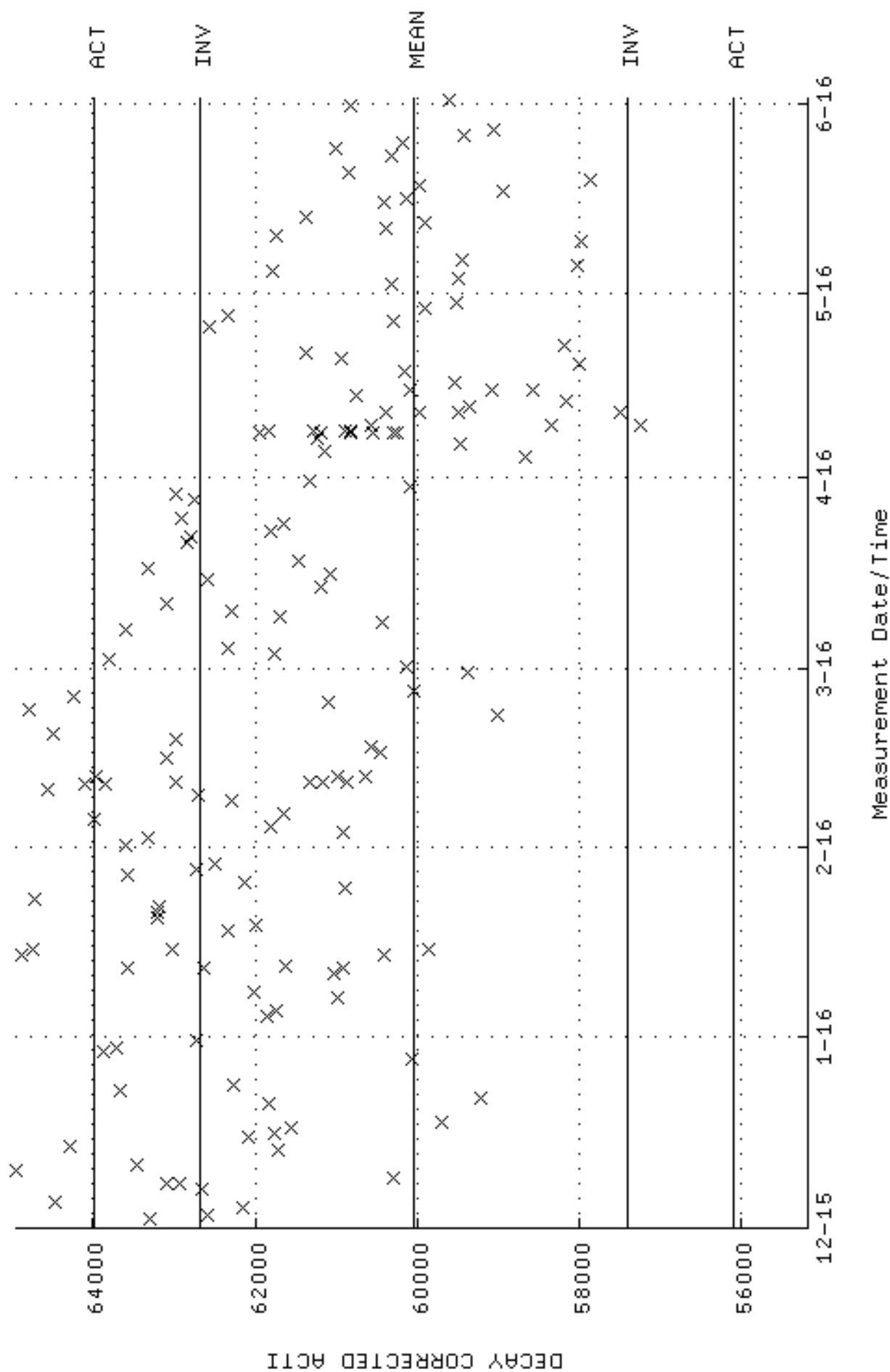
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM11_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-DEC-2015 08:45:39 through 1-JUN-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



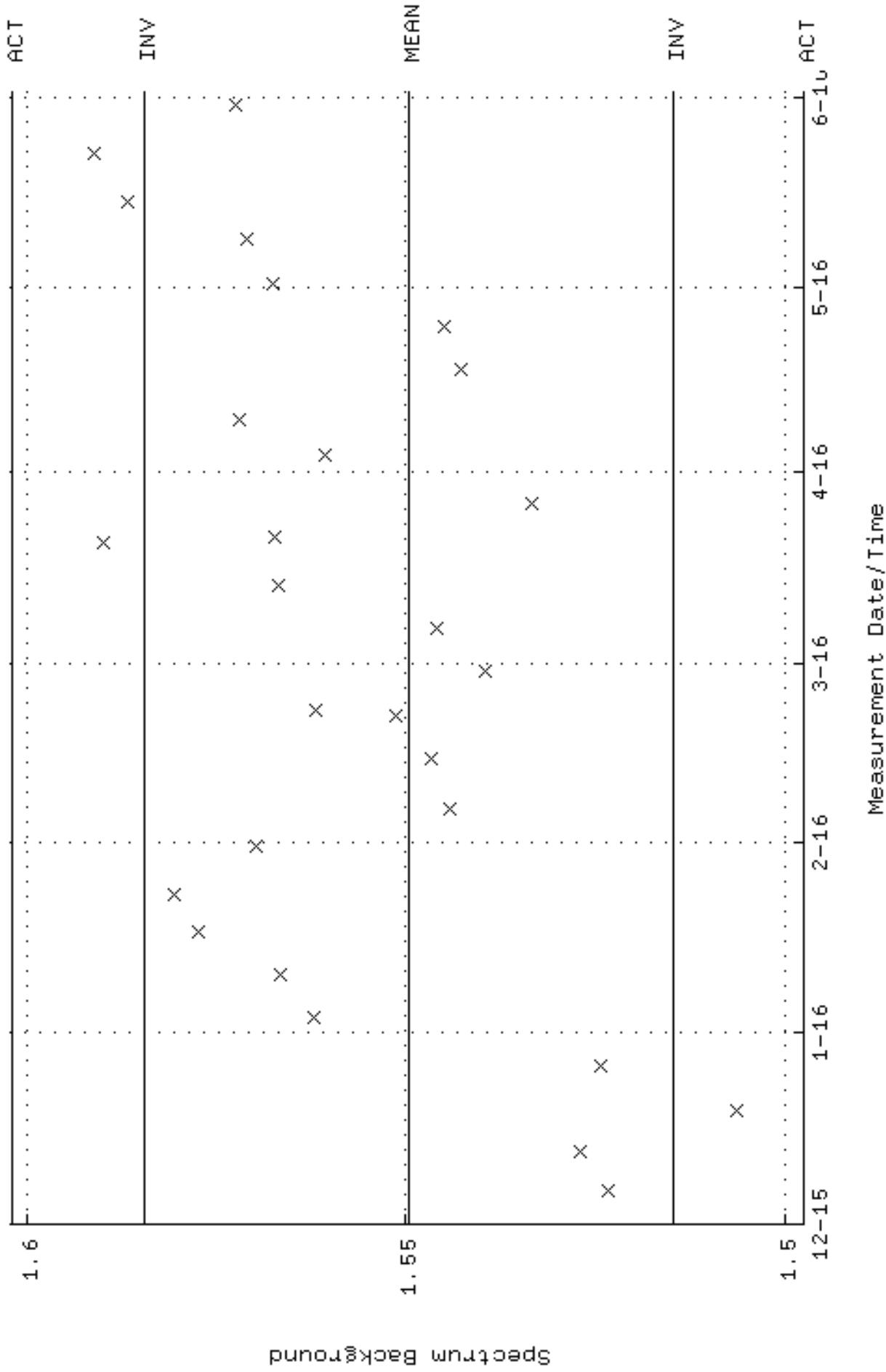
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM11_JAR.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:45:39 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 0.811280 +- 2.896658E-02 (3.57 %)



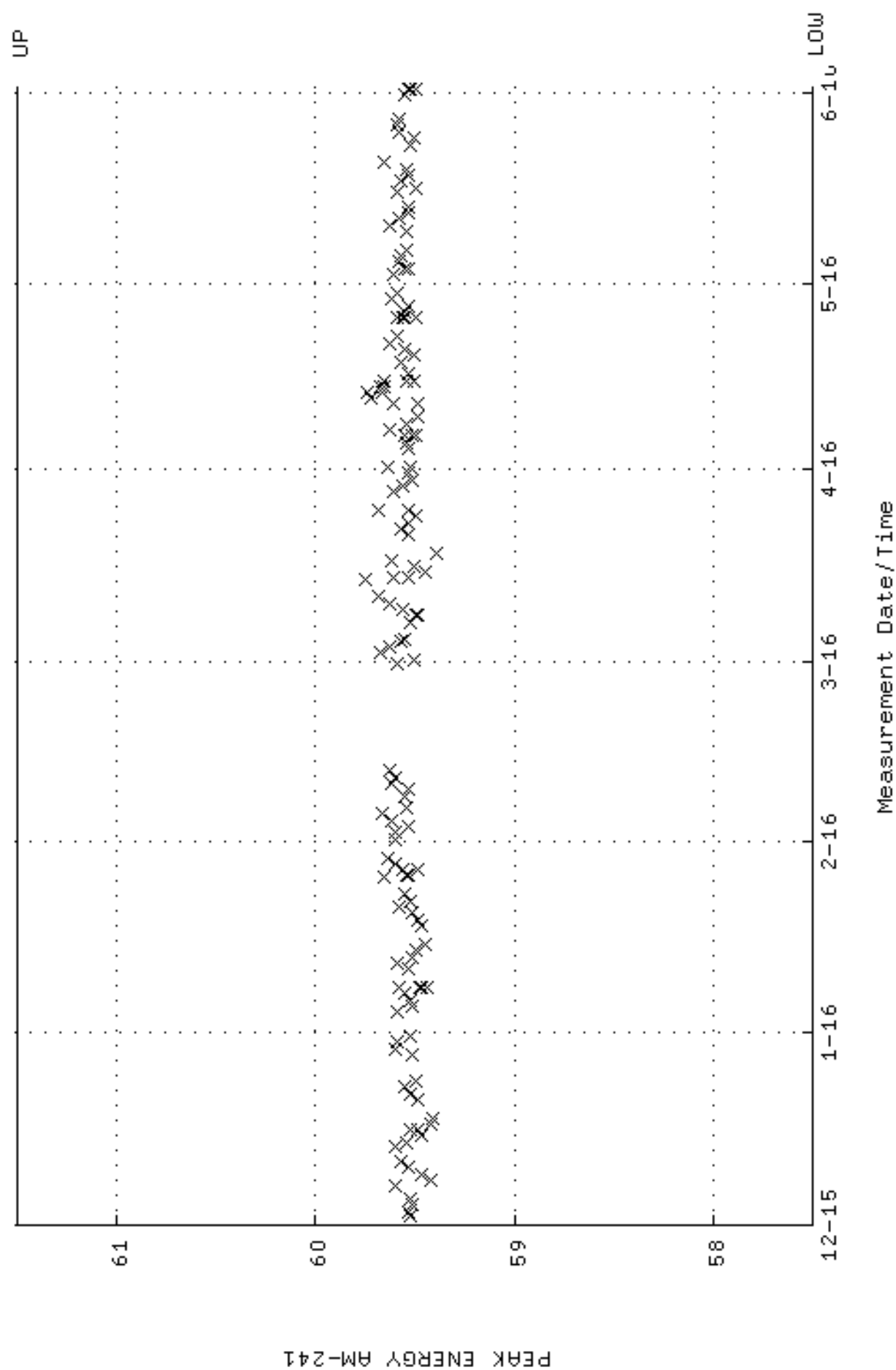
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM11-JAR.QAF;1
 Parameter Name : NLACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:45:39 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 60054.4 +- 1312.98 (2.19 %)



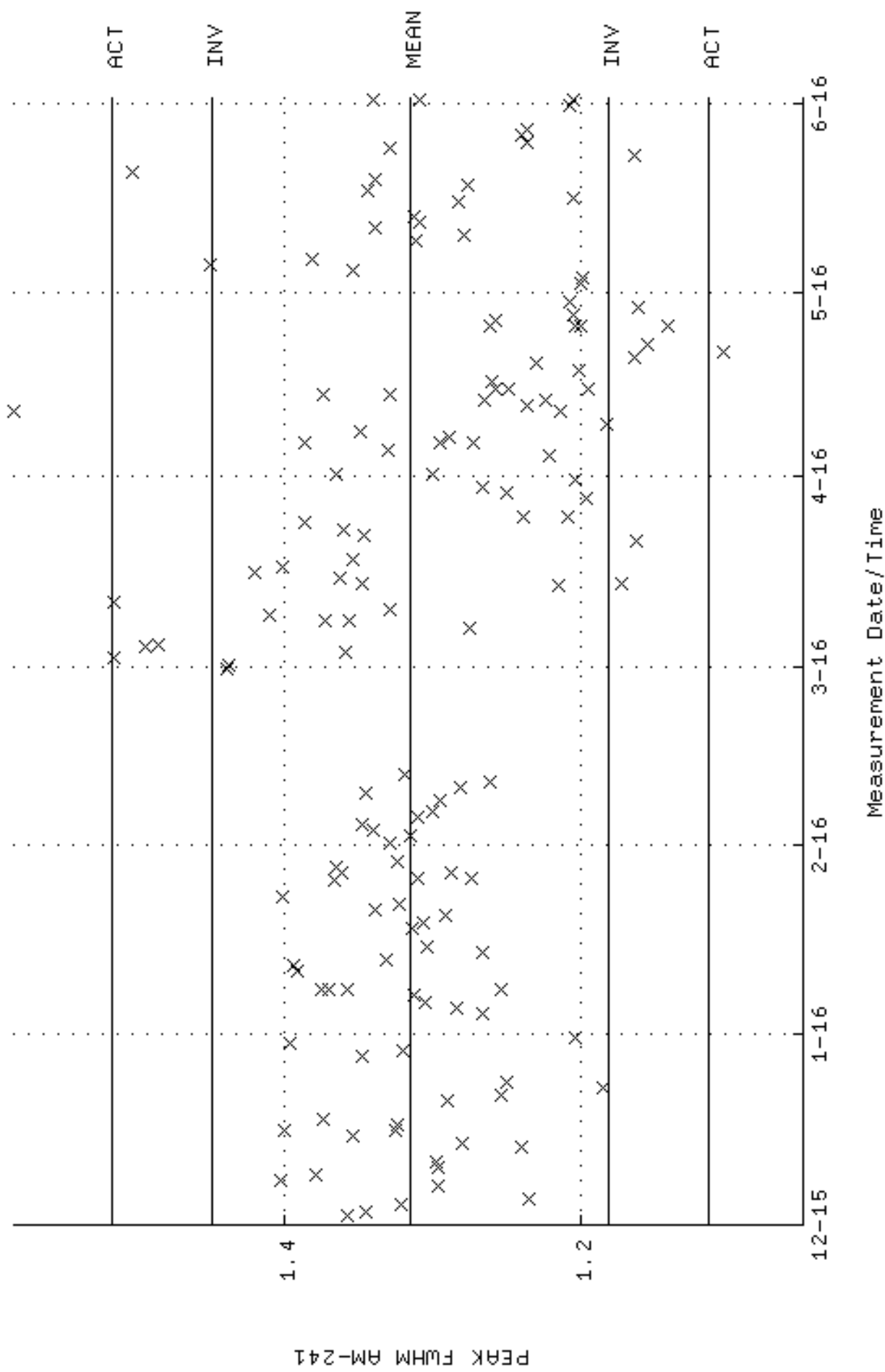
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM11.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 6-DEC-2015 13:48:15 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.54973 +- 1.740346E-02 (1.12 %)



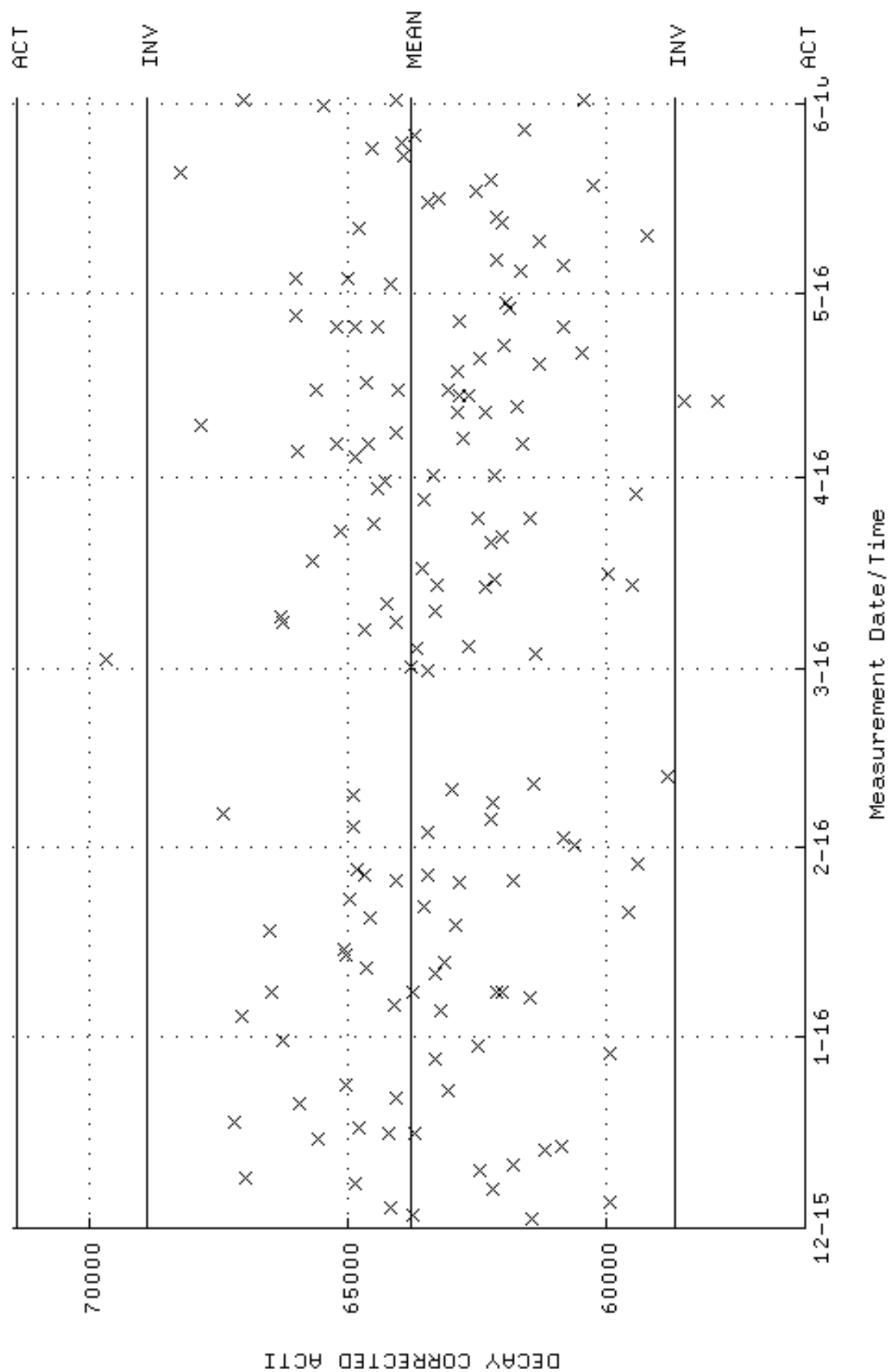
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM12_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:44:15 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



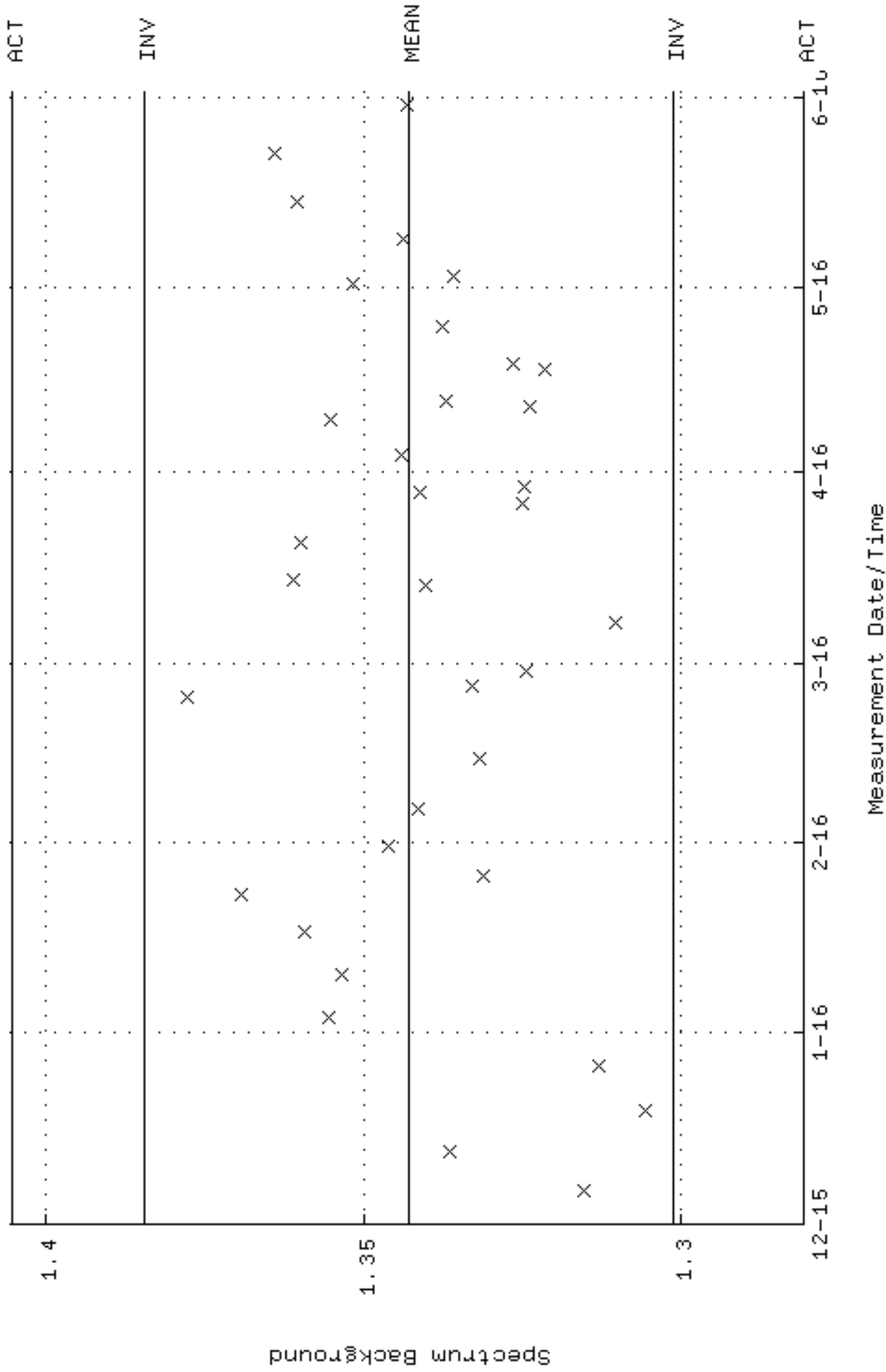
QA filename : DKA100:[CANSBERRA.GAMMA.SCUSR.QA]QCC_GAM12_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:44:15 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.31520 +- 6.711367E-02 (5.10 %)



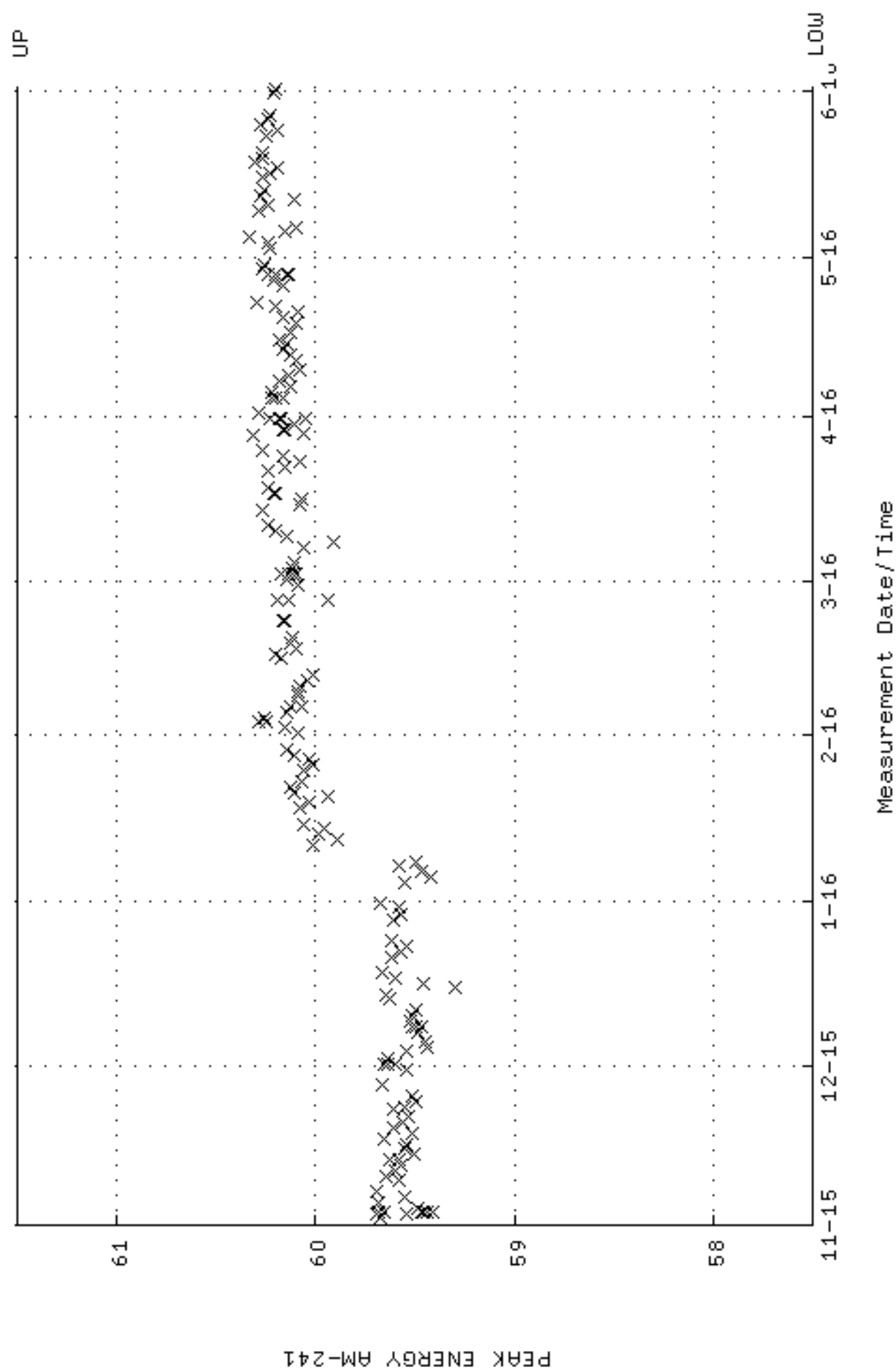
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 Parameter Name : NLACTVY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:44:15 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 63806.4 +- 2547.16 (3.99 %)



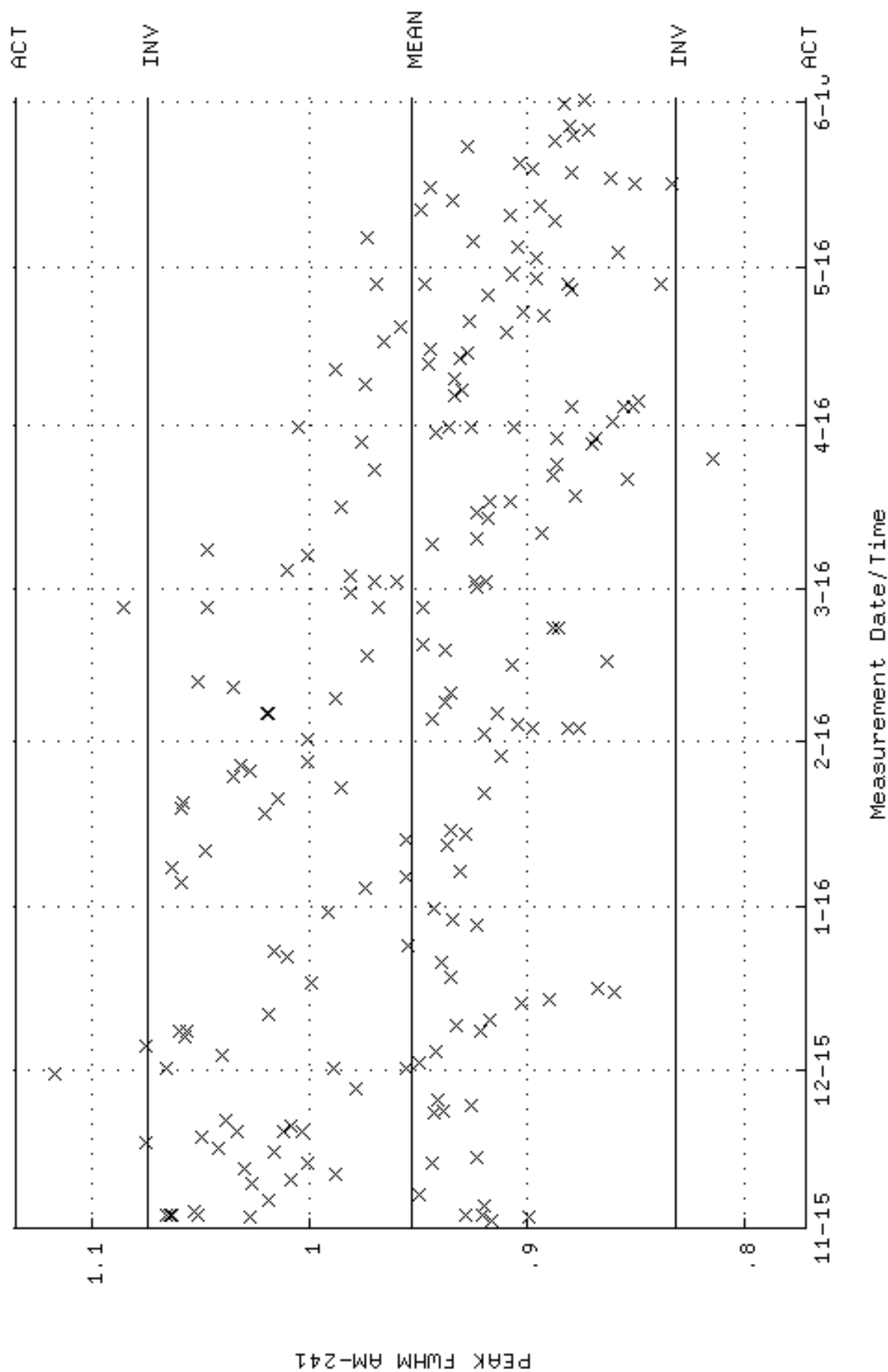
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Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 6-DEC-2015 13:48:21 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.34296 +- 2.081531E-02 (1.55 %)



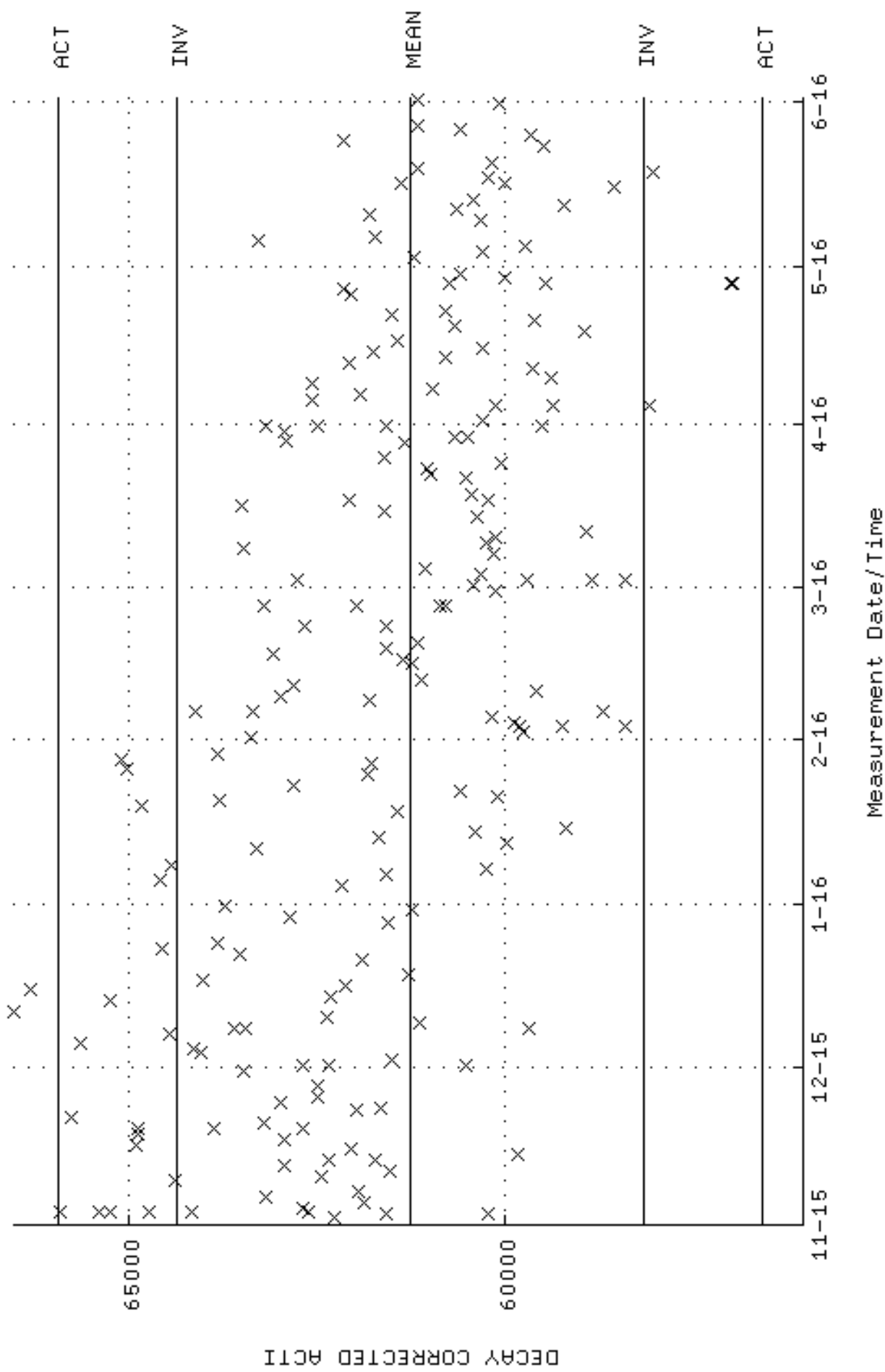
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM14_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-NOV-2015 06:33:13 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



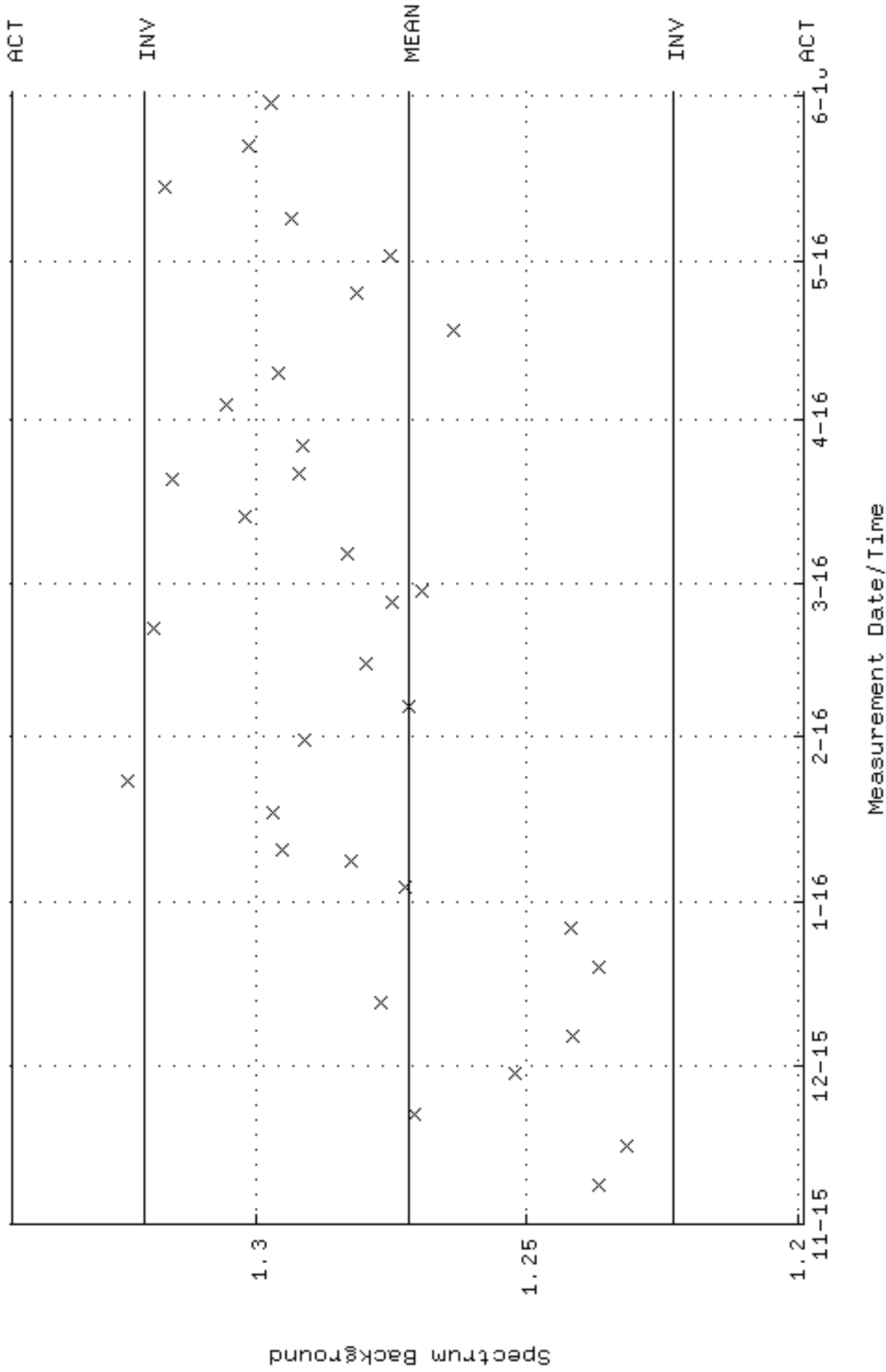
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM14_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
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 Mean +- Std Dev : 0.953448 +- 6.060031E-02 (6.36 %)



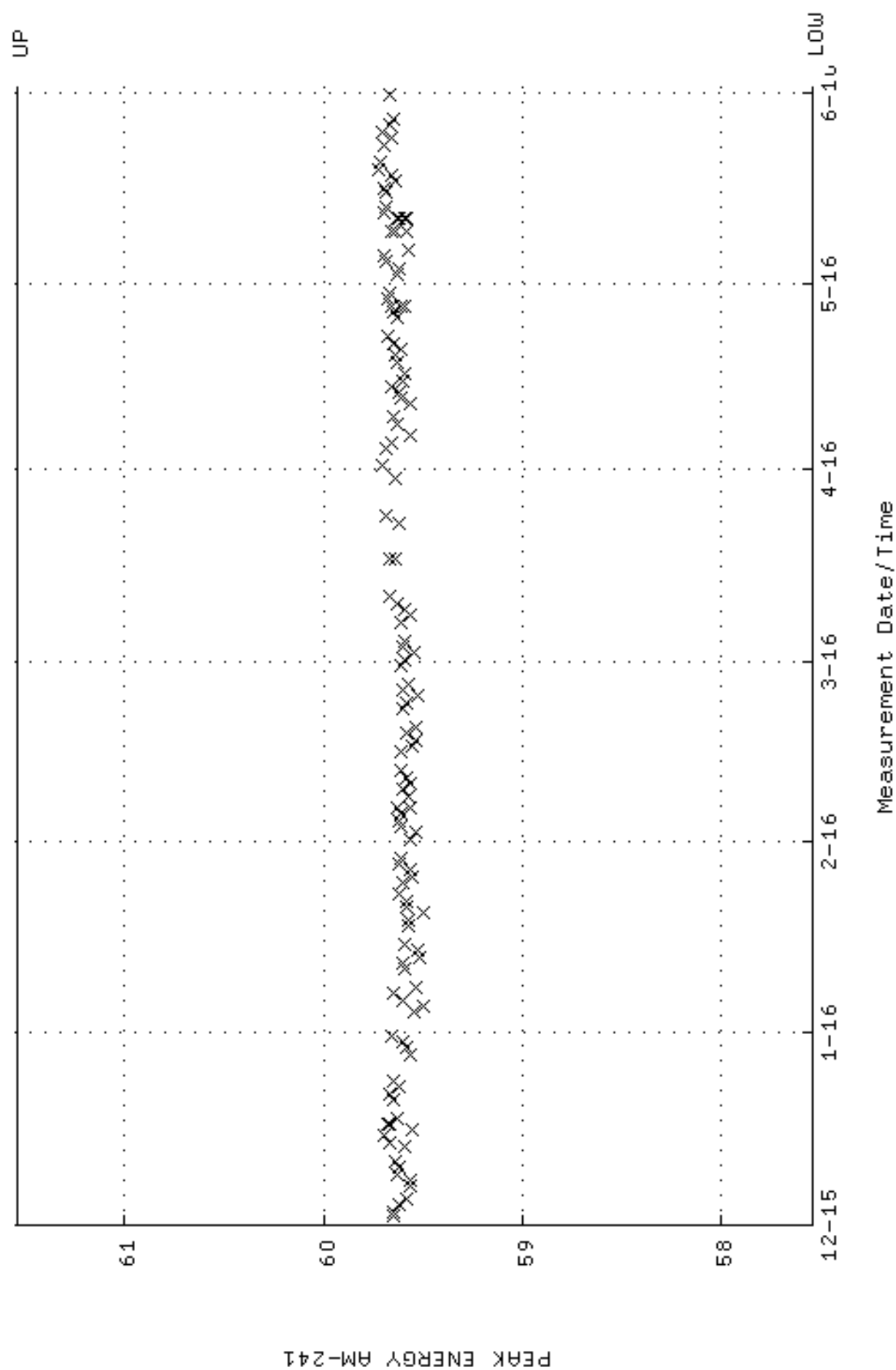
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM14-CAN.QAF;1
Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
Start/End Dates : 2-NOV-2015 06:33:13 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 61274.1 +- 1559.20 (2.54 %)



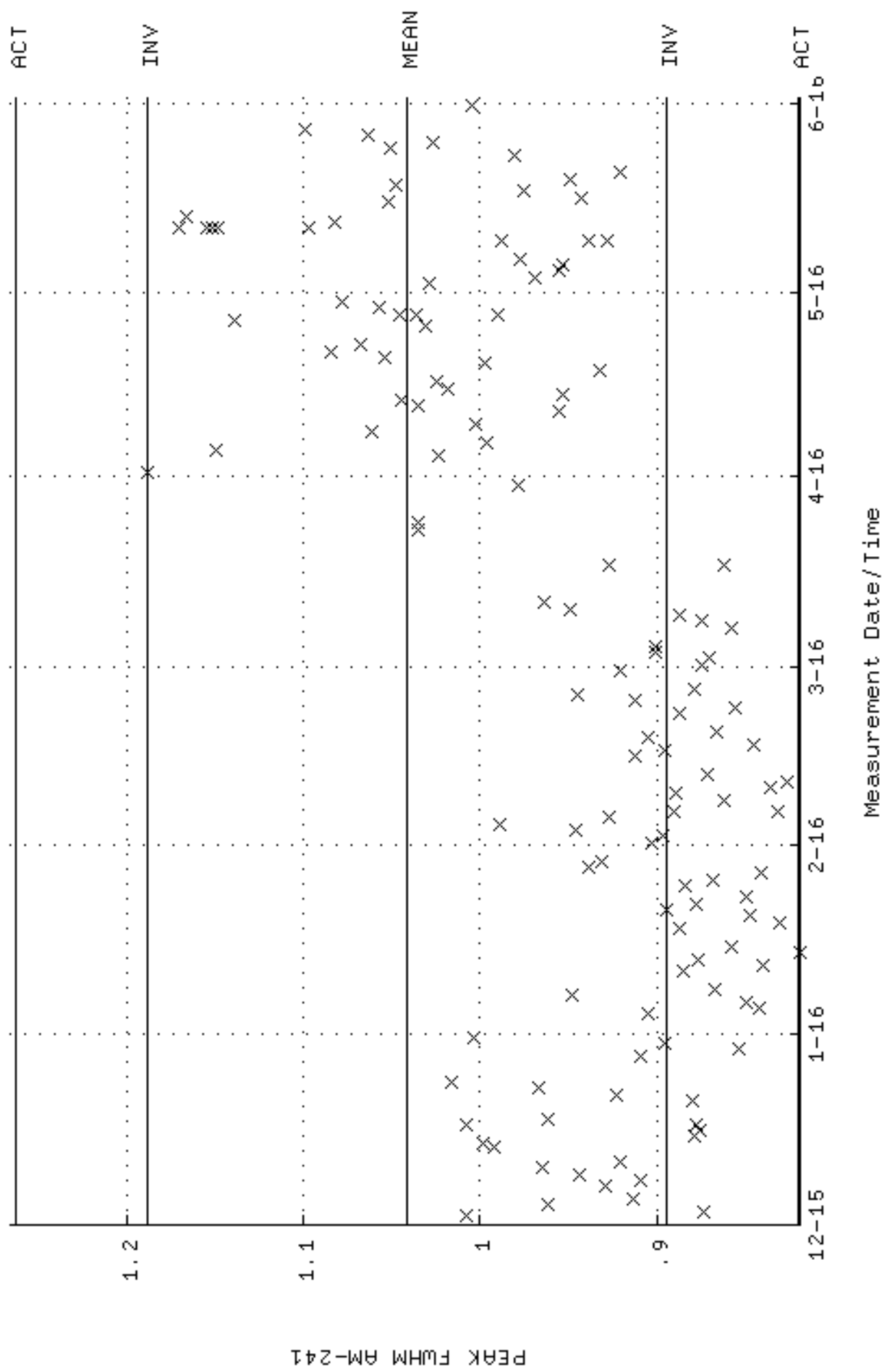
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM14.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 8-NOV-2015 10:14:34 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.27200 +- 2.435330E-02 (1.91 %)



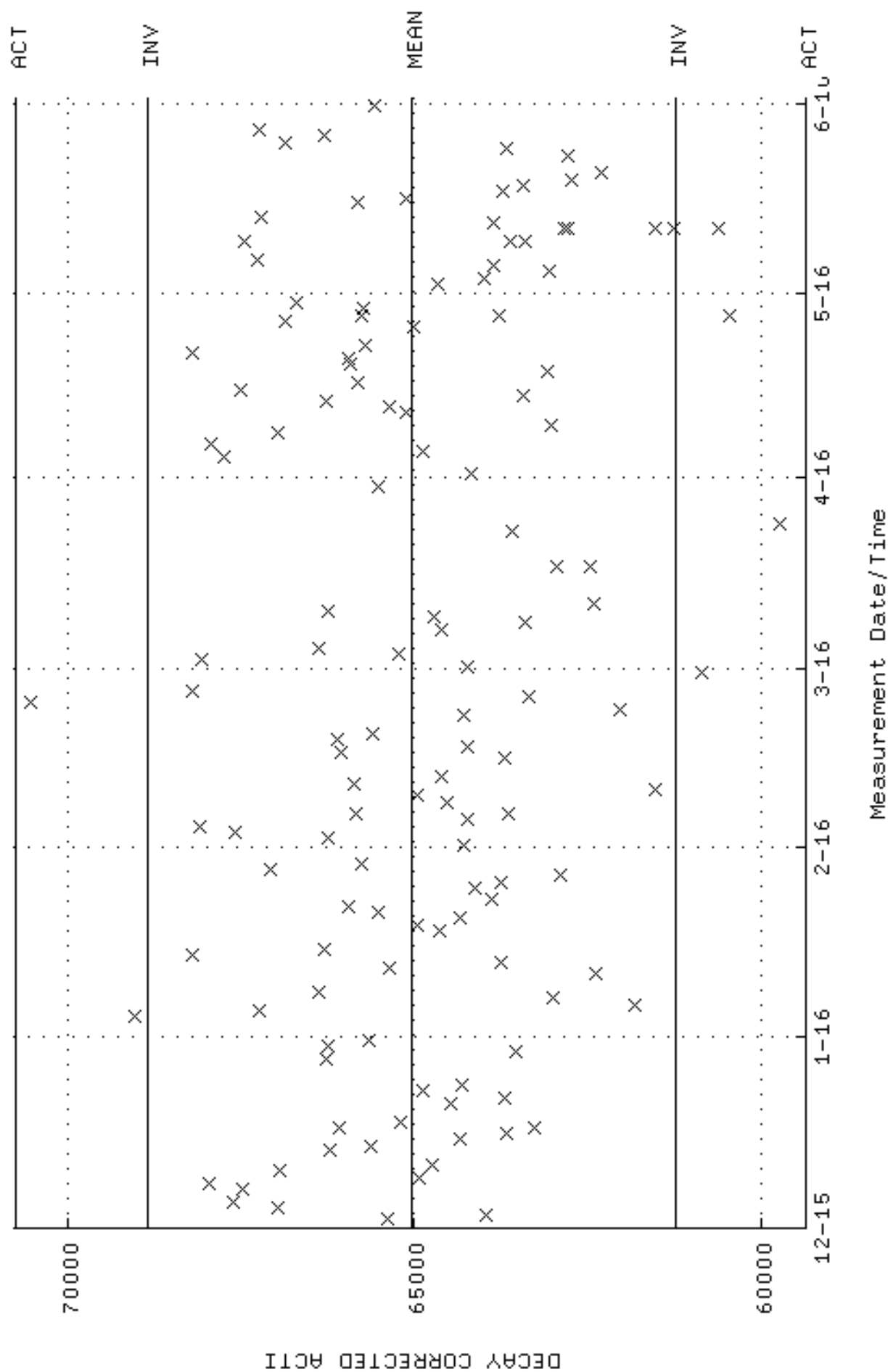
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Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-DEC-2015 08:52:53 through 1-JUN-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



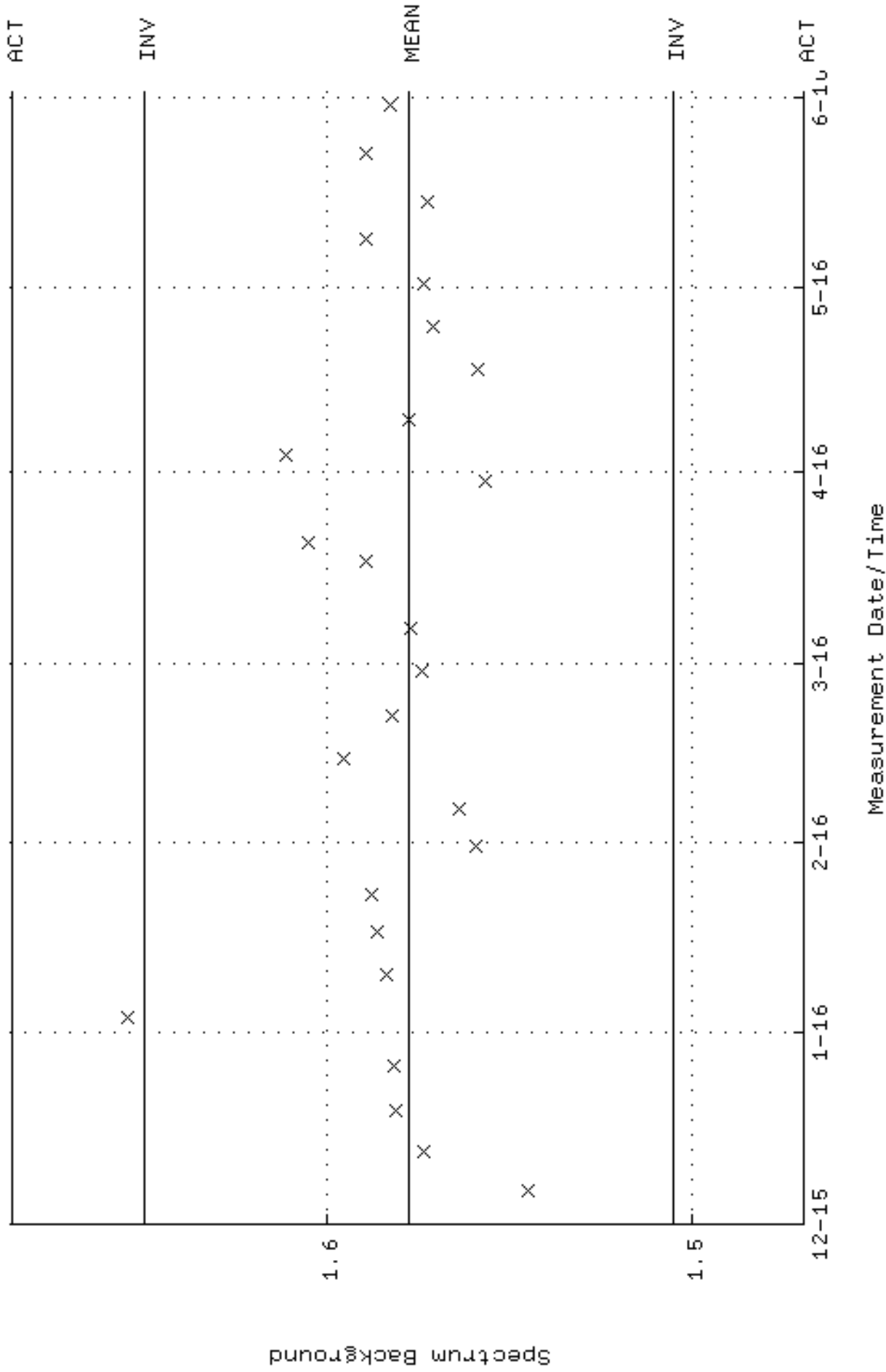
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM15_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 2-DEC-2015 08:52:53 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.04201 +- 7.374109E-02 (7.08 %)



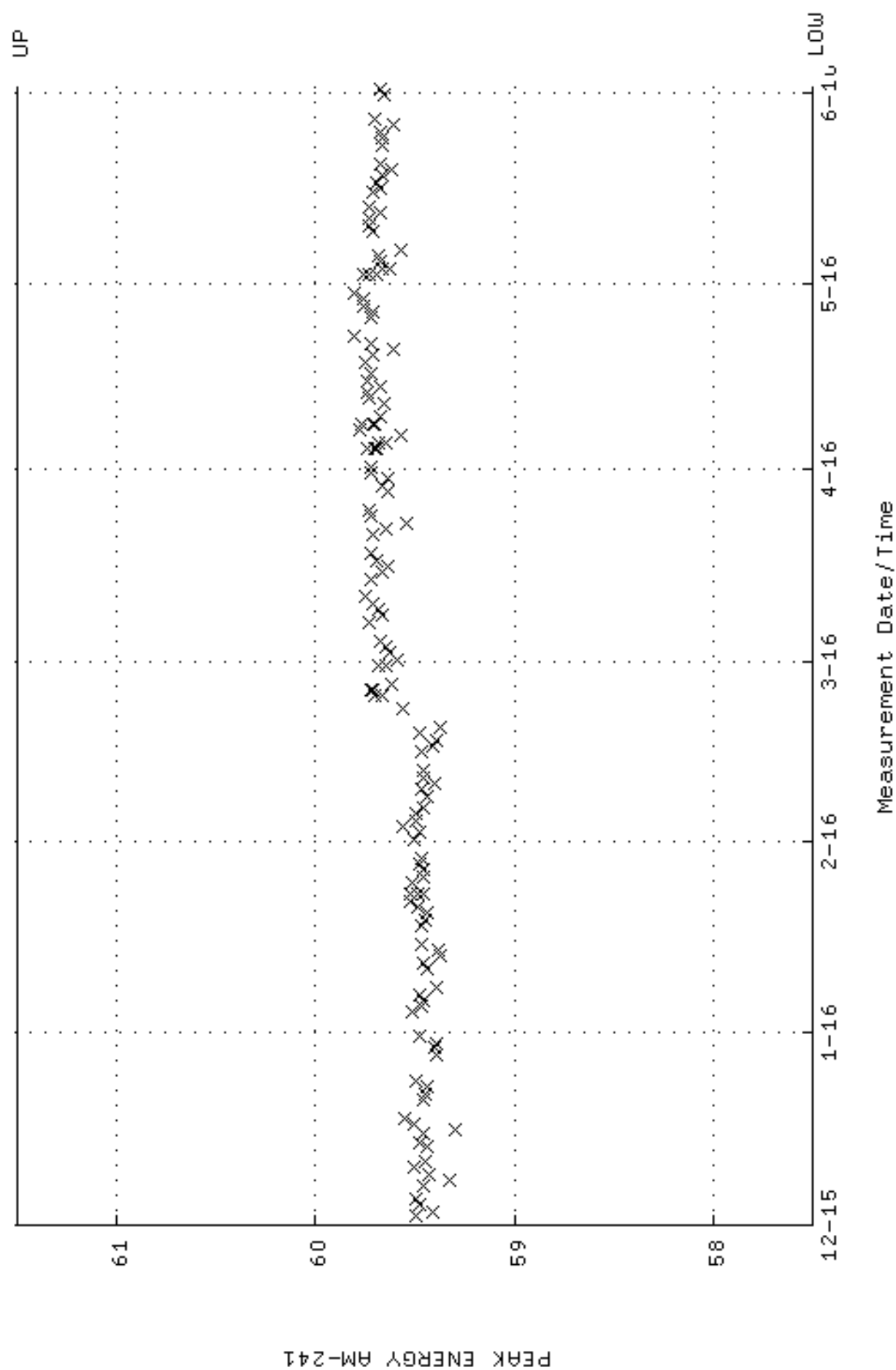
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM15-CAN.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:52:53 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 65052.9 +- 1895.90 (2.91 %)



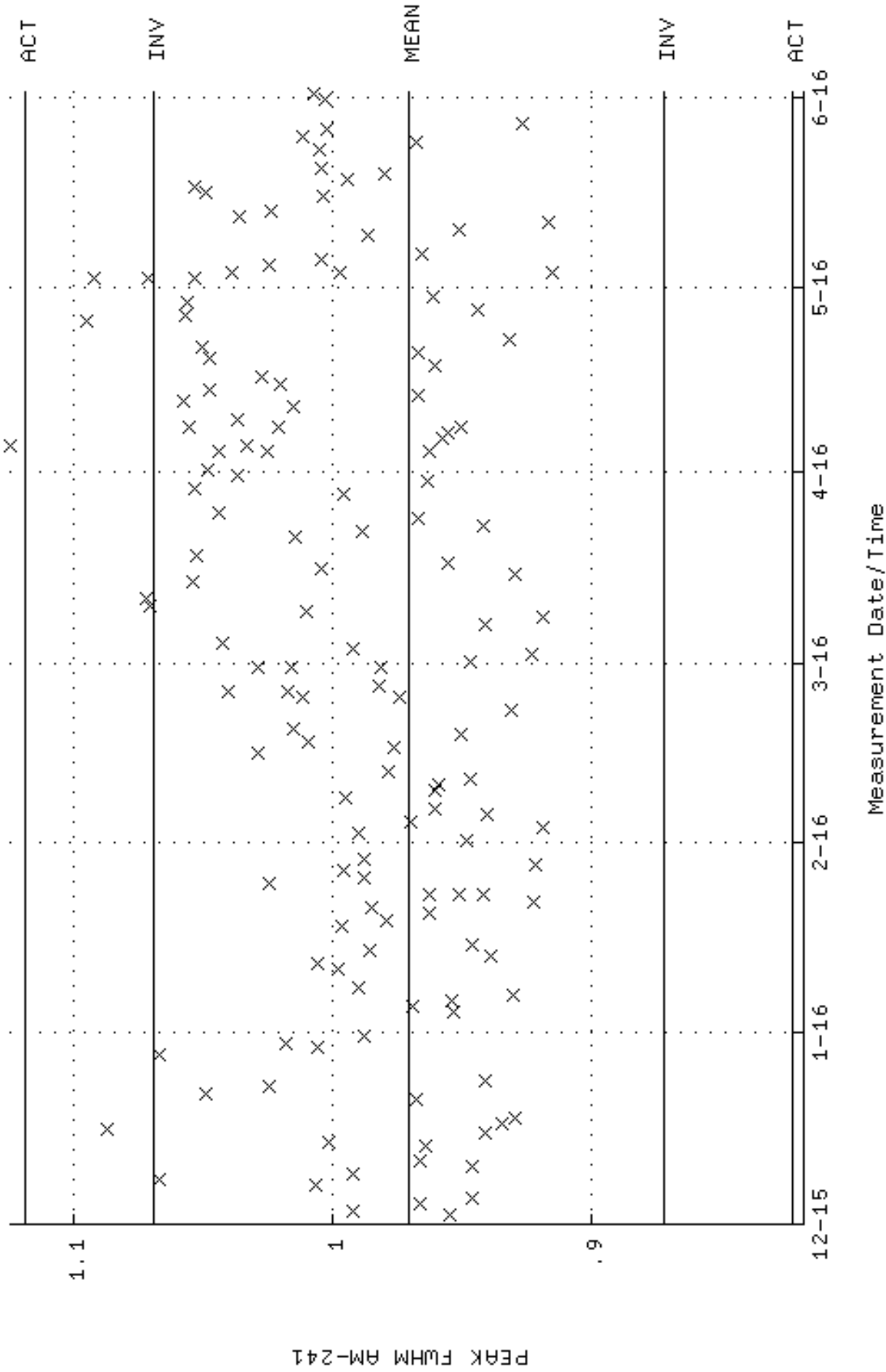
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM15.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 6-DEC-2015 13:48:31 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.57790 +- 3.619762E-02 (2.29 %)



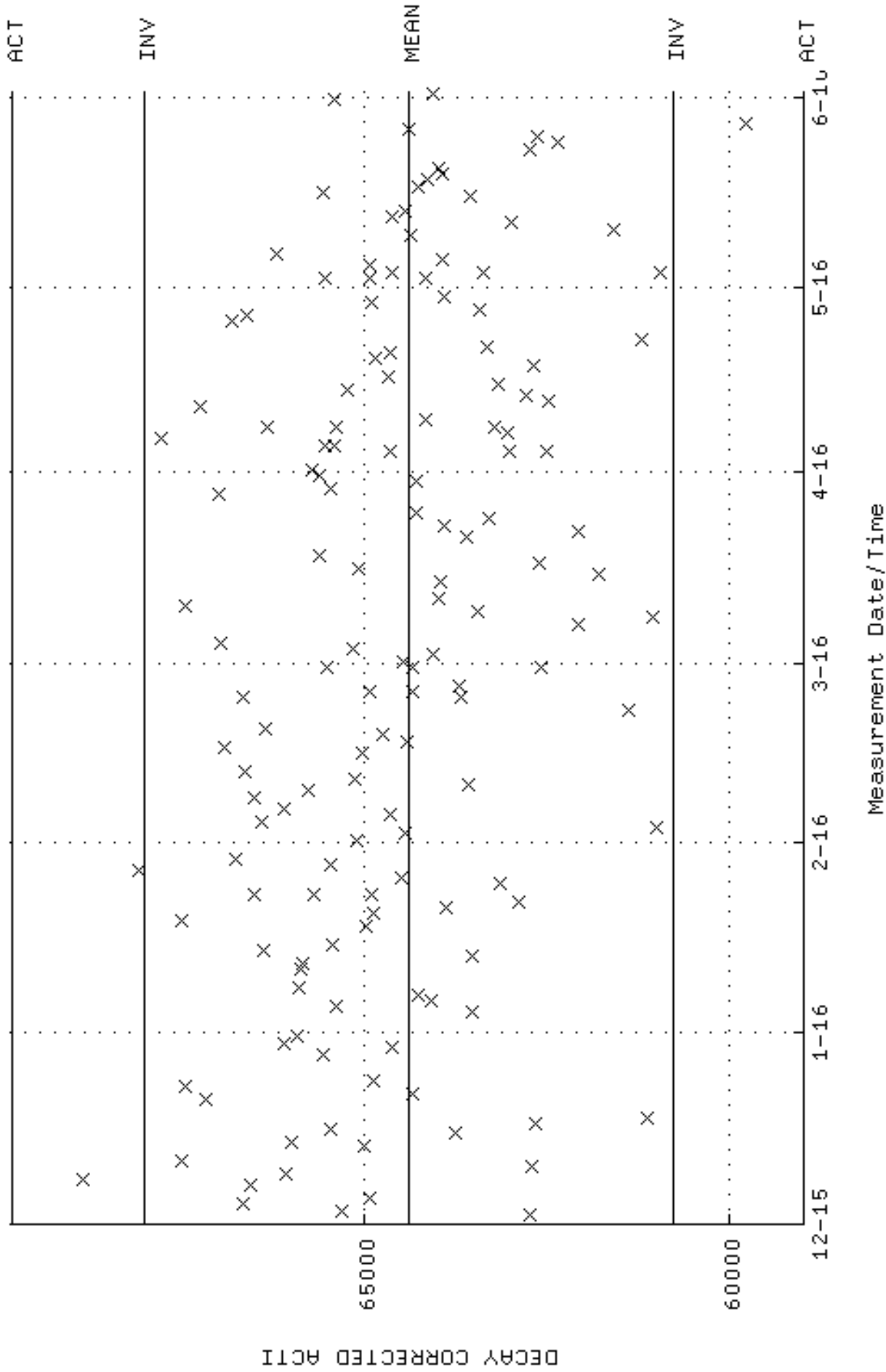
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM16_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-DEC-2015 08:43:24 through 1-JUN-2016 12:00:00
Lower/Upper Lmts: 57.5000 through 61.5000



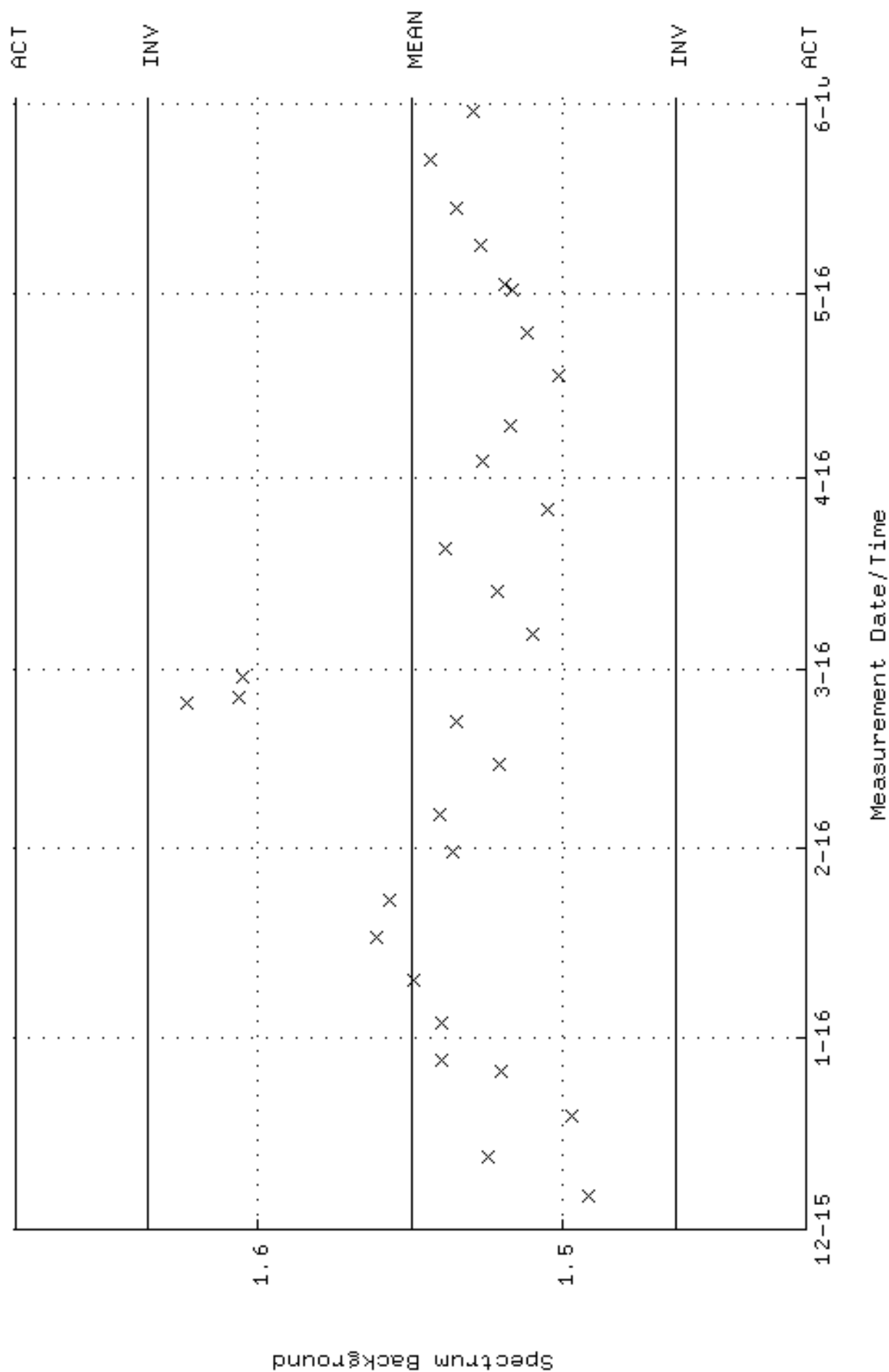
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM16_CAN.QAF;1
Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
Start/End Dates : 2-DEC-2015 08:43:24 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 0.971014 +- 4.917469E-02 (5.06 %)



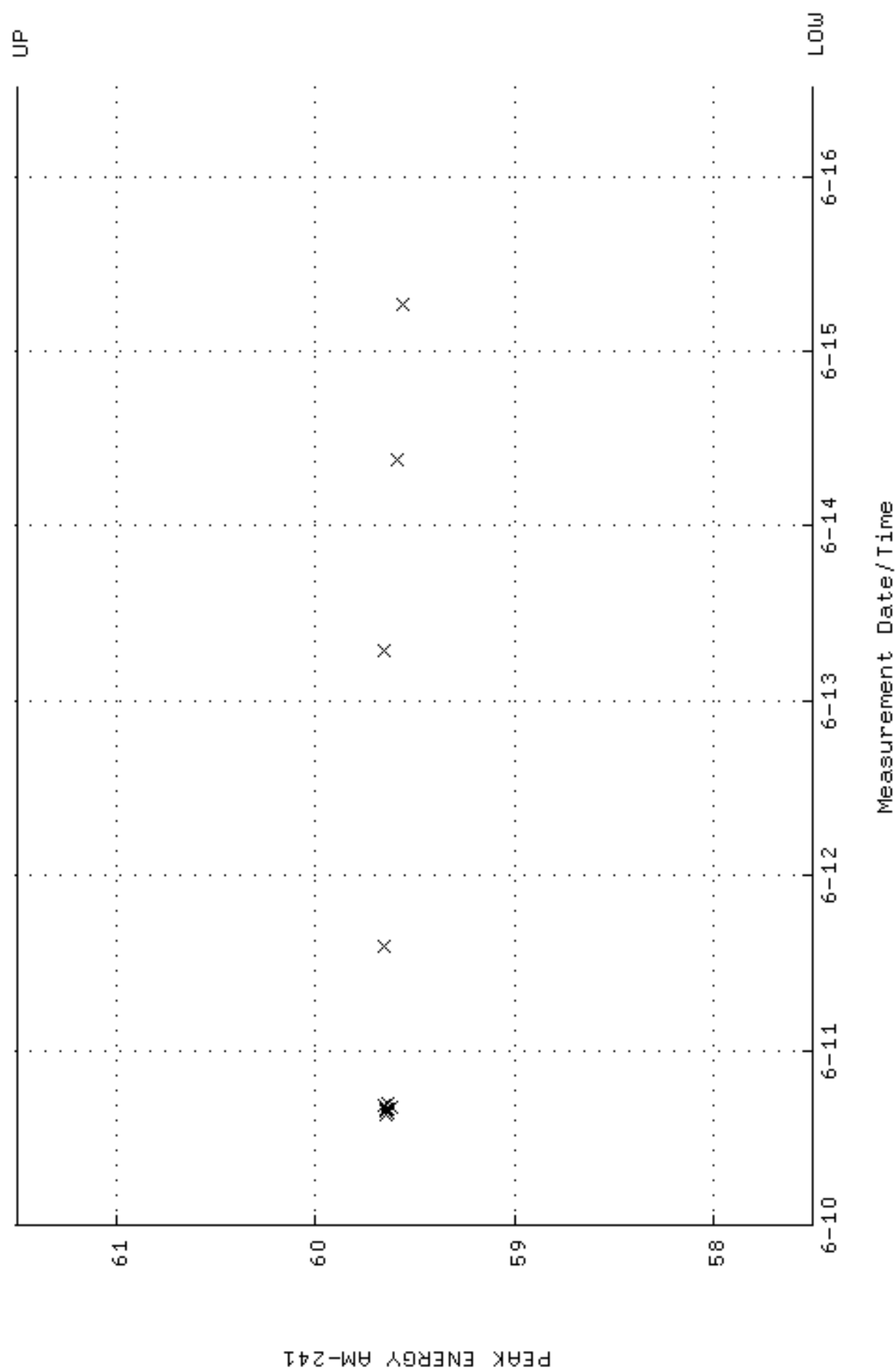
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM16-CAN.QAF;1
Parameter Name : NLACTVY-59 (DECAY CORRECTED ACTIVITY AM-241)
Start/End Dates : 2-DEC-2015 08:43:24 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 64408.8 +- 1807.39 (2.81 %)



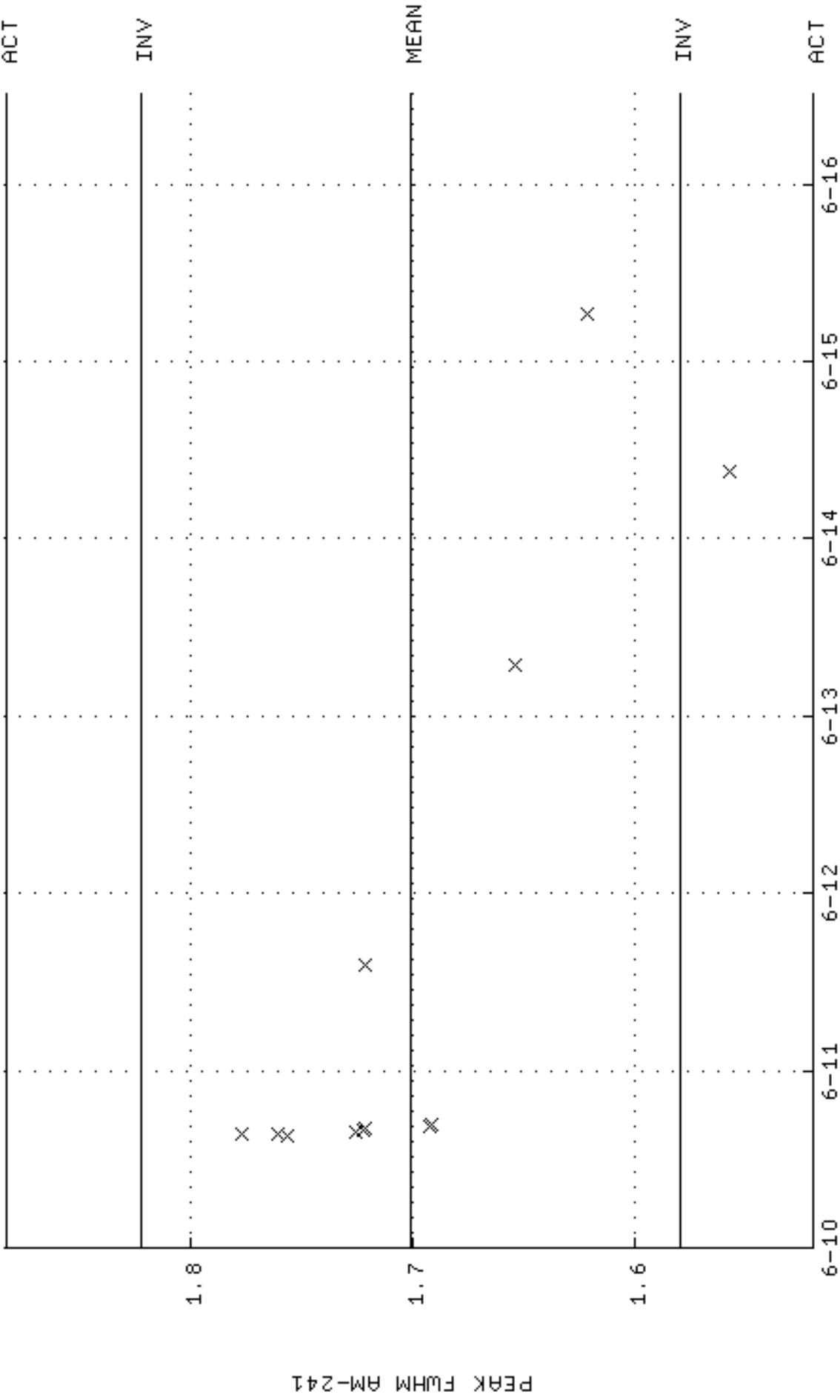
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM16.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:48:37 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.54986 +- 4.312605E-02 (2.78 %)



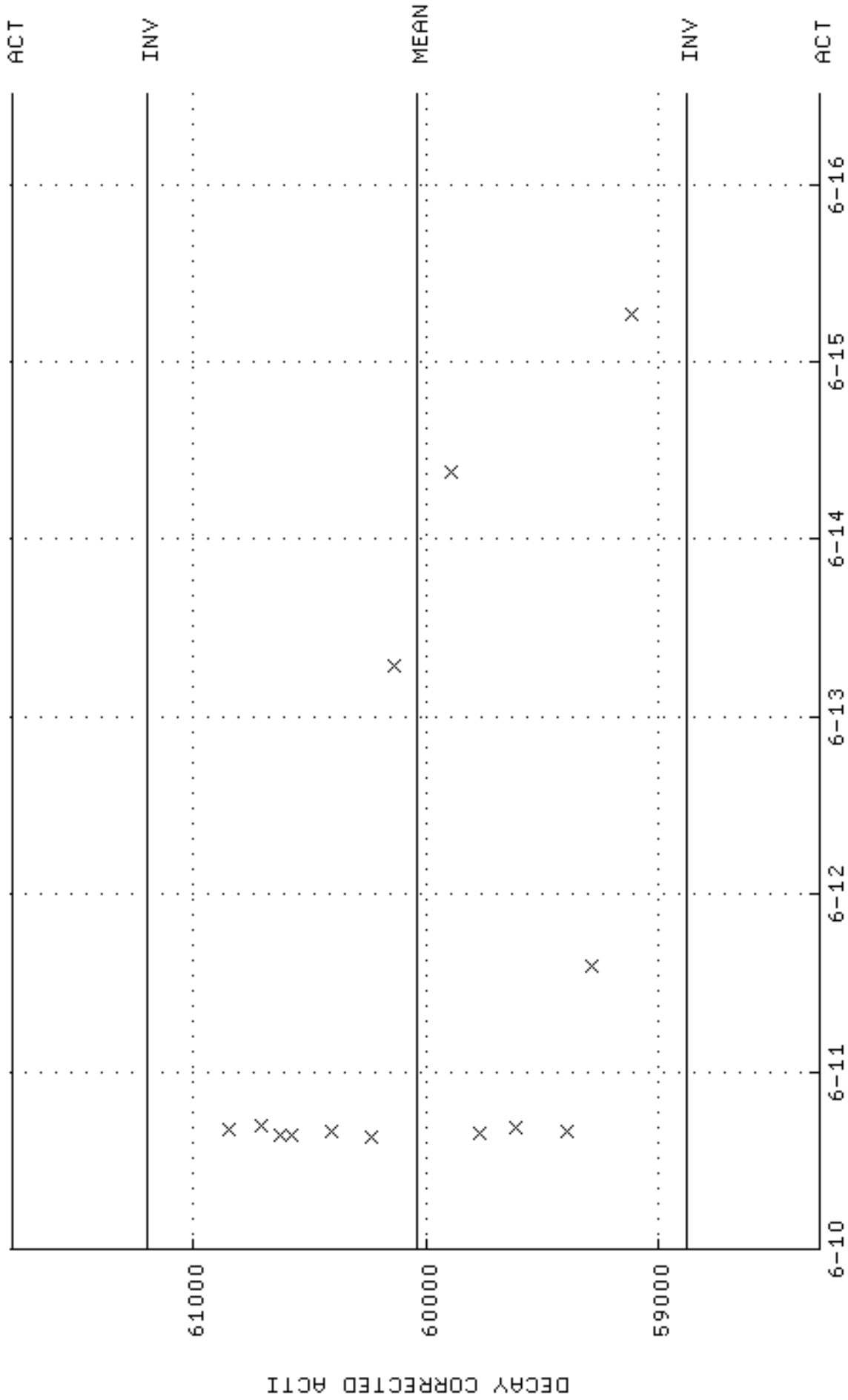
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM17_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 10-JUN-2016 15:03:33 through 16-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



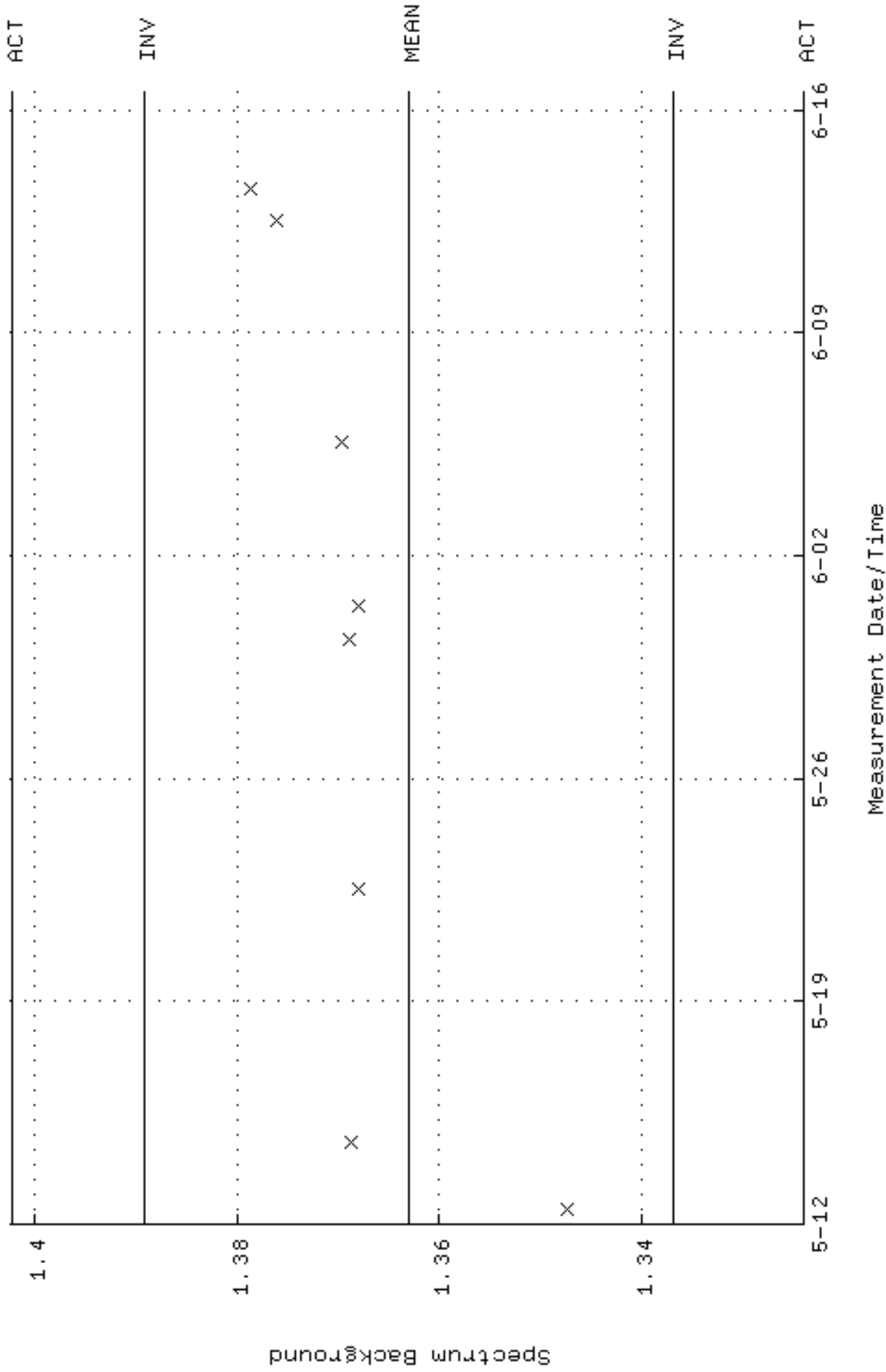
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM17_CAN.QAF;1
Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
Start/End Dates : 10-JUN-2016 15:03:33 through 16-JUN-2016 12:00:00
Mean +- Std Dev : 1.70113 +- 6.070133E-02 (3.57 %)



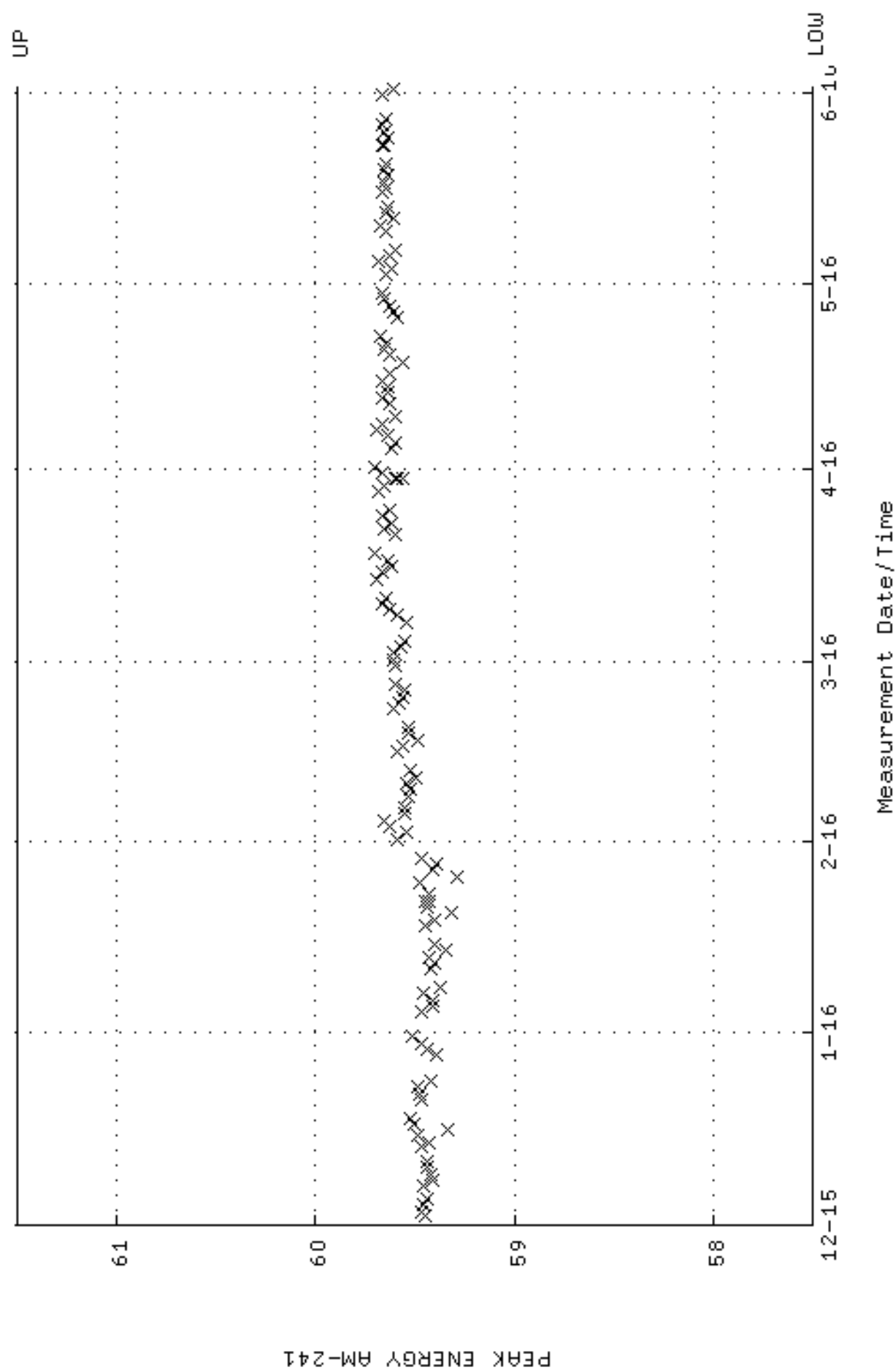
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM17-CAN.QAF;1
Parameter Name : NLACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
Start/End Dates : 10-JUN-2016 15:03:33 through 16-JUN-2016 12:00:00
Mean +- Std Dev : 60041.8 +- 577.287 (0.96 %)



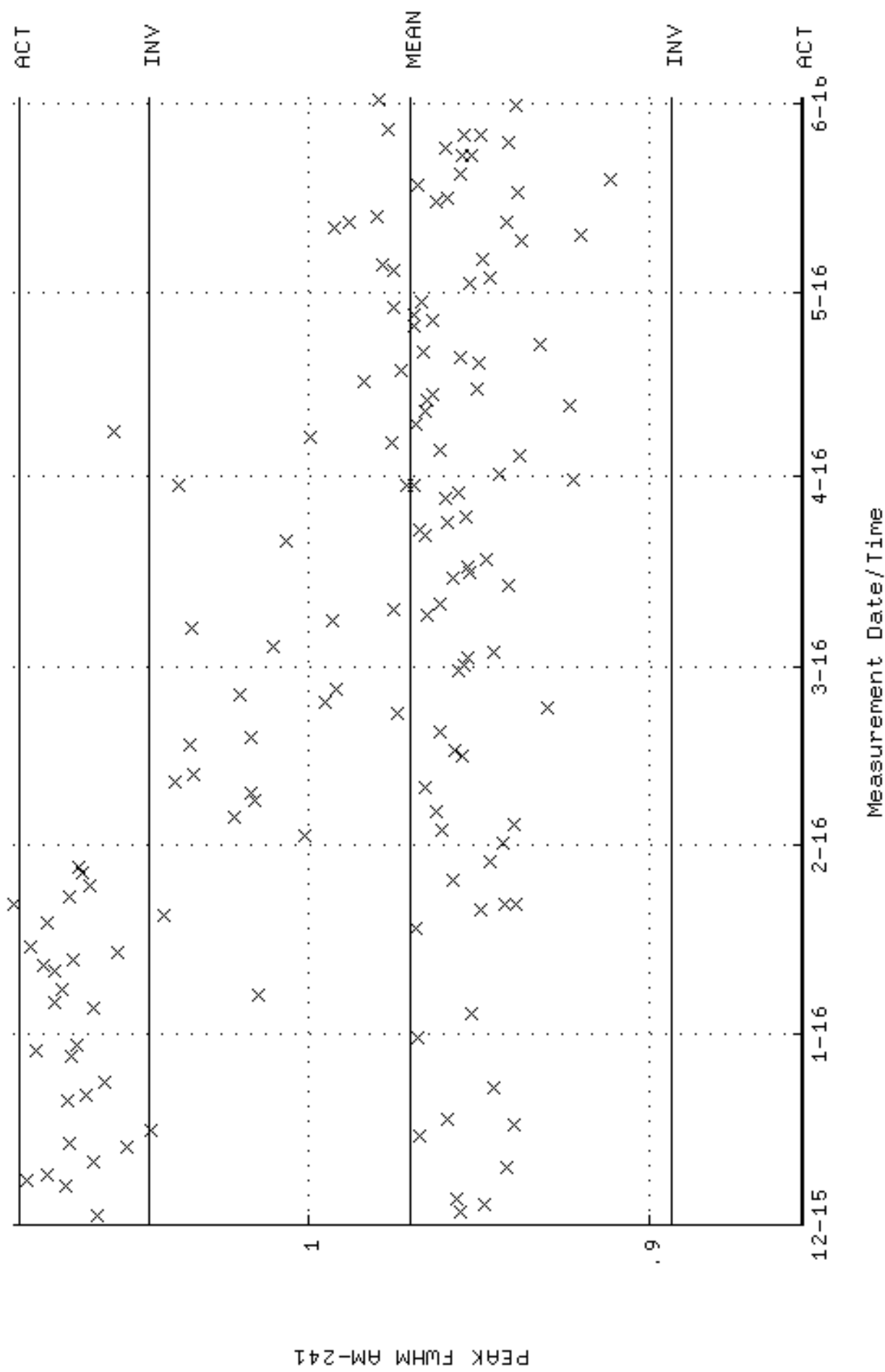
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM17.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 12-MAY-2016 11:34:48 through 16-JUN-2016 12:00:00
Mean +- Std Dev : 1.36306 +- 1.304474E-02 (0.96 %)



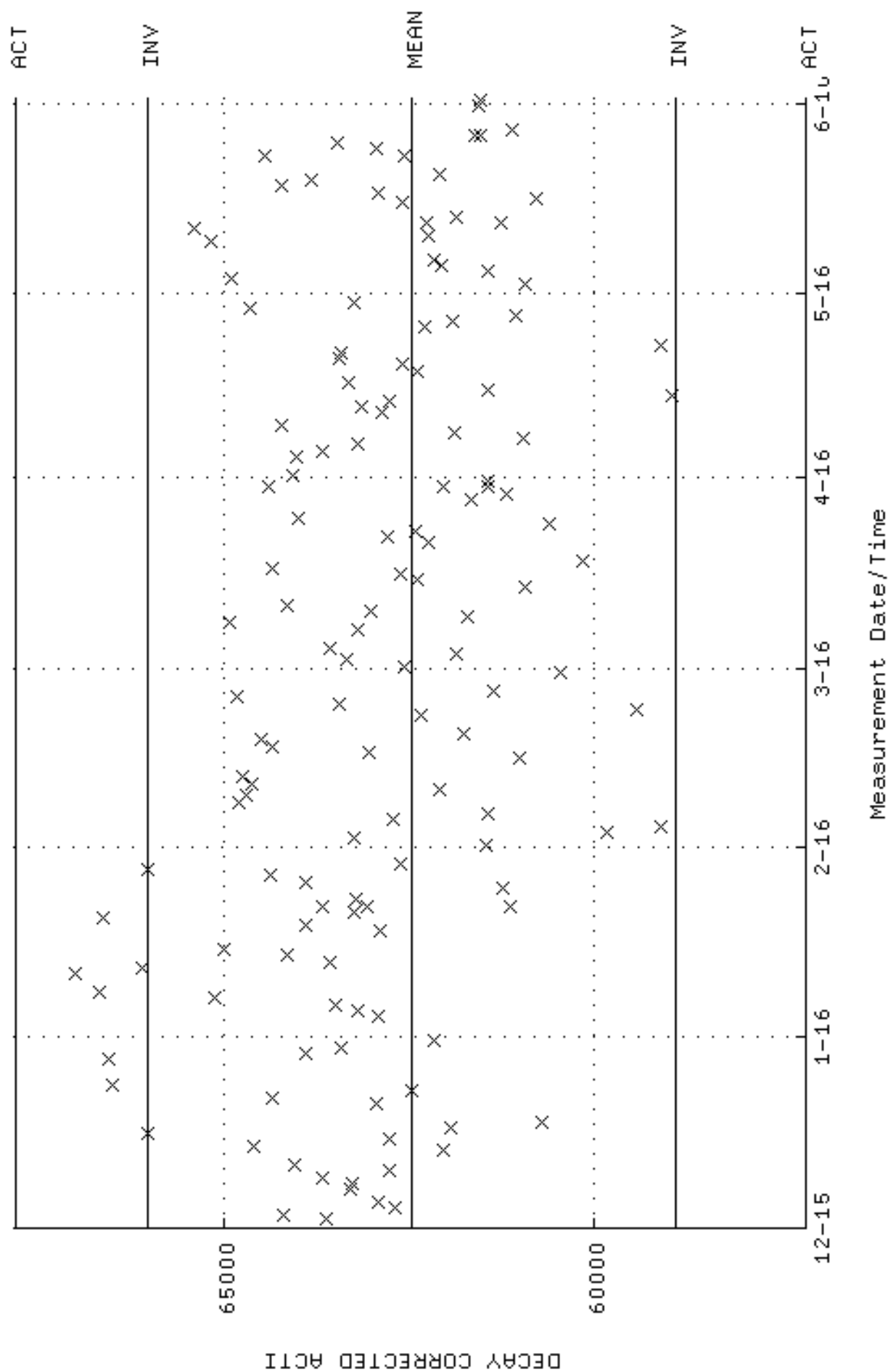
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM18_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:43:29 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



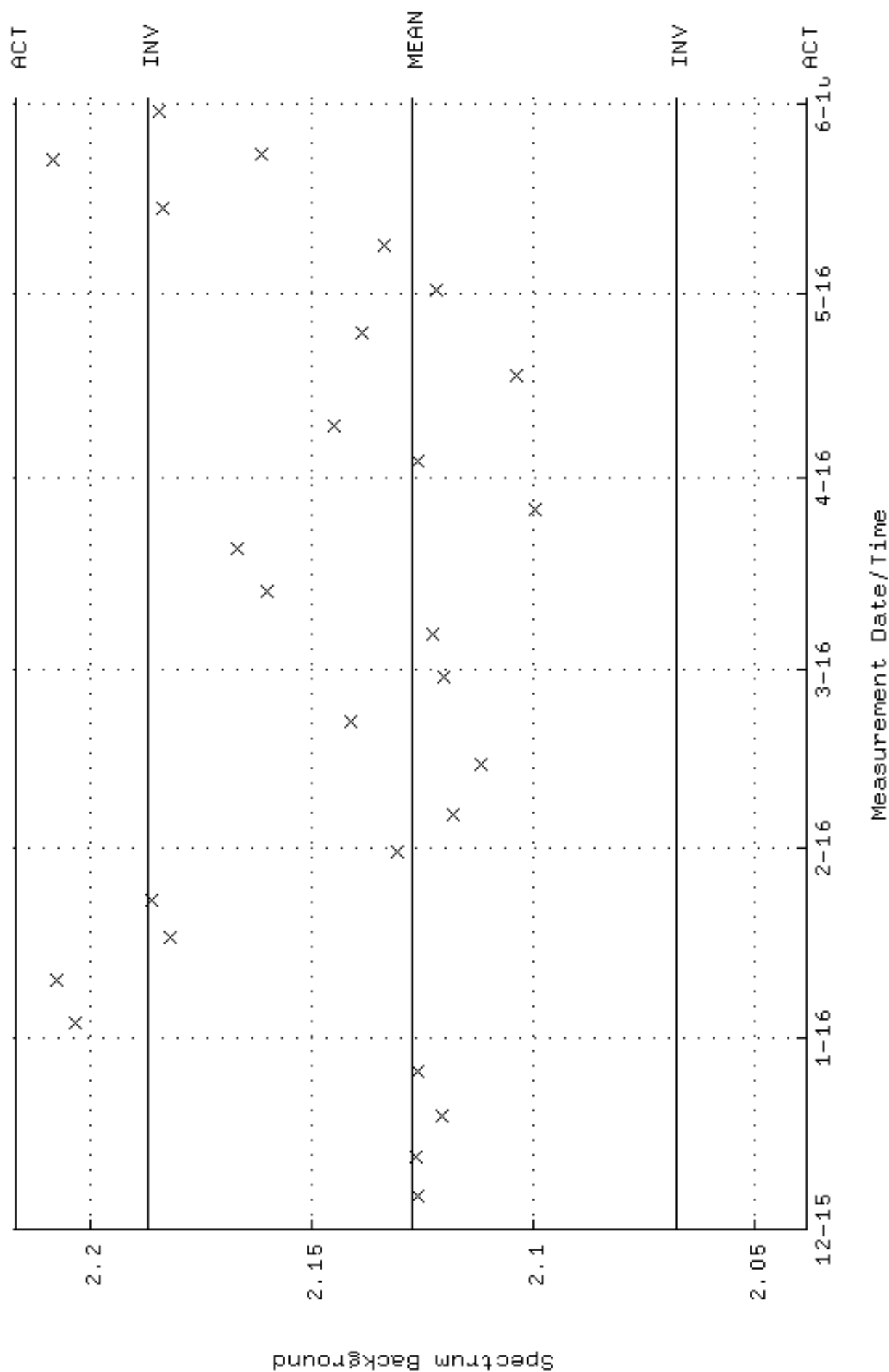
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM18_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:43:29 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 0.970506 +- 3.822271E-02 (3.94 %)



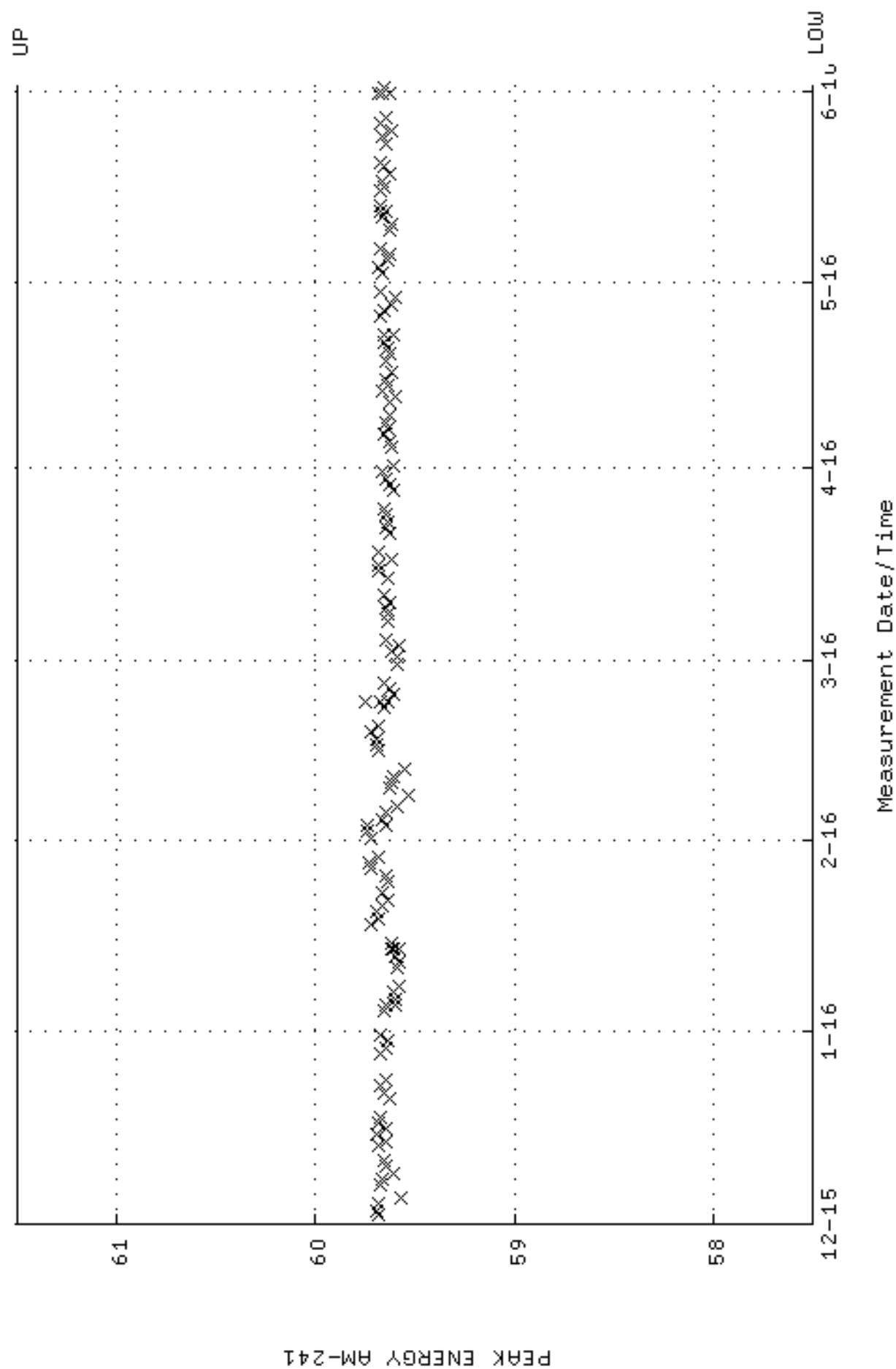
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM18-CAN.QAF;1
 Parameter Name : NLACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:43:29 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 62485.8 +- 1778.76 (2.85 %)



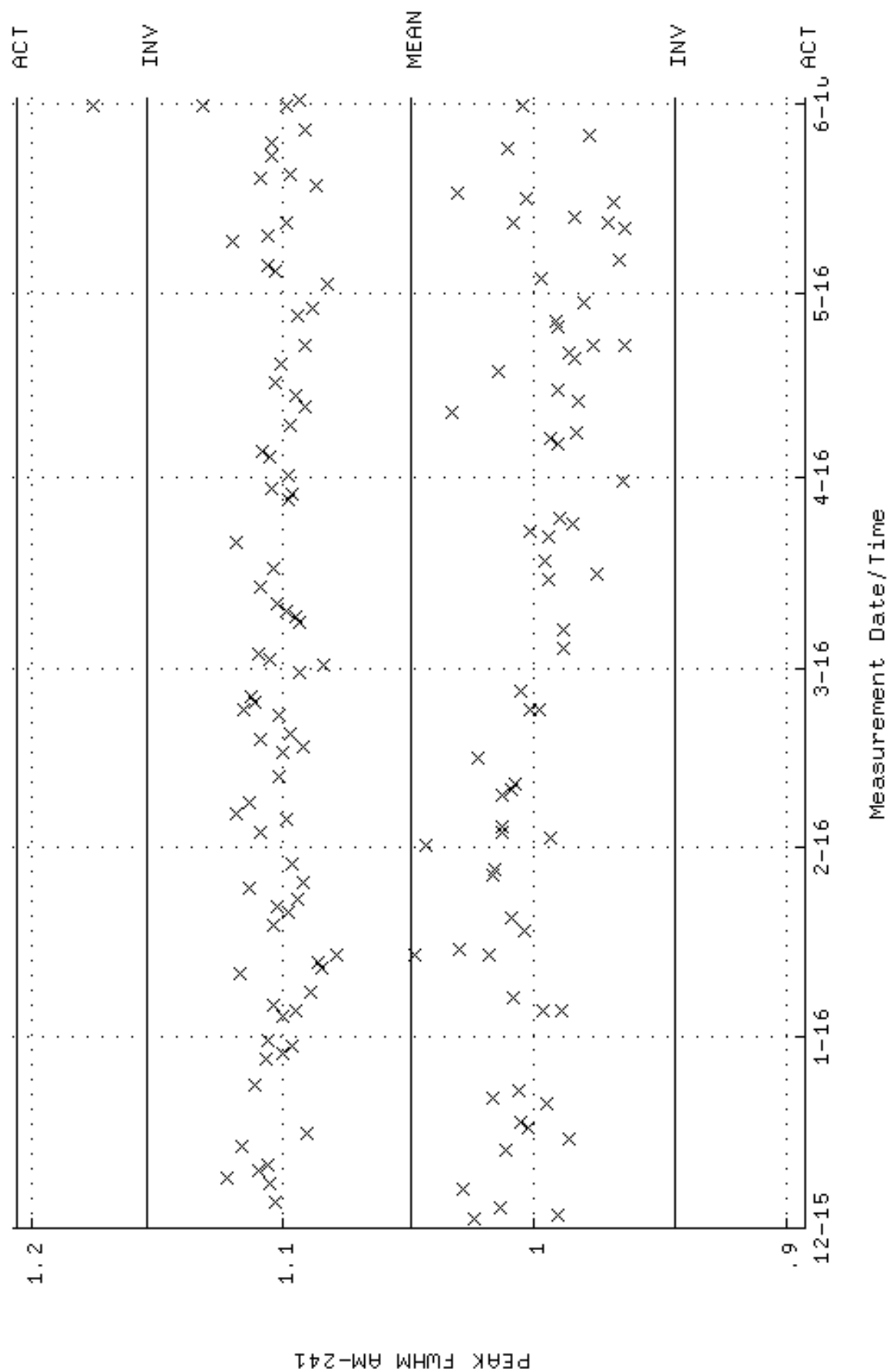
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM18.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:48:43 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 2.12760 +- 2.980382E-02 (1.40 %)



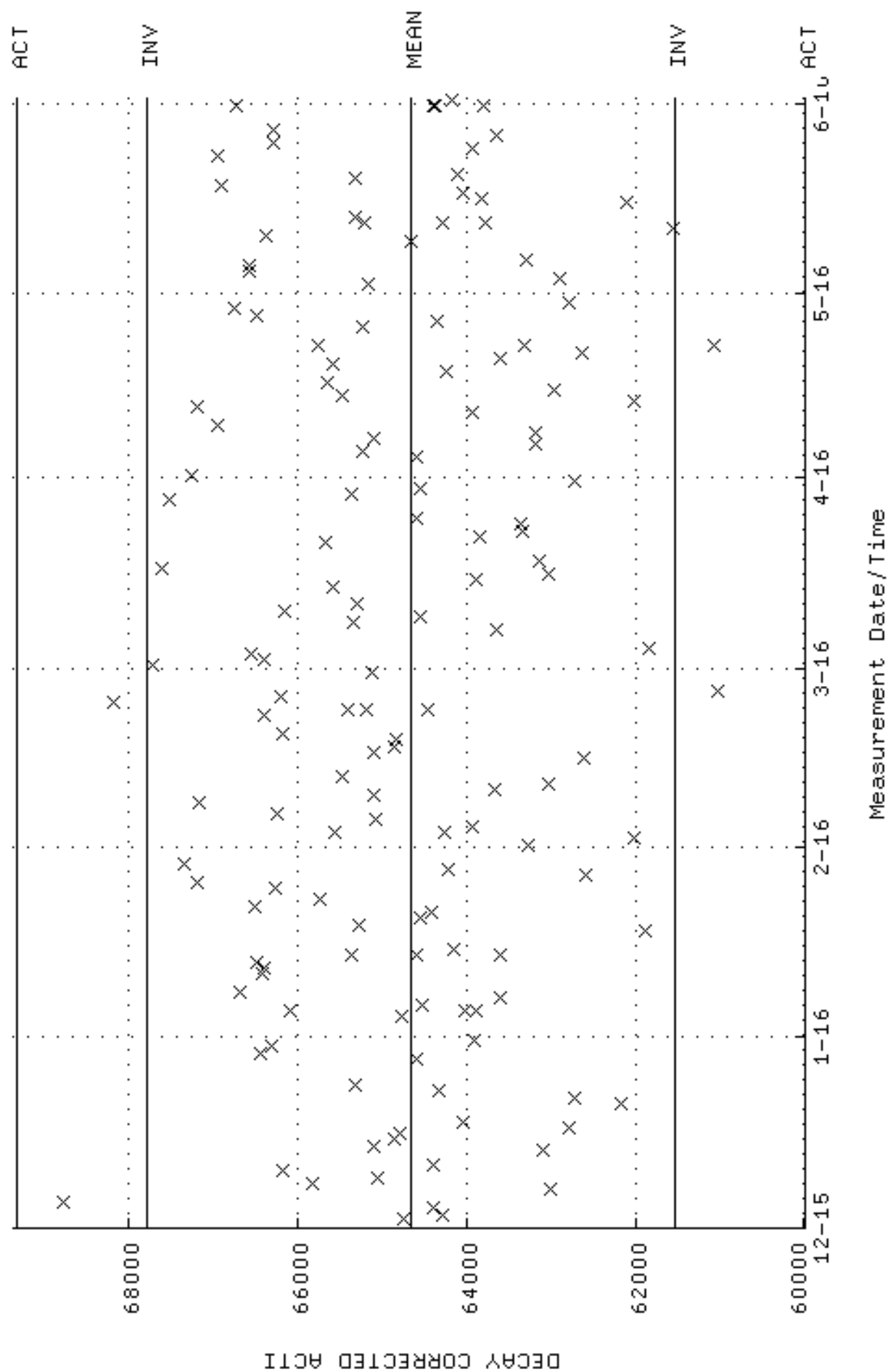
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM20_500MLMB.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:43:34 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



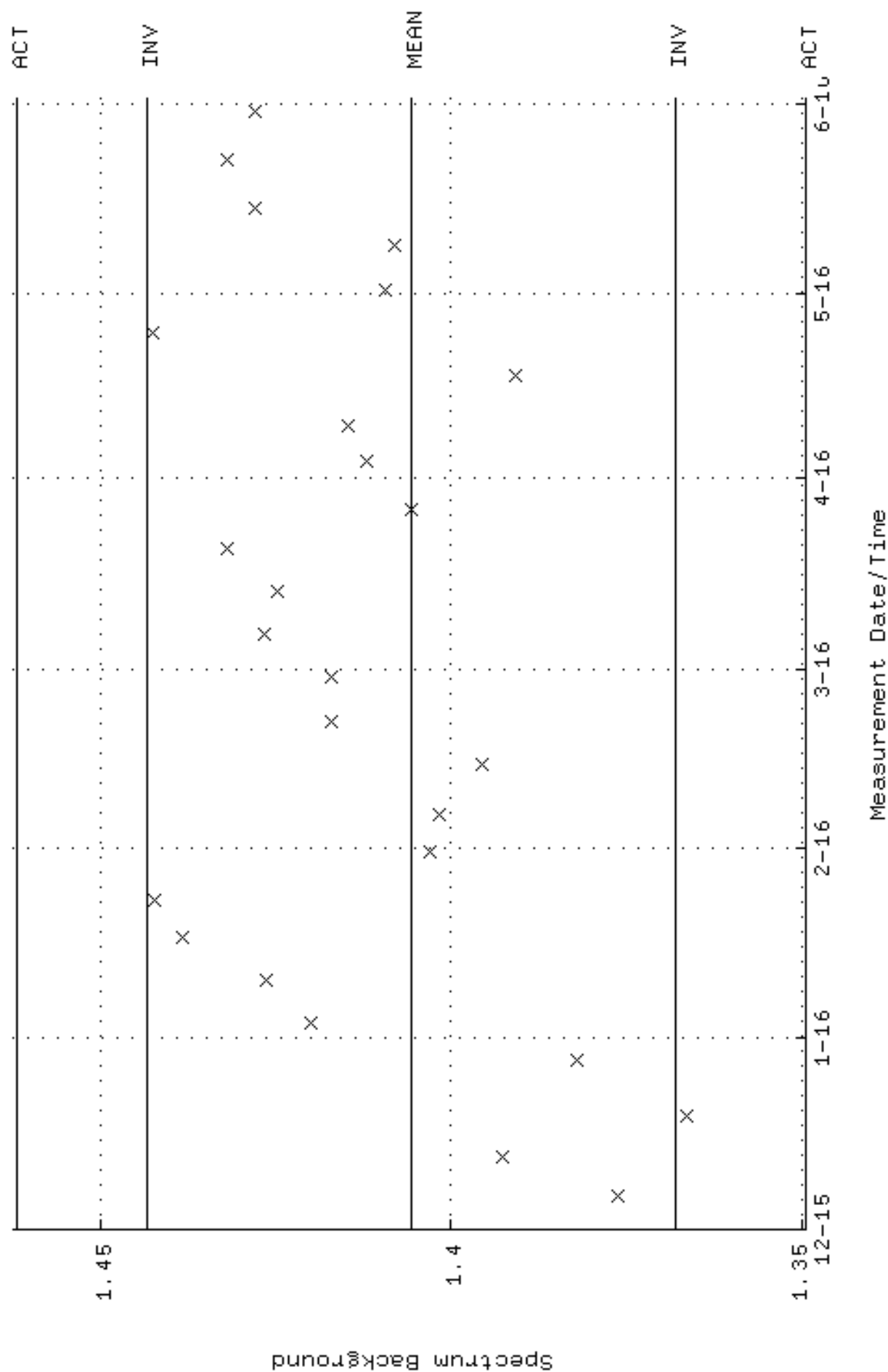
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM20_500MLMB.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:43:34 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.04945 +- 5.238558E-02 (4.99 %)



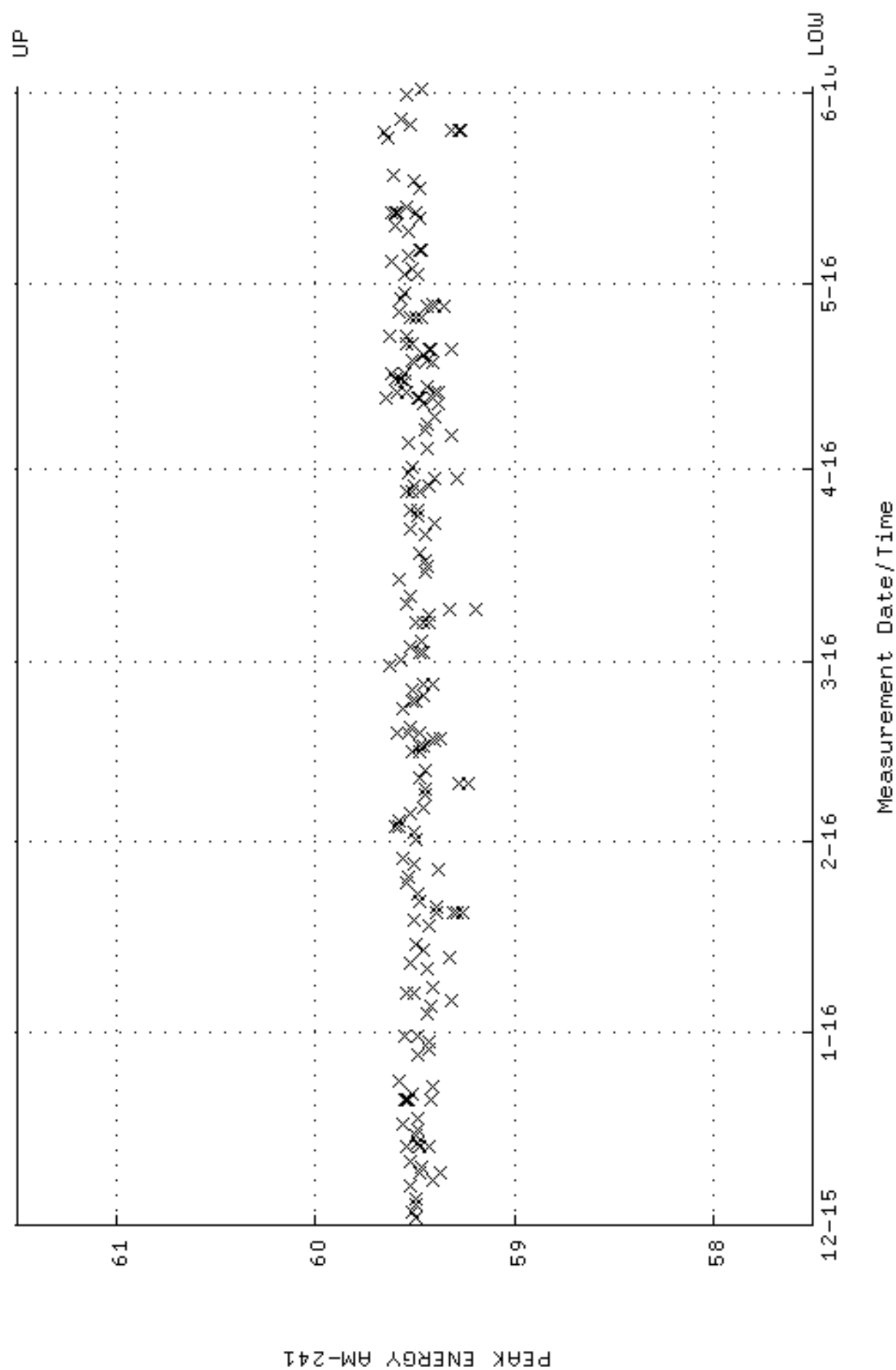
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM20_500MLMB.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:43:34 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 64670.3 +- 1560.85 (2.41 %)



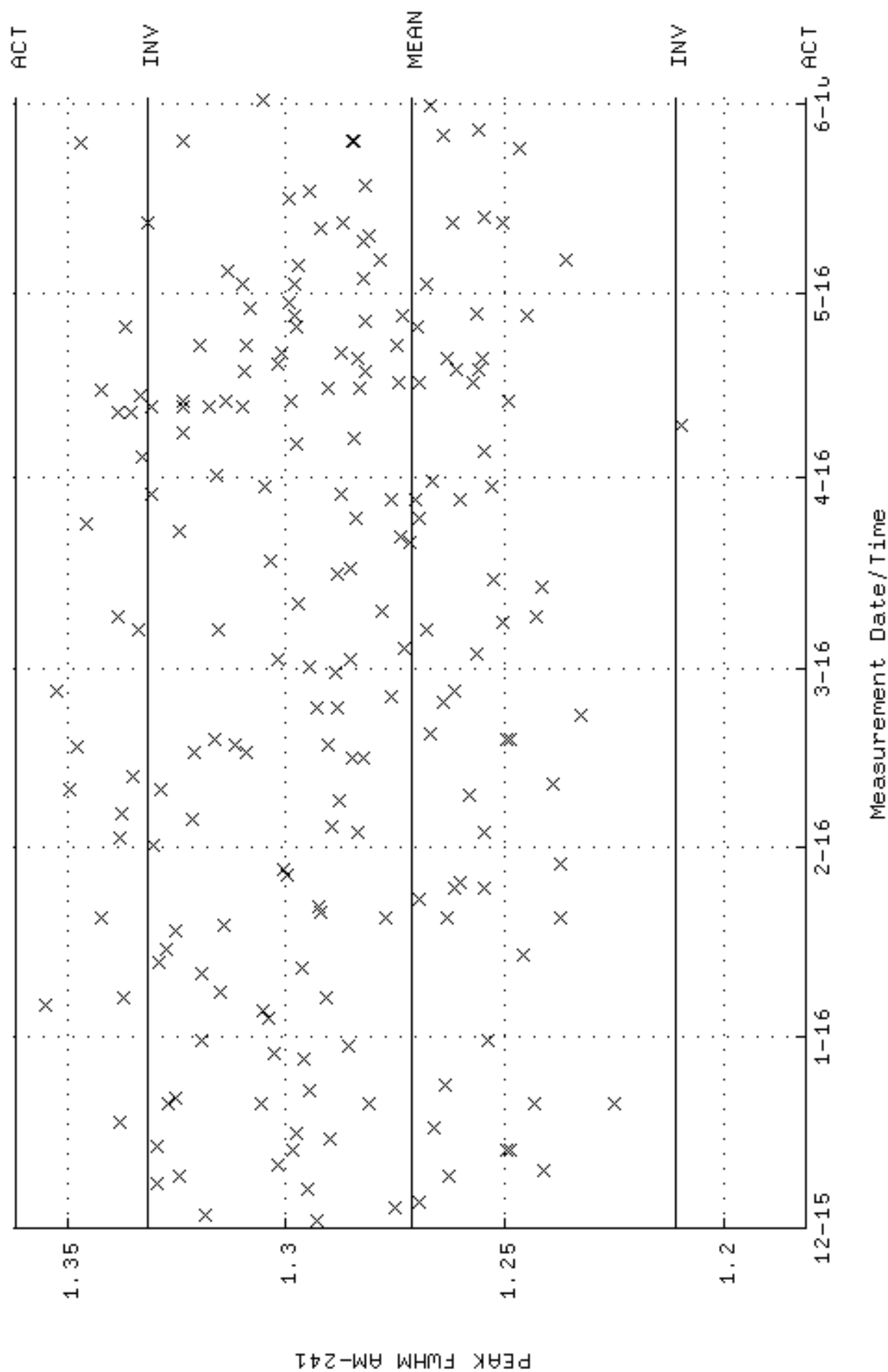
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM20.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:48:54 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.40579 +- 1.881187E-02 (1.34 %)



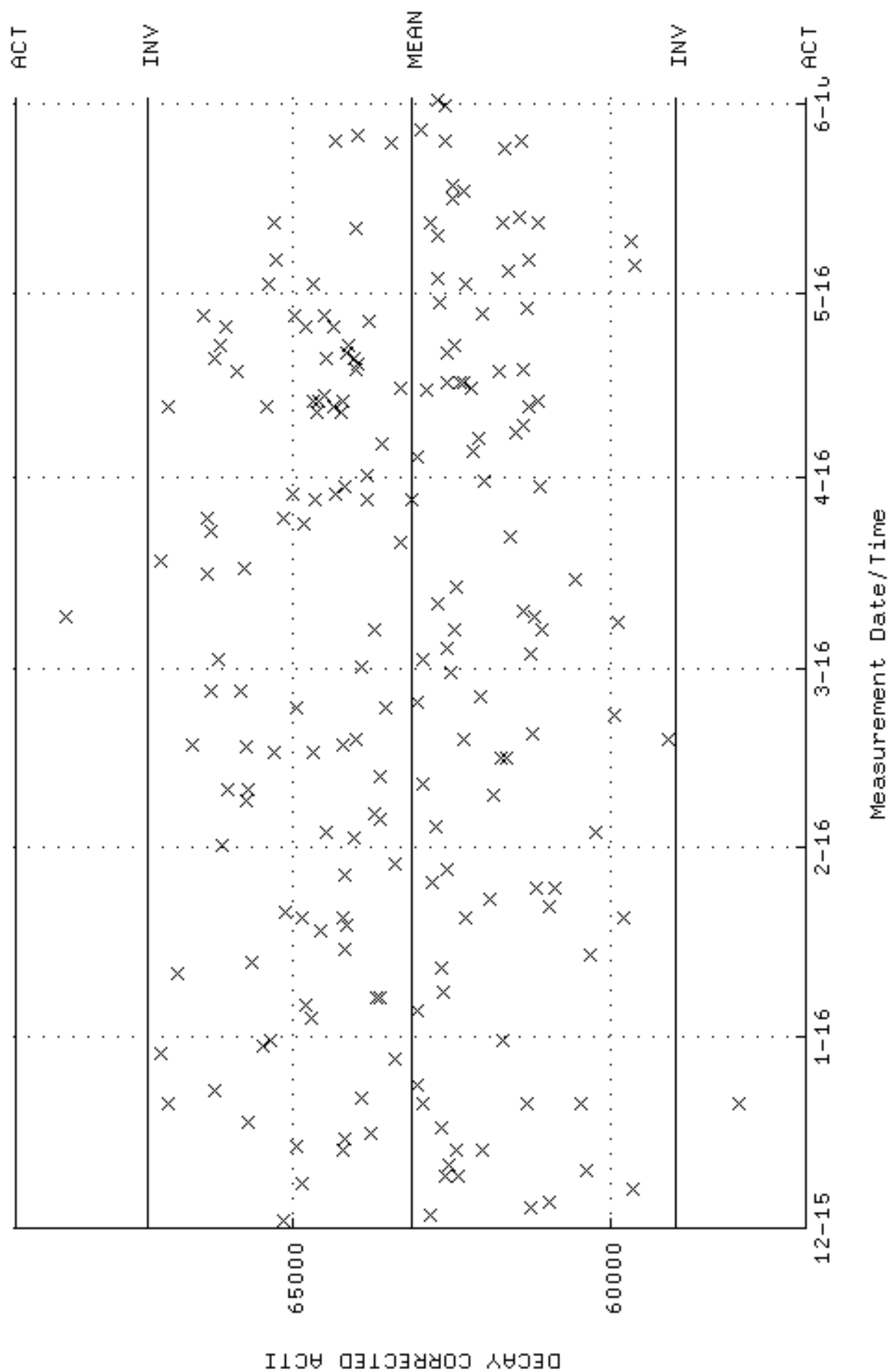
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM22_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:53 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



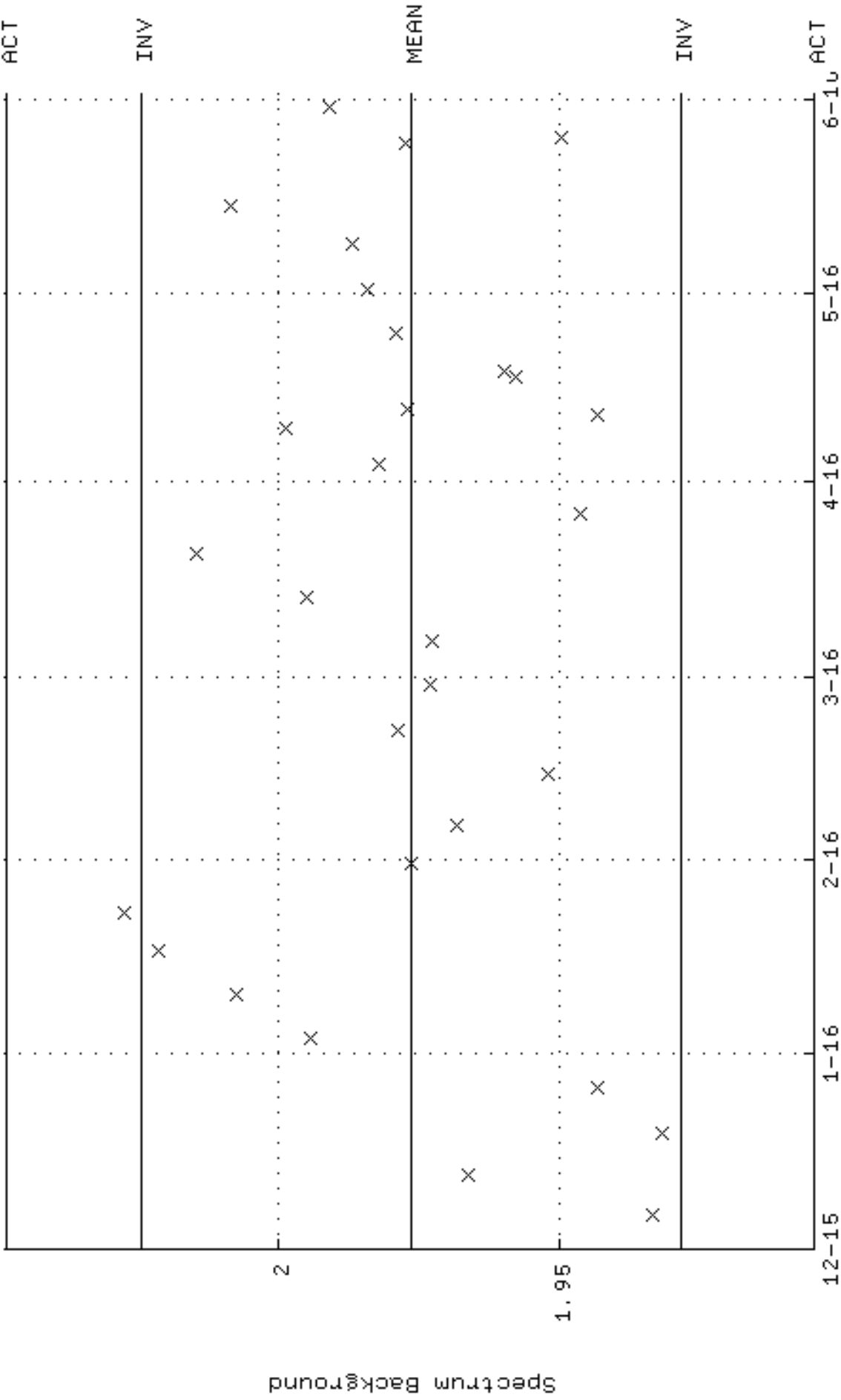
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM22_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:28:53 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.27153 +- 3.00791E-02 (2.37 %)



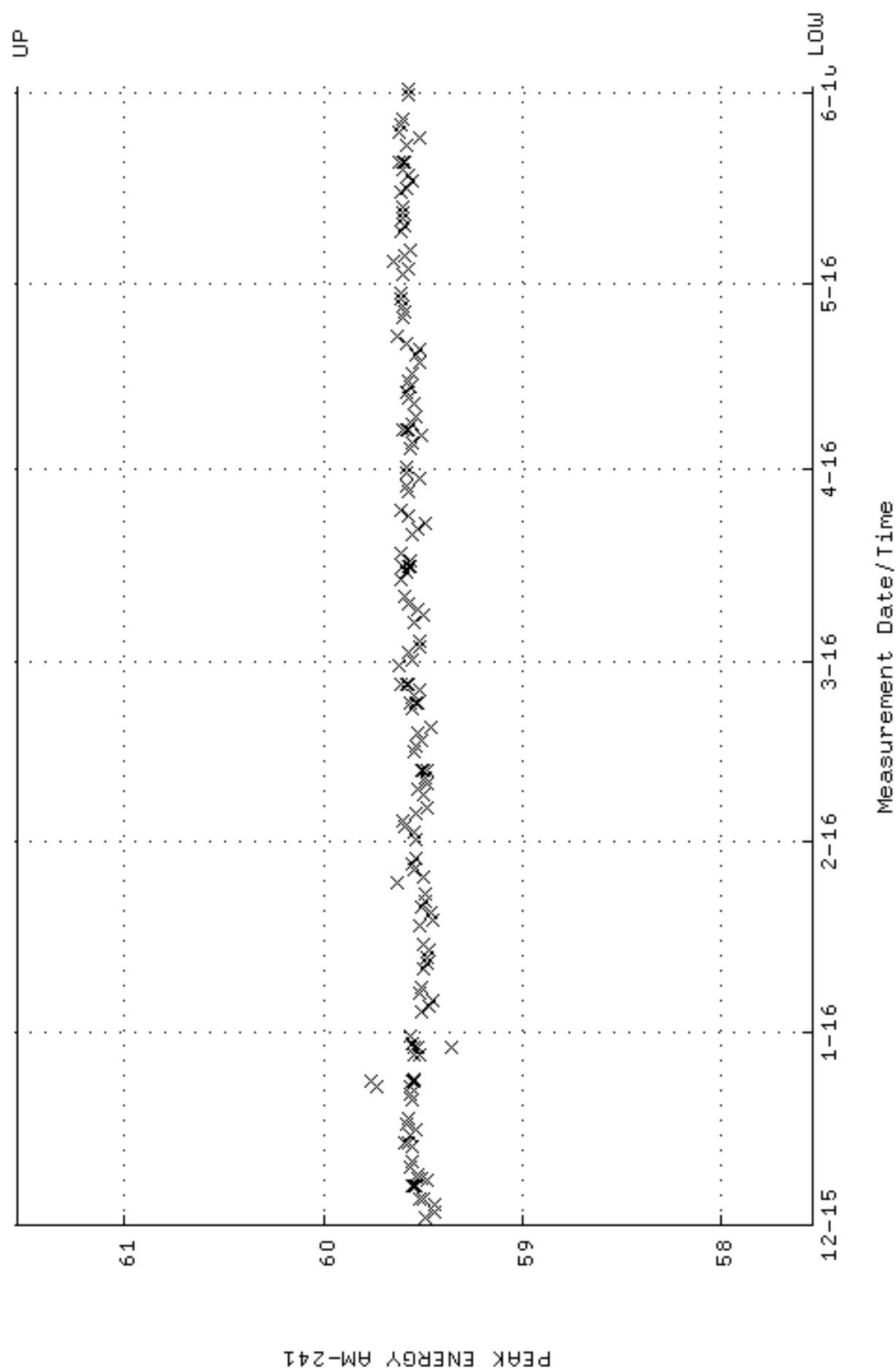
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM22_CAN.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:28:53 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 63136.2 +- 2069.25 (3.28 %)



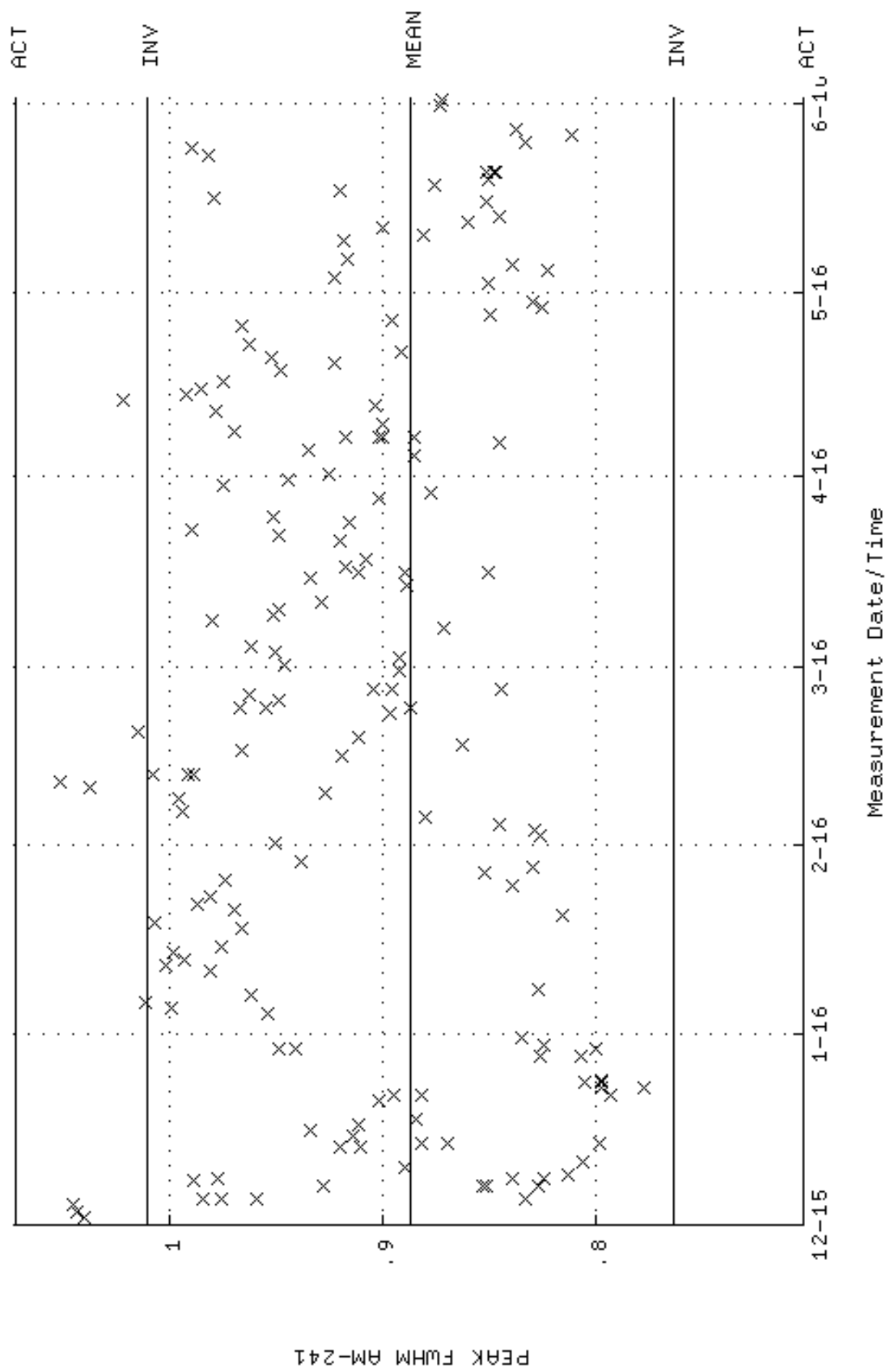
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM22.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:49:04 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.97656 +- 2.394001E-02 (1.21 %)



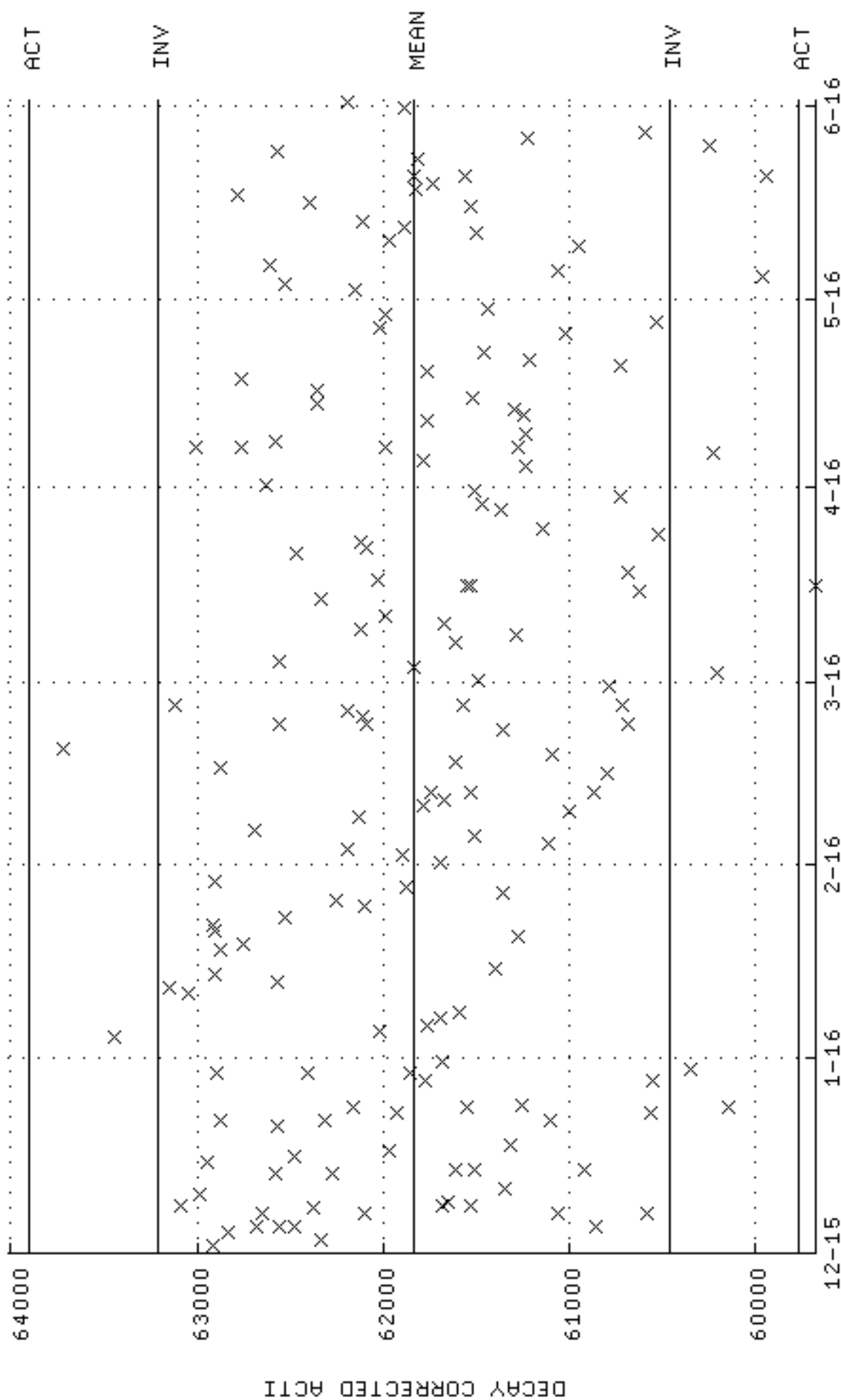
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM25_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:29:03 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM25_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:29:03 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 0.887333 +- 6.147716E-02 (6.93 %)

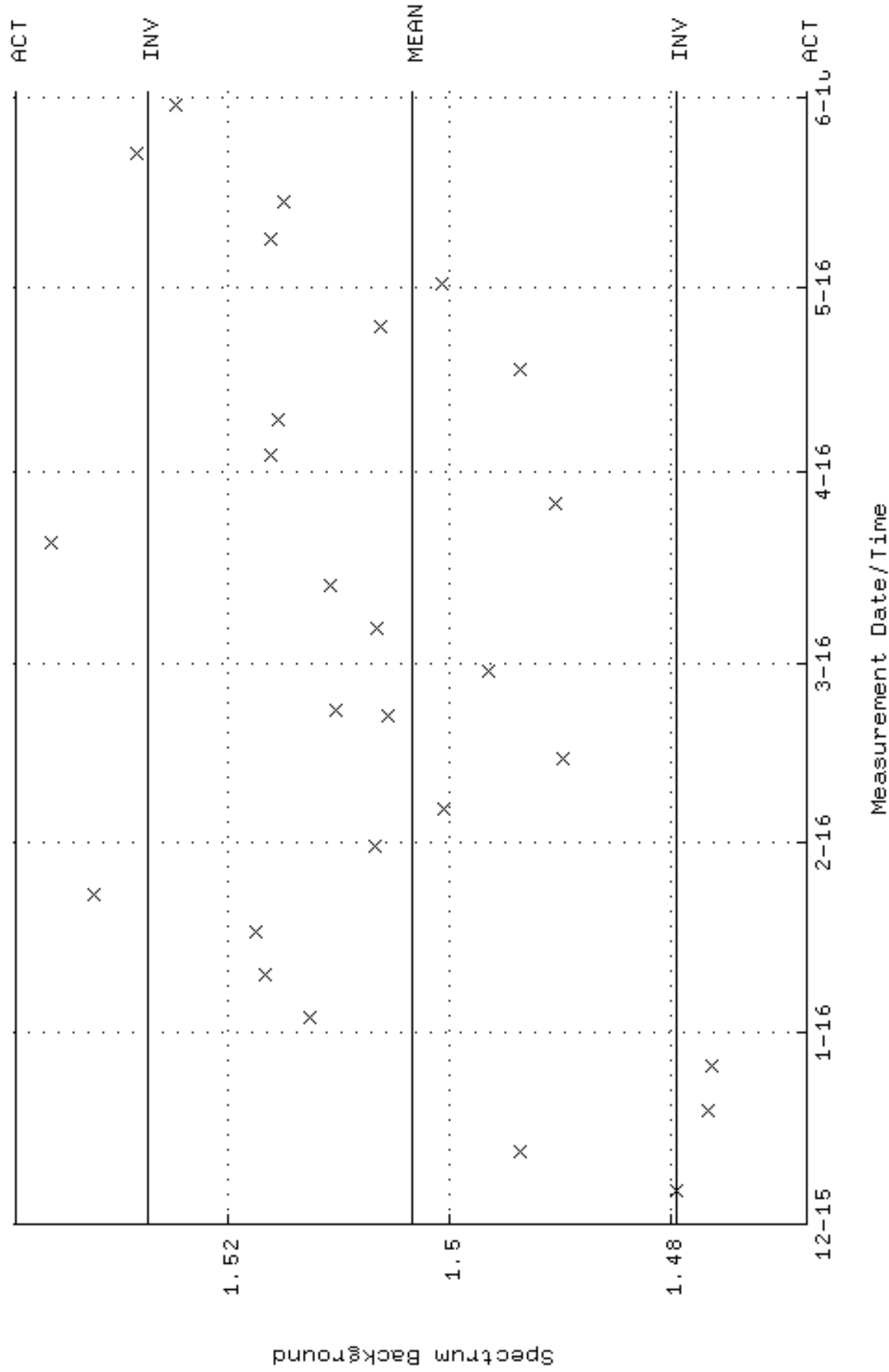


QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM25_CAN.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:29:03 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 61839.2 +- 688.813 (1.11 %)

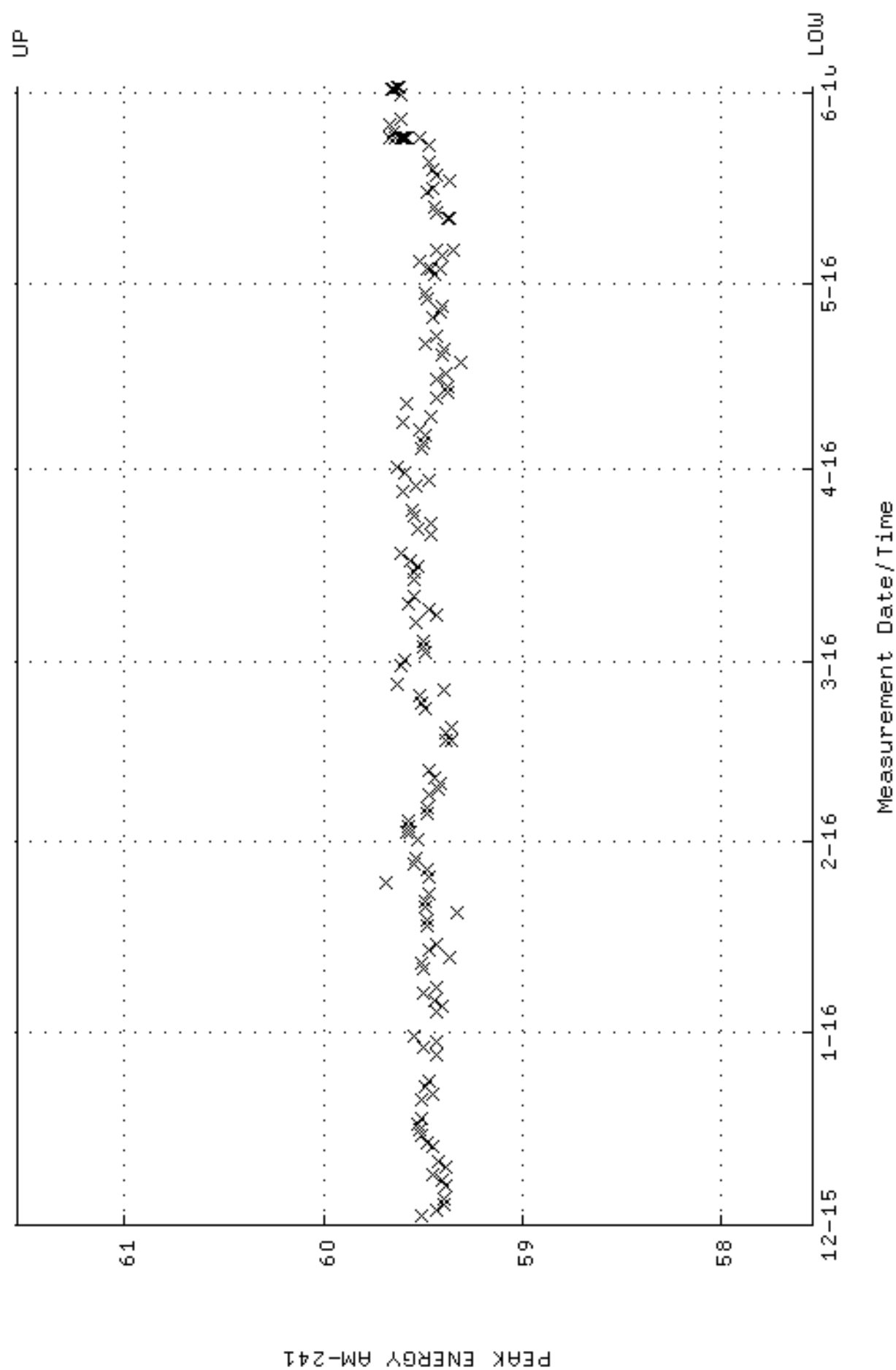


Measurement Date/Time

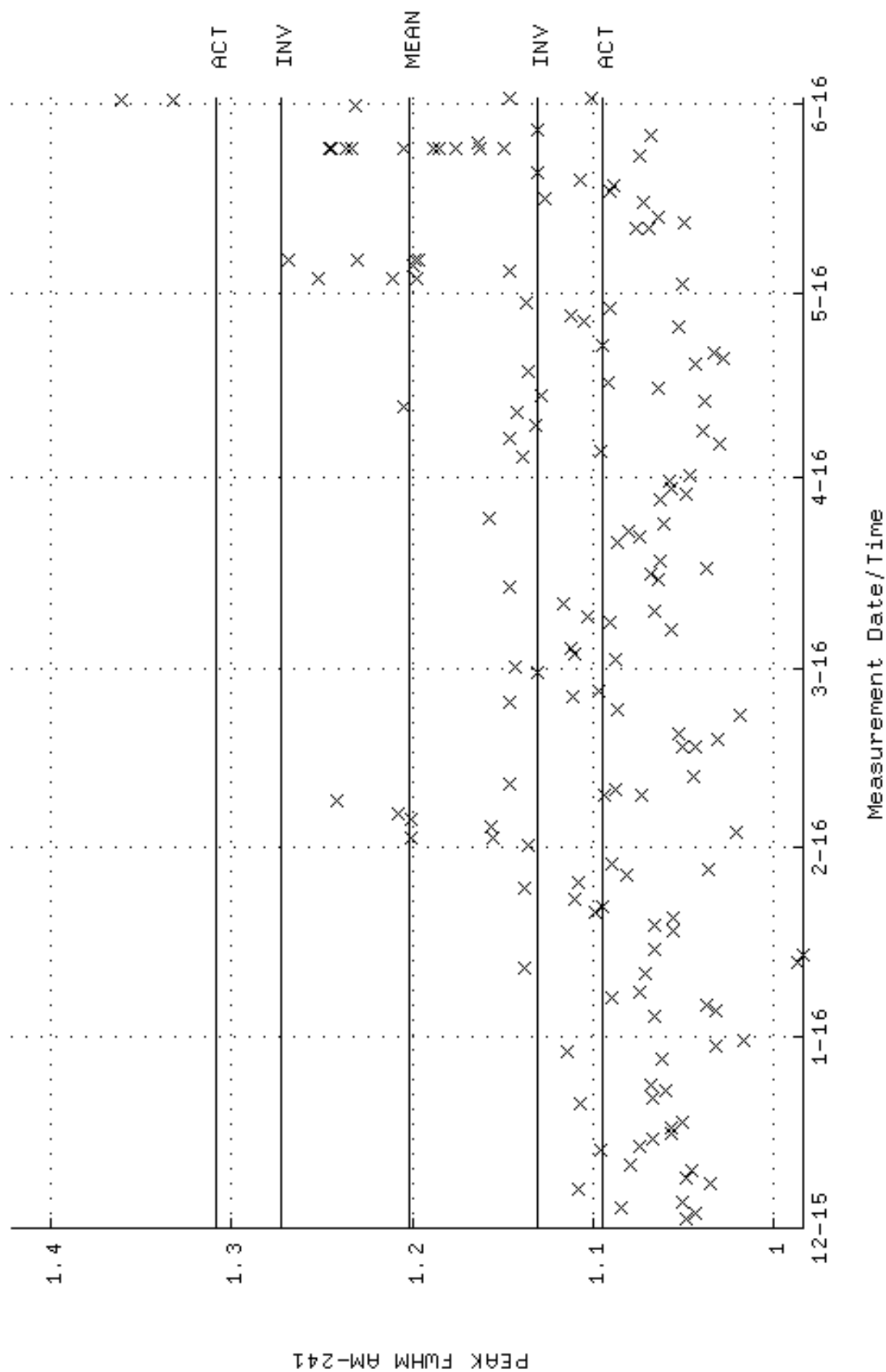
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM25.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:49:19 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.50341 +- 1.187922E-02 (0.79 %)



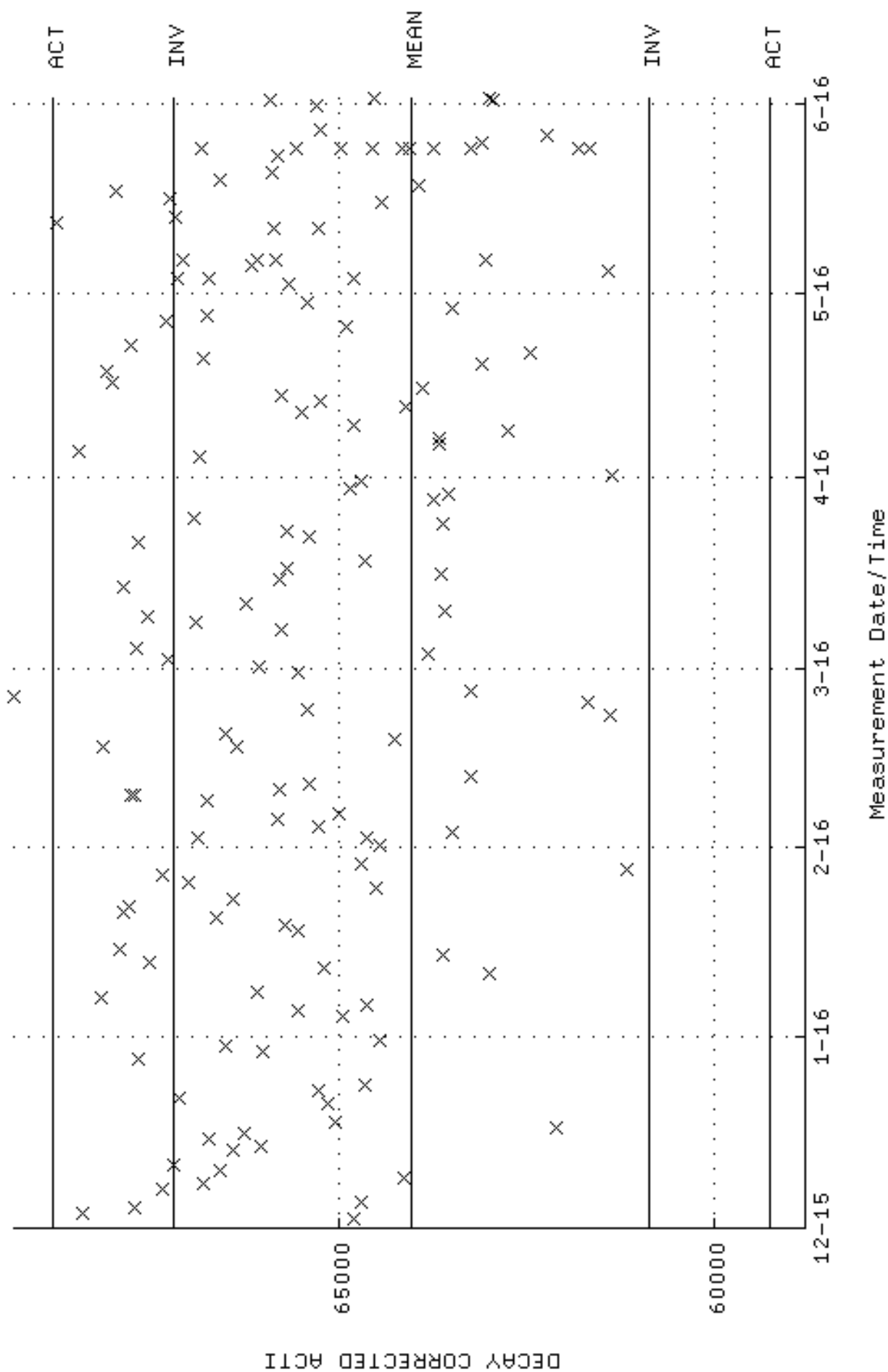
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM28_JAR.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:54:16 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



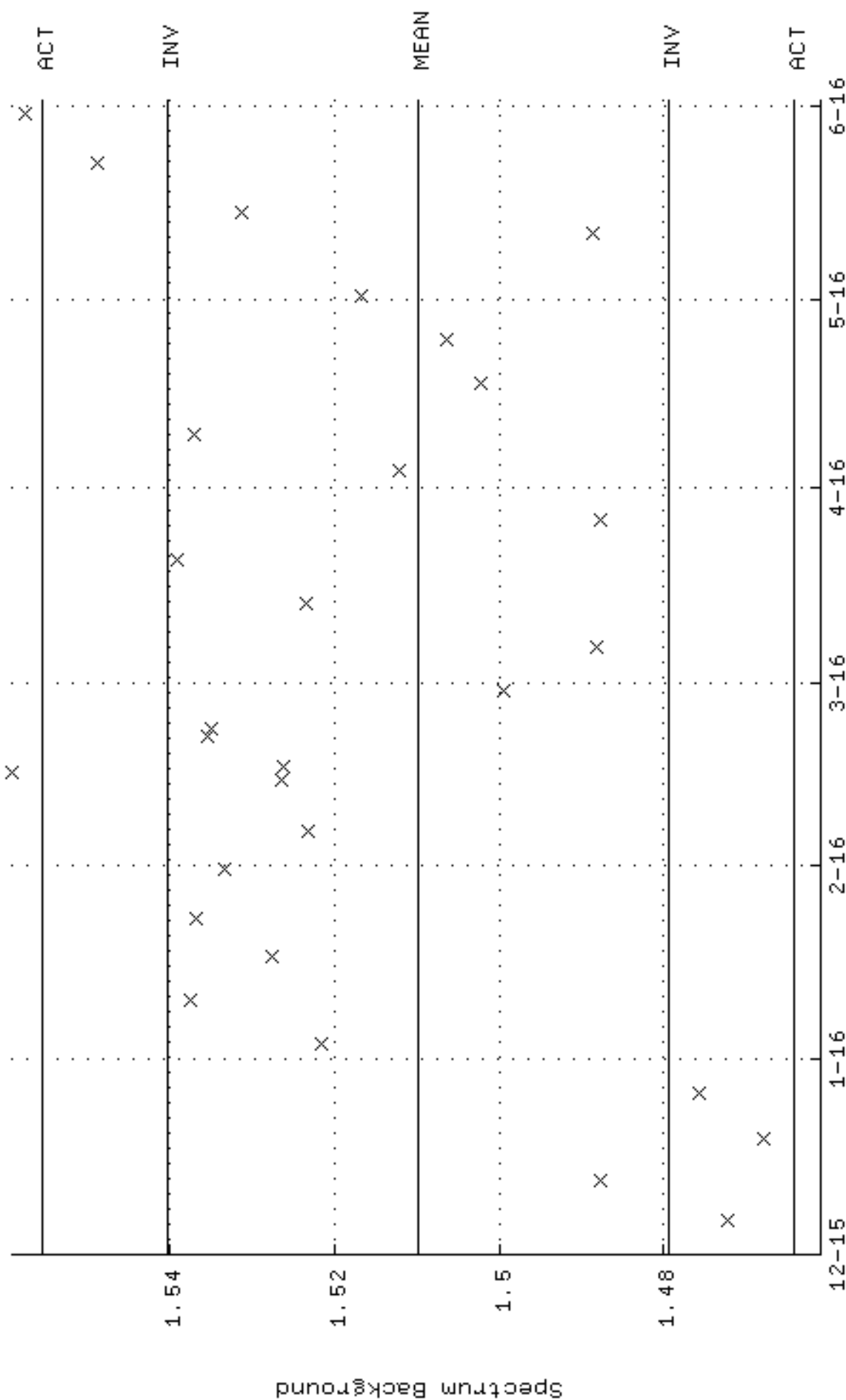
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM28_JAR.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:54:16 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.20208 +- 3.554162E-02 (2.96 %)



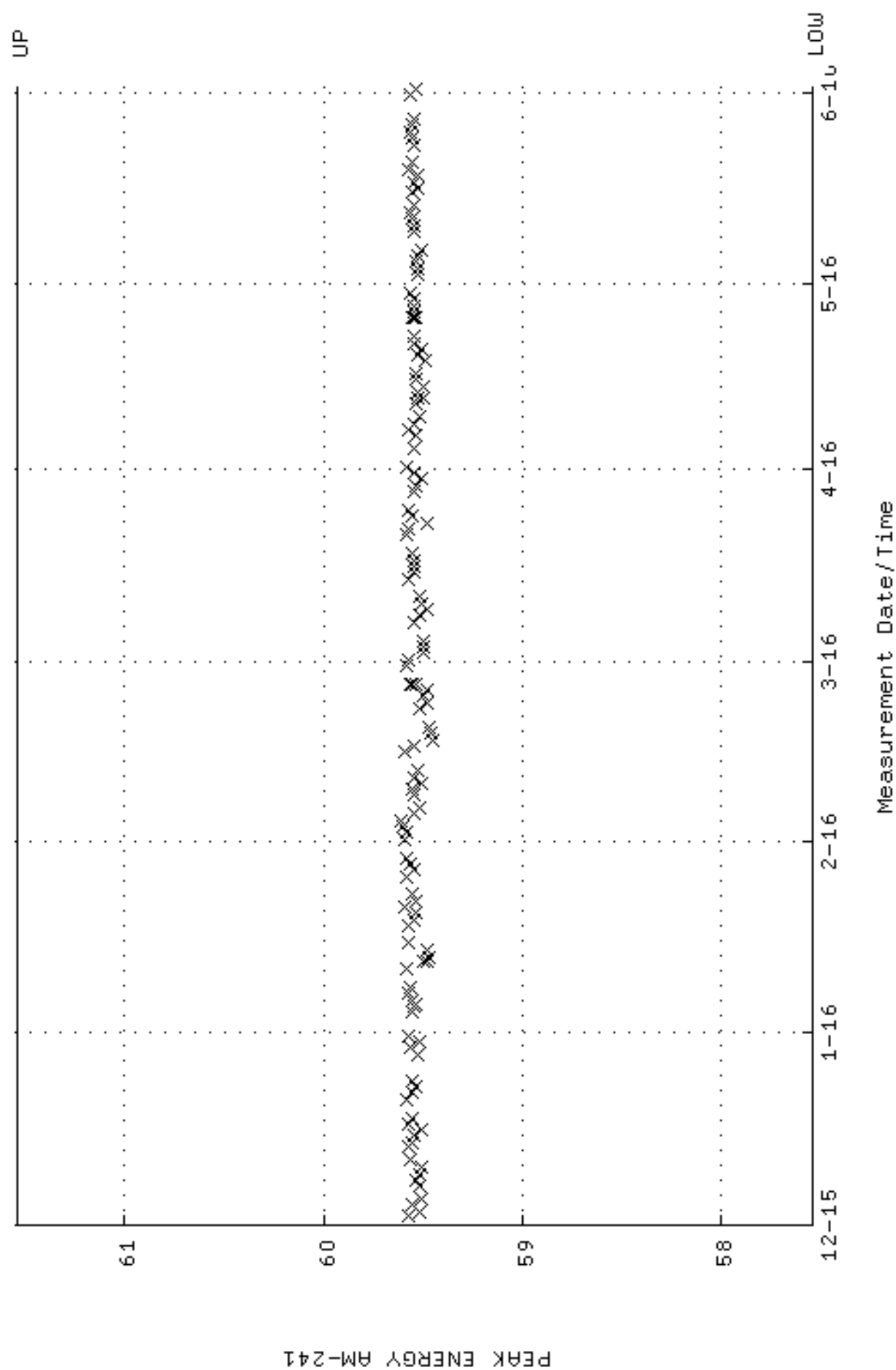
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM28-JAR.QAF;1
 Parameter Name : NACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:54:16 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 64051.7 +- 1587.33 (2.48 %)



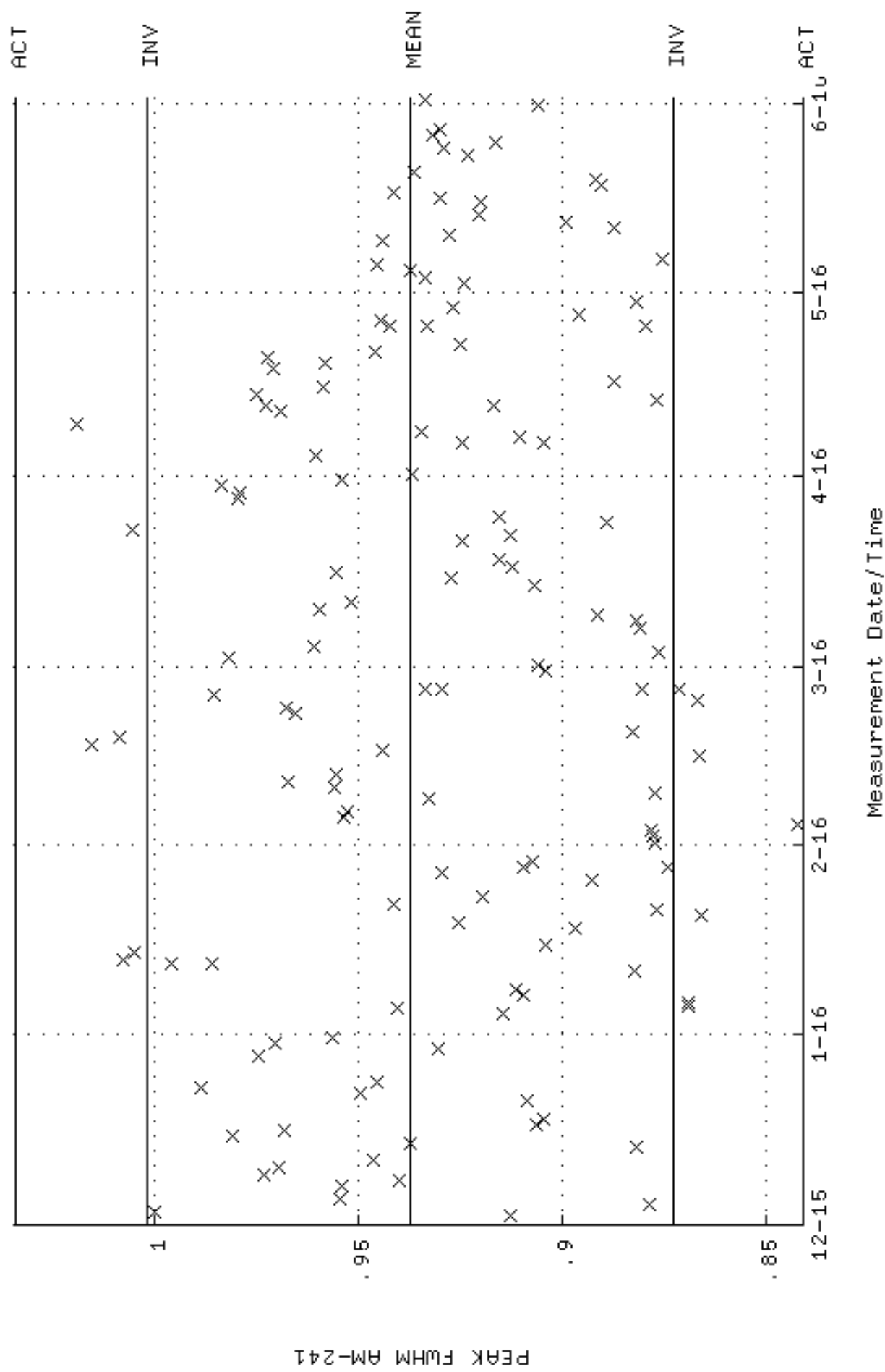
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM28.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:49:34 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.50994 +- 1.525503E-02 (1.01 %)



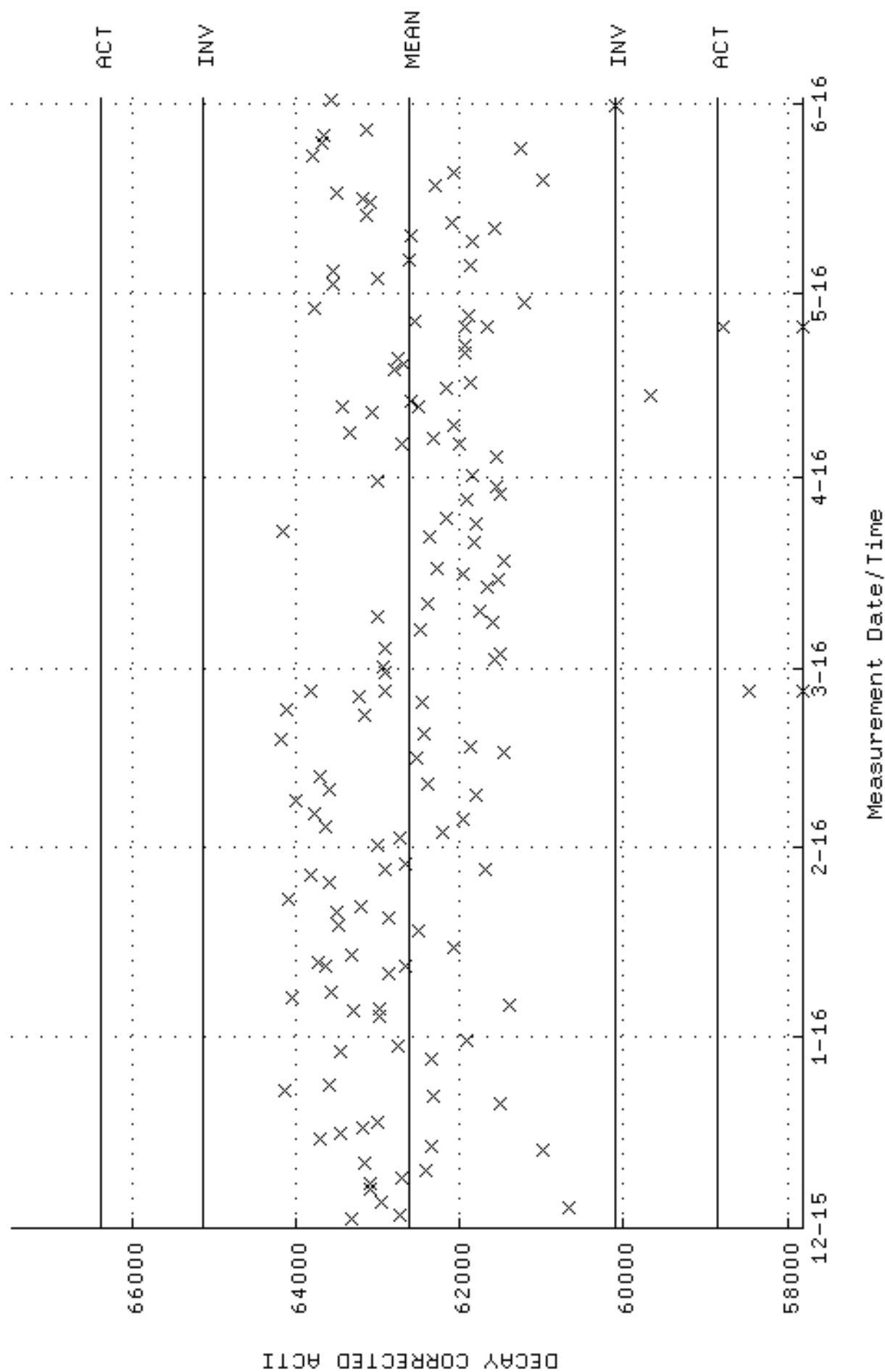
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM31_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-DEC-2015 09:02:53 through 1-JUN-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



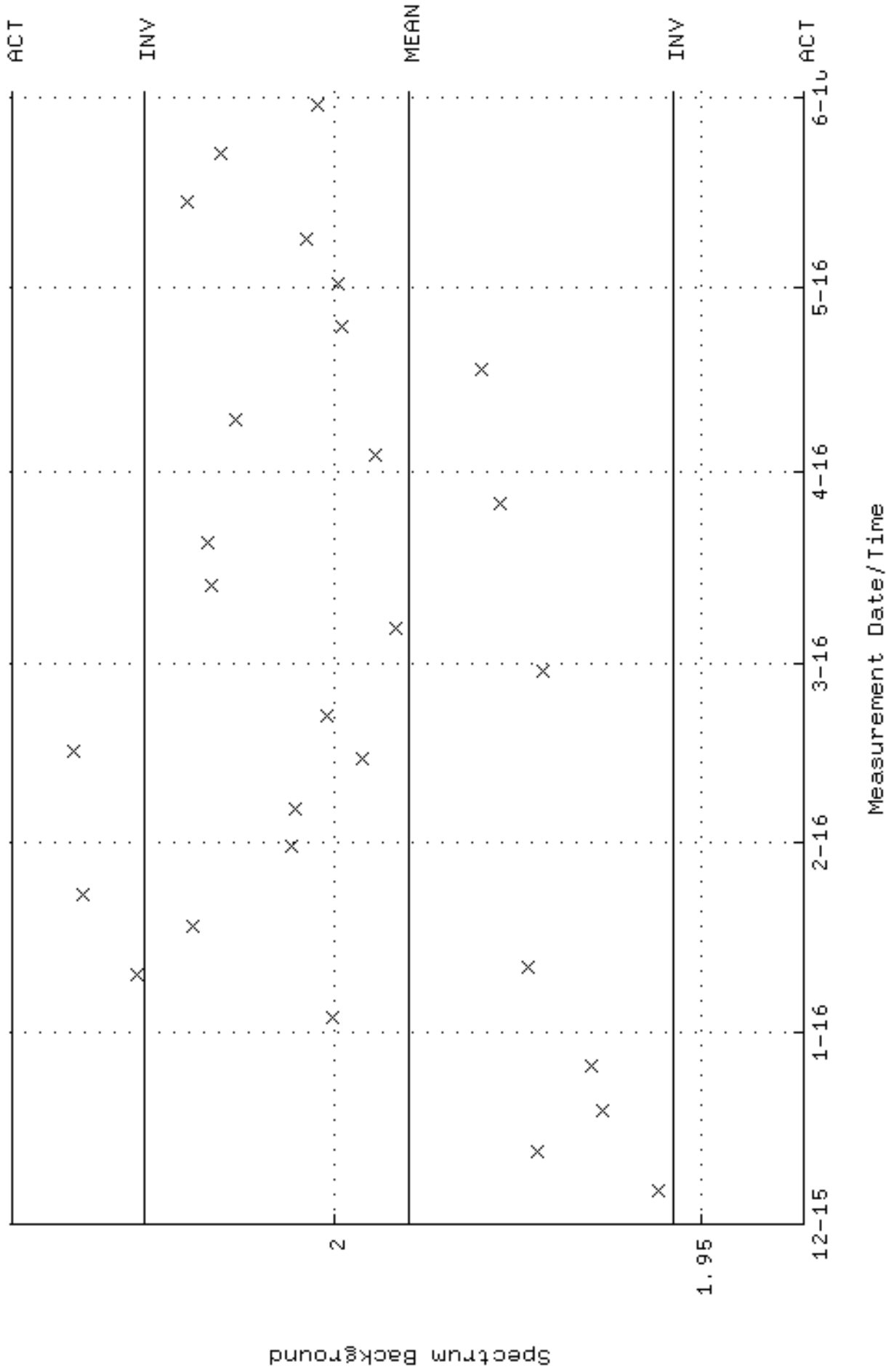
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC-GAM31-CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 09:02:53 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 0.937571 +- 3.219782E-02 (3.43 %)



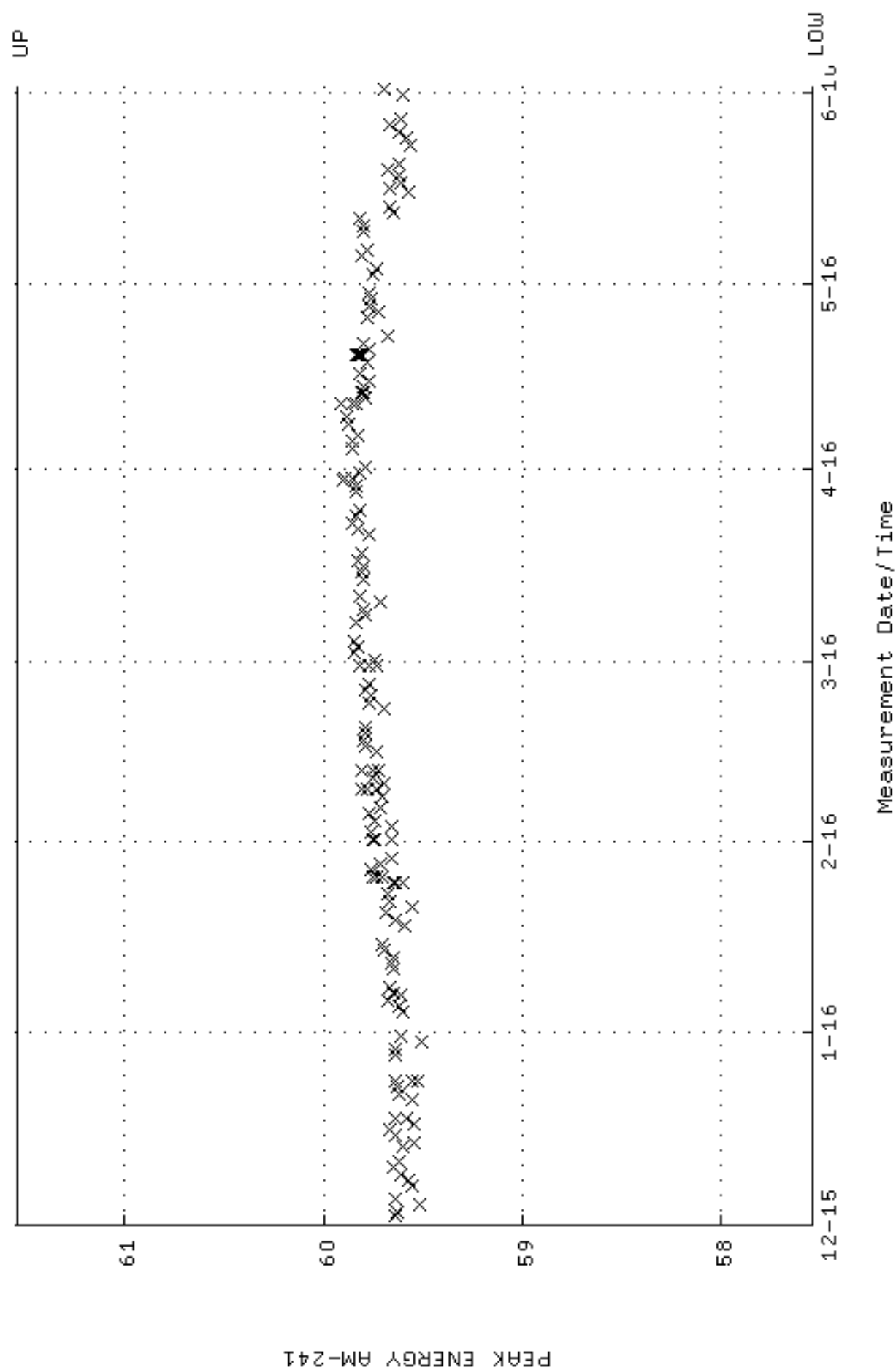
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM31-CAN.QAF;1
 Parameter Name : NLACTVY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 09:02:53 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 62628.2 +- 1256.53 (2.01 %)



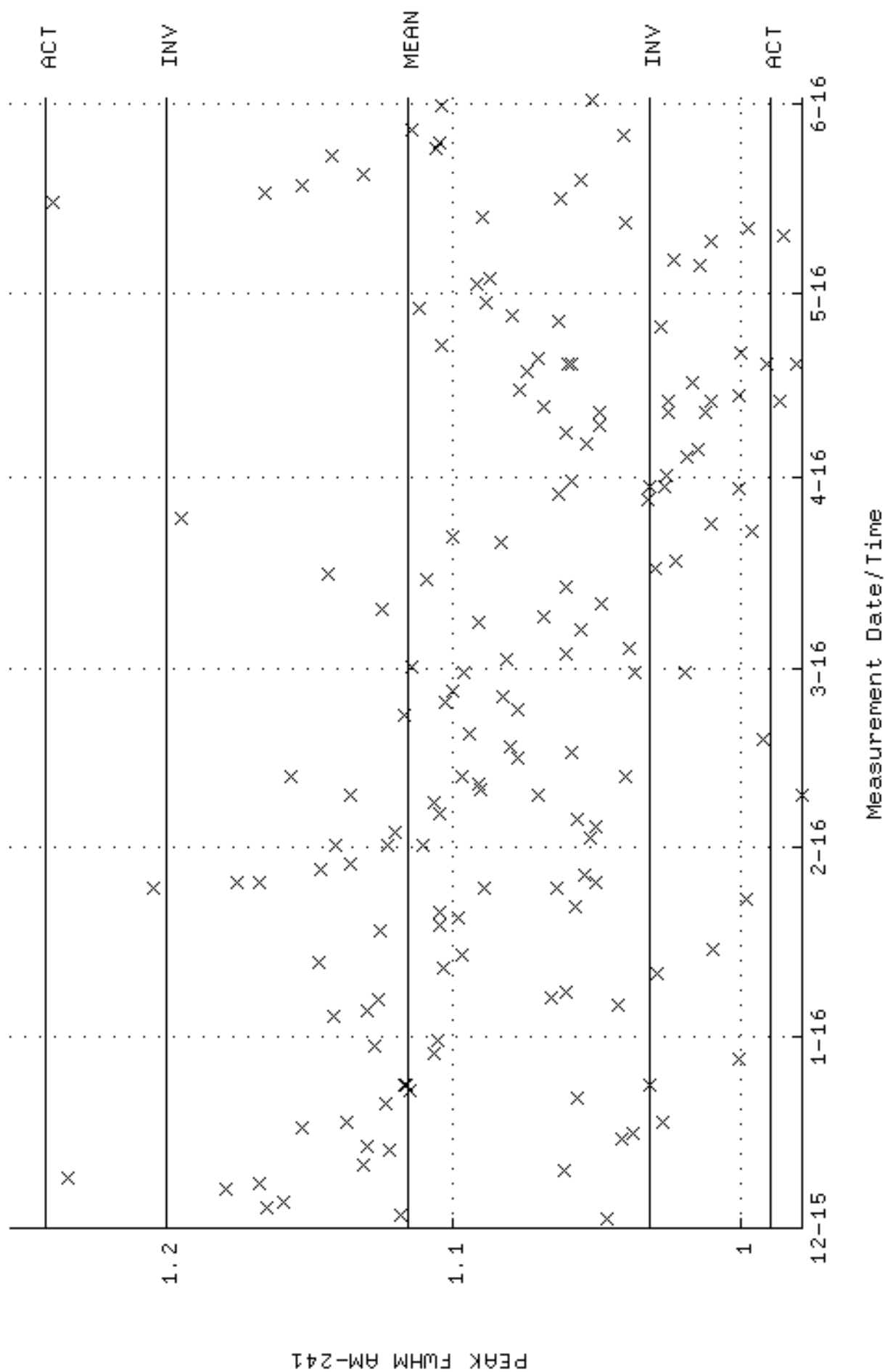
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM31.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 6-DEC-2015 13:49:50 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.98998 +- 1.794291E-02 (0.90 %)



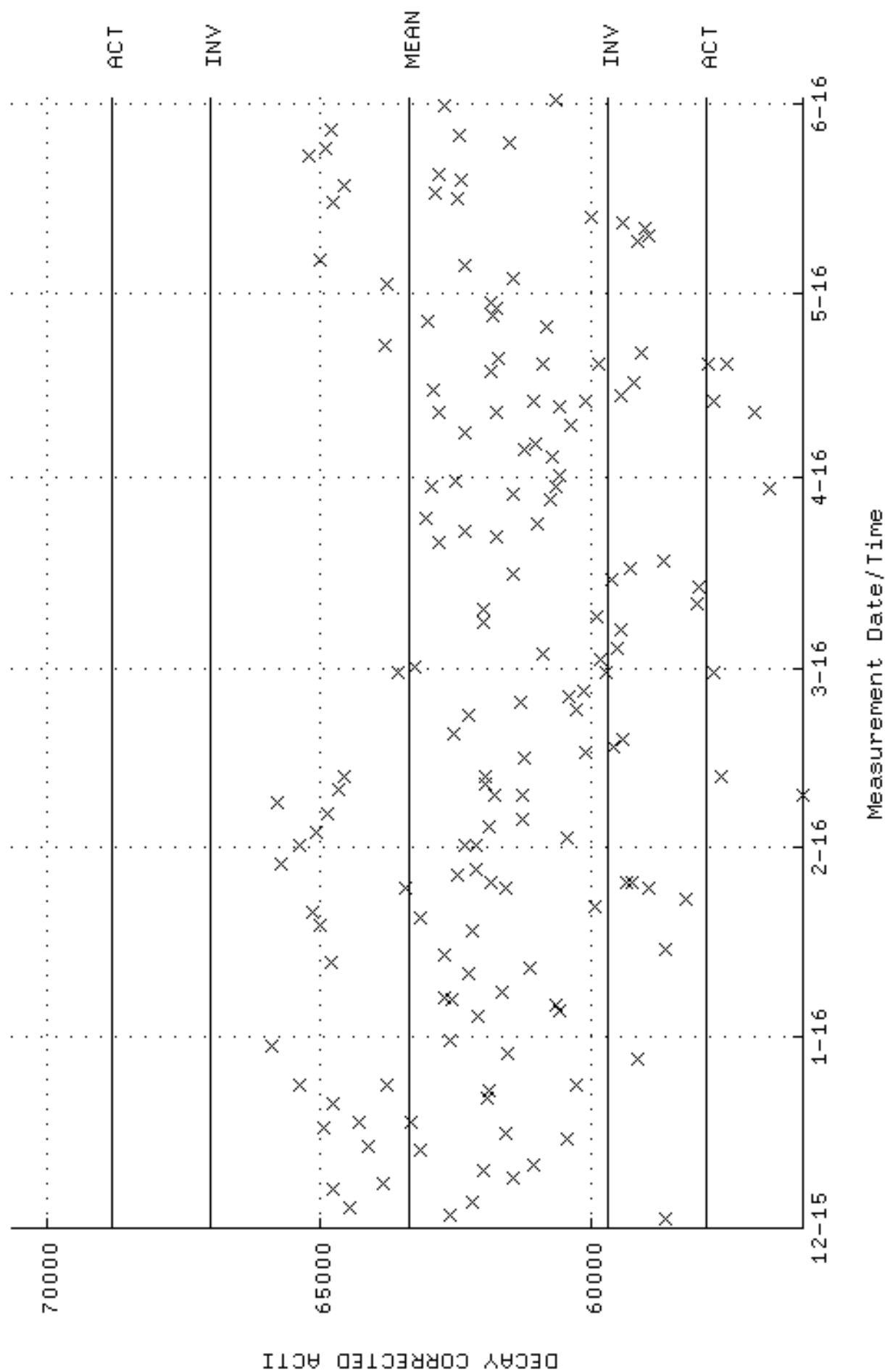
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM32_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:44:20 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



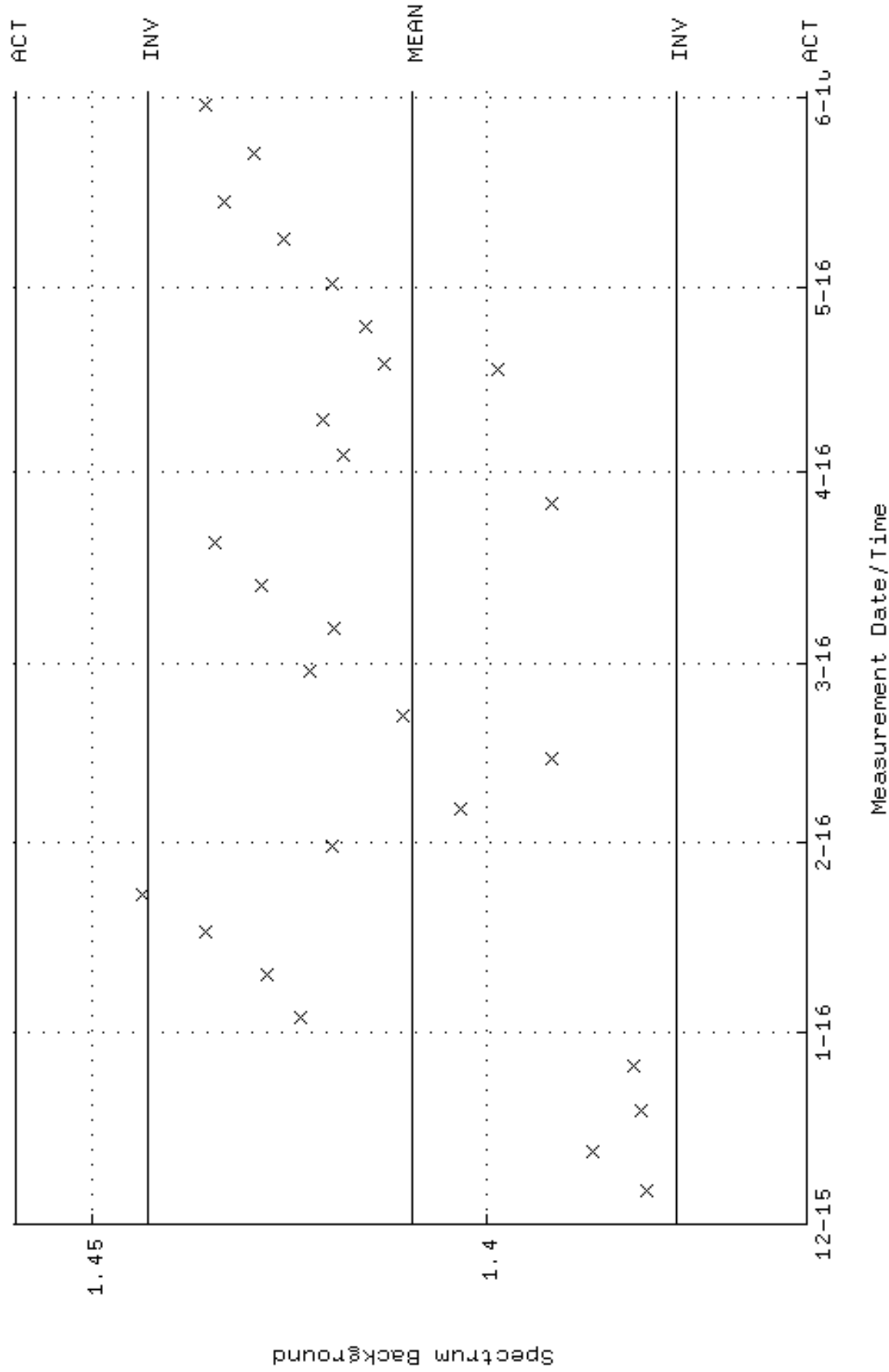
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM32_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 2-DEC-2015 08:44:20 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.11609 +- 4.210256E-02 (3.77 %)



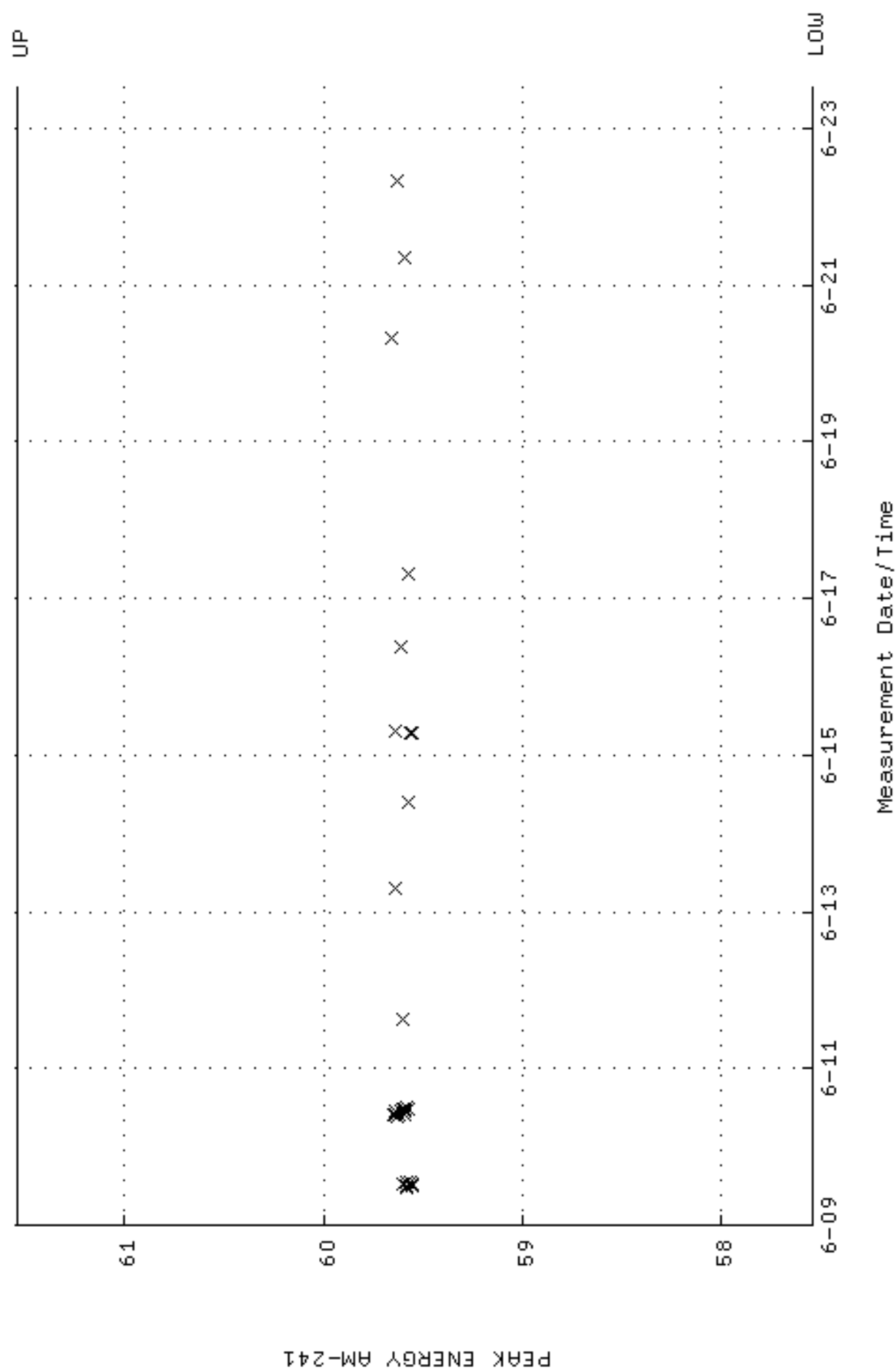
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM32_CAN.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:44:20 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 63365.2 +- 1822.91 (2.88 %)



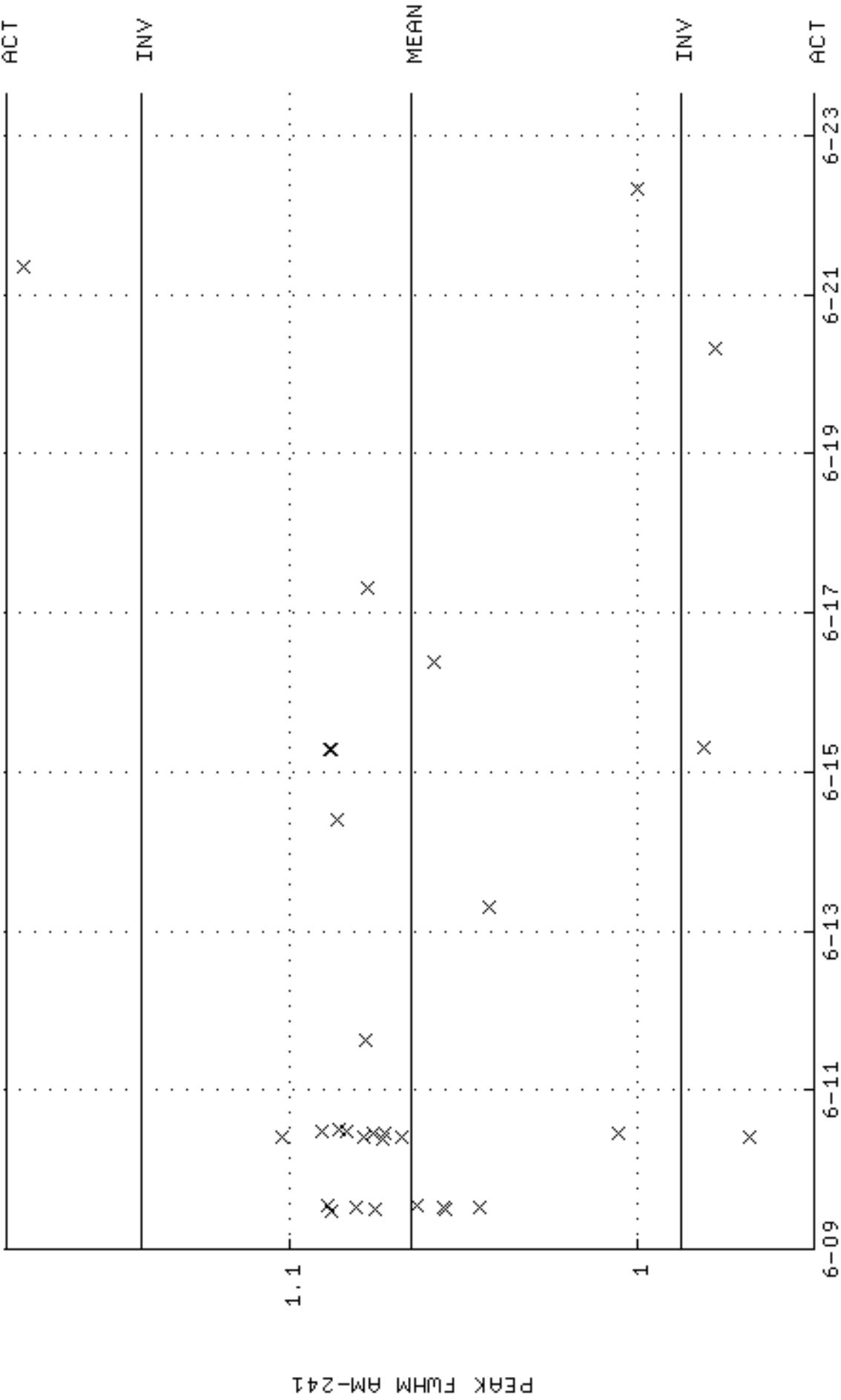
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM32.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:49:55 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.40960 +- 1.667514E-02 (1.18 %)



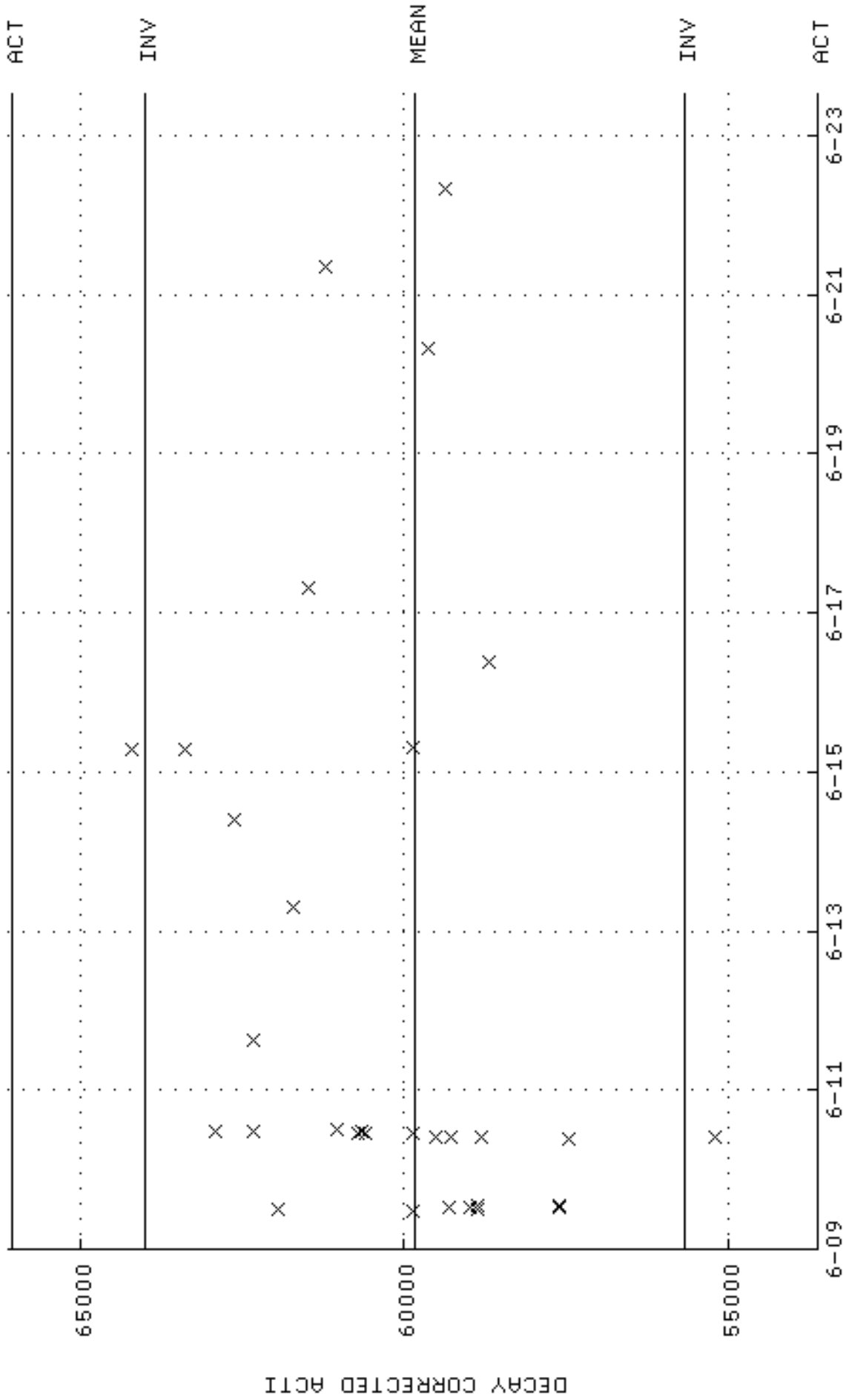
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM33_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 9-JUN-2016 11:42:11 through 23-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM33_CAN.QAF;1
 Parameter Name : PSFWM-59 (PEAK FWHM AM-241)
 Start/End Dates : 9-JUN-2016 11:42:11 through 23-JUN-2016 12:00:00
 Mean +- Std Dev : 1.06532 +- 3.869417E-02 (3.63 %)

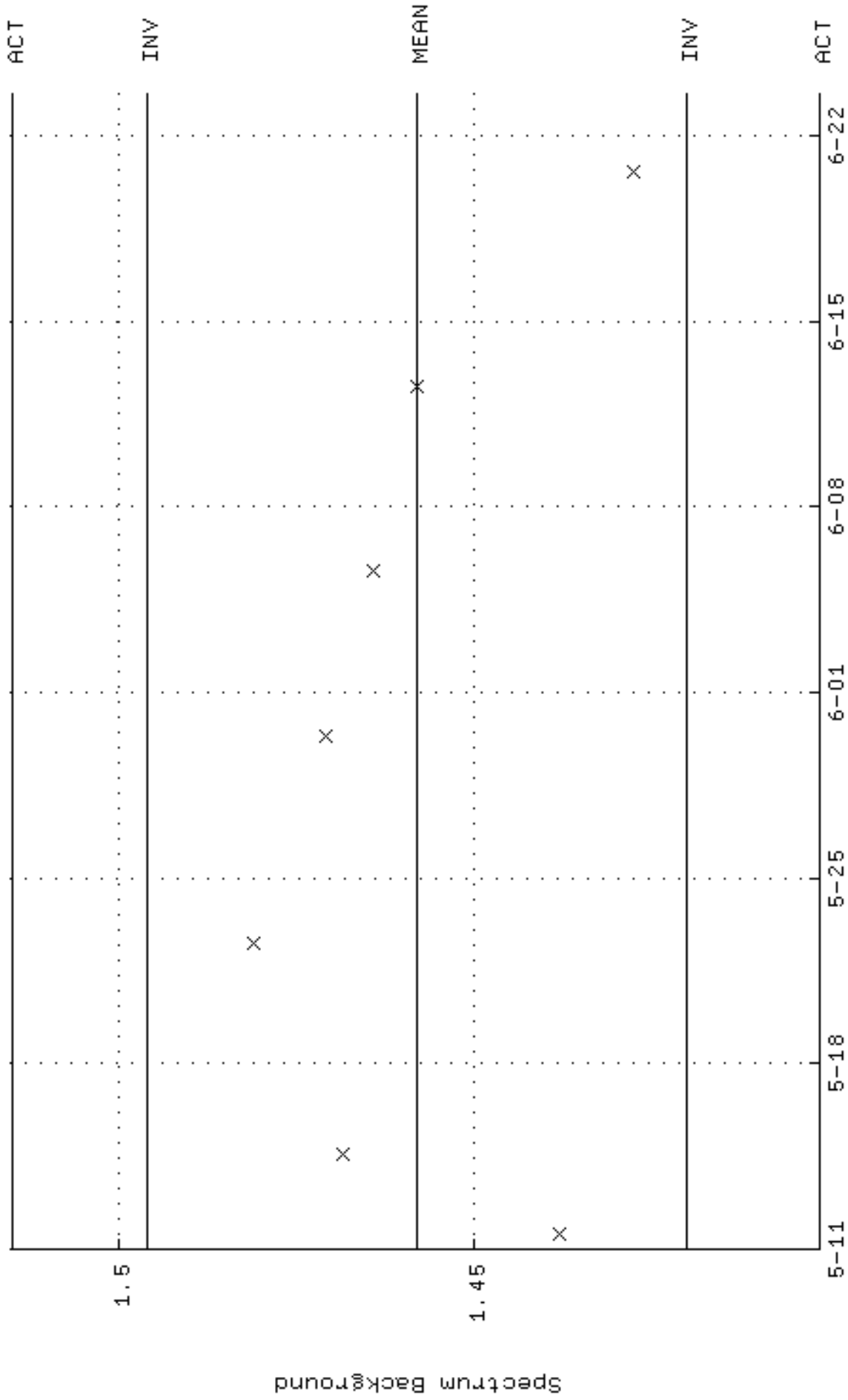


QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM33_CAN.QAF;1
Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
Start/End Dates : 9-JUN-2016 11:42:11 through 23-JUN-2016 12:00:00
Mean +- Std Dev : 59853.3 +- 2075.03 (3.47 %)

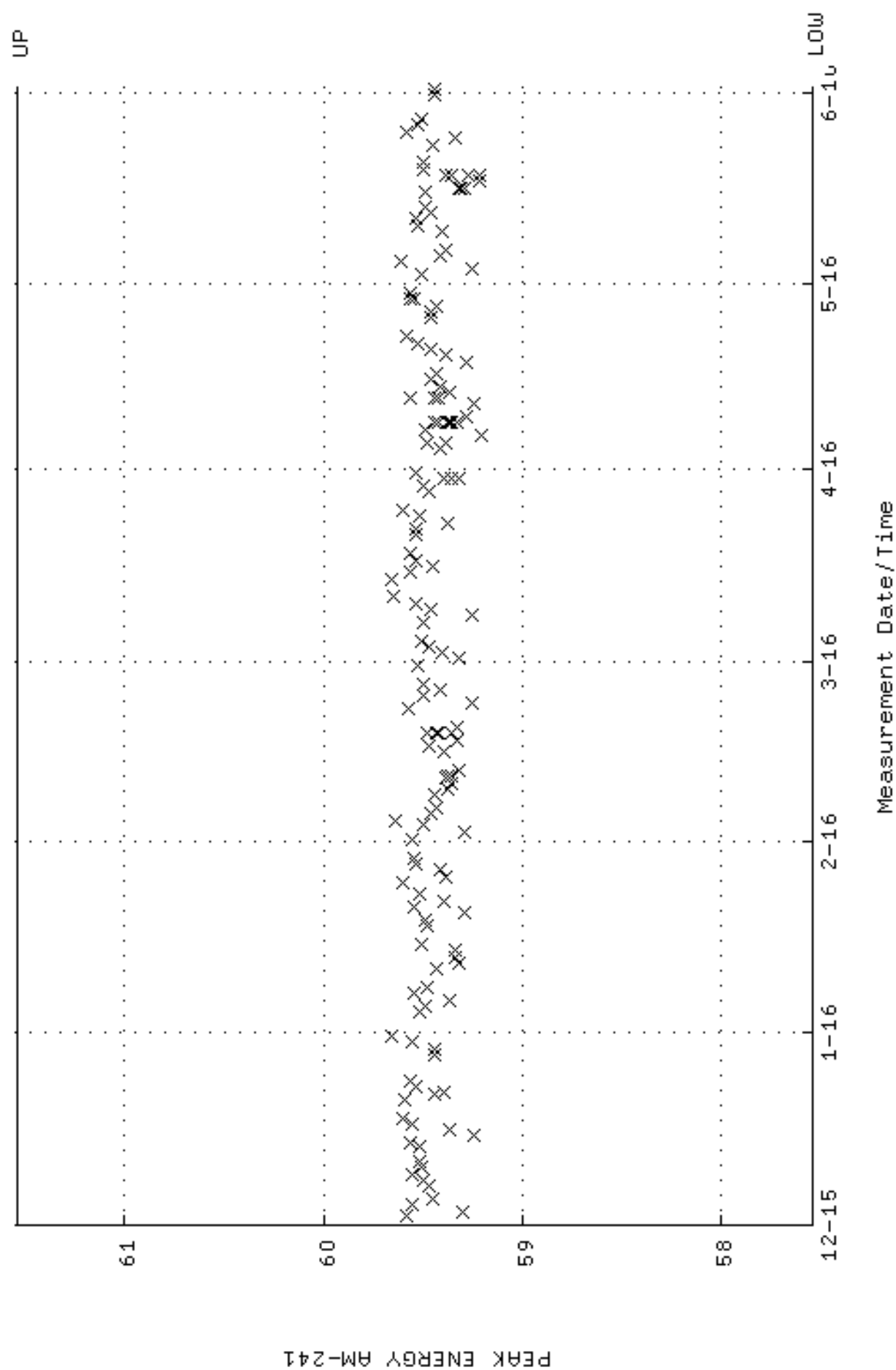


Measurement Date/Time

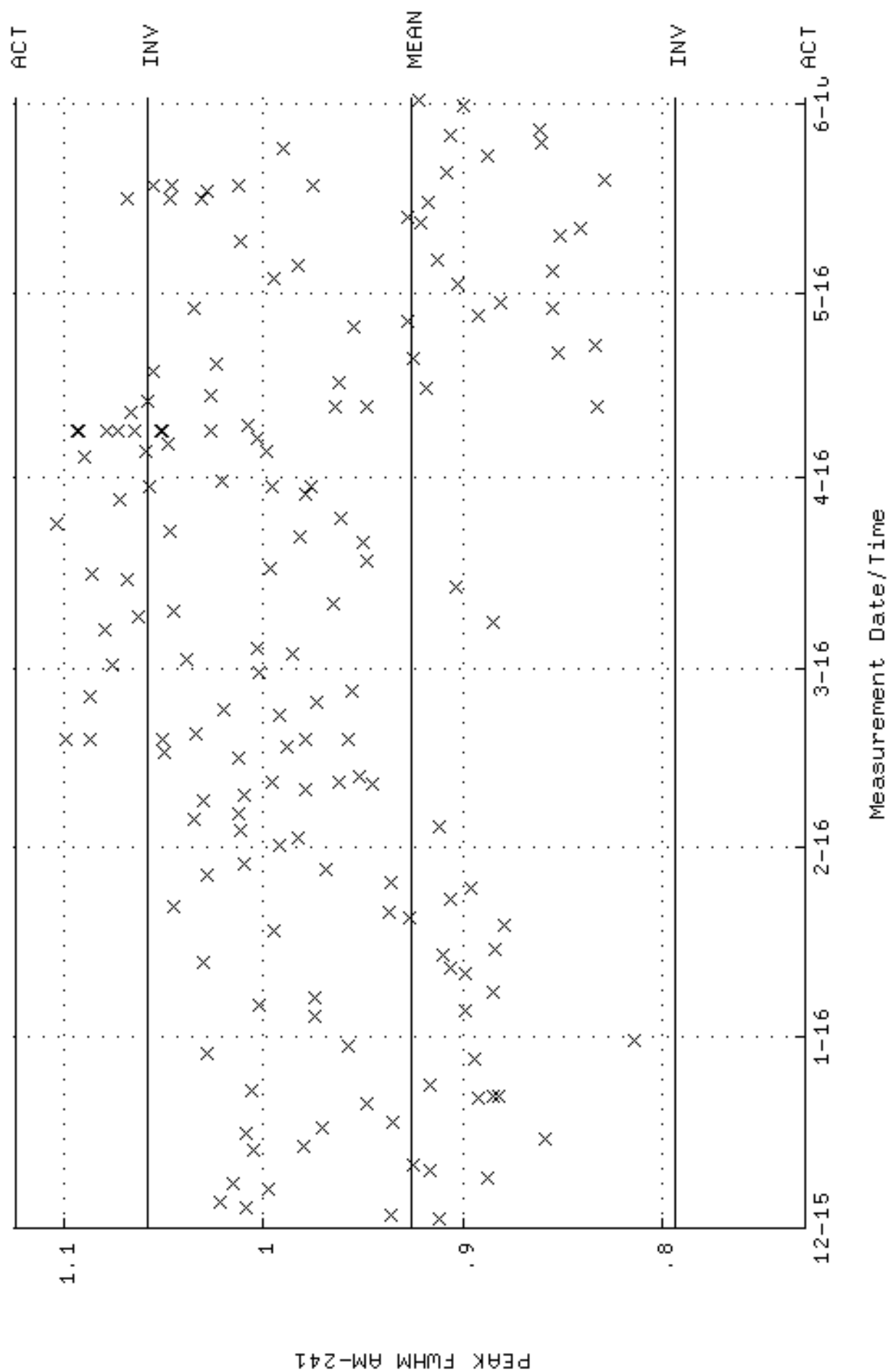
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM33.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 11-MAY-2016 13:17:48 through 23-JUN-2016 12:00:00
Mean +- Std Dev : 1.45809 +- 1.896396E-02 (1.30 %)



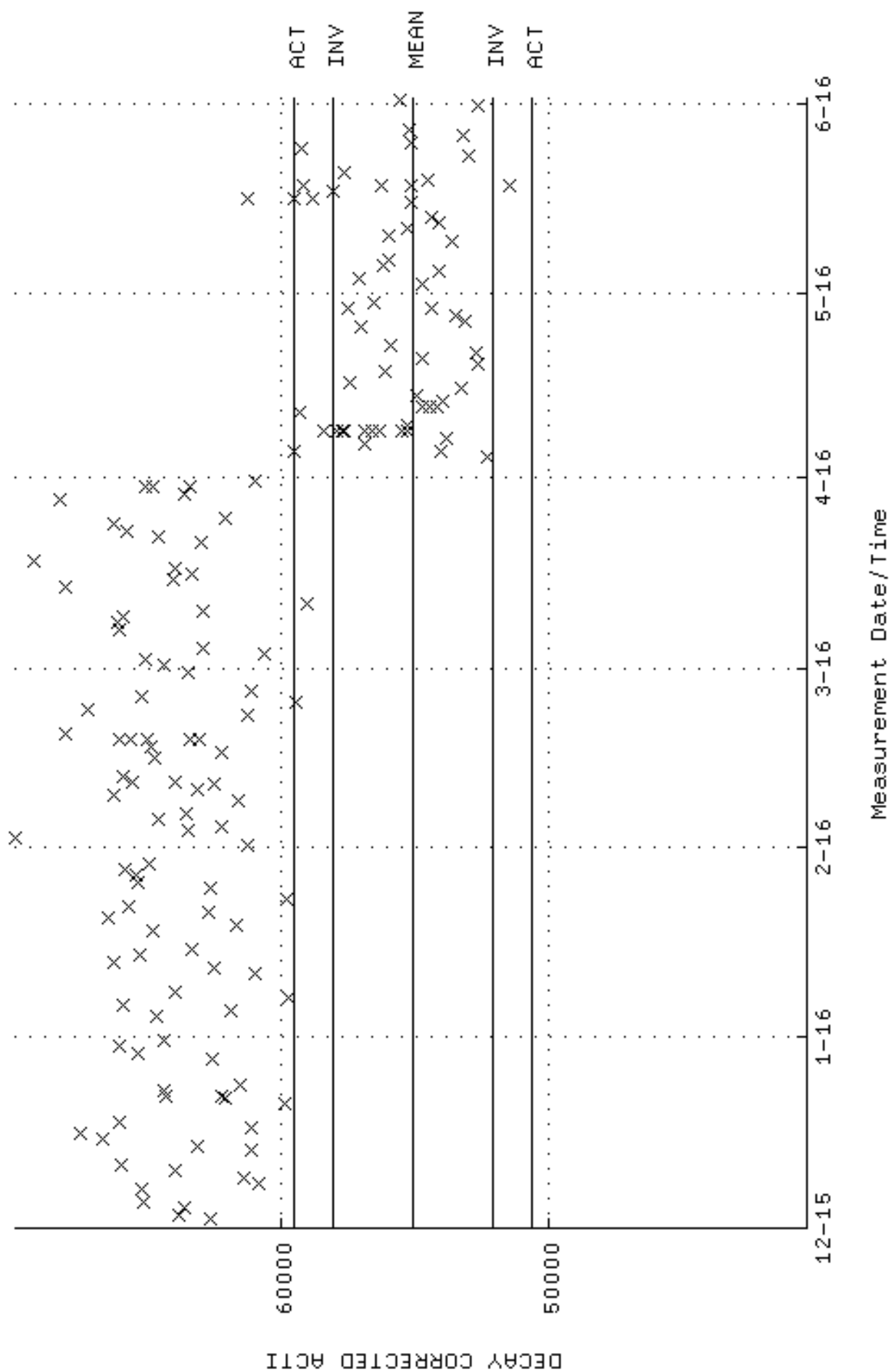
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM43_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 2-DEC-2015 08:56:44 through 1-JUN-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



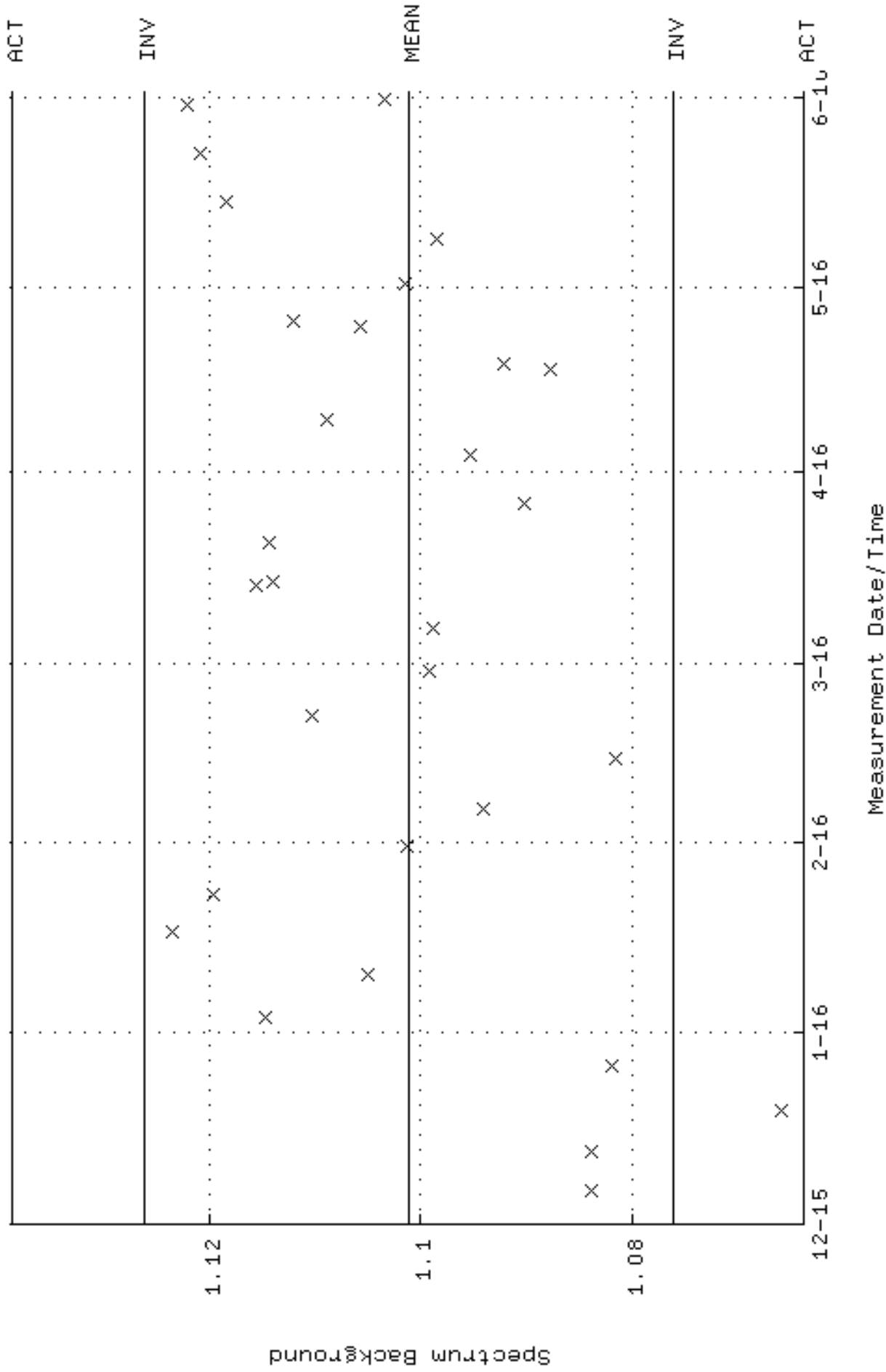
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM43_JAR.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:56:44 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 0.926214 +- 6.594121E-02 (7.12 %)



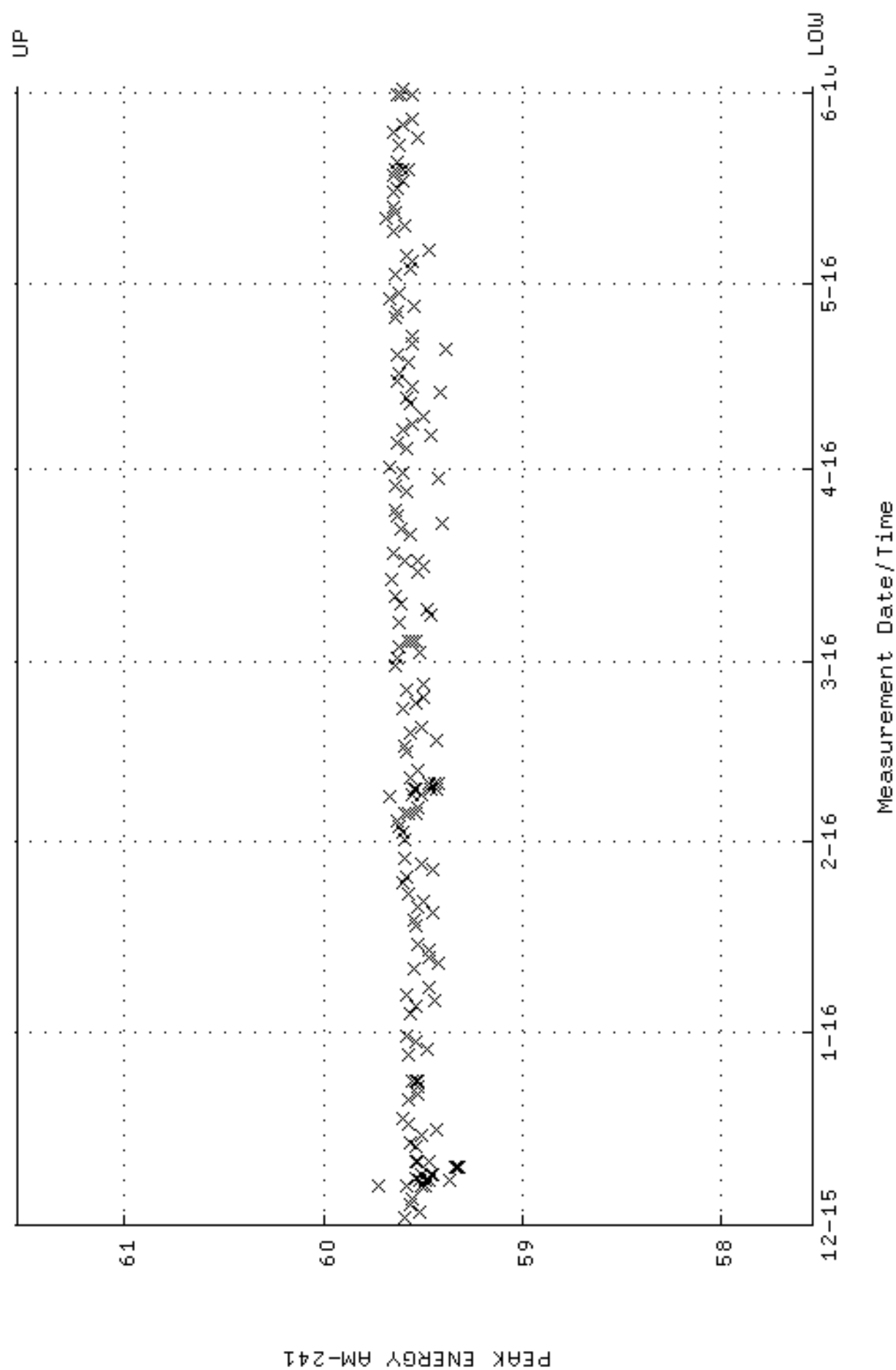
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM43_JAR.QAF;1
 Parameter Name : NLACTVY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:56:44 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 55119.1 +- 1484.18 (2.69 %)



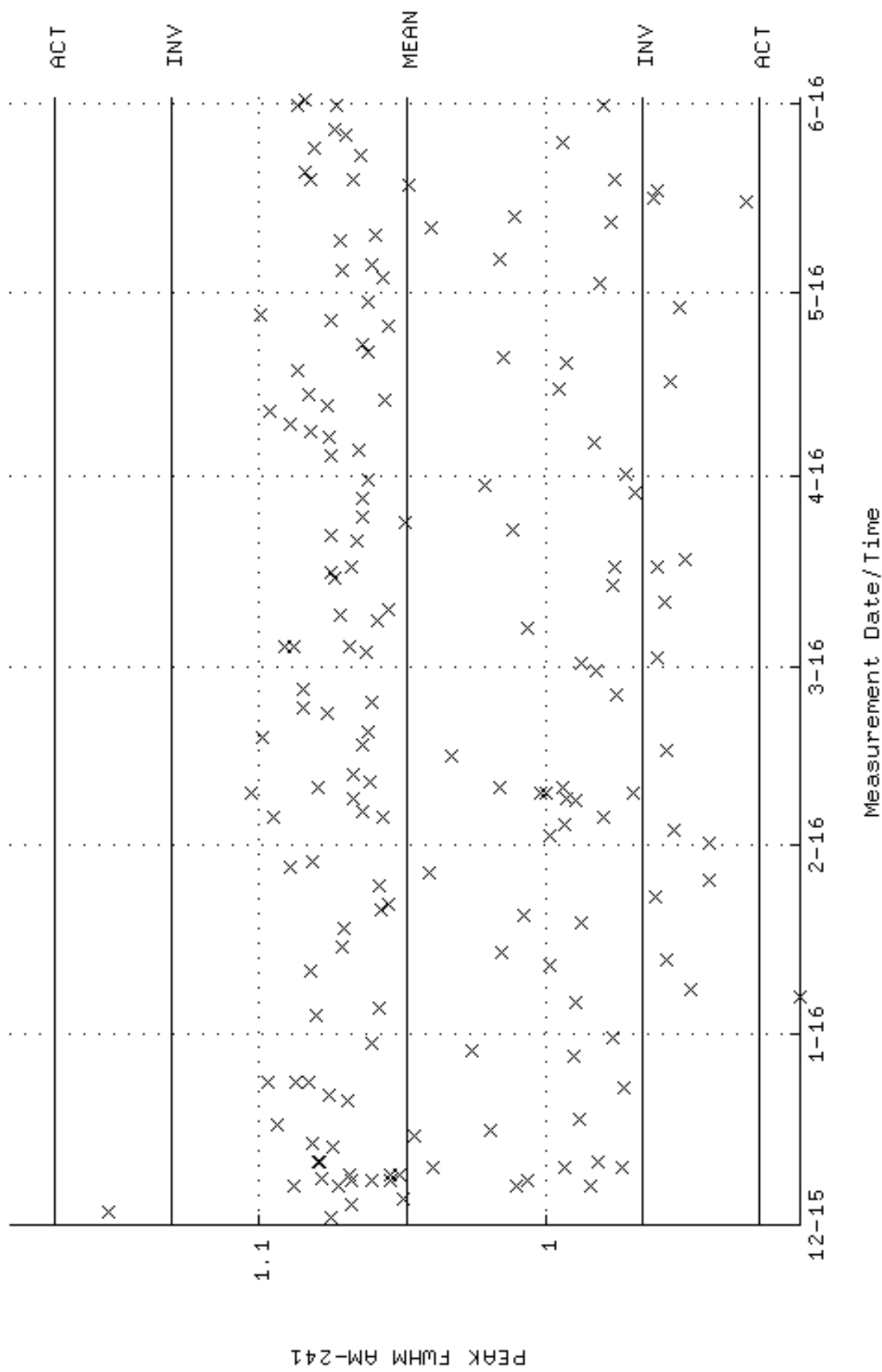
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM43.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 6-DEC-2015 13:50:17 through 1-JUN-2016 12:00:00
Mean +- Std Dev : 1.10118 +- 1.247801E-02 (1.13 %)



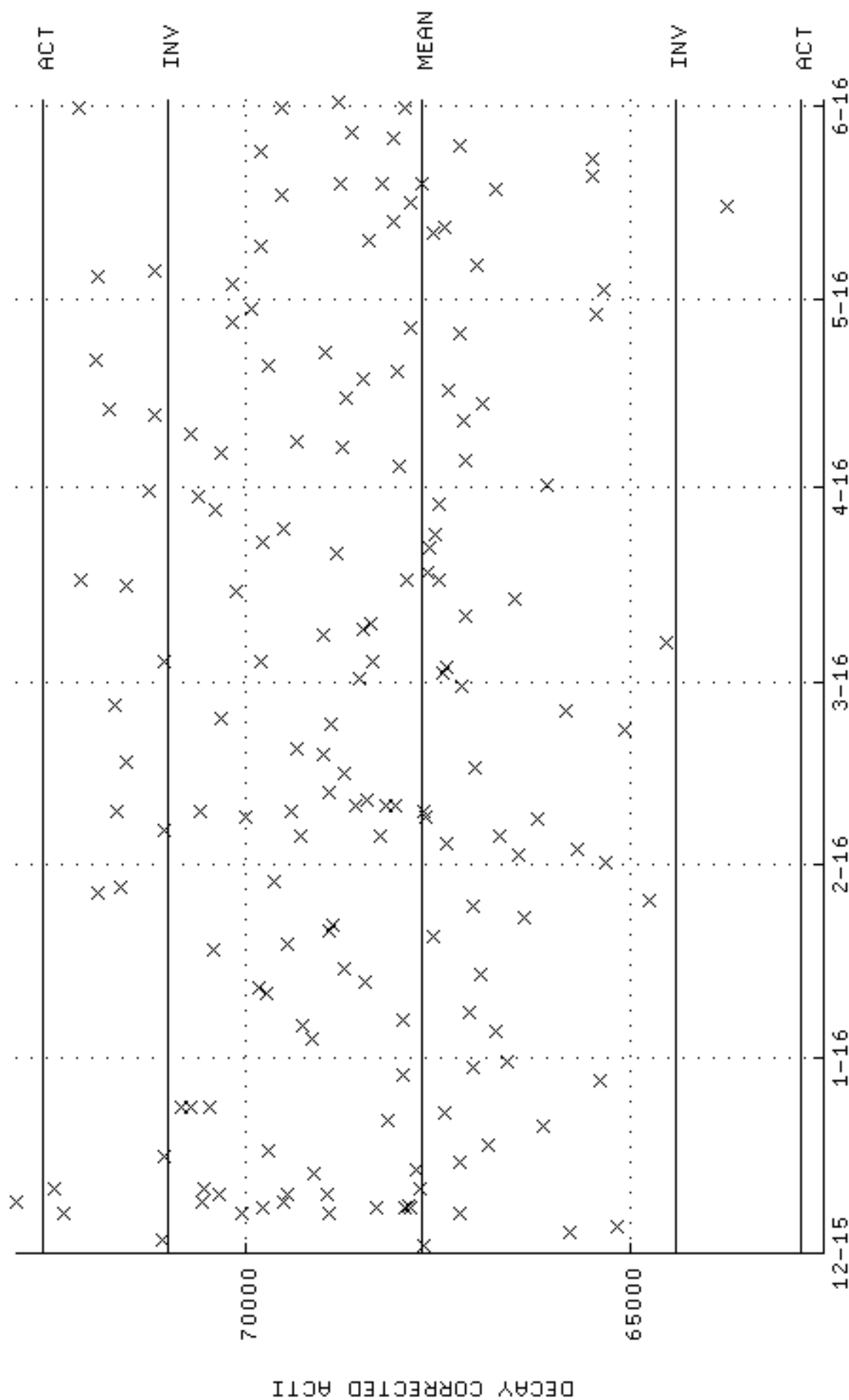
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM44_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 2-DEC-2015 08:29:13 through 1-JUN-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



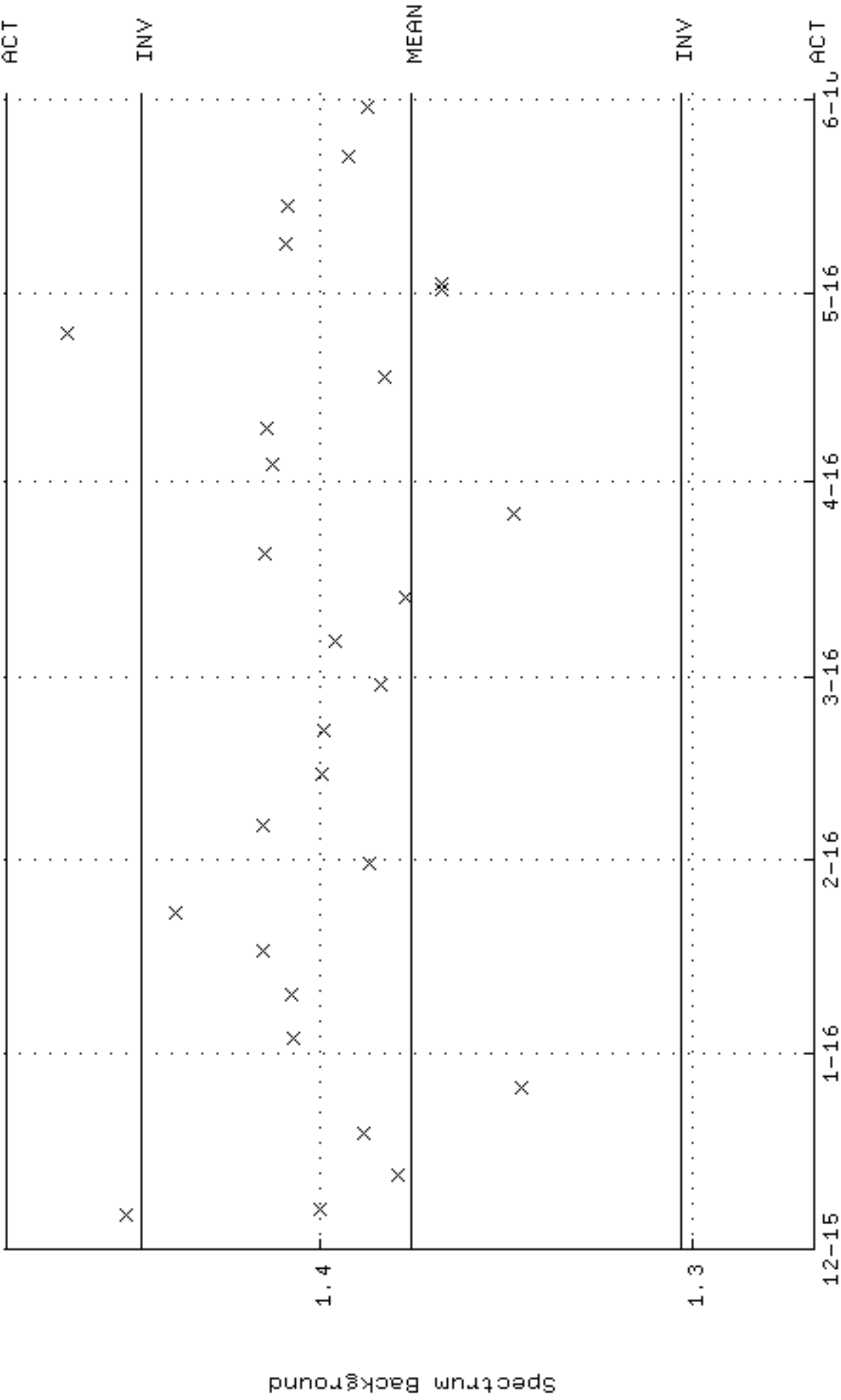
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM44_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 2-DEC-2015 08:29:13 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.04869 +- 4.075399E-02 (3.89 %)



QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM44_CAN.QAF;1
 Parameter Name : NLACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 2-DEC-2015 08:29:13 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 67718.2 +- 1644.35 (2.43 %)



QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM44.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 6-DEC-2015 13:50:22 through 1-JUN-2016 12:00:00
 Mean +- Std Dev : 1.37573 +- 3.601018E-02 (2.62 %)



Quality Control Charts

Data used for Gamma Spec Liquids 30-JUN-2016

Americium-241 BLANK: Limits LCL = -1297 UCL = 1140

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570587	1203557131	27-MAY-2016 15:50	DONE	8.2	0.21	pCi/L	-76	-1300	-890	737	1140	407
1567987	1203550447	27-MAY-2016 15:53	DONE	-19	0.14	pCi/L	-76	-1300	-890	737	1140	407
1568666	1203552275	31-MAY-2016 08:06	DONE	-3.1	0.18	pCi/L	-76	-1300	-890	737	1140	407
1568667	1203552278	31-MAY-2016 09:13	DONE	3.16	0.2	pCi/L	-76	-1300	-890	737	1140	407
1570609	1203557202	01-JUN-2016 09:29	DONE	-1.1	0.18	pCi/L	-76	-1300	-890	737	1140	407
1570974	1203558129	02-JUN-2016 11:01	DONE	14.8	0.22	pCi/L	-76	-1300	-890	737	1140	407
1570987	1203558176	02-JUN-2016 11:17	DONE	-4.2	0.18	pCi/L	-76	-1300	-890	737	1140	407
1570997	1203558208	02-JUN-2016 11:19	DONE	2.75	0.19	pCi/L	-76	-1300	-890	737	1140	407
1571725	1203560160	06-JUN-2016 06:55	DONE	-13	0.16	pCi/L	-76	-1300	-890	737	1140	407
1572401	1203561763	07-JUN-2016 09:06	DONE	-0.57	0.19	pCi/L	-76	-1300	-890	737	1140	407
1568982	1203553071	07-JUN-2016 09:24	DONE	1.49	0.19	pCi/L	-76	-1300	-890	737	1140	407
1572902	1203563157	07-JUN-2016 16:02	DONE	-840	-2	pCi/L	-76	-1300	-890	737	1140	407
1571641	1203559921	09-JUN-2016 08:00	DONE	-6.4	0.17	pCi/L	-76	-1300	-890	737	1140	407
1568983	1203553075	09-JUN-2016 08:01	DONE	-11	0.16	pCi/L	-76	-1300	-890	737	1140	407
1571640	1203559918	09-JUN-2016 09:30	DONE	0.67	0.19	pCi/L	-76	-1300	-890	737	1140	407
1570439	1203556718	09-JUN-2016 09:47	DONE	-2394	-6	pCi/L	-76	-1300	-890	737	1140	407
1570966	1203558112	09-JUN-2016 15:25	DONE	3.4	0.2	pCi/L	-76	-1300	-890	737	1140	407
1570612	1203557221	10-JUN-2016 09:04	DONE	7.7	0.21	pCi/L	-76	-1300	-890	737	1140	407
1569450	1203554207	10-JUN-2016 09:48	DONE	1.39	0.19	pCi/L	-76	-1300	-890	737	1140	407
1570963	1203558104	10-JUN-2016 13:39	DONE	20.8	0.24	pCi/L	-76	-1300	-890	737	1140	407
1572736	1203562679	10-JUN-2016 16:05	DONE	-0.044	0.19	pCi/L	-76	-1300	-890	737	1140	407
1573846	1203565616	11-JUN-2016 17:36	DONE	-8	0.17	pCi/L	-76	-1300	-890	737	1140	407
1573091	1203563751	13-JUN-2016 08:00	DONE	13.6	0.22	pCi/L	-76	-1300	-890	737	1140	407
1572113	1203561112	13-JUN-2016 08:05	DONE	-4.8	0.18	pCi/L	-76	-1300	-890	737	1140	407
1569952	1203555472	13-JUN-2016 15:43	DONE	-6.1	0.17	pCi/L	-76	-1300	-890	737	1140	407
1570977	1203558135	13-JUN-2016 15:45	DONE	13.4	0.22	pCi/L	-76	-1300	-890	737	1140	407
1569453	1203554213	13-JUN-2016 15:50	DONE	-8.1	0.17	pCi/L	-76	-1300	-890	737	1140	407
1572169	1203561234	15-JUN-2016 06:47	DONE	3.36	0.2	pCi/L	-76	-1300	-890	737	1140	407
1570611	1203557212	15-JUN-2016 08:51	DONE	2.03	0.19	pCi/L	-76	-1300	-890	737	1140	407
1573423	1203564603	16-JUN-2016 12:25	DONE	-1.7	0.18	pCi/L	-76	-1300	-890	737	1140	407
1573769	1203565423	20-JUN-2016 07:23	DONE	270	0.85	pCi/L	-76	-1300	-890	737	1140	407
1572168	1203561231	20-JUN-2016 08:19	DONE	-15	0.15	pCi/L	-76	-1300	-890	737	1140	407
1575174	1203569164	20-JUN-2016 08:20	DONE	-10	0.16	pCi/L	-76	-1300	-890	737	1140	407
1575356	1203569601	20-JUN-2016 08:20	DONE	-3.3	0.18	pCi/L	-76	-1300	-890	737	1140	407
1572167	1203561227	20-JUN-2016 08:30	DONE	-3.3	0.18	pCi/L	-76	-1300	-890	737	1140	407
1572404	1203561772	20-JUN-2016 11:40	DONE	12	0.22	pCi/L	-76	-1300	-890	737	1140	407
1568993	1203553093	21-JUN-2016 10:29	DONE	3.09	0.2	pCi/L	-76	-1300	-890	737	1140	407
1575822	1203570721	22-JUN-2016 09:11	DONE	-2.4	0.18	pCi/L	-76	-1300	-890	737	1140	407
1572406	1203561781	22-JUN-2016 11:21	DONE	0.72	0.19	pCi/L	-76	-1300	-890	737	1140	407

Americium-241 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570600	1203557171	27-MAY-2016 15:53	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1568666	1203552276	27-MAY-2016 15:56	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1568665	1203552273	31-MAY-2016 08:06	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570609	1203557203	01-JUN-2016 09:30	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570974	1203558130	02-JUN-2016 12:01	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570997	1203558209	02-JUN-2016 13:21	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572401	1203561764	07-JUN-2016 09:06	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572902	1203563158	08-JUN-2016 08:38	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1571641	1203559922	09-JUN-2016 08:00	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1568983	1203553076	09-JUN-2016 08:05	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1571640	1203559919	09-JUN-2016 09:30	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570966	1203558113	09-JUN-2016 15:26	DONE	22.3	6.1	percent	0.57	0	-6.6	7.73	20.0	3.58
1569450	1203554208	10-JUN-2016 09:48	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570963	1203558105	11-JUN-2016 15:28	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1573846	1203565617	13-JUN-2016 10:56	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572113	1203561113	13-JUN-2016 11:29	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1569453	1203554214	14-JUN-2016 09:28	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1569952	1203555473	14-JUN-2016 10:33	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570977	1203558136	14-JUN-2016 15:56	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1573423	1203564604	16-JUN-2016 12:25	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1573769	1203565424	20-JUN-2016 08:12	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1575356	1203569602	20-JUN-2016 11:09	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572168	1203569678	20-JUN-2016 11:09	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1572404	1203561773	20-JUN-2016 11:40	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1568993	1203553094	22-JUN-2016 07:40	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58
1575822	1203570722	22-JUN-2016 12:00	DONE	0	-0.16	percent	0.57	0	-6.6	7.73	20.0	3.58

Americium-241 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570609	1203557204	01-JUN-2016 09:30	DONE	103	0.33	percent	100	75.0	83.3	117	125	8.33
1570987	1203558178	02-JUN-2016 10:07	DONE	95.5	-0.54	percent	100	75.0	83.3	117	125	8.33
1570974	1203558131	02-JUN-2016 11:12	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
1570997	1203558210	02-JUN-2016 11:39	DONE	106	0.75	percent	100	75.0	83.3	117	125	8.33
1571725	1203560162	06-JUN-2016 06:56	DONE	106	0.76	percent	100	75.0	83.3	117	125	8.33
1571725	1203560161	06-JUN-2016 07:29	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
1572401	1203561765	07-JUN-2016 07:25	DONE	113	1.6	percent	100	75.0	83.3	117	125	8.33
1568982	1203553074	07-JUN-2016 09:20	DONE	116	2	percent	100	75.0	83.3	117	125	8.33
1572902	1203563159	07-JUN-2016 18:37	DONE	104	0.49	percent	100	75.0	83.3	117	125	8.33
1570966	1203558114	08-JUN-2016 14:42	DONE	109	1	percent	100	75.0	83.3	117	125	8.33
1568983	1203553077	09-JUN-2016 08:21	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1571641	1203559923	09-JUN-2016 08:43	DONE	112	1.5	percent	100	75.0	83.3	117	125	8.33
1571640	1203559920	09-JUN-2016 11:06	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1570439	1203556719	09-JUN-2016 12:01	DONE	108	0.91	percent	100	75.0	83.3	117	125	8.33
1570612	1203557222	10-JUN-2016 09:04	DONE	98.3	-0.2	percent	100	75.0	83.3	117	125	8.33
1569450	1203554209	10-JUN-2016 09:49	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
1570612	1203557223	10-JUN-2016 10:55	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
1570963	1203558106	11-JUN-2016 14:58	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
1572736	1203562681	11-JUN-2016 17:49	DONE	102	0.29	percent	100	75.0	83.3	117	125	8.33
1573846	1203565618	13-JUN-2016 06:30	DONE	99.7	-0.04	percent	100	75.0	83.3	117	125	8.33
1573091	1203563752	13-JUN-2016 08:01	DONE	107	0.83	percent	100	75.0	83.3	117	125	8.33
1573091	1203563753	13-JUN-2016 08:24	DONE	102	0.29	percent	100	75.0	83.3	117	125	8.33
1572113	1203561114	13-JUN-2016 09:04	DONE	99.4	-0.07	percent	100	75.0	83.3	117	125	8.33
1569453	1203554215	14-JUN-2016 09:28	DONE	104	0.53	percent	100	75.0	83.3	117	125	8.33
1569952	1203555474	14-JUN-2016 10:40	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
1570977	1203558137	15-JUN-2016 06:16	DONE	108	1	percent	100	75.0	83.3	117	125	8.33
1572169	1203561236	15-JUN-2016 07:06	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
1570611	1203557214	15-JUN-2016 10:28	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
1573423	1203564605	16-JUN-2016 09:51	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
1573769	1203565425	20-JUN-2016 07:23	DONE	103	0.3	percent	100	75.0	83.3	117	125	8.33
1575174	1203569166	20-JUN-2016 11:08	DONE	106	0.7	percent	100	75.0	83.3	117	125	8.33
1572168	1203561232	20-JUN-2016 11:10	DONE	104	0.44	percent	100	75.0	83.3	117	125	8.33
1575356	1203569603	20-JUN-2016 11:33	DONE	107	0.82	percent	100	75.0	83.3	117	125	8.33
1572167	1203561230	20-JUN-2016 11:33	DONE	96.9	-0.37	percent	100	75.0	83.3	117	125	8.33
1572404	1203561774	20-JUN-2016 13:32	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
1568993	1203553095	22-JUN-2016 07:40	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
1575822	1203570723	22-JUN-2016 11:59	DONE	107	0.89	percent	100	75.0	83.3	117	125	8.33
1572406	1203561782	22-JUN-2016 13:48	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
1572406	1203561783	22-JUN-2016 14:06	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33

Americium-241 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1548402	1203499133	01-MAR-2016 06:52	DONE	4.64	-0.59	percent	8.09	0	-3.5	19.7	20.0	5.8
1550712	1203504308	09-MAR-2016 06:46	DONE	4.75	-0.57	percent	8.09	0	-3.5	19.7	20.0	5.8
1551384	1203505976	11-MAR-2016 12:45	DONE	6.02	-0.36	percent	8.09	0	-3.5	19.7	20.0	5.8
1551569	1203506493	15-MAR-2016 06:40	DONE	20.6	2.2	percent	8.09	0	-3.5	19.7	20.0	5.8
1552300	1203508376	15-MAR-2016 12:12	DONE	6.69	-0.24	percent	8.09	0	-3.5	19.7	20.0	5.8
1552689	1203510454	17-MAR-2016 09:26	DONE	2.72	-0.93	percent	8.09	0	-3.5	19.7	20.0	5.8
1553748	1203512186	24-MAR-2016 07:39	DONE	14.9	1.2	percent	8.09	0	-3.5	19.7	20.0	5.8
1556978	1203520767	11-APR-2016 12:31	DONE	3.36	-0.81	percent	8.09	0	-3.5	19.7	20.0	5.8
1562911	1203536738	28-APR-2016 07:11	DONE	2.14	-1	percent	8.09	0	-3.5	19.7	20.0	5.8
1561431	1203532709	28-APR-2016 15:34	DONE	10.3	0.38	percent	8.09	0	-3.5	19.7	20.0	5.8
1559555	1203527633	06-MAY-2016 06:59	DONE	3.18	-0.85	percent	8.09	0	-3.5	19.7	20.0	5.8
1571725	1203560162	06-JUN-2016 06:56	DONE	8.43	0.06	percent	8.09	0	-3.5	19.7	20.0	5.8
1570612	1203557223	10-JUN-2016 10:55	DONE	18	1.7	percent	8.09	0	-3.5	19.7	20.0	5.8
1573091	1203563753	13-JUN-2016 08:24	DONE	4.25	-0.66	percent	8.09	0	-3.5	19.7	20.0	5.8
1572406	1203561783	22-JUN-2016 14:06	DONE	11.4	0.57	percent	8.09	0	-3.5	19.7	20.0	5.8

Americium-241 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DONE	0.11	-1	dec	0.79	0	-0.184	1.75	3.00	0.48
1570600	1203557171	27-MAY-2016 15:53	DONE	1.2	0.85	dec	0.79	0	-0.184	1.75	3.00	0.48
1568666	1203552276	27-MAY-2016 15:56	DONE	0.29	-1	dec	0.79	0	-0.184	1.75	3.00	0.48
1567987	1203550448	31-MAY-2016 08:05	DONE	1.29	1	dec	0.79	0	-0.184	1.75	3.00	0.48
1568665	1203552273	31-MAY-2016 08:06	DONE	0.11	-1	dec	0.79	0	-0.184	1.75	3.00	0.48
1570609	1203557203	01-JUN-2016 09:30	DONE	1.07	0.58	dec	0.79	0	-0.184	1.75	3.00	0.48
1568667	1203552279	02-JUN-2016 11:22	DONE	1.77	2	dec	0.79	0	-0.184	1.75	3.00	0.48
1570974	1203558130	02-JUN-2016 12:01	DONE	1.44	1.3	dec	0.79	0	-0.184	1.75	3.00	0.48
1570997	1203558209	02-JUN-2016 13:21	DONE	1.15	0.76	dec	0.79	0	-0.184	1.75	3.00	0.48
1570987	1203558177	02-JUN-2016 13:25	DONE	1.59	1.7	dec	0.79	0	-0.184	1.75	3.00	0.48
1572401	1203561764	07-JUN-2016 09:06	DONE	0.43	-0.73	dec	0.79	0	-0.184	1.75	3.00	0.48
1568982	1203553072	07-JUN-2016 09:24	DONE	0.45	-0.68	dec	0.79	0	-0.184	1.75	3.00	0.48
1568982	1203553073	07-JUN-2016 09:25	DONE	0.47	-0.66	dec	0.79	0	-0.184	1.75	3.00	0.48
1572902	1203563158	08-JUN-2016 08:38	DONE	0.17	-1	dec	0.79	0	-0.184	1.75	3.00	0.48
1570439	1203556720	09-JUN-2016 07:37	DONE	0.32	-0.96	dec	0.79	0	-0.184	1.75	3.00	0.48
1571641	1203559922	09-JUN-2016 08:00	DONE	1.2	0.85	dec	0.79	0	-0.184	1.75	3.00	0.48
1568983	1203553076	09-JUN-2016 08:05	DONE	0.31	-0.98	dec	0.79	0	-0.184	1.75	3.00	0.48
1571640	1203559919	09-JUN-2016 09:30	DONE	0.9	0.25	dec	0.79	0	-0.184	1.75	3.00	0.48
1570966	1203558113	09-JUN-2016 15:26	DONE	0.43	-0.74	dec	0.79	0	-0.184	1.75	3.00	0.48
1569450	1203554208	10-JUN-2016 09:48	DONE	0.82	0.06	dec	0.79	0	-0.184	1.75	3.00	0.48
1570963	1203558105	11-JUN-2016 15:28	DONE	1.86	2.2	dec	0.79	0	-0.184	1.75	3.00	0.48
1572736	1203562680	11-JUN-2016 17:31	DONE	0.16	-1	dec	0.79	0	-0.184	1.75	3.00	0.48
1573846	1203565617	13-JUN-2016 10:56	DONE	1.15	0.76	dec	0.79	0	-0.184	1.75	3.00	0.48

1572113	1203561113	13-JUN-2016 11:29	DONE	0.4	-0.79	dec	0.79	0	-0.184	1.75	3.00	0.48
1569453	1203554214	14-JUN-2016 09:28	DONE	1.28	1	dec	0.79	0	-0.184	1.75	3.00	0.48
1569952	1203555473	14-JUN-2016 10:33	DONE	0.83	0.09	dec	0.79	0	-0.184	1.75	3.00	0.48
1570977	1203558136	14-JUN-2016 15:56	DONE	0.52	-0.55	dec	0.79	0	-0.184	1.75	3.00	0.48
1572169	1203561235	15-JUN-2016 07:01	DONE	1.14	0.73	dec	0.79	0	-0.184	1.75	3.00	0.48
1570611	1203557213	15-JUN-2016 10:57	DONE	0.5	-0.59	dec	0.79	0	-0.184	1.75	3.00	0.48
1573423	1203564604	16-JUN-2016 12:25	DONE	0.31	-0.98	dec	0.79	0	-0.184	1.75	3.00	0.48
1573769	1203565424	20-JUN-2016 08:12	DONE	0.77	-0.03	dec	0.79	0	-0.184	1.75	3.00	0.48
1575174	1203569165	20-JUN-2016 11:08	DONE	0.75	-0.07	dec	0.79	0	-0.184	1.75	3.00	0.48
1575356	1203569602	20-JUN-2016 11:09	DONE	0.74	-0.08	dec	0.79	0	-0.184	1.75	3.00	0.48
1572168	1203569678	20-JUN-2016 11:09	DONE	1.07	0.59	dec	0.79	0	-0.184	1.75	3.00	0.48
1572167	1203561228	20-JUN-2016 11:21	DONE	0.55	-0.48	dec	0.79	0	-0.184	1.75	3.00	0.48
1572167	1203561229	20-JUN-2016 11:21	DONE	0.16	-1	dec	0.79	0	-0.184	1.75	3.00	0.48
1572404	1203561773	20-JUN-2016 11:40	DONE	0.44	-0.7	dec	0.79	0	-0.184	1.75	3.00	0.48
1568993	1203553094	22-JUN-2016 07:40	DONE	1.3	1.1	dec	0.79	0	-0.184	1.75	3.00	0.48
1575822	1203570722	22-JUN-2016 12:00	DONE	1.16	0.76	dec	0.79	0	-0.184	1.75	3.00	0.48

Beryllium-7 BLANK: Limits LCL = -1751 UCL = 1820

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570587	1203557131	27-MAY-2016 15:50	DUSE	1.17	-0.06	pCi/L	34.6	-1800	-1200	1230	1820	595
1567987	1203550447	27-MAY-2016 15:53	DONE	8.06	-0.04	pCi/L	34.6	-1800	-1200	1230	1820	595
1568666	1203552275	31-MAY-2016 08:06	DUSE	-5.6	-0.07	pCi/L	34.6	-1800	-1200	1230	1820	595
1568667	1203552278	31-MAY-2016 09:13	DONE	2.13	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1570609	1203557202	01-JUN-2016 09:29	DUSE	-1.9	-0.06	pCi/L	34.6	-1800	-1200	1230	1820	595
1570974	1203558129	02-JUN-2016 11:01	DUSE	2.18	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1570987	1203558176	02-JUN-2016 11:17	DONE	11.4	-0.04	pCi/L	34.6	-1800	-1200	1230	1820	595
1570997	1203558208	02-JUN-2016 11:19	DUSE	19.5	-0.03	pCi/L	34.6	-1800	-1200	1230	1820	595
1571725	1203560160	06-JUN-2016 06:55	DUSE	0.79	-0.06	pCi/L	34.6	-1800	-1200	1230	1820	595
1572401	1203561763	07-JUN-2016 09:06	DUSE	2.39	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1568982	1203553071	07-JUN-2016 09:24	DONE	-19	-0.09	pCi/L	34.6	-1800	-1200	1230	1820	595
1572902	1203563157	07-JUN-2016 16:02	DONE	3225	5.4	pCi/L	34.6	-1800	-1200	1230	1820	595
1571641	1203559921	09-JUN-2016 08:00	DUSE	-7.7	-0.07	pCi/L	34.6	-1800	-1200	1230	1820	595
1568983	1203553075	09-JUN-2016 08:01	DUSE	7.01	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1571640	1203559918	09-JUN-2016 09:30	DUSE	-41	-0.13	pCi/L	34.6	-1800	-1200	1230	1820	595
1570439	1203556718	09-JUN-2016 09:47	DONE	-1733	-3	pCi/L	34.6	-1800	-1200	1230	1820	595
1570966	1203558112	09-JUN-2016 15:25	DUSE	-7.1	-0.07	pCi/L	34.6	-1800	-1200	1230	1820	595
1570612	1203557221	10-JUN-2016 09:04	DONE	6.01	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1569450	1203554207	10-JUN-2016 09:48	DUSE	8.44	-0.04	pCi/L	34.6	-1800	-1200	1230	1820	595
1570963	1203558104	10-JUN-2016 13:39	DUSE	5.49	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1572736	1203562679	10-JUN-2016 16:05	DONE	-2.8	-0.06	pCi/L	34.6	-1800	-1200	1230	1820	595
1573846	1203565616	11-JUN-2016 17:36	DONE	1.9	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1573091	1203563751	13-JUN-2016 08:00	DUSE	6.72	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1572113	1203561112	13-JUN-2016 08:05	DUSE	-3.1	-0.06	pCi/L	34.6	-1800	-1200	1230	1820	595

1569952	1203555472	13-JUN-2016 15:43	DONE	3.19	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1570977	1203558135	13-JUN-2016 15:45	DUSE	26.3	-0.01	pCi/L	34.6	-1800	-1200	1230	1820	595
1569453	1203554213	13-JUN-2016 15:50	DUSE	12	-0.04	pCi/L	34.6	-1800	-1200	1230	1820	595
1572169	1203561234	15-JUN-2016 06:47	DUSE	20.5	-0.02	pCi/L	34.6	-1800	-1200	1230	1820	595
1570611	1203557212	15-JUN-2016 08:51	DONE	-0.88	-0.06	pCi/L	34.6	-1800	-1200	1230	1820	595
1573423	1203564603	16-JUN-2016 12:25	DUSE	-15	-0.08	pCi/L	34.6	-1800	-1200	1230	1820	595
1573769	1203565423	20-JUN-2016 07:23	DUSE	-310	-0.57	pCi/L	34.6	-1800	-1200	1230	1820	595
1572168	1203561231	20-JUN-2016 08:19	DUSE	3.35	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1575174	1203569164	20-JUN-2016 08:20	DONE	41.6	0.01	pCi/L	34.6	-1800	-1200	1230	1820	595
1575356	1203569601	20-JUN-2016 08:20	DUSE	60.3	0.04	pCi/L	34.6	-1800	-1200	1230	1820	595
1572167	1203561227	20-JUN-2016 08:30	DONE	16.5	-0.03	pCi/L	34.6	-1800	-1200	1230	1820	595
1572404	1203561772	20-JUN-2016 11:40	DUSE	-11	-0.08	pCi/L	34.6	-1800	-1200	1230	1820	595
1568993	1203553093	21-JUN-2016 10:29	DONE	3.03	-0.05	pCi/L	34.6	-1800	-1200	1230	1820	595
1575822	1203570721	22-JUN-2016 09:11	DUSE	-0.772	-0.06	pCi/L	34.6	-1800	-1200	1230	1820	595
1572406	1203561781	22-JUN-2016 11:21	DONE	13.1	-0.04	pCi/L	34.6	-1800	-1200	1230	1820	595

Beryllium-7 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0		percent	0	0	0	0	20.0	0
1570600	1203557171	27-MAY-2016 15:53	DUSE	0		percent	0	0	0	0	20.0	0
1568666	1203552276	27-MAY-2016 15:56	DUSE	0		percent	0	0	0	0	20.0	0
1567987	1203550448	31-MAY-2016 08:05	DONE	0		percent	0	0	0	0	20.0	0
1568665	1203552273	31-MAY-2016 08:06	DUSE	0		percent	0	0	0	0	20.0	0
1570609	1203557203	01-JUN-2016 09:30	DUSE	0		percent	0	0	0	0	20.0	0
1568667	1203552279	02-JUN-2016 11:22	DONE	0		percent	0	0	0	0	20.0	0
1570974	1203558130	02-JUN-2016 12:01	DUSE	0		percent	0	0	0	0	20.0	0
1570997	1203558209	02-JUN-2016 13:21	DUSE	0		percent	0	0	0	0	20.0	0
1570987	1203558177	02-JUN-2016 13:25	DONE	0		percent	0	0	0	0	20.0	0
1572401	1203561764	07-JUN-2016 09:06	DUSE	0		percent	0	0	0	0	20.0	0
1568982	1203553072	07-JUN-2016 09:24	DONE	0		percent	0	0	0	0	20.0	0
1568982	1203553073	07-JUN-2016 09:25	DONE	0		percent	0	0	0	0	20.0	0
1572902	1203563158	08-JUN-2016 08:38	DONE	0		percent	0	0	0	0	20.0	0
1570439	1203556720	09-JUN-2016 07:37	DONE	0		percent	0	0	0	0	20.0	0
1571641	1203559922	09-JUN-2016 08:00	DUSE	0		percent	0	0	0	0	20.0	0
1568983	1203553076	09-JUN-2016 08:05	DUSE	0		percent	0	0	0	0	20.0	0
1571640	1203559919	09-JUN-2016 09:30	DUSE	0		percent	0	0	0	0	20.0	0
1570966	1203558113	09-JUN-2016 15:26	DUSE	0		percent	0	0	0	0	20.0	0
1569450	1203554208	10-JUN-2016 09:48	DUSE	0		percent	0	0	0	0	20.0	0
1570963	1203558105	11-JUN-2016 15:28	DUSE	0		percent	0	0	0	0	20.0	0
1572736	1203562680	11-JUN-2016 17:31	DONE	0		percent	0	0	0	0	20.0	0
1573846	1203565617	13-JUN-2016 10:56	DONE	0		percent	0	0	0	0	20.0	0
1572113	1203561113	13-JUN-2016 11:29	DUSE	0		percent	0	0	0	0	20.0	0
1569453	1203554214	14-JUN-2016 09:28	DUSE	0		percent	0	0	0	0	20.0	0

1569952	1203555473	14-JUN-2016 10:33	DONE	0		percent	0	0	0	0	20.0	0
1570977	1203558136	14-JUN-2016 15:56	DUSE	0		percent	0	0	0	0	20.0	0
1572169	1203561235	15-JUN-2016 07:01	DUSE	0		percent	0	0	0	0	20.0	0
1570611	1203557213	15-JUN-2016 10:57	DONE	0		percent	0	0	0	0	20.0	0
1573423	1203564604	16-JUN-2016 12:25	DUSE	0		percent	0	0	0	0	20.0	0
1573769	1203565424	20-JUN-2016 08:12	DUSE	0		percent	0	0	0	0	20.0	0
1575174	1203569165	20-JUN-2016 11:08	DONE	0		percent	0	0	0	0	20.0	0
1575356	1203569602	20-JUN-2016 11:09	DUSE	0		percent	0	0	0	0	20.0	0
1572168	1203569678	20-JUN-2016 11:09	DUSE	0		percent	0	0	0	0	20.0	0
1572167	1203561228	20-JUN-2016 11:21	DONE	0		percent	0	0	0	0	20.0	0
1572167	1203561229	20-JUN-2016 11:21	DONE	0		percent	0	0	0	0	20.0	0
1572404	1203561773	20-JUN-2016 11:40	DUSE	0		percent	0	0	0	0	20.0	0
1568993	1203553094	22-JUN-2016 07:40	DONE	0		percent	0	0	0	0	20.0	0
1575822	1203570722	22-JUN-2016 12:00	DUSE	0		percent	0	0	0	0	20.0	0

Beryllium-7 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0.95	0.35	dec	0.72	0	-0.591	2.03	3.00	0.65
1570600	1203557171	27-MAY-2016 15:53	DUSE	0.41	-0.47	dec	0.72	0	-0.591	2.03	3.00	0.65
1568666	1203552276	27-MAY-2016 15:56	DUSE	0.99	0.41	dec	0.72	0	-0.591	2.03	3.00	0.65
1567987	1203550448	31-MAY-2016 08:05	DONE	0.63	-0.14	dec	0.72	0	-0.591	2.03	3.00	0.65
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.32	-0.61	dec	0.72	0	-0.591	2.03	3.00	0.65
1570609	1203557203	01-JUN-2016 09:30	DUSE	0.32	-0.62	dec	0.72	0	-0.591	2.03	3.00	0.65
1568667	1203552279	02-JUN-2016 11:22	DONE	0.84	0.19	dec	0.72	0	-0.591	2.03	3.00	0.65
1570974	1203558130	02-JUN-2016 12:01	DUSE	1.32	0.92	dec	0.72	0	-0.591	2.03	3.00	0.65
1570997	1203558209	02-JUN-2016 13:21	DUSE	0.07	-01	dec	0.72	0	-0.591	2.03	3.00	0.65
1570987	1203558177	02-JUN-2016 13:25	DONE	1.98	1.9	dec	0.72	0	-0.591	2.03	3.00	0.65
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.06	-1	dec	0.72	0	-0.591	2.03	3.00	0.65
1568982	1203553072	07-JUN-2016 09:24	DONE	0.12	-0.92	dec	0.72	0	-0.591	2.03	3.00	0.65
1568982	1203553073	07-JUN-2016 09:25	DONE	0.16	-0.85	dec	0.72	0	-0.591	2.03	3.00	0.65
1572902	1203563158	08-JUN-2016 08:38	DONE	0.15	-0.87	dec	0.72	0	-0.591	2.03	3.00	0.65
1570439	1203556720	09-JUN-2016 07:37	DONE	0.44	-0.42	dec	0.72	0	-0.591	2.03	3.00	0.65
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.72	0.01	dec	0.72	0	-0.591	2.03	3.00	0.65
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.36	-0.55	dec	0.72	0	-0.591	2.03	3.00	0.65
1571640	1203559919	09-JUN-2016 09:30	DUSE	0.04	-1	dec	0.72	0	-0.591	2.03	3.00	0.65
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.1	-0.95	dec	0.72	0	-0.591	2.03	3.00	0.65
1569450	1203554208	10-JUN-2016 09:48	DUSE	0.2	-0.79	dec	0.72	0	-0.591	2.03	3.00	0.65
1570963	1203558105	11-JUN-2016 15:28	DUSE	1.1	0.59	dec	0.72	0	-0.591	2.03	3.00	0.65
1572736	1203562680	11-JUN-2016 17:31	DONE	0.38	-0.52	dec	0.72	0	-0.591	2.03	3.00	0.65
1573846	1203565617	13-JUN-2016 10:56	DONE	0.76	0.07	dec	0.72	0	-0.591	2.03	3.00	0.65
1572113	1203561113	13-JUN-2016 11:29	DUSE	1.98	1.9	dec	0.72	0	-0.591	2.03	3.00	0.65
1569453	1203554214	14-JUN-2016 09:28	DUSE	1.22	0.77	dec	0.72	0	-0.591	2.03	3.00	0.65
1569952	1203555473	14-JUN-2016 10:33	DONE	0.93	0.32	dec	0.72	0	-0.591	2.03	3.00	0.65

1570977	1203558136	14-JUN-2016 15:56	DUSE	2.32	2.5	dec	0.72	0	-0.591	2.03	3.00	0.65
1572169	1203561235	15-JUN-2016 07:01	DUSE	2.3	2.4	dec	0.72	0	-0.591	2.03	3.00	0.65
1570611	1203557213	15-JUN-2016 10:57	DONE	1.49	1.2	dec	0.72	0	-0.591	2.03	3.00	0.65
1573423	1203564604	16-JUN-2016 12:25	DUSE	0.65	-0.1	dec	0.72	0	-0.591	2.03	3.00	0.65
1573769	1203565424	20-JUN-2016 08:12	DUSE	0.17	-0.84	dec	0.72	0	-0.591	2.03	3.00	0.65
1575174	1203569165	20-JUN-2016 11:08	DONE	0.1	-0.94	dec	0.72	0	-0.591	2.03	3.00	0.65
1575356	1203569602	20-JUN-2016 11:09	DUSE	1.71	1.5	dec	0.72	0	-0.591	2.03	3.00	0.65
1572168	1203569678	20-JUN-2016 11:09	DUSE	0.51	-0.31	dec	0.72	0	-0.591	2.03	3.00	0.65
1572167	1203561228	20-JUN-2016 11:21	DONE	0.36	-0.55	dec	0.72	0	-0.591	2.03	3.00	0.65
1572167	1203561229	20-JUN-2016 11:21	DONE	1.16	0.68	dec	0.72	0	-0.591	2.03	3.00	0.65
1572404	1203561773	20-JUN-2016 11:40	DUSE	0.19	-0.8	dec	0.72	0	-0.591	2.03	3.00	0.65
1568993	1203553094	22-JUN-2016 07:40	DONE	0.4	-0.49	dec	0.72	0	-0.591	2.03	3.00	0.65
1575822	1203570722	22-JUN-2016 12:00	DUSE	0.12	-0.92	dec	0.72	0	-0.591	2.03	3.00	0.65

Cesium-134 BLANK: Limits LCL = -520 UCL = 568

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570587	1203557131	27-MAY-2016 15:50	DUSE	1.97	-0.12	pCi/L	23.4	-520	-340	386	568	181
1567987	1203550447	27-MAY-2016 15:53	DONE	-0.842	-0.13	pCi/L	23.4	-520	-340	386	568	181
1568666	1203552275	31-MAY-2016 08:06	DUSE	-1	-0.13	pCi/L	23.4	-520	-340	386	568	181
1568667	1203552278	31-MAY-2016 09:13	DONE	0.22	-0.13	pCi/L	23.4	-520	-340	386	568	181
1570609	1203557202	01-JUN-2016 09:29	DUSE	0.87	-0.12	pCi/L	23.4	-520	-340	386	568	181
1570974	1203558129	02-JUN-2016 11:01	DUSE	6.72	-0.09	pCi/L	23.4	-520	-340	386	568	181
1570987	1203558176	02-JUN-2016 11:17	DONE	-0.306	-0.13	pCi/L	23.4	-520	-340	386	568	181
1570997	1203558208	02-JUN-2016 11:19	DONE	-0.434	-0.13	pCi/L	23.4	-520	-340	386	568	181
1571725	1203560160	06-JUN-2016 06:55	DUSE	5.97	-0.1	pCi/L	23.4	-520	-340	386	568	181
1572401	1203561763	07-JUN-2016 09:06	DUSE	0.48	-0.13	pCi/L	23.4	-520	-340	386	568	181
1568982	1203553071	07-JUN-2016 09:24	DONE	-1.7	-0.14	pCi/L	23.4	-520	-340	386	568	181
1572902	1203563157	07-JUN-2016 16:02	DONE	925	5	pCi/L	23.4	-520	-340	386	568	181
1571641	1203559921	09-JUN-2016 08:00	DUSE	-0.216	-0.13	pCi/L	23.4	-520	-340	386	568	181
1568983	1203553075	09-JUN-2016 08:01	DUSE	0.19	-0.13	pCi/L	23.4	-520	-340	386	568	181
1571640	1203559918	09-JUN-2016 09:30	DONE	2.71	-0.11	pCi/L	23.4	-520	-340	386	568	181
1570439	1203556718	09-JUN-2016 09:47	DONE	442	2.3	pCi/L	23.4	-520	-340	386	568	181
1570966	1203558112	09-JUN-2016 15:25	DUSE	-0.306	-0.13	pCi/L	23.4	-520	-340	386	568	181
1570612	1203557221	10-JUN-2016 09:04	DONE	0.22	-0.13	pCi/L	23.4	-520	-340	386	568	181
1569450	1203554207	10-JUN-2016 09:48	DUSE	-0.778	-0.13	pCi/L	23.4	-520	-340	386	568	181
1570963	1203558104	10-JUN-2016 13:39	DONE	-1.1	-0.14	pCi/L	23.4	-520	-340	386	568	181
1572736	1203562679	10-JUN-2016 16:05	DONE	0.34	-0.13	pCi/L	23.4	-520	-340	386	568	181
1573846	1203565616	11-JUN-2016 17:36	DUSE	0.23	-0.13	pCi/L	23.4	-520	-340	386	568	181
1573091	1203563751	13-JUN-2016 08:00	DUSE	-1.6	-0.14	pCi/L	23.4	-520	-340	386	568	181
1572113	1203561112	13-JUN-2016 08:05	DUSE	-1.6	-0.14	pCi/L	23.4	-520	-340	386	568	181
1569952	1203555472	13-JUN-2016 15:43	DONE	1.08	-0.12	pCi/L	23.4	-520	-340	386	568	181
1570977	1203558135	13-JUN-2016 15:45	DUSE	1.29	-0.12	pCi/L	23.4	-520	-340	386	568	181
1569453	1203554213	13-JUN-2016 15:50	DONE	-0.637	-0.13	pCi/L	23.4	-520	-340	386	568	181

1572169	1203561234	15-JUN-2016 06:47	DONE	1.06	-0.12	pCi/L	23.4	-520	-340	386	568	181
1570611	1203557212	15-JUN-2016 08:51	DONE	-0.067	-0.13	pCi/L	23.4	-520	-340	386	568	181
1573423	1203564603	16-JUN-2016 12:25	DONE	-1.7	-0.14	pCi/L	23.4	-520	-340	386	568	181
1573769	1203565423	20-JUN-2016 07:23	DUSE	-470	-3	pCi/L	23.4	-520	-340	386	568	181
1572168	1203561231	20-JUN-2016 08:19	DUSE	1.16	-0.12	pCi/L	23.4	-520	-340	386	568	181
1575174	1203569164	20-JUN-2016 08:20	DONE	3.19	-0.11	pCi/L	23.4	-520	-340	386	568	181
1575356	1203569601	20-JUN-2016 08:20	DONE	1.47	-0.12	pCi/L	23.4	-520	-340	386	568	181
1572167	1203561227	20-JUN-2016 08:30	DONE	0.58	-0.13	pCi/L	23.4	-520	-340	386	568	181
1572404	1203561772	20-JUN-2016 11:40	DONE	-0.667	-0.13	pCi/L	23.4	-520	-340	386	568	181
1568993	1203553093	21-JUN-2016 10:29	DONE	0.51	-0.13	pCi/L	23.4	-520	-340	386	568	181
1575822	1203570721	22-JUN-2016 09:11	DUSE	-1.3	-0.14	pCi/L	23.4	-520	-340	386	568	181
1572406	1203561781	22-JUN-2016 11:21	DONE	-0.624	-0.13	pCi/L	23.4	-520	-340	386	568	181

Cesium-134 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	17.2	6.1	percent	0.44	0	-5.1	5.94	20.0	2.75
1570600	1203557171	27-MAY-2016 15:53	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1568666	1203552276	27-MAY-2016 15:56	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1568665	1203552273	31-MAY-2016 08:06	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570609	1203557203	01-JUN-2016 09:30	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570974	1203558130	02-JUN-2016 12:01	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570997	1203558209	02-JUN-2016 13:21	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572401	1203561764	07-JUN-2016 09:06	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572902	1203563158	08-JUN-2016 08:38	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1571641	1203559922	09-JUN-2016 08:00	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1568983	1203553076	09-JUN-2016 08:05	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1571640	1203559919	09-JUN-2016 09:30	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570966	1203558113	09-JUN-2016 15:26	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1569450	1203554208	10-JUN-2016 09:48	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570963	1203558105	11-JUN-2016 15:28	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1573846	1203565617	13-JUN-2016 10:56	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572113	1203561113	13-JUN-2016 11:29	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1569453	1203554214	14-JUN-2016 09:28	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1569952	1203555473	14-JUN-2016 10:33	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1570977	1203558136	14-JUN-2016 15:56	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75

1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1573423	1203564604	16-JUN-2016 12:25	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1573769	1203565424	20-JUN-2016 08:12	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1575356	1203569602	20-JUN-2016 11:09	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572168	1203569678	20-JUN-2016 11:09	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1572404	1203561773	20-JUN-2016 11:40	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1568993	1203553094	22-JUN-2016 07:40	DONE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75
1575822	1203570722	22-JUN-2016 12:00	DUSE	0	-0.16	percent	0.44	0	-5.1	5.94	20.0	2.75

Cesium-134 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	2.01	2.1	dec	0.69	0	-0.605	1.98	3.00	0.65
1570600	1203557171	27-MAY-2016 15:53	DUSE	1.01	0.5	dec	0.69	0	-0.605	1.98	3.00	0.65
1568666	1203552276	27-MAY-2016 15:56	DUSE	2.66	3.1	dec	0.69	0	-0.605	1.98	3.00	0.65
1567987	1203550448	31-MAY-2016 08:05	DONE	1.41	1.1	dec	0.69	0	-0.605	1.98	3.00	0.65
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.48	-0.32	dec	0.69	0	-0.605	1.98	3.00	0.65
1570609	1203557203	01-JUN-2016 09:30	DUSE	1.73	1.6	dec	0.69	0	-0.605	1.98	3.00	0.65
1568667	1203552279	02-JUN-2016 11:22	DONE	1.38	1.1	dec	0.69	0	-0.605	1.98	3.00	0.65
1570974	1203558130	02-JUN-2016 12:01	DUSE	1.27	0.91	dec	0.69	0	-0.605	1.98	3.00	0.65
1570997	1203558209	02-JUN-2016 13:21	DONE	0.12	-0.87	dec	0.69	0	-0.605	1.98	3.00	0.65
1570987	1203558177	02-JUN-2016 13:25	DONE	0.71	0.03	dec	0.69	0	-0.605	1.98	3.00	0.65
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.02	-1	dec	0.69	0	-0.605	1.98	3.00	0.65
1568982	1203553072	07-JUN-2016 09:24	DONE	0.62	-0.11	dec	0.69	0	-0.605	1.98	3.00	0.65
1568982	1203553073	07-JUN-2016 09:25	DONE	0.45	-0.36	dec	0.69	0	-0.605	1.98	3.00	0.65
1572902	1203563158	08-JUN-2016 08:38	DONE	0.02	-1	dec	0.69	0	-0.605	1.98	3.00	0.65
1570439	1203556720	09-JUN-2016 07:37	DONE	0.79	0.16	dec	0.69	0	-0.605	1.98	3.00	0.65
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.9	0.34	dec	0.69	0	-0.605	1.98	3.00	0.65
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.21	-0.74	dec	0.69	0	-0.605	1.98	3.00	0.65
1571640	1203559919	09-JUN-2016 09:30	DONE	1.59	1.4	dec	0.69	0	-0.605	1.98	3.00	0.65
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.07	-0.96	dec	0.69	0	-0.605	1.98	3.00	0.65
1569450	1203554208	10-JUN-2016 09:48	DUSE	0.78	0.14	dec	0.69	0	-0.605	1.98	3.00	0.65
1570963	1203558105	11-JUN-2016 15:28	DONE	0.18	-0.79	dec	0.69	0	-0.605	1.98	3.00	0.65
1572736	1203562680	11-JUN-2016 17:31	DONE	0.04	-01	dec	0.69	0	-0.605	1.98	3.00	0.65
1573846	1203565617	13-JUN-2016 10:56	DUSE	0.19	-0.76	dec	0.69	0	-0.605	1.98	3.00	0.65
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.08	-0.94	dec	0.69	0	-0.605	1.98	3.00	0.65
1569453	1203554214	14-JUN-2016 09:28	DONE	0.54	-0.23	dec	0.69	0	-0.605	1.98	3.00	0.65
1569952	1203555473	14-JUN-2016 10:33	DONE	0.32	-0.57	dec	0.69	0	-0.605	1.98	3.00	0.65
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.02	-1	dec	0.69	0	-0.605	1.98	3.00	0.65
1572169	1203561235	15-JUN-2016 07:01	DONE	0.91	0.34	dec	0.69	0	-0.605	1.98	3.00	0.65
1570611	1203557213	15-JUN-2016 10:57	DONE	0.71	0.04	dec	0.69	0	-0.605	1.98	3.00	0.65

1573423	1203564604	16-JUN-2016 12:25	DONE	0.94	0.4	dec	0.69	0	-0.605	1.98	3.00	0.65
1573769	1203565424	20-JUN-2016 08:12	DUSE	0.02	-1	dec	0.69	0	-0.605	1.98	3.00	0.65
1575174	1203569165	20-JUN-2016 11:08	DONE	1.16	0.73	dec	0.69	0	-0.605	1.98	3.00	0.65
1575356	1203569602	20-JUN-2016 11:09	DONE	0.39	-0.45	dec	0.69	0	-0.605	1.98	3.00	0.65
1572168	1203569678	20-JUN-2016 11:09	DUSE	0.08	-0.94	dec	0.69	0	-0.605	1.98	3.00	0.65
1572167	1203561228	20-JUN-2016 11:21	DONE	0.03	-1	dec	0.69	0	-0.605	1.98	3.00	0.65
1572167	1203561229	20-JUN-2016 11:21	DONE	0.78	0.15	dec	0.69	0	-0.605	1.98	3.00	0.65
1572404	1203561773	20-JUN-2016 11:40	DONE	0.58	-0.17	dec	0.69	0	-0.605	1.98	3.00	0.65
1568993	1203553094	22-JUN-2016 07:40	DONE	00	-1	dec	0.69	0	-0.605	1.98	3.00	0.65
1575822	1203570722	22-JUN-2016 12:00	DUSE	1.56	1.4	dec	0.69	0	-0.605	1.98	3.00	0.65

Cesium-137 BLANK: Limits LCL = -750 UCL = 788

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570587	1203557131	27-MAY-2016 15:50	DONE	2.15	-0.07	pCi/L	20.7	-750	-490	532	788	256
1567987	1203550447	27-MAY-2016 15:53	DONE	-0.267	-0.08	pCi/L	20.7	-750	-490	532	788	256
1568666	1203552275	31-MAY-2016 08:06	DONE	-0.337	-0.08	pCi/L	20.7	-750	-490	532	788	256
1568667	1203552278	31-MAY-2016 09:13	DONE	-1.3	-0.09	pCi/L	20.7	-750	-490	532	788	256
1570609	1203557202	01-JUN-2016 09:29	DONE	2.01	-0.07	pCi/L	20.7	-750	-490	532	788	256
1570974	1203558129	02-JUN-2016 11:01	DONE	-5.9	-0.1	pCi/L	20.7	-750	-490	532	788	256
1570987	1203558176	02-JUN-2016 11:17	DONE	-0.134	-0.08	pCi/L	20.7	-750	-490	532	788	256
1570997	1203558208	02-JUN-2016 11:19	DONE	6.9	-0.05	pCi/L	20.7	-750	-490	532	788	256
1571725	1203560160	06-JUN-2016 06:55	DONE	0.14	-0.08	pCi/L	20.7	-750	-490	532	788	256
1572401	1203561763	07-JUN-2016 09:06	DONE	1.59	-0.07	pCi/L	20.7	-750	-490	532	788	256
1568982	1203553071	07-JUN-2016 09:24	DONE	-0.231	-0.08	pCi/L	20.7	-750	-490	532	788	256
1572902	1203563157	07-JUN-2016 16:02	DONE	-550	-2	pCi/L	20.7	-750	-490	532	788	256
1571641	1203559921	09-JUN-2016 08:00	DONE	3.88	-0.07	pCi/L	20.7	-750	-490	532	788	256
1568983	1203553075	09-JUN-2016 08:01	DONE	-0.64	-0.08	pCi/L	20.7	-750	-490	532	788	256
1571640	1203559918	09-JUN-2016 09:30	DONE	3.67	-0.07	pCi/L	20.7	-750	-490	532	788	256
1570439	1203556718	09-JUN-2016 09:47	DONE	1478	5.7	pCi/L	20.7	-750	-490	532	788	256
1570966	1203558112	09-JUN-2016 15:25	DONE	-0.013	-0.08	pCi/L	20.7	-750	-490	532	788	256
1570612	1203557221	10-JUN-2016 09:04	DONE	1.21	-0.08	pCi/L	20.7	-750	-490	532	788	256
1569450	1203554207	10-JUN-2016 09:48	DONE	-1.8	-0.09	pCi/L	20.7	-750	-490	532	788	256
1570963	1203558104	10-JUN-2016 13:39	DONE	-1.5	-0.09	pCi/L	20.7	-750	-490	532	788	256
1572736	1203562679	10-JUN-2016 16:05	DONE	0.46	-0.08	pCi/L	20.7	-750	-490	532	788	256
1573846	1203565616	11-JUN-2016 17:36	DONE	-0.498	-0.08	pCi/L	20.7	-750	-490	532	788	256
1573091	1203563751	13-JUN-2016 08:00	DONE	-1.2	-0.09	pCi/L	20.7	-750	-490	532	788	256
1572113	1203561112	13-JUN-2016 08:05	DONE	1.33	-0.08	pCi/L	20.7	-750	-490	532	788	256
1569952	1203555472	13-JUN-2016 15:43	DONE	1.03	-0.08	pCi/L	20.7	-750	-490	532	788	256
1570977	1203558135	13-JUN-2016 15:45	DONE	0.73	-0.08	pCi/L	20.7	-750	-490	532	788	256
1569453	1203554213	13-JUN-2016 15:50	DONE	-0.51	-0.08	pCi/L	20.7	-750	-490	532	788	256
1572169	1203561234	15-JUN-2016 06:47	DONE	1.5	-0.08	pCi/L	20.7	-750	-490	532	788	256
1570611	1203557212	15-JUN-2016 08:51	DONE	0.61	-0.08	pCi/L	20.7	-750	-490	532	788	256
1573423	1203564603	16-JUN-2016 12:25	DONE	-1.7	-0.09	pCi/L	20.7	-750	-490	532	788	256

1573769	1203565423	20-JUN-2016 07:23	DONE	-140	-0.62	pCi/L	20.7	-750	-490	532	788	256
1572168	1203561231	20-JUN-2016 08:19	DONE	-1.1	-0.09	pCi/L	20.7	-750	-490	532	788	256
1575174	1203569164	20-JUN-2016 08:20	DONE	-1.9	-0.09	pCi/L	20.7	-750	-490	532	788	256
1575356	1203569601	20-JUN-2016 08:20	DONE	7.08	-0.05	pCi/L	20.7	-750	-490	532	788	256
1572167	1203561227	20-JUN-2016 08:30	DONE	1.33	-0.08	pCi/L	20.7	-750	-490	532	788	256
1572404	1203561772	20-JUN-2016 11:40	DONE	-2.3	-0.09	pCi/L	20.7	-750	-490	532	788	256
1568993	1203553093	21-JUN-2016 10:29	DONE	-0.119	-0.08	pCi/L	20.7	-750	-490	532	788	256
1575822	1203570721	22-JUN-2016 09:11	DONE	2.27	-0.07	pCi/L	20.7	-750	-490	532	788	256
1572406	1203561781	22-JUN-2016 11:21	DONE	-0.834	-0.08	pCi/L	20.7	-750	-490	532	788	256

Cesium-137 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570600	1203557171	27-MAY-2016 15:53	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1568666	1203552276	27-MAY-2016 15:56	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1568665	1203552273	31-MAY-2016 08:06	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570609	1203557203	01-JUN-2016 09:30	DONE	20.1	2.3	percent	2.06	0	-14	17.7	20.0	7.8
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570974	1203558130	02-JUN-2016 12:01	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570997	1203558209	02-JUN-2016 13:21	DONE	1.6	-0.06	percent	2.06	0	-14	17.7	20.0	7.8
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572401	1203561764	07-JUN-2016 09:06	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572902	1203563158	08-JUN-2016 08:38	DONE	12.9	1.4	percent	2.06	0	-14	17.7	20.0	7.8
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1571641	1203559922	09-JUN-2016 08:00	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1568983	1203553076	09-JUN-2016 08:05	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1571640	1203559919	09-JUN-2016 09:30	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570966	1203558113	09-JUN-2016 15:26	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1569450	1203554208	10-JUN-2016 09:48	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570963	1203558105	11-JUN-2016 15:28	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1573846	1203565617	13-JUN-2016 10:56	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572113	1203561113	13-JUN-2016 11:29	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1569453	1203554214	14-JUN-2016 09:28	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1569952	1203555473	14-JUN-2016 10:33	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570977	1203558136	14-JUN-2016 15:56	DONE	43.6	5.3	percent	2.06	0	-14	17.7	20.0	7.8
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1573423	1203564604	16-JUN-2016 12:25	DONE	2.12	0.01	percent	2.06	0	-14	17.7	20.0	7.8
1573769	1203565424	20-JUN-2016 08:12	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8

1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1575356	1203569602	20-JUN-2016 11:09	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572168	1203569678	20-JUN-2016 11:09	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1572404	1203561773	20-JUN-2016 11:40	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1568993	1203553094	22-JUN-2016 07:40	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8
1575822	1203570722	22-JUN-2016 12:00	DONE	0	-0.26	percent	2.06	0	-14	17.7	20.0	7.8

Cesium-137 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570609	1203557204	01-JUN-2016 09:30	DONE	107	0.79	percent	100	75.0	83.3	117	125	8.33
1570987	1203558178	02-JUN-2016 10:07	DONE	102	0.19	percent	100	75.0	83.3	117	125	8.33
1570974	1203558131	02-JUN-2016 11:12	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
1570997	1203558210	02-JUN-2016 11:39	DONE	104	0.54	percent	100	75.0	83.3	117	125	8.33
1571725	1203560162	06-JUN-2016 06:56	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
1571725	1203560161	06-JUN-2016 07:29	DONE	106	0.73	percent	100	75.0	83.3	117	125	8.33
1572401	1203561765	07-JUN-2016 07:25	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
1568982	1203553074	07-JUN-2016 09:20	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
1572902	1203563159	07-JUN-2016 18:37	DONE	105	0.58	percent	100	75.0	83.3	117	125	8.33
1570966	1203558114	08-JUN-2016 14:42	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
1568983	1203553077	09-JUN-2016 08:21	DONE	101	0.13	percent	100	75.0	83.3	117	125	8.33
1571641	1203559923	09-JUN-2016 08:43	DONE	100	-0	percent	100	75.0	83.3	117	125	8.33
1571640	1203559920	09-JUN-2016 11:06	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
1570439	1203556719	09-JUN-2016 12:01	DONE	105	0.57	percent	100	75.0	83.3	117	125	8.33
1570612	1203557222	10-JUN-2016 09:04	DONE	106	0.68	percent	100	75.0	83.3	117	125	8.33
1569450	1203554209	10-JUN-2016 09:49	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
1570612	1203557223	10-JUN-2016 10:55	DONE	106	0.76	percent	100	75.0	83.3	117	125	8.33
1570963	1203558106	11-JUN-2016 14:58	DONE	101	0.14	percent	100	75.0	83.3	117	125	8.33
1572736	1203562681	11-JUN-2016 17:49	DONE	100	0.02	percent	100	75.0	83.3	117	125	8.33
1573846	1203565618	13-JUN-2016 06:30	DONE	104	0.54	percent	100	75.0	83.3	117	125	8.33
1573091	1203563752	13-JUN-2016 08:01	DONE	99.3	-0.09	percent	100	75.0	83.3	117	125	8.33
1573091	1203563753	13-JUN-2016 08:24	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
1572113	1203561114	13-JUN-2016 09:04	DONE	107	0.8	percent	100	75.0	83.3	117	125	8.33
1569453	1203554215	14-JUN-2016 09:28	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
1569952	1203555474	14-JUN-2016 10:40	DONE	105	0.64	percent	100	75.0	83.3	117	125	8.33
1570977	1203558137	15-JUN-2016 06:16	DONE	99.1	-0.11	percent	100	75.0	83.3	117	125	8.33
1572169	1203561236	15-JUN-2016 07:06	DONE	106	0.72	percent	100	75.0	83.3	117	125	8.33
1570611	1203557214	15-JUN-2016 10:28	DONE	101	0.11	percent	100	75.0	83.3	117	125	8.33
1573423	1203564605	16-JUN-2016 09:51	DONE	104	0.46	percent	100	75.0	83.3	117	125	8.33
1573769	1203565425	20-JUN-2016 07:23	DONE	107	0.85	percent	100	75.0	83.3	117	125	8.33
1575174	1203569166	20-JUN-2016 11:08	DONE	108	1	percent	100	75.0	83.3	117	125	8.33
1572168	1203561232	20-JUN-2016 11:10	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33

1575356	1203569603	20-JUN-2016 11:33	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1572167	1203561230	20-JUN-2016 11:33	DONE	106	0.69	percent	100	75.0	83.3	117	125	8.33
1572404	1203561774	20-JUN-2016 13:32	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
1568993	1203553095	22-JUN-2016 07:40	DONE	100	0.04	percent	100	75.0	83.3	117	125	8.33
1575822	1203570723	22-JUN-2016 11:59	DONE	106	0.69	percent	100	75.0	83.3	117	125	8.33
1572406	1203561782	22-JUN-2016 13:48	DONE	106	0.73	percent	100	75.0	83.3	117	125	8.33
1572406	1203561783	22-JUN-2016 14:06	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33

Cesium-137 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1548402	1203499133	01-MAR-2016 06:52	DONE	1.62	-0.38	percent	2.07	0	-0.263	4.4	20.0	1.17
1550712	1203504308	09-MAR-2016 06:46	DONE	1.25	-0.71	percent	2.07	0	-0.263	4.4	20.0	1.17
1551384	1203505976	11-MAR-2016 12:45	DONE	2.01	-0.05	percent	2.07	0	-0.263	4.4	20.0	1.17
1551569	1203506493	15-MAR-2016 06:40	DONE	1.65	-0.36	percent	2.07	0	-0.263	4.4	20.0	1.17
1552300	1203508376	15-MAR-2016 12:12	DONE	2.47	0.34	percent	2.07	0	-0.263	4.4	20.0	1.17
1552689	1203510454	17-MAR-2016 09:26	DONE	0.85	-1	percent	2.07	0	-0.263	4.4	20.0	1.17
1553748	1203512186	24-MAR-2016 07:39	DONE	5.25	2.7	percent	2.07	0	-0.263	4.4	20.0	1.17
1556978	1203520767	11-APR-2016 12:31	DONE	1.81	-0.22	percent	2.07	0	-0.263	4.4	20.0	1.17
1562911	1203536738	28-APR-2016 07:11	DONE	1.75	-0.27	percent	2.07	0	-0.263	4.4	20.0	1.17
1561431	1203532709	28-APR-2016 15:34	DONE	1.31	-0.65	percent	2.07	0	-0.263	4.4	20.0	1.17
1559555	1203527633	06-MAY-2016 06:59	DONE	1.8	-0.23	percent	2.07	0	-0.263	4.4	20.0	1.17
1571725	1203560162	06-JUN-2016 06:56	DONE	1.97	-0.09	percent	2.07	0	-0.263	4.4	20.0	1.17
1570612	1203557223	10-JUN-2016 10:55	DONE	0.61	-1	percent	2.07	0	-0.263	4.4	20.0	1.17
1573091	1203563753	13-JUN-2016 08:24	DONE	3.39	1.1	percent	2.07	0	-0.263	4.4	20.0	1.17
1572406	1203561783	22-JUN-2016 14:06	DONE	3.28	1	percent	2.07	0	-0.263	4.4	20.0	1.17

Cesium-137 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DONE	2.1	1.8	dec	0.95	0	-0.327	2.23	3.00	0.64
1570600	1203557171	27-MAY-2016 15:53	DONE	2.32	2.1	dec	0.95	0	-0.327	2.23	3.00	0.64
1568666	1203552276	27-MAY-2016 15:56	DONE	0.56	-0.62	dec	0.95	0	-0.327	2.23	3.00	0.64
1567987	1203550448	31-MAY-2016 08:05	DONE	1.55	0.93	dec	0.95	0	-0.327	2.23	3.00	0.64
1568665	1203552273	31-MAY-2016 08:06	DONE	0.19	-1	dec	0.95	0	-0.327	2.23	3.00	0.64
1570609	1203557203	01-JUN-2016 09:30	DONE	1.01	0.08	dec	0.95	0	-0.327	2.23	3.00	0.64
1568667	1203552279	02-JUN-2016 11:22	DONE	0.1	-1	dec	0.95	0	-0.327	2.23	3.00	0.64
1570974	1203558130	02-JUN-2016 12:01	DONE	1.67	1.1	dec	0.95	0	-0.327	2.23	3.00	0.64
1570997	1203558209	02-JUN-2016 13:21	DONE	0.25	-1	dec	0.95	0	-0.327	2.23	3.00	0.64
1570987	1203558177	02-JUN-2016 13:25	DONE	1.33	0.59	dec	0.95	0	-0.327	2.23	3.00	0.64
1572401	1203561764	07-JUN-2016 09:06	DONE	0.45	-0.79	dec	0.95	0	-0.327	2.23	3.00	0.64
1568982	1203553072	07-JUN-2016 09:24	DONE	1.12	0.26	dec	0.95	0	-0.327	2.23	3.00	0.64
1568982	1203553073	07-JUN-2016 09:25	DONE	1.43	0.74	dec	0.95	0	-0.327	2.23	3.00	0.64
1572902	1203563158	08-JUN-2016 08:38	DONE	2.46	2.4	dec	0.95	0	-0.327	2.23	3.00	0.64
1570439	1203556720	09-JUN-2016 07:37	DONE	0.08	-1	dec	0.95	0	-0.327	2.23	3.00	0.64

1571641	1203559922	09-JUN-2016 08:00	DONE	0.75	-0.32	dec	0.95	0	-0.327	2.23	3.00	0.64
1568983	1203553076	09-JUN-2016 08:05	DONE	0.37	-0.91	dec	0.95	0	-0.327	2.23	3.00	0.64
1571640	1203559919	09-JUN-2016 09:30	DONE	0.17	-1	dec	0.95	0	-0.327	2.23	3.00	0.64
1570966	1203558113	09-JUN-2016 15:26	DONE	0.1	-1	dec	0.95	0	-0.327	2.23	3.00	0.64
1569450	1203554208	10-JUN-2016 09:48	DONE	1.13	0.28	dec	0.95	0	-0.327	2.23	3.00	0.64
1570963	1203558105	11-JUN-2016 15:28	DONE	0.81	-0.22	dec	0.95	0	-0.327	2.23	3.00	0.64
1572736	1203562680	11-JUN-2016 17:31	DONE	1.3	0.54	dec	0.95	0	-0.327	2.23	3.00	0.64
1573846	1203565617	13-JUN-2016 10:56	DONE	0.29	-1	dec	0.95	0	-0.327	2.23	3.00	0.64
1572113	1203561113	13-JUN-2016 11:29	DONE	0.88	-0.11	dec	0.95	0	-0.327	2.23	3.00	0.64
1569453	1203554214	14-JUN-2016 09:28	DONE	2	1.6	dec	0.95	0	-0.327	2.23	3.00	0.64
1569952	1203555473	14-JUN-2016 10:33	DONE	0.9	-0.09	dec	0.95	0	-0.327	2.23	3.00	0.64
1570977	1203558136	14-JUN-2016 15:56	DONE	0.98	0.04	dec	0.95	0	-0.327	2.23	3.00	0.64
1572169	1203561235	15-JUN-2016 07:01	DONE	1.15	0.31	dec	0.95	0	-0.327	2.23	3.00	0.64
1570611	1203557213	15-JUN-2016 10:57	DONE	0.82	-0.21	dec	0.95	0	-0.327	2.23	3.00	0.64
1573423	1203564604	16-JUN-2016 12:25	DONE	0.18	-1	dec	0.95	0	-0.327	2.23	3.00	0.64
1573769	1203565424	20-JUN-2016 08:12	DONE	0.43	-0.82	dec	0.95	0	-0.327	2.23	3.00	0.64
1575174	1203569165	20-JUN-2016 11:08	DONE	1.07	0.18	dec	0.95	0	-0.327	2.23	3.00	0.64
1575356	1203569602	20-JUN-2016 11:09	DONE	1.83	1.4	dec	0.95	0	-0.327	2.23	3.00	0.64
1572168	1203569678	20-JUN-2016 11:09	DONE	0.42	-0.84	dec	0.95	0	-0.327	2.23	3.00	0.64
1572167	1203561228	20-JUN-2016 11:21	DONE	1.14	0.3	dec	0.95	0	-0.327	2.23	3.00	0.64
1572167	1203561229	20-JUN-2016 11:21	DONE	0.78	-0.27	dec	0.95	0	-0.327	2.23	3.00	0.64
1572404	1203561773	20-JUN-2016 11:40	DONE	0.88	-0.12	dec	0.95	0	-0.327	2.23	3.00	0.64
1568993	1203553094	22-JUN-2016 07:40	DONE	0.72	-0.37	dec	0.95	0	-0.327	2.23	3.00	0.64
1575822	1203570722	22-JUN-2016 12:00	DONE	1.47	0.81	dec	0.95	0	-0.327	2.23	3.00	0.64

Cobalt-57 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570600	1203557171	27-MAY-2016 15:53	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1568666	1203552276	27-MAY-2016 15:56	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1568665	1203552273	31-MAY-2016 08:06	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570609	1203557203	01-JUN-2016 09:30	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570974	1203558130	02-JUN-2016 12:01	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570997	1203558209	02-JUN-2016 13:21	DUSE	18.8	2.4	percent	1.63	0	-12	15.6	20.0	7
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572401	1203561764	07-JUN-2016 09:06	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572902	1203563158	08-JUN-2016 08:38	DONE	4.73	0.44	percent	1.63	0	-12	15.6	20.0	7
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1571641	1203559922	09-JUN-2016 08:00	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7

1568983	1203553076	09-JUN-2016 08:05	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1571640	1203559919	09-JUN-2016 09:30	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570966	1203558113	09-JUN-2016 15:26	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1569450	1203554208	10-JUN-2016 09:48	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570963	1203558105	11-JUN-2016 15:28	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1573846	1203565617	13-JUN-2016 10:56	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572113	1203561113	13-JUN-2016 11:29	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1569453	1203554214	14-JUN-2016 09:28	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1569952	1203555473	14-JUN-2016 10:33	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570977	1203558136	14-JUN-2016 15:56	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572169	1203561235	15-JUN-2016 07:01	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1573423	1203564604	16-JUN-2016 12:25	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1573769	1203565424	20-JUN-2016 08:12	DUSE	39.9	5.5	percent	1.63	0	-12	15.6	20.0	7
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1575356	1203569602	20-JUN-2016 11:09	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572168	1203569678	20-JUN-2016 11:09	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1572404	1203561773	20-JUN-2016 11:40	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1568993	1203553094	22-JUN-2016 07:40	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7
1575822	1203570722	22-JUN-2016 12:00	DUSE	0	-0.23	percent	1.63	0	-12	15.6	20.0	7

Cobalt-57 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0.52	-0.48	dec	0.78	0	-0.309	1.87	3.00	0.55
1570600	1203557171	27-MAY-2016 15:53	DUSE	0.48	-0.55	dec	0.78	0	-0.309	1.87	3.00	0.55
1568666	1203552276	27-MAY-2016 15:56	DUSE	1.01	0.41	dec	0.78	0	-0.309	1.87	3.00	0.55
1567987	1203550448	31-MAY-2016 08:05	DONE	0.1	-1	dec	0.78	0	-0.309	1.87	3.00	0.55
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.23	-1	dec	0.78	0	-0.309	1.87	3.00	0.55
1570609	1203557203	01-JUN-2016 09:30	DUSE	0.59	-0.34	dec	0.78	0	-0.309	1.87	3.00	0.55
1568667	1203552279	02-JUN-2016 11:22	DONE	1.41	1.2	dec	0.78	0	-0.309	1.87	3.00	0.55
1570974	1203558130	02-JUN-2016 12:01	DUSE	0.58	-0.37	dec	0.78	0	-0.309	1.87	3.00	0.55
1570997	1203558209	02-JUN-2016 13:21	DUSE	2.74	3.6	dec	0.78	0	-0.309	1.87	3.00	0.55
1570987	1203558177	02-JUN-2016 13:25	DONE	0.64	-0.27	dec	0.78	0	-0.309	1.87	3.00	0.55
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.17	-1	dec	0.78	0	-0.309	1.87	3.00	0.55
1568982	1203553072	07-JUN-2016 09:24	DONE	0.22	-1	dec	0.78	0	-0.309	1.87	3.00	0.55
1568982	1203553073	07-JUN-2016 09:25	DONE	0.22	-1	dec	0.78	0	-0.309	1.87	3.00	0.55
1572902	1203563158	08-JUN-2016 08:38	DONE	0.97	0.35	dec	0.78	0	-0.309	1.87	3.00	0.55
1570439	1203556720	09-JUN-2016 07:37	DONE	0.66	-0.22	dec	0.78	0	-0.309	1.87	3.00	0.55
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.82	0.08	dec	0.78	0	-0.309	1.87	3.00	0.55
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.17	-1	dec	0.78	0	-0.309	1.87	3.00	0.55

1571640	1203559919	09-JUN-2016 09:30	DUSE	1.05	0.5	dec	0.78	0	-0.309	1.87	3.00	0.55
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.8	0.03	dec	0.78	0	-0.309	1.87	3.00	0.55
1569450	1203554208	10-JUN-2016 09:48	DUSE	2.01	2.3	dec	0.78	0	-0.309	1.87	3.00	0.55
1570963	1203558105	11-JUN-2016 15:28	DUSE	0.68	-0.19	dec	0.78	0	-0.309	1.87	3.00	0.55
1572736	1203562680	11-JUN-2016 17:31	DONE	0.52	-0.48	dec	0.78	0	-0.309	1.87	3.00	0.55
1573846	1203565617	13-JUN-2016 10:56	DUSE	0.73	-0.1	dec	0.78	0	-0.309	1.87	3.00	0.55
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.52	-0.49	dec	0.78	0	-0.309	1.87	3.00	0.55
1569453	1203554214	14-JUN-2016 09:28	DUSE	0.69	-0.17	dec	0.78	0	-0.309	1.87	3.00	0.55
1569952	1203555473	14-JUN-2016 10:33	DUSE	0.6	-0.34	dec	0.78	0	-0.309	1.87	3.00	0.55
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.95	0.3	dec	0.78	0	-0.309	1.87	3.00	0.55
1572169	1203561235	15-JUN-2016 07:01	DUSE	0.19	-1	dec	0.78	0	-0.309	1.87	3.00	0.55
1570611	1203557213	15-JUN-2016 10:57	DONE	0.44	-0.62	dec	0.78	0	-0.309	1.87	3.00	0.55
1573423	1203564604	16-JUN-2016 12:25	DUSE	1.69	1.7	dec	0.78	0	-0.309	1.87	3.00	0.55
1573769	1203565424	20-JUN-2016 08:12	DUSE	1.5	1.3	dec	0.78	0	-0.309	1.87	3.00	0.55
1575174	1203569165	20-JUN-2016 11:08	DONE	0.25	-0.98	dec	0.78	0	-0.309	1.87	3.00	0.55
1575356	1203569602	20-JUN-2016 11:09	DUSE	0.81	0.05	dec	0.78	0	-0.309	1.87	3.00	0.55
1572168	1203569678	20-JUN-2016 11:09	DUSE	1.12	0.61	dec	0.78	0	-0.309	1.87	3.00	0.55
1572167	1203561228	20-JUN-2016 11:21	DONE	0.78	-0	dec	0.78	0	-0.309	1.87	3.00	0.55
1572167	1203561229	20-JUN-2016 11:21	DONE	0.89	0.2	dec	0.78	0	-0.309	1.87	3.00	0.55
1572404	1203561773	20-JUN-2016 11:40	DUSE	1.45	1.2	dec	0.78	0	-0.309	1.87	3.00	0.55
1568993	1203553094	22-JUN-2016 07:40	DUSE	0.54	-0.44	dec	0.78	0	-0.309	1.87	3.00	0.55
1575822	1203570722	22-JUN-2016 12:00	DUSE	0.75	-0.06	dec	0.78	0	-0.309	1.87	3.00	0.55

Cobalt-60 BLANK: Limits LCL = -1400 UCL = 1400

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570587	1203557131	27-MAY-2016 15:50	DONE	0.87	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1567987	1203550447	27-MAY-2016 15:53	DONE	-0.553	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1568666	1203552275	31-MAY-2016 08:06	DONE	0.21	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1568667	1203552278	31-MAY-2016 09:13	DONE	-0.515	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1570609	1203557202	01-JUN-2016 09:29	DONE	0.12	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1570974	1203558129	02-JUN-2016 11:01	DONE	6.35	-0.02	pCi/L	15.7	-1400	-910	937	1400	460
1570987	1203558176	02-JUN-2016 11:17	DONE	-2.2	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1570997	1203558208	02-JUN-2016 11:19	DONE	0.4	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1571725	1203560160	06-JUN-2016 06:55	DONE	-2.6	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1572401	1203561763	07-JUN-2016 09:06	DONE	0.87	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1568982	1203553071	07-JUN-2016 09:24	DONE	-2	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1572902	1203563157	07-JUN-2016 16:02	DONE	-1298	-3	pCi/L	15.7	-1400	-910	937	1400	460
1571641	1203559921	09-JUN-2016 08:00	DONE	-0.851	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1568983	1203553075	09-JUN-2016 08:01	DONE	-1.9	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1571640	1203559918	09-JUN-2016 09:30	DONE	4.06	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1570439	1203556718	09-JUN-2016 09:47	DONE	2463	5.3	pCi/L	15.7	-1400	-910	937	1400	460
1570966	1203558112	09-JUN-2016 15:25	DONE	0.01	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1570612	1203557221	10-JUN-2016 09:04	DONE	-0.987	-0.04	pCi/L	15.7	-1400	-910	937	1400	460

1569450	1203554207	10-JUN-2016 09:48	DONE	0.58	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1570963	1203558104	10-JUN-2016 13:39	DONE	1.09	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1572736	1203562679	10-JUN-2016 16:05	DONE	-0.264	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1573846	1203565616	11-JUN-2016 17:36	DONE	-0.045	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1573091	1203563751	13-JUN-2016 08:00	DONE	-0.862	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1572113	1203561112	13-JUN-2016 08:05	DONE	-0.333	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1569952	1203555472	13-JUN-2016 15:43	DONE	2.58	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1570977	1203558135	13-JUN-2016 15:45	DONE	2.99	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1569453	1203554213	13-JUN-2016 15:50	DONE	-2.4	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1572169	1203561234	15-JUN-2016 06:47	DONE	3.4	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1570611	1203557212	15-JUN-2016 08:51	DONE	0.54	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1573423	1203564603	16-JUN-2016 12:25	DONE	-4.4	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1573769	1203565423	20-JUN-2016 07:23	DONE	-560	-1	pCi/L	15.7	-1400	-910	937	1400	460
1572168	1203561231	20-JUN-2016 08:19	DONE	-2.4	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1575174	1203569164	20-JUN-2016 08:20	DONE	3.59	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1575356	1203569601	20-JUN-2016 08:20	DONE	2.66	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1572167	1203561227	20-JUN-2016 08:30	DONE	1.8	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1572404	1203561772	20-JUN-2016 11:40	DONE	0.24	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1568993	1203553093	21-JUN-2016 10:29	DONE	-0.015	-0.03	pCi/L	15.7	-1400	-910	937	1400	460
1575822	1203570721	22-JUN-2016 09:11	DONE	-0.961	-0.04	pCi/L	15.7	-1400	-910	937	1400	460
1572406	1203561781	22-JUN-2016 11:21	DONE	-0.037	-0.03	pCi/L	15.7	-1400	-910	937	1400	460

Cobalt-60 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570600	1203557171	27-MAY-2016 15:53	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1568666	1203552276	27-MAY-2016 15:56	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1568665	1203552273	31-MAY-2016 08:06	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570609	1203557203	01-JUN-2016 09:30	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570974	1203558130	02-JUN-2016 12:01	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570997	1203558209	02-JUN-2016 13:21	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572401	1203561764	07-JUN-2016 09:06	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572902	1203563158	08-JUN-2016 08:38	DONE	0.67	-0.02	percent	0.75	0	-8.4	9.92	20.0	4.58
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1571641	1203559922	09-JUN-2016 08:00	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1568983	1203553076	09-JUN-2016 08:05	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1571640	1203559919	09-JUN-2016 09:30	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570966	1203558113	09-JUN-2016 15:26	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58

1569450	1203554208	10-JUN-2016 09:48	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570963	1203558105	11-JUN-2016 15:28	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1573846	1203565617	13-JUN-2016 10:56	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572113	1203561113	13-JUN-2016 11:29	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1569453	1203554214	14-JUN-2016 09:28	DONE	28.6	6.1	percent	0.75	0	-8.4	9.92	20.0	4.58
1569952	1203555473	14-JUN-2016 10:33	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570977	1203558136	14-JUN-2016 15:56	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1573423	1203564604	16-JUN-2016 12:25	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1573769	1203565424	20-JUN-2016 08:12	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1575356	1203569602	20-JUN-2016 11:09	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572168	1203569678	20-JUN-2016 11:09	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1572404	1203561773	20-JUN-2016 11:40	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1568993	1203553094	22-JUN-2016 07:40	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58
1575822	1203570722	22-JUN-2016 12:00	DONE	0	-0.16	percent	0.75	0	-8.4	9.92	20.0	4.58

Cobalt-60 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570609	1203557204	01-JUN-2016 09:30	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
1570987	1203558178	02-JUN-2016 10:07	DONE	101	0.1	percent	100	75.0	83.3	117	125	8.33
1570974	1203558131	02-JUN-2016 11:12	DONE	102	0.24	percent	100	75.0	83.3	117	125	8.33
1570997	1203558210	02-JUN-2016 11:39	DONE	102	0.29	percent	100	75.0	83.3	117	125	8.33
1571725	1203560162	06-JUN-2016 06:56	DONE	99.8	-0.03	percent	100	75.0	83.3	117	125	8.33
1571725	1203560161	06-JUN-2016 07:29	DONE	102	0.2	percent	100	75.0	83.3	117	125	8.33
1572401	1203561765	07-JUN-2016 07:25	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
1568982	1203553074	07-JUN-2016 09:20	DONE	100	0.02	percent	100	75.0	83.3	117	125	8.33
1572902	1203563159	07-JUN-2016 18:37	DONE	108	0.94	percent	100	75.0	83.3	117	125	8.33
1570966	1203558114	08-JUN-2016 14:42	DONE	102	0.2	percent	100	75.0	83.3	117	125	8.33
1568983	1203553077	09-JUN-2016 08:21	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
1571641	1203559923	09-JUN-2016 08:43	DONE	103	0.39	percent	100	75.0	83.3	117	125	8.33
1571640	1203559920	09-JUN-2016 11:06	DONE	102	0.26	percent	100	75.0	83.3	117	125	8.33
1570439	1203556719	09-JUN-2016 12:01	DONE	105	0.62	percent	100	75.0	83.3	117	125	8.33
1570612	1203557222	10-JUN-2016 09:04	DONE	100	-0	percent	100	75.0	83.3	117	125	8.33
1569450	1203554209	10-JUN-2016 09:49	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
1570612	1203557223	10-JUN-2016 10:55	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
1570963	1203558106	11-JUN-2016 14:58	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
1572736	1203562681	11-JUN-2016 17:49	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33
1573846	1203565618	13-JUN-2016 06:30	DONE	102	0.2	percent	100	75.0	83.3	117	125	8.33

1573091	1203563752	13-JUN-2016 08:01	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
1573091	1203563753	13-JUN-2016 08:24	DONE	99.8	-0.02	percent	100	75.0	83.3	117	125	8.33
1572113	1203561114	13-JUN-2016 09:04	DONE	106	0.69	percent	100	75.0	83.3	117	125	8.33
1569453	1203554215	14-JUN-2016 09:28	DONE	105	0.57	percent	100	75.0	83.3	117	125	8.33
1569952	1203555474	14-JUN-2016 10:40	DONE	99.2	-0.09	percent	100	75.0	83.3	117	125	8.33
1570977	1203558137	15-JUN-2016 06:16	DONE	103	0.34	percent	100	75.0	83.3	117	125	8.33
1572169	1203561236	15-JUN-2016 07:06	DONE	101	0.17	percent	100	75.0	83.3	117	125	8.33
1570611	1203557214	15-JUN-2016 10:28	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
1573423	1203564605	16-JUN-2016 09:51	DONE	103	0.36	percent	100	75.0	83.3	117	125	8.33
1573769	1203565425	20-JUN-2016 07:23	DONE	106	0.69	percent	100	75.0	83.3	117	125	8.33
1575174	1203569166	20-JUN-2016 11:08	DONE	101	0.09	percent	100	75.0	83.3	117	125	8.33
1572168	1203561232	20-JUN-2016 11:10	DONE	103	0.4	percent	100	75.0	83.3	117	125	8.33
1575356	1203569603	20-JUN-2016 11:33	DONE	101	0.18	percent	100	75.0	83.3	117	125	8.33
1572167	1203561230	20-JUN-2016 11:33	DONE	103	0.39	percent	100	75.0	83.3	117	125	8.33
1572404	1203561774	20-JUN-2016 13:32	DONE	104	0.47	percent	100	75.0	83.3	117	125	8.33
1568993	1203553095	22-JUN-2016 07:40	DONE	103	0.34	percent	100	75.0	83.3	117	125	8.33
1575822	1203570723	22-JUN-2016 11:59	DONE	99.8	-0.02	percent	100	75.0	83.3	117	125	8.33
1572406	1203561782	22-JUN-2016 13:48	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
1572406	1203561783	22-JUN-2016 14:06	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33

Cobalt-60 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1548402	1203499133	01-MAR-2016 06:52	DONE	2.01	0.1	percent	1.88	0	-0.919	4.67	20.0	1.4
1550712	1203504308	09-MAR-2016 06:46	DONE	0.79	-0.78	percent	1.88	0	-0.919	4.67	20.0	1.4
1551384	1203505976	11-MAR-2016 12:45	DONE	2.87	0.71	percent	1.88	0	-0.919	4.67	20.0	1.4
1551569	1203506493	15-MAR-2016 06:40	DONE	0.15	-1	percent	1.88	0	-0.919	4.67	20.0	1.4
1552300	1203508376	15-MAR-2016 12:12	DONE	1.23	-0.46	percent	1.88	0	-0.919	4.67	20.0	1.4
1552689	1203510454	17-MAR-2016 09:26	DONE	1.74	-0.1	percent	1.88	0	-0.919	4.67	20.0	1.4
1553748	1203512186	24-MAR-2016 07:39	DONE	3.93	1.5	percent	1.88	0	-0.919	4.67	20.0	1.4
1556978	1203520767	11-APR-2016 12:31	DONE	0.36	-1	percent	1.88	0	-0.919	4.67	20.0	1.4
1562911	1203536738	28-APR-2016 07:11	DONE	0.42	-1	percent	1.88	0	-0.919	4.67	20.0	1.4
1561431	1203532709	28-APR-2016 15:34	DONE	4.09	1.6	percent	1.88	0	-0.919	4.67	20.0	1.4
1559555	1203527633	06-MAY-2016 06:59	DONE	2.05	0.13	percent	1.88	0	-0.919	4.67	20.0	1.4
1571725	1203560162	06-JUN-2016 06:56	DONE	1.89	0.01	percent	1.88	0	-0.919	4.67	20.0	1.4
1570612	1203557223	10-JUN-2016 10:55	DONE	3.99	1.5	percent	1.88	0	-0.919	4.67	20.0	1.4
1573091	1203563753	13-JUN-2016 08:24	DONE	2.55	0.48	percent	1.88	0	-0.919	4.67	20.0	1.4
1572406	1203561783	22-JUN-2016 14:06	DONE	0.07	-1	percent	1.88	0	-0.919	4.67	20.0	1.4

Cobalt-60 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DONE	0.3	-0.92	dec	0.82	0	-0.305	1.95	3.00	0.56
1570600	1203557171	27-MAY-2016 15:53	DONE	2.25	2.5	dec	0.82	0	-0.305	1.95	3.00	0.56
1568666	1203552276	27-MAY-2016 15:56	DONE	1.23	0.72	dec	0.82	0	-0.305	1.95	3.00	0.56

1567987	1203550448	31-MAY-2016 08:05	DONE	0.84	0.02	dec	0.82	0	-0.305	1.95	3.00	0.56
1568665	1203552273	31-MAY-2016 08:06	DONE	0.48	-0.61	dec	0.82	0	-0.305	1.95	3.00	0.56
1570609	1203557203	01-JUN-2016 09:30	DONE	0.75	-0.13	dec	0.82	0	-0.305	1.95	3.00	0.56
1568667	1203552279	02-JUN-2016 11:22	DONE	0.08	-1	dec	0.82	0	-0.305	1.95	3.00	0.56
1570974	1203558130	02-JUN-2016 12:01	DONE	1.96	2	dec	0.82	0	-0.305	1.95	3.00	0.56
1570997	1203558209	02-JUN-2016 13:21	DONE	0.72	-0.19	dec	0.82	0	-0.305	1.95	3.00	0.56
1570987	1203558177	02-JUN-2016 13:25	DONE	0.43	-0.69	dec	0.82	0	-0.305	1.95	3.00	0.56
1572401	1203561764	07-JUN-2016 09:06	DONE	0.4	-0.75	dec	0.82	0	-0.305	1.95	3.00	0.56
1568982	1203553072	07-JUN-2016 09:24	DONE	0.91	0.16	dec	0.82	0	-0.305	1.95	3.00	0.56
1568982	1203553073	07-JUN-2016 09:25	DONE	0.95	0.22	dec	0.82	0	-0.305	1.95	3.00	0.56
1572902	1203563158	08-JUN-2016 08:38	DONE	0.13	-1	dec	0.82	0	-0.305	1.95	3.00	0.56
1570439	1203556720	09-JUN-2016 07:37	DONE	0.56	-0.47	dec	0.82	0	-0.305	1.95	3.00	0.56
1571641	1203559922	09-JUN-2016 08:00	DONE	0.51	-0.55	dec	0.82	0	-0.305	1.95	3.00	0.56
1568983	1203553076	09-JUN-2016 08:05	DONE	0.58	-0.43	dec	0.82	0	-0.305	1.95	3.00	0.56
1571640	1203559919	09-JUN-2016 09:30	DONE	1.87	1.9	dec	0.82	0	-0.305	1.95	3.00	0.56
1570966	1203558113	09-JUN-2016 15:26	DONE	0.49	-0.59	dec	0.82	0	-0.305	1.95	3.00	0.56
1569450	1203554208	10-JUN-2016 09:48	DONE	0.95	0.23	dec	0.82	0	-0.305	1.95	3.00	0.56
1570963	1203558105	11-JUN-2016 15:28	DONE	0.01	-1	dec	0.82	0	-0.305	1.95	3.00	0.56
1572736	1203562680	11-JUN-2016 17:31	DONE	1.05	0.41	dec	0.82	0	-0.305	1.95	3.00	0.56
1573846	1203565617	13-JUN-2016 10:56	DONE	0.24	-1	dec	0.82	0	-0.305	1.95	3.00	0.56
1572113	1203561113	13-JUN-2016 11:29	DONE	0.46	-0.65	dec	0.82	0	-0.305	1.95	3.00	0.56
1569453	1203554214	14-JUN-2016 09:28	DONE	1.3	0.85	dec	0.82	0	-0.305	1.95	3.00	0.56
1569952	1203555473	14-JUN-2016 10:33	DONE	0.59	-0.41	dec	0.82	0	-0.305	1.95	3.00	0.56
1570977	1203558136	14-JUN-2016 15:56	DONE	0.69	-0.24	dec	0.82	0	-0.305	1.95	3.00	0.56
1572169	1203561235	15-JUN-2016 07:01	DONE	0.02	-1	dec	0.82	0	-0.305	1.95	3.00	0.56
1570611	1203557213	15-JUN-2016 10:57	DONE	1.04	0.4	dec	0.82	0	-0.305	1.95	3.00	0.56
1573423	1203564604	16-JUN-2016 12:25	DONE	0.74	-0.15	dec	0.82	0	-0.305	1.95	3.00	0.56
1573769	1203565424	20-JUN-2016 08:12	DONE	0.34	-0.85	dec	0.82	0	-0.305	1.95	3.00	0.56
1575174	1203569165	20-JUN-2016 11:08	DONE	1.67	1.5	dec	0.82	0	-0.305	1.95	3.00	0.56
1575356	1203569602	20-JUN-2016 11:09	DONE	1.38	0.98	dec	0.82	0	-0.305	1.95	3.00	0.56
1572168	1203569678	20-JUN-2016 11:09	DONE	0.82	-0.01	dec	0.82	0	-0.305	1.95	3.00	0.56
1572167	1203561228	20-JUN-2016 11:21	DONE	1.6	1.4	dec	0.82	0	-0.305	1.95	3.00	0.56
1572167	1203561229	20-JUN-2016 11:21	DONE	1.66	1.5	dec	0.82	0	-0.305	1.95	3.00	0.56
1572404	1203561773	20-JUN-2016 11:40	DONE	0.26	-1	dec	0.82	0	-0.305	1.95	3.00	0.56
1568993	1203553094	22-JUN-2016 07:40	DONE	0.55	-0.49	dec	0.82	0	-0.305	1.95	3.00	0.56
1575822	1203570722	22-JUN-2016 12:00	DONE	1.22	0.7	dec	0.82	0	-0.305	1.95	3.00	0.56

Europium-152 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570600	1203557171	27-MAY-2016 15:53	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1568666	1203552276	27-MAY-2016 15:56	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57

1568665	1203552273	31-MAY-2016 08:06	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570609	1203557203	01-JUN-2016 09:30	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570974	1203558130	02-JUN-2016 12:01	DUSE	16.1	6.1	percent	0.41	0	-4.7	5.56	20.0	2.57
1570997	1203558209	02-JUN-2016 13:21	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572401	1203561764	07-JUN-2016 09:06	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572902	1203563158	08-JUN-2016 08:38	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1571641	1203559922	09-JUN-2016 08:00	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1568983	1203553076	09-JUN-2016 08:05	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1571640	1203559919	09-JUN-2016 09:30	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570966	1203558113	09-JUN-2016 15:26	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1569450	1203554208	10-JUN-2016 09:48	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570963	1203558105	11-JUN-2016 15:28	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1573846	1203565617	13-JUN-2016 10:56	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572113	1203561113	13-JUN-2016 11:29	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1569453	1203554214	14-JUN-2016 09:28	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1569952	1203555473	14-JUN-2016 10:33	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570977	1203558136	14-JUN-2016 15:56	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1573423	1203564604	16-JUN-2016 12:25	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1573769	1203565424	20-JUN-2016 08:12	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1575356	1203569602	20-JUN-2016 11:09	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572168	1203569678	20-JUN-2016 11:09	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1572404	1203561773	20-JUN-2016 11:40	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1568993	1203553094	22-JUN-2016 07:40	DONE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57
1575822	1203570722	22-JUN-2016 12:00	DUSE	0	-0.16	percent	0.41	0	-4.7	5.56	20.0	2.57

Europium-152 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0.66	-0.18	dec	0.77	0	-0.462	2	3.00	0.62
1570600	1203557171	27-MAY-2016 15:53	DUSE	1.32	0.89	dec	0.77	0	-0.462	2	3.00	0.62
1568666	1203552276	27-MAY-2016 15:56	DUSE	0.69	-0.13	dec	0.77	0	-0.462	2	3.00	0.62
1567987	1203550448	31-MAY-2016 08:05	DONE	0.2	-0.93	dec	0.77	0	-0.462	2	3.00	0.62
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.68	-0.14	dec	0.77	0	-0.462	2	3.00	0.62

1570609	1203557203	01-JUN-2016 09:30	DUSE	0.03	-1	dec	0.77	0	-0.462	2	3.00	0.62
1568667	1203552279	02-JUN-2016 11:22	DONE	1.02	0.4	dec	0.77	0	-0.462	2	3.00	0.62
1570974	1203558130	02-JUN-2016 12:01	DUSE	2.12	2.2	dec	0.77	0	-0.462	2	3.00	0.62
1570997	1203558209	02-JUN-2016 13:21	DONE	1.21	0.71	dec	0.77	0	-0.462	2	3.00	0.62
1570987	1203558177	02-JUN-2016 13:25	DONE	1.42	1.1	dec	0.77	0	-0.462	2	3.00	0.62
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.06	-1	dec	0.77	0	-0.462	2	3.00	0.62
1568982	1203553072	07-JUN-2016 09:24	DONE	1.05	0.46	dec	0.77	0	-0.462	2	3.00	0.62
1568982	1203553073	07-JUN-2016 09:25	DONE	0.6	-0.28	dec	0.77	0	-0.462	2	3.00	0.62
1572902	1203563158	08-JUN-2016 08:38	DONE	1.42	1.1	dec	0.77	0	-0.462	2	3.00	0.62
1570439	1203556720	09-JUN-2016 07:37	DONE	0.32	-0.74	dec	0.77	0	-0.462	2	3.00	0.62
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.31	-0.74	dec	0.77	0	-0.462	2	3.00	0.62
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.21	-0.9	dec	0.77	0	-0.462	2	3.00	0.62
1571640	1203559919	09-JUN-2016 09:30	DONE	0.37	-0.64	dec	0.77	0	-0.462	2	3.00	0.62
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.27	-0.81	dec	0.77	0	-0.462	2	3.00	0.62
1569450	1203554208	10-JUN-2016 09:48	DUSE	0.65	-0.19	dec	0.77	0	-0.462	2	3.00	0.62
1570963	1203558105	11-JUN-2016 15:28	DONE	0.11	-1	dec	0.77	0	-0.462	2	3.00	0.62
1572736	1203562680	11-JUN-2016 17:31	DONE	0.14	-1	dec	0.77	0	-0.462	2	3.00	0.62
1573846	1203565617	13-JUN-2016 10:56	DUSE	0.45	-0.51	dec	0.77	0	-0.462	2	3.00	0.62
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.11	-1	dec	0.77	0	-0.462	2	3.00	0.62
1569453	1203554214	14-JUN-2016 09:28	DONE	1.44	1.1	dec	0.77	0	-0.462	2	3.00	0.62
1569952	1203555473	14-JUN-2016 10:33	DONE	1.01	0.39	dec	0.77	0	-0.462	2	3.00	0.62
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.25	-0.84	dec	0.77	0	-0.462	2	3.00	0.62
1572169	1203561235	15-JUN-2016 07:01	DONE	1.87	1.8	dec	0.77	0	-0.462	2	3.00	0.62
1570611	1203557213	15-JUN-2016 10:57	DONE	0.94	0.28	dec	0.77	0	-0.462	2	3.00	0.62
1573423	1203564604	16-JUN-2016 12:25	DONE	0.06	-1	dec	0.77	0	-0.462	2	3.00	0.62
1573769	1203565424	20-JUN-2016 08:12	DUSE	0.88	0.18	dec	0.77	0	-0.462	2	3.00	0.62
1575174	1203569165	20-JUN-2016 11:08	DONE	0.34	-0.7	dec	0.77	0	-0.462	2	3.00	0.62
1575356	1203569602	20-JUN-2016 11:09	DONE	0.05	-1	dec	0.77	0	-0.462	2	3.00	0.62
1572168	1203569678	20-JUN-2016 11:09	DUSE	2.07	2.1	dec	0.77	0	-0.462	2	3.00	0.62
1572167	1203561228	20-JUN-2016 11:21	DONE	1.6	1.3	dec	0.77	0	-0.462	2	3.00	0.62
1572167	1203561229	20-JUN-2016 11:21	DONE	1.31	0.88	dec	0.77	0	-0.462	2	3.00	0.62
1572404	1203561773	20-JUN-2016 11:40	DONE	0.86	0.14	dec	0.77	0	-0.462	2	3.00	0.62
1568993	1203553094	22-JUN-2016 07:40	DONE	1.72	1.5	dec	0.77	0	-0.462	2	3.00	0.62
1575822	1203570722	22-JUN-2016 12:00	DUSE	0.17	-0.98	dec	0.77	0	-0.462	2	3.00	0.62

Europium-154 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0		percent	0	0	0	0	20.0	0
1570600	1203557171	27-MAY-2016 15:53	DUSE	0		percent	0	0	0	0	20.0	0
1568666	1203552276	27-MAY-2016 15:56	DUSE	0		percent	0	0	0	0	20.0	0
1567987	1203550448	31-MAY-2016 08:05	DONE	0		percent	0	0	0	0	20.0	0
1568665	1203552273	31-MAY-2016 08:06	DUSE	0		percent	0	0	0	0	20.0	0
1570609	1203557203	01-JUN-2016 09:30	DUSE	0		percent	0	0	0	0	20.0	0

1568667	1203552279	02-JUN-2016 11:22	DONE	0		percent	0	0	0	0	20.0	0
1570974	1203558130	02-JUN-2016 12:01	DUSE	0		percent	0	0	0	0	20.0	0
1570997	1203558209	02-JUN-2016 13:21	DONE	0		percent	0	0	0	0	20.0	0
1570987	1203558177	02-JUN-2016 13:25	DONE	0		percent	0	0	0	0	20.0	0
1572401	1203561764	07-JUN-2016 09:06	DUSE	0		percent	0	0	0	0	20.0	0
1568982	1203553072	07-JUN-2016 09:24	DONE	0		percent	0	0	0	0	20.0	0
1568982	1203553073	07-JUN-2016 09:25	DONE	0		percent	0	0	0	0	20.0	0
1572902	1203563158	08-JUN-2016 08:38	DONE	0		percent	0	0	0	0	20.0	0
1570439	1203556720	09-JUN-2016 07:37	DONE	0		percent	0	0	0	0	20.0	0
1571641	1203559922	09-JUN-2016 08:00	DUSE	0		percent	0	0	0	0	20.0	0
1568983	1203553076	09-JUN-2016 08:05	DUSE	0		percent	0	0	0	0	20.0	0
1571640	1203559919	09-JUN-2016 09:30	DONE	0		percent	0	0	0	0	20.0	0
1570966	1203558113	09-JUN-2016 15:26	DUSE	0		percent	0	0	0	0	20.0	0
1569450	1203554208	10-JUN-2016 09:48	DUSE	0		percent	0	0	0	0	20.0	0
1570963	1203558105	11-JUN-2016 15:28	DONE	0		percent	0	0	0	0	20.0	0
1572736	1203562680	11-JUN-2016 17:31	DONE	0		percent	0	0	0	0	20.0	0
1573846	1203565617	13-JUN-2016 10:56	DUSE	0		percent	0	0	0	0	20.0	0
1572113	1203561113	13-JUN-2016 11:29	DUSE	0		percent	0	0	0	0	20.0	0
1569453	1203554214	14-JUN-2016 09:28	DONE	0		percent	0	0	0	0	20.0	0
1569952	1203555473	14-JUN-2016 10:33	DONE	0		percent	0	0	0	0	20.0	0
1570977	1203558136	14-JUN-2016 15:56	DUSE	0		percent	0	0	0	0	20.0	0
1572169	1203561235	15-JUN-2016 07:01	DONE	0		percent	0	0	0	0	20.0	0
1570611	1203557213	15-JUN-2016 10:57	DONE	0		percent	0	0	0	0	20.0	0
1573423	1203564604	16-JUN-2016 12:25	DONE	0		percent	0	0	0	0	20.0	0
1573769	1203565424	20-JUN-2016 08:12	DUSE	0		percent	0	0	0	0	20.0	0
1575174	1203569165	20-JUN-2016 11:08	DONE	0		percent	0	0	0	0	20.0	0
1575356	1203569602	20-JUN-2016 11:09	DONE	0		percent	0	0	0	0	20.0	0
1572168	1203569678	20-JUN-2016 11:09	DUSE	0		percent	0	0	0	0	20.0	0
1572167	1203561228	20-JUN-2016 11:21	DONE	0		percent	0	0	0	0	20.0	0
1572167	1203561229	20-JUN-2016 11:21	DONE	0		percent	0	0	0	0	20.0	0
1572404	1203561773	20-JUN-2016 11:40	DONE	0		percent	0	0	0	0	20.0	0
1568993	1203553094	22-JUN-2016 07:40	DONE	0		percent	0	0	0	0	20.0	0
1575822	1203570722	22-JUN-2016 12:00	DUSE	0		percent	0	0	0	0	20.0	0

Europium-154 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0.37	-0.67	dec	0.79	0	-0.457	2.04	3.00	0.63
1570600	1203557171	27-MAY-2016 15:53	DUSE	0.54	-0.41	dec	0.79	0	-0.457	2.04	3.00	0.63
1568666	1203552276	27-MAY-2016 15:56	DUSE	1.28	0.77	dec	0.79	0	-0.457	2.04	3.00	0.63
1567987	1203550448	31-MAY-2016 08:05	DONE	0.2	-0.94	dec	0.79	0	-0.457	2.04	3.00	0.63
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.13	-1	dec	0.79	0	-0.457	2.04	3.00	0.63
1570609	1203557203	01-JUN-2016 09:30	DUSE	2.23	2.3	dec	0.79	0	-0.457	2.04	3.00	0.63
1568667	1203552279	02-JUN-2016 11:22	DONE	1.63	1.3	dec	0.79	0	-0.457	2.04	3.00	0.63

1570974	1203558130	02-JUN-2016 12:01	DUSE	1.14	0.56	dec	0.79	0	-0.457	2.04	3.00	0.63
1570997	1203558209	02-JUN-2016 13:21	DONE	1.23	0.71	dec	0.79	0	-0.457	2.04	3.00	0.63
1570987	1203558177	02-JUN-2016 13:25	DONE	0.53	-0.42	dec	0.79	0	-0.457	2.04	3.00	0.63
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.18	-0.98	dec	0.79	0	-0.457	2.04	3.00	0.63
1568982	1203553072	07-JUN-2016 09:24	DONE	0.62	-0.27	dec	0.79	0	-0.457	2.04	3.00	0.63
1568982	1203553073	07-JUN-2016 09:25	DONE	0.64	-0.25	dec	0.79	0	-0.457	2.04	3.00	0.63
1572902	1203563158	08-JUN-2016 08:38	DONE	0.61	-0.3	dec	0.79	0	-0.457	2.04	3.00	0.63
1570439	1203556720	09-JUN-2016 07:37	DONE	0.78	-0.03	dec	0.79	0	-0.457	2.04	3.00	0.63
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.87	0.13	dec	0.79	0	-0.457	2.04	3.00	0.63
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.04	-1	dec	0.79	0	-0.457	2.04	3.00	0.63
1571640	1203559919	09-JUN-2016 09:30	DONE	0.89	0.15	dec	0.79	0	-0.457	2.04	3.00	0.63
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.1	-1	dec	0.79	0	-0.457	2.04	3.00	0.63
1569450	1203554208	10-JUN-2016 09:48	DUSE	0.53	-0.42	dec	0.79	0	-0.457	2.04	3.00	0.63
1570963	1203558105	11-JUN-2016 15:28	DONE	1.39	0.95	dec	0.79	0	-0.457	2.04	3.00	0.63
1572736	1203562680	11-JUN-2016 17:31	DONE	1.07	0.44	dec	0.79	0	-0.457	2.04	3.00	0.63
1573846	1203565617	13-JUN-2016 10:56	DUSE	0.48	-0.49	dec	0.79	0	-0.457	2.04	3.00	0.63
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.85	0.08	dec	0.79	0	-0.457	2.04	3.00	0.63
1569453	1203554214	14-JUN-2016 09:28	DONE	0.97	0.28	dec	0.79	0	-0.457	2.04	3.00	0.63
1569952	1203555473	14-JUN-2016 10:33	DONE	0.36	-0.7	dec	0.79	0	-0.457	2.04	3.00	0.63
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.16	-1	dec	0.79	0	-0.457	2.04	3.00	0.63
1572169	1203561235	15-JUN-2016 07:01	DONE	0.3	-0.78	dec	0.79	0	-0.457	2.04	3.00	0.63
1570611	1203557213	15-JUN-2016 10:57	DONE	1.4	0.98	dec	0.79	0	-0.457	2.04	3.00	0.63
1573423	1203564604	16-JUN-2016 12:25	DONE	0.01	-1	dec	0.79	0	-0.457	2.04	3.00	0.63
1573769	1203565424	20-JUN-2016 08:12	DUSE	0.31	-0.78	dec	0.79	0	-0.457	2.04	3.00	0.63
1575174	1203569165	20-JUN-2016 11:08	DONE	0.98	0.3	dec	0.79	0	-0.457	2.04	3.00	0.63
1575356	1203569602	20-JUN-2016 11:09	DONE	0.26	-0.85	dec	0.79	0	-0.457	2.04	3.00	0.63
1572168	1203569678	20-JUN-2016 11:09	DUSE	1.77	1.6	dec	0.79	0	-0.457	2.04	3.00	0.63
1572167	1203561228	20-JUN-2016 11:21	DONE	2.73	3.1	dec	0.79	0	-0.457	2.04	3.00	0.63
1572167	1203561229	20-JUN-2016 11:21	DONE	0.01	-1	dec	0.79	0	-0.457	2.04	3.00	0.63
1572404	1203561773	20-JUN-2016 11:40	DONE	1.41	0.99	dec	0.79	0	-0.457	2.04	3.00	0.63
1568993	1203553094	22-JUN-2016 07:40	DONE	1.24	0.71	dec	0.79	0	-0.457	2.04	3.00	0.63
1575822	1203570722	22-JUN-2016 12:00	DUSE	0.68	-0.17	dec	0.79	0	-0.457	2.04	3.00	0.63

Europium-155 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570600	1203557171	27-MAY-2016 15:53	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1568666	1203552276	27-MAY-2016 15:56	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1568665	1203552273	31-MAY-2016 08:06	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570609	1203557203	01-JUN-2016 09:30	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570974	1203558130	02-JUN-2016 12:01	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36

1570997	1203558209	02-JUN-2016 13:21	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572401	1203561764	07-JUN-2016 09:06	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572902	1203563158	08-JUN-2016 08:38	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1571641	1203559922	09-JUN-2016 08:00	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1568983	1203553076	09-JUN-2016 08:05	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1571640	1203559919	09-JUN-2016 09:30	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570966	1203558113	09-JUN-2016 15:26	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1569450	1203554208	10-JUN-2016 09:48	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570963	1203558105	11-JUN-2016 15:28	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1573846	1203565617	13-JUN-2016 10:56	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572113	1203561113	13-JUN-2016 11:29	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1569453	1203554214	14-JUN-2016 09:28	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1569952	1203555473	14-JUN-2016 10:33	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570977	1203558136	14-JUN-2016 15:56	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1573423	1203564604	16-JUN-2016 12:25	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1573769	1203565424	20-JUN-2016 08:12	DUSE	33.5	6.1	percent	0.86	0	-9.9	11.6	20.0	5.36
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1575356	1203569602	20-JUN-2016 11:09	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572168	1203569678	20-JUN-2016 11:09	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1572404	1203561773	20-JUN-2016 11:40	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1568993	1203553094	22-JUN-2016 07:40	DONE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36
1575822	1203570722	22-JUN-2016 12:00	DUSE	0	-0.16	percent	0.86	0	-9.9	11.6	20.0	5.36

Europium-155 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0.93	0.46	dec	0.68	0	-0.424	1.78	3.00	0.55
1570600	1203557171	27-MAY-2016 15:53	DUSE	0.14	-0.98	dec	0.68	0	-0.424	1.78	3.00	0.55
1568666	1203552276	27-MAY-2016 15:56	DUSE	0.76	0.14	dec	0.68	0	-0.424	1.78	3.00	0.55
1567987	1203550448	31-MAY-2016 08:05	DONE	0.2	-0.87	dec	0.68	0	-0.424	1.78	3.00	0.55
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.58	-0.18	dec	0.68	0	-0.424	1.78	3.00	0.55
1570609	1203557203	01-JUN-2016 09:30	DUSE	0.41	-0.49	dec	0.68	0	-0.424	1.78	3.00	0.55
1568667	1203552279	02-JUN-2016 11:22	DONE	0.36	-0.58	dec	0.68	0	-0.424	1.78	3.00	0.55
1570974	1203558130	02-JUN-2016 12:01	DUSE	0.29	-0.7	dec	0.68	0	-0.424	1.78	3.00	0.55
1570997	1203558209	02-JUN-2016 13:21	DONE	0.95	0.5	dec	0.68	0	-0.424	1.78	3.00	0.55

1570987	1203558177	02-JUN-2016 13:25	DONE	0.53	-0.27	dec	0.68	0	-0.424	1.78	3.00	0.55
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.18	-0.91	dec	0.68	0	-0.424	1.78	3.00	0.55
1568982	1203553072	07-JUN-2016 09:24	DONE	0.87	0.34	dec	0.68	0	-0.424	1.78	3.00	0.55
1568982	1203553073	07-JUN-2016 09:25	DONE	0.09	-1	dec	0.68	0	-0.424	1.78	3.00	0.55
1572902	1203563158	08-JUN-2016 08:38	DONE	2.02	2.4	dec	0.68	0	-0.424	1.78	3.00	0.55
1570439	1203556720	09-JUN-2016 07:37	DONE	0.42	-0.46	dec	0.68	0	-0.424	1.78	3.00	0.55
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.09	-1	dec	0.68	0	-0.424	1.78	3.00	0.55
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.18	-0.9	dec	0.68	0	-0.424	1.78	3.00	0.55
1571640	1203559919	09-JUN-2016 09:30	DONE	0.11	-1	dec	0.68	0	-0.424	1.78	3.00	0.55
1570966	1203558113	09-JUN-2016 15:26	DUSE	1.01	0.61	dec	0.68	0	-0.424	1.78	3.00	0.55
1569450	1203554208	10-JUN-2016 09:48	DUSE	2.07	2.5	dec	0.68	0	-0.424	1.78	3.00	0.55
1570963	1203558105	11-JUN-2016 15:28	DONE	1.32	1.2	dec	0.68	0	-0.424	1.78	3.00	0.55
1572736	1203562680	11-JUN-2016 17:31	DONE	0.37	-0.56	dec	0.68	0	-0.424	1.78	3.00	0.55
1573846	1203565617	13-JUN-2016 10:56	DUSE	0.08	-1	dec	0.68	0	-0.424	1.78	3.00	0.55
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.34	-0.61	dec	0.68	0	-0.424	1.78	3.00	0.55
1569453	1203554214	14-JUN-2016 09:28	DONE	0.32	-0.65	dec	0.68	0	-0.424	1.78	3.00	0.55
1569952	1203555473	14-JUN-2016 10:33	DONE	1.16	0.88	dec	0.68	0	-0.424	1.78	3.00	0.55
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.17	-0.91	dec	0.68	0	-0.424	1.78	3.00	0.55
1572169	1203561235	15-JUN-2016 07:01	DONE	0.56	-0.2	dec	0.68	0	-0.424	1.78	3.00	0.55
1570611	1203557213	15-JUN-2016 10:57	DONE	0.77	0.17	dec	0.68	0	-0.424	1.78	3.00	0.55
1573423	1203564604	16-JUN-2016 12:25	DONE	0.97	0.53	dec	0.68	0	-0.424	1.78	3.00	0.55
1573769	1203565424	20-JUN-2016 08:12	DUSE	2.32	3	dec	0.68	0	-0.424	1.78	3.00	0.55
1575174	1203569165	20-JUN-2016 11:08	DONE	0.96	0.51	dec	0.68	0	-0.424	1.78	3.00	0.55
1575356	1203569602	20-JUN-2016 11:09	DONE	1.27	1.1	dec	0.68	0	-0.424	1.78	3.00	0.55
1572168	1203569678	20-JUN-2016 11:09	DUSE	0.61	-0.12	dec	0.68	0	-0.424	1.78	3.00	0.55
1572167	1203561228	20-JUN-2016 11:21	DONE	0.56	-0.22	dec	0.68	0	-0.424	1.78	3.00	0.55
1572167	1203561229	20-JUN-2016 11:21	DONE	0.39	-0.53	dec	0.68	0	-0.424	1.78	3.00	0.55
1572404	1203561773	20-JUN-2016 11:40	DONE	0.84	0.29	dec	0.68	0	-0.424	1.78	3.00	0.55
1568993	1203553094	22-JUN-2016 07:40	DONE	0.44	-0.44	dec	0.68	0	-0.424	1.78	3.00	0.55
1575822	1203570722	22-JUN-2016 12:00	DUSE	0.79	0.2	dec	0.68	0	-0.424	1.78	3.00	0.55

Manganese-54 BLANK: Limits LCL = -441 UCL = 505

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570587	1203557131	27-MAY-2016 15:50	DUSE	2.42	-0.19	pCi/L	32.1	-440	-280	348	505	158
1567987	1203550447	27-MAY-2016 15:53	DONE	-1.2	-0.21	pCi/L	32.1	-440	-280	348	505	158
1568666	1203552275	31-MAY-2016 08:06	DUSE	0.8	-0.2	pCi/L	32.1	-440	-280	348	505	158
1568667	1203552278	31-MAY-2016 09:13	DONE	1.33	-0.2	pCi/L	32.1	-440	-280	348	505	158
1570609	1203557202	01-JUN-2016 09:29	DUSE	-1.3	-0.21	pCi/L	32.1	-440	-280	348	505	158
1570974	1203558129	02-JUN-2016 11:01	DUSE	3.66	-0.18	pCi/L	32.1	-440	-280	348	505	158
1570987	1203558176	02-JUN-2016 11:17	DONE	1.48	-0.19	pCi/L	32.1	-440	-280	348	505	158
1570997	1203558208	02-JUN-2016 11:19	DUSE	-2.1	-0.22	pCi/L	32.1	-440	-280	348	505	158
1571725	1203560160	06-JUN-2016 06:55	DUSE	-2.5	-0.22	pCi/L	32.1	-440	-280	348	505	158
1572401	1203561763	07-JUN-2016 09:06	DUSE	-0.64	-0.21	pCi/L	32.1	-440	-280	348	505	158

1568982	1203553071	07-JUN-2016 09:24	DONE	0.11	-0.2	pCi/L	32.1	-440	-280	348	505	158
1572902	1203563157	07-JUN-2016 16:02	DONE	954	5.8	pCi/L	32.1	-440	-280	348	505	158
1571641	1203559921	09-JUN-2016 08:00	DUSE	2.63	-0.19	pCi/L	32.1	-440	-280	348	505	158
1568983	1203553075	09-JUN-2016 08:01	DUSE	0.34	-0.2	pCi/L	32.1	-440	-280	348	505	158
1571640	1203559918	09-JUN-2016 09:30	DUSE	-4.9	-0.23	pCi/L	32.1	-440	-280	348	505	158
1570439	1203556718	09-JUN-2016 09:47	DONE	26.5	-0.04	pCi/L	32.1	-440	-280	348	505	158
1570966	1203558112	09-JUN-2016 15:25	DUSE	-0.289	-0.21	pCi/L	32.1	-440	-280	348	505	158
1570612	1203557221	10-JUN-2016 09:04	DONE	-0.431	-0.21	pCi/L	32.1	-440	-280	348	505	158
1569450	1203554207	10-JUN-2016 09:48	DUSE	-0.313	-0.21	pCi/L	32.1	-440	-280	348	505	158
1570963	1203558104	10-JUN-2016 13:39	DUSE	0.47	-0.2	pCi/L	32.1	-440	-280	348	505	158
1572736	1203562679	10-JUN-2016 16:05	DONE	0.31	-0.2	pCi/L	32.1	-440	-280	348	505	158
1573846	1203565616	11-JUN-2016 17:36	DUSE	0.5	-0.2	pCi/L	32.1	-440	-280	348	505	158
1573091	1203563751	13-JUN-2016 08:00	DUSE	-2.5	-0.22	pCi/L	32.1	-440	-280	348	505	158
1572113	1203561112	13-JUN-2016 08:05	DUSE	0.36	-0.2	pCi/L	32.1	-440	-280	348	505	158
1569952	1203555472	13-JUN-2016 15:43	DUSE	2.02	-0.19	pCi/L	32.1	-440	-280	348	505	158
1570977	1203558135	13-JUN-2016 15:45	DUSE	-0.004	-0.2	pCi/L	32.1	-440	-280	348	505	158
1569453	1203554213	13-JUN-2016 15:50	DONE	-1.5	-0.21	pCi/L	32.1	-440	-280	348	505	158
1572169	1203561234	15-JUN-2016 06:47	DONE	-1.6	-0.21	pCi/L	32.1	-440	-280	348	505	158
1570611	1203557212	15-JUN-2016 08:51	DONE	0.4	-0.2	pCi/L	32.1	-440	-280	348	505	158
1573423	1203564603	16-JUN-2016 12:25	DONE	1.44	-0.19	pCi/L	32.1	-440	-280	348	505	158
1573769	1203565423	20-JUN-2016 07:23	DUSE	271	1.5	pCi/L	32.1	-440	-280	348	505	158
1572168	1203561231	20-JUN-2016 08:19	DUSE	1.54	-0.19	pCi/L	32.1	-440	-280	348	505	158
1575174	1203569164	20-JUN-2016 08:20	DONE	-0.894	-0.21	pCi/L	32.1	-440	-280	348	505	158
1575356	1203569601	20-JUN-2016 08:20	DUSE	0.19	-0.2	pCi/L	32.1	-440	-280	348	505	158
1572167	1203561227	20-JUN-2016 08:30	DONE	-0.795	-0.21	pCi/L	32.1	-440	-280	348	505	158
1572404	1203561772	20-JUN-2016 11:40	DUSE	0.86	-0.2	pCi/L	32.1	-440	-280	348	505	158
1568993	1203553093	21-JUN-2016 10:29	DUSE	0.14	-0.2	pCi/L	32.1	-440	-280	348	505	158
1575822	1203570721	22-JUN-2016 09:11	DUSE	0.08	-0.2	pCi/L	32.1	-440	-280	348	505	158
1572406	1203561781	22-JUN-2016 11:21	DONE	-0.794	-0.21	pCi/L	32.1	-440	-280	348	505	158

Manganese-54 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570600	1203557171	27-MAY-2016 15:53	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1568666	1203552276	27-MAY-2016 15:56	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1568665	1203552273	31-MAY-2016 08:06	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570609	1203557203	01-JUN-2016 09:30	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570974	1203558130	02-JUN-2016 12:01	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570997	1203558209	02-JUN-2016 13:21	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572401	1203561764	07-JUN-2016 09:06	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28

1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572902	1203563158	08-JUN-2016 08:38	DONE	1.76	6.1	percent	0.05	0	-0.518	0.61	20.0	0.28
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1571641	1203559922	09-JUN-2016 08:00	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1568983	1203553076	09-JUN-2016 08:05	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1571640	1203559919	09-JUN-2016 09:30	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570966	1203558113	09-JUN-2016 15:26	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1569450	1203554208	10-JUN-2016 09:48	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570963	1203558105	11-JUN-2016 15:28	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1573846	1203565617	13-JUN-2016 10:56	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572113	1203561113	13-JUN-2016 11:29	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1569453	1203554214	14-JUN-2016 09:28	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1569952	1203555473	14-JUN-2016 10:33	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570977	1203558136	14-JUN-2016 15:56	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1573423	1203564604	16-JUN-2016 12:25	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1573769	1203565424	20-JUN-2016 08:12	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1575356	1203569602	20-JUN-2016 11:09	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572168	1203569678	20-JUN-2016 11:09	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1572404	1203561773	20-JUN-2016 11:40	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1568993	1203553094	22-JUN-2016 07:40	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28
1575822	1203570722	22-JUN-2016 12:00	DUSE	0	-0.16	percent	0.05	0	-0.518	0.61	20.0	0.28

Manganese-54 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0.94	0.48	dec	0.69	0	-0.354	1.72	3.00	0.52
1570600	1203557171	27-MAY-2016 15:53	DUSE	1.63	1.8	dec	0.69	0	-0.354	1.72	3.00	0.52
1568666	1203552276	27-MAY-2016 15:56	DUSE	0.08	-1	dec	0.69	0	-0.354	1.72	3.00	0.52
1567987	1203550448	31-MAY-2016 08:05	DONE	0.47	-0.41	dec	0.69	0	-0.354	1.72	3.00	0.52
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.37	-0.6	dec	0.69	0	-0.354	1.72	3.00	0.52
1570609	1203557203	01-JUN-2016 09:30	DUSE	0.66	-0.04	dec	0.69	0	-0.354	1.72	3.00	0.52
1568667	1203552279	02-JUN-2016 11:22	DONE	0.86	0.34	dec	0.69	0	-0.354	1.72	3.00	0.52
1570974	1203558130	02-JUN-2016 12:01	DUSE	0.63	-0.1	dec	0.69	0	-0.354	1.72	3.00	0.52
1570997	1203558209	02-JUN-2016 13:21	DUSE	1.17	0.93	dec	0.69	0	-0.354	1.72	3.00	0.52
1570987	1203558177	02-JUN-2016 13:25	DONE	1.53	1.6	dec	0.69	0	-0.354	1.72	3.00	0.52
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.27	-0.8	dec	0.69	0	-0.354	1.72	3.00	0.52
1568982	1203553072	07-JUN-2016 09:24	DONE	0.07	-1	dec	0.69	0	-0.354	1.72	3.00	0.52

1568982	1203553073	07-JUN-2016 09:25	DONE	0.9	0.41	dec	0.69	0	-0.354	1.72	3.00	0.52
1572902	1203563158	08-JUN-2016 08:38	DONE	0.33	-0.69	dec	0.69	0	-0.354	1.72	3.00	0.52
1570439	1203556720	09-JUN-2016 07:37	DONE	0.63	-0.11	dec	0.69	0	-0.354	1.72	3.00	0.52
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.78	0.18	dec	0.69	0	-0.354	1.72	3.00	0.52
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.18	-0.97	dec	0.69	0	-0.354	1.72	3.00	0.52
1571640	1203559919	09-JUN-2016 09:30	DUSE	0.97	0.54	dec	0.69	0	-0.354	1.72	3.00	0.52
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.07	-1	dec	0.69	0	-0.354	1.72	3.00	0.52
1569450	1203554208	10-JUN-2016 09:48	DUSE	2.07	2.7	dec	0.69	0	-0.354	1.72	3.00	0.52
1570963	1203558105	11-JUN-2016 15:28	DUSE	1.07	0.74	dec	0.69	0	-0.354	1.72	3.00	0.52
1572736	1203562680	11-JUN-2016 17:31	DONE	1.49	1.5	dec	0.69	0	-0.354	1.72	3.00	0.52
1573846	1203565617	13-JUN-2016 10:56	DUSE	0.43	-0.48	dec	0.69	0	-0.354	1.72	3.00	0.52
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.08	-1	dec	0.69	0	-0.354	1.72	3.00	0.52
1569453	1203554214	14-JUN-2016 09:28	DONE	0.63	-0.1	dec	0.69	0	-0.354	1.72	3.00	0.52
1569952	1203555473	14-JUN-2016 10:33	DUSE	0.59	-0.18	dec	0.69	0	-0.354	1.72	3.00	0.52
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.92	0.45	dec	0.69	0	-0.354	1.72	3.00	0.52
1572169	1203561235	15-JUN-2016 07:01	DONE	0.63	-0.11	dec	0.69	0	-0.354	1.72	3.00	0.52
1570611	1203557213	15-JUN-2016 10:57	DONE	0.53	-0.3	dec	0.69	0	-0.354	1.72	3.00	0.52
1573423	1203564604	16-JUN-2016 12:25	DONE	0.35	-0.64	dec	0.69	0	-0.354	1.72	3.00	0.52
1573769	1203565424	20-JUN-2016 08:12	DUSE	0.57	-0.23	dec	0.69	0	-0.354	1.72	3.00	0.52
1575174	1203569165	20-JUN-2016 11:08	DONE	0.4	-0.55	dec	0.69	0	-0.354	1.72	3.00	0.52
1575356	1203569602	20-JUN-2016 11:09	DUSE	0.15	-1	dec	0.69	0	-0.354	1.72	3.00	0.52
1572168	1203569678	20-JUN-2016 11:09	DUSE	1.77	2.1	dec	0.69	0	-0.354	1.72	3.00	0.52
1572167	1203561228	20-JUN-2016 11:21	DONE	0.14	-1	dec	0.69	0	-0.354	1.72	3.00	0.52
1572167	1203561229	20-JUN-2016 11:21	DONE	0.1	-1	dec	0.69	0	-0.354	1.72	3.00	0.52
1572404	1203561773	20-JUN-2016 11:40	DUSE	0.07	-1	dec	0.69	0	-0.354	1.72	3.00	0.52
1568993	1203553094	22-JUN-2016 07:40	DUSE	0.9	0.42	dec	0.69	0	-0.354	1.72	3.00	0.52
1575822	1203570722	22-JUN-2016 12:00	DUSE	1.32	1.2	dec	0.69	0	-0.354	1.72	3.00	0.52

Sodium-22 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0		percent	0	0	0	0	20.0	0
1570600	1203557171	27-MAY-2016 15:53	DUSE	0		percent	0	0	0	0	20.0	0
1568666	1203552276	27-MAY-2016 15:56	DUSE	0		percent	0	0	0	0	20.0	0
1567987	1203550448	31-MAY-2016 08:05	DONE	0		percent	0	0	0	0	20.0	0
1568665	1203552273	31-MAY-2016 08:06	DONE	0		percent	0	0	0	0	20.0	0
1570609	1203557203	01-JUN-2016 09:30	DUSE	0		percent	0	0	0	0	20.0	0
1568667	1203552279	02-JUN-2016 11:22	DONE	0		percent	0	0	0	0	20.0	0
1570974	1203558130	02-JUN-2016 12:01	DUSE	0		percent	0	0	0	0	20.0	0
1570997	1203558209	02-JUN-2016 13:21	DUSE	0		percent	0	0	0	0	20.0	0
1570987	1203558177	02-JUN-2016 13:25	DONE	0		percent	0	0	0	0	20.0	0
1572401	1203561764	07-JUN-2016 09:06	DONE	0		percent	0	0	0	0	20.0	0
1568982	1203553072	07-JUN-2016 09:24	DONE	0		percent	0	0	0	0	20.0	0
1568982	1203553073	07-JUN-2016 09:25	DONE	0		percent	0	0	0	0	20.0	0

1572902	1203563158	08-JUN-2016 08:38	DONE	0		percent	0	0	0	0	20.0	0
1570439	1203556720	09-JUN-2016 07:37	DONE	0		percent	0	0	0	0	20.0	0
1571641	1203559922	09-JUN-2016 08:00	DUSE	0		percent	0	0	0	0	20.0	0
1568983	1203553076	09-JUN-2016 08:05	DONE	0		percent	0	0	0	0	20.0	0
1571640	1203559919	09-JUN-2016 09:30	DUSE	0		percent	0	0	0	0	20.0	0
1570966	1203558113	09-JUN-2016 15:26	DUSE	0		percent	0	0	0	0	20.0	0
1569450	1203554208	10-JUN-2016 09:48	DUSE	0		percent	0	0	0	0	20.0	0
1570963	1203558105	11-JUN-2016 15:28	DUSE	0		percent	0	0	0	0	20.0	0
1572736	1203562680	11-JUN-2016 17:31	DONE	0		percent	0	0	0	0	20.0	0
1573846	1203565617	13-JUN-2016 10:56	DONE	0		percent	0	0	0	0	20.0	0
1572113	1203561113	13-JUN-2016 11:29	DUSE	0		percent	0	0	0	0	20.0	0
1569453	1203554214	14-JUN-2016 09:28	DUSE	0		percent	0	0	0	0	20.0	0
1569952	1203555473	14-JUN-2016 10:33	DUSE	0		percent	0	0	0	0	20.0	0
1570977	1203558136	14-JUN-2016 15:56	DUSE	0		percent	0	0	0	0	20.0	0
1572169	1203561235	15-JUN-2016 07:01	DUSE	0		percent	0	0	0	0	20.0	0
1570611	1203557213	15-JUN-2016 10:57	DONE	0		percent	0	0	0	0	20.0	0
1573423	1203564604	16-JUN-2016 12:25	DUSE	0		percent	0	0	0	0	20.0	0
1573769	1203565424	20-JUN-2016 08:12	DUSE	0		percent	0	0	0	0	20.0	0
1575174	1203569165	20-JUN-2016 11:08	DONE	0		percent	0	0	0	0	20.0	0
1575356	1203569602	20-JUN-2016 11:09	DUSE	0		percent	0	0	0	0	20.0	0
1572168	1203569678	20-JUN-2016 11:09	DUSE	0		percent	0	0	0	0	20.0	0
1572167	1203561228	20-JUN-2016 11:21	DONE	0		percent	0	0	0	0	20.0	0
1572167	1203561229	20-JUN-2016 11:21	DONE	0		percent	0	0	0	0	20.0	0
1572404	1203561773	20-JUN-2016 11:40	DUSE	0		percent	0	0	0	0	20.0	0
1568993	1203553094	22-JUN-2016 07:40	DUSE	0		percent	0	0	0	0	20.0	0
1575822	1203570722	22-JUN-2016 12:00	DUSE	0		percent	0	0	0	0	20.0	0

Sodium-22 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	0.47	-0.52	dec	0.78	0	-0.415	1.97	3.00	0.6
1570600	1203557171	27-MAY-2016 15:53	DUSE	0.56	-0.37	dec	0.78	0	-0.415	1.97	3.00	0.6
1568666	1203552276	27-MAY-2016 15:56	DUSE	1.33	0.94	dec	0.78	0	-0.415	1.97	3.00	0.6
1567987	1203550448	31-MAY-2016 08:05	DONE	0.45	-0.54	dec	0.78	0	-0.415	1.97	3.00	0.6
1568665	1203552273	31-MAY-2016 08:06	DONE	0.12	-1	dec	0.78	0	-0.415	1.97	3.00	0.6
1570609	1203557203	01-JUN-2016 09:30	DUSE	2.27	2.5	dec	0.78	0	-0.415	1.97	3.00	0.6
1568667	1203552279	02-JUN-2016 11:22	DONE	1.5	1.2	dec	0.78	0	-0.415	1.97	3.00	0.6
1570974	1203558130	02-JUN-2016 12:01	DUSE	1.58	1.4	dec	0.78	0	-0.415	1.97	3.00	0.6
1570997	1203558209	02-JUN-2016 13:21	DUSE	1.11	0.56	dec	0.78	0	-0.415	1.97	3.00	0.6
1570987	1203558177	02-JUN-2016 13:25	DONE	1.13	0.59	dec	0.78	0	-0.415	1.97	3.00	0.6
1572401	1203561764	07-JUN-2016 09:06	DONE	0.16	-1	dec	0.78	0	-0.415	1.97	3.00	0.6
1568982	1203553072	07-JUN-2016 09:24	DONE	0.44	-0.56	dec	0.78	0	-0.415	1.97	3.00	0.6
1568982	1203553073	07-JUN-2016 09:25	DONE	0.39	-0.64	dec	0.78	0	-0.415	1.97	3.00	0.6
1572902	1203563158	08-JUN-2016 08:38	DONE	0.66	-0.2	dec	0.78	0	-0.415	1.97	3.00	0.6

1570439	1203556720	09-JUN-2016 07:37	DONE	0.78	00	dec	0.78	0	-0.415	1.97	3.00	0.6
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.86	0.14	dec	0.78	0	-0.415	1.97	3.00	0.6
1568983	1203553076	09-JUN-2016 08:05	DONE	0.06	-1	dec	0.78	0	-0.415	1.97	3.00	0.6
1571640	1203559919	09-JUN-2016 09:30	DUSE	0.92	0.24	dec	0.78	0	-0.415	1.97	3.00	0.6
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.11	-1	dec	0.78	0	-0.415	1.97	3.00	0.6
1569450	1203554208	10-JUN-2016 09:48	DUSE	0.57	-0.35	dec	0.78	0	-0.415	1.97	3.00	0.6
1570963	1203558105	11-JUN-2016 15:28	DUSE	0.76	-0.03	dec	0.78	0	-0.415	1.97	3.00	0.6
1572736	1203562680	11-JUN-2016 17:31	DONE	0.74	-0.06	dec	0.78	0	-0.415	1.97	3.00	0.6
1573846	1203565617	13-JUN-2016 10:56	DONE	0.52	-0.44	dec	0.78	0	-0.415	1.97	3.00	0.6
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.47	-0.52	dec	0.78	0	-0.415	1.97	3.00	0.6
1569453	1203554214	14-JUN-2016 09:28	DUSE	0.74	-0.06	dec	0.78	0	-0.415	1.97	3.00	0.6
1569952	1203555473	14-JUN-2016 10:33	DUSE	0.35	-0.72	dec	0.78	0	-0.415	1.97	3.00	0.6
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.24	-0.91	dec	0.78	0	-0.415	1.97	3.00	0.6
1572169	1203561235	15-JUN-2016 07:01	DUSE	0.28	-0.84	dec	0.78	0	-0.415	1.97	3.00	0.6
1570611	1203557213	15-JUN-2016 10:57	DONE	1.13	0.59	dec	0.78	0	-0.415	1.97	3.00	0.6
1573423	1203564604	16-JUN-2016 12:25	DUSE	0.02	-1	dec	0.78	0	-0.415	1.97	3.00	0.6
1573769	1203565424	20-JUN-2016 08:12	DUSE	0.56	-0.37	dec	0.78	0	-0.415	1.97	3.00	0.6
1575174	1203569165	20-JUN-2016 11:08	DONE	0.97	0.32	dec	0.78	0	-0.415	1.97	3.00	0.6
1575356	1203569602	20-JUN-2016 11:09	DUSE	0.3	-0.79	dec	0.78	0	-0.415	1.97	3.00	0.6
1572168	1203569678	20-JUN-2016 11:09	DUSE	2.03	2.1	dec	0.78	0	-0.415	1.97	3.00	0.6
1572167	1203561228	20-JUN-2016 11:21	DONE	2.38	2.7	dec	0.78	0	-0.415	1.97	3.00	0.6
1572167	1203561229	20-JUN-2016 11:21	DONE	0.27	-0.85	dec	0.78	0	-0.415	1.97	3.00	0.6
1572404	1203561773	20-JUN-2016 11:40	DUSE	1.5	1.2	dec	0.78	0	-0.415	1.97	3.00	0.6
1568993	1203553094	22-JUN-2016 07:40	DUSE	1.2	0.72	dec	0.78	0	-0.415	1.97	3.00	0.6
1575822	1203570722	22-JUN-2016 12:00	DUSE	0.37	-0.69	dec	0.78	0	-0.415	1.97	3.00	0.6

Zinc-65 BLANK: Limits LCL = -1500 UCL = 1340

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570587	1203557131	27-MAY-2016 15:50	DUSE	-2.6	0.11	pCi/L	-56	-1500	-990	877	1340	467
1567987	1203550447	27-MAY-2016 15:53	DONE	-1.8	0.12	pCi/L	-56	-1500	-990	877	1340	467
1568666	1203552275	31-MAY-2016 08:06	DUSE	-0.028	0.12	pCi/L	-56	-1500	-990	877	1340	467
1568667	1203552278	31-MAY-2016 09:13	DONE	2.93	0.13	pCi/L	-56	-1500	-990	877	1340	467
1570609	1203557202	01-JUN-2016 09:29	DUSE	1.03	0.12	pCi/L	-56	-1500	-990	877	1340	467
1570974	1203558129	02-JUN-2016 11:01	DUSE	4.98	0.13	pCi/L	-56	-1500	-990	877	1340	467
1570987	1203558176	02-JUN-2016 11:17	DONE	5.53	0.13	pCi/L	-56	-1500	-990	877	1340	467
1570997	1203558208	02-JUN-2016 11:19	DONE	-1.2	0.12	pCi/L	-56	-1500	-990	877	1340	467
1571725	1203560160	06-JUN-2016 06:55	DUSE	17.7	0.16	pCi/L	-56	-1500	-990	877	1340	467
1572401	1203561763	07-JUN-2016 09:06	DUSE	-0.819	0.12	pCi/L	-56	-1500	-990	877	1340	467
1568982	1203553071	07-JUN-2016 09:24	DONE	3.42	0.13	pCi/L	-56	-1500	-990	877	1340	467
1572902	1203563157	07-JUN-2016 16:02	DONE	-2797	-6	pCi/L	-56	-1500	-990	877	1340	467
1571641	1203559921	09-JUN-2016 08:00	DUSE	-1.7	0.12	pCi/L	-56	-1500	-990	877	1340	467
1568983	1203553075	09-JUN-2016 08:01	DUSE	-2.2	0.11	pCi/L	-56	-1500	-990	877	1340	467
1571640	1203559918	09-JUN-2016 09:30	DONE	-16	0.09	pCi/L	-56	-1500	-990	877	1340	467

1570439	1203556718	09-JUN-2016 09:47	DONE	744	1.7	pCi/L	-56	-1500	-990	877	1340	467
1570966	1203558112	09-JUN-2016 15:25	DUSE	3.13	0.13	pCi/L	-56	-1500	-990	877	1340	467
1570612	1203557221	10-JUN-2016 09:04	DONE	3.63	0.13	pCi/L	-56	-1500	-990	877	1340	467
1569450	1203554207	10-JUN-2016 09:48	DUSE	-2.2	0.11	pCi/L	-56	-1500	-990	877	1340	467
1570963	1203558104	10-JUN-2016 13:39	DUSE	4.83	0.13	pCi/L	-56	-1500	-990	877	1340	467
1572736	1203562679	10-JUN-2016 16:05	DONE	0.48	0.12	pCi/L	-56	-1500	-990	877	1340	467
1573846	1203565616	11-JUN-2016 17:36	DUSE	-0.387	0.12	pCi/L	-56	-1500	-990	877	1340	467
1573091	1203563751	13-JUN-2016 08:00	DUSE	0.12	0.12	pCi/L	-56	-1500	-990	877	1340	467
1572113	1203561112	13-JUN-2016 08:05	DUSE	-6.6	0.11	pCi/L	-56	-1500	-990	877	1340	467
1569952	1203555472	13-JUN-2016 15:43	DUSE	-0.88	0.12	pCi/L	-56	-1500	-990	877	1340	467
1570977	1203558135	13-JUN-2016 15:45	DUSE	-0.583	0.12	pCi/L	-56	-1500	-990	877	1340	467
1569453	1203554213	13-JUN-2016 15:50	DONE	-1.4	0.12	pCi/L	-56	-1500	-990	877	1340	467
1572169	1203561234	15-JUN-2016 06:47	DONE	-4.1	0.11	pCi/L	-56	-1500	-990	877	1340	467
1570611	1203557212	15-JUN-2016 08:51	DONE	2.17	0.12	pCi/L	-56	-1500	-990	877	1340	467
1573423	1203564603	16-JUN-2016 12:25	DONE	-1.2	0.12	pCi/L	-56	-1500	-990	877	1340	467
1573769	1203565423	20-JUN-2016 07:23	DUSE	-134	-0.17	pCi/L	-56	-1500	-990	877	1340	467
1572168	1203561231	20-JUN-2016 08:19	DUSE	-0.969	0.12	pCi/L	-56	-1500	-990	877	1340	467
1575174	1203569164	20-JUN-2016 08:20	DONE	-1.8	0.12	pCi/L	-56	-1500	-990	877	1340	467
1575356	1203569601	20-JUN-2016 08:20	DUSE	12.8	0.15	pCi/L	-56	-1500	-990	877	1340	467
1572167	1203561227	20-JUN-2016 08:30	DONE	-0.735	0.12	pCi/L	-56	-1500	-990	877	1340	467
1572404	1203561772	20-JUN-2016 11:40	DUSE	-3	0.11	pCi/L	-56	-1500	-990	877	1340	467
1568993	1203553093	21-JUN-2016 10:29	DUSE	-0.867	0.12	pCi/L	-56	-1500	-990	877	1340	467
1575822	1203570721	22-JUN-2016 09:11	DUSE	2.3	0.12	pCi/L	-56	-1500	-990	877	1340	467
1572406	1203561781	22-JUN-2016 11:21	DONE	-3	0.11	pCi/L	-56	-1500	-990	877	1340	467

Zinc-65 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1567985	1203550443	27-MAY-2016 15:53	DUSE	134	6.1	percent	3.78	0	-39	46.8	20.0	21.5
1570600	1203557171	27-MAY-2016 15:53	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1568666	1203552276	27-MAY-2016 15:56	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1567987	1203550448	31-MAY-2016 08:05	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1568665	1203552273	31-MAY-2016 08:06	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570609	1203557203	01-JUN-2016 09:30	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1568667	1203552279	02-JUN-2016 11:22	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570974	1203558130	02-JUN-2016 12:01	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570997	1203558209	02-JUN-2016 13:21	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570987	1203558177	02-JUN-2016 13:25	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572401	1203561764	07-JUN-2016 09:06	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1568982	1203553072	07-JUN-2016 09:24	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1568982	1203553073	07-JUN-2016 09:25	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572902	1203563158	08-JUN-2016 08:38	DONE	13.6	0.45	percent	3.78	0	-39	46.8	20.0	21.5
1570439	1203556720	09-JUN-2016 07:37	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1571641	1203559922	09-JUN-2016 08:00	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5

1568983	1203553076	09-JUN-2016 08:05	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1571640	1203559919	09-JUN-2016 09:30	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570966	1203558113	09-JUN-2016 15:26	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1569450	1203554208	10-JUN-2016 09:48	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570963	1203558105	11-JUN-2016 15:28	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572736	1203562680	11-JUN-2016 17:31	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1573846	1203565617	13-JUN-2016 10:56	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572113	1203561113	13-JUN-2016 11:29	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1569453	1203554214	14-JUN-2016 09:28	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1569952	1203555473	14-JUN-2016 10:33	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570977	1203558136	14-JUN-2016 15:56	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572169	1203561235	15-JUN-2016 07:01	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1570611	1203557213	15-JUN-2016 10:57	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1573423	1203564604	16-JUN-2016 12:25	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1573769	1203565424	20-JUN-2016 08:12	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1575174	1203569165	20-JUN-2016 11:08	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1575356	1203569602	20-JUN-2016 11:09	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572168	1203569678	20-JUN-2016 11:09	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572167	1203561228	20-JUN-2016 11:21	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572167	1203561229	20-JUN-2016 11:21	DONE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1572404	1203561773	20-JUN-2016 11:40	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1568993	1203553094	22-JUN-2016 07:40	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5
1575822	1203570722	22-JUN-2016 12:00	DUSE	0	-0.18	percent	3.78	0	-39	46.8	20.0	21.5

Zinc-65 RER: Limits LCL = 0 UCL = 3.00

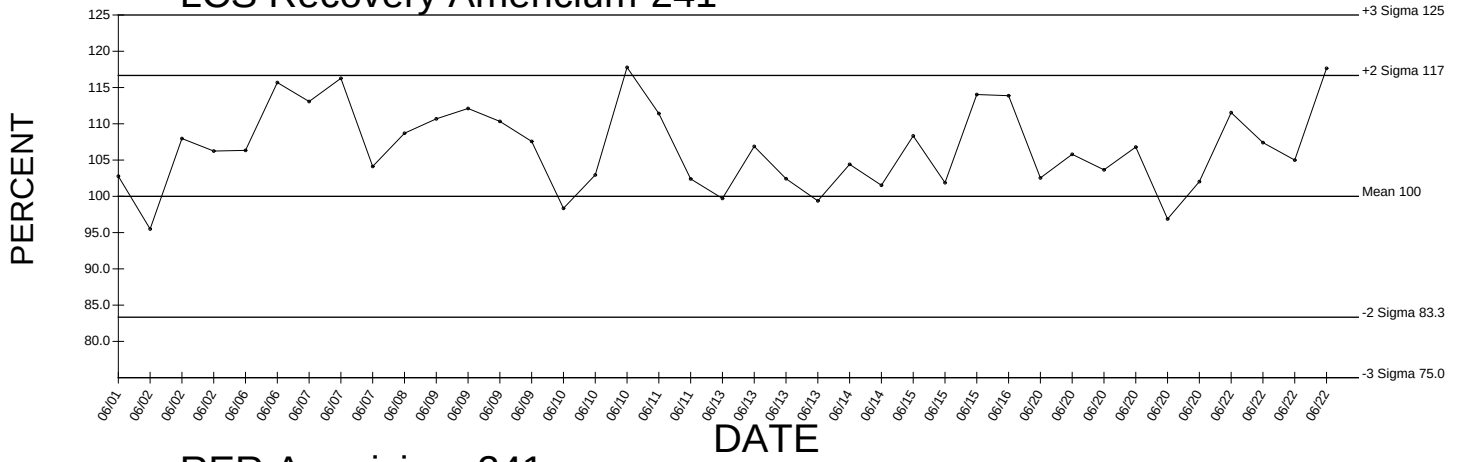
Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
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1570600	1203557171	27-MAY-2016 15:53	DUSE	1.04	0.53	dec	0.7	0	-0.606	2	3.00	0.65
1568666	1203552276	27-MAY-2016 15:56	DUSE	1.22	0.8	dec	0.7	0	-0.606	2	3.00	0.65
1567987	1203550448	31-MAY-2016 08:05	DONE	0.25	-0.69	dec	0.7	0	-0.606	2	3.00	0.65
1568665	1203552273	31-MAY-2016 08:06	DUSE	0.36	-0.51	dec	0.7	0	-0.606	2	3.00	0.65
1570609	1203557203	01-JUN-2016 09:30	DUSE	0.4	-0.46	dec	0.7	0	-0.606	2	3.00	0.65
1568667	1203552279	02-JUN-2016 11:22	DONE	0.89	0.28	dec	0.7	0	-0.606	2	3.00	0.65
1570974	1203558130	02-JUN-2016 12:01	DUSE	0.2	-0.76	dec	0.7	0	-0.606	2	3.00	0.65
1570997	1203558209	02-JUN-2016 13:21	DONE	0.35	-0.54	dec	0.7	0	-0.606	2	3.00	0.65
1570987	1203558177	02-JUN-2016 13:25	DONE	0.26	-0.67	dec	0.7	0	-0.606	2	3.00	0.65
1572401	1203561764	07-JUN-2016 09:06	DUSE	0.47	-0.35	dec	0.7	0	-0.606	2	3.00	0.65
1568982	1203553072	07-JUN-2016 09:24	DONE	0.02	-1	dec	0.7	0	-0.606	2	3.00	0.65
1568982	1203553073	07-JUN-2016 09:25	DONE	1.34	0.99	dec	0.7	0	-0.606	2	3.00	0.65
1572902	1203563158	08-JUN-2016 08:38	DONE	0.73	0.05	dec	0.7	0	-0.606	2	3.00	0.65
1570439	1203556720	09-JUN-2016 07:37	DONE	0.63	-0.11	dec	0.7	0	-0.606	2	3.00	0.65
1571641	1203559922	09-JUN-2016 08:00	DUSE	0.75	0.08	dec	0.7	0	-0.606	2	3.00	0.65
1568983	1203553076	09-JUN-2016 08:05	DUSE	0.21	-0.75	dec	0.7	0	-0.606	2	3.00	0.65

1571640	1203559919	09-JUN-2016 09:30	DONE	0.09	-0.94	dec	0.7	0	-0.606	2	3.00	0.65
1570966	1203558113	09-JUN-2016 15:26	DUSE	0.05	-0.99	dec	0.7	0	-0.606	2	3.00	0.65
1569450	1203554208	10-JUN-2016 09:48	DUSE	0.3	-0.61	dec	0.7	0	-0.606	2	3.00	0.65
1570963	1203558105	11-JUN-2016 15:28	DUSE	0.82	0.19	dec	0.7	0	-0.606	2	3.00	0.65
1572736	1203562680	11-JUN-2016 17:31	DONE	1.2	0.76	dec	0.7	0	-0.606	2	3.00	0.65
1573846	1203565617	13-JUN-2016 10:56	DUSE	0.18	-0.8	dec	0.7	0	-0.606	2	3.00	0.65
1572113	1203561113	13-JUN-2016 11:29	DUSE	0.92	0.35	dec	0.7	0	-0.606	2	3.00	0.65
1569453	1203554214	14-JUN-2016 09:28	DONE	0.16	-0.83	dec	0.7	0	-0.606	2	3.00	0.65
1569952	1203555473	14-JUN-2016 10:33	DUSE	0.99	0.44	dec	0.7	0	-0.606	2	3.00	0.65
1570977	1203558136	14-JUN-2016 15:56	DUSE	0.39	-0.48	dec	0.7	0	-0.606	2	3.00	0.65
1572169	1203561235	15-JUN-2016 07:01	DONE	1.25	0.85	dec	0.7	0	-0.606	2	3.00	0.65
1570611	1203557213	15-JUN-2016 10:57	DONE	0.98	0.42	dec	0.7	0	-0.606	2	3.00	0.65
1573423	1203564604	16-JUN-2016 12:25	DONE	1.03	0.51	dec	0.7	0	-0.606	2	3.00	0.65
1573769	1203565424	20-JUN-2016 08:12	DUSE	0.86	0.25	dec	0.7	0	-0.606	2	3.00	0.65
1575174	1203569165	20-JUN-2016 11:08	DONE	1.17	0.72	dec	0.7	0	-0.606	2	3.00	0.65
1575356	1203569602	20-JUN-2016 11:09	DUSE	0.61	-0.14	dec	0.7	0	-0.606	2	3.00	0.65
1572168	1203569678	20-JUN-2016 11:09	DUSE	0.97	0.42	dec	0.7	0	-0.606	2	3.00	0.65
1572167	1203561228	20-JUN-2016 11:21	DONE	0.3	-0.61	dec	0.7	0	-0.606	2	3.00	0.65
1572167	1203561229	20-JUN-2016 11:21	DONE	1.22	0.79	dec	0.7	0	-0.606	2	3.00	0.65
1572404	1203561773	20-JUN-2016 11:40	DUSE	0.02	-1	dec	0.7	0	-0.606	2	3.00	0.65
1568993	1203553094	22-JUN-2016 07:40	DUSE	0.78	0.13	dec	0.7	0	-0.606	2	3.00	0.65
1575822	1203570722	22-JUN-2016 12:00	DUSE	0.08	-0.95	dec	0.7	0	-0.606	2	3.00	0.65

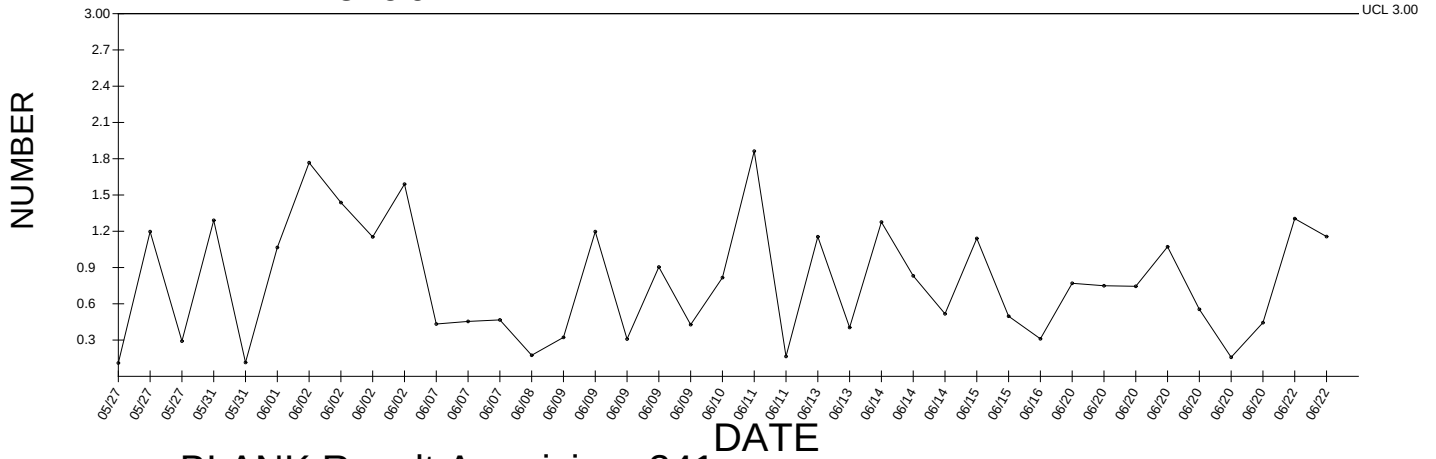
Gamma Spec Liquids GSCGAMML

LCS Recovery Americium-241

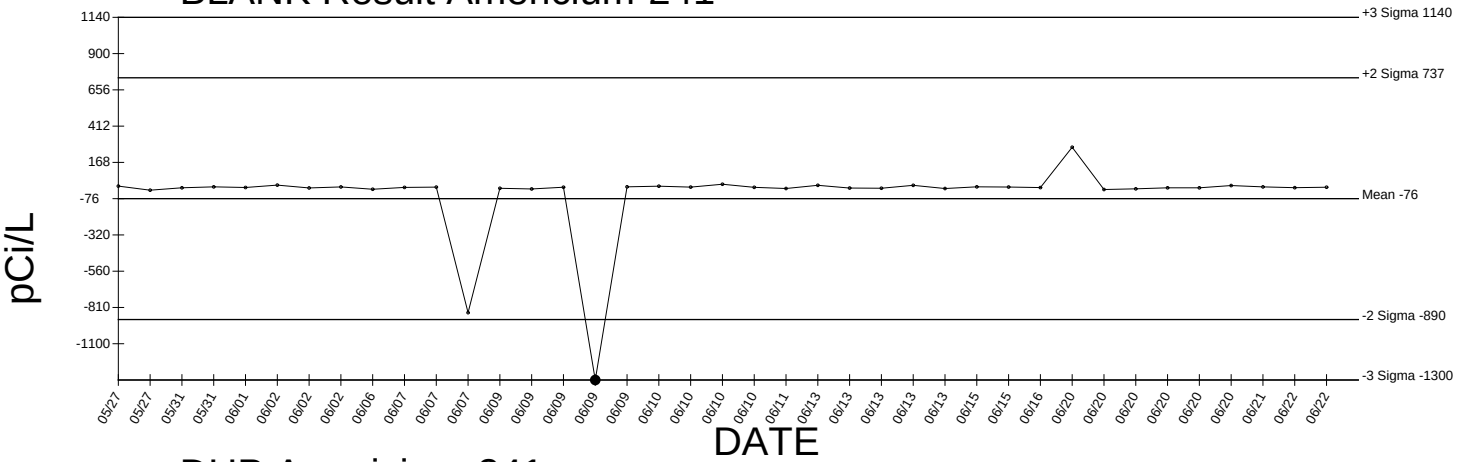
Generated 06/27/2016



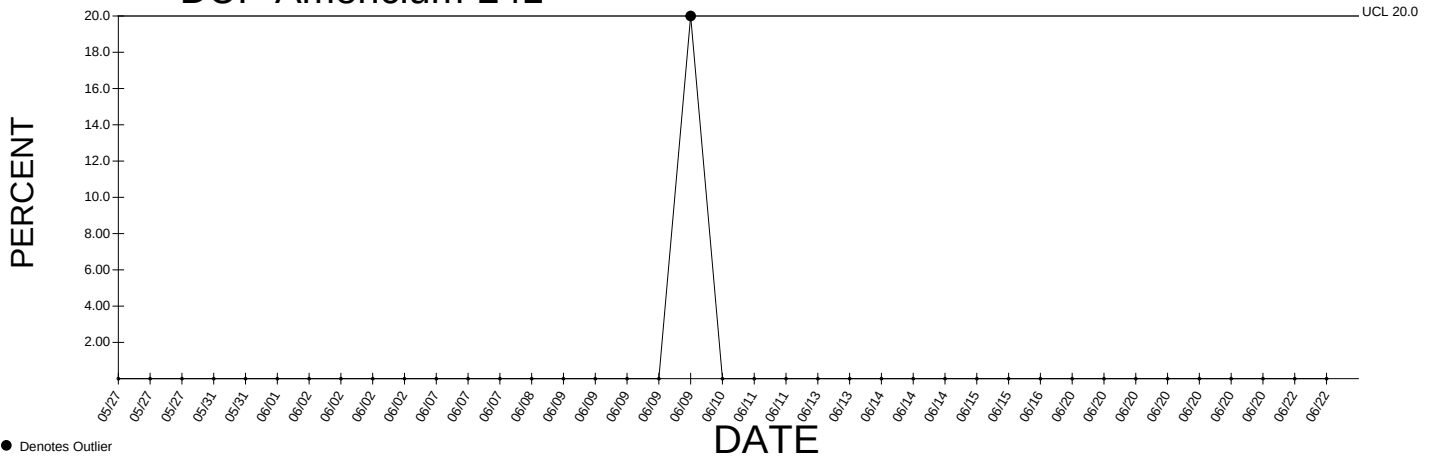
RER Americium-241



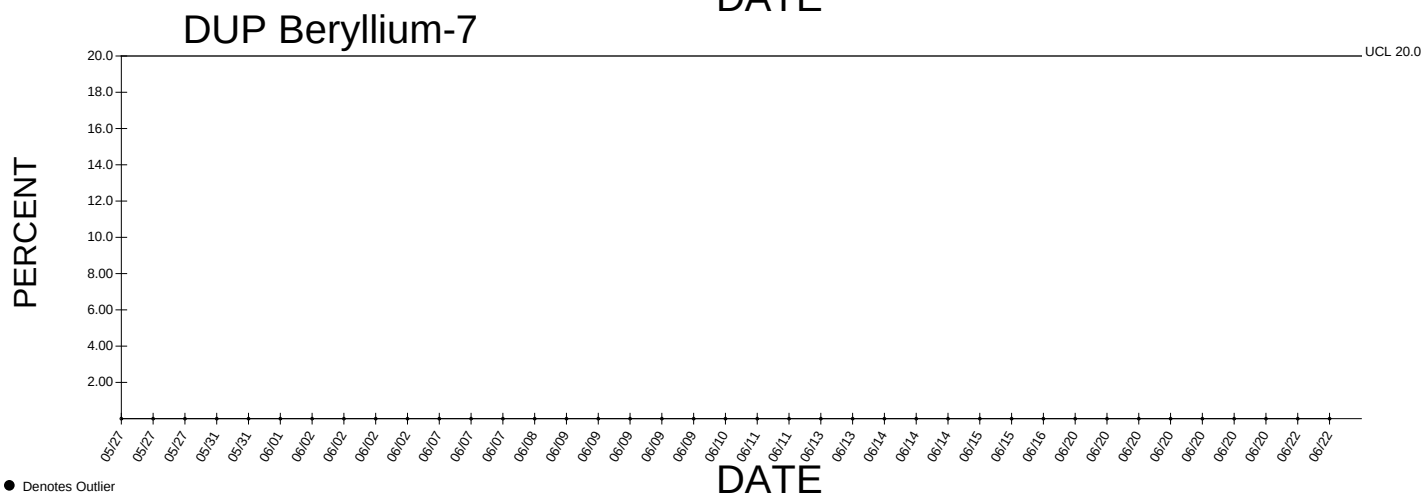
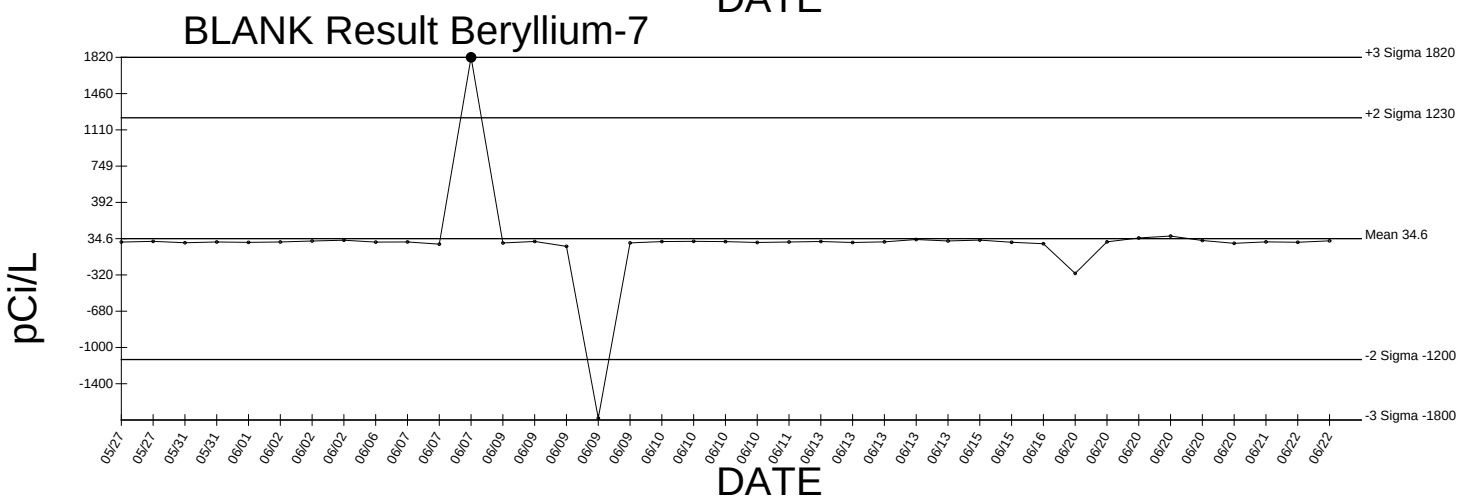
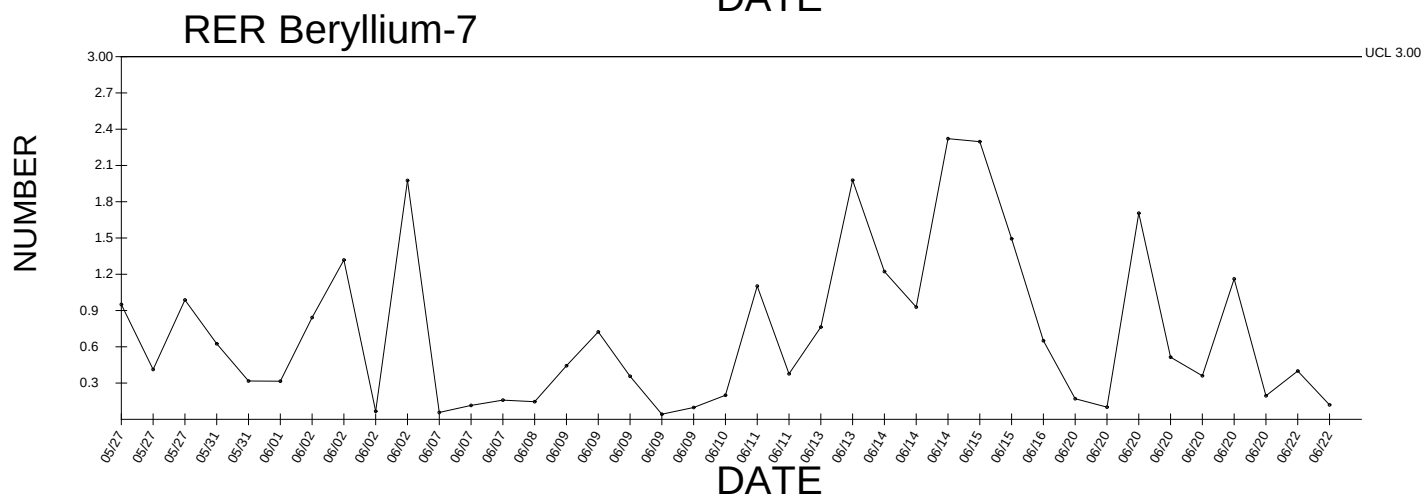
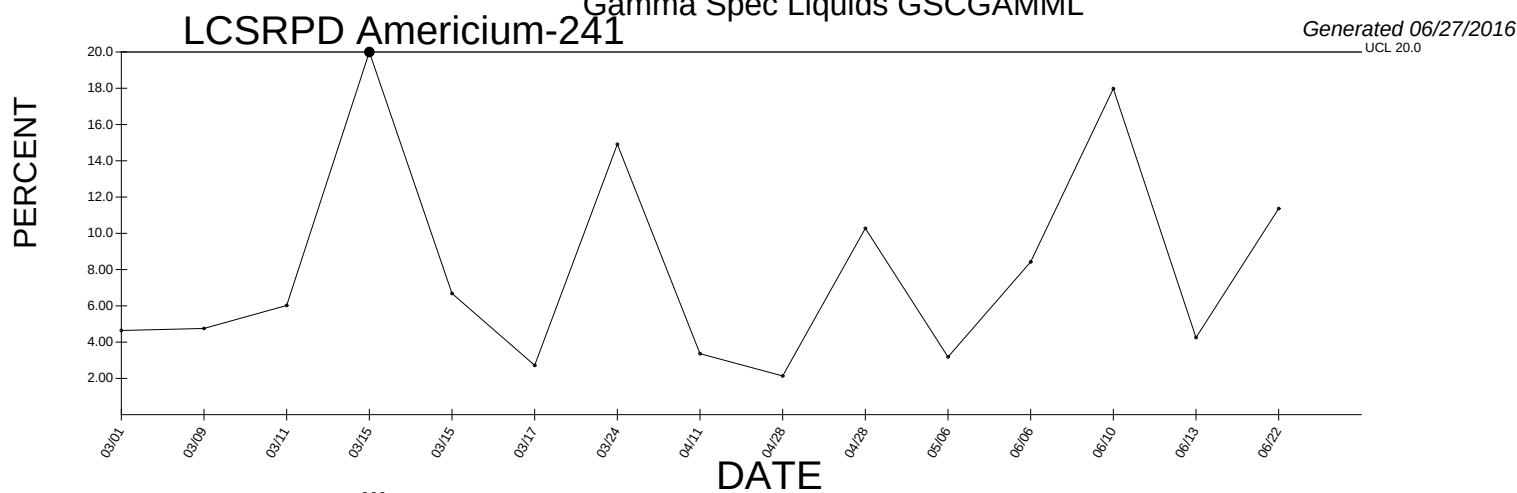
BLANK Result Americium-241

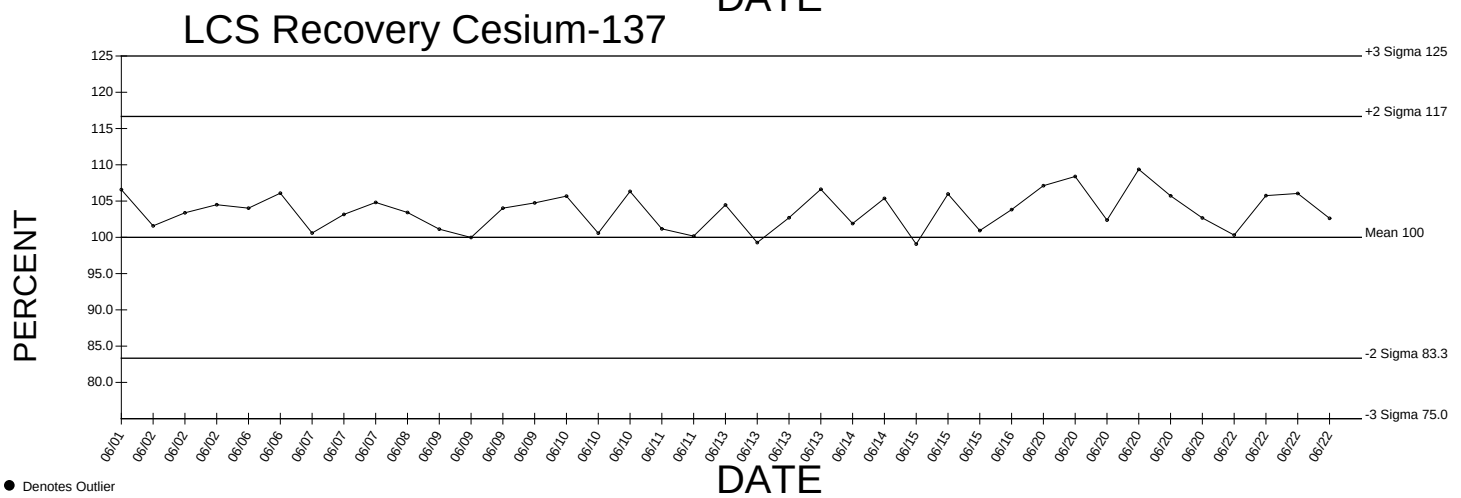
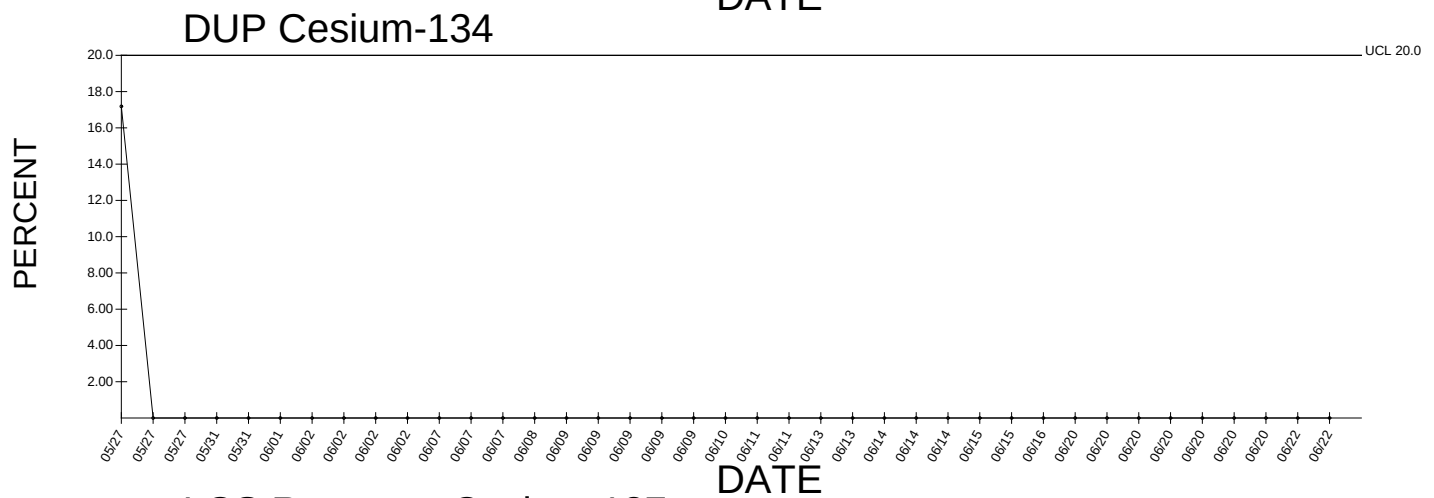
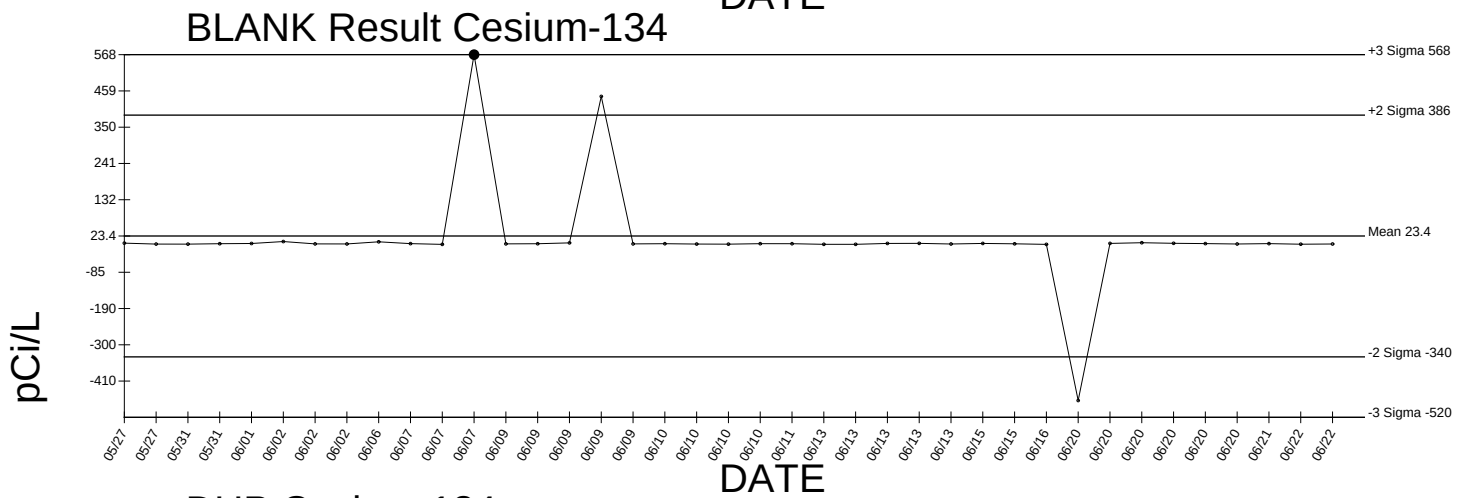
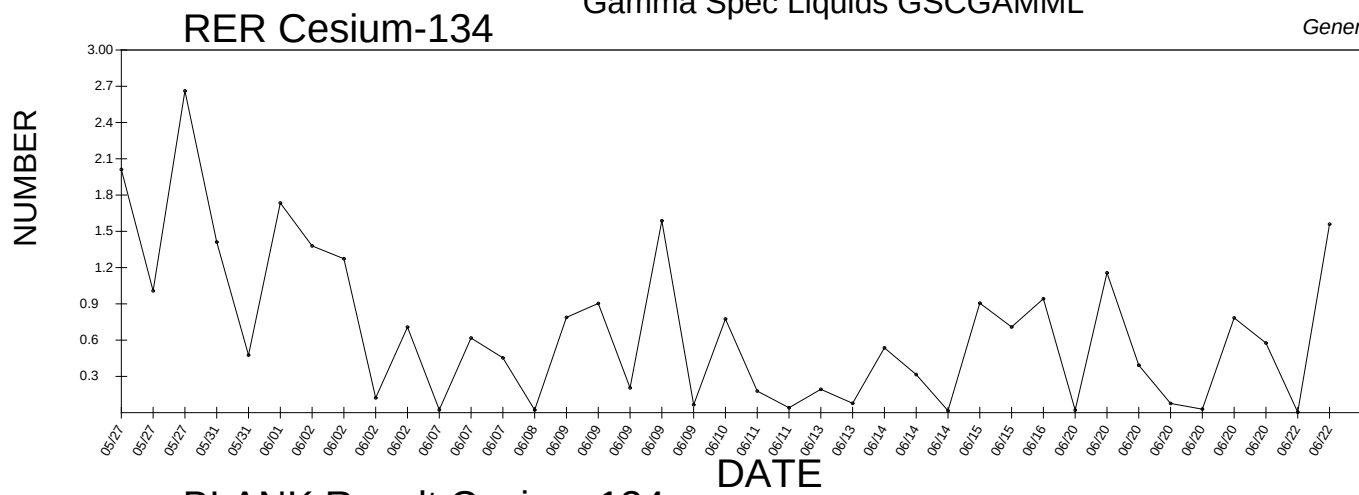


DUP Americium-241

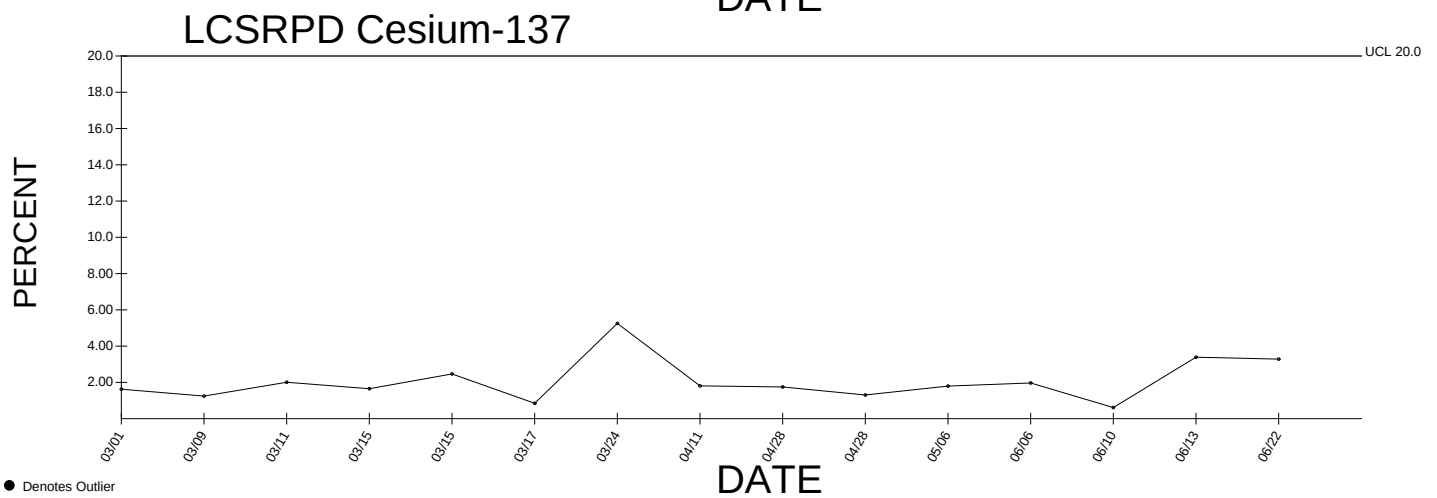
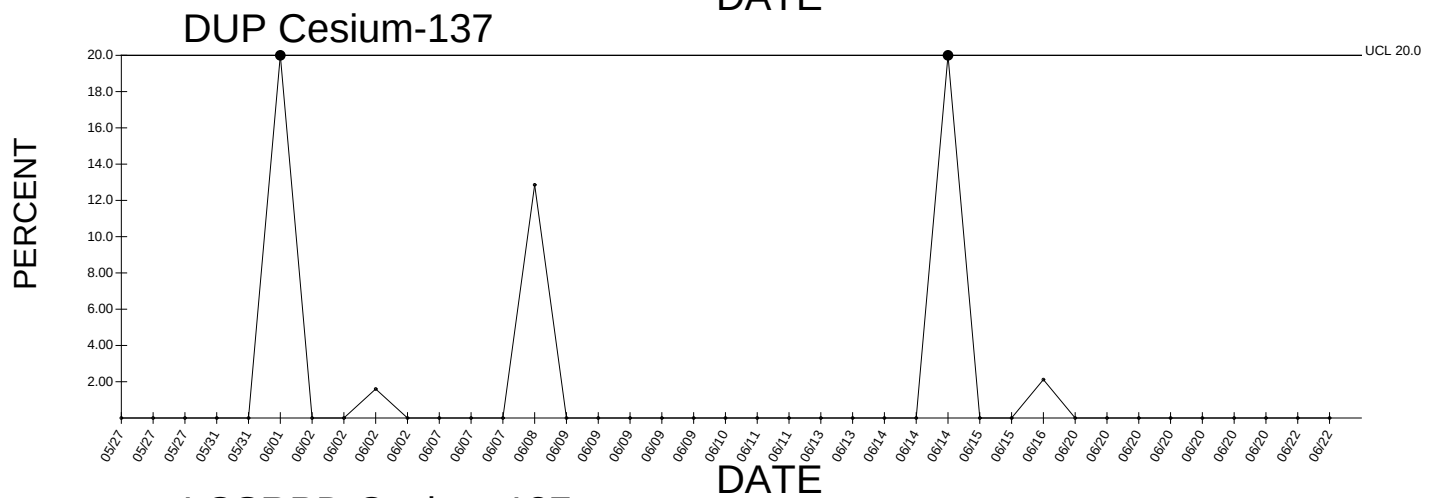
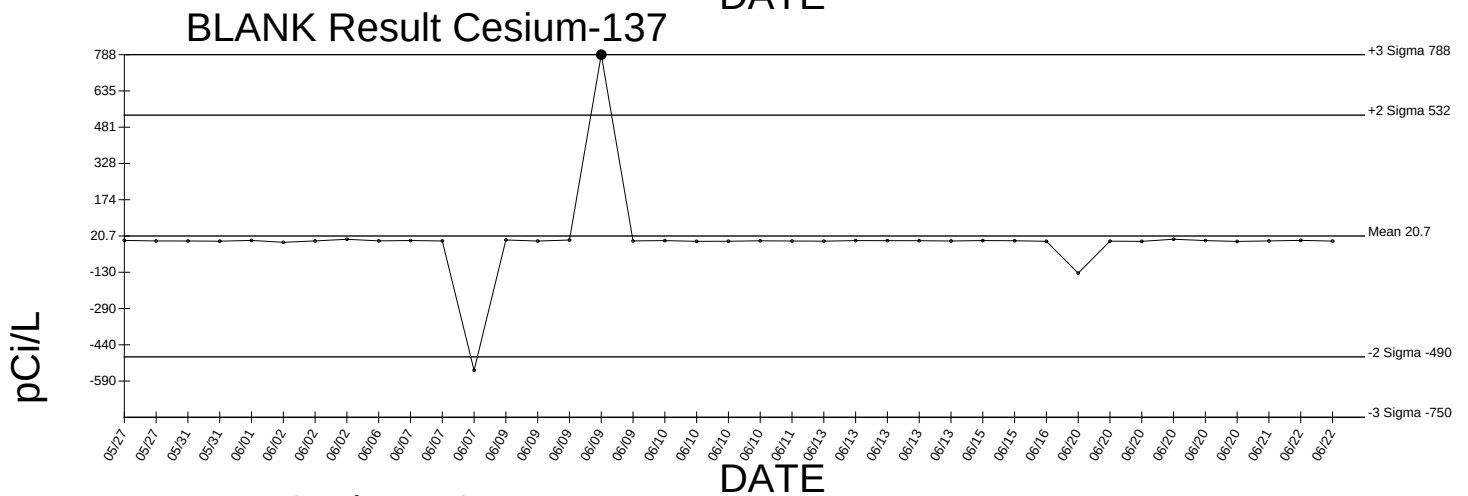
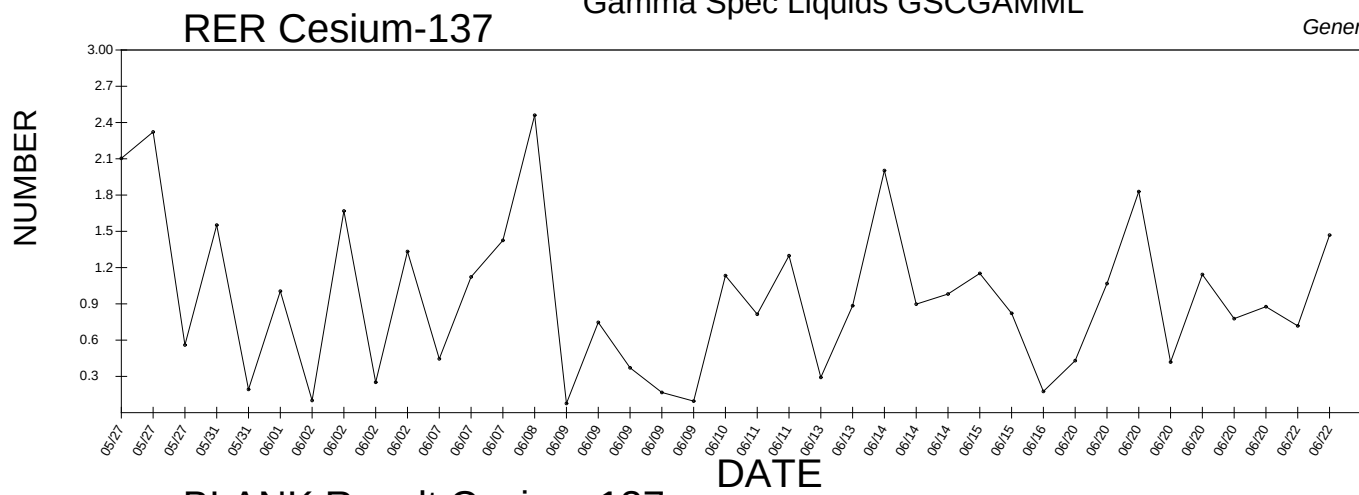


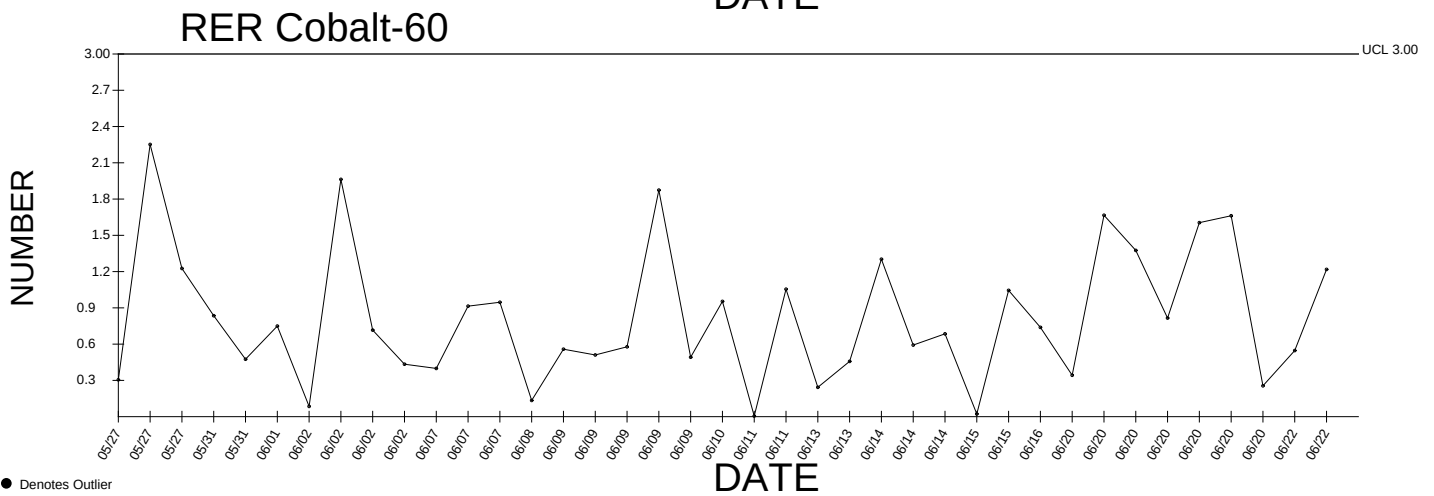
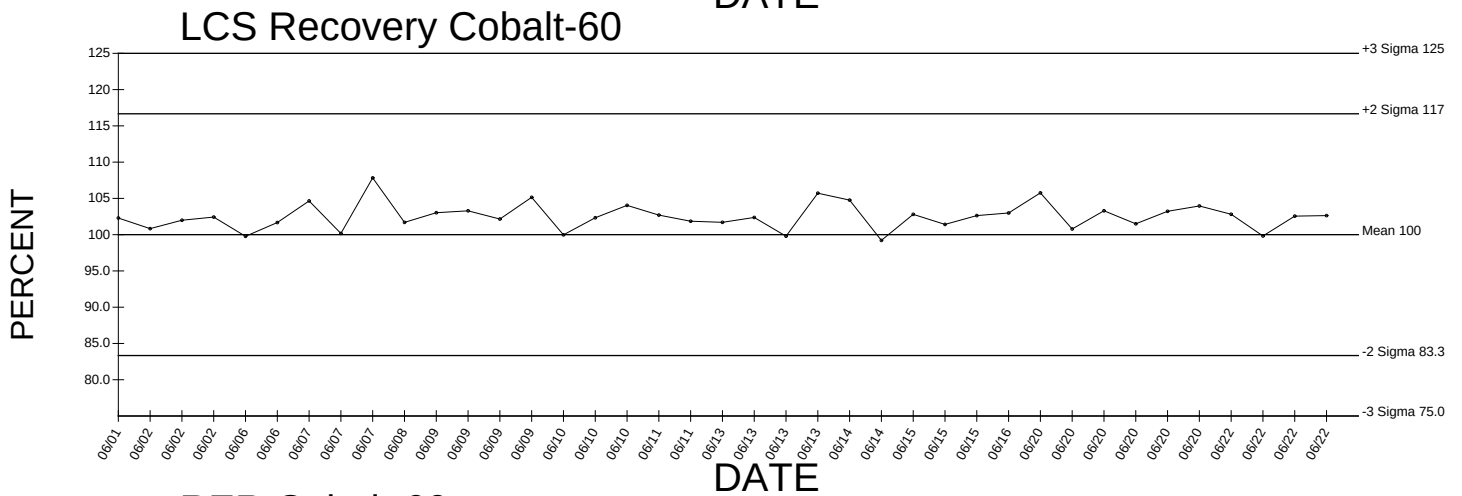
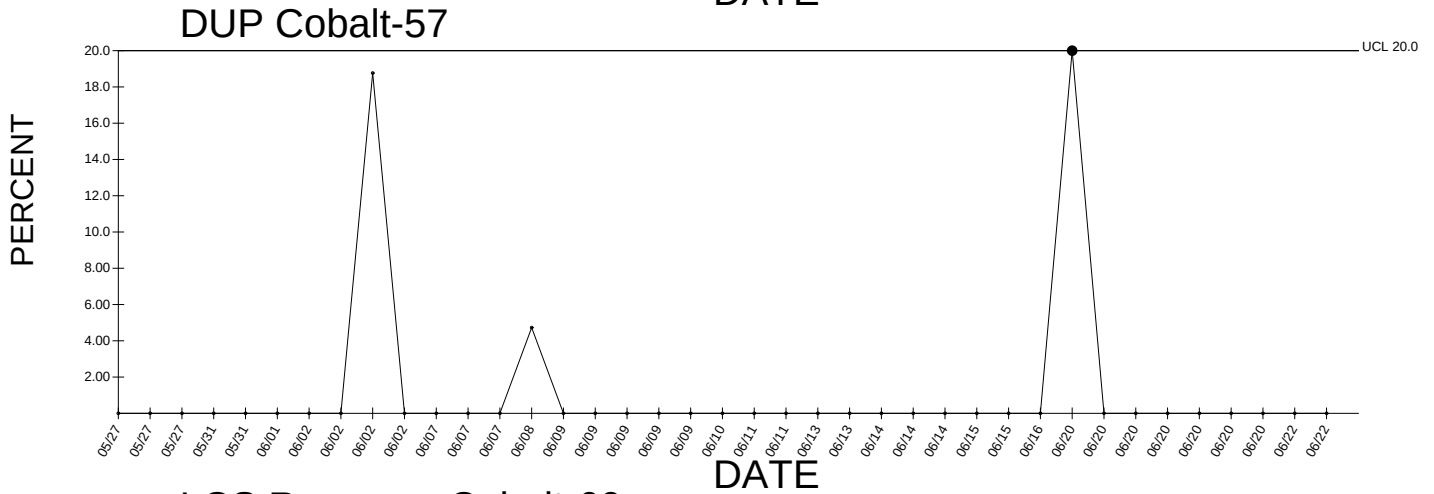
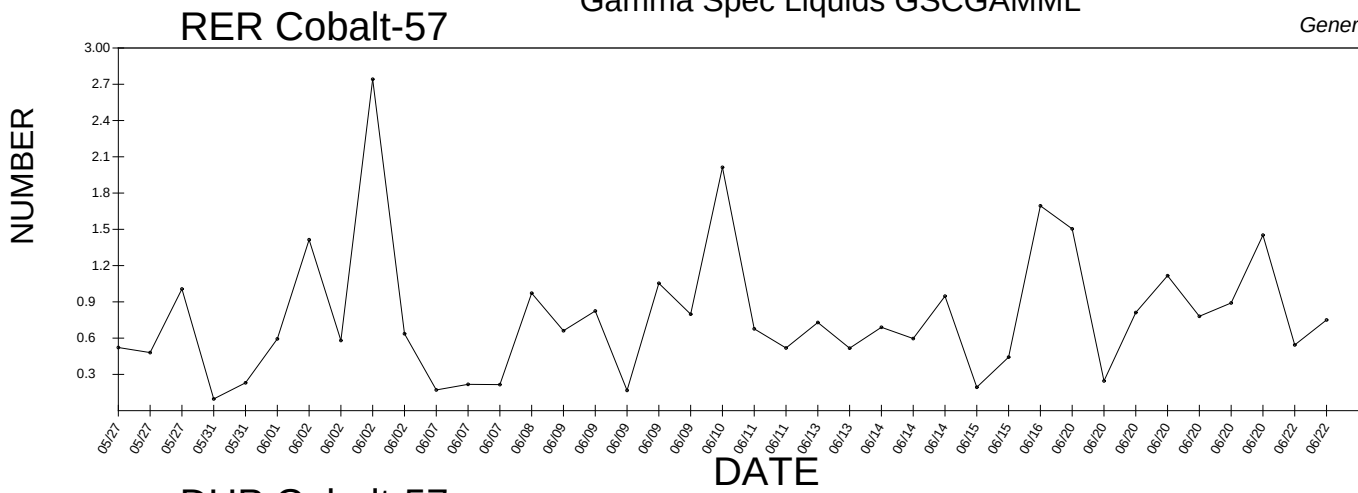
● Denotes Outlier





● Denotes Outlier



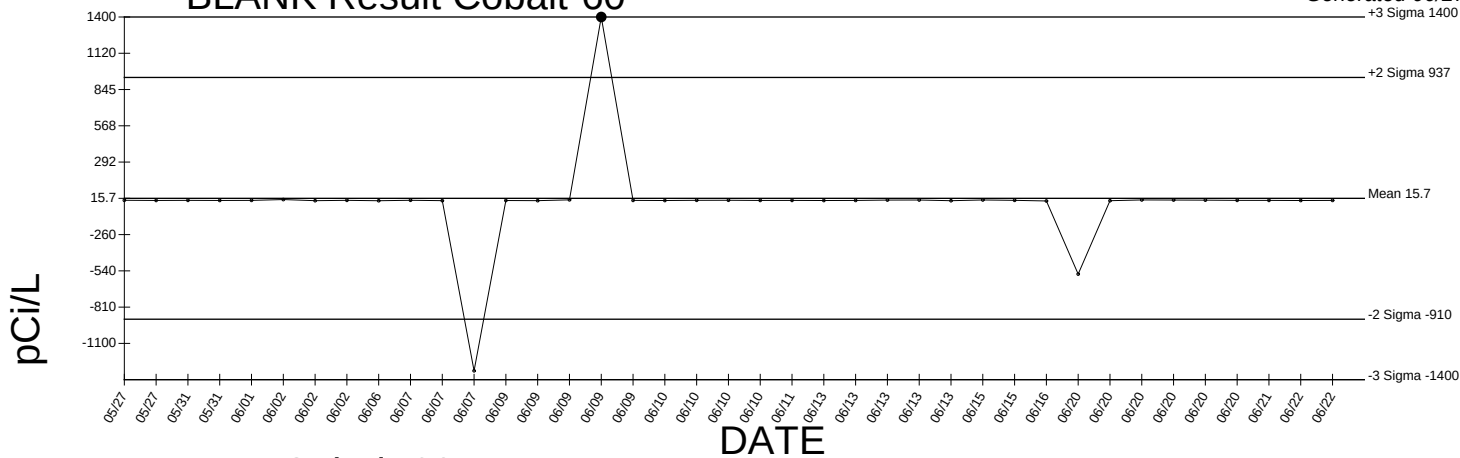


● Denotes Outlier

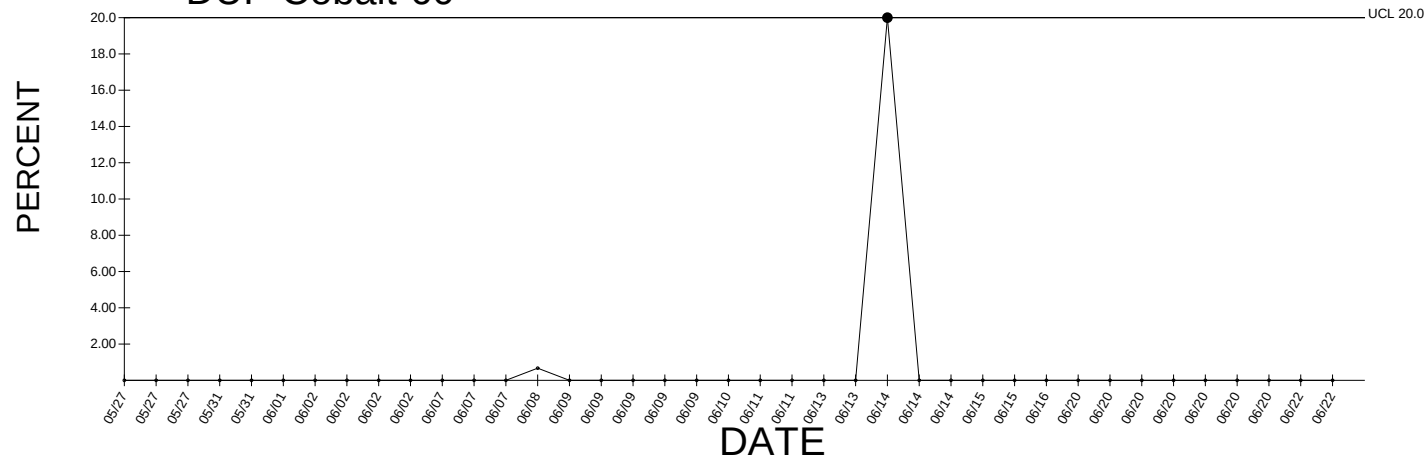
BLANK Result Cobalt-60

Gamma Spec Liquids GSCGAMML

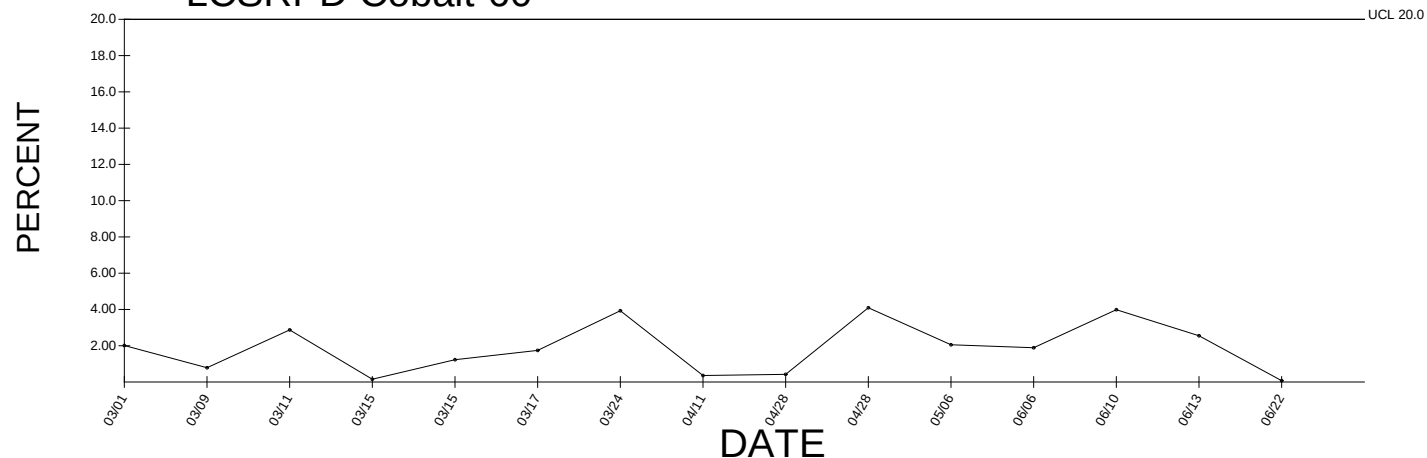
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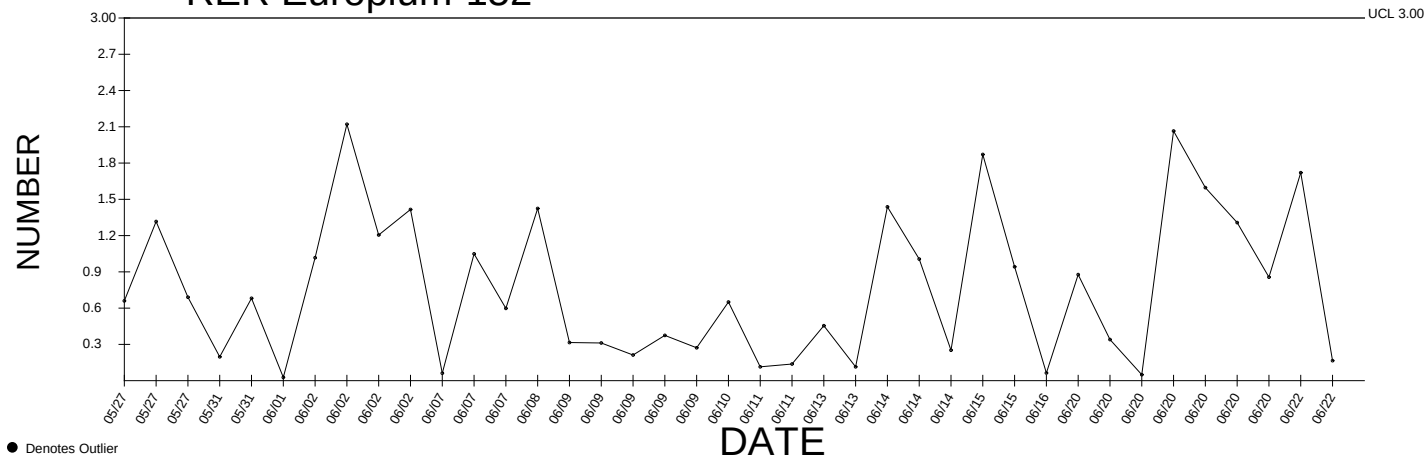
DUP Cobalt-60



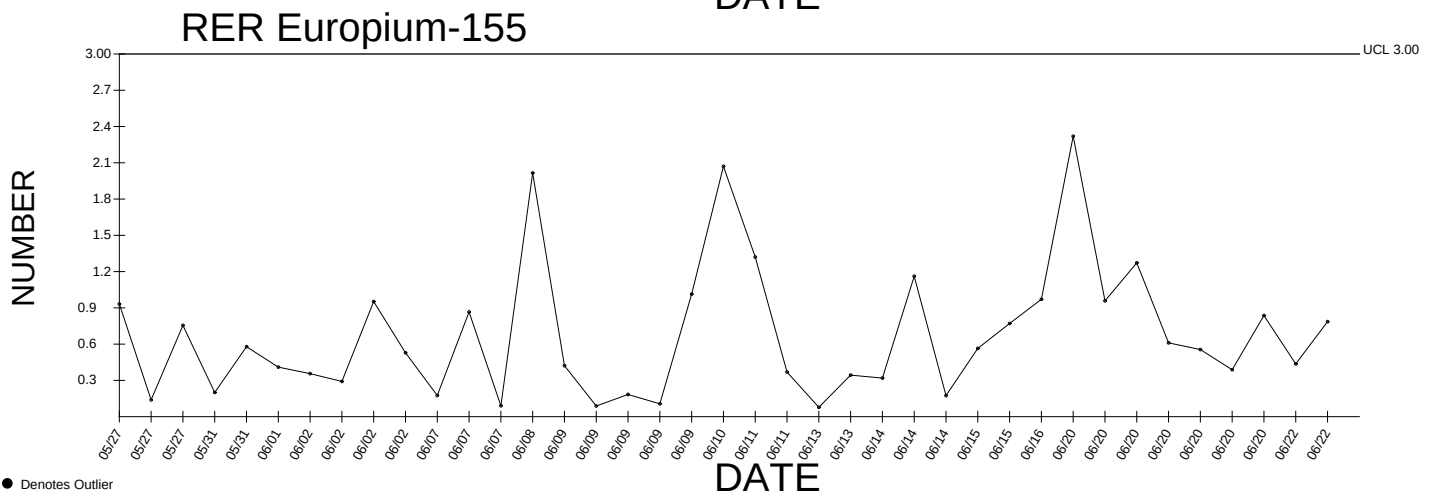
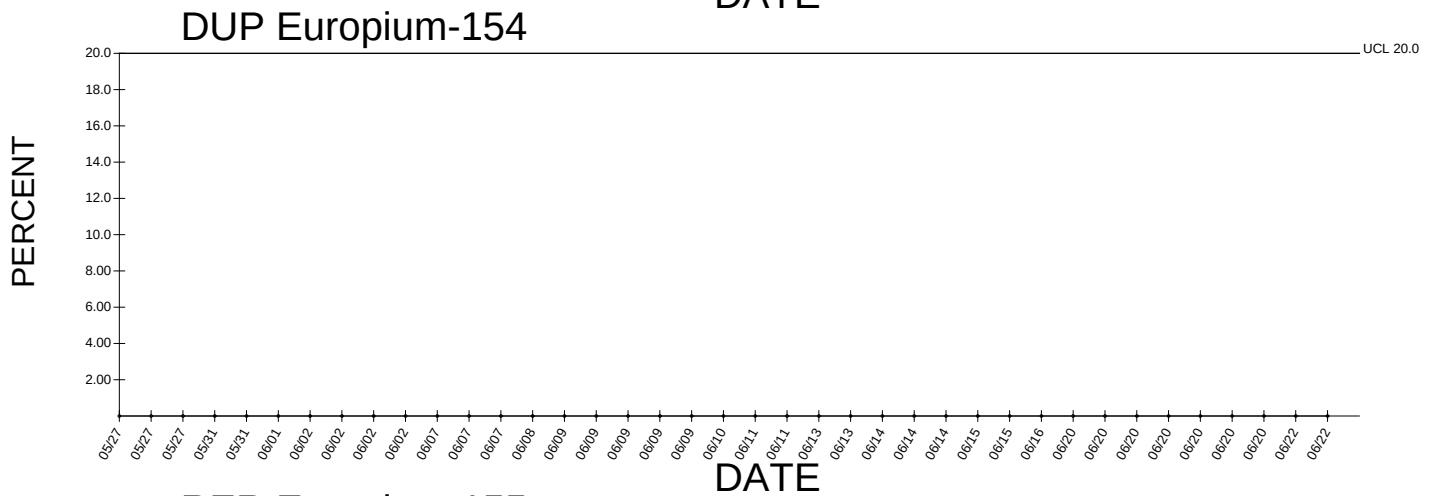
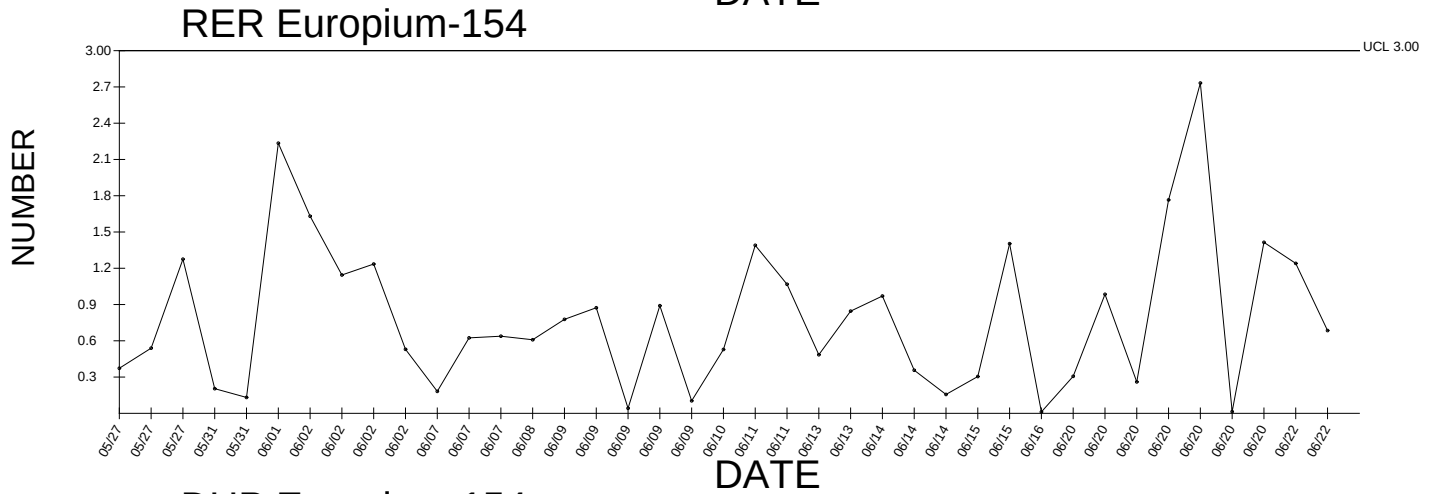
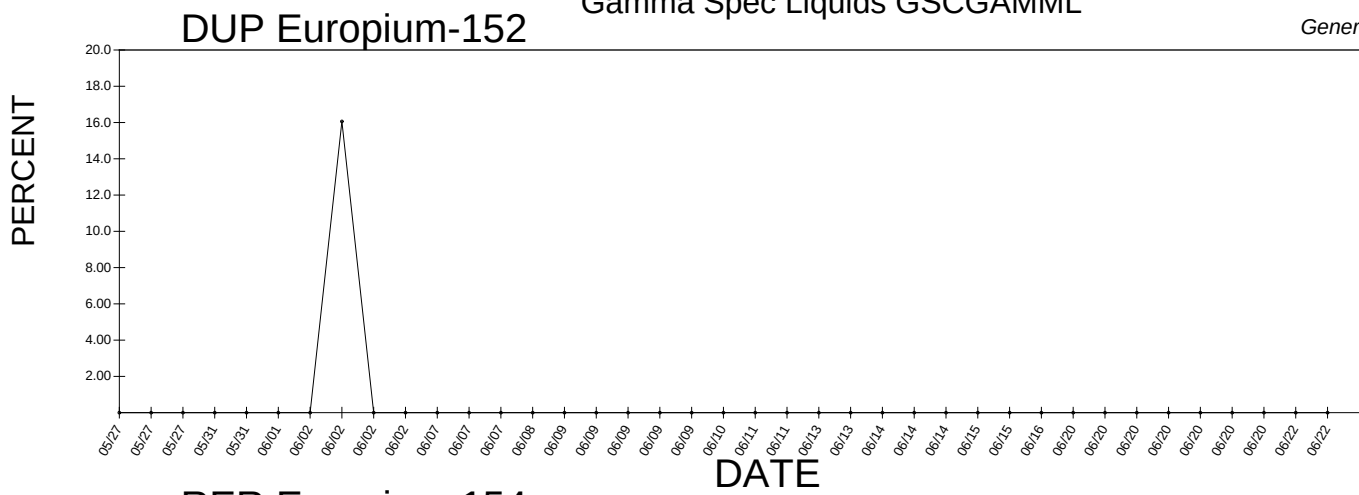
LCSRPD Cobalt-60



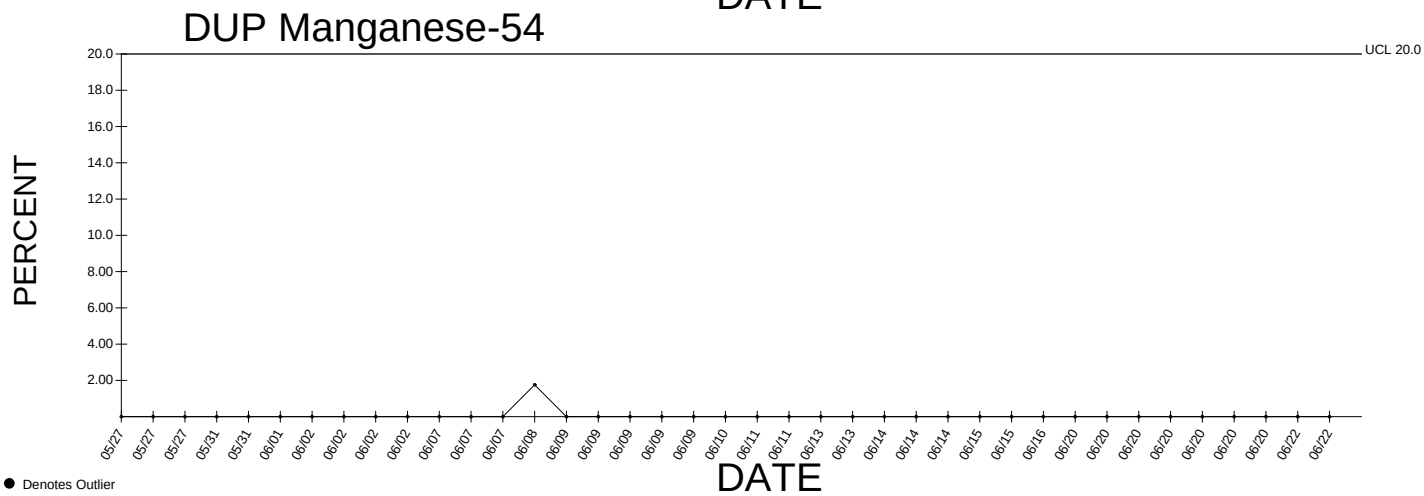
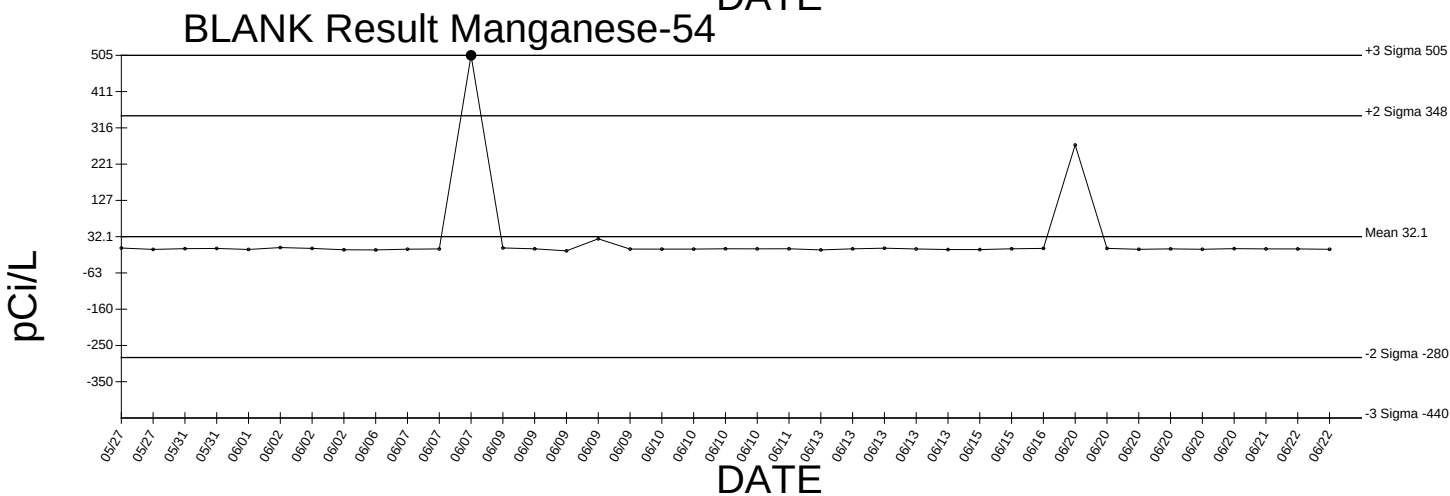
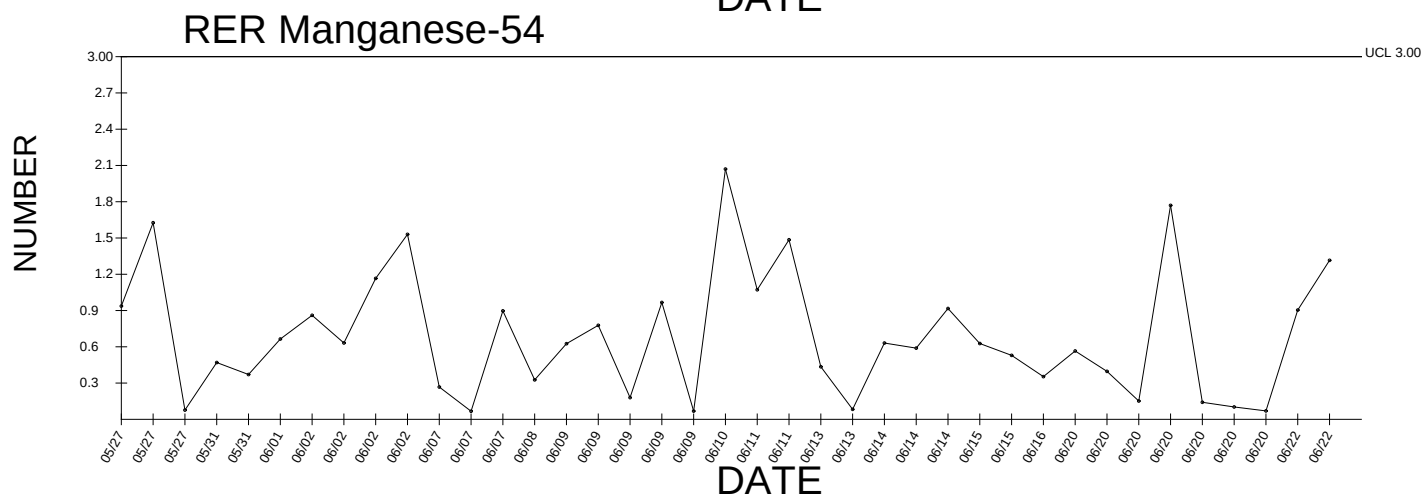
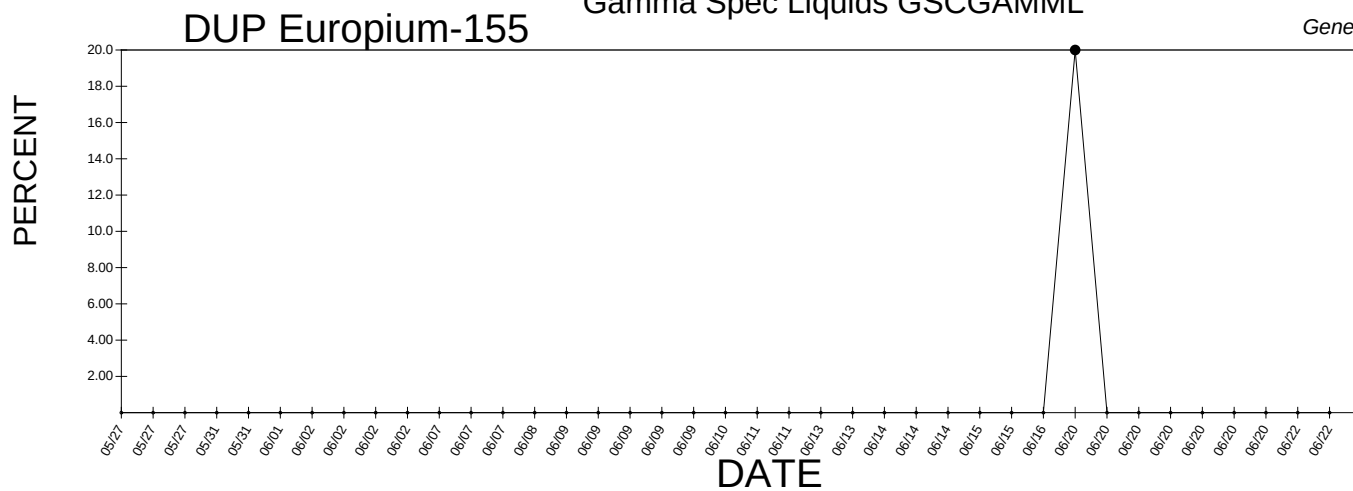
RER Europium-152



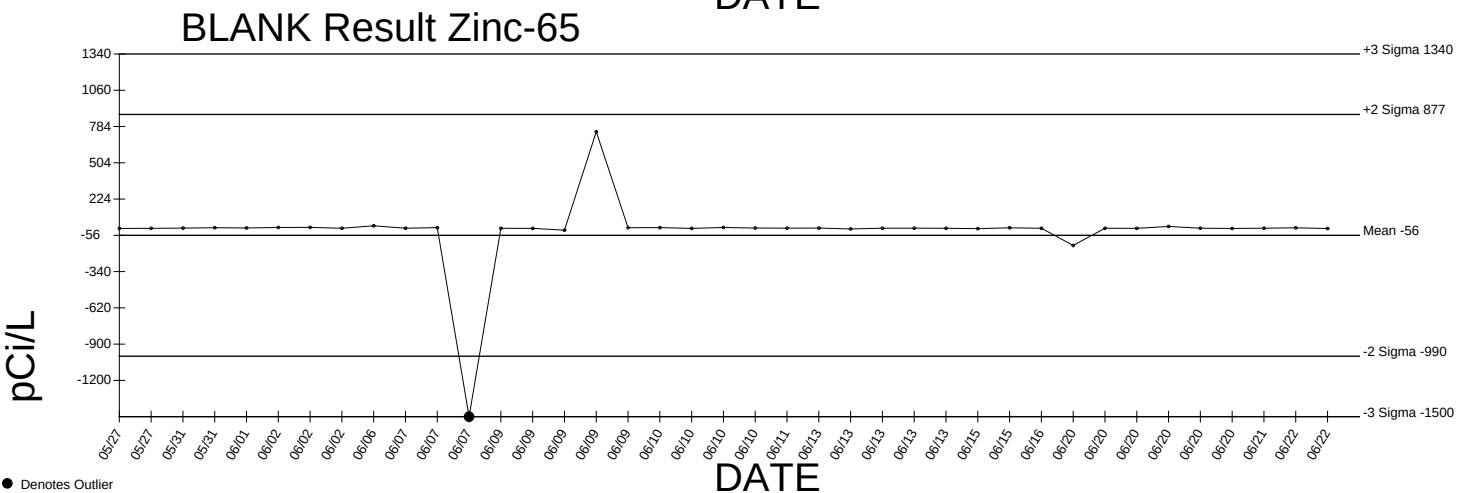
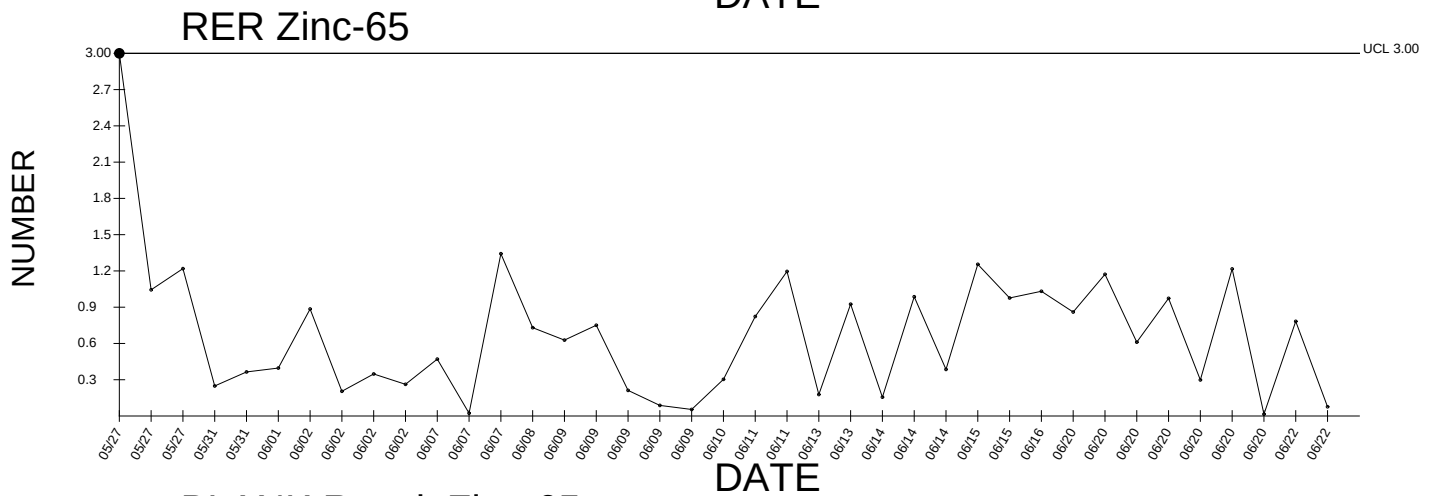
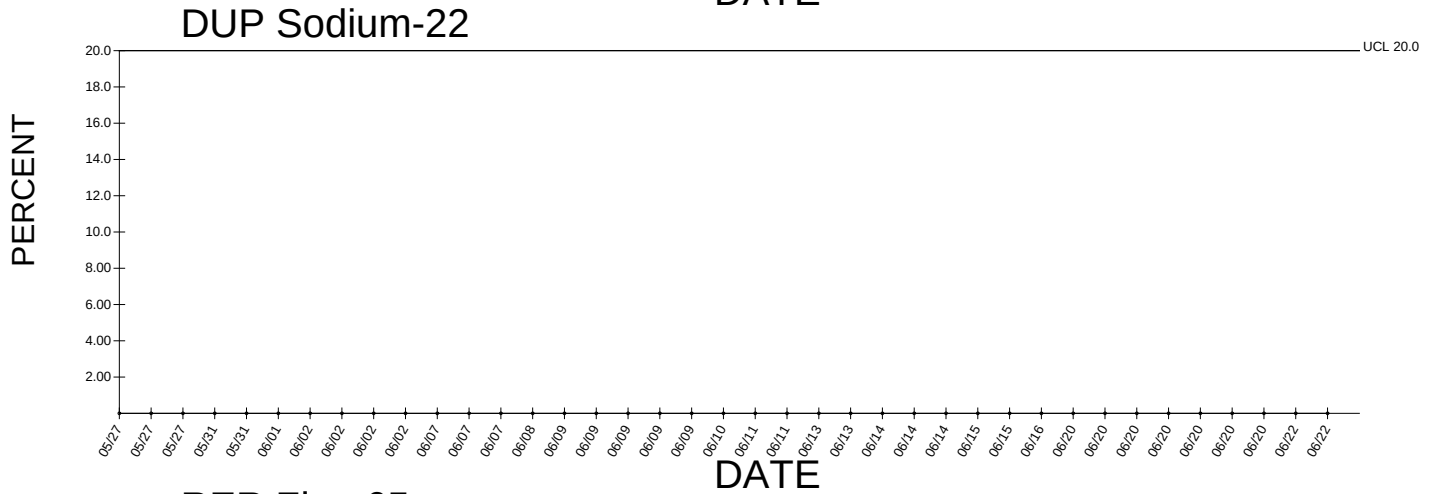
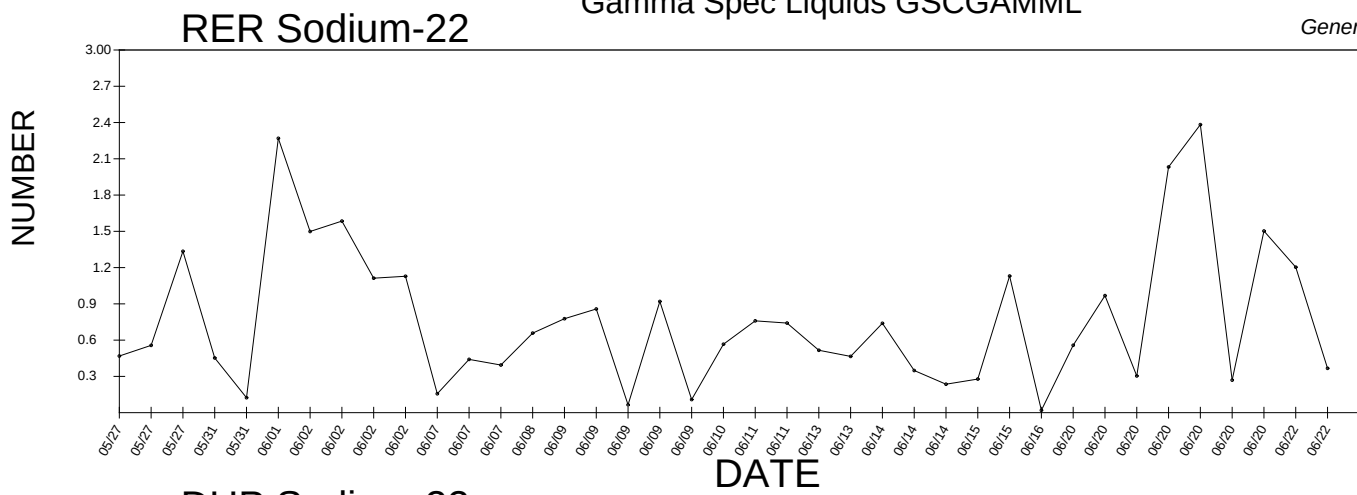
● Denotes Outlier



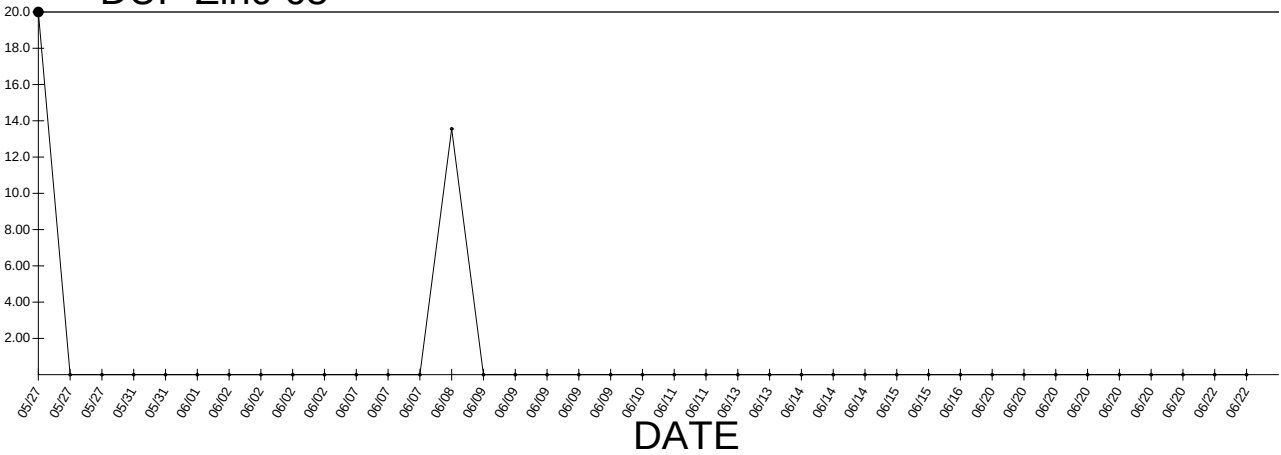
● Denotes Outlier



● Denotes Outlier



PERCENT



● Denotes Outlier

Data used for Gamma Spec Solids 30-JUN-2016

Americium-241 BLANK: Limits LCL = -28 UCL = 25.4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559465	10-JUN-2016 13:48	DONE	-0.007	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1569972	1203555533	11-JUN-2016 17:57	DONE	-0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1569038	1203553198	13-JUN-2016 07:51	DONE	0.07	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1569992	1203555577	13-JUN-2016 08:14	DUSE	-0.383	0.09	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1571050	1203558393	13-JUN-2016 15:47	DONE	-0.029	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1573439	1203564639	14-JUN-2016 09:29	DONE	-0.017	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1569386	1203554053	14-JUN-2016 10:24	DONE	0.16	0.15	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1574188	1203566570	14-JUN-2016 12:57	DONE	0.02	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1569992	1203555577	14-JUN-2016 12:58	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1574190	1203566581	14-JUN-2016 13:20	DONE	0.05	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1571029	1203558339	14-JUN-2016 14:32	DONE	-0.038	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1570346	1203556468	15-JUN-2016 06:41	DONE	0.07	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1571459	1203559441	15-JUN-2016 08:02	DONE	0.01	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572084	1203561062	15-JUN-2016 10:50	DONE	-0.038	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572190	1203561289	15-JUN-2016 10:58	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572384	1203561714	16-JUN-2016 12:25	DONE	00	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572385	1203561724	16-JUN-2016 12:51	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.035	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1569039	1203553209	17-JUN-2016 07:31	DONE	-0.013	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.02	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1573929	1203565769	17-JUN-2016 11:17	DONE	-40	-4	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.099	0.12	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1575505	1203569877	21-JUN-2016 07:25	DONE	23.7	2.8	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1575357	1203569604	21-JUN-2016 07:41	DONE	-29	-3	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1571024	1203558315	22-JUN-2016 07:20	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1575812	1203570695	22-JUN-2016 08:54	DONE	-0.028	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1573772	1203565433	22-JUN-2016 09:37	DONE	-0.024	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1576217	1203571735	23-JUN-2016 07:37	DONE	-0.03	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1571803	1203560365	23-JUN-2016 07:37	DUSE	0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1570476	1203556811	23-JUN-2016 07:38	DONE	-0.13	0.12	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1576430	1203572280	23-JUN-2016 09:24	DONE	0.03	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1576426	1203572270	23-JUN-2016 11:01	DONE	-0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1571802	1203560362	24-JUN-2016 11:07	DONE	-0.009	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572703	1203562586	24-JUN-2016 14:22	DONE	-0.005	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572236	1203561386	24-JUN-2016 15:52	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1572234	1203561383	24-JUN-2016 15:53	DONE	00	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1573057	1203563601	25-JUN-2016 07:30	DONE	-0.041	0.13	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1573059	1203563607	25-JUN-2016 09:16	DONE	0.01	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87
1573399	1203564536	25-JUN-2016 09:21	DONE	0.02	0.14	pCi/g	-1.2	-28	-19	16.5	25.4	8.87

Americium-241 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1569972	1203555534	11-JUN-2016 17:58	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1569038	1203553199	13-JUN-2016 07:56	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1569992	1203555578	13-JUN-2016 09:17	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1571050	1203558394	13-JUN-2016 15:47	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1573439	1203564640	14-JUN-2016 09:29	DONE	34.8	6	percent	1.03	0	-10	12.3	20.0	5.61
1569386	1203554054	14-JUN-2016 10:24	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1574188	1203566571	14-JUN-2016 13:21	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1571029	1203558340	14-JUN-2016 14:32	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1573929	1203565770	14-JUN-2016 14:39	DONE	5.29	0.76	percent	1.03	0	-10	12.3	20.0	5.61
1574190	1203566582	14-JUN-2016 15:57	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572084	1203561063	15-JUN-2016 10:51	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572384	1203561715	16-JUN-2016 12:26	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1569039	1203553210	17-JUN-2016 07:36	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1575505	1203569878	20-JUN-2016 07:04	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1575357	1203569605	21-JUN-2016 10:13	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1571024	1203558316	22-JUN-2016 07:21	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1575812	1203570696	22-JUN-2016 08:54	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1576217	1203571736	23-JUN-2016 07:44	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1573399	1203564537	25-JUN-2016 09:21	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.18	percent	1.03	0	-10	12.3	20.0	5.61

Americium-241 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559467	10-JUN-2016 14:04	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
1573465	1203564716	10-JUN-2016 14:52	DONE	104	0.53	percent	100	75.0	83.3	117	125	8.33
1569038	1203553202	13-JUN-2016 06:39	DONE	108	01	percent	100	75.0	83.3	117	125	8.33
1569992	1203555579	13-JUN-2016 09:32	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1573439	1203564641	14-JUN-2016 09:48	DONE	103	0.33	percent	100	75.0	83.3	117	125	8.33
1569386	1203554057	14-JUN-2016 10:25	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1571050	1203558395	14-JUN-2016 10:32	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
1571029	1203558341	14-JUN-2016 10:43	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1571459	1203559443	14-JUN-2016 11:14	DONE	100	0.01	percent	100	75.0	83.3	117	125	8.33
1574188	1203566574	14-JUN-2016 13:22	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
1574190	1203566583	15-JUN-2016 06:17	DONE	100	0.04	percent	100	75.0	83.3	117	125	8.33
1570346	1203556470	15-JUN-2016 06:42	DONE	117	2	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	15-JUN-2016 10:52	DUSE	121	2.5	percent	100	75.0	83.3	117	125	8.33
1572190	1203561291	15-JUN-2016 10:59	DONE	103	0.37	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	16-JUN-2016 09:10	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
1572384	1203561716	16-JUN-2016 09:33	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
1569039	1203553211	17-JUN-2016 07:36	DONE	101	0.16	percent	100	75.0	83.3	117	125	8.33
1564838	1203541919	17-JUN-2016 08:00	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
1573929	1203565771	17-JUN-2016 13:24	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1570471	1203556801	20-JUN-2016 07:03	DONE	107	0.81	percent	100	75.0	83.3	117	125	8.33
1572385	1203561726	20-JUN-2016 08:51	DONE	110	1.1	percent	100	75.0	83.3	117	125	8.33
1572233	1203561382	20-JUN-2016 08:53	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33
1575505	1203569879	21-JUN-2016 07:26	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
1575357	1203569606	21-JUN-2016 07:44	DONE	102	0.29	percent	100	75.0	83.3	117	125	8.33
1571024	1203558317	22-JUN-2016 07:21	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1575812	1203570699	22-JUN-2016 07:51	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1573772	1203565435	22-JUN-2016 10:20	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1576217	1203571739	23-JUN-2016 07:45	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
1571803	1203560367	23-JUN-2016 08:02	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
1570476	1203556813	23-JUN-2016 08:22	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1576426	1203572272	23-JUN-2016 11:02	DONE	99.5	-0.06	percent	100	75.0	83.3	117	125	8.33
1576430	1203572282	23-JUN-2016 11:35	DONE	104	0.43	percent	100	75.0	83.3	117	125	8.33
1572234	1203561385	25-JUN-2016 09:20	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
1573057	1203563603	25-JUN-2016 09:22	DONE	98.2	-0.22	percent	100	75.0	83.3	117	125	8.33
1573399	1203564538	25-JUN-2016 09:37	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1572703	1203562588	25-JUN-2016 09:54	DONE	106	0.66	percent	100	75.0	83.3	117	125	8.33
1573059	1203563609	25-JUN-2016 10:14	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1571802	1203560364	25-JUN-2016 10:47	DONE	106	0.75	percent	100	75.0	83.3	117	125	8.33
1572236	1203561388	25-JUN-2016 11:03	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33

Americium-241 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519622	1203423730	02-NOV-2015 10:04	DONE	0.76	-0.87	percent	5.07	0	-4.9	15	20.0	4.96
1524802	1203437209	20-NOV-2015 10:34	DONE	5.54	0.09	percent	5.07	0	-4.9	15	20.0	4.96
1533266	1203458681	22-DEC-2015 16:44	DONE	1.86	-0.65	percent	5.07	0	-4.9	15	20.0	4.96
1536364	1203466302	11-JAN-2016 11:23	DONE	2.8	-0.46	percent	5.07	0	-4.9	15	20.0	4.96
1542010	1203481039	03-FEB-2016 11:23	DONE	3.07	-0.4	percent	5.07	0	-4.9	15	20.0	4.96
1547288	1203495684	24-FEB-2016 12:31	DONE	1.21	-0.78	percent	5.07	0	-4.9	15	20.0	4.96
1548218	1203497950	29-FEB-2016 10:21	DONE	5.74	0.13	percent	5.07	0	-4.9	15	20.0	4.96
1550425	1203503644	08-MAR-2016 14:59	DONE	15.1	2	percent	5.07	0	-4.9	15	20.0	4.96
1553712	1203512070	23-MAR-2016 10:30	DONE	8.08	0.61	percent	5.07	0	-4.9	15	20.0	4.96
1555195	1203515984	28-MAR-2016 09:58	DONE	0.43	-0.94	percent	5.07	0	-4.9	15	20.0	4.96
1559978	1203528668	16-APR-2016 10:01	DONE	15.2	2	percent	5.07	0	-4.9	15	20.0	4.96
1570342	1203556453	26-MAY-2016 15:47	DONE	2.92	-0.43	percent	5.07	0	-4.9	15	20.0	4.96
1573465	1203564716	10-JUN-2016 14:52	DONE	3.22	-0.37	percent	5.07	0	-4.9	15	20.0	4.96

Americium-241 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	0.62	-0.22	dec	0.78	0	-0.706	2.27	3.00	0.74
1571466	1203559466	11-JUN-2016 15:29	DONE	0.14	-0.86	dec	0.78	0	-0.706	2.27	3.00	0.74
1569972	1203555534	11-JUN-2016 17:58	DONE	0.45	-0.45	dec	0.78	0	-0.706	2.27	3.00	0.74
1569038	1203553199	13-JUN-2016 07:56	DONE	0.37	-0.55	dec	0.78	0	-0.706	2.27	3.00	0.74
1569992	1203555578	13-JUN-2016 09:17	DONE	1.12	0.46	dec	0.78	0	-0.706	2.27	3.00	0.74
1571050	1203558394	13-JUN-2016 15:47	DONE	0.62	-0.22	dec	0.78	0	-0.706	2.27	3.00	0.74
1573439	1203564640	14-JUN-2016 09:29	DONE	1.92	1.5	dec	0.78	0	-0.706	2.27	3.00	0.74
1569386	1203554054	14-JUN-2016 10:24	DONE	0.67	-0.15	dec	0.78	0	-0.706	2.27	3.00	0.74
1574188	1203566571	14-JUN-2016 13:21	DONE	0.04	-1	dec	0.78	0	-0.706	2.27	3.00	0.74
1571029	1203558340	14-JUN-2016 14:32	DONE	0.31	-0.64	dec	0.78	0	-0.706	2.27	3.00	0.74
1573929	1203565770	14-JUN-2016 14:39	DONE	0.14	-0.87	dec	0.78	0	-0.706	2.27	3.00	0.74
1574190	1203566582	14-JUN-2016 15:57	DONE	2.09	1.8	dec	0.78	0	-0.706	2.27	3.00	0.74
1570346	1203556469	15-JUN-2016 06:41	DONE	1.68	1.2	dec	0.78	0	-0.706	2.27	3.00	0.74
1571459	1203559442	15-JUN-2016 08:43	DONE	3.23	3.3	dec	0.78	0	-0.706	2.27	3.00	0.74
1572084	1203561063	15-JUN-2016 10:51	DONE	0.37	-0.56	dec	0.78	0	-0.706	2.27	3.00	0.74
1572190	1203561290	15-JUN-2016 10:58	DONE	1.3	0.7	dec	0.78	0	-0.706	2.27	3.00	0.74
1572384	1203561715	16-JUN-2016 12:26	DONE	0.37	-0.55	dec	0.78	0	-0.706	2.27	3.00	0.74
1569039	1203553210	17-JUN-2016 07:36	DONE	0.02	-1	dec	0.78	0	-0.706	2.27	3.00	0.74
1564838	1203541918	17-JUN-2016 07:41	DONE	0.61	-0.24	dec	0.78	0	-0.706	2.27	3.00	0.74
1570471	1203556800	17-JUN-2016 13:17	DONE	0.56	-0.31	dec	0.78	0	-0.706	2.27	3.00	0.74
1575505	1203569878	20-JUN-2016 07:04	DONE	0.62	-0.22	dec	0.78	0	-0.706	2.27	3.00	0.74
1572385	1203561725	20-JUN-2016 08:50	DONE	0.82	0.05	dec	0.78	0	-0.706	2.27	3.00	0.74
1572233	1203561381	20-JUN-2016 08:52	DONE	1.53	01	dec	0.78	0	-0.706	2.27	3.00	0.74
1575357	1203569605	21-JUN-2016 10:13	DONE	0.4	-0.52	dec	0.78	0	-0.706	2.27	3.00	0.74
1571024	1203558316	22-JUN-2016 07:21	DONE	0.38	-0.54	dec	0.78	0	-0.706	2.27	3.00	0.74

1575812	1203570696	22-JUN-2016 08:54	DONE	1.06	0.37	dec	0.78	0	-0.706	2.27	3.00	0.74
1573772	1203565434	22-JUN-2016 09:38	DONE	0.38	-0.55	dec	0.78	0	-0.706	2.27	3.00	0.74
1576217	1203571736	23-JUN-2016 07:44	DONE	0.55	-0.31	dec	0.78	0	-0.706	2.27	3.00	0.74
1570476	1203556812	23-JUN-2016 08:07	DONE	2.09	1.8	dec	0.78	0	-0.706	2.27	3.00	0.74
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.04	-01	dec	0.78	0	-0.706	2.27	3.00	0.74
1576426	1203572271	23-JUN-2016 12:05	DONE	0.31	-0.64	dec	0.78	0	-0.706	2.27	3.00	0.74
1576430	1203572281	24-JUN-2016 08:09	DONE	0.39	-0.53	dec	0.78	0	-0.706	2.27	3.00	0.74
1572234	1203561384	24-JUN-2016 15:54	DONE	0.18	-0.81	dec	0.78	0	-0.706	2.27	3.00	0.74
1572703	1203562587	25-JUN-2016 09:16	DONE	0.07	-0.96	dec	0.78	0	-0.706	2.27	3.00	0.74
1573059	1203563608	25-JUN-2016 09:17	DONE	0.34	-0.6	dec	0.78	0	-0.706	2.27	3.00	0.74
1573399	1203564537	25-JUN-2016 09:21	DONE	0.73	-0.08	dec	0.78	0	-0.706	2.27	3.00	0.74
1573057	1203563602	25-JUN-2016 09:38	DONE	0.18	-0.81	dec	0.78	0	-0.706	2.27	3.00	0.74
1571802	1203560363	25-JUN-2016 09:38	DONE	1.8	1.4	dec	0.78	0	-0.706	2.27	3.00	0.74
1572236	1203561387	25-JUN-2016 09:39	DONE	2.07	1.7	dec	0.78	0	-0.706	2.27	3.00	0.74

Beryllium-7 BLANK: Limits LCL = -34 UCL = 36.6

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
1571466	1203559465	10-JUN-2016 13:48	DONE	-0.024	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1569972	1203555533	11-JUN-2016 17:57	DUSE	-0.129	-0.12	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1569038	1203553198	13-JUN-2016 07:51	DUSE	0.02	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1569992	1203555577	13-JUN-2016 08:14	DUSE	-0.669	-0.17	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1571050	1203558393	13-JUN-2016 15:47	DONE	-1.6	-0.25	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1573439	1203564639	14-JUN-2016 09:29	DONE	-0.014	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1569386	1203554053	14-JUN-2016 10:24	DUSE	-0.101	-0.12	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1574188	1203566570	14-JUN-2016 12:57	DUSE	-0.014	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1569992	1203555577	14-JUN-2016 12:58	DUSE	-0.01	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1574190	1203566581	14-JUN-2016 13:20	DUSE	0.03	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1571029	1203558339	14-JUN-2016 14:32	DUSE	-0.157	-0.12	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1570346	1203556468	15-JUN-2016 06:41	DONE	0.12	-0.1	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.014	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572084	1203561062	15-JUN-2016 10:50	DUSE	0.13	-0.1	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572190	1203561289	15-JUN-2016 10:58	DONE	-0.129	-0.12	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572384	1203561714	16-JUN-2016 12:25	DUSE	-0.018	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572385	1203561724	16-JUN-2016 12:51	DUSE	0.01	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572233	1203561380	16-JUN-2016 12:53	DONE	0.01	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1569039	1203553209	17-JUN-2016 07:31	DONE	0.05	-0.1	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.019	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1573929	1203565769	17-JUN-2016 11:17	DONE	71.4	6	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.026	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1575505	1203569877	21-JUN-2016 07:25	DONE	-6.1	-0.63	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1575357	1203569604	21-JUN-2016 07:41	DONE	-13	-1	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1571024	1203558315	22-JUN-2016 07:20	DONE	0.05	-0.1	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1575812	1203570695	22-JUN-2016 08:54	DUSE	-0.079	-0.12	pCi/g	1.28	-34	-22	24.8	36.6	11.8

1573772	1203565433	22-JUN-2016 09:37	DUSE	0.01	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1576217	1203571735	23-JUN-2016 07:37	DUSE	-0.031	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1571803	1203560365	23-JUN-2016 07:37	DUSE	0.26	-0.09	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1570476	1203556811	23-JUN-2016 07:38	DONE	0.02	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1576430	1203572280	23-JUN-2016 09:24	DONE	0.07	-0.1	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1576426	1203572270	23-JUN-2016 11:01	DONE	0.04	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1571802	1203560362	24-JUN-2016 11:07	DONE	0.03	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572703	1203562586	24-JUN-2016 14:22	DUSE	-0.112	-0.12	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572236	1203561386	24-JUN-2016 15:52	DONE	-0.028	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1572234	1203561383	24-JUN-2016 15:53	DONE	0.01	-0.11	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1573057	1203563601	25-JUN-2016 07:30	DONE	0.14	-0.1	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1573059	1203563607	25-JUN-2016 09:16	DUSE	0.22	-0.09	pCi/g	1.28	-34	-22	24.8	36.6	11.8
1573399	1203564536	25-JUN-2016 09:21	DUSE	0.09	-0.1	pCi/g	1.28	-34	-22	24.8	36.6	11.8

Beryllium-7 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1569972	1203555534	11-JUN-2016 17:58	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1569992	1203555578	13-JUN-2016 09:17	DUSE	6.9	0.47	percent	2.75	0	-15	20.5	20.0	8.85
1571050	1203558394	13-JUN-2016 15:47	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1571029	1203558340	14-JUN-2016 14:32	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1573929	1203565770	14-JUN-2016 14:39	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1569039	1203553210	17-JUN-2016 07:36	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1570471	1203556800	17-JUN-2016 13:17	DONE	4.86	0.24	percent	2.75	0	-15	20.5	20.0	8.85
1575505	1203569878	20-JUN-2016 07:04	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572233	1203561381	20-JUN-2016 08:52	DONE	4.42	0.19	percent	2.75	0	-15	20.5	20.0	8.85
1575357	1203569605	21-JUN-2016 10:13	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1571024	1203558316	22-JUN-2016 07:21	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85

1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1570476	1203556812	23-JUN-2016 08:07	DONE	32.3	3.3	percent	2.75	0	-15	20.5	20.0	8.85
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572703	1203562587	25-JUN-2016 09:16	DUSE	43.6	4.6	percent	2.75	0	-15	20.5	20.0	8.85
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1573057	1203563602	25-JUN-2016 09:38	DONE	15.4	1.4	percent	2.75	0	-15	20.5	20.0	8.85
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.31	percent	2.75	0	-15	20.5	20.0	8.85

Beryllium-7 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0.41	-0.61	dec	0.77	0	-0.396	1.93	3.00	0.58
1571466	1203559466	11-JUN-2016 15:29	DONE	2.35	2.7	dec	0.77	0	-0.396	1.93	3.00	0.58
1569972	1203555534	11-JUN-2016 17:58	DUSE	0.14	-1	dec	0.77	0	-0.396	1.93	3.00	0.58
1569038	1203553199	13-JUN-2016 07:56	DUSE	0.98	0.37	dec	0.77	0	-0.396	1.93	3.00	0.58
1569992	1203555578	13-JUN-2016 09:17	DUSE	0.91	0.25	dec	0.77	0	-0.396	1.93	3.00	0.58
1571050	1203558394	13-JUN-2016 15:47	DONE	0.87	0.17	dec	0.77	0	-0.396	1.93	3.00	0.58
1573439	1203564640	14-JUN-2016 09:29	DONE	0.28	-0.84	dec	0.77	0	-0.396	1.93	3.00	0.58
1569386	1203554054	14-JUN-2016 10:24	DUSE	1.54	1.3	dec	0.77	0	-0.396	1.93	3.00	0.58
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.85	0.15	dec	0.77	0	-0.396	1.93	3.00	0.58
1571029	1203558340	14-JUN-2016 14:32	DUSE	0.35	-0.72	dec	0.77	0	-0.396	1.93	3.00	0.58
1573929	1203565770	14-JUN-2016 14:39	DONE	0.25	-0.89	dec	0.77	0	-0.396	1.93	3.00	0.58
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.87	0.18	dec	0.77	0	-0.396	1.93	3.00	0.58
1570346	1203556469	15-JUN-2016 06:41	DONE	0.84	0.13	dec	0.77	0	-0.396	1.93	3.00	0.58
1571459	1203559442	15-JUN-2016 08:43	DONE	2.13	2.3	dec	0.77	0	-0.396	1.93	3.00	0.58
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.24	-0.9	dec	0.77	0	-0.396	1.93	3.00	0.58
1572190	1203561290	15-JUN-2016 10:58	DONE	0.69	-0.13	dec	0.77	0	-0.396	1.93	3.00	0.58
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.63	1.5	dec	0.77	0	-0.396	1.93	3.00	0.58
1569039	1203553210	17-JUN-2016 07:36	DONE	0.61	-0.27	dec	0.77	0	-0.396	1.93	3.00	0.58
1564838	1203541918	17-JUN-2016 07:41	DONE	1.16	0.67	dec	0.77	0	-0.396	1.93	3.00	0.58
1570471	1203556800	17-JUN-2016 13:17	DONE	0.11	-1	dec	0.77	0	-0.396	1.93	3.00	0.58
1575505	1203569878	20-JUN-2016 07:04	DONE	2	2.1	dec	0.77	0	-0.396	1.93	3.00	0.58
1572385	1203561725	20-JUN-2016 08:50	DUSE	0.82	0.1	dec	0.77	0	-0.396	1.93	3.00	0.58
1572233	1203561381	20-JUN-2016 08:52	DONE	0.68	-0.15	dec	0.77	0	-0.396	1.93	3.00	0.58
1575357	1203569605	21-JUN-2016 10:13	DONE	0.26	-0.87	dec	0.77	0	-0.396	1.93	3.00	0.58
1571024	1203558316	22-JUN-2016 07:21	DONE	0.26	-0.87	dec	0.77	0	-0.396	1.93	3.00	0.58
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.16	-1	dec	0.77	0	-0.396	1.93	3.00	0.58
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.11	-1	dec	0.77	0	-0.396	1.93	3.00	0.58
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.35	-0.71	dec	0.77	0	-0.396	1.93	3.00	0.58

1570476	1203556812	23-JUN-2016 08:07	DONE	1.79	1.8	dec	0.77	0	-0.396	1.93	3.00	0.58
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.84	0.12	dec	0.77	0	-0.396	1.93	3.00	0.58
1576426	1203572271	23-JUN-2016 12:05	DONE	0.44	-0.57	dec	0.77	0	-0.396	1.93	3.00	0.58
1576430	1203572281	24-JUN-2016 08:09	DONE	1.16	0.67	dec	0.77	0	-0.396	1.93	3.00	0.58
1572234	1203561384	24-JUN-2016 15:54	DONE	0.92	0.26	dec	0.77	0	-0.396	1.93	3.00	0.58
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.55	-0.37	dec	0.77	0	-0.396	1.93	3.00	0.58
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.17	-1	dec	0.77	0	-0.396	1.93	3.00	0.58
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.31	-0.78	dec	0.77	0	-0.396	1.93	3.00	0.58
1573057	1203563602	25-JUN-2016 09:38	DONE	0.63	-0.24	dec	0.77	0	-0.396	1.93	3.00	0.58
1571802	1203560363	25-JUN-2016 09:38	DONE	0.66	-0.18	dec	0.77	0	-0.396	1.93	3.00	0.58
1572236	1203561387	25-JUN-2016 09:39	DONE	0.63	-0.24	dec	0.77	0	-0.396	1.93	3.00	0.58

Cesium-134 BLANK: Limits LCL = -2.0 UCL = 2.3

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559465	10-JUN-2016 13:48	DONE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1569972	1203555533	11-JUN-2016 17:57	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1569038	1203553198	13-JUN-2016 07:51	DUSE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1569992	1203555577	13-JUN-2016 08:14	DUSE	0.07	-0.11	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571050	1203558393	13-JUN-2016 15:47	DUSE	0.06	-0.13	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573439	1203564639	14-JUN-2016 09:29	DONE	-0.001	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1569386	1203554053	14-JUN-2016 10:24	DUSE	-0.021	-0.24	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1574188	1203566570	14-JUN-2016 12:57	DUSE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1569992	1203555577	14-JUN-2016 12:58	DONE	-0.027	-0.25	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1574190	1203566581	14-JUN-2016 13:20	DUSE	0.04	-0.16	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571029	1203558339	14-JUN-2016 14:32	DONE	-0.029	-0.25	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1570346	1203556468	15-JUN-2016 06:41	DONE	-0.007	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571459	1203559441	15-JUN-2016 08:02	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572084	1203561062	15-JUN-2016 10:50	DUSE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572190	1203561289	15-JUN-2016 10:58	DONE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572384	1203561714	16-JUN-2016 12:25	DUSE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572385	1203561724	16-JUN-2016 12:51	DUSE	0.02	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572233	1203561380	16-JUN-2016 12:53	DONE	0.06	-0.14	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1569039	1203553209	17-JUN-2016 07:31	DUSE	-0.004	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.023	-0.25	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573929	1203565769	17-JUN-2016 11:17	DONE	2.82	3.7	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.003	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1575505	1203569877	21-JUN-2016 07:25	DONE	3.54	4.7	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1575357	1203569604	21-JUN-2016 07:41	DONE	-0.517	-0.93	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571024	1203558315	22-JUN-2016 07:20	DUSE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1575812	1203570695	22-JUN-2016 08:54	DUSE	0.02	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573772	1203565433	22-JUN-2016 09:37	DONE	0.01	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1576217	1203571735	23-JUN-2016 07:37	DUSE	0.01	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.008	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72

1570476	1203556811	23-JUN-2016 07:38	DONE	-0.014	-0.23	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1576430	1203572280	23-JUN-2016 09:24	DONE	-0.02	-0.24	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1576426	1203572270	23-JUN-2016 11:01	DONE	-0	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571802	1203560362	24-JUN-2016 11:07	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572703	1203562586	24-JUN-2016 14:22	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572236	1203561386	24-JUN-2016 15:52	DONE	-0	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572234	1203561383	24-JUN-2016 15:53	DONE	-0.006	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573057	1203563601	25-JUN-2016 07:30	DONE	-0.015	-0.23	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573059	1203563607	25-JUN-2016 09:16	DONE	0.03	-0.17	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573399	1203564536	25-JUN-2016 09:21	DUSE	0.02	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72

Cesium-134 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1569972	1203555534	11-JUN-2016 17:58	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1569992	1203555578	13-JUN-2016 09:17	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1571050	1203558394	13-JUN-2016 15:47	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1573439	1203564640	14-JUN-2016 09:29	DONE	6.9	0.01	percent	6.74	0	-21	34.2	20.0	13.7
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1571029	1203558340	14-JUN-2016 14:32	DONE	60.6	3.9	percent	6.74	0	-21	34.2	20.0	13.7
1573929	1203565770	14-JUN-2016 14:39	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1572084	1203561063	15-JUN-2016 10:51	DUSE	13.3	0.48	percent	6.74	0	-21	34.2	20.0	13.7
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1569039	1203553210	17-JUN-2016 07:36	DUSE	29.5	1.7	percent	6.74	0	-21	34.2	20.0	13.7
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1570471	1203556800	17-JUN-2016 13:17	DONE	14.2	0.54	percent	6.74	0	-21	34.2	20.0	13.7
1575505	1203569878	20-JUN-2016 07:04	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1572385	1203561725	20-JUN-2016 08:50	DUSE	7.06	0.02	percent	6.74	0	-21	34.2	20.0	13.7
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1575357	1203569605	21-JUN-2016 10:13	DONE	35.8	2.1	percent	6.74	0	-21	34.2	20.0	13.7
1571024	1203558316	22-JUN-2016 07:21	DUSE	27.7	1.5	percent	6.74	0	-21	34.2	20.0	13.7
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7

1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1576430	1203572281	24-JUN-2016 08:09	DONE	37.2	2.2	percent	6.74	0	-21	34.2	20.0	13.7
1572234	1203561384	24-JUN-2016 15:54	DONE	0.36	-0.46	percent	6.74	0	-21	34.2	20.0	13.7
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.49	percent	6.74	0	-21	34.2	20.0	13.7
1571802	1203560363	25-JUN-2016 09:38	DONE	19.4	0.92	percent	6.74	0	-21	34.2	20.0	13.7
1572236	1203561387	25-JUN-2016 09:39	DONE	11	0.31	percent	6.74	0	-21	34.2	20.0	13.7

Cesium-134 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	1.18	0.91	dec	0.67	0	-0.463	1.8	3.00	0.57
1571466	1203559466	11-JUN-2016 15:29	DONE	1	0.59	dec	0.67	0	-0.463	1.8	3.00	0.57
1569972	1203555534	11-JUN-2016 17:58	DONE	1.01	0.61	dec	0.67	0	-0.463	1.8	3.00	0.57
1569038	1203553199	13-JUN-2016 07:56	DUSE	0.55	-0.21	dec	0.67	0	-0.463	1.8	3.00	0.57
1569992	1203555578	13-JUN-2016 09:17	DONE	0.15	-0.91	dec	0.67	0	-0.463	1.8	3.00	0.57
1571050	1203558394	13-JUN-2016 15:47	DUSE	0.22	-0.78	dec	0.67	0	-0.463	1.8	3.00	0.57
1573439	1203564640	14-JUN-2016 09:29	DONE	0.27	-0.71	dec	0.67	0	-0.463	1.8	3.00	0.57
1569386	1203554054	14-JUN-2016 10:24	DUSE	0.53	-0.25	dec	0.67	0	-0.463	1.8	3.00	0.57
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.39	-0.49	dec	0.67	0	-0.463	1.8	3.00	0.57
1571029	1203558340	14-JUN-2016 14:32	DONE	0.95	0.51	dec	0.67	0	-0.463	1.8	3.00	0.57
1573929	1203565770	14-JUN-2016 14:39	DONE	0.19	-0.84	dec	0.67	0	-0.463	1.8	3.00	0.57
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.44	-0.4	dec	0.67	0	-0.463	1.8	3.00	0.57
1570346	1203556469	15-JUN-2016 06:41	DONE	1.23	0.99	dec	0.67	0	-0.463	1.8	3.00	0.57
1571459	1203559442	15-JUN-2016 08:43	DONE	2.1	2.5	dec	0.67	0	-0.463	1.8	3.00	0.57
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.39	1.3	dec	0.67	0	-0.463	1.8	3.00	0.57
1572190	1203561290	15-JUN-2016 10:58	DONE	0.38	-0.51	dec	0.67	0	-0.463	1.8	3.00	0.57
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.45	-0.38	dec	0.67	0	-0.463	1.8	3.00	0.57
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.22	-0.78	dec	0.67	0	-0.463	1.8	3.00	0.57
1564838	1203541918	17-JUN-2016 07:41	DONE	1.83	2.1	dec	0.67	0	-0.463	1.8	3.00	0.57
1570471	1203556800	17-JUN-2016 13:17	DONE	0.37	-0.52	dec	0.67	0	-0.463	1.8	3.00	0.57
1575505	1203569878	20-JUN-2016 07:04	DONE	0.46	-0.36	dec	0.67	0	-0.463	1.8	3.00	0.57
1572385	1203561725	20-JUN-2016 08:50	DUSE	0.3	-0.64	dec	0.67	0	-0.463	1.8	3.00	0.57
1572233	1203561381	20-JUN-2016 08:52	DONE	1.28	1.1	dec	0.67	0	-0.463	1.8	3.00	0.57
1575357	1203569605	21-JUN-2016 10:13	DONE	2.22	2.7	dec	0.67	0	-0.463	1.8	3.00	0.57
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.21	-0.81	dec	0.67	0	-0.463	1.8	3.00	0.57
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.25	-0.75	dec	0.67	0	-0.463	1.8	3.00	0.57
1573772	1203565434	22-JUN-2016 09:38	DONE	0.02	-1	dec	0.67	0	-0.463	1.8	3.00	0.57
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.54	-0.23	dec	0.67	0	-0.463	1.8	3.00	0.57
1570476	1203556812	23-JUN-2016 08:07	DONE	0.86	0.34	dec	0.67	0	-0.463	1.8	3.00	0.57
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.34	-0.58	dec	0.67	0	-0.463	1.8	3.00	0.57
1576426	1203572271	23-JUN-2016 12:05	DONE	00	-1	dec	0.67	0	-0.463	1.8	3.00	0.57

1576430	1203572281	24-JUN-2016 08:09	DONE	0.97	0.53	dec	0.67	0	-0.463	1.8	3.00	0.57
1572234	1203561384	24-JUN-2016 15:54	DONE	0.01	-1	dec	0.67	0	-0.463	1.8	3.00	0.57
1572703	1203562587	25-JUN-2016 09:16	DONE	0.34	-0.58	dec	0.67	0	-0.463	1.8	3.00	0.57
1573059	1203563608	25-JUN-2016 09:17	DONE	0.54	-0.23	dec	0.67	0	-0.463	1.8	3.00	0.57
1573399	1203564537	25-JUN-2016 09:21	DUSE	1.46	1.4	dec	0.67	0	-0.463	1.8	3.00	0.57
1573057	1203563602	25-JUN-2016 09:38	DONE	0.7	0.06	dec	0.67	0	-0.463	1.8	3.00	0.57
1571802	1203560363	25-JUN-2016 09:38	DONE	0.41	-0.45	dec	0.67	0	-0.463	1.8	3.00	0.57
1572236	1203561387	25-JUN-2016 09:39	DONE	0.25	-0.73	dec	0.67	0	-0.463	1.8	3.00	0.57

Cesium-137 BLANK: Limits LCL = -12 UCL = 13.4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559465	10-JUN-2016 13:48	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1569972	1203555533	11-JUN-2016 17:57	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1569038	1203553198	13-JUN-2016 07:51	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1569992	1203555577	13-JUN-2016 08:14	DUSE	-0.026	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1571050	1203558393	13-JUN-2016 15:47	DONE	-0.131	-0.15	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1573439	1203564639	14-JUN-2016 09:29	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1569386	1203554053	14-JUN-2016 10:24	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1574188	1203566570	14-JUN-2016 12:57	DONE	0.02	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1569992	1203555577	14-JUN-2016 12:58	DONE	-0.003	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1574190	1203566581	14-JUN-2016 13:20	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1571029	1203558339	14-JUN-2016 14:32	DONE	-0.002	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1570346	1203556468	15-JUN-2016 06:41	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1571459	1203559441	15-JUN-2016 08:02	DONE	00	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572084	1203561062	15-JUN-2016 10:50	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572190	1203561289	15-JUN-2016 10:58	DONE	-0.007	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572384	1203561714	16-JUN-2016 12:25	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572385	1203561724	16-JUN-2016 12:51	DONE	-0.006	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.011	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1569039	1203553209	17-JUN-2016 07:31	DONE	-0.002	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.008	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1573929	1203565769	17-JUN-2016 11:17	DONE	26.4	6	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1570471	1203556799	17-JUN-2016 12:56	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1575505	1203569877	21-JUN-2016 07:25	DONE	-3.1	-0.83	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1575357	1203569604	21-JUN-2016 07:41	DONE	-3.6	-0.95	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1571024	1203558315	22-JUN-2016 07:20	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1575812	1203570695	22-JUN-2016 08:54	DONE	-0.022	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1573772	1203565433	22-JUN-2016 09:37	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1576217	1203571735	23-JUN-2016 07:37	DONE	-0.009	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.003	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1570476	1203556811	23-JUN-2016 07:38	DONE	-0.015	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1576430	1203572280	23-JUN-2016 09:24	DONE	0.02	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1576426	1203572270	23-JUN-2016 11:01	DONE	-0.006	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32

1571802	1203560362	24-JUN-2016 11:07	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572703	1203562586	24-JUN-2016 14:22	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572236	1203561386	24-JUN-2016 15:52	DONE	-0.002	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1572234	1203561383	24-JUN-2016 15:53	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1573057	1203563601	25-JUN-2016 07:30	DONE	-0.024	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1573059	1203563607	25-JUN-2016 09:16	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32
1573399	1203564536	25-JUN-2016 09:21	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.32

Cesium-137 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1569972	1203555534	11-JUN-2016 17:58	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1569038	1203553199	13-JUN-2016 07:56	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1569992	1203555578	13-JUN-2016 09:17	DONE	5.39	-0.24	percent	10.4	0	-31	52.1	20.0	20.9
1571050	1203558394	13-JUN-2016 15:47	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1573439	1203564640	14-JUN-2016 09:29	DONE	33.6	1.1	percent	10.4	0	-31	52.1	20.0	20.9
1569386	1203554054	14-JUN-2016 10:24	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1574188	1203566571	14-JUN-2016 13:21	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1571029	1203558340	14-JUN-2016 14:32	DONE	43.6	1.6	percent	10.4	0	-31	52.1	20.0	20.9
1573929	1203565770	14-JUN-2016 14:39	DONE	4	-0.3	percent	10.4	0	-31	52.1	20.0	20.9
1574190	1203566582	14-JUN-2016 15:57	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1572084	1203561063	15-JUN-2016 10:51	DONE	5.02	-0.26	percent	10.4	0	-31	52.1	20.0	20.9
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1572384	1203561715	16-JUN-2016 12:26	DONE	76.4	3.2	percent	10.4	0	-31	52.1	20.0	20.9
1569039	1203553210	17-JUN-2016 07:36	DONE	24.8	0.69	percent	10.4	0	-31	52.1	20.0	20.9
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1570471	1203556800	17-JUN-2016 13:17	DONE	3.86	-0.31	percent	10.4	0	-31	52.1	20.0	20.9
1575505	1203569878	20-JUN-2016 07:04	DONE	28.1	0.85	percent	10.4	0	-31	52.1	20.0	20.9
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1572233	1203561381	20-JUN-2016 08:52	DONE	20.4	0.48	percent	10.4	0	-31	52.1	20.0	20.9
1575357	1203569605	21-JUN-2016 10:13	DONE	2.35	-0.38	percent	10.4	0	-31	52.1	20.0	20.9
1571024	1203558316	22-JUN-2016 07:21	DONE	14.3	0.19	percent	10.4	0	-31	52.1	20.0	20.9
1575812	1203570696	22-JUN-2016 08:54	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1576217	1203571736	23-JUN-2016 07:44	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1570476	1203556812	23-JUN-2016 08:07	DONE	87.6	3.7	percent	10.4	0	-31	52.1	20.0	20.9
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1572234	1203561384	24-JUN-2016 15:54	DONE	5.09	-0.25	percent	10.4	0	-31	52.1	20.0	20.9

1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1573399	1203564537	25-JUN-2016 09:21	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.5	percent	10.4	0	-31	52.1	20.0	20.9
1571802	1203560363	25-JUN-2016 09:38	DONE	3.98	-0.31	percent	10.4	0	-31	52.1	20.0	20.9
1572236	1203561387	25-JUN-2016 09:39	DONE	45.5	1.7	percent	10.4	0	-31	52.1	20.0	20.9

Cesium-137 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559467	10-JUN-2016 14:04	DONE	96.9	-0.37	percent	100	75.0	83.3	117	125	8.33
1573465	1203564716	10-JUN-2016 14:52	DONE	96.4	-0.44	percent	100	75.0	83.3	117	125	8.33
1569038	1203553202	13-JUN-2016 06:39	DONE	99.7	-0.04	percent	100	75.0	83.3	117	125	8.33
1569992	1203555579	13-JUN-2016 09:32	DONE	104	0.47	percent	100	75.0	83.3	117	125	8.33
1573439	1203564641	14-JUN-2016 09:48	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
1569386	1203554057	14-JUN-2016 10:25	DONE	99.8	-0.02	percent	100	75.0	83.3	117	125	8.33
1571050	1203558395	14-JUN-2016 10:32	DONE	110	1.1	percent	100	75.0	83.3	117	125	8.33
1571029	1203558341	14-JUN-2016 10:43	DONE	99.9	-0.01	percent	100	75.0	83.3	117	125	8.33
1571459	1203559443	14-JUN-2016 11:14	DONE	106	0.74	percent	100	75.0	83.3	117	125	8.33
1574188	1203566574	14-JUN-2016 13:22	DONE	99.1	-0.11	percent	100	75.0	83.3	117	125	8.33
1574190	1203566583	15-JUN-2016 06:17	DONE	94.7	-0.64	percent	100	75.0	83.3	117	125	8.33
1570346	1203556470	15-JUN-2016 06:42	DONE	102	0.19	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	15-JUN-2016 10:52	DUSE	99	-0.12	percent	100	75.0	83.3	117	125	8.33
1572190	1203561291	15-JUN-2016 10:59	DONE	108	0.91	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	16-JUN-2016 09:10	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
1572384	1203561716	16-JUN-2016 09:33	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
1569039	1203553211	17-JUN-2016 07:36	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
1564838	1203541919	17-JUN-2016 08:00	DONE	98.8	-0.15	percent	100	75.0	83.3	117	125	8.33
1573929	1203565771	17-JUN-2016 13:24	DONE	104	0.45	percent	100	75.0	83.3	117	125	8.33
1570471	1203556801	20-JUN-2016 07:03	DONE	98.8	-0.14	percent	100	75.0	83.3	117	125	8.33
1572385	1203561726	20-JUN-2016 08:51	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
1572233	1203561382	20-JUN-2016 08:53	DONE	93.9	-0.73	percent	100	75.0	83.3	117	125	8.33
1575505	1203569879	21-JUN-2016 07:26	DONE	105	0.61	percent	100	75.0	83.3	117	125	8.33
1575357	1203569606	21-JUN-2016 07:44	DONE	106	0.66	percent	100	75.0	83.3	117	125	8.33
1571024	1203558317	22-JUN-2016 07:21	DONE	106	0.7	percent	100	75.0	83.3	117	125	8.33
1575812	1203570699	22-JUN-2016 07:51	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
1573772	1203565435	22-JUN-2016 10:20	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
1576217	1203571739	23-JUN-2016 07:45	DONE	101	0.17	percent	100	75.0	83.3	117	125	8.33
1571803	1203560367	23-JUN-2016 08:02	DONE	101	0.11	percent	100	75.0	83.3	117	125	8.33
1570476	1203556813	23-JUN-2016 08:22	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
1576426	1203572272	23-JUN-2016 11:02	DONE	97.6	-0.29	percent	100	75.0	83.3	117	125	8.33
1576430	1203572282	23-JUN-2016 11:35	DONE	95.9	-0.49	percent	100	75.0	83.3	117	125	8.33
1572234	1203561385	25-JUN-2016 09:20	DONE	95.3	-0.57	percent	100	75.0	83.3	117	125	8.33
1573057	1203563603	25-JUN-2016 09:22	DONE	90.3	-1	percent	100	75.0	83.3	117	125	8.33

1573399	1203564538	25-JUN-2016 09:37	DONE	94.9	-0.61	percent	100	75.0	83.3	117	125	8.33
1572703	1203562588	25-JUN-2016 09:54	DONE	95.4	-0.55	percent	100	75.0	83.3	117	125	8.33
1573059	1203563609	25-JUN-2016 10:14	DONE	96.1	-0.47	percent	100	75.0	83.3	117	125	8.33
1571802	1203560364	25-JUN-2016 10:47	DONE	97.6	-0.29	percent	100	75.0	83.3	117	125	8.33
1572236	1203561388	25-JUN-2016 11:03	DONE	95.5	-0.54	percent	100	75.0	83.3	117	125	8.33

Cesium-137 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519622	1203423730	02-NOV-2015 10:04	DONE	0.55	-0.98	percent	4.74	0	-3.8	13.3	20.0	4.29
1524802	1203437209	20-NOV-2015 10:34	DONE	14.7	2.3	percent	4.74	0	-3.8	13.3	20.0	4.29
1533266	1203458681	22-DEC-2015 16:44	DONE	0.54	-0.98	percent	4.74	0	-3.8	13.3	20.0	4.29
1536364	1203466302	11-JAN-2016 11:23	DONE	5.3	0.13	percent	4.74	0	-3.8	13.3	20.0	4.29
1542010	1203481039	03-FEB-2016 11:23	DONE	3.4	-0.31	percent	4.74	0	-3.8	13.3	20.0	4.29
1547288	1203495684	24-FEB-2016 12:31	DONE	1.07	-0.86	percent	4.74	0	-3.8	13.3	20.0	4.29
1548218	1203497950	29-FEB-2016 10:21	DONE	9.81	1.2	percent	4.74	0	-3.8	13.3	20.0	4.29
1550425	1203503644	08-MAR-2016 14:59	DONE	5.6	0.2	percent	4.74	0	-3.8	13.3	20.0	4.29
1553712	1203512070	23-MAR-2016 10:30	DONE	4.71	-0.01	percent	4.74	0	-3.8	13.3	20.0	4.29
1555195	1203515984	28-MAR-2016 09:58	DONE	1.32	-0.8	percent	4.74	0	-3.8	13.3	20.0	4.29
1559978	1203528668	16-APR-2016 10:01	DONE	2.35	-0.56	percent	4.74	0	-3.8	13.3	20.0	4.29
1570342	1203556453	26-MAY-2016 15:47	DONE	9.45	1.1	percent	4.74	0	-3.8	13.3	20.0	4.29
1573465	1203564716	10-JUN-2016 14:52	DONE	2.78	-0.46	percent	4.74	0	-3.8	13.3	20.0	4.29

Cesium-137 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	0.36	-0.61	dec	0.87	0	-0.793	2.53	3.00	0.83
1571466	1203559466	11-JUN-2016 15:29	DONE	1.17	0.37	dec	0.87	0	-0.793	2.53	3.00	0.83
1569972	1203555534	11-JUN-2016 17:58	DONE	0.82	-0.06	dec	0.87	0	-0.793	2.53	3.00	0.83
1569038	1203553199	13-JUN-2016 07:56	DONE	1.55	0.83	dec	0.87	0	-0.793	2.53	3.00	0.83
1569992	1203555578	13-JUN-2016 09:17	DONE	0.24	-0.76	dec	0.87	0	-0.793	2.53	3.00	0.83
1571050	1203558394	13-JUN-2016 15:47	DONE	0.21	-0.79	dec	0.87	0	-0.793	2.53	3.00	0.83
1573439	1203564640	14-JUN-2016 09:29	DONE	1.73	1	dec	0.87	0	-0.793	2.53	3.00	0.83
1569386	1203554054	14-JUN-2016 10:24	DONE	0.73	-0.17	dec	0.87	0	-0.793	2.53	3.00	0.83
1574188	1203566571	14-JUN-2016 13:21	DONE	0.96	0.11	dec	0.87	0	-0.793	2.53	3.00	0.83
1571029	1203558340	14-JUN-2016 14:32	DONE	0.47	-0.48	dec	0.87	0	-0.793	2.53	3.00	0.83
1573929	1203565770	14-JUN-2016 14:39	DONE	0.44	-0.51	dec	0.87	0	-0.793	2.53	3.00	0.83
1574190	1203566582	14-JUN-2016 15:57	DONE	0.91	0.06	dec	0.87	0	-0.793	2.53	3.00	0.83
1570346	1203556469	15-JUN-2016 06:41	DONE	0.13	-0.88	dec	0.87	0	-0.793	2.53	3.00	0.83
1571459	1203559442	15-JUN-2016 08:43	DONE	0.28	-0.71	dec	0.87	0	-0.793	2.53	3.00	0.83
1572084	1203561063	15-JUN-2016 10:51	DONE	0.14	-0.87	dec	0.87	0	-0.793	2.53	3.00	0.83
1572190	1203561290	15-JUN-2016 10:58	DONE	00	-1	dec	0.87	0	-0.793	2.53	3.00	0.83
1572384	1203561715	16-JUN-2016 12:26	DONE	1.74	1.1	dec	0.87	0	-0.793	2.53	3.00	0.83
1569039	1203553210	17-JUN-2016 07:36	DONE	0.49	-0.45	dec	0.87	0	-0.793	2.53	3.00	0.83
1564838	1203541918	17-JUN-2016 07:41	DONE	1.77	1.1	dec	0.87	0	-0.793	2.53	3.00	0.83

1570471	1203556800	17-JUN-2016 13:17	DONE	0.94	0.08	dec	0.87	0	-0.793	2.53	3.00	0.83
1575505	1203569878	20-JUN-2016 07:04	DONE	2.16	1.6	dec	0.87	0	-0.793	2.53	3.00	0.83
1572385	1203561725	20-JUN-2016 08:50	DONE	2.52	2	dec	0.87	0	-0.793	2.53	3.00	0.83
1572233	1203561381	20-JUN-2016 08:52	DONE	0.54	-0.39	dec	0.87	0	-0.793	2.53	3.00	0.83
1575357	1203569605	21-JUN-2016 10:13	DONE	0.32	-0.65	dec	0.87	0	-0.793	2.53	3.00	0.83
1571024	1203558316	22-JUN-2016 07:21	DONE	0.56	-0.37	dec	0.87	0	-0.793	2.53	3.00	0.83
1575812	1203570696	22-JUN-2016 08:54	DONE	0.13	-0.89	dec	0.87	0	-0.793	2.53	3.00	0.83
1573772	1203565434	22-JUN-2016 09:38	DONE	0.3	-0.68	dec	0.87	0	-0.793	2.53	3.00	0.83
1576217	1203571736	23-JUN-2016 07:44	DONE	1.35	0.59	dec	0.87	0	-0.793	2.53	3.00	0.83
1570476	1203556812	23-JUN-2016 08:07	DONE	4.32	4.2	dec	0.87	0	-0.793	2.53	3.00	0.83
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.64	-0.27	dec	0.87	0	-0.793	2.53	3.00	0.83
1576426	1203572271	23-JUN-2016 12:05	DONE	0.12	-0.9	dec	0.87	0	-0.793	2.53	3.00	0.83
1576430	1203572281	24-JUN-2016 08:09	DONE	0.89	0.03	dec	0.87	0	-0.793	2.53	3.00	0.83
1572234	1203561384	24-JUN-2016 15:54	DONE	1.02	0.19	dec	0.87	0	-0.793	2.53	3.00	0.83
1572703	1203562587	25-JUN-2016 09:16	DONE	0.8	-0.08	dec	0.87	0	-0.793	2.53	3.00	0.83
1573059	1203563608	25-JUN-2016 09:17	DONE	0.17	-0.84	dec	0.87	0	-0.793	2.53	3.00	0.83
1573399	1203564537	25-JUN-2016 09:21	DONE	0.27	-0.72	dec	0.87	0	-0.793	2.53	3.00	0.83
1573057	1203563602	25-JUN-2016 09:38	DONE	0.97	0.12	dec	0.87	0	-0.793	2.53	3.00	0.83
1571802	1203560363	25-JUN-2016 09:38	DONE	0.53	-0.4	dec	0.87	0	-0.793	2.53	3.00	0.83
1572236	1203561387	25-JUN-2016 09:39	DONE	1.1	0.29	dec	0.87	0	-0.793	2.53	3.00	0.83

Cobalt-57 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1569972	1203555534	11-JUN-2016 17:58	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1569992	1203555578	13-JUN-2016 09:17	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1571050	1203558394	13-JUN-2016 15:47	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1571029	1203558340	14-JUN-2016 14:32	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1573929	1203565770	14-JUN-2016 14:39	DONE	11.1	1.8	percent	1.22	0	-10	12.5	20.0	5.63
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63

1575505	1203569878	20-JUN-2016 07:04	DONE	2.83	0.29	percent	1.22	0	-10	12.5	20.0	5.63
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1575357	1203569605	21-JUN-2016 10:13	DONE	33.7	5.8	percent	1.22	0	-10	12.5	20.0	5.63
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.22	percent	1.22	0	-10	12.5	20.0	5.63

Cobalt-57 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0.94	0.28	dec	0.78	0	-0.405	1.96	3.00	0.59
1571466	1203559466	11-JUN-2016 15:29	DONE	1.75	1.7	dec	0.78	0	-0.405	1.96	3.00	0.59
1569972	1203555534	11-JUN-2016 17:58	DUSE	1.11	0.56	dec	0.78	0	-0.405	1.96	3.00	0.59
1569038	1203553199	13-JUN-2016 07:56	DUSE	0.75	-0.04	dec	0.78	0	-0.405	1.96	3.00	0.59
1569992	1203555578	13-JUN-2016 09:17	DUSE	1.05	0.46	dec	0.78	0	-0.405	1.96	3.00	0.59
1571050	1203558394	13-JUN-2016 15:47	DUSE	0.42	-0.61	dec	0.78	0	-0.405	1.96	3.00	0.59
1573439	1203564640	14-JUN-2016 09:29	DONE	0.55	-0.38	dec	0.78	0	-0.405	1.96	3.00	0.59
1569386	1203554054	14-JUN-2016 10:24	DUSE	1.1	0.54	dec	0.78	0	-0.405	1.96	3.00	0.59
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.62	-0.26	dec	0.78	0	-0.405	1.96	3.00	0.59
1571029	1203558340	14-JUN-2016 14:32	DUSE	0.32	-0.77	dec	0.78	0	-0.405	1.96	3.00	0.59
1573929	1203565770	14-JUN-2016 14:39	DONE	0.88	0.18	dec	0.78	0	-0.405	1.96	3.00	0.59
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.27	-0.86	dec	0.78	0	-0.405	1.96	3.00	0.59
1570346	1203556469	15-JUN-2016 06:41	DONE	0.38	-0.68	dec	0.78	0	-0.405	1.96	3.00	0.59
1571459	1203559442	15-JUN-2016 08:43	DONE	2.22	2.4	dec	0.78	0	-0.405	1.96	3.00	0.59
1572084	1203561063	15-JUN-2016 10:51	DUSE	2.15	2.3	dec	0.78	0	-0.405	1.96	3.00	0.59
1572190	1203561290	15-JUN-2016 10:58	DONE	1.05	0.46	dec	0.78	0	-0.405	1.96	3.00	0.59
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.13	0.6	dec	0.78	0	-0.405	1.96	3.00	0.59
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.18	-1	dec	0.78	0	-0.405	1.96	3.00	0.59
1564838	1203541918	17-JUN-2016 07:41	DONE	1.12	0.57	dec	0.78	0	-0.405	1.96	3.00	0.59
1570471	1203556800	17-JUN-2016 13:17	DONE	0.02	-1	dec	0.78	0	-0.405	1.96	3.00	0.59
1575505	1203569878	20-JUN-2016 07:04	DONE	0.45	-0.56	dec	0.78	0	-0.405	1.96	3.00	0.59

1572385	1203561725	20-JUN-2016 08:50	DUSE	0.6	-0.3	dec	0.78	0	-0.405	1.96	3.00	0.59
1572233	1203561381	20-JUN-2016 08:52	DONE	0.65	-0.21	dec	0.78	0	-0.405	1.96	3.00	0.59
1575357	1203569605	21-JUN-2016 10:13	DONE	1.25	0.8	dec	0.78	0	-0.405	1.96	3.00	0.59
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.45	-0.55	dec	0.78	0	-0.405	1.96	3.00	0.59
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.16	-1	dec	0.78	0	-0.405	1.96	3.00	0.59
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.36	-0.7	dec	0.78	0	-0.405	1.96	3.00	0.59
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.94	0.27	dec	0.78	0	-0.405	1.96	3.00	0.59
1570476	1203556812	23-JUN-2016 08:07	DONE	0.93	0.26	dec	0.78	0	-0.405	1.96	3.00	0.59
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.22	-0.95	dec	0.78	0	-0.405	1.96	3.00	0.59
1576426	1203572271	23-JUN-2016 12:05	DONE	0.21	-0.96	dec	0.78	0	-0.405	1.96	3.00	0.59
1576430	1203572281	24-JUN-2016 08:09	DONE	0.04	-1	dec	0.78	0	-0.405	1.96	3.00	0.59
1572234	1203561384	24-JUN-2016 15:54	DONE	0.52	-0.44	dec	0.78	0	-0.405	1.96	3.00	0.59
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.63	-0.26	dec	0.78	0	-0.405	1.96	3.00	0.59
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.32	-0.78	dec	0.78	0	-0.405	1.96	3.00	0.59
1573399	1203564537	25-JUN-2016 09:21	DUSE	1.94	2	dec	0.78	0	-0.405	1.96	3.00	0.59
1573057	1203563602	25-JUN-2016 09:38	DONE	0.19	-1	dec	0.78	0	-0.405	1.96	3.00	0.59
1571802	1203560363	25-JUN-2016 09:38	DONE	0.42	-0.6	dec	0.78	0	-0.405	1.96	3.00	0.59
1572236	1203561387	25-JUN-2016 09:39	DONE	2.02	2.1	dec	0.78	0	-0.405	1.96	3.00	0.59

Cobalt-60 BLANK: Limits LCL = -6.0 UCL = 5.4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559465	10-JUN-2016 13:48	DONE	-0.005	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1569972	1203555533	11-JUN-2016 17:57	DONE	0.01	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1569038	1203553198	13-JUN-2016 07:51	DONE	-0.023	0.14	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1569992	1203555577	13-JUN-2016 08:14	DUSE	0.02	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1571050	1203558393	13-JUN-2016 15:47	DONE	0.02	0.17	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1573439	1203564639	14-JUN-2016 09:29	DONE	-0.003	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1569386	1203554053	14-JUN-2016 10:24	DONE	0.02	0.17	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1574188	1203566570	14-JUN-2016 12:57	DONE	-0.004	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1569992	1203555577	14-JUN-2016 12:58	DONE	-0.023	0.14	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1574190	1203566581	14-JUN-2016 13:20	DONE	0.01	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1571029	1203558339	14-JUN-2016 14:32	DONE	-0.02	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1570346	1203556468	15-JUN-2016 06:41	DONE	-0.011	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.002	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572084	1203561062	15-JUN-2016 10:50	DONE	-0.009	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572190	1203561289	15-JUN-2016 10:58	DONE	0.01	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572384	1203561714	16-JUN-2016 12:25	DONE	-0.003	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572385	1203561724	16-JUN-2016 12:51	DONE	0.01	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.03	0.14	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1569039	1203553209	17-JUN-2016 07:31	DONE	00	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.028	0.14	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1573929	1203565769	17-JUN-2016 11:17	DONE	-12	-6	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1570471	1203556799	17-JUN-2016 12:56	DONE	00	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9

1575505	1203569877	21-JUN-2016 07:25	DONE	-0.391	-0.05	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1575357	1203569604	21-JUN-2016 07:41	DONE	0.63	0.49	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1571024	1203558315	22-JUN-2016 07:20	DONE	-0.004	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1575812	1203570695	22-JUN-2016 08:54	DONE	0.01	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1573772	1203565433	22-JUN-2016 09:37	DONE	0.01	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1576217	1203571735	23-JUN-2016 07:37	DONE	-0.002	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.023	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1570476	1203556811	23-JUN-2016 07:38	DONE	0.02	0.17	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1576430	1203572280	23-JUN-2016 09:24	DONE	0.04	0.18	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1576426	1203572270	23-JUN-2016 11:01	DONE	-0.016	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1571802	1203560362	24-JUN-2016 11:07	DONE	00	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572703	1203562586	24-JUN-2016 14:22	DONE	-0.013	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572236	1203561386	24-JUN-2016 15:52	DONE	00	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1572234	1203561383	24-JUN-2016 15:53	DONE	00	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1573057	1203563601	25-JUN-2016 07:30	DONE	00	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1573059	1203563607	25-JUN-2016 09:16	DONE	-0	0.16	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9
1573399	1203564536	25-JUN-2016 09:21	DONE	-0.021	0.15	pCi/g	-0.299	-6	-4.1	3.51	5.41	1.9

Cobalt-60 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1569972	1203555534	11-JUN-2016 17:58	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1569038	1203553199	13-JUN-2016 07:56	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1569992	1203555578	13-JUN-2016 09:17	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1571050	1203558394	13-JUN-2016 15:47	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1569386	1203554054	14-JUN-2016 10:24	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1574188	1203566571	14-JUN-2016 13:21	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1571029	1203558340	14-JUN-2016 14:32	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1573929	1203565770	14-JUN-2016 14:39	DONE	2.19	2.8	percent	0.21	0	-1.2	1.6	20.0	0.7
1574190	1203566582	14-JUN-2016 15:57	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1572084	1203561063	15-JUN-2016 10:51	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1572384	1203561715	16-JUN-2016 12:26	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1569039	1203553210	17-JUN-2016 07:36	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1575505	1203569878	20-JUN-2016 07:04	DONE	0.47	0.37	percent	0.21	0	-1.2	1.6	20.0	0.7
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7

1575357	1203569605	21-JUN-2016 10:13	DONE	2.77	3.7	percent	0.21	0	-1.2	1.6	20.0	0.7
1571024	1203558316	22-JUN-2016 07:21	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1575812	1203570696	22-JUN-2016 08:54	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1576217	1203571736	23-JUN-2016 07:44	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1573399	1203564537	25-JUN-2016 09:21	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7
1571802	1203560363	25-JUN-2016 09:38	DONE	2.73	3.6	percent	0.21	0	-1.2	1.6	20.0	0.7
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.3	percent	0.21	0	-1.2	1.6	20.0	0.7

Cobalt-60 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559467	10-JUN-2016 14:04	DONE	95.1	-0.59	percent	100	75.0	83.3	117	125	8.33
1573465	1203564716	10-JUN-2016 14:52	DONE	98.7	-0.16	percent	100	75.0	83.3	117	125	8.33
1569038	1203553202	13-JUN-2016 06:39	DONE	94.1	-0.71	percent	100	75.0	83.3	117	125	8.33
1569992	1203555579	13-JUN-2016 09:32	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
1573439	1203564641	14-JUN-2016 09:48	DONE	107	0.88	percent	100	75.0	83.3	117	125	8.33
1569386	1203554057	14-JUN-2016 10:25	DONE	93.9	-0.74	percent	100	75.0	83.3	117	125	8.33
1571050	1203558395	14-JUN-2016 10:32	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1571029	1203558341	14-JUN-2016 10:43	DONE	93.4	-0.79	percent	100	75.0	83.3	117	125	8.33
1571459	1203559443	14-JUN-2016 11:14	DONE	100	0.02	percent	100	75.0	83.3	117	125	8.33
1574188	1203566574	14-JUN-2016 13:22	DONE	93.8	-0.74	percent	100	75.0	83.3	117	125	8.33
1574190	1203566583	15-JUN-2016 06:17	DONE	94.2	-0.7	percent	100	75.0	83.3	117	125	8.33
1570346	1203556470	15-JUN-2016 06:42	DONE	96.4	-0.44	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	15-JUN-2016 10:52	DUSE	96.8	-0.38	percent	100	75.0	83.3	117	125	8.33
1572190	1203561291	15-JUN-2016 10:59	DONE	106	0.67	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	16-JUN-2016 09:10	DONE	95.3	-0.56	percent	100	75.0	83.3	117	125	8.33
1572384	1203561716	16-JUN-2016 09:33	DONE	98.2	-0.21	percent	100	75.0	83.3	117	125	8.33
1569039	1203553211	17-JUN-2016 07:36	DONE	94.9	-0.62	percent	100	75.0	83.3	117	125	8.33
1564838	1203541919	17-JUN-2016 08:00	DONE	95.4	-0.55	percent	100	75.0	83.3	117	125	8.33
1573929	1203565771	17-JUN-2016 13:24	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1570471	1203556801	20-JUN-2016 07:03	DONE	94.1	-0.7	percent	100	75.0	83.3	117	125	8.33
1572385	1203561726	20-JUN-2016 08:51	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1572233	1203561382	20-JUN-2016 08:53	DONE	94.8	-0.62	percent	100	75.0	83.3	117	125	8.33
1575505	1203569879	21-JUN-2016 07:26	DONE	99.9	-0.01	percent	100	75.0	83.3	117	125	8.33
1575357	1203569606	21-JUN-2016 07:44	DONE	103	0.33	percent	100	75.0	83.3	117	125	8.33

1571024	1203558317	22-JUN-2016 07:21	DONE	98.2	-0.22	percent	100	75.0	83.3	117	125	8.33
1575812	1203570699	22-JUN-2016 07:51	DONE	96.4	-0.43	percent	100	75.0	83.3	117	125	8.33
1573772	1203565435	22-JUN-2016 10:20	DONE	95.3	-0.57	percent	100	75.0	83.3	117	125	8.33
1576217	1203571739	23-JUN-2016 07:45	DONE	98.6	-0.16	percent	100	75.0	83.3	117	125	8.33
1571803	1203560367	23-JUN-2016 08:02	DONE	101	0.08	percent	100	75.0	83.3	117	125	8.33
1570476	1203556813	23-JUN-2016 08:22	DONE	101	0.09	percent	100	75.0	83.3	117	125	8.33
1576426	1203572272	23-JUN-2016 11:02	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1576430	1203572282	23-JUN-2016 11:35	DONE	93.4	-0.79	percent	100	75.0	83.3	117	125	8.33
1572234	1203561385	25-JUN-2016 09:20	DONE	95.6	-0.52	percent	100	75.0	83.3	117	125	8.33
1573057	1203563603	25-JUN-2016 09:22	DONE	91.2	-1	percent	100	75.0	83.3	117	125	8.33
1573399	1203564538	25-JUN-2016 09:37	DONE	95.6	-0.52	percent	100	75.0	83.3	117	125	8.33
1572703	1203562588	25-JUN-2016 09:54	DONE	94.9	-0.61	percent	100	75.0	83.3	117	125	8.33
1573059	1203563609	25-JUN-2016 10:14	DONE	96	-0.48	percent	100	75.0	83.3	117	125	8.33
1571802	1203560364	25-JUN-2016 10:47	DONE	96.9	-0.37	percent	100	75.0	83.3	117	125	8.33
1572236	1203561388	25-JUN-2016 11:03	DONE	93.4	-0.79	percent	100	75.0	83.3	117	125	8.33

Cobalt-60 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519622	1203423730	02-NOV-2015 10:04	DONE	0.2	-0.97	percent	3.83	0	-3.7	11.3	20.0	3.76
1524802	1203437209	20-NOV-2015 10:34	DONE	8.12	1.1	percent	3.83	0	-3.7	11.3	20.0	3.76
1533266	1203458681	22-DEC-2015 16:44	DONE	4.94	0.3	percent	3.83	0	-3.7	11.3	20.0	3.76
1536364	1203466302	11-JAN-2016 11:23	DONE	0.36	-0.92	percent	3.83	0	-3.7	11.3	20.0	3.76
1542010	1203481039	03-FEB-2016 11:23	DONE	4.91	0.29	percent	3.83	0	-3.7	11.3	20.0	3.76
1547288	1203495684	24-FEB-2016 12:31	DONE	2.56	-0.34	percent	3.83	0	-3.7	11.3	20.0	3.76
1548218	1203497950	29-FEB-2016 10:21	DONE	3.32	-0.14	percent	3.83	0	-3.7	11.3	20.0	3.76
1550425	1203503644	08-MAR-2016 14:59	DONE	0.33	-0.93	percent	3.83	0	-3.7	11.3	20.0	3.76
1553712	1203512070	23-MAR-2016 10:30	DONE	2.57	-0.34	percent	3.83	0	-3.7	11.3	20.0	3.76
1555195	1203515984	28-MAR-2016 09:58	DONE	1.82	-0.53	percent	3.83	0	-3.7	11.3	20.0	3.76
1559978	1203528668	16-APR-2016 10:01	DONE	13.6	2.6	percent	3.83	0	-3.7	11.3	20.0	3.76
1570342	1203556453	26-MAY-2016 15:47	DONE	1.45	-0.63	percent	3.83	0	-3.7	11.3	20.0	3.76
1573465	1203564716	10-JUN-2016 14:52	DONE	5.63	0.48	percent	3.83	0	-3.7	11.3	20.0	3.76

Cobalt-60 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DONE	0.28	-0.6	dec	0.65	0	-0.6	1.91	3.00	0.63
1571466	1203559466	11-JUN-2016 15:29	DONE	0.1	-0.88	dec	0.65	0	-0.6	1.91	3.00	0.63
1569972	1203555534	11-JUN-2016 17:58	DONE	1.35	1.1	dec	0.65	0	-0.6	1.91	3.00	0.63
1569038	1203553199	13-JUN-2016 07:56	DONE	0.94	0.45	dec	0.65	0	-0.6	1.91	3.00	0.63
1569992	1203555578	13-JUN-2016 09:17	DONE	0.29	-0.58	dec	0.65	0	-0.6	1.91	3.00	0.63
1571050	1203558394	13-JUN-2016 15:47	DONE	0.1	-0.88	dec	0.65	0	-0.6	1.91	3.00	0.63
1573439	1203564640	14-JUN-2016 09:29	DONE	0.52	-0.22	dec	0.65	0	-0.6	1.91	3.00	0.63
1569386	1203554054	14-JUN-2016 10:24	DONE	0.97	0.5	dec	0.65	0	-0.6	1.91	3.00	0.63
1574188	1203566571	14-JUN-2016 13:21	DONE	0.51	-0.23	dec	0.65	0	-0.6	1.91	3.00	0.63

1571029	1203558340	14-JUN-2016 14:32	DONE	0.7	0.06	dec	0.65	0	-0.6	1.91	3.00	0.63
1573929	1203565770	14-JUN-2016 14:39	DONE	0.34	-0.51	dec	0.65	0	-0.6	1.91	3.00	0.63
1574190	1203566582	14-JUN-2016 15:57	DONE	0.81	0.24	dec	0.65	0	-0.6	1.91	3.00	0.63
1570346	1203556469	15-JUN-2016 06:41	DONE	0.98	0.53	dec	0.65	0	-0.6	1.91	3.00	0.63
1571459	1203559442	15-JUN-2016 08:43	DONE	0.29	-0.59	dec	0.65	0	-0.6	1.91	3.00	0.63
1572084	1203561063	15-JUN-2016 10:51	DONE	1.55	1.4	dec	0.65	0	-0.6	1.91	3.00	0.63
1572190	1203561290	15-JUN-2016 10:58	DONE	1.32	1.1	dec	0.65	0	-0.6	1.91	3.00	0.63
1572384	1203561715	16-JUN-2016 12:26	DONE	1.02	0.59	dec	0.65	0	-0.6	1.91	3.00	0.63
1569039	1203553210	17-JUN-2016 07:36	DONE	0.14	-0.81	dec	0.65	0	-0.6	1.91	3.00	0.63
1564838	1203541918	17-JUN-2016 07:41	DONE	0.85	0.31	dec	0.65	0	-0.6	1.91	3.00	0.63
1570471	1203556800	17-JUN-2016 13:17	DONE	3.47	4.5	dec	0.65	0	-0.6	1.91	3.00	0.63
1575505	1203569878	20-JUN-2016 07:04	DONE	0.07	-0.93	dec	0.65	0	-0.6	1.91	3.00	0.63
1572385	1203561725	20-JUN-2016 08:50	DONE	0.49	-0.27	dec	0.65	0	-0.6	1.91	3.00	0.63
1572233	1203561381	20-JUN-2016 08:52	DONE	0.59	-0.11	dec	0.65	0	-0.6	1.91	3.00	0.63
1575357	1203569605	21-JUN-2016 10:13	DONE	0.44	-0.35	dec	0.65	0	-0.6	1.91	3.00	0.63
1571024	1203558316	22-JUN-2016 07:21	DONE	0.4	-0.41	dec	0.65	0	-0.6	1.91	3.00	0.63
1575812	1203570696	22-JUN-2016 08:54	DONE	1.11	0.72	dec	0.65	0	-0.6	1.91	3.00	0.63
1573772	1203565434	22-JUN-2016 09:38	DONE	0.02	-1	dec	0.65	0	-0.6	1.91	3.00	0.63
1576217	1203571736	23-JUN-2016 07:44	DONE	0.19	-0.74	dec	0.65	0	-0.6	1.91	3.00	0.63
1570476	1203556812	23-JUN-2016 08:07	DONE	0.23	-0.68	dec	0.65	0	-0.6	1.91	3.00	0.63
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.45	-0.33	dec	0.65	0	-0.6	1.91	3.00	0.63
1576426	1203572271	23-JUN-2016 12:05	DONE	0.04	-0.97	dec	0.65	0	-0.6	1.91	3.00	0.63
1576430	1203572281	24-JUN-2016 08:09	DONE	1.37	1.1	dec	0.65	0	-0.6	1.91	3.00	0.63
1572234	1203561384	24-JUN-2016 15:54	DONE	0.56	-0.15	dec	0.65	0	-0.6	1.91	3.00	0.63
1572703	1203562587	25-JUN-2016 09:16	DONE	0.02	-1	dec	0.65	0	-0.6	1.91	3.00	0.63
1573059	1203563608	25-JUN-2016 09:17	DONE	0.35	-0.49	dec	0.65	0	-0.6	1.91	3.00	0.63
1573399	1203564537	25-JUN-2016 09:21	DONE	1.06	0.64	dec	0.65	0	-0.6	1.91	3.00	0.63
1573057	1203563602	25-JUN-2016 09:38	DONE	0.53	-0.2	dec	0.65	0	-0.6	1.91	3.00	0.63
1571802	1203560363	25-JUN-2016 09:38	DONE	0.21	-0.71	dec	0.65	0	-0.6	1.91	3.00	0.63
1572236	1203561387	25-JUN-2016 09:39	DONE	0.92	0.42	dec	0.65	0	-0.6	1.91	3.00	0.63

Europium-152 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0		percent	0	0	0	0	20.0	0
1571466	1203559466	11-JUN-2016 15:29	DONE	0		percent	0	0	0	0	20.0	0
1569972	1203555534	11-JUN-2016 17:58	DUSE	0		percent	0	0	0	0	20.0	0
1569038	1203553199	13-JUN-2016 07:56	DUSE	0		percent	0	0	0	0	20.0	0
1569992	1203555578	13-JUN-2016 09:17	DUSE	0		percent	0	0	0	0	20.0	0
1571050	1203558394	13-JUN-2016 15:47	DUSE	0		percent	0	0	0	0	20.0	0
1573439	1203564640	14-JUN-2016 09:29	DONE	0		percent	0	0	0	0	20.0	0
1569386	1203554054	14-JUN-2016 10:24	DUSE	0		percent	0	0	0	0	20.0	0
1574188	1203566571	14-JUN-2016 13:21	DUSE	0		percent	0	0	0	0	20.0	0
1571029	1203558340	14-JUN-2016 14:32	DUSE	0		percent	0	0	0	0	20.0	0

1573929	1203565770	14-JUN-2016 14:39	DONE	0		percent	0	0	0	0	20.0	0
1574190	1203566582	14-JUN-2016 15:57	DONE	0		percent	0	0	0	0	20.0	0
1570346	1203556469	15-JUN-2016 06:41	DUSE	0		percent	0	0	0	0	20.0	0
1571459	1203559442	15-JUN-2016 08:43	DUSE	0		percent	0	0	0	0	20.0	0
1572084	1203561063	15-JUN-2016 10:51	DUSE	0		percent	0	0	0	0	20.0	0
1572190	1203561290	15-JUN-2016 10:58	DONE	0		percent	0	0	0	0	20.0	0
1572384	1203561715	16-JUN-2016 12:26	DUSE	0		percent	0	0	0	0	20.0	0
1569039	1203553210	17-JUN-2016 07:36	DUSE	0		percent	0	0	0	0	20.0	0
1564838	1203541918	17-JUN-2016 07:41	DONE	0		percent	0	0	0	0	20.0	0
1570471	1203556800	17-JUN-2016 13:17	DONE	0		percent	0	0	0	0	20.0	0
1575505	1203569878	20-JUN-2016 07:04	DUSE	0		percent	0	0	0	0	20.0	0
1572385	1203561725	20-JUN-2016 08:50	DONE	0		percent	0	0	0	0	20.0	0
1572233	1203561381	20-JUN-2016 08:52	DONE	0		percent	0	0	0	0	20.0	0
1575357	1203569605	21-JUN-2016 10:13	DUSE	0		percent	0	0	0	0	20.0	0
1571024	1203558316	22-JUN-2016 07:21	DUSE	0		percent	0	0	0	0	20.0	0
1575812	1203570696	22-JUN-2016 08:54	DUSE	0		percent	0	0	0	0	20.0	0
1573772	1203565434	22-JUN-2016 09:38	DUSE	0		percent	0	0	0	0	20.0	0
1576217	1203571736	23-JUN-2016 07:44	DUSE	0		percent	0	0	0	0	20.0	0
1570476	1203556812	23-JUN-2016 08:07	DONE	0		percent	0	0	0	0	20.0	0
1571803	1203560366	23-JUN-2016 08:25	DUSE	0		percent	0	0	0	0	20.0	0
1576426	1203572271	23-JUN-2016 12:05	DONE	0		percent	0	0	0	0	20.0	0
1576430	1203572281	24-JUN-2016 08:09	DONE	0		percent	0	0	0	0	20.0	0
1572234	1203561384	24-JUN-2016 15:54	DONE	0		percent	0	0	0	0	20.0	0
1572703	1203562587	25-JUN-2016 09:16	DUSE	0		percent	0	0	0	0	20.0	0
1573059	1203563608	25-JUN-2016 09:17	DUSE	0		percent	0	0	0	0	20.0	0
1573399	1203564537	25-JUN-2016 09:21	DUSE	0		percent	0	0	0	0	20.0	0
1573057	1203563602	25-JUN-2016 09:38	DONE	0		percent	0	0	0	0	20.0	0
1571802	1203560363	25-JUN-2016 09:38	DONE	0		percent	0	0	0	0	20.0	0
1572236	1203561387	25-JUN-2016 09:39	DONE	0		percent	0	0	0	0	20.0	0

Europium-152 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	01	0.46	dec	0.74	0	-0.379	1.86	3.00	0.56
1571466	1203559466	11-JUN-2016 15:29	DONE	0.01	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1569972	1203555534	11-JUN-2016 17:58	DUSE	0.48	-0.47	dec	0.74	0	-0.379	1.86	3.00	0.56
1569038	1203553199	13-JUN-2016 07:56	DUSE	0.11	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1569992	1203555578	13-JUN-2016 09:17	DUSE	1.58	1.5	dec	0.74	0	-0.379	1.86	3.00	0.56
1571050	1203558394	13-JUN-2016 15:47	DUSE	0.17	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1573439	1203564640	14-JUN-2016 09:29	DONE	1.69	1.7	dec	0.74	0	-0.379	1.86	3.00	0.56
1569386	1203554054	14-JUN-2016 10:24	DUSE	1.07	0.58	dec	0.74	0	-0.379	1.86	3.00	0.56
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.04	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1571029	1203558340	14-JUN-2016 14:32	DUSE	0.63	-0.2	dec	0.74	0	-0.379	1.86	3.00	0.56
1573929	1203565770	14-JUN-2016 14:39	DONE	0.61	-0.22	dec	0.74	0	-0.379	1.86	3.00	0.56

1574190	1203566582	14-JUN-2016 15:57	DONE	0.57	-0.3	dec	0.74	0	-0.379	1.86	3.00	0.56
1570346	1203556469	15-JUN-2016 06:41	DUSE	2.33	2.9	dec	0.74	0	-0.379	1.86	3.00	0.56
1571459	1203559442	15-JUN-2016 08:43	DUSE	0.88	0.25	dec	0.74	0	-0.379	1.86	3.00	0.56
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.54	-0.36	dec	0.74	0	-0.379	1.86	3.00	0.56
1572190	1203561290	15-JUN-2016 10:58	DONE	0.42	-0.57	dec	0.74	0	-0.379	1.86	3.00	0.56
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.75	1.8	dec	0.74	0	-0.379	1.86	3.00	0.56
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.11	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1564838	1203541918	17-JUN-2016 07:41	DONE	0.43	-0.56	dec	0.74	0	-0.379	1.86	3.00	0.56
1570471	1203556800	17-JUN-2016 13:17	DONE	0.4	-0.6	dec	0.74	0	-0.379	1.86	3.00	0.56
1575505	1203569878	20-JUN-2016 07:04	DUSE	1.32	1	dec	0.74	0	-0.379	1.86	3.00	0.56
1572385	1203561725	20-JUN-2016 08:50	DONE	1.33	1.1	dec	0.74	0	-0.379	1.86	3.00	0.56
1572233	1203561381	20-JUN-2016 08:52	DONE	0.9	0.28	dec	0.74	0	-0.379	1.86	3.00	0.56
1575357	1203569605	21-JUN-2016 10:13	DUSE	0.69	-0.08	dec	0.74	0	-0.379	1.86	3.00	0.56
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.35	-0.69	dec	0.74	0	-0.379	1.86	3.00	0.56
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.71	-0.06	dec	0.74	0	-0.379	1.86	3.00	0.56
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.04	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.57	-0.3	dec	0.74	0	-0.379	1.86	3.00	0.56
1570476	1203556812	23-JUN-2016 08:07	DONE	0.44	-0.54	dec	0.74	0	-0.379	1.86	3.00	0.56
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.27	-0.84	dec	0.74	0	-0.379	1.86	3.00	0.56
1576426	1203572271	23-JUN-2016 12:05	DONE	0.05	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1576430	1203572281	24-JUN-2016 08:09	DONE	0.92	0.32	dec	0.74	0	-0.379	1.86	3.00	0.56
1572234	1203561384	24-JUN-2016 15:54	DONE	1.12	0.68	dec	0.74	0	-0.379	1.86	3.00	0.56
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.51	-0.42	dec	0.74	0	-0.379	1.86	3.00	0.56
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.12	-1	dec	0.74	0	-0.379	1.86	3.00	0.56
1573399	1203564537	25-JUN-2016 09:21	DUSE	1.49	1.3	dec	0.74	0	-0.379	1.86	3.00	0.56
1573057	1203563602	25-JUN-2016 09:38	DONE	1.45	1.3	dec	0.74	0	-0.379	1.86	3.00	0.56
1571802	1203560363	25-JUN-2016 09:38	DONE	0.9	0.29	dec	0.74	0	-0.379	1.86	3.00	0.56
1572236	1203561387	25-JUN-2016 09:39	DONE	0.84	0.19	dec	0.74	0	-0.379	1.86	3.00	0.56

Europium-154 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1569972	1203555534	11-JUN-2016 17:58	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1569992	1203555578	13-JUN-2016 09:17	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571050	1203558394	13-JUN-2016 15:47	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571029	1203558340	14-JUN-2016 14:32	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573929	1203565770	14-JUN-2016 14:39	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1574190	1203566582	14-JUN-2016 15:57	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44

1570346	1203556469	15-JUN-2016 06:41	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571459	1203559442	15-JUN-2016 08:43	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1575505	1203569878	20-JUN-2016 07:04	DUSE	6.26	1.6	percent	0.69	0	-6.2	7.57	20.0	3.44
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1575357	1203569605	21-JUN-2016 10:13	DUSE	20.7	5.8	percent	0.69	0	-6.2	7.57	20.0	3.44
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44

Europium-154 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0.03	-1	dec	0.68	0	-0.567	1.93	3.00	0.62
1571466	1203559466	11-JUN-2016 15:29	DONE	0.66	-0.03	dec	0.68	0	-0.567	1.93	3.00	0.62
1569972	1203555534	11-JUN-2016 17:58	DUSE	1.03	0.56	dec	0.68	0	-0.567	1.93	3.00	0.62
1569038	1203553199	13-JUN-2016 07:56	DUSE	0.08	-0.97	dec	0.68	0	-0.567	1.93	3.00	0.62
1569992	1203555578	13-JUN-2016 09:17	DONE	0.45	-0.37	dec	0.68	0	-0.567	1.93	3.00	0.62
1571050	1203558394	13-JUN-2016 15:47	DUSE	0.59	-0.14	dec	0.68	0	-0.567	1.93	3.00	0.62
1573439	1203564640	14-JUN-2016 09:29	DONE	0.19	-0.79	dec	0.68	0	-0.567	1.93	3.00	0.62
1569386	1203554054	14-JUN-2016 10:24	DUSE	0.4	-0.45	dec	0.68	0	-0.567	1.93	3.00	0.62
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.58	-0.17	dec	0.68	0	-0.567	1.93	3.00	0.62
1571029	1203558340	14-JUN-2016 14:32	DUSE	0.18	-0.81	dec	0.68	0	-0.567	1.93	3.00	0.62
1573929	1203565770	14-JUN-2016 14:39	DONE	00	-1	dec	0.68	0	-0.567	1.93	3.00	0.62
1574190	1203566582	14-JUN-2016 15:57	DONE	0.52	-0.25	dec	0.68	0	-0.567	1.93	3.00	0.62
1570346	1203556469	15-JUN-2016 06:41	DUSE	0.88	0.32	dec	0.68	0	-0.567	1.93	3.00	0.62

1571459	1203559442	15-JUN-2016 08:43	DUSE	1.36	1.1	dec	0.68	0	-0.567	1.93	3.00	0.62
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.67	1.6	dec	0.68	0	-0.567	1.93	3.00	0.62
1572190	1203561290	15-JUN-2016 10:58	DONE	1.32	1	dec	0.68	0	-0.567	1.93	3.00	0.62
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.43	-0.4	dec	0.68	0	-0.567	1.93	3.00	0.62
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.53	-0.25	dec	0.68	0	-0.567	1.93	3.00	0.62
1564838	1203541918	17-JUN-2016 07:41	DONE	1.14	0.73	dec	0.68	0	-0.567	1.93	3.00	0.62
1570471	1203556800	17-JUN-2016 13:17	DONE	0.62	-0.1	dec	0.68	0	-0.567	1.93	3.00	0.62
1575505	1203569878	20-JUN-2016 07:04	DUSE	0.14	-0.87	dec	0.68	0	-0.567	1.93	3.00	0.62
1572385	1203561725	20-JUN-2016 08:50	DONE	1.32	1	dec	0.68	0	-0.567	1.93	3.00	0.62
1572233	1203561381	20-JUN-2016 08:52	DONE	0.01	-1	dec	0.68	0	-0.567	1.93	3.00	0.62
1575357	1203569605	21-JUN-2016 10:13	DUSE	1.41	1.2	dec	0.68	0	-0.567	1.93	3.00	0.62
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.39	-0.46	dec	0.68	0	-0.567	1.93	3.00	0.62
1575812	1203570696	22-JUN-2016 08:54	DUSE	1.61	1.5	dec	0.68	0	-0.567	1.93	3.00	0.62
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.36	-0.51	dec	0.68	0	-0.567	1.93	3.00	0.62
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.42	-0.42	dec	0.68	0	-0.567	1.93	3.00	0.62
1570476	1203556812	23-JUN-2016 08:07	DONE	0.27	-0.65	dec	0.68	0	-0.567	1.93	3.00	0.62
1571803	1203560366	23-JUN-2016 08:25	DUSE	1.02	0.54	dec	0.68	0	-0.567	1.93	3.00	0.62
1576426	1203572271	23-JUN-2016 12:05	DONE	0.54	-0.23	dec	0.68	0	-0.567	1.93	3.00	0.62
1576430	1203572281	24-JUN-2016 08:09	DONE	0.02	-1	dec	0.68	0	-0.567	1.93	3.00	0.62
1572234	1203561384	24-JUN-2016 15:54	DONE	0.06	-01	dec	0.68	0	-0.567	1.93	3.00	0.62
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.46	-0.35	dec	0.68	0	-0.567	1.93	3.00	0.62
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.64	-0.07	dec	0.68	0	-0.567	1.93	3.00	0.62
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.4	-0.44	dec	0.68	0	-0.567	1.93	3.00	0.62
1573057	1203563602	25-JUN-2016 09:38	DONE	1.66	1.6	dec	0.68	0	-0.567	1.93	3.00	0.62
1571802	1203560363	25-JUN-2016 09:38	DONE	0.19	-0.79	dec	0.68	0	-0.567	1.93	3.00	0.62
1572236	1203561387	25-JUN-2016 09:39	DONE	2.99	3.7	dec	0.68	0	-0.567	1.93	3.00	0.62

Europium-155 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1569972	1203555534	11-JUN-2016 17:58	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1569992	1203555578	13-JUN-2016 09:17	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571050	1203558394	13-JUN-2016 15:47	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571029	1203558340	14-JUN-2016 14:32	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573929	1203565770	14-JUN-2016 14:39	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1570346	1203556469	15-JUN-2016 06:41	DUSE	14.6	1.6	percent	2.72	0	-12	17.7	20.0	7.47
1571459	1203559442	15-JUN-2016 08:43	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47

1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572384	1203561715	16-JUN-2016 12:26	DUSE	22	2.6	percent	2.72	0	-12	17.7	20.0	7.47
1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1575505	1203569878	20-JUN-2016 07:04	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1575357	1203569605	21-JUN-2016 10:13	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571024	1203558316	22-JUN-2016 07:21	DUSE	17.6	2	percent	2.72	0	-12	17.7	20.0	7.47
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576430	1203572281	24-JUN-2016 08:09	DONE	7.35	0.62	percent	2.72	0	-12	17.7	20.0	7.47
1572234	1203561384	24-JUN-2016 15:54	DONE	7.51	0.64	percent	2.72	0	-12	17.7	20.0	7.47
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571802	1203560363	25-JUN-2016 09:38	DONE	0.9	-0.24	percent	2.72	0	-12	17.7	20.0	7.47
1572236	1203561387	25-JUN-2016 09:39	DONE	35.9	4.4	percent	2.72	0	-12	17.7	20.0	7.47

Europium-155 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	2.21	2	dec	0.71	0	-0.773	2.2	3.00	0.74
1571466	1203559466	11-JUN-2016 15:29	DONE	1.41	0.93	dec	0.71	0	-0.773	2.2	3.00	0.74
1569972	1203555534	11-JUN-2016 17:58	DUSE	0.28	-0.59	dec	0.71	0	-0.773	2.2	3.00	0.74
1569038	1203553199	13-JUN-2016 07:56	DUSE	1.14	0.57	dec	0.71	0	-0.773	2.2	3.00	0.74
1569992	1203555578	13-JUN-2016 09:17	DUSE	0.38	-0.44	dec	0.71	0	-0.773	2.2	3.00	0.74
1571050	1203558394	13-JUN-2016 15:47	DUSE	0.19	-0.7	dec	0.71	0	-0.773	2.2	3.00	0.74
1573439	1203564640	14-JUN-2016 09:29	DONE	0.23	-0.65	dec	0.71	0	-0.773	2.2	3.00	0.74
1569386	1203554054	14-JUN-2016 10:24	DUSE	0.03	-0.92	dec	0.71	0	-0.773	2.2	3.00	0.74
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.94	0.31	dec	0.71	0	-0.773	2.2	3.00	0.74
1571029	1203558340	14-JUN-2016 14:32	DUSE	0.41	-0.41	dec	0.71	0	-0.773	2.2	3.00	0.74
1573929	1203565770	14-JUN-2016 14:39	DONE	0.18	-0.72	dec	0.71	0	-0.773	2.2	3.00	0.74
1574190	1203566582	14-JUN-2016 15:57	DUSE	2.66	2.6	dec	0.71	0	-0.773	2.2	3.00	0.74
1570346	1203556469	15-JUN-2016 06:41	DUSE	2.61	2.6	dec	0.71	0	-0.773	2.2	3.00	0.74
1571459	1203559442	15-JUN-2016 08:43	DUSE	2.46	2.4	dec	0.71	0	-0.773	2.2	3.00	0.74
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.05	0.46	dec	0.71	0	-0.773	2.2	3.00	0.74

1572190	1203561290	15-JUN-2016 10:58	DONE	1.7	1.3	dec	0.71	0	-0.773	2.2	3.00	0.74
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.39	-0.43	dec	0.71	0	-0.773	2.2	3.00	0.74
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.16	-0.75	dec	0.71	0	-0.773	2.2	3.00	0.74
1564838	1203541918	17-JUN-2016 07:41	DONE	0.32	-0.53	dec	0.71	0	-0.773	2.2	3.00	0.74
1570471	1203556800	17-JUN-2016 13:17	DONE	0.69	-0.03	dec	0.71	0	-0.773	2.2	3.00	0.74
1575505	1203569878	20-JUN-2016 07:04	DUSE	0.96	0.33	dec	0.71	0	-0.773	2.2	3.00	0.74
1572385	1203561725	20-JUN-2016 08:50	DONE	1.06	0.47	dec	0.71	0	-0.773	2.2	3.00	0.74
1572233	1203561381	20-JUN-2016 08:52	DONE	1.4	0.93	dec	0.71	0	-0.773	2.2	3.00	0.74
1575357	1203569605	21-JUN-2016 10:13	DUSE	0.26	-0.61	dec	0.71	0	-0.773	2.2	3.00	0.74
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.12	-0.8	dec	0.71	0	-0.773	2.2	3.00	0.74
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.1	-0.82	dec	0.71	0	-0.773	2.2	3.00	0.74
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.22	-0.67	dec	0.71	0	-0.773	2.2	3.00	0.74
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.16	-0.75	dec	0.71	0	-0.773	2.2	3.00	0.74
1570476	1203556812	23-JUN-2016 08:07	DONE	0.66	-0.07	dec	0.71	0	-0.773	2.2	3.00	0.74
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.85	0.19	dec	0.71	0	-0.773	2.2	3.00	0.74
1576426	1203572271	23-JUN-2016 12:05	DONE	0.04	-0.91	dec	0.71	0	-0.773	2.2	3.00	0.74
1576430	1203572281	24-JUN-2016 08:09	DONE	0.2	-0.68	dec	0.71	0	-0.773	2.2	3.00	0.74
1572234	1203561384	24-JUN-2016 15:54	DONE	0.13	-0.78	dec	0.71	0	-0.773	2.2	3.00	0.74
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.41	-0.41	dec	0.71	0	-0.773	2.2	3.00	0.74
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.35	-0.49	dec	0.71	0	-0.773	2.2	3.00	0.74
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.19	-0.7	dec	0.71	0	-0.773	2.2	3.00	0.74
1573057	1203563602	25-JUN-2016 09:38	DONE	0.51	-0.27	dec	0.71	0	-0.773	2.2	3.00	0.74
1571802	1203560363	25-JUN-2016 09:38	DONE	0.02	-0.93	dec	0.71	0	-0.773	2.2	3.00	0.74
1572236	1203561387	25-JUN-2016 09:39	DONE	0.68	-0.04	dec	0.71	0	-0.773	2.2	3.00	0.74

Manganese-54 BLANK: Limits LCL = -1.8 UCL = 1.5

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
1571466	1203559465	10-JUN-2016 13:48	DONE	0.02	0.24	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1569972	1203555533	11-JUN-2016 17:57	DUSE	-0.011	0.19	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1569038	1203553198	13-JUN-2016 07:51	DUSE	0.01	0.22	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1569992	1203555577	13-JUN-2016 08:14	DUSE	00	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1571050	1203558393	13-JUN-2016 15:47	DUSE	0.04	0.29	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1573439	1203564639	14-JUN-2016 09:29	DONE	00	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1569386	1203554053	14-JUN-2016 10:24	DUSE	-0.011	0.19	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1574188	1203566570	14-JUN-2016 12:57	DUSE	-0.002	0.2	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1569992	1203555577	14-JUN-2016 12:58	DONE	-0.012	0.18	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1574190	1203566581	14-JUN-2016 13:20	DUSE	-0.006	0.2	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1571029	1203558339	14-JUN-2016 14:32	DUSE	0.01	0.23	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1570346	1203556468	15-JUN-2016 06:41	DONE	0.01	0.22	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.001	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1572084	1203561062	15-JUN-2016 10:50	DUSE	00	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1572190	1203561289	15-JUN-2016 10:58	DONE	-0.013	0.18	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1572384	1203561714	16-JUN-2016 12:25	DUSE	-0.006	0.19	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55

1572385	1203561724	16-JUN-2016 12:51	DUSE	-0.007	0.19	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1572233	1203561380	16-JUN-2016 12:53	DONE	0.02	0.24	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1569039	1203553209	17-JUN-2016 07:31	DUSE	00	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1564838	1203541917	17-JUN-2016 07:41	DONE	0.01	0.23	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1573929	1203565769	17-JUN-2016 11:17	DONE	-3.2	-6	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.001	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1575505	1203569877	21-JUN-2016 07:25	DONE	00	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1575357	1203569604	21-JUN-2016 07:41	DONE	-1.4	-2	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1571024	1203558315	22-JUN-2016 07:20	DUSE	00	0.22	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1575812	1203570695	22-JUN-2016 08:54	DUSE	-0.008	0.19	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1573772	1203565433	22-JUN-2016 09:37	DUSE	0.04	0.27	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1576217	1203571735	23-JUN-2016 07:37	DUSE	-0.012	0.18	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.008	0.19	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1570476	1203556811	23-JUN-2016 07:38	DONE	0.01	0.23	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1576430	1203572280	23-JUN-2016 09:24	DONE	0.03	0.27	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1576426	1203572270	23-JUN-2016 11:01	DUSE	-0.014	0.18	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1571802	1203560362	24-JUN-2016 11:07	DONE	0.01	0.22	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1572703	1203562586	24-JUN-2016 14:22	DUSE	-0.021	0.17	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1572236	1203561386	24-JUN-2016 15:52	DONE	00	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1572234	1203561383	24-JUN-2016 15:53	DONE	-0.002	0.2	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1573057	1203563601	25-JUN-2016 07:30	DONE	0.01	0.23	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1573059	1203563607	25-JUN-2016 09:16	DUSE	0.01	0.22	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55
1573399	1203564536	25-JUN-2016 09:21	DUSE	00	0.21	pCi/g	-0.114	-1.8	-1.2	0.99	1.54	0.55

Manganese-54 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1569972	1203555534	11-JUN-2016 17:58	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1569992	1203555578	13-JUN-2016 09:17	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1571050	1203558394	13-JUN-2016 15:47	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1571029	1203558340	14-JUN-2016 14:32	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1573929	1203565770	14-JUN-2016 14:39	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53

1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1575505	1203569878	20-JUN-2016 07:04	DONE	3.43	0.16	percent	2.24	0	-13	17.3	20.0	7.53
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1575357	1203569605	21-JUN-2016 10:13	DONE	6.79	0.6	percent	2.24	0	-13	17.3	20.0	7.53
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1576426	1203572271	23-JUN-2016 12:05	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1576430	1203572281	24-JUN-2016 08:09	DONE	26.2	3.2	percent	2.24	0	-13	17.3	20.0	7.53
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.3	percent	2.24	0	-13	17.3	20.0	7.53
1571802	1203560363	25-JUN-2016 09:38	DONE	37.9	4.7	percent	2.24	0	-13	17.3	20.0	7.53
1572236	1203561387	25-JUN-2016 09:39	DONE	13.1	1.4	percent	2.24	0	-13	17.3	20.0	7.53

Manganese-54 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0.04	-1	dec	0.76	0	-0.482	2.01	3.00	0.62
1571466	1203559466	11-JUN-2016 15:29	DONE	01	0.38	dec	0.76	0	-0.482	2.01	3.00	0.62
1569972	1203555534	11-JUN-2016 17:58	DUSE	0.16	-0.97	dec	0.76	0	-0.482	2.01	3.00	0.62
1569038	1203553199	13-JUN-2016 07:56	DUSE	0.82	0.09	dec	0.76	0	-0.482	2.01	3.00	0.62
1569992	1203555578	13-JUN-2016 09:17	DONE	0.37	-0.63	dec	0.76	0	-0.482	2.01	3.00	0.62
1571050	1203558394	13-JUN-2016 15:47	DUSE	0.44	-0.52	dec	0.76	0	-0.482	2.01	3.00	0.62
1573439	1203564640	14-JUN-2016 09:29	DONE	2.46	2.7	dec	0.76	0	-0.482	2.01	3.00	0.62
1569386	1203554054	14-JUN-2016 10:24	DUSE	1.84	1.7	dec	0.76	0	-0.482	2.01	3.00	0.62
1574188	1203566571	14-JUN-2016 13:21	DUSE	1.1	0.54	dec	0.76	0	-0.482	2.01	3.00	0.62
1571029	1203558340	14-JUN-2016 14:32	DUSE	0.05	-1	dec	0.76	0	-0.482	2.01	3.00	0.62
1573929	1203565770	14-JUN-2016 14:39	DONE	0.82	0.1	dec	0.76	0	-0.482	2.01	3.00	0.62
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.14	-1	dec	0.76	0	-0.482	2.01	3.00	0.62
1570346	1203556469	15-JUN-2016 06:41	DONE	0.5	-0.42	dec	0.76	0	-0.482	2.01	3.00	0.62
1571459	1203559442	15-JUN-2016 08:43	DONE	1.98	2	dec	0.76	0	-0.482	2.01	3.00	0.62
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.09	-1	dec	0.76	0	-0.482	2.01	3.00	0.62
1572190	1203561290	15-JUN-2016 10:58	DONE	0.07	-1	dec	0.76	0	-0.482	2.01	3.00	0.62
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.45	1.1	dec	0.76	0	-0.482	2.01	3.00	0.62
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.48	-0.45	dec	0.76	0	-0.482	2.01	3.00	0.62

1564838	1203541918	17-JUN-2016 07:41	DONE	0.55	-0.34	dec	0.76	0	-0.482	2.01	3.00	0.62
1570471	1203556800	17-JUN-2016 13:17	DONE	1.59	1.3	dec	0.76	0	-0.482	2.01	3.00	0.62
1575505	1203569878	20-JUN-2016 07:04	DONE	0.54	-0.36	dec	0.76	0	-0.482	2.01	3.00	0.62
1572385	1203561725	20-JUN-2016 08:50	DUSE	0.13	-1	dec	0.76	0	-0.482	2.01	3.00	0.62
1572233	1203561381	20-JUN-2016 08:52	DONE	1.17	0.66	dec	0.76	0	-0.482	2.01	3.00	0.62
1575357	1203569605	21-JUN-2016 10:13	DONE	0.81	0.07	dec	0.76	0	-0.482	2.01	3.00	0.62
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.09	-1	dec	0.76	0	-0.482	2.01	3.00	0.62
1575812	1203570696	22-JUN-2016 08:54	DUSE	2.27	2.4	dec	0.76	0	-0.482	2.01	3.00	0.62
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.8	0.06	dec	0.76	0	-0.482	2.01	3.00	0.62
1576217	1203571736	23-JUN-2016 07:44	DUSE	1.05	0.45	dec	0.76	0	-0.482	2.01	3.00	0.62
1570476	1203556812	23-JUN-2016 08:07	DONE	1.2	0.71	dec	0.76	0	-0.482	2.01	3.00	0.62
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.7	-0.1	dec	0.76	0	-0.482	2.01	3.00	0.62
1576426	1203572271	23-JUN-2016 12:05	DUSE	0.31	-0.74	dec	0.76	0	-0.482	2.01	3.00	0.62
1576430	1203572281	24-JUN-2016 08:09	DONE	0.83	0.1	dec	0.76	0	-0.482	2.01	3.00	0.62
1572234	1203561384	24-JUN-2016 15:54	DONE	0.69	-0.11	dec	0.76	0	-0.482	2.01	3.00	0.62
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.23	-0.86	dec	0.76	0	-0.482	2.01	3.00	0.62
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.29	-0.76	dec	0.76	0	-0.482	2.01	3.00	0.62
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.6	-0.25	dec	0.76	0	-0.482	2.01	3.00	0.62
1573057	1203563602	25-JUN-2016 09:38	DONE	0.78	0.03	dec	0.76	0	-0.482	2.01	3.00	0.62
1571802	1203560363	25-JUN-2016 09:38	DONE	1.06	0.48	dec	0.76	0	-0.482	2.01	3.00	0.62
1572236	1203561387	25-JUN-2016 09:39	DONE	0.25	-0.82	dec	0.76	0	-0.482	2.01	3.00	0.62

Sodium-22 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1569972	1203555534	11-JUN-2016 17:58	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1569992	1203555578	13-JUN-2016 09:17	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571050	1203558394	13-JUN-2016 15:47	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571029	1203558340	14-JUN-2016 14:32	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573929	1203565770	14-JUN-2016 14:39	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1570346	1203556469	15-JUN-2016 06:41	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571459	1203559442	15-JUN-2016 08:43	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1569039	1203553210	17-JUN-2016 07:36	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9

1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1575505	1203569878	20-JUN-2016 07:04	DUSE	6.4	1.4	percent	1.02	0	-6.8	8.82	20.0	3.9
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1575357	1203569605	21-JUN-2016 10:13	DUSE	20.2	4.9	percent	1.02	0	-6.8	8.82	20.0	3.9
1571024	1203558316	22-JUN-2016 07:21	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1575812	1203570696	22-JUN-2016 08:54	DUSE	13	3.1	percent	1.02	0	-6.8	8.82	20.0	3.9
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9

Sodium-22 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0.02	-0.99	dec	0.69	0	-0.667	2.05	3.00	0.68
1571466	1203559466	11-JUN-2016 15:29	DONE	0.61	-0.12	dec	0.69	0	-0.667	2.05	3.00	0.68
1569972	1203555534	11-JUN-2016 17:58	DUSE	0.71	0.02	dec	0.69	0	-0.667	2.05	3.00	0.68
1569038	1203553199	13-JUN-2016 07:56	DUSE	0.29	-0.6	dec	0.69	0	-0.667	2.05	3.00	0.68
1569992	1203555578	13-JUN-2016 09:17	DUSE	0.67	-0.03	dec	0.69	0	-0.667	2.05	3.00	0.68
1571050	1203558394	13-JUN-2016 15:47	DONE	0.63	-0.1	dec	0.69	0	-0.667	2.05	3.00	0.68
1573439	1203564640	14-JUN-2016 09:29	DONE	0.2	-0.73	dec	0.69	0	-0.667	2.05	3.00	0.68
1569386	1203554054	14-JUN-2016 10:24	DUSE	0.4	-0.44	dec	0.69	0	-0.667	2.05	3.00	0.68
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.62	-0.1	dec	0.69	0	-0.667	2.05	3.00	0.68
1571029	1203558340	14-JUN-2016 14:32	DONE	0.13	-0.83	dec	0.69	0	-0.667	2.05	3.00	0.68
1573929	1203565770	14-JUN-2016 14:39	DONE	0.01	-1	dec	0.69	0	-0.667	2.05	3.00	0.68
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.24	-0.66	dec	0.69	0	-0.667	2.05	3.00	0.68
1570346	1203556469	15-JUN-2016 06:41	DUSE	1.01	0.46	dec	0.69	0	-0.667	2.05	3.00	0.68
1571459	1203559442	15-JUN-2016 08:43	DUSE	1.78	1.6	dec	0.69	0	-0.667	2.05	3.00	0.68
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.76	1.6	dec	0.69	0	-0.667	2.05	3.00	0.68
1572190	1203561290	15-JUN-2016 10:58	DONE	1.31	0.9	dec	0.69	0	-0.667	2.05	3.00	0.68
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.35	-0.51	dec	0.69	0	-0.667	2.05	3.00	0.68
1569039	1203553210	17-JUN-2016 07:36	DONE	0.31	-0.57	dec	0.69	0	-0.667	2.05	3.00	0.68
1564838	1203541918	17-JUN-2016 07:41	DONE	1.16	0.68	dec	0.69	0	-0.667	2.05	3.00	0.68
1570471	1203556800	17-JUN-2016 13:17	DONE	0.51	-0.27	dec	0.69	0	-0.667	2.05	3.00	0.68

1575505	1203569878	20-JUN-2016 07:04	DUSE	0.2	-0.72	dec	0.69	0	-0.667	2.05	3.00	0.68
1572385	1203561725	20-JUN-2016 08:50	DUSE	1.68	1.4	dec	0.69	0	-0.667	2.05	3.00	0.68
1572233	1203561381	20-JUN-2016 08:52	DONE	0.05	-0.94	dec	0.69	0	-0.667	2.05	3.00	0.68
1575357	1203569605	21-JUN-2016 10:13	DUSE	1.59	1.3	dec	0.69	0	-0.667	2.05	3.00	0.68
1571024	1203558316	22-JUN-2016 07:21	DONE	0.37	-0.47	dec	0.69	0	-0.667	2.05	3.00	0.68
1575812	1203570696	22-JUN-2016 08:54	DUSE	1.72	1.5	dec	0.69	0	-0.667	2.05	3.00	0.68
1573772	1203565434	22-JUN-2016 09:38	DONE	0.36	-0.5	dec	0.69	0	-0.667	2.05	3.00	0.68
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.39	-0.44	dec	0.69	0	-0.667	2.05	3.00	0.68
1570476	1203556812	23-JUN-2016 08:07	DONE	0.12	-0.84	dec	0.69	0	-0.667	2.05	3.00	0.68
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.88	0.27	dec	0.69	0	-0.667	2.05	3.00	0.68
1576426	1203572271	23-JUN-2016 12:05	DONE	0.65	-0.07	dec	0.69	0	-0.667	2.05	3.00	0.68
1576430	1203572281	24-JUN-2016 08:09	DONE	0.04	-0.96	dec	0.69	0	-0.667	2.05	3.00	0.68
1572234	1203561384	24-JUN-2016 15:54	DONE	0.01	-1	dec	0.69	0	-0.667	2.05	3.00	0.68
1572703	1203562587	25-JUN-2016 09:16	DONE	0.47	-0.33	dec	0.69	0	-0.667	2.05	3.00	0.68
1573059	1203563608	25-JUN-2016 09:17	DONE	0.65	-0.07	dec	0.69	0	-0.667	2.05	3.00	0.68
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.43	-0.38	dec	0.69	0	-0.667	2.05	3.00	0.68
1573057	1203563602	25-JUN-2016 09:38	DONE	1.61	1.4	dec	0.69	0	-0.667	2.05	3.00	0.68
1571802	1203560363	25-JUN-2016 09:38	DONE	0.02	-0.99	dec	0.69	0	-0.667	2.05	3.00	0.68
1572236	1203561387	25-JUN-2016 09:39	DONE	3.12	3.6	dec	0.69	0	-0.667	2.05	3.00	0.68

Zinc-65 BLANK: Limits LCL = -5.9 UCL = 5.3

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571466	1203559465	10-JUN-2016 13:48	DONE	0.05	0.2	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1569972	1203555533	11-JUN-2016 17:57	DUSE	-0.02	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1569038	1203553198	13-JUN-2016 07:51	DUSE	0.04	0.19	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1569992	1203555577	13-JUN-2016 08:14	DUSE	-0.021	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1571050	1203558393	13-JUN-2016 15:47	DUSE	-0.034	0.15	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1573439	1203564639	14-JUN-2016 09:29	DONE	00	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1569386	1203554053	14-JUN-2016 10:24	DUSE	-0.06	0.14	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1574188	1203566570	14-JUN-2016 12:57	DUSE	-0.014	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1569992	1203555577	14-JUN-2016 12:58	DUSE	0.01	0.18	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1574190	1203566581	14-JUN-2016 13:20	DUSE	-0.02	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1571029	1203558339	14-JUN-2016 14:32	DUSE	-0.028	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1570346	1203556468	15-JUN-2016 06:41	DONE	-0.015	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.003	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572084	1203561062	15-JUN-2016 10:50	DUSE	-0.003	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572190	1203561289	15-JUN-2016 10:58	DONE	-0	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572384	1203561714	16-JUN-2016 12:25	DUSE	0.02	0.18	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572385	1203561724	16-JUN-2016 12:51	DUSE	-0.026	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.084	0.13	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1569039	1203553209	17-JUN-2016 07:31	DUSE	-0.001	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.005	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1573929	1203565769	17-JUN-2016 11:17	DONE	-12	-6	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87

1570471	1203556799	17-JUN-2016 12:56	DONE	-0.018	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1575505	1203569877	21-JUN-2016 07:25	DONE	-0.743	-0.23	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1575357	1203569604	21-JUN-2016 07:41	DONE	0.19	0.27	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1571024	1203558315	22-JUN-2016 07:20	DUSE	-0.014	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1575812	1203570695	22-JUN-2016 08:54	DUSE	-0.035	0.15	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1573772	1203565433	22-JUN-2016 09:37	DUSE	0.02	0.18	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1576217	1203571735	23-JUN-2016 07:37	DUSE	0.03	0.19	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.128	0.1	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1570476	1203556811	23-JUN-2016 07:38	DONE	-0.015	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1576430	1203572280	23-JUN-2016 09:24	DONE	-0.008	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1576426	1203572270	23-JUN-2016 11:01	DUSE	-0.028	0.16	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1571802	1203560362	24-JUN-2016 11:07	DONE	00	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572703	1203562586	24-JUN-2016 14:22	DUSE	0.04	0.19	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572236	1203561386	24-JUN-2016 15:52	DONE	0.01	0.18	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1572234	1203561383	24-JUN-2016 15:53	DONE	0.01	0.18	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1573057	1203563601	25-JUN-2016 07:30	DONE	0.04	0.19	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1573059	1203563607	25-JUN-2016 09:16	DUSE	-0.044	0.15	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87
1573399	1203564536	25-JUN-2016 09:21	DUSE	-0.003	0.17	pCi/g	-0.322	-5.9	-4.1	3.41	5.28	1.87

Zinc-65 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1571466	1203559466	11-JUN-2016 15:29	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1569972	1203555534	11-JUN-2016 17:58	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1569038	1203553199	13-JUN-2016 07:56	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1569992	1203555578	13-JUN-2016 09:17	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1571050	1203558394	13-JUN-2016 15:47	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1573439	1203564640	14-JUN-2016 09:29	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1569386	1203554054	14-JUN-2016 10:24	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1574188	1203566571	14-JUN-2016 13:21	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1571029	1203558340	14-JUN-2016 14:32	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1573929	1203565770	14-JUN-2016 14:39	DONE	15	0.43	percent	6.14	0	-35	47.5	20.0	20.7
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1569039	1203553210	17-JUN-2016 07:36	DUSE	86	3.9	percent	6.14	0	-35	47.5	20.0	20.7
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1575505	1203569878	20-JUN-2016 07:04	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1572385	1203561725	20-JUN-2016 08:50	DUSE	53.4	2.3	percent	6.14	0	-35	47.5	20.0	20.7

1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1575357	1203569605	21-JUN-2016 10:13	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1576426	1203572271	23-JUN-2016 12:05	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7
1571802	1203560363	25-JUN-2016 09:38	DONE	85.1	3.8	percent	6.14	0	-35	47.5	20.0	20.7
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.3	percent	6.14	0	-35	47.5	20.0	20.7

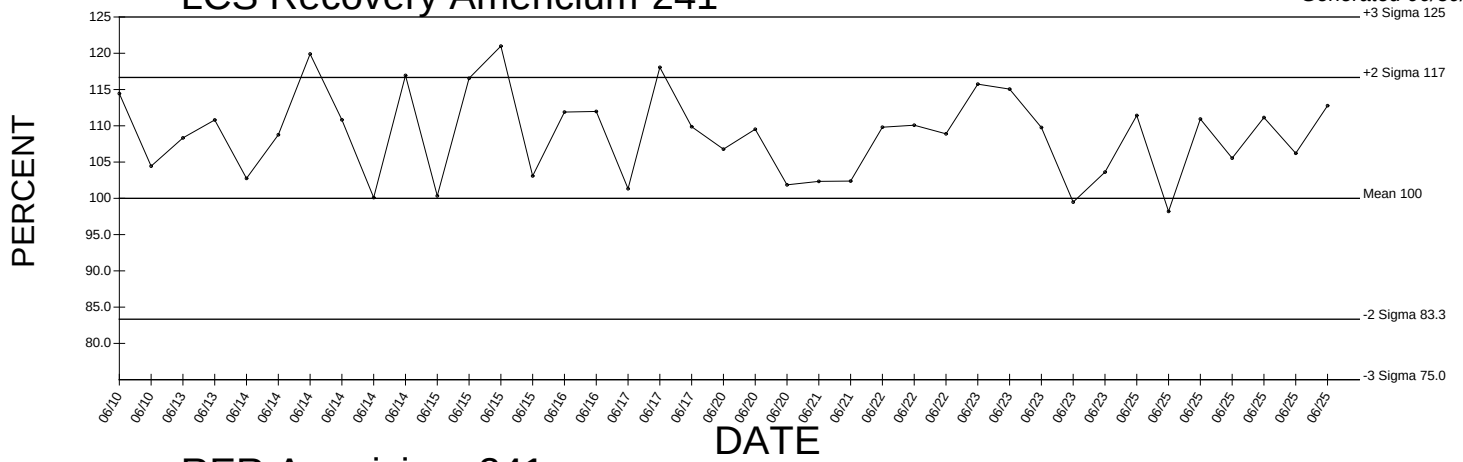
Zinc-65 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569387	1203554059	10-JUN-2016 12:28	DUSE	1.87	0.94	dec	1.09	0	-0.586	2.76	3.00	0.84
1571466	1203559466	11-JUN-2016 15:29	DONE	0.12	-1	dec	1.09	0	-0.586	2.76	3.00	0.84
1569972	1203555534	11-JUN-2016 17:58	DUSE	0.83	-0.3	dec	1.09	0	-0.586	2.76	3.00	0.84
1569038	1203553199	13-JUN-2016 07:56	DUSE	1.2	0.14	dec	1.09	0	-0.586	2.76	3.00	0.84
1569992	1203555578	13-JUN-2016 09:17	DUSE	0.01	-1	dec	1.09	0	-0.586	2.76	3.00	0.84
1571050	1203558394	13-JUN-2016 15:47	DUSE	0.99	-0.11	dec	1.09	0	-0.586	2.76	3.00	0.84
1573439	1203564640	14-JUN-2016 09:29	DONE	0.96	-0.15	dec	1.09	0	-0.586	2.76	3.00	0.84
1569386	1203554054	14-JUN-2016 10:24	DUSE	1.84	0.9	dec	1.09	0	-0.586	2.76	3.00	0.84
1574188	1203566571	14-JUN-2016 13:21	DUSE	0.67	-0.49	dec	1.09	0	-0.586	2.76	3.00	0.84
1571029	1203558340	14-JUN-2016 14:32	DUSE	0.38	-0.84	dec	1.09	0	-0.586	2.76	3.00	0.84
1573929	1203565770	14-JUN-2016 14:39	DONE	0.77	-0.38	dec	1.09	0	-0.586	2.76	3.00	0.84
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.82	-0.31	dec	1.09	0	-0.586	2.76	3.00	0.84
1570346	1203556469	15-JUN-2016 06:41	DONE	0.26	-0.98	dec	1.09	0	-0.586	2.76	3.00	0.84
1571459	1203559442	15-JUN-2016 08:43	DONE	2.92	2.2	dec	1.09	0	-0.586	2.76	3.00	0.84
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.82	-0.31	dec	1.09	0	-0.586	2.76	3.00	0.84
1572190	1203561290	15-JUN-2016 10:58	DONE	1.11	0.03	dec	1.09	0	-0.586	2.76	3.00	0.84
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.14	0.07	dec	1.09	0	-0.586	2.76	3.00	0.84
1569039	1203553210	17-JUN-2016 07:36	DUSE	1.08	-0	dec	1.09	0	-0.586	2.76	3.00	0.84
1564838	1203541918	17-JUN-2016 07:41	DONE	1.14	0.07	dec	1.09	0	-0.586	2.76	3.00	0.84
1570471	1203556800	17-JUN-2016 13:17	DONE	0.92	-0.2	dec	1.09	0	-0.586	2.76	3.00	0.84
1575505	1203569878	20-JUN-2016 07:04	DONE	3.7	3.1	dec	1.09	0	-0.586	2.76	3.00	0.84
1572385	1203561725	20-JUN-2016 08:50	DUSE	2.09	1.2	dec	1.09	0	-0.586	2.76	3.00	0.84
1572233	1203561381	20-JUN-2016 08:52	DONE	0.32	-0.92	dec	1.09	0	-0.586	2.76	3.00	0.84

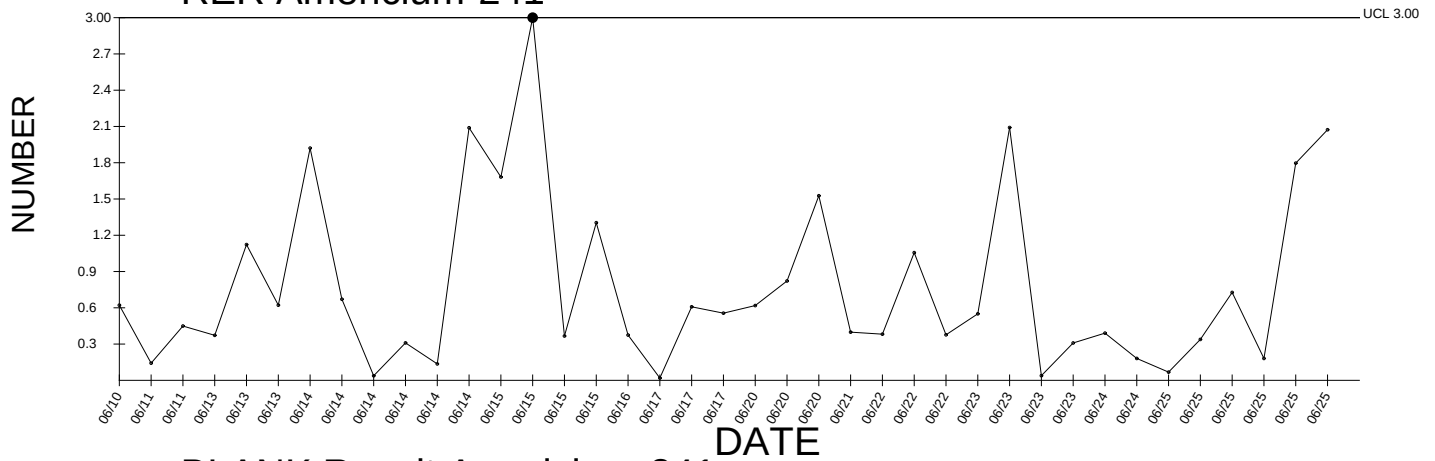
1575357	1203569605	21-JUN-2016 10:13	DONE	0.4	-0.82	dec	1.09	0	-0.586	2.76	3.00	0.84
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.58	-0.6	dec	1.09	0	-0.586	2.76	3.00	0.84
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.74	-0.41	dec	1.09	0	-0.586	2.76	3.00	0.84
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.65	-0.53	dec	1.09	0	-0.586	2.76	3.00	0.84
1576217	1203571736	23-JUN-2016 07:44	DUSE	1.53	0.54	dec	1.09	0	-0.586	2.76	3.00	0.84
1570476	1203556812	23-JUN-2016 08:07	DONE	1.01	-0.09	dec	1.09	0	-0.586	2.76	3.00	0.84
1571803	1203560366	23-JUN-2016 08:25	DUSE	1.4	0.38	dec	1.09	0	-0.586	2.76	3.00	0.84
1576426	1203572271	23-JUN-2016 12:05	DUSE	0.24	-1	dec	1.09	0	-0.586	2.76	3.00	0.84
1576430	1203572281	24-JUN-2016 08:09	DONE	1.84	0.9	dec	1.09	0	-0.586	2.76	3.00	0.84
1572234	1203561384	24-JUN-2016 15:54	DONE	1.16	0.09	dec	1.09	0	-0.586	2.76	3.00	0.84
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.21	-1	dec	1.09	0	-0.586	2.76	3.00	0.84
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.64	-0.53	dec	1.09	0	-0.586	2.76	3.00	0.84
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.83	-0.31	dec	1.09	0	-0.586	2.76	3.00	0.84
1573057	1203563602	25-JUN-2016 09:38	DONE	0.07	-1	dec	1.09	0	-0.586	2.76	3.00	0.84
1571802	1203560363	25-JUN-2016 09:38	DONE	3.19	2.5	dec	1.09	0	-0.586	2.76	3.00	0.84
1572236	1203561387	25-JUN-2016 09:39	DONE	1.85	0.91	dec	1.09	0	-0.586	2.76	3.00	0.84

Gamma Spec Solids GSCGAMMS LCS Recovery Americium-241

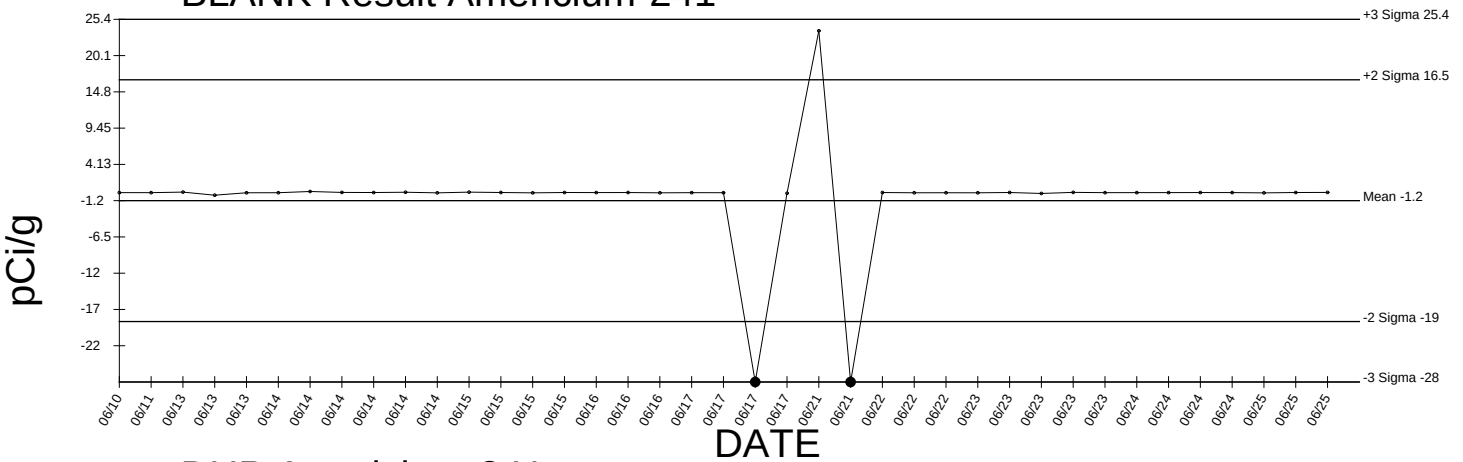
Generated 06/30/2016
+3 Sigma 125



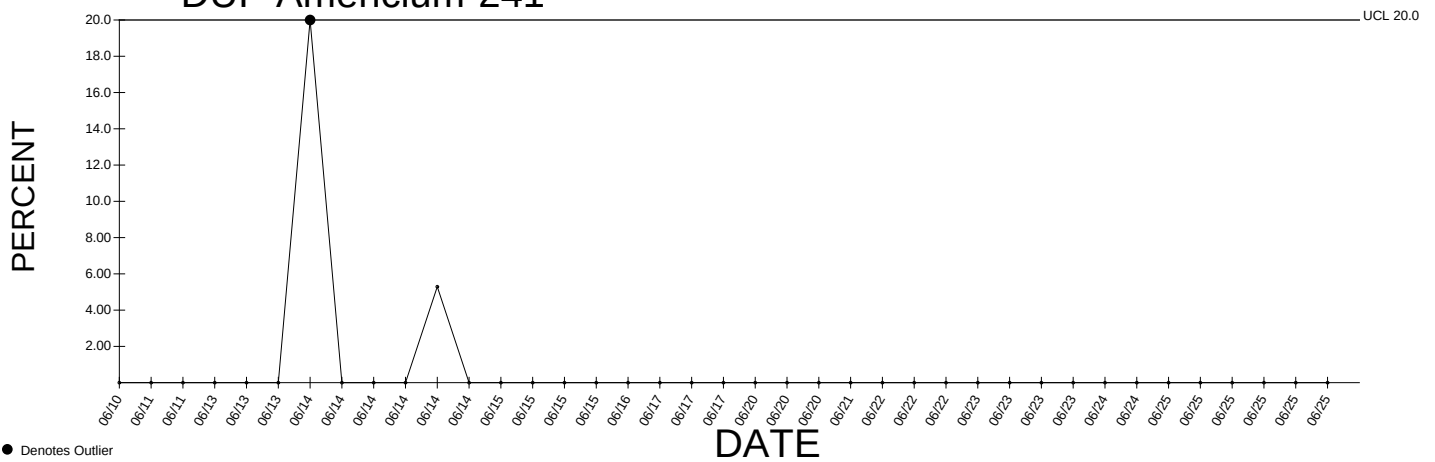
RER Americium-241



BLANK Result Americium-241



DUP Americium-241



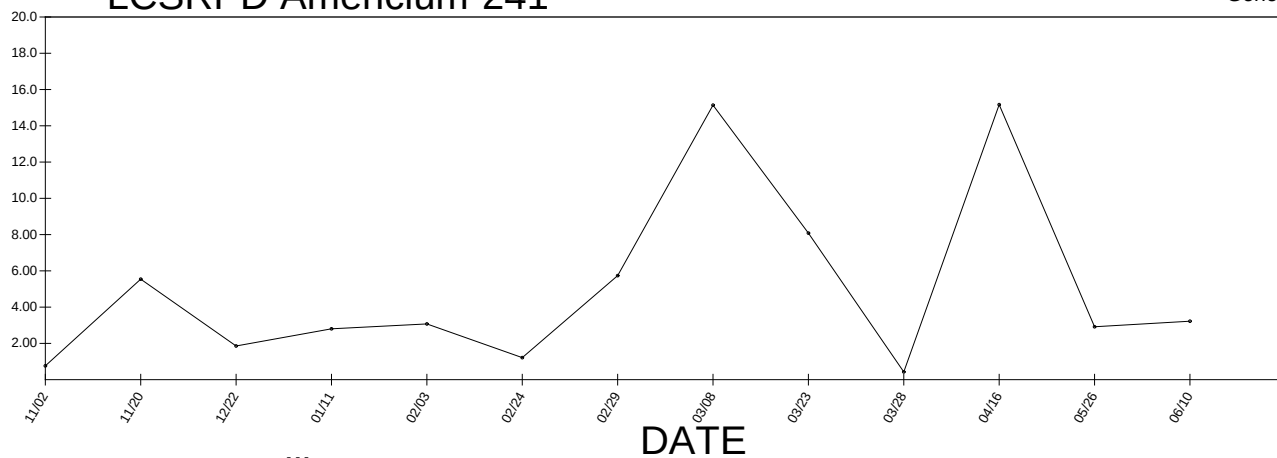
● Denotes Outlier

LCSRPD Americium-241

Gamma Spec Solids GSCGAMMS

Generated 06/30/2016
UCL 20.0

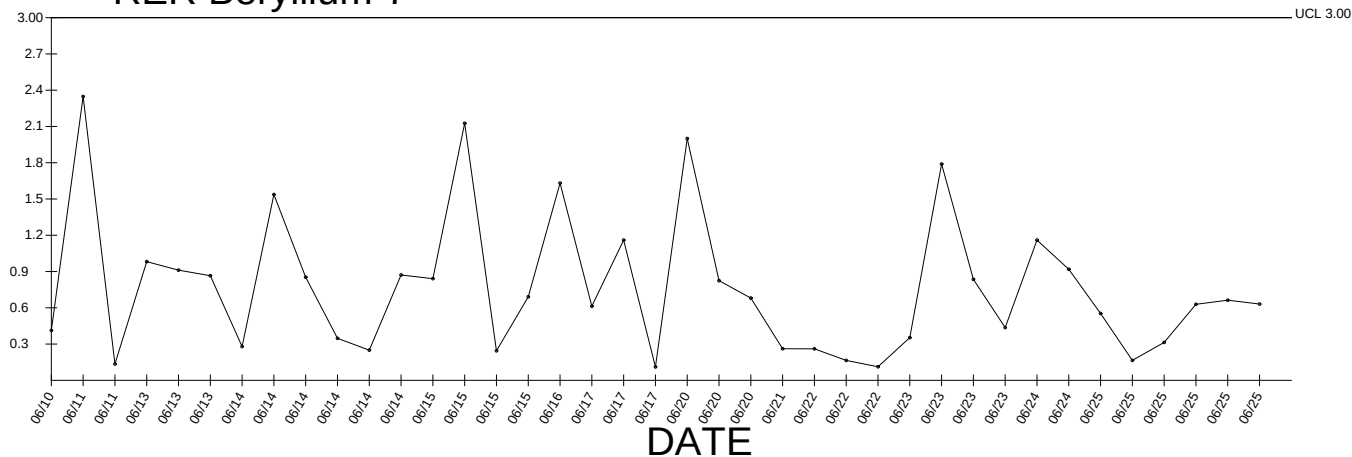
PERCENT



DATE

RER Beryllium-7

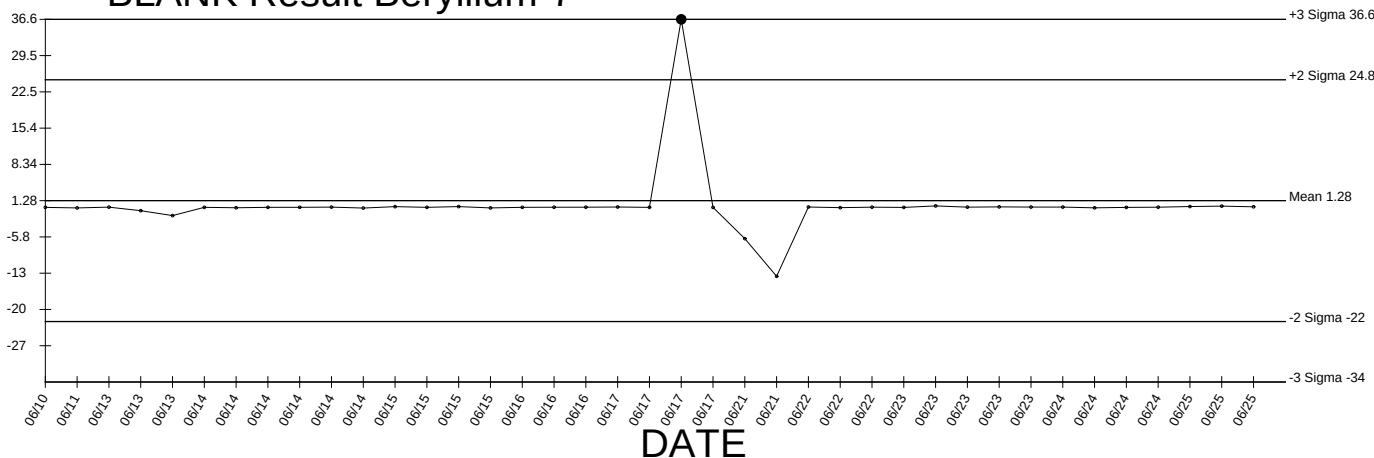
NUMBER



DATE

BLANK Result Beryllium-7

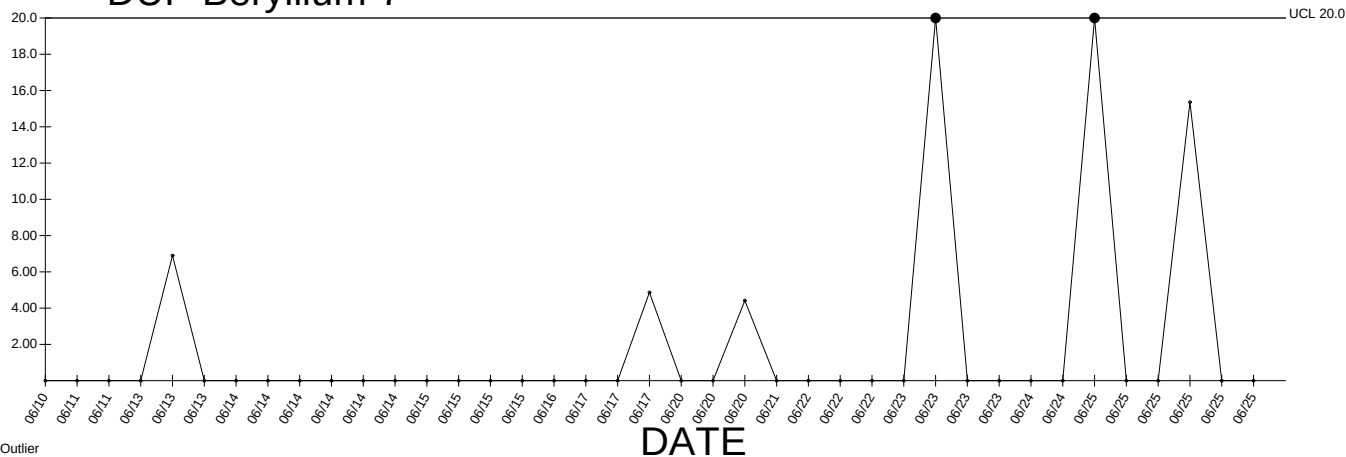
pCi/g



DATE

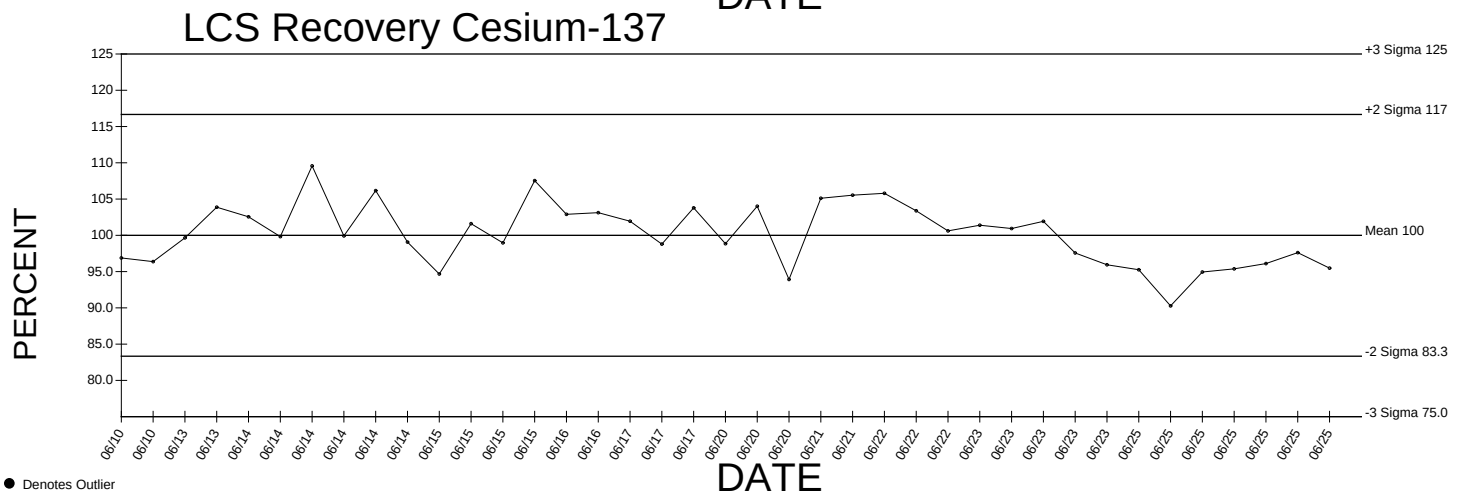
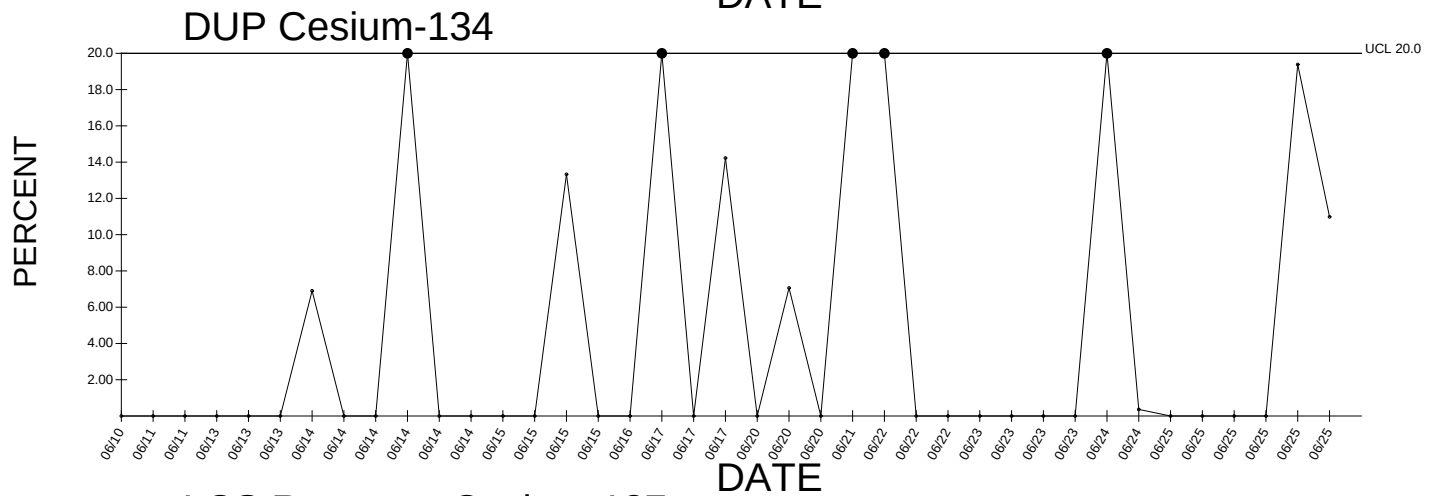
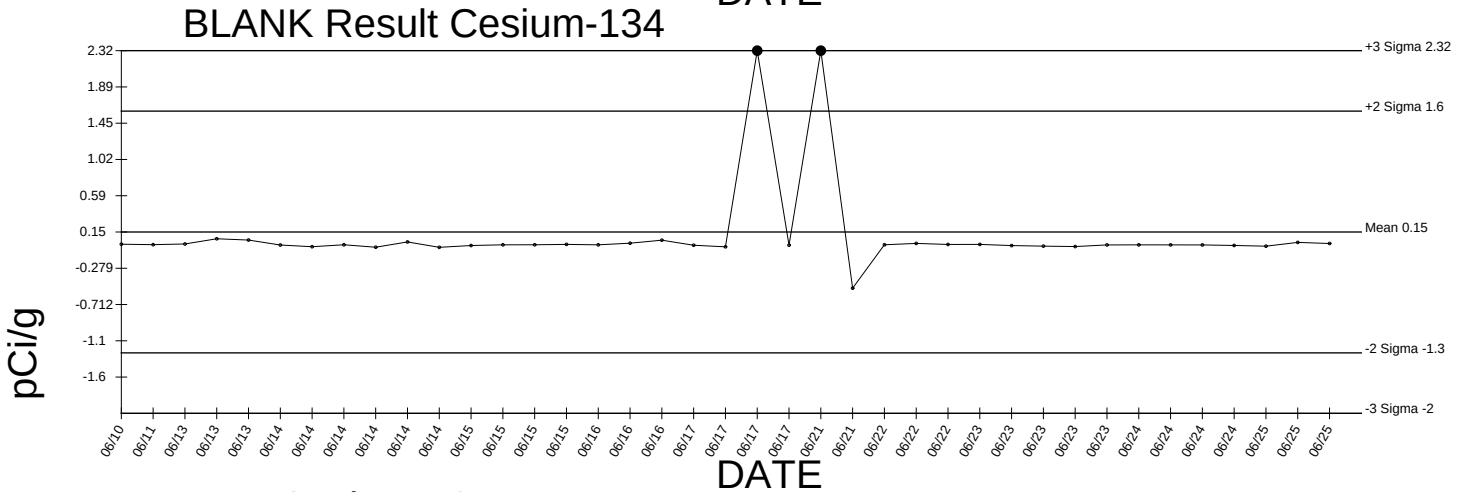
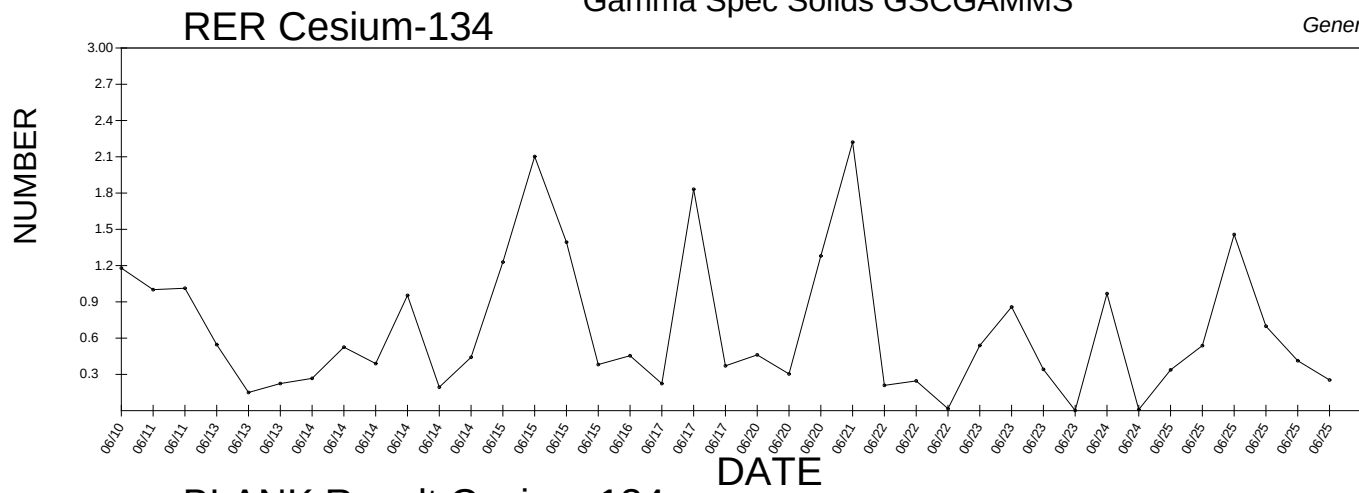
DUP Beryllium-7

PERCENT

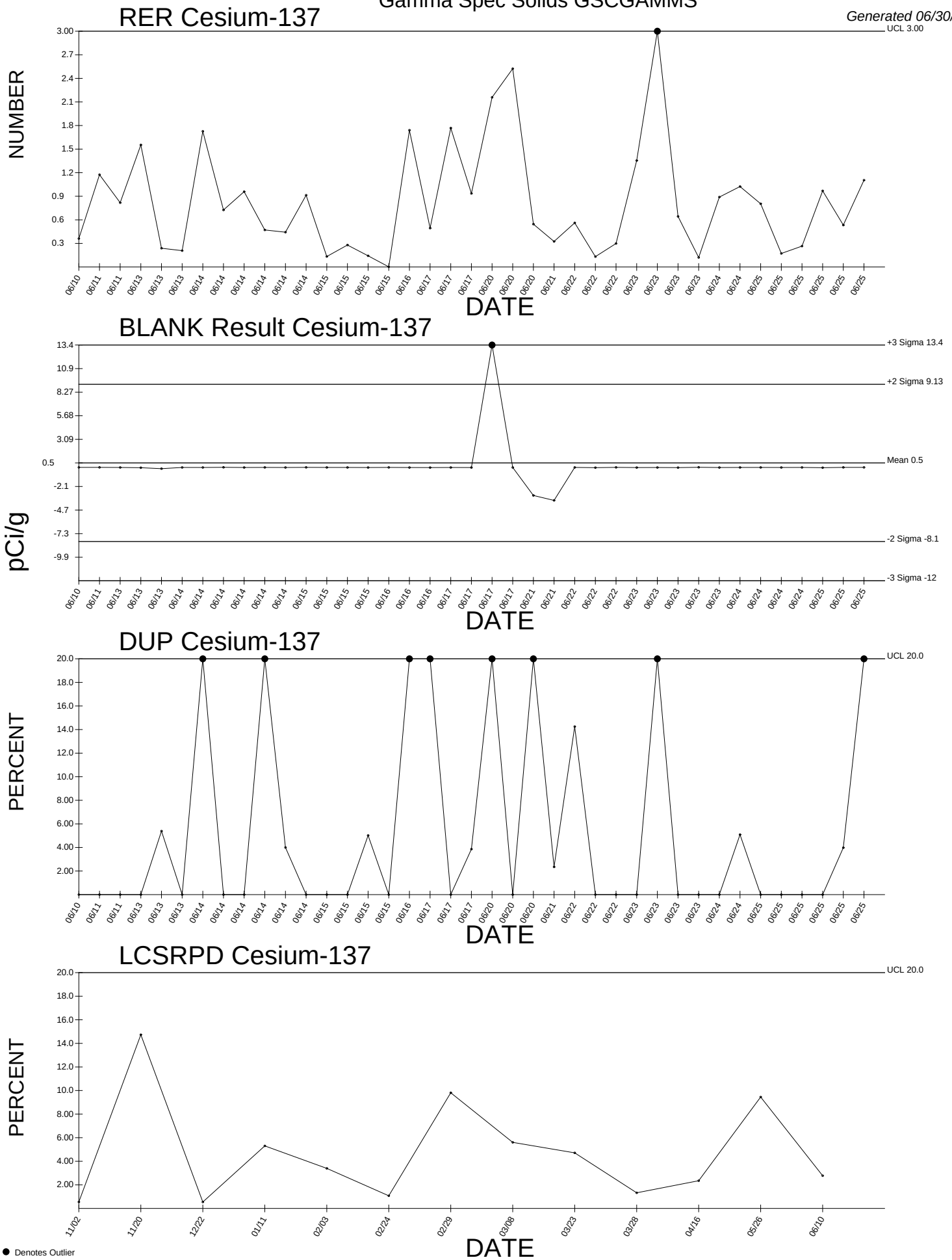


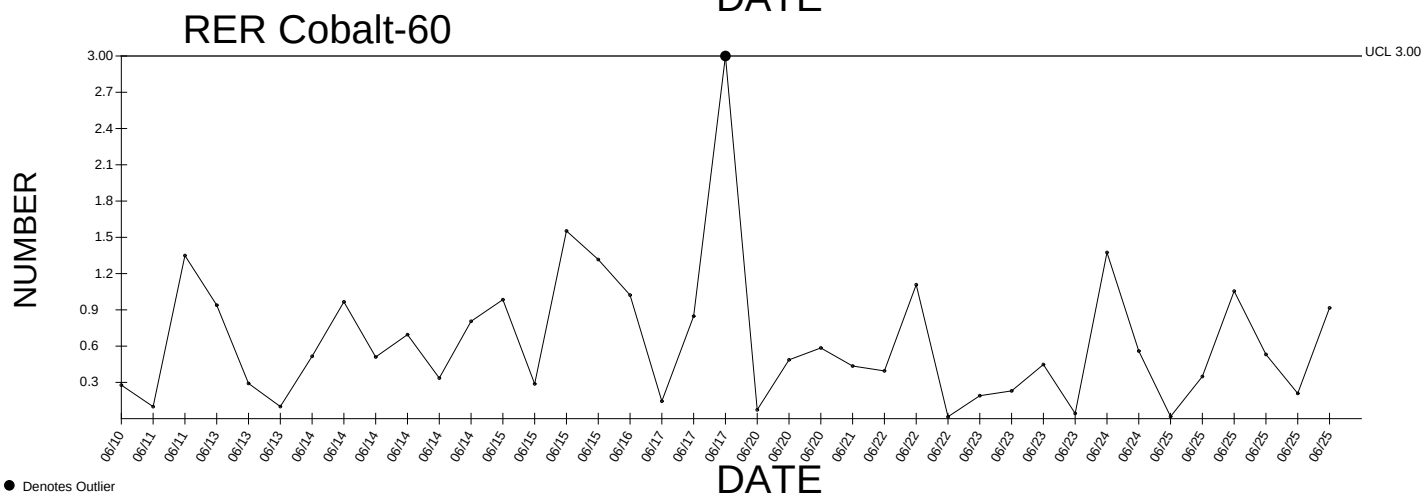
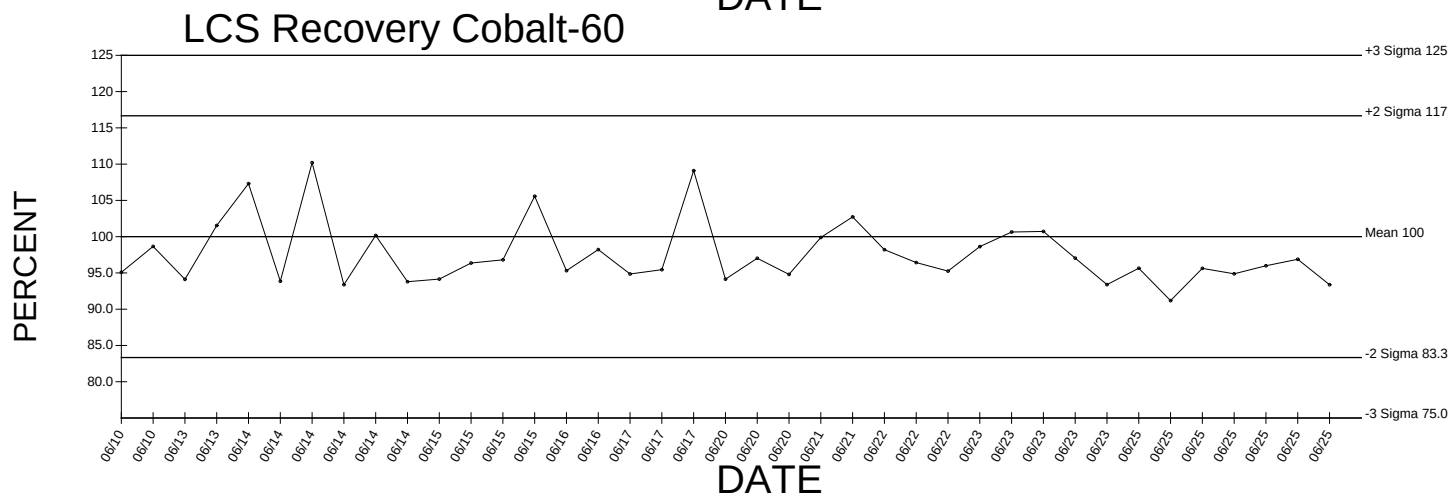
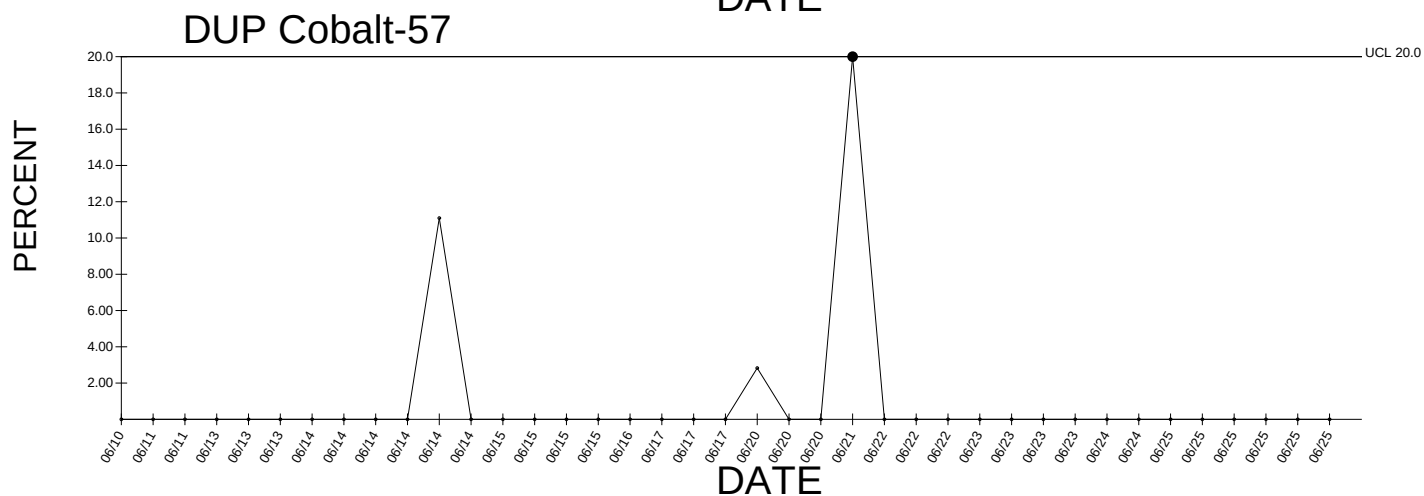
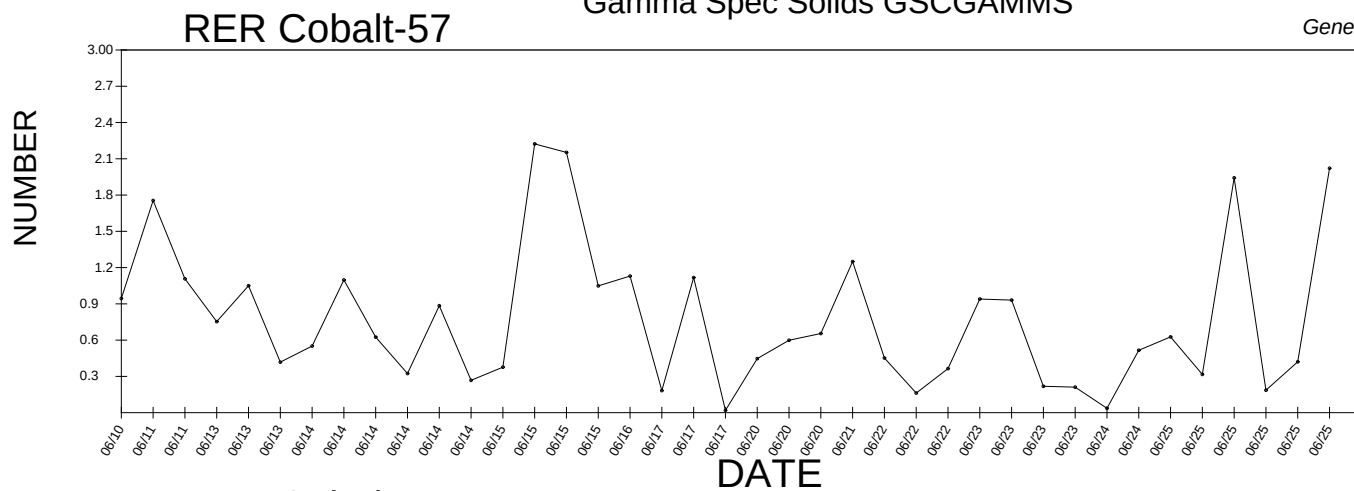
DATE

● Denotes Outlier



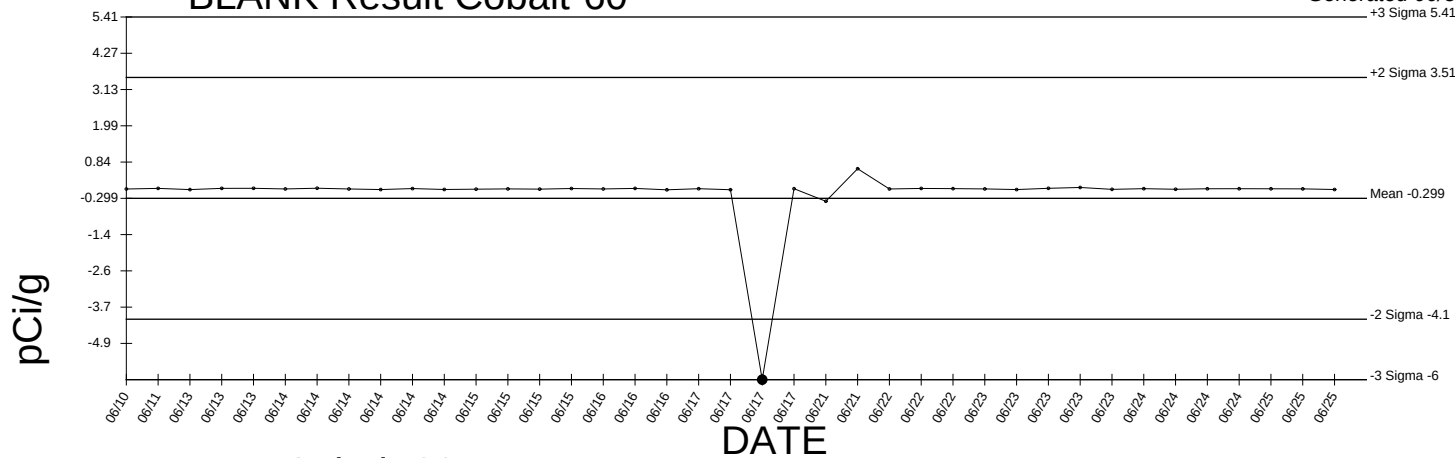
● Denotes Outlier



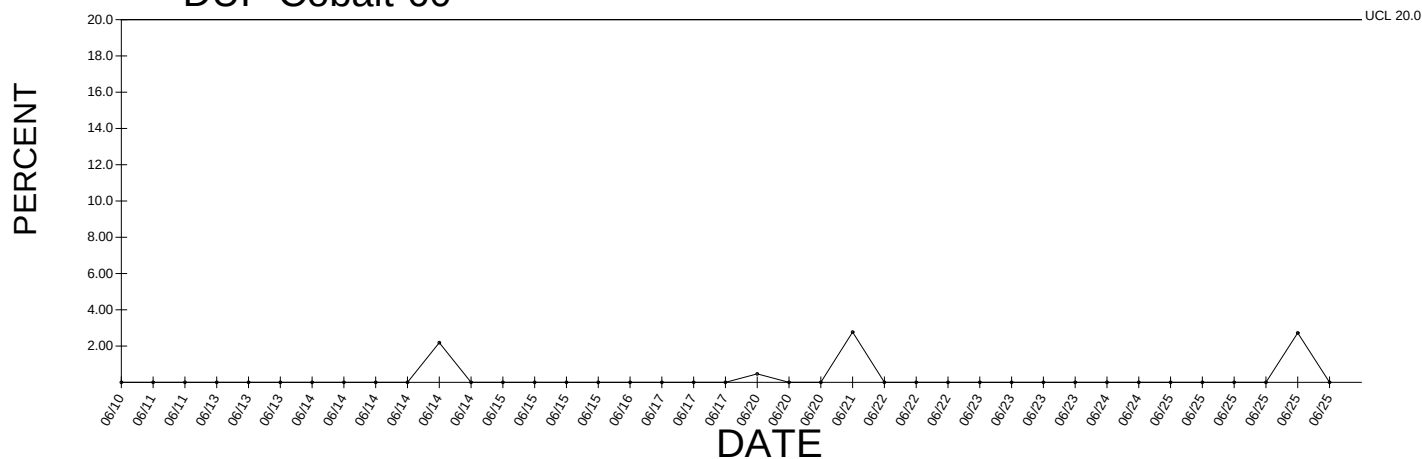


● Denotes Outlier

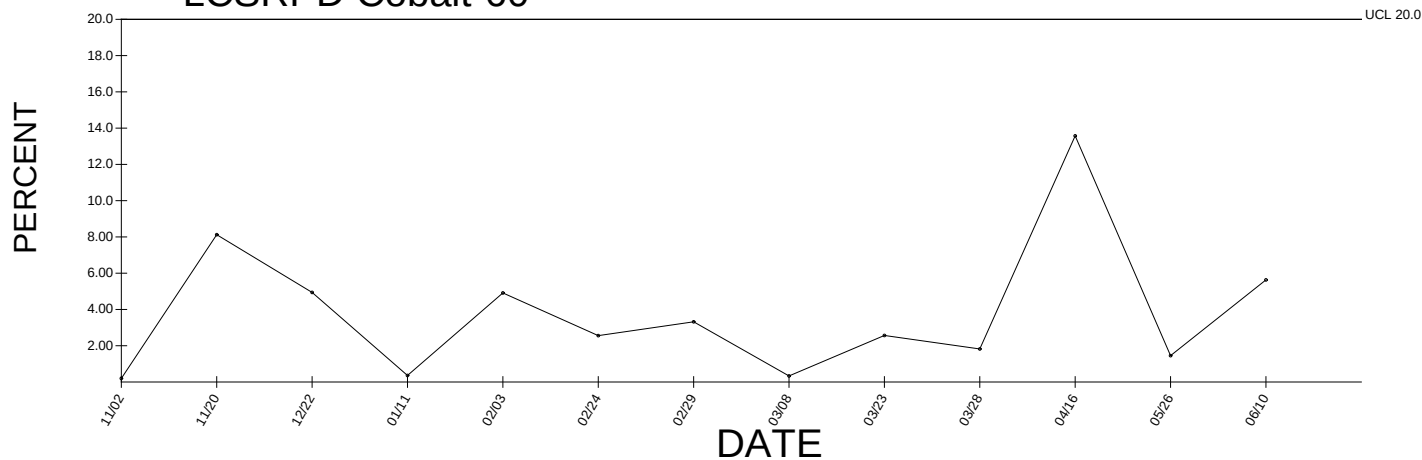
BLANK Result Cobalt-60



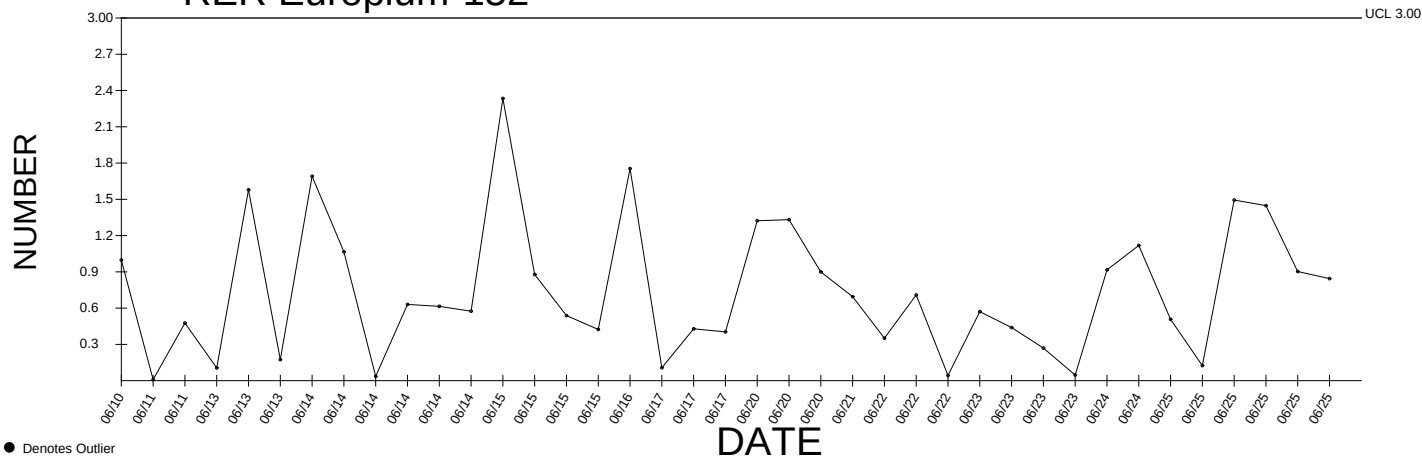
DUP Cobalt-60



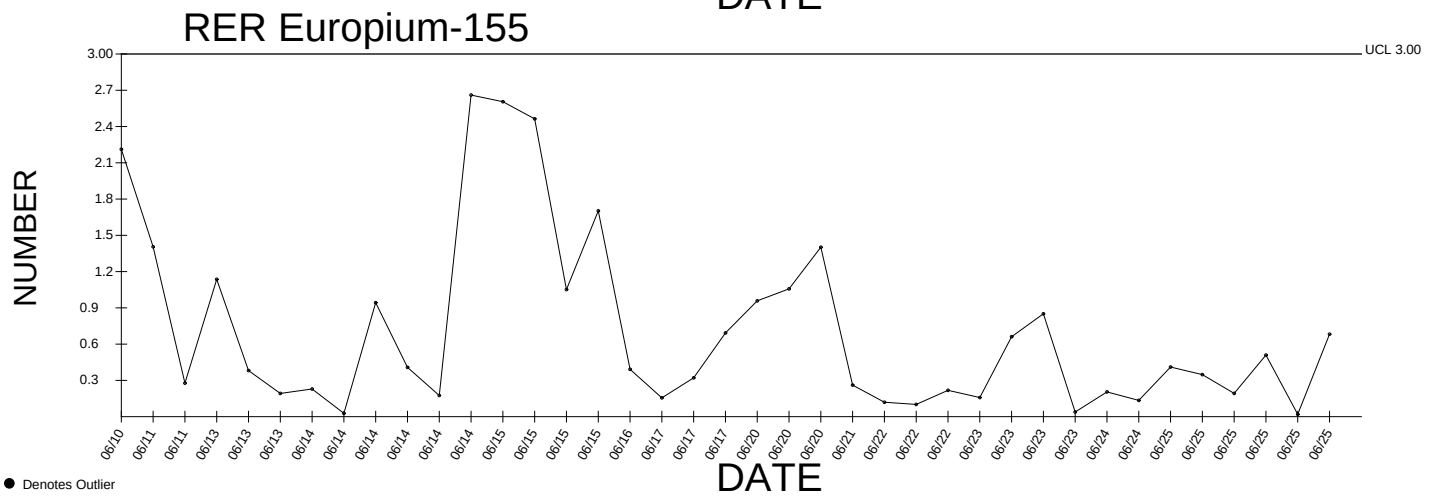
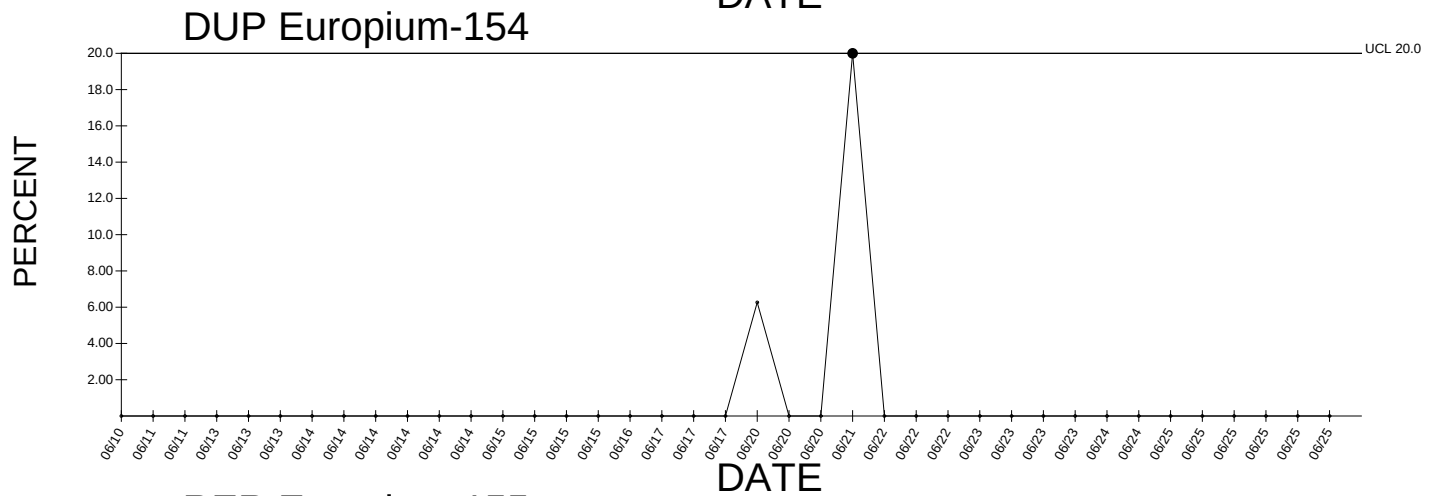
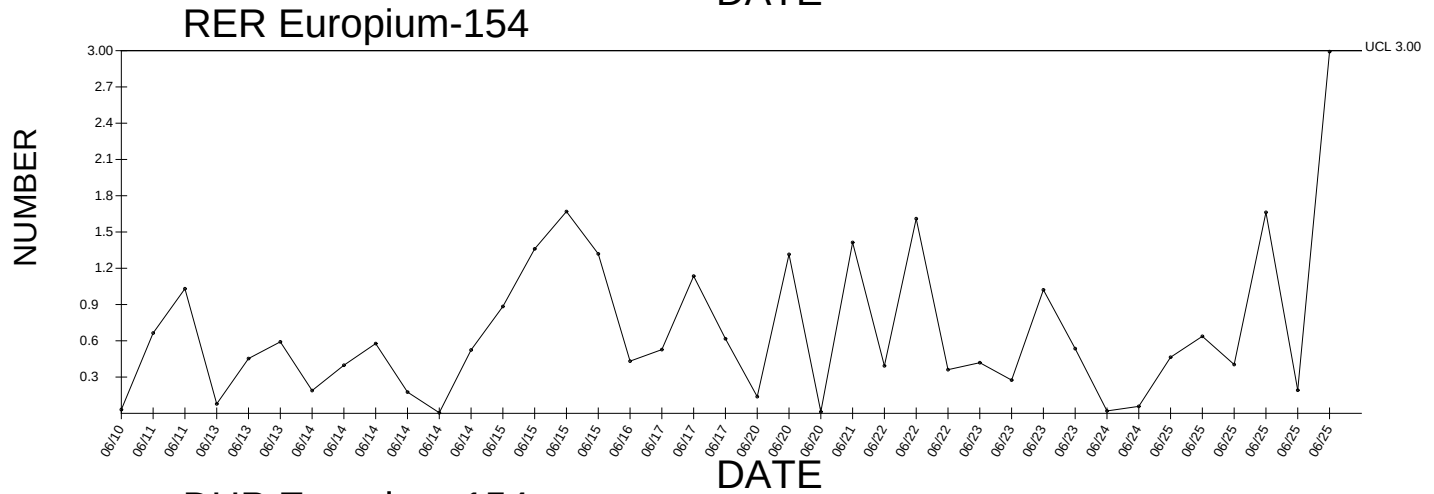
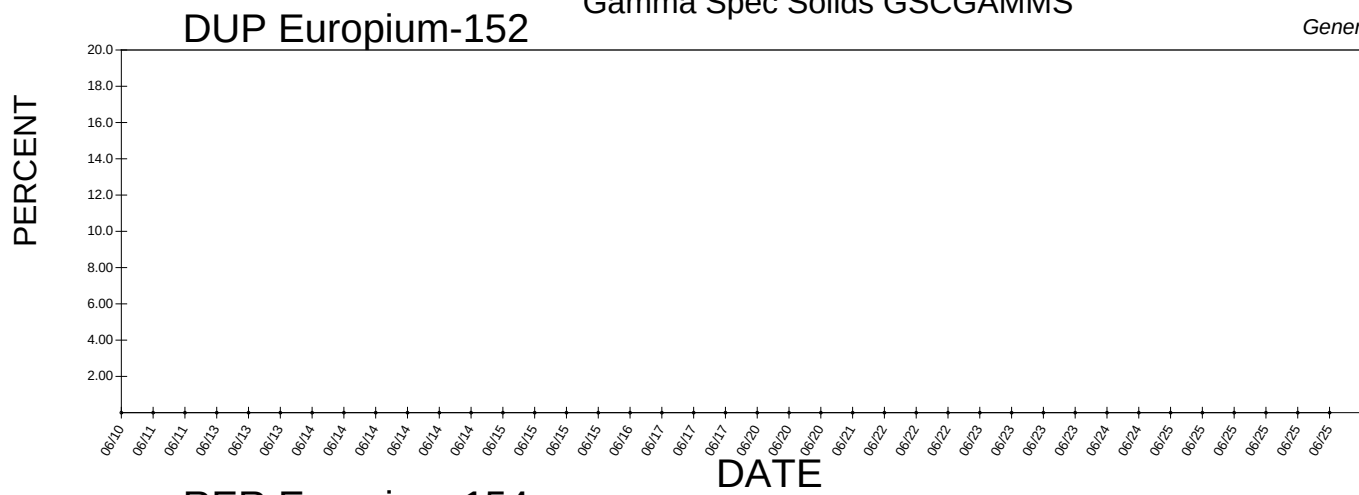
LCSRPD Cobalt-60



RER Europium-152



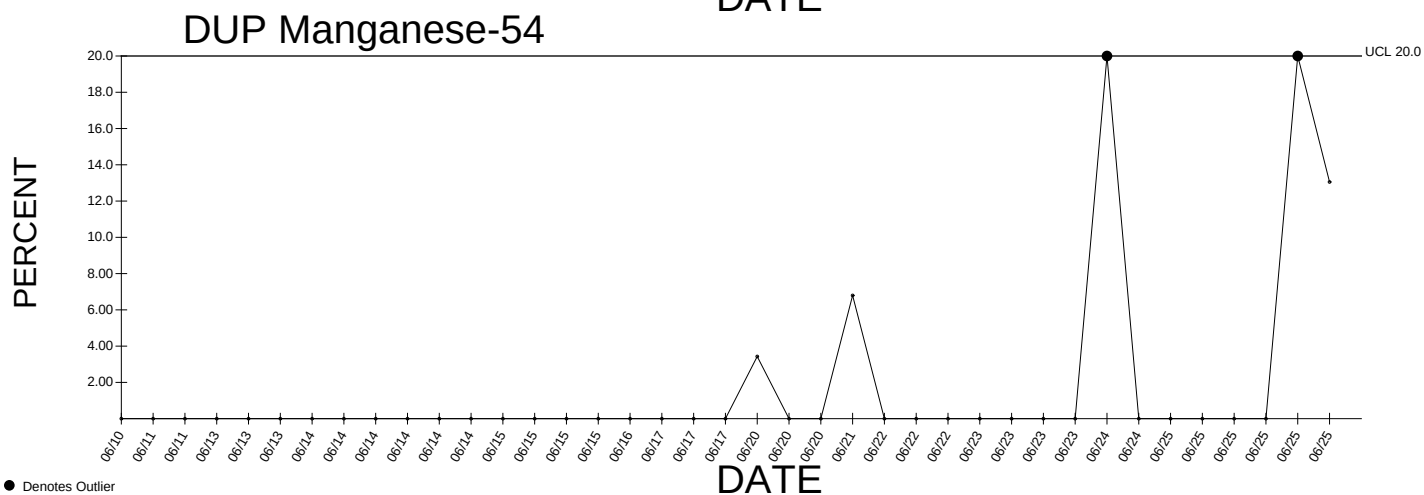
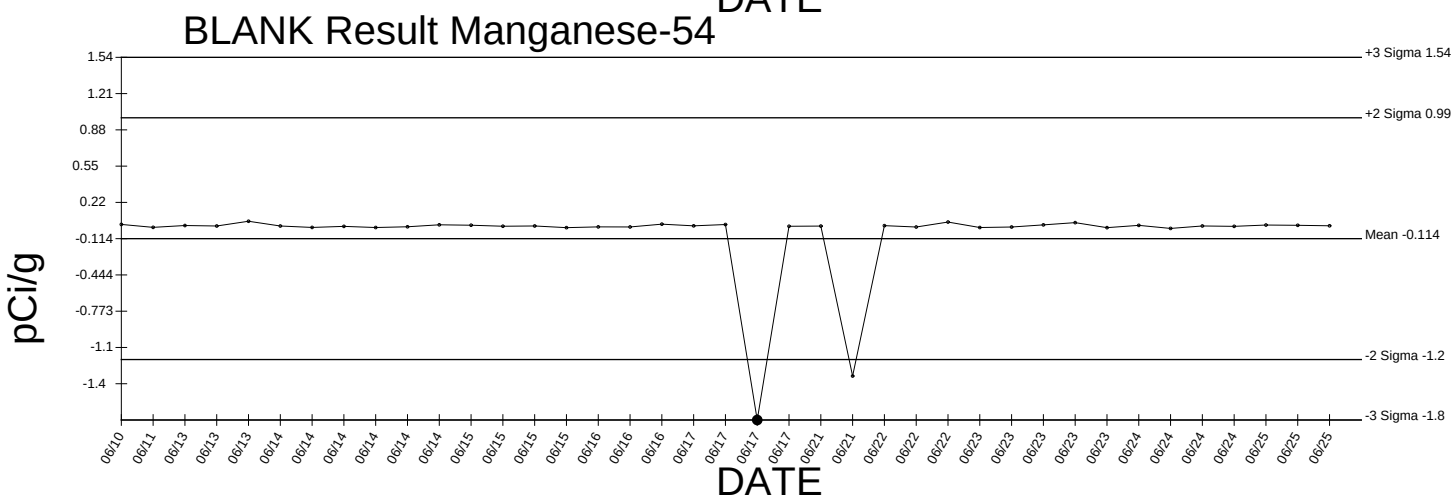
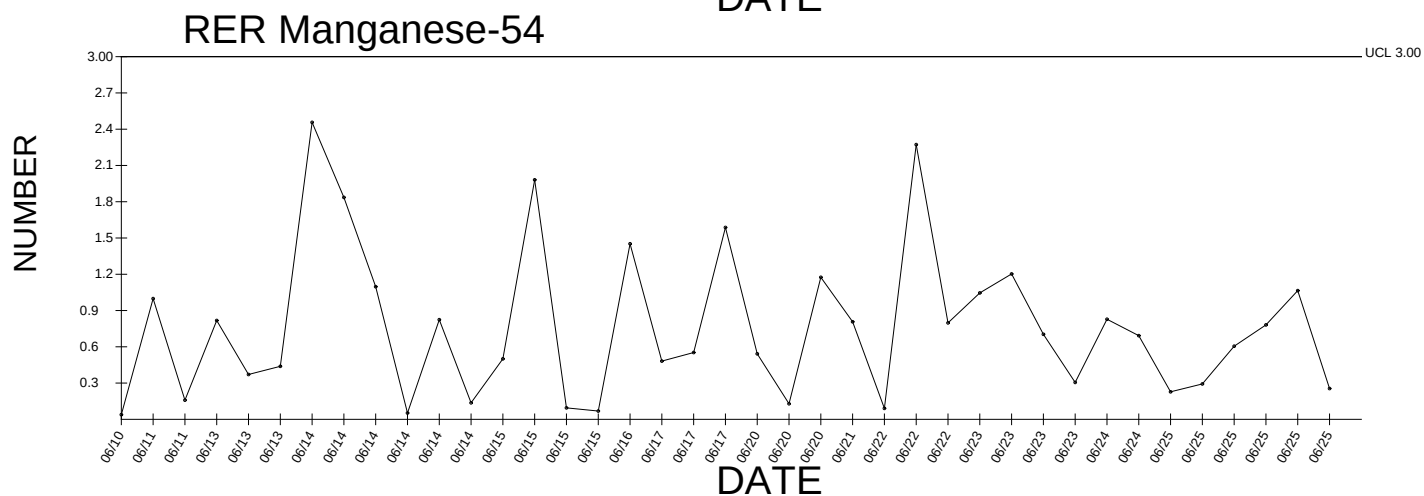
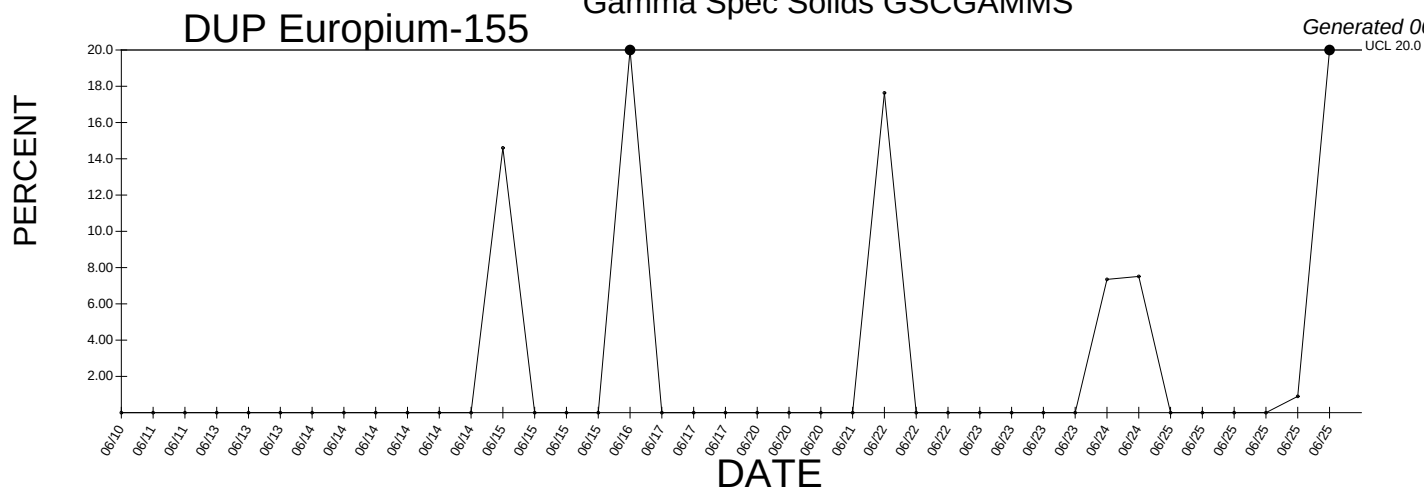
● Denotes Outlier



● Denotes Outlier

Gamma Spec Solids GSCGAMMS

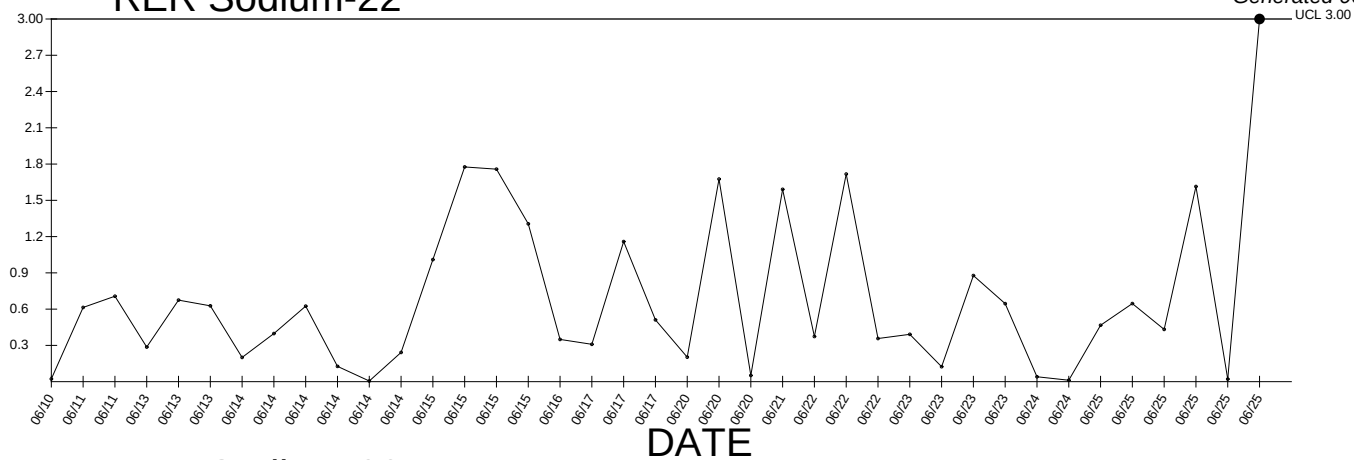
Generated 06/30/2016



● Denotes Outlier

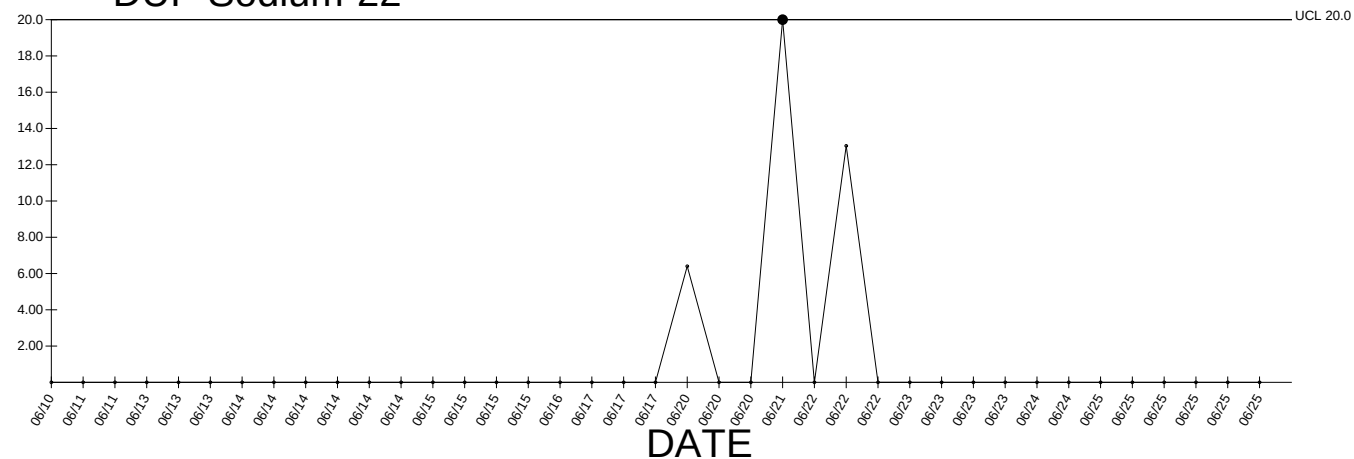
RER Sodium-22

NUMBER



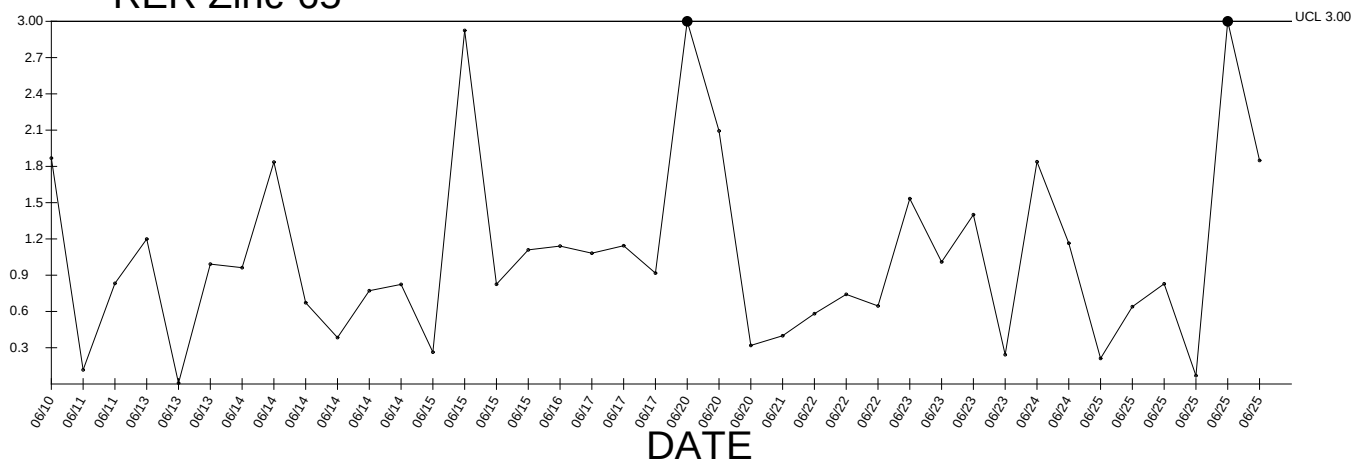
DUP Sodium-22

PERCENT



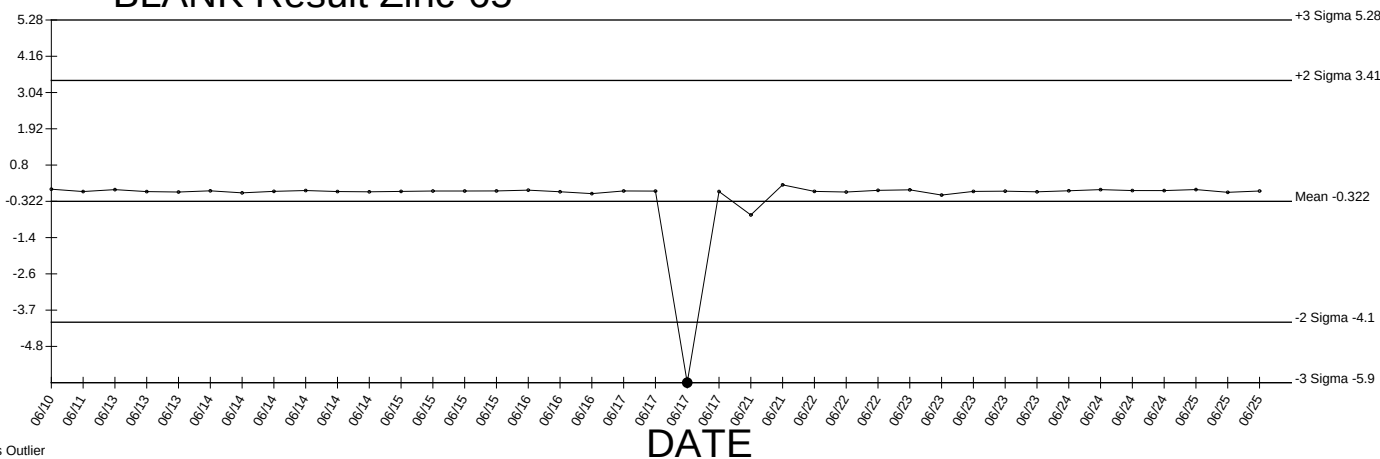
RER Zinc-65

NUMBER



BLANK Result Zinc-65

pCi/g



● Denotes Outlier

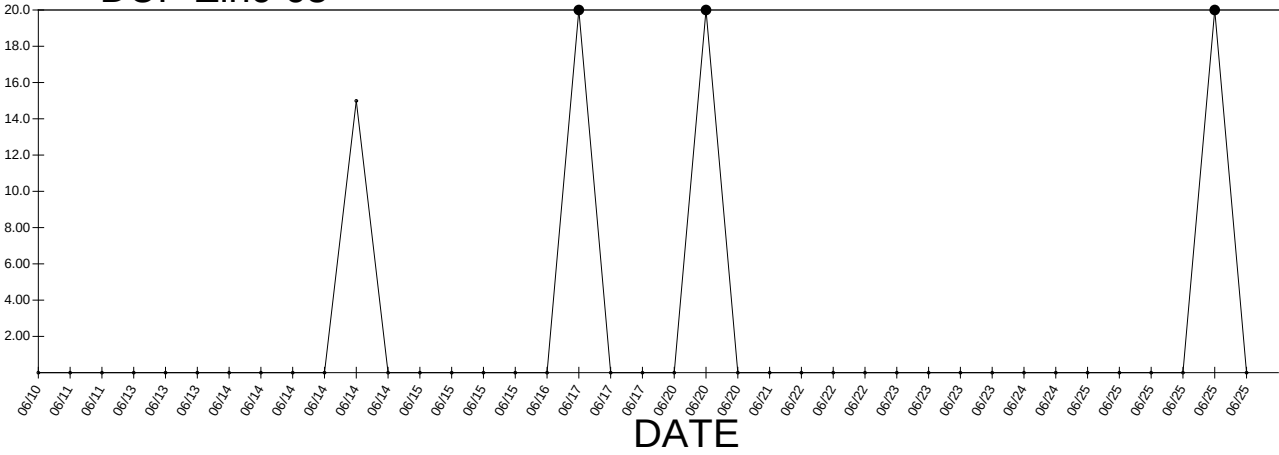
DUP Zinc-65

Gamma Spec Solids GSCGAMMS

Generated 06/30/2016

UCL 20.0

PERCENT



● Denotes Outlier

RAD Standards Traceability

1604

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

90616

2.0 Liter Solid in 230G GA-MA Beaker

Customer: GEL Laboratories, LLC

P.O. No.: 188182RD, Item 1

Reference Date: 01-Apr-2012

12:00 PM EST

Grams of Master Source: 0.0083625

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

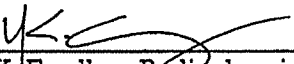
Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.469E+03	0.1	2.1	4.1	4π LS
Am-241	59.5	1.580E+05	—	9.196E+02	0.1	1.7	3.5	4π LS
Cd-109	88.0	4.626E+02	1.664E+05	1.391E+03	0.5	2.3	4.7	HPGe
Co-57	122.1	2.718E+02	8.863E+04	7.411E+02	0.4	2.0	4.1	HPGe
Ce-139	165.9	1.376E+02	1.239E+05	1.036E+03	0.4	1.9	3.9	HPGe
Hg-203	279.2	4.661E+01	2.641E+05	2.208E+03	0.3	1.9	3.8	HPGe
Sn-113	391.7	1.151E+02	1.742E+05	1.456E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.098E+04	1.114E+05	9.317E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.157E+05	3.476E+03	0.5	1.9	3.9	HPGe
Zn-65	1115.6	2.441E+02	—	1.695E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.084E+05	1.743E+03	0.6	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.084E+05	1.743E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.401E+05	3.680E+03	0.7	1.9	4.0	HPGe

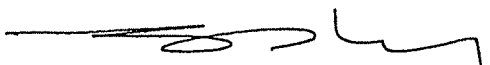
* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



Source Prepared by: 
K. Eardley, Radiochemist

QA Approved: 
J.D. McCorvey, Counting Room Manager

Date: 26 APR 12



Standard Logbook

Serial ID: 1604 **Open/Reference Date:** 01-APR-12 **Aliquot :** 1 mL
Name: Mixed Gamma LCS 2LMB **Received:** 01-APR-12 **Density :** Hand Calculated
Type: Source Material **Expires:** 01-APR-38 **Lot Number :** 90616
Employee: Maggie Stamps **Verified:** 10-SEP-13
Supplier: Eckert & Zeigler Analytics
Description: 90616
Comments: None

Analyte	Concentration	Analyte	Concentration
Americium-241	153693.59 dpm/mL	Cesium-137	65689.78 dpm/mL
Cobalt-60	104600.92 dpm/mL		

Verification for Mixed Gamma Standard

1604

2LMB

V1.1.1

M. Stamps
9/10/2013

Isotope	Result
Am-241	pCi/L
Mixed Gamma N1	75130
Mixed Gamma N2	74490
Mixed Gamma N3	74280

Isotopic Abundance:
Certificate Value (dps):

0.359
919.6

Mean Value (Counting) =
Stdev =

74633.33
442.757

pCi/L
pCi/L

Fail
Rule B (Pass/Fail)

*Exception taken due to the high uncertainty of the certified value

Certificate Value =
Two sigma =
10 % of Mean =
Rule A (Pass/Fail)

69231.3
885.513034
7463.333333
Pass

pCi/L

Stamp 9/11/13
R. Futed 9/11/13

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard

1604

2LMB

V1.1.1

M. Stamps
9/10/2013

Isotope	Result
Cs-137	pCi/L
Mixed Gamma N1	30140
Mixed Gamma N2	29700
Mixed Gamma N3	30170

Isotopic Abundance:
Certificate Value (dps):
0.851
931.7

Mean Value (Counting) =
Stdev =

30003.33
263.122

101.3969
Pass
Rule B (Pass/Fail)

Certificate Value =
Two sigma =
10 % of Mean =
Rule A (Pass/Fail)

29590.0
526.2445566
3000.333333
Pass

pCi/L

Handwritten:
Stamp 9/11/13
R. Eitel 9/11/13

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
Rule B = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1604 2LMB

v1.1.1

M. Stamps
9/10/2013

Isotope	Result
Co-60 (1173)	pCi/L
Mixed Gamma N1	47190
Mixed Gamma N2	47310
Mixed Gamma N3	46930

Isotopic Abundance:
Certificate Value (dps):
0.9985
1743

Mean Value (Counting) =

Stdev =

99.92466

Pass

Rule B (Pass/Fail)

Certificate Value =

Two sigma =

10 % of Mean =

Rule A (Pass/Fail)

47143.33
194.251

47178.9
388.5013942
4714.333333

Pass

M. Stamps 9/10/13

R. Finkel 9/10/13

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1604 2LMB

v1.1.1

M. Stamps
9/10/2013

Isotope	Result
Co-60 (1332.50)	pCi/L
Mixed Gamma N1	47960
Mixed Gamma N2	47810
Mixed Gamma N3	47610

Isotopic Abundance:
Certificate Value (dps):
0.9998
1743

Mean Value (Counting) =
Stddev =

47793.33
175.594

101.4343
Pass
Rule B (Pass/Fail)

Certificate Value =
Two sigma =
10 % of Mean =
Rule A (Pass/Fail)

47117.5
351.1884584
4779.333333
Pass

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

M. Stamps 9/10/13
R. Fiedel 9/11/13

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_1604_1.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;337
Background date    : 8-SEP-2013 12:49:53.
Sample date       : 1-APR-2012 12:00:00. Acquisition date : 10-SEP-2013 11:37:30
Sample ID        : VER_1604_1          Sample quantity   : 1.00000E+00 SAMPLE
Detector name     : GAM02              Detector geometry: 2LMB
Elapsed live time : 0 01:00:00.00      Elapsed real time: 0 01:00:19.23 0.5%
Energy tolerance  : 1.50000 keV        Analyst Initials :
Abundance limit   : 75.00000           Sensitivity       : 3.00000
Batch ID          :                    Detector SN#        :
Matrix Spike ID   :                    LCS ID              :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.36*	9384	12119	1.02	93.25	89	8	2.61E+00	2.2	
2	0	49.48	326	8652	2.23	99.50	98	6	9.05E-02	45.4	
3	0	59.40	26066	15259	1.06	119.34	114	11	7.24E+00	1.1	
4	0	74.53*	360	8984	1.12	149.57	147	6	1.00E-01	42.1	
5	0	87.94	45653	15875	1.07	176.38	170	11	1.27E+01	0.7	
6	0	121.99	17866	9583	1.09	244.45	239	11	4.96E+00	1.3	
7	0	136.43	2455	6695	1.14	273.32	269	9	6.82E-01	6.3	
8	0	165.80	6854	6504	1.06	332.03	327	10	1.90E+00	2.5	
9	0	255.01	236	3077	1.27	510.37	508	6	6.56E-02	37.7	
10	0	362.97	150	2202	1.12	726.22	724	7	4.18E-02	52.4	
11	0	391.65	3391	3151	1.24	783.56	779	10	9.42E-01	3.5	
12	0	486.03	51	1773	1.10	972.25	969	7	1.42E-02	137.0	
13	0	511.19*	1082	4028	2.64	1022.56	1014	17	3.00E-01	13.8	
14	0	645.71	75	1237	1.05	1291.52	1289	7	2.10E-02	78.1	
15	0	661.60*	34258	2748	1.51	1323.29	1315	16	9.52E+00	0.6	
16	0	688.94	66	1093	1.43	1377.95	1373	7	1.83E-02	84.4	
17	0	897.97	3274	2348	1.67	1795.91	1790	11	9.09E-01	3.4	
18	0	948.95	137	1261	1.37	1897.85	1895	6	3.79E-02	42.2	
19	0	1107.34	43	1003	1.68	2214.56	2209	7	1.20E-02	123.3	
20	0	1115.50	10172	2229	1.91	2230.90	2223	16	2.83E+00	1.4	
21	0	1173.18*	34369	1384	1.94	2346.24	2336	20	9.55E+00	0.6	
22	0	1285.81	29	225	1.50	2571.47	2566	11	8.05E-03	102.0	
23	0	1332.45	31522	482	2.03	2664.74	2654	20	8.76E+00	0.6	
24	0	1441.92	24	140	0.55	2883.67	2873	14	6.67E-03	106.6	
25	0	1453.76	42	115	5.04	2907.33	2901	13	1.17E-02	54.5	
26	0	1835.97	1994	109	2.37	3671.77	3662	19	5.54E-01	2.6	
27	0	1915.22	42	22	5.44	3830.27	3822	16	1.16E-02	30.3	
28	0	1983.72	26	51	6.03	3967.28	3957	20	7.32E-03	68.7	
29	0	2035.45	21	36	1.42	4070.77	4064	13	5.96E-03	61.4	
30	0	2043.53	19	3	1.49	4086.92	4085	6	5.15E-03	30.0	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	17866	85.60*	2.569E+00	6.100E+03	2.340E+04	2.60
	136.47	2455	10.68	2.594E+00	6.654E+03	2.552E+04	12.68
CO-60	1173.23	34369	99.85	6.620E-01	3.903E+04	4.719E+04	1.20
	1332.49	31522	99.98*	5.967E-01	3.967E+04	4.796E+04	1.18
ZN-65	1115.54	10172	50.60*	6.899E-01	2.188E+04	9.772E+04	2.87
Y-88	898.04	3274	93.70	8.218E-01	3.192E+03	9.814E+04	6.71
	1836.06	1994	99.20*	4.697E-01	3.212E+03	9.877E+04	5.14
CD-109	88.03	45653	3.70*	2.009E+00	4.611E+05	1.018E+06	1.42
SN-113	391.70	3391	64.97*	1.496E+00	2.619E+03	6.260E+04	7.08
CS-137	661.66	34258	85.10*	1.037E+00	2.915E+04	3.014E+04	1.28
CE-139	165.86	6854	80.00*	2.492E+00	2.581E+03	3.667E+04	5.03
PB-210	46.54	9384	4.25*	1.966E-01	8.432E+05	8.821E+05	4.46
AM-241	59.54	26066	35.90*	7.272E-01	7.496E+04	7.513E+04	2.23

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_1604_2.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;337
Background date    : 8-SEP-2013 12:49:53.
Sample date       : 1-APR-2012 12:00:00. Acquisition date : 10-SEP-2013 13:16:34
Sample ID        : VER_1604_2          Sample quantity   : 1.00000E+00 SAMPLE
Detector name     : GAM02              Detector geometry: 2LMB
Elapsed live time : 0 01:00:00.00      Elapsed real time: 0 01:00:19.27 0.5%
Energy tolerance  : 1.50000 keV        Analyst Initials :
Abundance limit   : 75.00000           Sensitivity       : 3.00000
Batch ID          :                    Detector SN#       :
Matrix Spike ID   :                    LCS ID            :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.32*	10422	13762	1.07	93.18	88	10	2.90E+00	2.3	
2	0	59.42	25879	14577	1.06	119.38	114	10	7.19E+00	1.1	
3	0	87.94	45177	15299	1.06	176.39	171	11	1.25E+01	0.7	
4	0	121.99	17996	9705	1.10	244.44	239	11	5.00E+00	1.3	
5	0	136.41	2598	6698	1.09	273.29	269	9	7.22E-01	6.0	
6	0	165.82	6770	6608	1.08	332.07	328	10	1.88E+00	2.6	
7	0	185.74*	168	4402	1.70	371.90	369	7	4.66E-02	66.1	
8	0	254.58	141	3659	0.71	509.51	508	7	3.93E-02	71.5	
9	0	310.16	180	2182	1.83	620.64	618	6	5.01E-02	41.7	
10	0	343.60	51	2738	2.13	687.49	685	8	1.42E-02	177.4	
11	0	391.63	3275	3565	1.25	783.52	778	11	9.10E-01	3.9	
12	0	451.64	99	2120	1.61	903.48	900	7	2.74E-02	78.1	
13	0	510.95*	1238	3587	2.26	1022.07	1014	16	3.44E-01	11.2	
14	0	556.03	120	1368	1.81	1112.21	1109	7	3.34E-02	51.9	
15	0	601.63	162	1985	0.65	1203.38	1198	11	4.49E-02	53.9	
16	0	661.59*	33762	2749	1.50	1323.25	1316	15	9.38E+00	0.6	
17	0	897.98	3328	2599	1.74	1795.93	1790	12	9.24E-01	3.5	
18	0	905.64	139	1635	1.44	1811.24	1809	8	3.85E-02	51.3	
19	0	955.55	125	2001	2.34	1911.05	1906	9	3.48E-02	65.0	
20	0	1115.46	10046	2283	1.92	2230.80	2221	17	2.79E+00	1.5	
21	0	1173.13*	34458	1515	1.93	2346.14	2336	20	9.57E+00	0.6	
22	0	1325.60	21	303	1.55	2651.04	2642	11	5.85E-03	161.4	
23	0	1332.42	31424	499	2.06	2664.67	2654	20	8.73E+00	0.6	
24	0	1483.08	10	157	3.71	2965.98	2963	13	2.89E-03	249.7	
25	0	1765.99*	21	56	4.06	3531.79	3524	14	5.78E-03	80.8	
26	0	1836.00	2057	75	2.59	3671.82	3661	22	5.71E-01	2.5	
27	1	1994.40*	32	6	2.75	3988.66	3983	29	8.86E-03	24.7	1.23E+00
28	1	1998.57	28	11	2.50	3997.00	3983	29	7.71E-03	37.5	
29	1	2004.07	32	8	2.51	4008.00	3983	29	8.91E-03	22.5	
30	0	2044.20	12	5	0.91	4088.27	4087	4	3.33E-03	43.3	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	17996	85.60*	2.569E+00	6.144E+03	2.357E+04	2.60
	136.47	2598	10.68	2.594E+00	7.041E+03	2.701E+04	12.03
CO-60	1173.23	34458	99.85	6.620E-01	3.913E+04	4.731E+04	1.21
	1332.49	31424	99.98*	5.967E-01	3.954E+04	4.781E+04	1.18
ZN-65	1115.54	10046	50.60*	6.899E-01	2.160E+04	9.652E+04	2.95
Y-88	898.04	3328	93.70	8.218E-01	3.245E+03	9.981E+04	7.04
	1836.06	2057	99.20*	4.697E-01	3.314E+03	1.019E+05	4.92
CD-109	88.03	45177	3.70*	2.009E+00	4.562E+05	1.007E+06	1.42
SN-113	391.70	3275	64.97*	1.496E+00	2.529E+03	6.048E+04	7.88
CS-137	661.66	33762	85.10*	1.037E+00	2.873E+04	2.970E+04	1.28
CE-139	165.86	6770	80.00*	2.492E+00	2.549E+03	3.623E+04	5.11
PB-210	46.54	10422	4.25*	1.955E-01	9.416E+05	9.850E+05	4.65
AM-241	59.54	25879	35.90*	7.282E-01	7.431E+04	7.449E+04	2.15

Flag: "*" = Keyline

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_1604_3.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM02.CNF;337
Background date    : 8-SEP-2013 12:49:53.
Sample date       : 1-APR-2012 12:00:00. Acquisition date : 10-SEP-2013 14:47:41
Sample ID        : VER_1604_3          Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM02              Detector geometry  : 2LMB
Elapsed live time: 0 01:00:00.00      Elapsed real time: 0 01:00:19.26 0.5%
Energy tolerance : 1.50000 keV        Analyst Initials  :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID         :                   Detector SN#        :
Matrix Spike ID  :                   LCS ID             :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.36*	10375	12772	1.06	93.26	88	9	2.88E+00	2.2	
2	0	49.80	266	8735	1.41	100.14	98	6	7.40E-02	55.7	
3	0	59.40	25771	14375	1.05	119.34	114	10	7.16E+00	1.1	
4	0	66.59	319	11783	1.88	133.70	132	8	8.87E-02	59.0	
5	0	87.96	44634	13685	1.06	176.42	172	10	1.24E+01	0.7	
6	0	121.99	17524	9604	1.09	244.46	239	11	4.87E+00	1.3	
7	0	136.41	2439	6746	1.04	273.28	269	9	6.77E-01	6.4	
8	0	165.78	6865	6531	1.04	332.00	327	10	1.91E+00	2.5	
9	0	178.02	192	3059	1.31	356.46	355	5	5.33E-02	43.8	
10	0	254.79	183	3186	1.82	509.93	508	6	5.10E-02	49.2	
11	0	300.38	167	2351	1.52	601.09	599	6	4.64E-02	46.5	
12	0	391.64	3394	3141	1.32	783.54	779	10	9.43E-01	3.5	
13	0	459.40	104	2491	1.19	919.01	914	8	2.88E-02	83.9	
14	0	473.29	152	2337	2.24	946.78	943	8	4.23E-02	55.7	
15	0	510.81*	882	3183	2.08	1021.80	1016	13	2.45E-01	13.7	
16	0	573.13	166	1590	1.41	1146.39	1142	9	4.60E-02	44.0	
17	0	599.01	66	1705	2.31	1198.14	1196	9	1.85E-02	112.8	
18	0	661.58*	34292	2697	1.52	1323.24	1316	15	9.53E+00	0.6	
19	0	688.76	66	1331	1.58	1377.59	1375	8	1.82E-02	97.0	
20	0	813.79	134	1629	1.93	1627.57	1623	9	3.73E-02	54.8	
21	0	898.08	3504	3356	1.64	1796.13	1789	16	9.73E-01	4.1	
22	0	911.00*	78	1429	1.17	1821.95	1820	7	2.16E-02	81.3	
23	0	965.31*	81	1294	1.54	1930.56	1928	7	2.25E-02	74.7	
24	0	991.06	61	1347	1.06	1982.04	1979	8	1.69E-02	105.1	
25	0	1043.88	167	1514	4.20	2087.66	2082	11	4.65E-02	45.8	
26	0	1115.47	10278	1965	1.83	2230.82	2223	15	2.85E+00	1.4	
27	0	1173.14*	34180	1684	1.96	2346.15	2335	22	9.49E+00	0.6	
28	0	1293.89	41	418	5.28	2587.61	2573	18	1.14E-02	117.8	
29	0	1332.40	31292	466	2.09	2664.63	2655	19	8.69E+00	0.6	
30	0	1430.52	23	83	0.74	2860.86	2857	8	6.48E-03	71.5	
31	0	1548.49	38	179	0.58	3096.80	3087	15	1.04E-02	80.1	
32	0	1807.47	13	37	1.38	3614.75	3607	10	3.51E-03	86.1	
33	0	1835.95	2048	119	2.56	3671.72	3659	22	5.69E-01	2.6	
34	0	1942.51	19	48	1.42	3884.86	3878	17	5.39E-03	84.1	

Sample ID : VER_1604_3

Acquisition date : 10-SEP-2013 14:47:41

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1987.25	14	24	0.88	3974.36	3969	9	3.90E-03	68.9	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	17524	85.60*	2.569E+00	5.983E+03	2.295E+04	2.65
	136.47	2439	10.68	2.594E+00	6.609E+03	2.536E+04	12.82
CO-60	1173.23	34180	99.85	6.620E-01	3.882E+04	4.693E+04	1.24
	1332.49	31292	99.98*	5.967E-01	3.938E+04	4.761E+04	1.18
ZN-65	1115.54	10278	50.60*	6.899E-01	2.210E+04	9.877E+04	2.72
Y-88	898.04	3504	93.70	8.217E-01	3.417E+03	1.051E+05	8.14
	1836.06	2048	99.20*	4.697E-01	3.299E+03	1.015E+05	5.17
CD-109	88.03	44634	3.70*	2.010E+00	4.506E+05	9.948E+05	1.37
SN-113	391.70	3394	64.97*	1.496E+00	2.621E+03	6.271E+04	7.07
CS-137	661.66	34292	85.10*	1.037E+00	2.918E+04	3.017E+04	1.27
CE-139	165.86	6865	80.00*	2.493E+00	2.585E+03	3.675E+04	5.03
PB-210	46.54	10375	4.25*	1.967E-01	9.316E+05	9.746E+05	4.39
AM-241	59.54	25771	35.90*	7.272E-01	7.411E+04	7.428E+04	2.14

Flag: "*" = Keyline

CERTIFICATE OF CALIBRATION Standard Radionuclide Source

1556

84680-278

100 mL Solid in Aluminum Can

Customer: GEL Labs

P.O. No.: 489884RD, Item 3

Reference Date: 01-Apr-2011 12:00 PM EST **Grams of Master Source:** 0.0066498

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101. Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* $\mu\text{ps/gram}$	This Source μps	Uncertainty, %			Calibration Method
					Type	u_A	u_B	U
Pb-210	46.5	8.120E+03	—	1.129E+03	0.1	2.1	4.1	4 π LS
Am-241	59.5	1.580E+05	—	7.538E+02	0.1	1.7	3.5	4 π LS
Cd-109	88.0	4.626E+02	1.659E+05	1.103E+03	0.6	2.3	4.8	HPGe
Co-57	122.1	2.718E+02	8.949E+04	5.951E+02	0.6	2.0	4.2	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	8.292E+02	0.6	1.9	4.0	HPGe
Hg-203	279.2	4.661E+01	2.899E+05	1.928E+03	0.6	1.9	4.0	HPGe
Sn-113	391.7	1.151E+02	1.739E+05	1.156E+03	0.6	1.9	4.0	HPGe
Cs-137	661.7	1.098E+04	1.107E+05	7.361E+02	0.8	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	4.246E+05	2.824E+03	0.6	1.9	4.0	HPGe
Zn-65	1115.6	2.441E+02	—	1.445E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.118E+05	1.408E+03	0.7	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.118E+05	1.408E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.495E+05	2.989E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



PC-S-060-101

This standard will expire one year after the reference date.

Source Prepared by: M. Williford
M. Williford, Radiochemist

QA Approved: J. D. McCorvey
J. D. McCorvey, QA Manager Alternate

Date: 6/27/11



Standard Logbook

Serial ID: 1556 Open/Reference Date: 01-APR-11 Aliquot : 1 mL
Name: Mixed Gamma LCS CAN Received: 01-APR-11 Density : Hand Calculated
Type: Source Material Expires: 01-APR-37 Lot Number : 84680-278
Employee: Maggie Stamps Verified: 14-JUL-11
Supplier: Eckert & Zeigler Analytics
Description: 84680-278
Comments: None

Analyte	Concentration	Analyte	Concentration
Americium-241	125983.3 dpm/mL	Cesium-137	51898.9 dpm/mL
Cobalt-60	84496.9 dpm/mL		

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Pb-210	pCi/L
Mixed Gamma N1	722900
Mixed Gamma N2	752300
Mixed Gamma N3	692100

Isotopic Abundance:
Certificate Value (dps):
0.0425
1129

Mean Value (Counting) =
Stdev =

722433.33	pCi/L	100.622	Pass
30102.713	pCi/L		Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

717965.0	pCi/L
662227.9072	pCi/L
782638.7594	pCi/L
Pass	
60205.42611	
72243.33333	
Pass	

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

mg
7/20/11

Stamp
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	Isotopic Abundance:
Am-241	pCi/L	Certificate Value (dps):
Mixed Gamma N1	58390	0.359
Mixed Gamma N2	60740	753.8
Mixed Gamma N3	57770	

Mean Value (Counting) = 103.9074 Pass
Sidev = Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

58966.67	pCi/L
1566.727	pCi/L
56749.2	pCi/L
55833.21277	pCi/L
62100.12057	pCi/L
Pass	
3133.453898	
5896.666667	
Pass	

Verification Rules

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- Rule 3 = The determined mean value shall be within 5% of the certificate value.

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7/20/11

Verification for Mixed Gamma Standard

Michael Hilton
7/14/2011

Isotope	Result
Cd-109	pCi/L
Mixed Gamma N1	818400
Mixed Gamma N2	798000
Mixed Gamma N3	764700

Isotopic Abundance:	0.037
Certificate Value (dps):	1103

Mean Value (Counting) =	793700.00	pCi/L	98.51091	Pass
Stdev =	27107.010	pCi/L		Rule 3 (Pass/Fail)

Certificate Value =	805697.6	pCi/L
Lower Limit =	739485.9797	pCi/L
Upper Limit =	847914.0203	pCi/L
Rule 1 Pass/Fail	Pass	
Two sigma =	54214.02033	
10 % of Mean =	79370	
Rule 2 (Pass/Fail)	Pass	

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11/20/12
11/20/12

Verification Rules

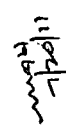
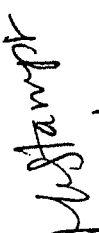
Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements

Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton 7/14/2011	Isotope	Result	Isotopic Abundance: Certificate Value (dps):	0.856 595.1		
	Co-57	pCi/L				
	Mixed Gamma N1	19090				
	Mixed Gamma N2	18820				
	Mixed Gamma N3	18830				
	Mean Value (Counting) =	pCi/L			100.6592	Pass
	Sidev =	pCi/L			Rule 3 (Pass/Fail)	
	Certificate Value =				pCi/L	
Lower Limit =		pCi/L				
Upper Limit =		pCi/L				
Rule 1 Pass/Fail						
Two sigma =						
10 % of Mean =						
Rule 2 (Pass/Fail)						



 7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
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- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	Isotopic Abundance:
Ce-139	pCi/L	0.8
Mixed Gamma N1	28740	829.2
Mixed Gamma N2	29410	
Mixed Gamma N3	27560	

Mean Value (Counting) = 101.9865 Pass
Stdev = Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
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- Rule 3 = The determined mean value shall be within 5% of the certificate value.

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Stamp

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	
Hg-203	pCi/L	
Mixed Gamma N1	66300	Isotopic Abundance:
Mixed Gamma N2	68180	Certificate Value (dps):
Mixed Gamma N3	64480	0.8156
		1928

Mean Value (Counting) = 103.8046 Pass
Sidev = Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

66320.00	pCi/L
1850.081	pCi/L
63889.3	pCi/L
62619.83784	pCi/L
70020.16216	pCi/L
Pass	
3700.162159	
6632	
Pass	

Verification Rules

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- Rule 3 = The determined mean value shall be within 5% of the certificate value.

might
7/20/11

W. Stanev
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Sn-113	pCi/L
Mixed Gamma N1	49560
Mixed Gamma N2	49620
Mixed Gamma N3	48300

Isotopic Abundance:
Certificate Value (dps): 0.6497
1156

Mean Value (Counting) = 49160.00 pCi/L 102.2277 Pass
Sidev = 745.386 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 48088.7 pCi/L
Lower Limit = 47669.22839 pCi/L
Upper Limit = 50650.77161 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 1490.771612
10 % of Mean = 4916
Rule 2 (Pass/Fail) Pass

Verification Rules

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- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

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Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton 7/14/2011		Isotope Cs-137	Result pCi/L	Isotopic Abundance: Certificate Value (dps):	0.851 736.1
		Mixed Gamma N1	23710		
		Mixed Gamma N2	23950		
		Mixed Gamma N3	24040		
Mean Value (Counting) =		23900.00	pCi/L	102.2333	Pass
Sidev =		170.587	pCi/L		Rule 3 (Pass/Fail)
Certificate Value =		23377.9	pCi/L		
Lower Limit =		23558.82556	pCi/L		
Upper Limit =		24241.17444	pCi/L		
Rule 1 Pass/Fail		Fail		*exception taken due to full recovery of standard	
Two sigma =		341.1744422			
10 % of Mean =		2390			
Rule 2 (Pass/Fail)		Pass			

7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
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Pass
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Y-88 (898)	pCi/L
Mixed Gamma N1	82690
Mixed Gamma N2	81320
Mixed Gamma N3	80940

Isotopic Abundance:
Certificate Value (dps): 0.937 2824

Mean Value (Counting) = 81650.00 pCi/L 100.2381 Pass
Sidev = 920.489 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 81456.1 pCi/L
Lower Limit = 79809.022 pCi/L
Upper Limit = 83490.978 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 1840.978001
10 % of Mean = 8165
Rule 2 (Pass/Fail) Pass

Verification Rules

- Rule 1 = The certificate value (NOT Including any uncertainty) shall lie within the 95% confidence Interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence Interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

7/20/11
7/20/11
Hilton

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	Isotopic Abundance:
Co-60 (1173)	pCi/L	
Mixed Gamma N1	38910	0.9985
Mixed Gamma N2	39750	1408
Mixed Gamma N3	38840	

Mean Value (Counting) = 39166.67
 Stdev = 506.392

102.7694

Pass

Rule 3 (Pass/Fail)

Certificate Value = 38111.2
 Lower Limit = 38153.88173
 Upper Limit = 40179.45161

Rule 1 Pass/Fail Fail
 Two sigma = 1012.784939
 10 % of Mean = 3916.666667

Pass

*exception taken due to full recovery of standard

Verification Rules

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1/20/11

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Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Co-60 (1332.50)	pCi/L
Mixed Gamma N1	38940
Mixed Gamma N2	40200
Mixed Gamma N3	39150

Isotopic Abundance:
Certificate Value (dps):
0.9998
1408

Mean Value (Counting) =
Stdev =

Isotope	Mean Value (Counting)	Stdev
Co-60 (1332.50)	39430.00	103.595
Mixed Gamma N1	675.056	

Pass
Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

Isotope	Certificate Value	Lower Limit	Upper Limit	Rule 1 Pass/Fail	Two sigma	10 % of Mean	Rule 2 (Pass/Fail)
Co-60 (1332.50)	38061.7	38079.88889	40780.11111	Fall	1350.111107	3943	Pass

*exception taken due to full recovery of standard

Verification Rules

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7/20/11
1556
1408

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Y-88 (1836.1)
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
82870
83080
84640

Isotopic Abundance:
Certificate Value (dps):
0.992
2989

Mean Value (Counting) =
Stdev =

83530.00
967.006

102.5723
Pass
Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

81435.3
81595.98862
85464.01138
Fail
1934.011375
8353
Pass

*exception taken due to full recovery of standard

mg
7/20/11

W. Stamp
7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
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Runlogs

Instrument Run Log

Instrument Type: GAMMA SPECTROMETER

Batch ID: 1572234

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398656001	SAMPLE	MXR1	GAM18	JUN-16-16 14:10:47	DONE CAN		22-JUN-15 00:00
398656002	SAMPLE	MXR1	GAM22	JUN-16-16 15:23:55	DONE CAN		07-JUL-15 00:00
398656003	SAMPLE	MXR1	GAM22	JUN-22-16 12:50:03	DONE CAN		07-JUL-15 00:00
398656004	SAMPLE	MXR1	GAM43	JUN-22-16 15:18:40	DONE CAN		10-SEP-15 00:00
398656005	SAMPLE	MXR1	GAM22	JUN-23-16 12:00:15	DONE CAN		07-JUL-15 00:00
398656006	SAMPLE	MXR1	GAM02	JUN-23-16 12:03:15	DONE CAN		18-AUG-15 00:00
398656007	SAMPLE	MXR1	GAM11	JUN-23-16 13:04:57	DONE CAN		16-JUL-15 00:00
398656008	SAMPLE	MXR1	GAM15	JUN-23-16 13:05:23	DONE CAN		18-JUN-15 00:00
398656009	SAMPLE	MXR1	GAM18	JUN-23-16 13:05:49	DONE CAN		22-JUN-15 00:00
398656010	SAMPLE	MXR1	GAM20	JUN-23-16 13:06:10	DONE CAN		03-JUN-15 00:00
398656012	SAMPLE	MXR1	GAM32	JUN-23-16 13:07:08	DONE CAN		06-AUG-15 00:00
398656013	SAMPLE	MXR1	GAM05	JUN-23-16 13:08:07	DONE CAN		17-SEP-15 00:00
398656011	SAMPLE	MXR1	GAM09	JUN-23-16 14:59:37	DONE CAN		03-JUN-16 00:00
398656014	SAMPLE	MXR1	GAM12	JUN-23-16 14:59:59	DONE CAN		29-SEP-15 00:00
398656015	SAMPLE	MXR1	GAM17	JUN-23-16 15:00:19	DONE CAN		01-JUN-16 00:00
398656016	SAMPLE	MXR1	GAM33	JUN-23-16 15:00:40	DONE CAN		10-JUN-16 00:00
398656017	SAMPLE	MXR1	GAM44	JUN-23-16 15:01:04	DONE CAN		09-SEP-15 00:00
398656018	SAMPLE	MXR1	GAM43	JUN-23-16 17:17:36	DONE CAN		10-SEP-15 00:00
398656019	SAMPLE	MXR1	GAM31	JUN-24-16 15:53:07	DONE CAN		15-JUN-16 00:00
398656020	SAMPLE	MXR1	GAM02	JUN-24-16 15:53:26	DONE CAN		18-AUG-15 00:00
1203561383	MB	MXR1	GAM06	JUN-24-16 15:53:53	DONE CAN		08-MAR-16 00:00
1203561384	DUP	MXR1	GAM09	JUN-24-16 15:54:22	DONE CAN		03-JUN-16 00:00
1203561385	LCS	MXR1	GAM08	JUN-25-16 09:20:27	DONE CAN		08-JUL-15 00:00

Instrument Run Log

Instrument Type: GAMMA SPECTROMETER

Batch ID: 1572236

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398656021	SAMPLE	MXR1	GAM11	JUN-24-16 15:50:46	DONE CAN		16-JUL-15 00:00
398656022	SAMPLE	MXR1	GAM12	JUN-24-16 15:51:06	DONE CAN		29-SEP-15 00:00
398656023	SAMPLE	MXR1	GAM14	JUN-24-16 15:51:24	DONE CAN		13-OCT-15 00:00
398656024	SAMPLE	MXR1	GAM15	JUN-24-16 15:51:59	DONE CAN		18-JUN-15 00:00
398656025	SAMPLE	MXR1	GAM17	JUN-24-16 15:52:18	DONE CAN		01-JUN-16 00:00
1203561386	MB	MXR1	GAM28	JUN-24-16 15:52:42	DONE CAN		27-JUL-15 00:00
1203561387	DUP	MXR1	GAM22	JUN-25-16 09:39:24	DONE CAN		07-JUL-15 00:00
1203561388	LCS	MXR1	GAM08	JUN-25-16 11:03:45	DONE CAN		08-JUL-15 00:00

Instrument Run Log

Instrument Type: GAMMA SPECTROMETER

Batch ID: 1572406

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203561781	MB	MXR1	GAM25	JUN-22-16 11:21:51	DONE	2LMB	16-JUL-15 00:00
398656026	SAMPLE	MXR1	GAM16	JUN-22-16 12:14:46	DONE	2LMB	01-OCT-15 00:00
1203561782	LCS	MXR1	GAM09	JUN-22-16 13:48:41	DONE	2LMB	07-JUN-16 00:00
1203561783	LCSD	MXR1	GAM43	JUN-22-16 14:06:47	DONE	2LMB	11-SEP-15 00:00

Gas Flow Raw Data

28-Jun-2016

Batch# 1575826 Product: Sr 90 Date: 6/28/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/MDC, error is 40% or less. If below the MDA/MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5x MDA/MDC, then RPD is 100% or less, If greater 5x MDA/MDC, then RPD 20% or less, If below the MDA/MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	/		
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			M
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: 

713
BRL

Secondary Review Performed By:  6/30/16

Strontium 90 Queue Sheet

06/20/16

Batch #: 1575826

Analyst: KSD1

First Client Due Date: 07/03/2016

Internal Due Date: 06/29/2016

Comments

Sr-90 Spike Code: 12430

Expiration Date: 12/18/16 Vol: 21

Sr Sep. Date/time: 01:50 6/27/16

Sr-90 LCS Code: 12430

Expiration Date: 12/18/16 Vol: 21

Sr Carrier Code: 2414665 Exp Date: 01/17/17

Vol: 0.5 Sdt Wt: 4.32

Pipet ID: 701119 Balance #: 1850299

Analytical Scale #: F30360 Witness: D.L. 6-24-16

Prep Date: 06/24/16 Initials: 140

754115

Sample ID	Client Description	Type	RDL	Collection Date	Matrix	Client	Rad	Pos. #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)
398656001-1	37695-001	SAMPLE	2 pCi/g	MAY-17-16 10:20 AM	SOIL	BRKL007		1	0.374	11B	0.0245	0.0305	6.0
398656002-1	37695-002	SAMPLE	2 pCi/g	MAY-17-16 10:25 AM	SOIL	BRKL007		2	0.349	10A	0.0347	0.0302	5.5
398656003-1	37695-003	SAMPLE	2 pCi/g	MAY-17-16 10:30 AM	SOIL	BRKL007		3	0.324	10B	0.0246	0.0308	6.2
398656004-1	37695-004	SAMPLE	2 pCi/g	MAY-17-16 10:35 AM	SOIL	BRKL007		4	0.340	11A	0.0247	0.0316	6.9
398656005-1	37695-005	SAMPLE	2 pCi/g	MAY-17-16 10:45 AM	SOIL	BRKL007		5	0.340	10C	0.0243	0.0305	6.2
398656006-1	37695-006	SAMPLE	2 pCi/g	MAY-17-16 10:50 AM	SOIL	BRKL007		6	0.340	11C	0.0245	0.0289	4.4
398656007-1	37695-007	SAMPLE	2 pCi/g	MAY-17-16 10:55 AM	SOIL	BRKL007		7	0.307	9D	0.0244	0.0309	6.5
398656008-1	37695-008	SAMPLE	2 pCi/g	MAY-17-16 11:00 AM	SOIL	BRKL007		8	0.308	12D	0.0245	0.0310	6.5
398656009-1	37695-009	SAMPLE	2 pCi/g	MAY-17-16 11:10 AM	SOIL	BRKL007		9	0.370	13D	0.0240	0.0306	6.6
398656010-1	37695-010	SAMPLE	2 pCi/g	MAY-17-16 11:15 AM	SOIL	BRKL007		10	0.354	14A	0.0246	0.0311	6.5
398656011-1	37695-011	SAMPLE	2 pCi/g	MAY-17-16 11:20 AM	SOIL	BRKL007		11	0.349	13B	0.0243	0.0304	6.1
398656012-1	37695-012	SAMPLE	2 pCi/g	MAY-17-16 11:25 AM	SOIL	BRKL007		12	0.370	2B	0.0246	0.0309	6.3
398656013-1	37695-013	SAMPLE	2 pCi/g	MAY-17-16 11:35 AM	SOIL	BRKL007		13	0.344	2C	0.0240	0.0307	6.5
398656014-1	37695-014	SAMPLE	2 pCi/g	MAY-17-16 11:40 AM	SOIL	BRKL007		14	0.370	9B	0.0245	0.0306	6.1
398656015-1	37695-015	SAMPLE	2 pCi/g	MAY-17-16 11:45 AM	SOIL	BRKL007		15	0.407	4C	0.0245	0.0303	5.8
398656016-1	37695-016	SAMPLE	2 pCi/g	MAY-17-16 11:50 AM	SOIL	BRKL007		16	0.387	10A	0.0246	0.0312	6.6
398656017-1	37695-017	SAMPLE	2 pCi/g	MAY-17-16 01:30 PM	SOIL	BRKL007		17	0.340	4C	0.0244	0.0307	6.3
398656018-1	37695-018	SAMPLE	2 pCi/g	MAY-17-16 01:35 PM	SOIL	BRKL007		18	0.308	7B	0.0244	0.0308	6.4
398656019-1	37695-019	SAMPLE	2 pCi/g	MAY-17-16 01:45 PM	SOIL	BRKL007		19	0.378	7C	0.0245	0.0307	6.2
398656020-1	37695-020	SAMPLE	2 pCi/g	MAY-17-16 01:55 PM	SOIL	BRKL007		20	0.349	7B	0.0244	0.0305	6.1
1203570739-1	MB for batch 1575826	MB	2 pCi/g		SOIL	QC ACCOUNT		21	0.401	8B	0.0337	0.0309	7.2
1203570740-1	37695-005(398656005DUP)	DUP	2 pCi/g	MAY-17-16 10:45 AM	SOIL	QC ACCOUNT		22	0.378	8D	0.0245	0.0308	6.3
1203570741-1	37695-005(398656005MS)	MS	2 pCi/g	MAY-17-16 10:45 AM	SOIL	QC ACCOUNT		23	0.379	9D	0.0245	0.0306	6.1
1203570742-1	37695-005(398656005MSD)	MSD	2 pCi/g	MAY-17-16 10:45 AM	SOIL	QC ACCOUNT		24	0.324	10A	0.0243	0.0311	6.9
1203570743-1	LCS for batch 1575826	LCS	2 pCi/g		SOIL	QC ACCOUNT		25	0.401	10B	0.0243	0.0305	6.2

ANL 6/28/16

Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: *William J. J.*

Circle One

Page 1 of 1

Strontium-90 Solid

Filename : SR90.XLS
File type : Excel
Version # : 1.3.10

Carrier S/N : 2414995
Carrier Exp Date : 6/3/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 14.73
Carrier Weight StDev.: 0.10

Batch : 1575826
Analyst : KSD1
Prep Date : 6/24/2016
Method Uncertainty : 0.089724205

Geometry: Tuffryn Filter

Procedure Code : GFC90SRS
Parmname : Strontium-90
Required MDA : 2 pCi/g
Sr-90 Abundance : 1.00 years
Half-life of Sr-90 : 28.90 years
Half-life of Y-90 : 64.053 hours

Sample Characteristics			Carrier Calculations			
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Carrier Weight (mg) (Standard)	Net Weight (mg) (Sample)
1	398656001.1	0.3740	3.2581E-03	5/17/2016 10:20	14.73	6.00
2	398656002.1	0.3420	3.2547E-03	5/17/2016 10:25	14.73	5.50
3	398656003.1	0.3240	3.2529E-03	5/17/2016 10:30	14.73	6.20
4	398656004.1	0.3460	3.2552E-03	5/17/2016 10:35	14.73	6.90
5	398656005.1	0.3460	3.2552E-03	5/17/2016 10:45	14.73	6.20
6	398656006.1	0.3400	3.2545E-03	5/17/2016 10:50	14.73	4.40
7	398656007.1	0.3670	3.2574E-03	5/17/2016 10:55	14.73	6.50
8	398656008.1	0.3680	3.2575E-03	5/17/2016 11:00	14.73	6.50
9	398656009.1	0.3700	3.2577E-03	5/17/2016 11:10	14.73	6.60
10	398656010.1	0.3540	3.2560E-03	5/17/2016 11:15	14.73	6.50
11	398656011.1	0.3490	3.2555E-03	5/17/2016 11:20	14.73	6.10
12	398656012.1	0.3800	3.2587E-03	5/17/2016 11:25	14.73	6.30
13	398656013.1	0.3640	3.2570E-03	5/17/2016 11:35	14.73	6.50
14	398656014.1	0.3290	3.2534E-03	5/17/2016 11:40	14.73	6.10
15	398656015.1	0.4070	3.2615E-03	5/17/2016 11:45	14.73	5.80
16	398656016.1	0.3870	3.2594E-03	5/17/2016 11:50	14.73	6.60
17	398656017.1	0.3400	3.2545E-03	5/17/2016 13:30	14.73	6.30
18	398656018.1	0.3080	3.2512E-03	5/17/2016 13:35	14.73	6.40
19	398656019.1	0.3780	3.2585E-03	5/17/2016 13:45	14.73	6.20
20	398656020.1	0.3490	3.2555E-03	5/17/2016 13:55	14.73	6.10
21	1203570739.1	0.4070	3.2615E-03	6/24/2016 0:00	14.73	7.20
22	1203570740.1	0.3780	3.2585E-03	5/17/2016 10:45	14.73	6.30
23	1203570741.1	0.2990	3.2503E-03	5/17/2016 10:45	14.73	6.10
24	1203570742.1	0.3240	3.2529E-03	5/17/2016 10:45	14.73	6.90
25	1203570743.1	0.4070	3.2615E-03	6/24/2016 0:00	14.73	6.20
					Net Weight (mg) StDev. (mg)	Carrier Aliquot (mL) StDev. (mL)
					0.033118	0.5
					0.030969	0.5
					0.033978	0.5
					0.036986	0.5
					0.033978	0.5
					0.026241	0.5
					0.035267	0.5
					0.035267	0.5
					0.035697	0.5
					0.035267	0.5
					0.033548	0.5
					0.034407	0.5
					0.035267	0.5
					0.033548	0.5
					0.032258	0.5
					0.035697	0.5
					0.034407	0.5
					0.034837	0.5
					0.033978	0.5
					0.033548	0.5
					0.038276	0.5
					0.034407	0.5
					0.033548	0.5
					0.036986	0.5
					0.033978	0.5

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data												
Pos.	Detector ID	Counting Time (min.)		Gross Counts		Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Calculated Sample Recovery %	Sample Recovery Error %
		Alpha	Beta	Alpha	Beta							
1	11B	60	4	53		0.879	6/29/2016 8:19	6/27/2016 10:50	0.392	0.997	81.5%	1.05%
2	10A	60	4	21		0.315	6/29/2016 8:17	6/27/2016 10:50	0.392	0.997	74.7%	1.07%
3	10B	60	3	44		0.725	6/29/2016 8:17	6/27/2016 10:50	0.392	0.997	84.2%	1.05%
4	11A	60	5	49		0.808	6/29/2016 8:19	6/27/2016 10:50	0.392	0.997	93.7%	1.04%
5	10C	60	1	33		0.546	6/29/2016 8:17	6/27/2016 10:50	0.392	0.997	84.2%	1.05%
6	11C	60	1	17		0.281	6/29/2016 8:19	6/27/2016 10:50	0.392	0.997	59.7%	1.10%
7	9D	60	9	72		1.191	6/29/2016 8:17	6/27/2016 10:50	0.392	0.997	88.3%	1.04%
8	12D	60	9	111		1.835	6/29/2016 8:19	6/27/2016 10:50	0.392	0.997	88.3%	1.04%
9	13D	60	3	33		0.538	6/29/2016 8:33	6/27/2016 10:50	0.394	0.997	89.6%	1.04%
10	14A	60	6	40		0.649	6/29/2016 8:33	6/27/2016 10:50	0.394	0.997	88.3%	1.04%
11	1B	60	9	56		0.921	6/29/2016 9:52	6/27/2016 10:50	0.402	0.997	82.8%	1.05%
12	2B	60	5	32		0.511	6/29/2016 9:52	6/27/2016 10:50	0.402	0.997	85.5%	1.05%
13	2C	60	16	38		0.616	6/29/2016 9:53	6/27/2016 10:50	0.402	0.997	88.3%	1.04%
14	9B	60	6	33		0.544	6/29/2016 12:26	6/27/2016 10:50	0.419	0.997	82.8%	1.05%
15	12D	60	0	123		2.050	6/29/2016 14:02	6/27/2016 10:50	0.429	0.997	78.8%	1.06%
16	6A	60	1	41		0.682	6/29/2016 9:57	6/27/2016 10:50	0.403	0.997	89.6%	1.04%
17	9D	60	2	64		1.065	6/29/2016 12:26	6/27/2016 10:50	0.419	0.997	85.5%	1.05%
18	7B	60	3	27		0.447	6/29/2016 9:57	6/27/2016 10:50	0.403	0.997	86.9%	1.05%
19	7C	60	8	35		0.568	6/29/2016 9:57	6/27/2016 10:50	0.403	0.997	84.2%	1.05%
20	14C	60	20	75		1.200	6/29/2016 14:02	6/27/2016 10:50	0.429	0.997	82.8%	1.05%
21	8B	60	2	14		0.231	6/29/2016 9:57	6/27/2016 10:50	0.403	1.000	97.8%	1.03%
22	8D	60	16	34		0.553	6/29/2016 9:57	6/27/2016 10:50	0.403	0.997	85.5%	1.05%
23	9D	60	13	1726		28.754	6/29/2016 9:58	6/27/2016 10:50	0.403	0.997	82.8%	1.05%
24	10A	60	1	1638		27.291	6/29/2016 9:58	6/27/2016 10:50	0.403	0.997	93.7%	1.04%
25	10B	60	10	1435		23.888	6/29/2016 9:58	6/27/2016 10:50	0.403	1.000	84.2%	1.05%

Calibration Data		Calibration		Detector		Detector		Alpha		Weekly Bkg		Weekly Bkg		Weekly Bkg	
Pos.	Counted on	Calibration Date	Due Date	Efficiency Sr-90	Efficiency Y-90	Error (cpm/dpm)	Efficiency Error (cpm/dpm)	X-Talk	CPM	Count Start Date/Time	Count Time (min.)	Count Start Date/Time	Count Time (min.)	Count Start Date/Time	Count Time (min.)
1	PIC	4/1/2016	2/28/2017	0.4333	0.5589	0.00697	0.07005	0.07005	0.838	6/24/2016 17:35	500	6/24/2016 17:35	500	6/24/2016 17:35	500
2	PIC	4/1/2016	2/28/2017	0.3721	0.4608	0.00651	0.52199	0.52199	0.502	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
3	PIC	4/1/2016	2/28/2017	0.4101	0.5325	0.00652	0.17295	0.17295	0.568	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
4	PIC	4/1/2016	2/28/2017	0.4242	0.5473	0.01317	0.10799	0.10799	0.918	6/25/2016 12:48	500	6/25/2016 12:48	500	6/25/2016 12:48	500
5	PIC	4/1/2016	2/28/2017	0.4067	0.5237	0.00638	0.23972	0.23972	0.716	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
6	PIC	4/1/2016	2/28/2017	0.4184	0.5497	0.01278	0.15877	0.15877	0.474	6/24/2016 17:35	500	6/24/2016 17:35	500	6/24/2016 17:35	500
7	PIC	4/1/2016	2/28/2017	0.4216	0.5596	0.02610	0.05884	0.05884	1.134	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
8	PIC	4/1/2016	2/28/2017	0.4216	0.5487	0.01845	0.10251	0.10251	1.484	6/24/2016 17:35	500	6/24/2016 17:35	500	6/24/2016 17:35	500
9	PIC	4/1/2016	2/28/2017	0.3807	0.4297	0.01144	0.23223	0.23223	0.350	6/24/2016 17:36	1000	6/24/2016 17:36	1000	6/24/2016 17:36	1000
10	PIC	4/1/2016	2/28/2017	0.4311	0.5582	0.02119	0.18143	0.18143	0.511	6/24/2016 17:36	1000	6/24/2016 17:36	1000	6/24/2016 17:36	1000
11	PIC	4/1/2016	2/28/2017	0.4270	0.5497	0.00711	0.08158	0.08158	1.000	6/24/2016 17:27	500	6/24/2016 17:27	500	6/24/2016 17:27	500
12	PIC	4/1/2016	2/28/2017	0.4006	0.5091	0.02111	0.27340	0.27340	0.426	6/24/2016 17:27	500	6/24/2016 17:27	500	6/24/2016 17:27	500
13	PIC	4/1/2016	2/28/2017	0.4095	0.5331	0.01274	0.06321	0.06321	0.536	6/24/2016 17:27	500	6/24/2016 17:27	500	6/24/2016 17:27	500
14	PIC	4/1/2016	2/28/2017	0.4210	0.5570	0.00754	0.05873	0.05873	0.582	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
15	PIC	4/1/2016	2/28/2017	0.4224	0.5487	0.01845	0.10135	0.10135	1.484	6/24/2016 17:35	500	6/24/2016 17:35	500	6/24/2016 17:35	500
16	PIC	4/1/2016	2/28/2017	0.4134	0.5572	0.02228	0.06276	0.06276	0.758	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
17	PIC	4/1/2016	2/28/2017	0.4219	0.5596	0.02610	0.05850	0.05850	1.134	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
18	PIC	4/1/2016	2/28/2017	0.4309	0.5632	0.00627	0.05248	0.05248	0.496	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
19	PIC	4/1/2016	2/28/2017	0.4151	0.5415	0.00790	0.11574	0.11574	0.456	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
20	PIC	4/1/2016	2/28/2017	0.4271	0.5645	0.01828	0.15020	0.15020	1.421	6/24/2016 17:36	1000	6/24/2016 17:36	1000	6/24/2016 17:36	1000
21	PIC	4/1/2016	2/28/2017	0.4289	0.5567	0.02148	0.07654	0.07654	0.366	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
22	PIC	4/1/2016	2/28/2017	0.4260	0.5674	0.00609	0.05135	0.05135	0.744	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
23	PIC	4/1/2016	2/28/2017	0.4221	0.5596	0.02610	0.05816	0.05816	1.134	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
24	PIC	4/1/2016	2/28/2017	0.3715	0.4608	0.00651	0.52920	0.52920	0.502	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500
25	PIC	4/1/2016	2/28/2017	0.4101	0.5325	0.00652	0.17295	0.17295	0.568	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1243-O
 Spike Exp Date : 12/18/2016
 Spike Activity (dpm/ml): 486.16
 Spike Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 486.16
 LCS Volume Added: 0.10

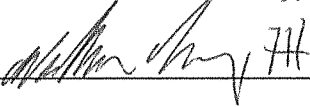
Results																								
Pos.	Decision Level		Critical Level		Required		Sample Act.		Sample Act.		Net Count		Net Count		2 SIGMA		2 SIGMA		Total Prop.		Sample		Nominal	
	pCi/G	Level	pCi/G	Level	MDA	MDA	Conc.	Error	Rate	Rate	CPM	CPM	Rate Error	Rate Error	Counting	Uncertainty	Counting	Uncertainty	Sample QC	Type	RPD	RER	pCi/G	Recovery
1	0.6623	0.4676	2	1.0487	0.0924	314.17%	0.0407	0.1278	0.5690	0.5693	SAMPLE													
2	0.7219	0.5097	2	1.1794	-0.5979	42.38%	-0.1868	0.0791	0.4962	0.4963	SAMPLE													
3	0.6421	0.4533	2	1.0405	0.4194	73.38%	0.1567	0.1150	0.6030	0.6077	SAMPLE													
4	0.6654	0.4698	2	1.0487	-0.2407	112.12%	-0.1103	0.1237	0.5289	0.5289	SAMPLE													
5	0.6827	0.4820	2	1.0907	-0.4309	60.39%	-0.1700	0.1026	0.5098	0.5099	SAMPLE													
6	0.7689	0.5429	2	1.2612	-0.6782	38.85%	-0.1933	0.0750	0.5158	0.5159	SAMPLE													
7	0.7376	0.5208	2	1.1503	0.1244	260.15%	0.0572	0.1487	0.6343	0.6347	SAMPLE													
8	0.8471	0.5980	2	1.3053	0.7659	52.29%	0.3506	0.1832	0.7841	0.7968	SAMPLE													
9	0.4539	0.3205	2	0.7649	0.4668	51.28%	0.1884	0.0966	0.4689	0.4764	SAMPLE													
10	0.4918	0.3472	2	0.8055	0.3055	77.41%	0.1375	0.1064	0.4633	0.4668	SAMPLE													
11	0.7675	0.5419	2	1.2043	-0.1902	166.95%	-0.0789	0.1317	0.6225	0.6225	SAMPLE													
12	0.4770	0.3367	2	0.7883	0.1941	114.46%	0.0846	0.0968	0.4353	0.4368	SAMPLE													
13	0.5252	0.3708	2	0.8543	0.1814	132.37%	0.0805	0.1065	0.4705	0.4716	SAMPLE													
14	0.6154	0.4345	2	0.9957	-0.0960	267.10%	-0.0379	0.1012	0.5024	0.5025	SAMPLE													
15	0.8312	0.5868	2	1.2808	1.2131	34.12%	0.5660	0.1927	0.8095	0.8401	SAMPLE													
16	0.5661	0.3996	2	0.9014	-0.1546	149.96%	-0.0757	0.1135	0.4544	0.4545	SAMPLE													
17	0.8025	0.5666	2	1.2515	-0.1640	204.21%	-0.0693	0.1415	0.6564	0.6564	SAMPLE													
18	0.5753	0.4062	2	0.9407	-0.1248	189.04%	-0.0486	0.0919	0.4623	0.4624	SAMPLE													
19	0.4820	0.3403	2	0.7926	0.2509	91.05%	0.1119	0.1019	0.4476	0.4499	SAMPLE													
20	0.8623	0.6088	2	1.3344	-0.5164	66.24%	-0.2211	0.1464	0.6701	0.6701	SAMPLE													
21	0.3339	0.2358	2	0.5582	-0.2345	50.10%	-0.1352	0.0677	0.2300	0.2300	MB													
22	0.5861	0.4138	2	0.9344	-0.4078	54.18%	-0.1910	0.1035	0.4329	0.4329	398656005.1	DUP	*	0.0%										
23	0.9550	0.6742	2	1.4893	77.8101	3.93%	27.6201	0.6939	3.8315	15.4570	398656005.1	MS												
24	0.6025	0.4254	2	0.9843	71.5594	2.98%	26.7892	0.6752	3.5349	13.2902	398656005.1	MSD		8.4%	67.7565	105.6%								
25	0.5052	0.3566	2	0.8186	49.1006	3.08%	23.3198	0.6319	2.6076	9.1522		LCS			53.8060	91.3%								

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
398656001	11B	60	4	53	6/29/2016 8:19	6/29/2016 9:19	PIC	1575826
398656002	10A	60	4	21	6/29/2016 8:17	6/29/2016 9:17	PIC	1575826
398656003	10B	60	3	44	6/29/2016 8:17	6/29/2016 9:17	PIC	1575826
398656004	11A	60	5	49	6/29/2016 8:19	6/29/2016 9:19	PIC	1575826
398656005	10C	60	1	33	6/29/2016 8:17	6/29/2016 9:17	PIC	1575826
398656006	11C	60	1	17	6/29/2016 8:19	6/29/2016 9:19	PIC	1575826
398656007	9D	60	9	72	6/29/2016 8:17	6/29/2016 9:17	PIC	1575826
398656008	12D	60	9	111	6/29/2016 8:19	6/29/2016 9:19	PIC	1575826
398656009	13D	60	3	33	6/29/2016 8:33	6/29/2016 9:33	PIC	1575826
398656010	14A	60	6	40	6/29/2016 8:33	6/29/2016 9:33	PIC	1575826
398656011	1B	60	9	56	6/29/2016 9:52	6/29/2016 10:52	PIC	1575826
398656012	2B	60	5	32	6/29/2016 9:52	6/29/2016 10:52	PIC	1575826
398656013	2C	60	16	38	6/29/2016 9:53	6/29/2016 10:53	PIC	1575826
398656014	9B	60	6	33	6/29/2016 12:26	6/29/2016 13:26	PIC	1575826
398656015	12D	60	0	123	6/29/2016 14:02	6/29/2016 15:02	PIC	1575826
398656016	6A	60	1	41	6/29/2016 9:57	6/29/2016 10:57	PIC	1575826
398656017	9D	60	2	64	6/29/2016 12:26	6/29/2016 13:26	PIC	1575826
398656018	7B	60	3	27	6/29/2016 9:57	6/29/2016 10:57	PIC	1575826
398656019	7C	60	8	35	6/29/2016 9:57	6/29/2016 10:57	PIC	1575826
398656020	14C	60	20	75	6/29/2016 14:02	6/29/2016 15:02	PIC	1575826
1203570739	8B	60	2	14	6/29/2016 9:57	6/29/2016 10:57	PIC	1575826
1203570740	8D	60	16	34	6/29/2016 9:57	6/29/2016 10:57	PIC	1575826
1203570741	9D	60	13	1726	6/29/2016 9:58	6/29/2016 10:58	PIC	1575826
1203570742	10A	60	1	1638	6/29/2016 9:58	6/29/2016 10:58	PIC	1575826
1203570743	10B	60	10	1435	6/29/2016 9:58	6/29/2016 10:58	PIC	1575826

28-Jun-2016

Batch# 1575817 Product: Sr 90 Date: 6/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/MDC, error is 40% or less. If below the MDA/MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples. < 5% of lowest activity)	/		
Sample was run within hold time.	/		
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: 

7/3
BRK

Secondary Review Performed By: 

Strontium 90 Queue Sheet

06/20/16

Batch #: 1575817 Analyst: KSD1 First Client Due Date: 07/03/2016 Internal Due Date: 06/25/2016 Comments
 Sr-90 Spike Code: 12430 Expiration Date: 12/18/10 Vol: 0.1 Sr Sep. Date/time: 7:50 6/24/16
 Sr-90 LCS Code: 12430 Expiration Date: 12/18/10 Vol: 0.1 * 8:26 6/29/16
 Sr Carrier Code: 141445 Exp Date: 6/15/17 Vol: 0.5 Sdt Wt: 7.37
 Prep Date: 6/28/14 Initials: 162 Balance #: 51204868 Analytical Scale #: F30560 Witness: JLB 6/23/16

Sample ID	Client Description	Type	RDL	Collection Date	Matrix	Client	Rad	Pos. #	Wet/Dry Aliquot (mL) for (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)
398656026-1	37695-026	SAMPLE	.8 pCi/L	MAY-17-16 10:00 AM	WATER	BRKL007	*	1	700 11C	-	0.0245	0.0301	5.6
398675001-1	37837-001	SAMPLE	.8 pCi/L	JUN-02-16 09:13 AM	WATER	BRKL007		2	700 11C	1D	0.0244	0.0305	6.1
1203570734-1	MB for batch 1575817	MB	.8 pCi/L		WATER	QC ACCOUNT		3	700 13B	-	0.0247	0.0307	6.0
1203570735-1	37837-001(398675001DUP)	DUP	.8 pCi/L	JUN-02-16 09:13 AM	WATER	QC ACCOUNT		4	700 14B	-	0.0248	0.0307	5.9
1203570736-1	37837-001(398675001MS)	MS	.8 pCi/L	JUN-02-16 09:13 AM	WATER	QC ACCOUNT		5	100 11B	-	0.0245	0.0306	6.1
1203570737-1	37837-001(398675001MSD)	MSD	.8 pCi/L	JUN-02-16 09:13 AM	WATER	QC ACCOUNT		6	100 14B	-	0.0246	0.0307	6.1
1203570738-1	LCS for batch 1575817	LCS	.8 pCi/L		WATER	QC ACCOUNT		7	700 14C	-	0.0245	0.0308	5.7

ANL 6/29/16 w/v

a) 0.0237 0.0292 5.5

Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: *Michael J. H.*

Circle One

Strontium-90 Liquid

Filename : SR90.XLS
File type : Excel
Version # : 1.3.10

Carrier S/N : 2414995
Carrier Exp Date : 6/3/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 14.73
Carrier Weight StDev.: 0.10

Batch : 1575817
Analyst : KSD1
Prep Date : 6/23/2016
Method Uncertainty : 0.0784

Procedure Code : GFC90SRL
Parname : Strontium-90
Required MDA : 0.8 pCi/L
Sr-90 Abundance : 1.00
Half-life of Sr-90 : 28.90 years
Half-life of Y-90 : 64.053 hours

Geometry: Tuffryn Filter

Sample Characteristics			Carrier Calculations			
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Carrier Weight (mg) (Standard)	Net Weight (mg) (Sample)
1	398656026.1	0.7000	2.0772E-05	5/17/2016 10:00	14.73	5.60
2	398675001.1	0.7000	2.0772E-05	6/2/2016 9:13	14.73	5.50
3	1203570734.1	0.7000	2.0772E-05	6/23/2016 0:00	14.73	6.00
4	1203570735.1	0.7000	2.0772E-05	6/2/2016 9:13	14.73	5.90
5	1203570736.1	0.1000	1.1370E-05	6/2/2016 9:13	14.73	6.10
6	1203570737.1	0.1000	1.1370E-05	6/2/2016 9:13	14.73	6.10
7	1203570738.1	0.7000	2.0772E-05	6/23/2016 0:00	14.73	5.70
					Net Weight StDev. (mg)	Carrier Aliquot (mL)
					0.031399	0.5
					0.030969	0.5
					0.033118	0.5
					0.032688	0.5
					0.033548	0.5
					0.033548	0.5
					0.031829	0.5
					Carrier Aliquot StDev. (mL)	Carrier Aliquot StDev. (mL)
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data												
Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta		Count Start		Strontium Separation		Yttrium Ingrowth	Sr-90 Decay
			Alpha	Beta	CPM		Date/Time		Date/Time			
1	11C	60	1	34	0.564		6/24/2016 12:27		6/24/2016 7:50		0.054	0.997
2	1D	130	12	196	1.503		6/29/2016 10:23		6/29/2016 8:20		0.033	0.998
3	13B	60	2	33	0.546		6/24/2016 12:27		6/24/2016 7:50		0.054	1.000
4	14B	60	6	65	1.073		6/24/2016 16:21		6/24/2016 7:50		0.093	0.999
5	11D	60	4	1277	21.279		6/24/2016 12:27		6/24/2016 7:50		0.054	0.999
6	14B	60	2	1254	20.897		6/24/2016 12:27		6/24/2016 7:50		0.054	0.999
7	14C	60	19	1256	20.886		6/24/2016 12:27		6/24/2016 7:50		0.054	1.000
										Calculated Sample Recovery %		Sample Recovery Error %
										76.0%		1.06%
										74.7%		1.07%
										81.5%		1.05%
										80.1%		1.06%
										82.8%		1.05%
										82.8%		1.05%
										77.4%		1.06%

Calibration Data										
Pos.	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency (cpm/dpm)		Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)
1	PIC	4/1/2016	2/28/2017	0.4177	0.5497	0.01278	0.16222	0.414	6/17/2016 17:21	500
2	PIC	4/1/2016	2/28/2017	0.4202	0.5546	0.00692	0.04671	1.350	6/24/2016 17:27	500
3	PIC	4/1/2016	2/28/2017	0.4201	0.5214	0.00967	0.12845	0.452	6/17/2016 17:39	1000
4	PIC	4/1/2016	2/28/2017	0.4232	0.5524	0.01028	0.10296	0.730	6/18/2016 11:52	1000
5	PIC	4/1/2016	2/28/2017	0.4305	0.5699	0.01068	0.06622	1.284	6/17/2016 17:21	500
6	PIC	4/1/2016	2/28/2017	0.4231	0.5524	0.01028	0.10340	0.730	6/18/2016 11:52	1000
7	PIC	4/1/2016	2/28/2017	0.4275	0.5645	0.01828	0.14897	1.325	6/17/2016 17:39	1000

1 - Results are decay corrected to Sample Date/Time
2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1243-O
Spike Exp Date : 12/18/2016
Spike Activity (dpm/ml): 486.19
Spike Volume Added: 0.10

* - RPD changed to 0% due to sample & dup activity below MDA

LCS S/N :	1243-O
LCS Exp Date :	12/18/2016
LCS Activity (dpm/ml):	486.19
LCS Volume Added:	0.10

Results																	
Pos.	Decision Level		Critical Level	Required MDA	Sample Act.		Sample Error %	Net Count Rate CPM	Net Count Rate Error CPM	Counting Uncertainty pCi/L	2 SIGMA Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery
	pCi/L	pCi/L	pCi/L	MDA pCi/L	Conc. pCi/L			CPM	CPM	pCi/L	pCi/L						
1	0.3884	0.2742	0.8	0.6433	0.2844	67.46%	0.1500	0.1011	0.3759	0.3786			SAMPLE				
2	0.5244	0.3702	0.8	0.7859	0.3018	77.88%	0.1534	0.1194	0.4606	0.4630			SAMPLE				
3	0.3669	0.2591	0.8	0.6063	0.1652	104.27%	0.0937	0.0977	0.3375	0.3385			MB				
4	0.4485	0.3166	0.8	0.7180	0.5814	39.80%	0.3430	0.1364	0.4532	0.4624		398675001.1	DUP	* 0.0%		219.3015	107.7%
5	4.2594	3.0072	0.8	6.6048	236.1023	3.34%	19.9949	0.5977	13.8326	39.7509		398675001.1	MS			219.3015	110.6%
6	3.1822	2.2466	0.8	5.0946	242.5275	3.28%	20.1666	0.5908	13.9252	40.6887		398675001.1	MSD	2.7%		31.2864	113.5%
7	0.6473	0.4570	0.8	1.0048	35.5209	3.69%	19.5612	0.5911	2.1039	6.1647			LCS				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
398656026	11C	60	1	34	6/24/2016 12:27	6/24/2016 13:27	PIC	1575817
398675001	1D	130	12	196	6/29/2016 10:23	6/29/2016 12:33	PIC	1575817
1203570734	13B	60	2	33	6/24/2016 12:27	6/24/2016 13:27	PIC	1575817
1203570735	14B	60	6	65	6/24/2016 16:21	6/24/2016 17:21	PIC	1575817
1203570736	11D	60	4	1277	6/24/2016 12:27	6/24/2016 13:27	PIC	1575817
1203570737	14B	60	2	1254	6/24/2016 12:27	6/24/2016 13:27	PIC	1575817
1203570738	14C	60	19	1256	6/24/2016 12:27	6/24/2016 13:27	PIC	1575817

28-Jun-2016

Batch# 1515827 Product: Sr90 Date: 6/29/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10* MDA/ MDC, error is 40% or less. If below the MDA/ MDC, error is okay.	/		
Instrument source check is within limits.	/		
Instrument bkg check is within limits.	/		
Method RDL/ LLD has been met.	/		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	/		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	/		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	/		
Sample was run within hold time.	/		
Sample was correctly preserved if required.	/		
Smears Taken for Radioactive batches.	/		
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	/		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	/		
Aux data is correct.			NA
Client Special requirements page has been checked.	/		
Raw Data and/ or spectrum are included and properly stasured.	/		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	/		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	/		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	/		

Primary Review Performed By: 

713
BRKL

Secondary Review Performed By: ROst 6/29/16

Strontium 90 Queue Sheet

06/20/16

Batch #: 1575827 Analyst: KSD1 First Client Due Date: 07/03/2016 Internal Due Date: 06/29/2016 Comments

Sr-90 Spike Code: 12430 Expiration Date: 01/21/18 Vol: 0.1 Sr Sep. Date/time: 6-27-16 / 1600

Sr-90 LCS Code: 12430 Expiration Date: 12-18-16 Vol: 0.1

Sr Carrier Code: 2414445 Exp Date: 6/3/17 Vol: 0.5 Sdt Wt: 7.37

Prep Date: 6/24/16 Initials: LS Balance #: 1795415 Analytical Scale #: 1858799 Wet/Dry Aliquot (mL) or (g) 1 & 2 Det # Initial Sr Final Sr wt (g) wt (g) Net Sr wt (mg)

Pipet ID: 1795415 Balance #: 1795415

Witness: D-L 6-24-16

Sample ID	Client Description	Type	RDL	Collection Date	Matrix	Client	Rad	Pos. #	Wet/Dry Aliquot (mL) or (g) 1 & 2	Det #	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)
398656021-1	37695-021	SAMPLE	2 pCi/g	MAY-17-16 02:30 PM	SOIL	BRKL007		1	0.299	2C	0.0842	0.0302	6.6
398656022-1	37695-022	SAMPLE	2 pCi/g	MAY-17-16 02:35 PM	SOIL	BRKL007		2	0.312	3C	0.0843	0.0310	6.7
398656023-1	37695-023	SAMPLE	2 pCi/g	MAY-17-16 02:40 PM	SOIL	BRKL007		3	0.328	3D	0.0836	0.0306	7.0
398656024-1	37695-024	SAMPLE	2 pCi/g	MAY-17-16 02:45 PM	SOIL	BRKL007		4	0.349	4C	0.0838	0.0304	6.6
398656025-1	37695-025	SAMPLE	2 pCi/g	MAY-17-16 12:00 AM	SOIL	BRKL007		5	0.362	6a7	0.0845	0.0310	6.5
1203570747-1	MB for batch 1575827	MB	2 pCi/g		SOIL	QC ACCOUNT		6	0.362	6C	0.0844	0.0310	6.6
1203570748-1	37695-024(398656024DUP)	DUP	2 pCi/g	MAY-17-16 02:45 PM	SOIL	QC ACCOUNT		7	0.361	7C	0.0838	0.0302	6.4
1203570749-1	37695-024(398656024MS)	MS	2 pCi/g	MAY-17-16 02:45 PM	SOIL	QC ACCOUNT		8	0.348	7D	0.0843	0.0311	6.8
1203570750-1	37695-024(398656024MSD)	MSD	2 pCi/g	MAY-17-16 02:45 PM	SOIL	QC ACCOUNT		9	0.342	8B	0.0840	0.0306	6.4
1203570751-1	LCS for batch 1575827	LCS	2 pCi/g		SOIL	QC ACCOUNT		10	0.362	8D	0.0840	0.0307	6.7

Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: MLH

Circle One

Page 1 of 1

Strontium-90 Solid

Filename : SR90.XLS
File type : Excel
Version # : 1.3.10

Carrier S/N : 2414995
Carrier Exp Date : 6/3/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 14.73
Carrier Weight StDev.: 0.10

Batch : 1575827
Analyst : KSD1
Prep Date : 6/24/2016
Method Uncertainty : 0.089724205

Procedure Code : GFC90SRS
Paramname : Strontium-90
Required MDA : 2 pCi/G
Sr-90 Abundance : 1.00 years
Half-life of Sr-90 : 28.90 years
Half-life of Y-90 : 64.053 hours

Geometry: Tuffryn Filter

Sample Characteristics				Carrier Calculations					
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Carrier Weight (Standard)	Net Weight (Sample)	Net Weight StDev. (mg)	Carrier Aliquot (mL)	Carrier Aliquot StDev. (mL)
1	398656021.1	0.2990	3.2503E-03	5/17/2016 14:30	14.73	6.60	0.035697	0.5	0.001000
2	398656022.1	0.3120	3.2516E-03	5/17/2016 14:35	14.73	6.70	0.036127	0.5	0.001000
3	398656023.1	0.3280	3.2533E-03	5/17/2016 14:40	14.73	7.00	0.037416	0.5	0.001000
4	398656024.1	0.2990	3.2503E-03	5/17/2016 14:45	14.73	6.60	0.035697	0.5	0.001000
5	398656025.1	0.3620	3.2568E-03	5/17/2016 0:00	14.73	6.50	0.035267	0.5	0.001000
6	1203570747.1	0.3620	3.2568E-03	6/24/2016 0:00	14.73	6.60	0.035697	0.5	0.001000
7	1203570748.1	0.3610	3.2567E-03	5/17/2016 14:45	14.73	6.40	0.034837	0.5	0.001000
8	1203570749.1	0.2980	3.2501E-03	5/17/2016 14:45	14.73	6.80	0.036556	0.5	0.001000
9	1203570750.1	0.3420	3.2547E-03	5/17/2016 14:45	14.73	6.40	0.034837	0.5	0.001000
10	1203570751.1	0.3620	3.2568E-03	6/24/2016 0:00	14.73	6.70	0.036127	0.5	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data												
Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta		Count Start		Strontium Separation		Yttrium Ingrowth	
			Alpha	Beta	CPM		Date/Time		Date/Time		Sr-90 Decay	Calculated Sample Recovery %
1	2C	60	12	40	0.654		6/29/2016 8:02		6/27/2016 16:00		0.997	89.6%
2	3C	60	20	23	0.369		6/29/2016 8:02		6/27/2016 16:00		0.997	91.0%
3	3D	60	13	39	0.637		6/29/2016 8:02		6/27/2016 16:00		0.997	95.0%
4	4C	60	5	43	0.713		6/29/2016 8:02		6/27/2016 16:00		0.997	89.6%
5	6A	60	8	39	0.642		6/29/2016 8:05		6/27/2016 16:00		0.997	88.3%
6	6C	60	5	33	0.546		6/29/2016 8:05		6/27/2016 16:00		1.000	89.6%
7	7C	60	5	25	0.407		6/29/2016 8:05		6/27/2016 16:00		0.997	86.9%
8	7D	60	1	1659	27.649		6/29/2016 8:05		6/27/2016 16:00		0.997	92.3%
9	8B	60	2	1668	27.798		6/29/2016 8:05		6/27/2016 16:00		0.997	86.9%
10	8D	60	30	1782	29.674		6/29/2016 8:07		6/27/2016 16:00		1.000	91.0%
												Sample Recovery Error %
												1.04%
												1.04%
												1.04%
												1.04%
												1.04%
												1.04%
												1.05%
												1.04%
												1.05%
												1.04%

Calibration Data		Calibration		Calibration		Detector		Detector		Alpha		Weekly Bkg		Weekly Bkg		Weekly Bkg	
Pos.	Counted on	Date	Due Date	Sr-90 Efficiency (cpm/dpm)	Y-90 Efficiency (cpm/dpm)	Error (cpm/dpm)	X-Talk	CPM	Start Date/Time	Count Time (min.)	Count Time (min.)	Start Date/Time	Count Time (min.)	Start Date/Time	Count Time (min.)	Start Date/Time	Count Time (min.)
1	PIC	4/1/2016	2/28/2017	0.4095	0.5331	0.01274	0.06339	0.536	6/24/2016 17:27	500	500	6/24/2016 17:27	500	6/24/2016 17:27	500	6/24/2016 17:27	500
2	PIC	4/1/2016	2/28/2017	0.4177	0.5563	0.00988	0.04171	0.566	6/24/2016 17:27	500	500	6/24/2016 17:27	500	6/24/2016 17:27	500	6/24/2016 17:27	500
3	PIC	4/1/2016	2/28/2017	0.4030	0.5395	0.02297	0.05975	0.610	6/24/2016 17:27	500	500	6/24/2016 17:27	500	6/24/2016 17:27	500	6/24/2016 17:27	500
4	PIC	4/1/2016	2/28/2017	0.4261	0.5613	0.00889	0.04494	0.744	6/24/2016 17:30	500	500	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
5	PIC	4/1/2016	2/28/2017	0.4135	0.5572	0.02228	0.06252	0.758	6/24/2016 17:30	500	500	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
6	PIC	4/1/2016	2/28/2017	0.4229	0.5617	0.01970	0.04709	0.714	6/24/2016 17:30	500	500	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
7	PIC	4/1/2016	2/28/2017	0.4150	0.5415	0.00790	0.11617	0.456	6/24/2016 17:30	500	500	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
8	PIC	4/1/2016	2/28/2017	0.4135	0.5455	0.01113	0.07961	0.694	6/24/2016 17:30	500	500	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
9	PIC	4/1/2016	2/28/2017	0.4299	0.5567	0.02148	0.07494	0.366	6/24/2016 17:30	500	500	6/24/2016 17:30	500	6/24/2016 17:30	500	6/24/2016 17:30	500
10	PIC	4/1/2016	2/28/2017	0.4259	0.5674	0.00609	0.05194	0.744	6/24/2016 17:31	500	500	6/24/2016 17:31	500	6/24/2016 17:31	500	6/24/2016 17:31	500

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time
- * - RPD changed to 0% due to sample & dup activity below MDA

Results																			
Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act.		Sample Act. Error %	Net Count		Net Count Rate Error CPM	2 SIGMA		Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/g	Recovery
					Conc.	pCi/g		Rate	CPM		Counting	pCi/g							
1	0.6561	0.4632	2	1.0673	0.3322	92.75%	0.1180	0.1094	0.6038	0.6068	SAMPLE								
2	0.6196	0.4374	2	1.0042	-0.5085	43.47%	-0.1966	0.0854	0.4329	0.4330	SAMPLE								
3	0.6060	0.4278	2	0.9775	0.0659	402.18%	0.0271	0.1088	0.5197	0.5199	SAMPLE								
4	0.7402	0.5226	2	1.1799	-0.0838	372.06%	-0.0311	0.1156	0.6109	0.6110	SAMPLE								
5	0.6408	0.4524	2	1.0205	-0.2690	95.02%	-0.1163	0.1105	0.5008	0.5008	SAMPLE								
6	0.6002	0.4237	2	0.9590	-0.3747	61.15%	-0.1679	0.1026	0.4487	0.4488	MB								
7	0.5095	0.3597	2	0.8380	-0.1162	178.98%	-0.0490	0.0877	0.4075	0.4076	DUP	398656024.1	•	0.0%					
8	0.7168	0.5061	2	1.1473	72.8556	3.14%	26.9547	0.6799	3.6016	13.6678	MS	398656024.1	MS				73.6674	98.9%	
9	0.4662	0.3292	2	0.7794	66.4070	3.58%	27.4315	0.6812	3.3231	12.8795	MSD	398656024.1	MSD				64.1897	103.5%	
10	0.5986	0.4226	2	0.9542	63.0648	2.86%	28.9300	0.7043	3.0093	11.6653	LCS		LCS				60.4946	104.2%	

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
398656021	2C	60	12	40	6/29/2016 8:02	6/29/2016 9:02	PIC	1575827
398656022	3C	60	20	23	6/29/2016 8:02	6/29/2016 9:02	PIC	1575827
398656023	3D	60	13	39	6/29/2016 8:02	6/29/2016 9:02	PIC	1575827
398656024	4C	60	5	43	6/29/2016 8:02	6/29/2016 9:02	PIC	1575827
398656025	6A	60	8	39	6/29/2016 8:05	6/29/2016 9:05	PIC	1575827
1203570747	6C	60	5	33	6/29/2016 8:05	6/29/2016 9:05	PIC	1575827
1203570748	7C	60	5	25	6/29/2016 8:05	6/29/2016 9:05	PIC	1575827
1203570749	7D	60	1	1659	6/29/2016 8:05	6/29/2016 9:05	PIC	1575827
1203570750	8B	60	2	1668	6/29/2016 8:05	6/29/2016 9:05	PIC	1575827
1203570751	8D	60	30	1782	6/29/2016 8:07	6/29/2016 9:07	PIC	1575827

Method Calibration Data

Gas Flow Proportional Counter Calibration Package

Method: Strontium 89/90

Instrument (circle one): LB4100 / Protean

Part 1: Efficiency determination

- 1 Efficiency spreadsheet (eff pts, graphs, trendline equation)
- 2 Applicable portion of GFPC_Machines.XLS
- 3 Raw Data for Calibration standards
- 4 Verification Spreadsheet and Raw Data (recoveries 75%-125%)
- 5 Plateau graph and raw data
- 6 Standardization of Carrier (if applicable)

Included/

Acceptable

Comments

✓	
✓	
✓	
✓	
✓	
✓	

Part 2. Documentation for Calibration Source

- 1 Vendor Certificate
- 2 Standard Traceability Log (from LIMS)
- 3 Current Verification of Source
- 4 Source preparation sheet

✓	
✓	
✓	
✓	

Part 3. Documentation for Verification Source

- 1 Vendor Certificate
- 2 Standard Traceability Log (from LIMS)
- 3 Current Verification of Source
- 4 Source preparation sheet

✓	
✓	
✓	
✓	

Part 4. Enter into LIMS

- 1 Alpha LIMS instrument calibration updated

✓	

Primary Review of Package

[Signature]

Secondary Review of Package

Amanda Lehn

Effective Date:

4/1/16

Exp Date 2/28/17

GEL Laboratories

2040 Savage Road, Charleston, SC 29407

(843)556-8171

Rev 7 SSC 8/3/09

Sr-89 Calibration - PIC - Feb 2016

Standard Data	Isotope	Sr-89
	Standard ID number	1758-A
	Half Life (days)	50.53
	Std. Act. (dpm/mL)	60715.1145
	Reference Date	9/1/2015
	Volume of spike (mL)	2.0
	Std. Nominal (dpm)	12802.80
	Decay Date	2/12/2016

Carrier Data		Std ID	2338630	
		Std weight	18.68	mg/mL
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	1.7	0.1	1.87	91.0%
2	3.6	0.2	3.74	96.4%
3	4.9	0.3	5.60	87.4%
4	7.0	0.4	7.47	93.7%
5	8.9	0.5	9.34	95.3%
6	10.8	0.6	11.21	96.4%
7	12.2	0.7	13.08	93.3%
8	14.0	0.8	14.94	93.7%

***Recovery values exceeding 100% will be evaluated at 100%.

The following detectors were not calibrated:
6D, 13C

*Background is considered negligible.

**Decay corrected to mid-point of count

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
1A	1	2/12/2016 6:36	2	12427	6213.50	91.0%	6827.54	12754.44	0.5353	0.5310
1A	2	2/12/2016 6:55	2	13208	6604.00	96.4%	6853.48	12752.11	0.5374	0.5306
1A	3	2/12/2016 6:50	2	11754	5877.00	87.4%	6721.37	12752.67	0.5271	0.5304
1A	4	2/12/2016 6:42	2	12491	6245.50	93.7%	6666.63	12753.65	0.5227	0.5300
1A	5	2/12/2016 6:58	2	12583	6291.50	95.3%	6602.54	12751.70	0.5178	0.5297
1A	6	2/12/2016 7:12	2	13067	6533.50	96.4%	6780.32	12750.01	0.5318	0.5293
1A	7	2/12/2016 7:07	2	12713	6356.50	93.3%	6812.92	12750.62	0.5343	0.5291
1A	8	2/12/2016 7:03	2	12717	6358.50	93.7%	6787.24	12751.12	0.5323	0.5287
1B	1	2/12/2016 6:42	2	12488	6244.00	91.0%	6861.05	12753.64	0.5380	0.5332
1B	2	2/12/2016 6:36	2	13267	6633.50	96.4%	6884.10	12754.42	0.5397	0.5327
1B	3	2/12/2016 6:55	2	11650	5825.00	87.4%	6661.90	12752.09	0.5224	0.5323
1B	4	2/12/2016 6:50	2	12651	6325.50	93.7%	6752.02	12752.66	0.5295	0.5317
1B	5	2/12/2016 7:03	2	12841	6420.50	95.3%	6737.92	12751.11	0.5284	0.5312
1B	6	2/12/2016 6:58	2	12903	6451.50	96.4%	6695.22	12751.70	0.5250	0.5306
1B	7	2/12/2016 7:12	2	12701	6350.50	93.3%	6806.49	12750.00	0.5338	0.5303
1B	8	2/12/2016 7:07	2	12779	6389.50	93.7%	6820.33	12750.61	0.5349	0.5297
1C	1	2/12/2016 6:50	2	12525	6262.50	91.0%	6881.38	12752.65	0.5396	0.5382
1C	2	2/12/2016 6:42	2	13293	6646.50	96.4%	6897.59	12753.64	0.5408	0.5381
1C	3	2/12/2016 6:36	2	11907	5953.50	87.4%	6808.86	12754.41	0.5338	0.5381
1C	4	2/12/2016 6:55	2	12818	6409.00	93.7%	6841.15	12752.08	0.5365	0.5380
1C	5	2/12/2016 7:07	2	13004	6502.00	95.3%	6823.45	12750.60	0.5351	0.5379
1C	6	2/12/2016 7:03	2	13177	6588.50	96.4%	6837.40	12751.11	0.5362	0.5379
1C	7	2/12/2016 6:58	2	13095	6547.50	93.3%	7017.63	12751.69	0.5503	0.5378
1C	8	2/12/2016 7:12	2	12691	6345.50	93.7%	6773.37	12749.99	0.5312	0.5378
1D	1	2/12/2016 6:55	2	12483	6241.50	91.0%	6858.31	12752.07	0.5378	0.5320
1D	2	2/12/2016 6:51	2	12948	6474.00	96.4%	6718.57	12752.64	0.5268	0.5318
1D	3	2/12/2016 6:42	2	11880	5940.00	87.4%	6793.42	12753.63	0.5327	0.5317
1D	4	2/12/2016 6:36	2	12591	6295.50	93.7%	6720.00	12754.39	0.5269	0.5314
1D	5	2/12/2016 7:12	2	12829	6414.50	95.3%	6731.62	12749.99	0.5280	0.5312
1D	6	2/12/2016 7:07	2	13063	6531.50	96.4%	6778.25	12750.59	0.5316	0.5310
1D	7	2/12/2016 7:03	2	12875	6437.50	93.3%	6899.73	12751.10	0.5411	0.5309
1D	8	2/12/2016 6:58	2	12566	6283.00	93.7%	6706.65	12751.68	0.5259	0.5307
2A	1	2/12/2016 6:59	2	12279	6139.50	91.0%	6746.23	12751.67	0.5290	0.5230
2A	2	2/12/2016 7:12	2	12709	6354.50	96.4%	6594.56	12749.98	0.5172	0.5240
2A	3	2/12/2016 7:07	2	11820	5910.00	87.4%	6759.11	12750.58	0.5301	0.5246
2A	4	2/12/2016 7:03	2	12528	6264.00	93.7%	6686.37	12751.09	0.5244	0.5257
2A	5	2/12/2016 6:36	2	12570	6285.00	95.3%	6595.72	12754.38	0.5171	0.5266
2A	6	2/12/2016 6:55	2	12822	6411.00	96.4%	6653.19	12752.06	0.5217	0.5276
2A	7	2/12/2016 6:51	2	12867	6433.50	93.3%	6895.45	12752.64	0.5407	0.5283
2A	8	2/12/2016 6:43	2	12631	6315.50	93.7%	6741.35	12753.62	0.5286	0.5292
2B	1	2/12/2016 7:03	2	11795	5897.50	91.0%	6480.31	12751.09	0.5082	0.4963
2B	2	2/12/2016 6:59	2	12190	6095.00	96.4%	6325.26	12751.67	0.4960	0.4977
2B	3	2/12/2016 7:13	2	11039	5519.50	87.4%	6312.51	12749.97	0.4951	0.4987
2B	4	2/12/2016 7:08	2	11792	5896.00	93.7%	6293.56	12750.58	0.4936	0.5002
2B	5	2/12/2016 6:43	2	11966	5983.00	95.3%	6278.79	12753.61	0.4923	0.5016
2B	6	2/12/2016 6:36	2	12226	6113.00	96.4%	6343.94	12754.36	0.4974	0.5030
2B	7	2/12/2016 6:55	2	12210	6105.00	93.3%	6543.36	12752.05	0.5131	0.5040
2B	8	2/12/2016 6:51	2	12216	6108.00	93.7%	6519.85	12752.62	0.5113	0.5054
2C	1	2/12/2016 7:08	2	12076	6038.00	91.0%	6634.70	12750.57	0.5203	0.5110
2C	2	2/12/2016 7:03	2	12701	6350.50	96.4%	6590.41	12751.08	0.5169	0.5129
2C	3	2/12/2016 6:59	2	11357	5678.50	87.4%	6494.35	12751.66	0.5093	0.5142
2C	4	2/12/2016 7:13	2	12114	6057.00	93.7%	6465.41	12749.96	0.5071	0.5163
2C	5	2/12/2016 6:51	2	12228	6114.00	95.3%	6416.27	12752.62	0.5031	0.5182
2C	6	2/12/2016 6:43	2	12933	6466.50	96.4%	6710.79	12753.60	0.5262	0.5201
2C	7	2/12/2016 6:36	2	12558	6279.00	93.3%	6729.85	12754.35	0.5277	0.5214
2C	8	2/12/2016 6:55	2	12588	6294.00	93.7%	6718.40	12752.05	0.5268	0.5232
2D	1	2/12/2016 7:13	2	11364	5682.00	91.0%	6243.52	12749.96	0.4897	0.4801

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
2D	2	2/12/2016 7:08	2	12029	6014.50	96.4%	6241.71	12750.56	0.4895	0.4828
2D	3	2/12/2016 7:04	2	10628	5314.00	87.4%	6077.48	12751.07	0.4766	0.4846
2D	4	2/12/2016 6:59	2	11391	5695.50	93.7%	6079.54	12751.65	0.4768	0.4875
2D	5	2/12/2016 6:56	2	11786	5893.00	95.3%	6184.34	12752.04	0.4850	0.4902
2D	6	2/12/2016 6:51	2	11842	5921.00	96.4%	6144.68	12752.61	0.4818	0.4928
2D	7	2/12/2016 6:43	2	12068	6034.00	93.3%	6467.26	12753.59	0.5071	0.4948
2D	8	2/12/2016 6:37	2	12036	6018.00	93.7%	6423.79	12754.34	0.5037	0.4973
3A	1	2/12/2016 7:17	2	12099	6049.50	91.0%	6647.33	12749.46	0.5214	0.5181
3A	2	2/12/2016 7:32	2	12697	6348.50	96.4%	6588.33	12747.62	0.5168	0.5181
3A	3	2/12/2016 7:27	2	11515	5757.50	87.4%	6584.70	12748.22	0.5165	0.5181
3A	4	2/12/2016 7:24	2	12412	6206.00	93.7%	6624.46	12748.62	0.5196	0.5181
3A	5	2/12/2016 7:36	2	12472	6236.00	95.3%	6544.30	12747.17	0.5134	0.5181
3A	6	2/12/2016 7:47	2	12621	6310.50	96.4%	6548.90	12745.76	0.5138	0.5181
3A	7	2/12/2016 7:44	2	12498	6249.00	93.3%	6697.70	12746.11	0.5255	0.5181
3A	8	2/12/2016 7:41	2	12362	6181.00	93.7%	6597.78	12746.56	0.5176	0.5181
3B	1	2/12/2016 7:24	2	12341	6170.50	91.0%	6780.29	12748.61	0.5318	0.5259
3B	2	2/12/2016 7:17	2	12861	6430.50	96.4%	6673.43	12749.46	0.5234	0.5257
3B	3	2/12/2016 7:32	2	11526	5763.00	87.4%	6590.99	12747.61	0.5170	0.5257
3B	4	2/12/2016 7:27	2	12573	6286.50	93.7%	6710.39	12748.21	0.5264	0.5256
3B	5	2/12/2016 7:41	2	12877	6438.50	95.3%	6756.81	12746.55	0.5301	0.5254
3B	6	2/12/2016 7:36	2	12819	6409.50	96.4%	6651.64	12747.16	0.5218	0.5253
3B	7	2/12/2016 7:47	2	12635	6317.50	93.3%	6771.12	12745.76	0.5312	0.5253
3B	8	2/12/2016 7:44	2	12471	6235.50	93.7%	6655.95	12746.11	0.5222	0.5252
3C	1	2/20/2016 11:56	3	15683	5227.67	91.0%	5744.28	11393.99	0.5042	0.5073
3C	2	2/20/2016 11:25	2	10521	5260.50	96.4%	5459.23	11397.33	0.4790	0.4985
3C	3	2/20/2016 12:13	3	14628	4876.00	87.4%	5576.55	11392.09	0.4895	0.4925
3C	4	2/20/2016 12:19	3	15762	5254.00	93.7%	5608.27	11391.52	0.4923	0.4827
3C	5	2/20/2016 11:35	3	16928	5642.67	95.3%	5921.63	11396.19	0.5196	0.4739
3C	6	2/20/2016 11:40	3	16450	5483.33	96.4%	5690.48	11395.74	0.4994	0.4651
3C	7	2/20/2016 11:46	3	12123	4041.00	93.3%	4331.16	11395.07	0.3801	0.4586
3C	8	2/20/2016 11:50	3	14890	4963.33	93.7%	5298.00	11394.58	0.4650	0.4503
3D	1	2/20/2016 11:26	2	9525	4762.50	91.0%	5233.15	11397.33	0.4592	0.4697
3D	2	2/20/2016 11:56	3	13991	4663.67	96.4%	4839.85	11393.98	0.4248	0.4653
3D	3	2/20/2016 12:19	3	14344	4781.33	87.4%	5468.28	11391.50	0.4800	0.4622
3D	4	2/20/2016 12:13	3	15478	5159.33	93.7%	5507.22	11392.09	0.4834	0.4574
3D	5	2/20/2016 11:40	3	16293	5431.00	95.3%	5699.50	11395.74	0.5001	0.4530
3D	6	2/20/2016 11:36	3	15808	5269.33	96.4%	5468.40	11396.18	0.4798	0.4486
3D	7	2/20/2016 11:50	3	11821	3940.33	93.3%	4223.26	11394.57	0.3706	0.4453
3D	8	2/20/2016 11:46	3	14240	4746.67	93.7%	5066.73	11395.07	0.4446	0.4412
4A	1	2/20/2016 11:40	3	15827	5275.67	91.0%	5797.03	11395.73	0.5087	0.4874
4A	2	2/20/2016 11:46	3	14499	4833.00	96.4%	5015.58	11395.06	0.4402	0.4892
4A	3	2/20/2016 11:51	3	14629	4876.33	87.4%	5576.93	11394.56	0.4894	0.4904
4A	4	2/20/2016 11:56	3	15998	5332.67	93.7%	5692.24	11393.97	0.4996	0.4924
4A	5	2/20/2016 12:13	3	16942	5647.33	95.3%	5926.53	11392.08	0.5202	0.4943
4A	6	2/20/2016 12:19	3	16472	5490.67	96.4%	5698.09	11391.50	0.5002	0.4961
4A	7	2/12/2016 7:29	2	12633	6316.50	93.3%	6770.05	12747.98	0.5311	0.4974
4A	8	2/20/2016 11:36	3	14634	4878.00	93.7%	5206.92	11396.16	0.4569	0.4991
4B	1	2/12/2016 7:41	2	12496	6248.00	91.0%	6865.45	12746.52	0.5386	0.5375
4B	2	2/12/2016 7:36	2	13353	6676.50	96.4%	6928.72	12747.13	0.5436	0.5372
4B	3	2/12/2016 7:48	2	11968	5984.00	87.4%	6843.74	12745.72	0.5369	0.5369
4B	4	2/12/2016 7:45	2	12643	6321.50	93.7%	6747.75	12746.07	0.5294	0.5365
4B	5	2/12/2016 7:24	2	12727	6363.50	95.3%	6678.10	12748.58	0.5238	0.5361
4B	6	2/12/2016 7:17	2	13327	6663.50	96.4%	6915.23	12749.45	0.5424	0.5358
4B	7	2/12/2016 7:32	2	12883	6441.50	93.3%	6904.02	12747.57	0.5416	0.5355
4B	8	2/12/2016 7:27	2	12764	6382.00	93.7%	6812.33	12748.18	0.5344	0.5352
4C	1	2/12/2016 7:45	2	12761	6380.50	91.0%	7011.04	12746.06	0.5501	0.5441
4C	2	2/12/2016 7:41	2	13234	6617.00	96.4%	6866.98	12746.51	0.5387	0.5435
4C	3	2/12/2016 7:36	2	11973	5986.50	87.4%	6846.60	12747.13	0.5371	0.5431
4C	4	2/12/2016 7:48	2	13178	6589.00	93.7%	7033.29	12745.71	0.5518	0.5425
4C	5	2/12/2016 7:27	2	12993	6496.50	95.3%	6817.68	12748.17	0.5348	0.5419
4C	6	2/12/2016 7:24	2	13186	6593.00	96.4%	6842.07	12748.57	0.5367	0.5413
4C	7	2/12/2016 7:20	2	13083	6541.50	93.3%	7011.20	12749.07	0.5499	0.5409
4C	8	2/12/2016 7:32	2	12861	6430.50	93.7%	6864.10	12747.56	0.5385	0.5403
4D	1	2/12/2016 7:48	2	12214	6107.00	91.0%	6710.52	12745.70	0.5265	0.5252
4D	2	2/12/2016 7:45	2	12985	6492.50	96.4%	6737.77	12746.05	0.5286	0.5262
4D	3	2/12/2016 7:41	2	11710	5855.00	87.4%	6696.21	12746.50	0.5253	0.5270
4D	4	2/12/2016 7:36	2	12689	6344.50	93.7%	6772.30	12747.12	0.5313	0.5282
4D	5	2/12/2016 7:32	2	12641	6320.50	95.3%	6632.97	12747.56	0.5203	0.5292
4D	6	2/12/2016 7:27	2	12926	6463.00	96.4%	6707.16	12748.16	0.5261	0.5303
4D	7	2/12/2016 7:24	2	12778	6389.00	93.3%	6847.75	12748.56	0.5371	0.5311
4D	8	2/12/2016 7:20	2	12754	6377.00	93.7%	6806.99	12749.05	0.5339	0.5321
5A	1	2/12/2016 7:52	2	12457	6228.50	91.0%	6844.02	12745.19	0.5370	0.5407
5A	2	2/12/2016 8:02	2	13359	6679.50	96.4%	6931.84	12743.99	0.5439	0.5417
5A	3	2/12/2016 7:58	2	11998	5999.00	87.4%	6860.90	12744.40	0.5383	0.5424
5A	4	2/12/2016 7:55	2	13258	6629.00	93.7%	7075.98	12744.78	0.5552	0.5435
5A	5	2/12/2016 8:05	2	12979	6489.50	95.3%	6810.33	12743.58	0.5344	0.5445

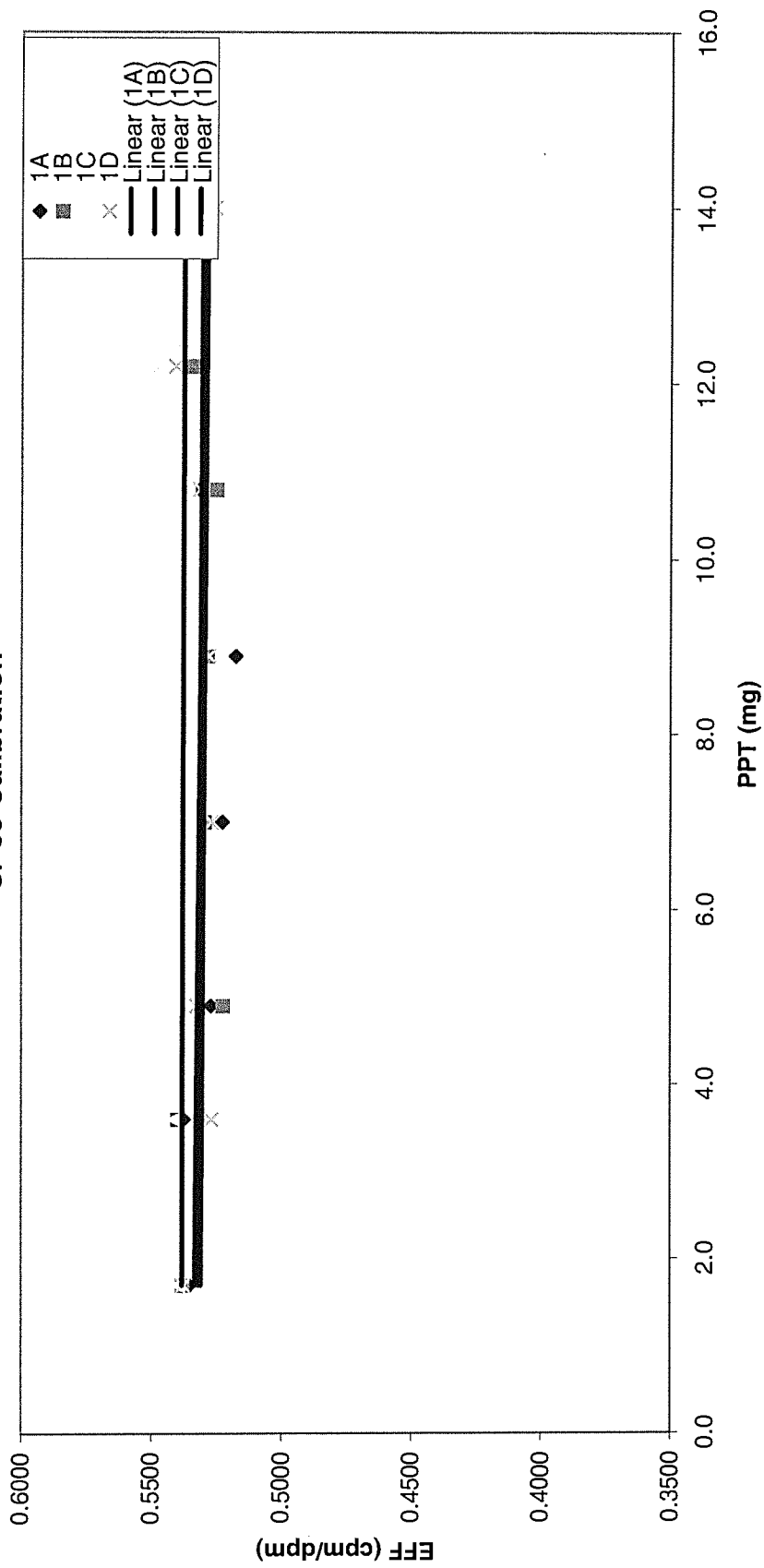
Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
5A	6	2/12/2016 8:18	2	13542	6771.00	96.4%	7026.79	12742.06	0.5515	0.5455
5A	7	2/12/2016 8:14	2	13110	6555.00	93.3%	7025.67	12742.56	0.5514	0.5463
5A	8	2/12/2016 8:10	2	12894	6447.00	93.7%	6881.71	12743.00	0.5400	0.5472
5B	1	2/12/2016 7:55	2	12623	6311.50	91.0%	6935.22	12744.78	0.5442	0.5404
5B	2	2/12/2016 7:52	2	13294	6647.00	96.4%	6898.11	12745.19	0.5412	0.5406
5B	3	2/12/2016 8:02	2	11991	5995.50	87.4%	6856.89	12743.98	0.5380	0.5406
5B	4	2/12/2016 7:59	2	13073	6536.50	93.7%	6977.25	12744.39	0.5475	0.5408
5B	5	2/12/2016 8:10	2	12595	6297.50	95.3%	6608.84	12742.99	0.5186	0.5409
5B	6	2/12/2016 8:05	2	13425	6712.50	96.4%	6966.08	12743.57	0.5466	0.5410
5B	7	2/12/2016 8:18	2	13122	6561.00	93.3%	7032.10	12742.05	0.5519	0.5411
5B	8	2/12/2016 8:14	2	12858	6429.00	93.7%	6862.50	12742.55	0.5385	0.5412
5C	1	2/12/2016 7:59	2	12800	6400.00	91.0%	7032.47	12744.38	0.5518	0.5427
5C	2	2/12/2016 7:55	2	13380	6690.00	96.4%	6942.73	12744.77	0.5448	0.5419
5C	3	2/12/2016 7:52	2	11910	5955.00	87.4%	6810.58	12745.19	0.5344	0.5414
5C	4	2/12/2016 8:02	2	12654	6327.00	93.7%	6753.62	12743.97	0.5299	0.5405
5C	5	2/12/2016 8:14	2	12938	6469.00	95.3%	6788.82	12742.54	0.5328	0.5397
5C	6	2/12/2016 8:10	2	13368	6684.00	96.4%	6936.51	12742.98	0.5443	0.5389
5C	7	2/12/2016 8:05	2	12990	6495.00	93.3%	6961.36	12743.56	0.5463	0.5383
5C	8	2/12/2016 8:18	2	12811	6405.50	93.7%	6837.41	12742.04	0.5366	0.5375
5D	1	2/12/2016 8:02	2	12811	6405.50	91.0%	7038.51	12743.96	0.5523	0.5476
5D	2	2/12/2016 7:59	2	13302	6651.00	96.4%	6902.26	12744.37	0.5416	0.5458
5D	3	2/12/2016 7:55	2	12034	6017.00	87.4%	6881.48	12744.76	0.5399	0.5446
5D	4	2/12/2016 7:52	2	13117	6558.50	93.7%	7000.73	12745.19	0.5493	0.5426
5D	5	2/12/2016 8:18	2	12876	6438.00	95.3%	6756.28	12742.03	0.5302	0.5409
5D	6	2/12/2016 8:14	2	13332	6666.00	96.4%	6917.83	12742.53	0.5429	0.5391
5D	7	2/12/2016 8:10	2	13112	6556.00	93.3%	7026.74	12742.97	0.5514	0.5378
5D	8	2/12/2016 8:05	2	12580	6290.00	93.7%	6714.13	12743.55	0.5269	0.5361
6A	1	2/12/2016 8:08	2	12279	6139.50	91.0%	6746.23	12743.27	0.5294	0.5355
6A	2	2/12/2016 8:20	2	13280	6640.00	96.4%	6890.84	12741.82	0.5408	0.5350
6A	3	2/12/2016 8:16	2	12002	6001.00	87.4%	6863.18	12742.31	0.5386	0.5346
6A	4	2/12/2016 8:12	2	12744	6372.00	93.7%	6801.65	12742.79	0.5338	0.5340
6A	5	2/12/2016 7:53	2	12775	6387.50	95.3%	6703.29	12745.02	0.5260	0.5334
6A	6	2/12/2016 8:04	2	13076	6538.00	96.4%	6784.99	12743.78	0.5324	0.5328
6A	7	2/12/2016 8:00	2	12916	6458.00	93.3%	6921.71	12744.17	0.5431	0.5324
6A	8	2/12/2016 7:57	2	12551	6275.50	93.7%	6698.65	12744.57	0.5256	0.5319
6B	1	2/12/2016 8:12	2	12782	6391.00	91.0%	7022.58	12742.78	0.5511	0.5412
6B	2	2/12/2016 8:08	2	13217	6608.50	96.4%	6858.15	12743.26	0.5382	0.5402
6B	3	2/12/2016 8:20	2	11967	5983.50	87.4%	6843.17	12741.81	0.5371	0.5395
6B	4	2/12/2016 8:16	2	12723	6361.50	93.7%	6790.45	12742.29	0.5329	0.5383
6B	5	2/12/2016 7:57	2	12759	6379.50	95.3%	6694.89	12744.56	0.5253	0.5373
6B	6	2/12/2016 7:53	2	13236	6618.00	96.4%	6868.01	12745.02	0.5389	0.5362
6B	7	2/12/2016 8:04	2	12890	6445.00	93.3%	6907.77	12743.77	0.5421	0.5355
6B	8	2/12/2016 8:00	2	12827	6413.50	93.7%	6845.95	12744.16	0.5372	0.5345
6C	1	2/12/2016 8:16	2	12525	6262.50	91.0%	6881.38	12742.27	0.5400	0.5403
6C	2	2/12/2016 8:12	2	13400	6700.00	96.4%	6953.11	12742.77	0.5457	0.5396
6C	3	2/12/2016 8:08	2	11967	5983.50	87.4%	6843.17	12743.25	0.5370	0.5392
6C	4	2/12/2016 8:20	2	12767	6383.50	93.7%	6813.93	12741.80	0.5348	0.5384
6C	5	2/12/2016 8:00	2	13001	6500.50	95.3%	6821.87	12744.16	0.5353	0.5377
6C	6	2/12/2016 7:57	2	13069	6534.50	96.4%	6781.36	12744.55	0.5321	0.5370
6C	7	2/12/2016 7:53	2	12943	6471.50	93.3%	6936.17	12745.02	0.5442	0.5365
6C	8	2/12/2016 8:04	2	12783	6391.50	93.7%	6822.47	12743.75	0.5354	0.5358
7A	1	2/13/2016 12:03	2	12376	6188.00	91.0%	6799.52	12541.55	0.5422	0.5342
7A	2	2/13/2016 12:13	2	12913	6456.50	96.4%	6700.41	12540.38	0.5343	0.5329
7A	3	2/13/2016 12:10	2	11638	5819.00	87.4%	6655.04	12540.73	0.5307	0.5320
7A	4	2/13/2016 12:06	2	12323	6161.50	93.7%	6576.96	12541.13	0.5244	0.5305
7A	5	2/13/2016 12:16	2	12280	6140.00	95.3%	6443.55	12540.00	0.5138	0.5292
7A	6	2/13/2016 12:27	2	12839	6419.50	96.4%	6662.01	12538.64	0.5313	0.5278
7A	7	2/13/2016 12:23	2	12446	6223.00	93.3%	6669.83	12539.11	0.5319	0.5268
7A	8	2/13/2016 12:19	2	12459	6229.50	93.7%	6649.55	12539.60	0.5303	0.5255
7B	1	2/13/2016 12:06	2	12440	6220.00	91.0%	6834.68	12541.12	0.5450	0.5393
7B	2	2/13/2016 12:03	2	12952	6476.00	96.4%	6720.65	12541.54	0.5359	0.5391
7B	3	2/13/2016 12:13	2	11854	5927.00	87.4%	6778.55	12540.37	0.5405	0.5390
7B	4	2/13/2016 12:10	2	12584	6292.00	93.7%	6716.26	12540.72	0.5356	0.5388
7B	5	2/13/2016 12:19	2	12675	6337.50	95.3%	6650.81	12539.59	0.5304	0.5386
7B	6	2/13/2016 12:16	2	12838	6419.00	96.4%	6661.50	12540.00	0.5312	0.5384
7B	7	2/13/2016 12:27	2	13073	6536.50	93.3%	7005.84	12538.63	0.5587	0.5383
7B	8	2/13/2016 12:23	2	12507	6253.50	93.7%	6675.16	12539.09	0.5323	0.5381
7C	1	2/13/2016 12:10	2	11936	5968.00	91.0%	6557.78	12540.72	0.5229	0.5201
7C	2	2/13/2016 12:06	2	12584	6292.00	96.4%	6529.70	12541.11	0.5207	0.5209
7C	3	2/13/2016 12:03	2	11367	5683.50	87.4%	6500.07	12541.53	0.5183	0.5214
7C	4	2/13/2016 12:13	2	12463	6231.50	93.7%	6651.68	12540.36	0.5304	0.5223
7C	5	2/13/2016 12:23	2	12111	6055.50	95.3%	6354.87	12539.09	0.5068	0.5231
7C	6	2/13/2016 12:19	2	12684	6342.00	96.4%	6581.59	12539.58	0.5249	0.5239
7C	7	2/13/2016 12:16	2	12526	6263.00	93.3%	6712.70	12539.92	0.5353	0.5244
7C	8	2/13/2016 12:27	2	12265	6132.50	93.7%	6546.01	12538.61	0.5221	0.5252
7D	1	2/13/2016 12:13	2	12204	6102.00	91.0%	6705.02	12540.35	0.5347	0.5249

Detector (#)	Source ID (#)	Raw Count Data			Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
		Start Time	Count Time (min)	Beta (counts)						
7D	2	2/13/2016 12:10	2	12695	6347.50	96.4%	6587.29	12540.71	0.5253	0.5246
7D	3	2/13/2016 12:07	2	11335	5667.50	87.4%	6481.77	12541.10	0.5168	0.5245
7D	4	2/13/2016 12:03	2	12308	6154.00	93.7%	6568.96	12541.51	0.5238	0.5242
7D	5	2/13/2016 12:27	2	12153	6076.50	95.3%	6376.91	12538.60	0.5086	0.5239
7D	6	2/13/2016 12:23	2	12650	6325.00	96.4%	6563.94	12539.08	0.5235	0.5237
7D	7	2/13/2016 12:19	2	12559	6279.50	93.3%	6730.39	12539.57	0.5367	0.5235
7D	8	2/13/2016 12:16	2	12289	6144.50	93.7%	6558.81	12539.91	0.5230	0.5232
8A	1	2/13/2016 12:16	2	12192	6096.00	91.0%	6698.43	12539.97	0.5342	0.5328
8A	2	2/13/2016 12:28	2	13036	6518.00	96.4%	6764.24	12538.58	0.5395	0.5329
8A	3	2/13/2016 12:24	2	11605	5802.50	87.4%	6636.17	12539.07	0.5292	0.5330
8A	4	2/13/2016 12:19	2	12419	6209.50	93.7%	6628.20	12539.57	0.5286	0.5331
8A	5	2/13/2016 12:03	2	12685	6342.50	95.3%	6656.06	12541.50	0.5307	0.5332
8A	6	2/13/2016 12:13	2	12787	6393.50	96.4%	6635.03	12540.34	0.5291	0.5333
8A	7	2/13/2016 12:10	2	12579	6289.50	93.3%	6741.11	12540.70	0.5375	0.5334
8A	8	2/13/2016 12:07	2	12606	6303.00	93.7%	6728.00	12541.09	0.5365	0.5335
8B	1	2/13/2016 12:19	2	12269	6134.50	91.0%	6740.73	12539.56	0.5376	0.5341
8B	2	2/13/2016 12:16	2	12968	6484.00	96.4%	6728.95	12539.96	0.5366	0.5343
8B	3	2/13/2016 12:28	2	11698	5849.00	87.4%	6689.35	12538.57	0.5335	0.5344
8B	4	2/13/2016 12:24	2	12424	6212.00	93.7%	6630.87	12539.06	0.5288	0.5347
8B	5	2/13/2016 12:07	2	12536	6268.00	95.3%	6577.88	12541.08	0.5245	0.5349
8B	6	2/13/2016 12:03	2	13107	6553.50	96.4%	6801.08	12541.49	0.5423	0.5351
8B	7	2/13/2016 12:13	2	12693	6346.50	93.3%	6802.20	12540.33	0.5424	0.5352
8B	8	2/13/2016 12:10	2	12509	6254.50	93.7%	6676.23	12540.69	0.5324	0.5354
8C	1	2/13/2016 12:24	2	12367	6183.50	91.0%	6794.58	12539.05	0.5419	0.5339
8C	2	2/13/2016 12:19	2	12879	6439.50	96.4%	6682.77	12539.55	0.5329	0.5327
8C	3	2/13/2016 12:16	2	11626	5813.00	87.4%	6648.17	12539.95	0.5302	0.5319
8C	4	2/13/2016 12:28	2	12360	6180.00	93.7%	6596.71	12538.57	0.5261	0.5307
8C	5	2/13/2016 12:10	2	12282	6141.00	95.3%	6444.60	12540.68	0.5139	0.5295
8C	6	2/13/2016 12:07	2	12880	6440.00	96.4%	6683.29	12541.07	0.5329	0.5284
8C	7	2/13/2016 12:03	2	12507	6253.50	93.3%	6702.52	12541.47	0.5344	0.5275
8C	8	2/13/2016 12:13	2	12424	6212.00	93.7%	6630.87	12540.32	0.5288	0.5265
8D	1	2/13/2016 12:28	2	12480	6240.00	91.0%	6856.66	12538.55	0.5468	0.5396
8D	2	2/13/2016 12:24	2	12937	6468.50	96.4%	6712.87	12539.05	0.5354	0.5403
8D	3	2/13/2016 12:20	2	11828	5914.00	87.4%	6763.68	12539.54	0.5394	0.5407
8D	4	2/13/2016 12:16	2	12626	6313.00	93.7%	6738.68	12539.94	0.5374	0.5414
8D	5	2/13/2016 12:13	2	12853	6426.50	95.3%	6744.21	12540.31	0.5378	0.5421
8D	6	2/13/2016 12:10	2	13155	6577.50	96.4%	6825.98	12540.68	0.5443	0.5427
8D	7	2/13/2016 12:07	2	12972	6486.00	93.3%	6951.72	12541.06	0.5543	0.5432
8D	8	2/13/2016 12:03	2	12656	6328.00	93.7%	6754.69	12541.46	0.5386	0.5438
9A	1	2/13/2016 12:30	2	12191	6095.50	91.0%	6697.88	12538.24	0.5342	0.5368
9A	2	2/13/2016 12:40	2	13057	6528.50	96.4%	6775.13	12537.07	0.5404	0.5379
9A	3	2/13/2016 12:37	2	11939	5969.50	87.4%	6827.16	12537.45	0.5445	0.5386
9A	4	2/13/2016 12:34	2	12613	6306.50	93.7%	6731.74	12537.80	0.5369	0.5398
9A	5	2/13/2016 12:43	2	12569	6284.50	95.3%	6595.19	12536.69	0.5261	0.5409
9A	6	2/13/2016 12:53	2	13313	6656.50	96.4%	6907.97	12535.56	0.5511	0.5419
9A	7	2/13/2016 12:50	2	12928	6464.00	93.3%	6928.14	12535.92	0.5527	0.5427
9A	8	2/13/2016 12:46	2	12602	6301.00	93.7%	6725.87	12536.33	0.5365	0.5438
9B	1	2/13/2016 12:34	2	12418	6209.00	91.0%	6822.60	12537.80	0.5442	0.5377
9B	2	2/13/2016 12:30	2	12913	6456.50	96.4%	6700.41	12538.24	0.5344	0.5360
9B	3	2/13/2016 12:40	2	11796	5898.00	87.4%	6745.39	12537.06	0.5380	0.5348
9B	4	2/13/2016 12:37	2	12501	6250.50	93.7%	6671.96	12537.44	0.5322	0.5328
9B	5	2/13/2016 12:46	2	12192	6096.00	95.3%	6397.38	12536.32	0.5103	0.5311
9B	6	2/13/2016 12:43	2	12780	6390.00	96.4%	6631.40	12536.68	0.5290	0.5293
9B	7	2/13/2016 12:53	2	12593	6296.50	93.3%	6748.61	12535.55	0.5384	0.5280
9B	8	2/13/2016 12:50	2	12439	6219.50	93.7%	6638.87	12535.91	0.5296	0.5263
9C	1	2/13/2016 12:37	2	12142	6071.00	91.0%	6670.96	12537.43	0.5321	0.5314
9C	2	2/13/2016 12:34	2	13005	6502.50	96.4%	6748.15	12537.79	0.5382	0.5304
9C	3	2/13/2016 12:30	2	11557	5778.50	87.4%	6608.72	12538.25	0.5271	0.5298
9C	4	2/13/2016 12:40	2	12333	6166.50	93.7%	6582.30	12537.06	0.5250	0.5288
9C	5	2/13/2016 12:50	2	12303	6151.50	95.3%	6455.62	12535.90	0.5150	0.5279
9C	6	2/13/2016 12:47	2	12863	6431.50	96.4%	6674.47	12536.31	0.5324	0.5270
9C	7	2/13/2016 12:44	2	12446	6223.00	93.3%	6669.83	12536.67	0.5320	0.5263
9C	8	2/13/2016 12:53	2	12337	6168.50	93.7%	6584.43	12535.54	0.5253	0.5254
9D	1	2/13/2016 12:40	2	12393	6196.50	91.0%	6808.86	12537.04	0.5431	0.5382
9D	2	2/13/2016 12:37	2	13114	6557.00	96.4%	6804.71	12537.42	0.5428	0.5369
9D	3	2/13/2016 12:34	2	11494	5747.00	87.4%	6572.69	12537.78	0.5242	0.5360
9D	4	2/13/2016 12:30	2	12530	6265.00	93.7%	6687.44	12538.25	0.5334	0.5345
9D	5	2/13/2016 12:53	2	12524	6262.00	95.3%	6571.58	12535.54	0.5242	0.5332
9D	6	2/13/2016 12:50	2	13041	6520.50	96.4%	6766.83	12535.89	0.5398	0.5319
9D	7	2/13/2016 12:47	2	12605	6302.50	93.3%	6755.04	12536.31	0.5388	0.5309
9D	8	2/13/2016 12:44	2	12330	6165.00	93.7%	6580.70	12536.66	0.5249	0.5297
10A	1	2/13/2016 12:44	2	11343	5671.50	91.0%	6231.98	12536.66	0.4971	0.4920
10A	2	2/13/2016 12:53	2	11861	5930.50	96.4%	6154.54	12535.53	0.4910	0.4923
10A	3	2/13/2016 12:50	2	10851	5425.50	87.4%	6205.00	12535.89	0.4950	0.4925
10A	4	2/13/2016 12:47	2	11547	5773.50	93.7%	6162.80	12536.30	0.4916	0.4928
10A	5	2/13/2016 12:30	2	11374	5687.00	95.3%	5968.16	12538.24	0.4760	0.4931

Detector (#)	Source ID (#)	Raw Count Data			Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
		Start Time	Count Time (min)	Beta (counts)						
10A	6	2/13/2016 12:41	2	11975	5987.50	96.4%	6213.69	12537.01	0.4956	0.4934
10A	7	2/13/2016 12:37	2	11786	5893.00	93.3%	6316.14	12537.41	0.5038	0.4936
10A	8	2/13/2016 12:34	2	11597	5798.50	93.7%	6189.48	12537.77	0.4937	0.4939
10B	1	2/13/2016 12:47	2	12025	6012.50	91.0%	6606.68	12536.29	0.5270	0.5193
10B	2	2/13/2016 12:44	2	12608	6304.00	96.4%	6542.15	12536.65	0.5218	0.5207
10B	3	2/13/2016 12:53	2	11275	5637.50	87.4%	6447.46	12535.52	0.5143	0.5216
10B	4	2/13/2016 12:50	2	12156	6078.00	93.7%	6487.83	12535.88	0.5175	0.5232
10B	5	2/13/2016 12:34	2	12288	6144.00	95.3%	6447.75	12537.76	0.5143	0.5246
10B	6	2/13/2016 12:30	2	12928	6464.00	96.4%	6708.20	12538.24	0.5350	0.5260
10B	7	2/13/2016 12:41	2	12615	6307.50	93.3%	6760.40	12537.01	0.5392	0.5270
10B	8	2/13/2016 12:37	2	12246	6123.00	93.7%	6535.87	12537.40	0.5213	0.5283
10C	1	2/13/2016 12:50	2	11924	5962.00	91.0%	6551.19	12535.86	0.5226	0.5187
10C	2	2/13/2016 12:47	2	12409	6204.50	96.4%	6438.89	12536.28	0.5136	0.5186
10C	3	2/13/2016 12:44	2	11567	5783.50	87.4%	6614.44	12536.64	0.5276	0.5185
10C	4	2/13/2016 12:53	2	12180	6090.00	93.7%	6500.64	12535.51	0.5186	0.5183
10C	5	2/13/2016 12:38	2	11909	5954.50	95.3%	6248.88	12537.39	0.4984	0.5182
10C	6	2/13/2016 12:35	2	12500	6250.00	96.4%	6486.11	12537.75	0.5173	0.5181
10C	7	2/13/2016 12:30	2	12404	6202.00	93.3%	6647.32	12538.24	0.5302	0.5180
10C	8	2/13/2016 12:41	2	12165	6082.50	93.7%	6492.63	12536.99	0.5179	0.5179
10D	1	2/13/2016 12:53	2	11599	5799.50	91.0%	6372.63	12535.50	0.5084	0.5061
10D	2	2/13/2016 12:50	2	12344	6172.00	96.4%	6405.16	12535.85	0.5109	0.5067
10D	3	2/13/2016 12:47	2	11102	5551.00	87.4%	6348.53	12536.27	0.5064	0.5070
10D	4	2/13/2016 12:44	2	11872	5936.00	93.7%	6336.26	12536.63	0.5054	0.5076
10D	5	2/13/2016 12:41	2	11821	5910.50	95.3%	6202.70	12536.98	0.4948	0.5082
10D	7	2/13/2016 12:35	2	12137	6068.50	93.3%	6504.24	12537.74	0.5188	0.5091
10D	8	2/13/2016 12:30	2	11972	5986.00	93.7%	6389.63	12538.23	0.5096	0.5096
11A	1	2/13/2016 12:58	2	12240	6120.00	91.0%	6724.80	12534.94	0.5365	0.5334
11A	2	2/13/2016 13:08	2	12864	6432.00	96.4%	6674.99	12533.80	0.5326	0.5328
11A	3	2/13/2016 13:05	2	11721	5860.50	87.4%	6702.50	12534.15	0.5347	0.5324
11A	4	2/13/2016 13:01	2	12367	6183.50	93.7%	6600.44	12534.55	0.5266	0.5318
11A	5	2/13/2016 13:12	2	12418	6209.00	95.3%	6515.96	12533.33	0.5199	0.5313
11A	6	2/13/2016 13:22	2	13026	6513.00	96.4%	6759.05	12532.08	0.5393	0.5307
11A	7	2/13/2016 13:19	2	12533	6266.50	93.3%	6716.46	12532.47	0.5359	0.5303
11A	8	2/13/2016 13:15	2	12375	6187.50	93.7%	6604.71	12532.89	0.5270	0.5298
11B	1	2/13/2016 13:01	2	12226	6113.00	91.0%	6717.11	12534.54	0.5359	0.5379
11B	2	2/13/2016 12:58	2	13006	6503.00	96.4%	6748.67	12534.94	0.5384	0.5375
11B	3	2/13/2016 13:08	2	11817	5908.50	87.4%	6757.39	12533.79	0.5391	0.5372
11B	4	2/13/2016 13:05	2	12632	6316.00	93.7%	6741.88	12534.15	0.5379	0.5368
11B	5	2/13/2016 13:15	2	12659	6329.50	95.3%	6642.42	12532.88	0.5300	0.5364
11B	6	2/13/2016 13:12	2	13058	6529.00	96.4%	6775.65	12533.32	0.5406	0.5360
11B	7	2/13/2016 13:22	2	12620	6310.00	93.3%	6763.08	12532.07	0.5397	0.5357
11B	8	2/13/2016 13:19	2	12472	6236.00	93.7%	6656.48	12532.47	0.5311	0.5353
11C	1	2/13/2016 13:05	2	12263	6131.50	91.0%	6737.44	12534.14	0.5375	0.5338
11C	2	2/13/2016 13:01	2	12809	6404.50	96.4%	6646.45	12534.53	0.5303	0.5320
11C	3	2/13/2016 12:58	2	11453	5726.50	87.4%	6549.25	12534.94	0.5225	0.5308
11C	4	2/13/2016 13:08	2	12528	6264.00	93.7%	6686.37	12533.78	0.5335	0.5288
11C	5	2/13/2016 13:19	2	12439	6219.50	95.3%	6526.98	12532.46	0.5208	0.5269
11C	6	2/13/2016 13:15	2	12902	6451.00	96.4%	6694.70	12532.87	0.5342	0.5251
11C	7	2/13/2016 13:12	2	12475	6237.50	93.3%	6685.37	12533.32	0.5334	0.5238
11C	8	2/13/2016 13:22	2	12001	6000.50	93.7%	6405.11	12532.06	0.5111	0.5220
11D	1	2/13/2016 13:08	2	12747	6373.50	91.0%	7003.35	12533.77	0.5588	0.5569
11D	2	2/13/2016 13:05	2	13426	6713.00	96.4%	6966.60	12534.13	0.5558	0.5537
11D	3	2/13/2016 13:02	2	11899	5949.50	87.4%	6804.29	12534.52	0.5428	0.5514
11D	4	2/13/2016 12:58	2	12990	6495.00	93.7%	6932.95	12534.94	0.5531	0.5478
11D	5	2/13/2016 13:22	2	12735	6367.50	95.3%	6682.30	12532.05	0.5332	0.5446
11D	6	2/13/2016 13:19	2	13403	6701.50	96.4%	6954.67	12532.45	0.5549	0.5413
11D	7	2/13/2016 13:15	2	12746	6373.00	93.3%	6830.60	12532.86	0.5450	0.5389
11D	8	2/13/2016 13:12	2	12369	6184.50	93.7%	6601.51	12533.31	0.5267	0.5358
12A	1	2/13/2016 13:12	2	11826	5913.00	91.0%	6497.34	12533.30	0.5184	0.5201
12A	2	2/13/2016 13:22	2	12570	6285.00	96.4%	6522.43	12532.04	0.5205	0.5190
12A	3	2/13/2016 13:19	2	11331	5665.50	87.4%	6479.48	12532.44	0.5170	0.5182
12A	4	2/13/2016 13:16	2	12092	6046.00	93.7%	6453.67	12532.85	0.5149	0.5170
12A	5	2/13/2016 12:58	2	12276	6138.00	95.3%	6441.45	12534.93	0.5139	0.5159
12A	6	2/13/2016 13:08	2	12688	6344.00	96.4%	6583.66	12533.76	0.5253	0.5148
12A	7	2/13/2016 13:05	2	12100	6050.00	93.3%	6484.41	12534.12	0.5173	0.5140
12A	8	2/13/2016 13:02	2	11845	5922.50	93.7%	6321.85	12534.51	0.5044	0.5129
12B	1	2/13/2016 13:16	2	12043	6021.50	91.0%	6616.57	12532.84	0.5279	0.5205
12B	2	2/13/2016 13:12	2	12407	6203.50	96.4%	6437.85	12533.29	0.5137	0.5203
12B	3	2/13/2016 13:22	2	11486	5743.00	87.4%	6568.12	12532.03	0.5241	0.5202
12B	4	2/13/2016 13:19	2	12229	6114.50	93.7%	6526.79	12532.43	0.5208	0.5200
12B	5	2/13/2016 13:02	2	12081	6040.50	95.3%	6339.13	12534.50	0.5057	0.5198
12B	6	2/13/2016 12:58	2	12628	6314.00	96.4%	6552.53	12534.94	0.5227	0.5196
12B	7	2/13/2016 13:08	2	12134	6067.00	93.3%	6502.63	12533.76	0.5188	0.5195
12B	8	2/13/2016 13:05	2	12339	6169.50	93.7%	6585.50	12534.11	0.5254	0.5193
12C	1	2/13/2016 13:19	2	12170	6085.00	91.0%	6686.34	12532.42	0.5335	0.5275
12C	2	2/13/2016 13:16	2	12865	6432.50	96.4%	6675.51	12532.83	0.5326	0.5276

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
12C	3	2/13/2016 13:12	2	11428	5714.00	87.4%	6534.95	12533.28	0.5214	0.5277
12C	4	2/13/2016 13:22	2	12174	6087.00	93.7%	6497.44	12532.02	0.5185	0.5278
12C	5	2/13/2016 13:05	2	12339	6169.50	95.3%	6474.51	12534.10	0.5166	0.5280
12C	6	2/13/2016 13:02	2	13043	6521.50	96.4%	6767.87	12534.49	0.5399	0.5281
12C	7	2/13/2016 12:58	2	12572	6286.00	93.3%	6737.36	12534.94	0.5375	0.5282
12C	8	2/13/2016 13:08	2	12286	6143.00	93.7%	6557.21	12533.75	0.5232	0.5283
12D	1	2/13/2016 13:23	2	12042	6021.00	91.0%	6616.02	12532.01	0.5279	0.5305
12D	2	2/13/2016 13:19	2	12787	6393.50	96.4%	6635.03	12532.41	0.5294	0.5303
12D	3	2/13/2016 13:16	2	11643	5821.50	87.4%	6657.90	12532.83	0.5312	0.5301
12D	4	2/13/2016 13:12	2	12314	6157.00	93.7%	6572.16	12533.28	0.5244	0.5298
12D	5	2/13/2016 13:08	2	12837	6418.50	95.3%	6735.82	12533.74	0.5374	0.5296
12D	6	2/13/2016 13:05	2	13037	6518.50	96.4%	6764.75	12534.09	0.5397	0.5294
12D	7	2/13/2016 13:02	2	12313	6156.50	93.3%	6598.56	12534.48	0.5264	0.5292
12D	8	2/13/2016 12:58	2	12244	6122.00	93.7%	6534.80	12533.94	0.5213	0.5290
13A	1	2/13/2016 13:26	2	11415	5707.50	91.0%	6271.54	12531.65	0.5005	0.4988
13A	2	2/13/2016 13:35	2	12024	6012.00	96.4%	6239.12	12530.53	0.4979	0.4977
13A	3	2/13/2016 13:32	2	10754	5377.00	87.4%	6149.53	12530.91	0.4907	0.4970
13A	4	2/13/2016 13:29	2	11814	5907.00	93.7%	6305.30	12531.30	0.5032	0.4957
13A	5	2/13/2016 13:38	2	11536	5768.00	95.3%	6053.16	12530.14	0.4831	0.4946
13A	6	2/13/2016 13:49	2	12158	6079.00	96.4%	6308.65	12528.80	0.5035	0.4935
13A	7	2/13/2016 13:46	2	11644	5822.00	93.3%	6240.04	12529.26	0.4980	0.4927
13A	8	2/13/2016 13:41	2	11382	5691.00	93.7%	6074.74	12529.77	0.4848	0.4916
13B	1	2/13/2016 13:29	2	11770	5885.00	91.0%	6466.58	12531.29	0.5160	0.5160
13B	2	2/13/2016 13:26	2	12412	6206.00	96.4%	6440.45	12531.65	0.5139	0.5131
13B	3	2/13/2016 13:35	2	10984	5492.00	87.4%	6281.05	12530.52	0.5013	0.5111
13B	4	2/13/2016 13:32	2	12093	6046.50	93.7%	6454.21	12530.90	0.5151	0.5080
13B	5	2/13/2016 13:38	2	12415	6207.50	95.3%	6514.39	12530.13	0.5199	0.5051
13B	6	2/20/2016 11:50	3	15859	5286.33	96.4%	5486.04	11394.63	0.4815	0.5022
13B	7	2/13/2016 13:50	2	11979	5989.50	93.3%	6419.57	12528.79	0.5124	0.5001
13B	8	2/13/2016 13:46	2	11574	5787.00	93.7%	6177.21	12529.25	0.4930	0.4974
13D	1	2/13/2016 13:35	2	9891	4945.50	91.0%	5434.23	12530.52	0.4337	0.4329
13D	2	2/13/2016 13:32	2	10349	5174.50	96.4%	5369.98	12530.90	0.4285	0.4316
13D	3	2/13/2016 13:29	2	9430	4715.00	87.4%	5392.42	12531.29	0.4303	0.4307
13D	4	2/13/2016 13:26	2	10192	5096.00	93.7%	5439.62	12531.65	0.4341	0.4292
13D	5	2/13/2016 13:50	2	9942	4971.00	95.3%	5216.76	12528.78	0.4164	0.4279
13D	6	2/13/2016 13:46	2	10496	5248.00	96.4%	5446.26	12529.24	0.4347	0.4266
13D	7	2/13/2016 13:42	2	10265	5132.50	93.3%	5501.03	12529.74	0.4390	0.4256
13D	8	2/13/2016 13:38	2	9675	4837.50	93.7%	5163.69	12530.12	0.4121	0.4244
14A	1	2/13/2016 13:39	2	12594	6297.00	91.0%	6919.29	12530.11	0.5522	0.5450
14A	2	2/13/2016 13:50	2	13180	6590.00	96.4%	6838.96	12528.77	0.5459	0.5432
14A	3	2/13/2016 13:46	2	11684	5842.00	87.4%	6681.34	12529.23	0.5333	0.5420
14A	4	2/13/2016 13:42	2	12548	6274.00	93.7%	6697.05	12529.73	0.5345	0.5400
14A	5	2/13/2016 13:26	2	12664	6332.00	95.3%	6645.04	12531.64	0.5303	0.5383
14A	6	2/13/2016 13:35	2	13167	6583.50	96.4%	6832.21	12530.51	0.5452	0.5365
14A	7	2/13/2016 13:32	2	12700	6350.00	93.3%	6805.95	12530.89	0.5431	0.5352
14A	8	2/13/2016 13:29	2	12428	6214.00	93.7%	6633.00	12531.28	0.5293	0.5336
14B	1	2/13/2016 13:42	2	12207	6103.50	91.0%	6706.67	12529.72	0.5353	0.5349
14B	2	2/13/2016 13:39	2	12992	6496.00	96.4%	6741.40	12530.10	0.5380	0.5326
14B	3	2/13/2016 13:50	2	11542	5771.00	87.4%	6600.14	12528.76	0.5268	0.5310
14B	4	2/13/2016 13:46	2	12382	6191.00	93.7%	6608.45	12529.22	0.5274	0.5284
14B	5	2/13/2016 13:29	2	12355	6177.50	95.3%	6482.90	12531.27	0.5173	0.5261
14B	6	2/13/2016 13:26	2	12776	6388.00	96.4%	6629.32	12531.64	0.5290	0.5238
14B	7	2/13/2016 13:35	2	12365	6182.50	93.3%	6626.42	12530.50	0.5288	0.5222
14B	8	2/13/2016 13:32	2	12122	6061.00	93.7%	6469.68	12530.88	0.5163	0.5200
14C	1	2/13/2016 13:46	2	12309	6154.50	91.0%	6762.71	12529.21	0.5398	0.5402
14C	2	2/13/2016 13:42	2	13176	6588.00	96.4%	6836.88	12529.71	0.5457	0.5386
14C	3	2/13/2016 13:39	2	11611	5805.50	87.4%	6639.60	12530.09	0.5299	0.5375
14C	4	2/13/2016 13:50	2	12686	6343.00	93.7%	6770.70	12528.75	0.5404	0.5358
14C	5	2/13/2016 13:32	2	12353	6176.50	95.3%	6481.86	12530.87	0.5173	0.5342
14C	6	2/13/2016 13:29	2	13062	6531.00	96.4%	6777.73	12531.26	0.5409	0.5327
14C	7	2/13/2016 13:26	2	12801	6400.50	93.3%	6860.08	12531.65	0.5474	0.5315
14C	8	2/13/2016 13:35	2	12190	6095.00	93.7%	6505.98	12530.49	0.5192	0.5300
14D	1	2/13/2016 13:50	2	12285	6142.50	91.0%	6749.52	12528.73	0.5387	0.5408
14D	2	2/13/2016 13:46	2	13132	6566.00	96.4%	6814.05	12529.20	0.5439	0.5378
14D	3	2/13/2016 13:42	2	11689	5844.50	87.4%	6684.20	12529.70	0.5335	0.5357
14D	4	2/13/2016 13:39	2	12477	6238.50	93.7%	6659.15	12530.08	0.5315	0.5324
14D	5	2/13/2016 13:35	2	12497	6248.50	95.3%	6557.41	12530.48	0.5233	0.5294
14D	6	2/13/2016 13:32	2	12844	6422.00	96.4%	6664.61	12530.86	0.5319	0.5264
14D	7	2/13/2016 13:29	2	12286	6143.00	93.3%	6584.09	12531.25	0.5254	0.5242
14D	8	2/13/2016 13:26	2	12206	6103.00	93.7%	6514.52	12531.65	0.5198	0.5213

Sr-89 Calibration



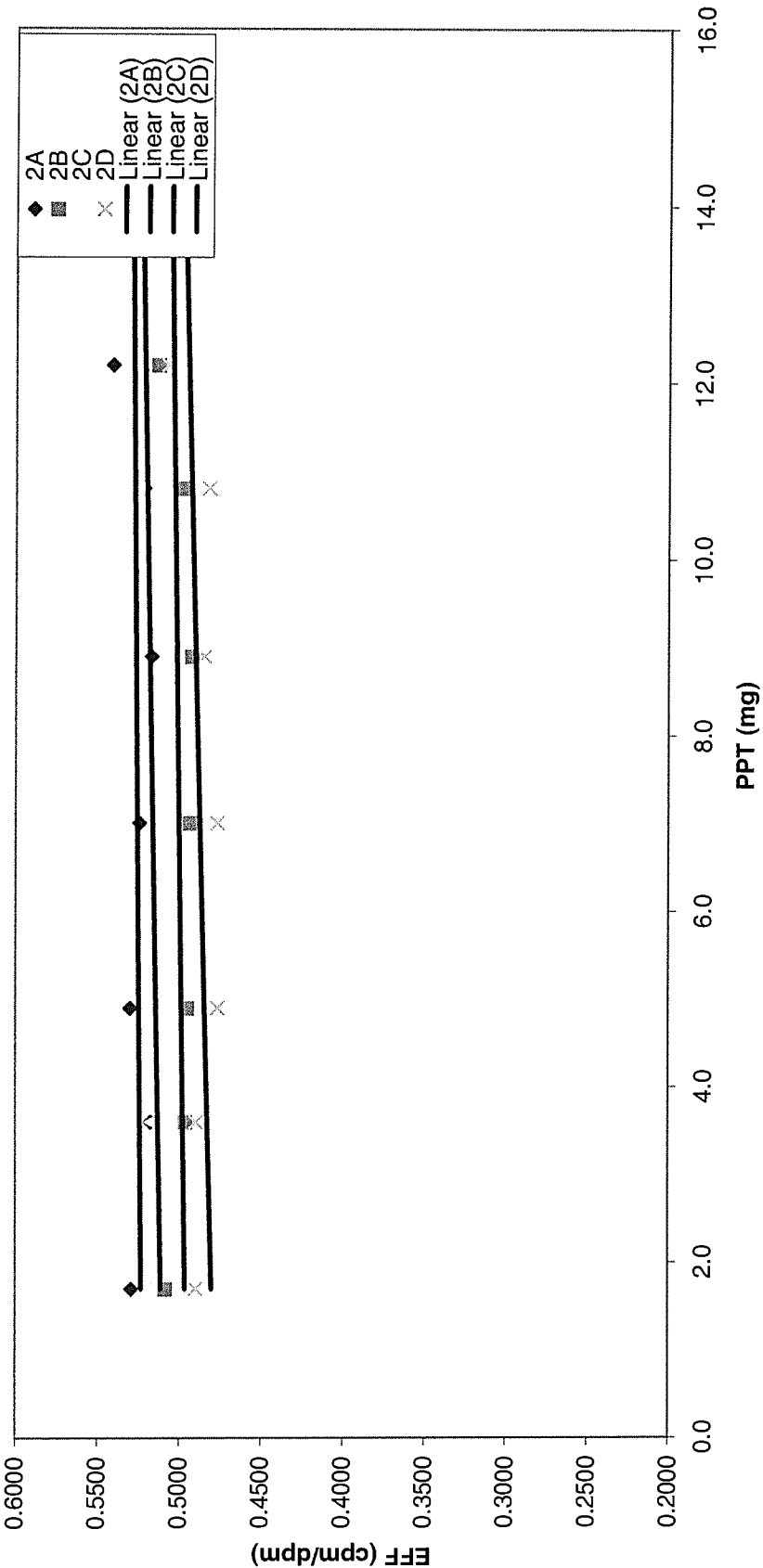
$$1A y = -1.823061E-04x + 5.312753E-01$$

$$1B y = -2.838927E-04x + 5.337135E-01$$

$$1C y = -3.407366E-05x + 5.382307E-01$$

$$1D y = -1.084148E-04x + 5.322082E-01$$

Sr-89 Calibration



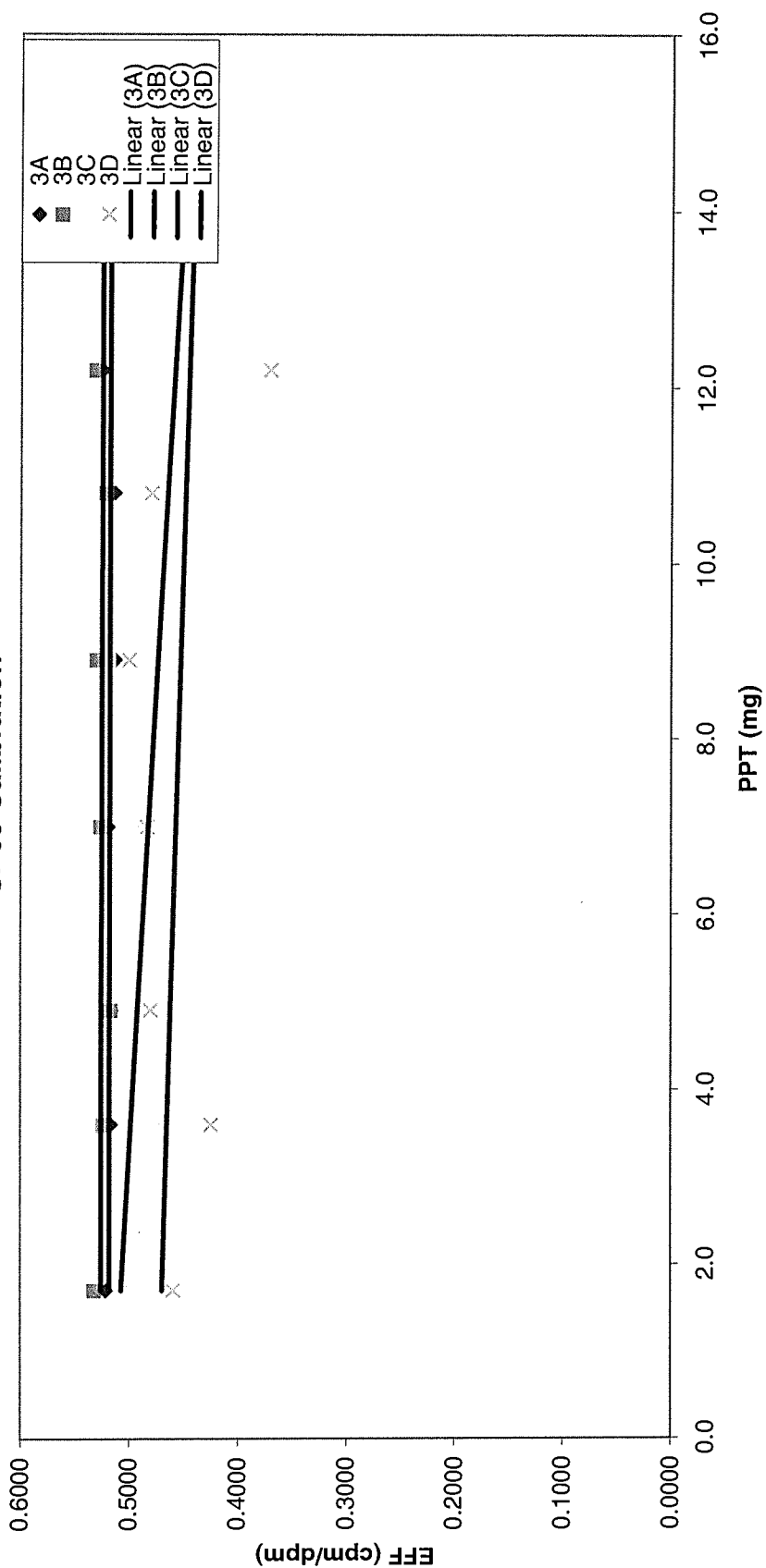
2A $y = 4.989765E-04x + 5.221775E-01$

2B $y = 7.319898E-04x + 4.951047E-01$

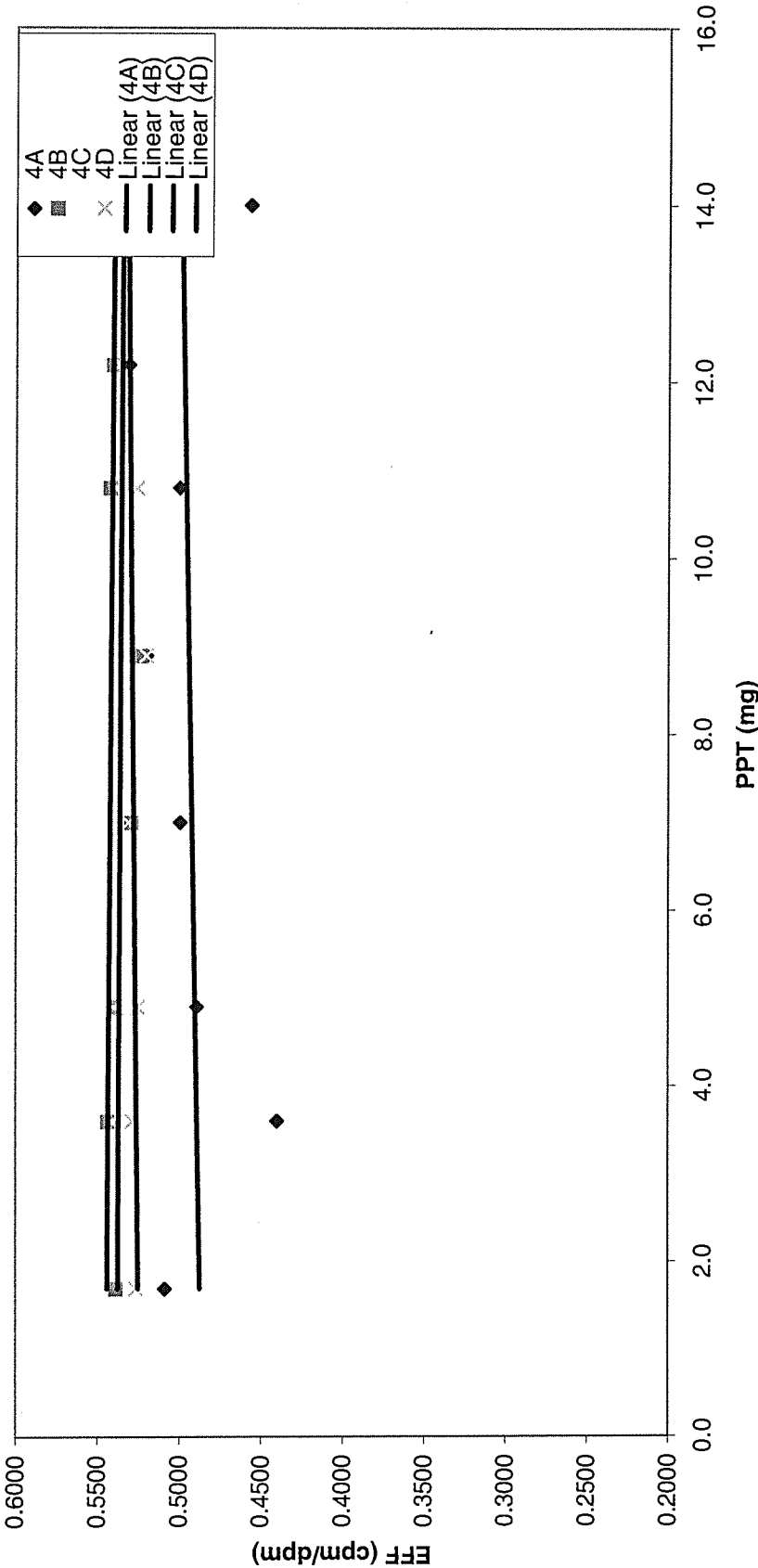
2C $y = 9.905720E-04x + 5.093624E-01$

2D $y = 1.395366E-03x + 4.777639E-01$

Sr-89 Calibration



Sr-89 Calibration



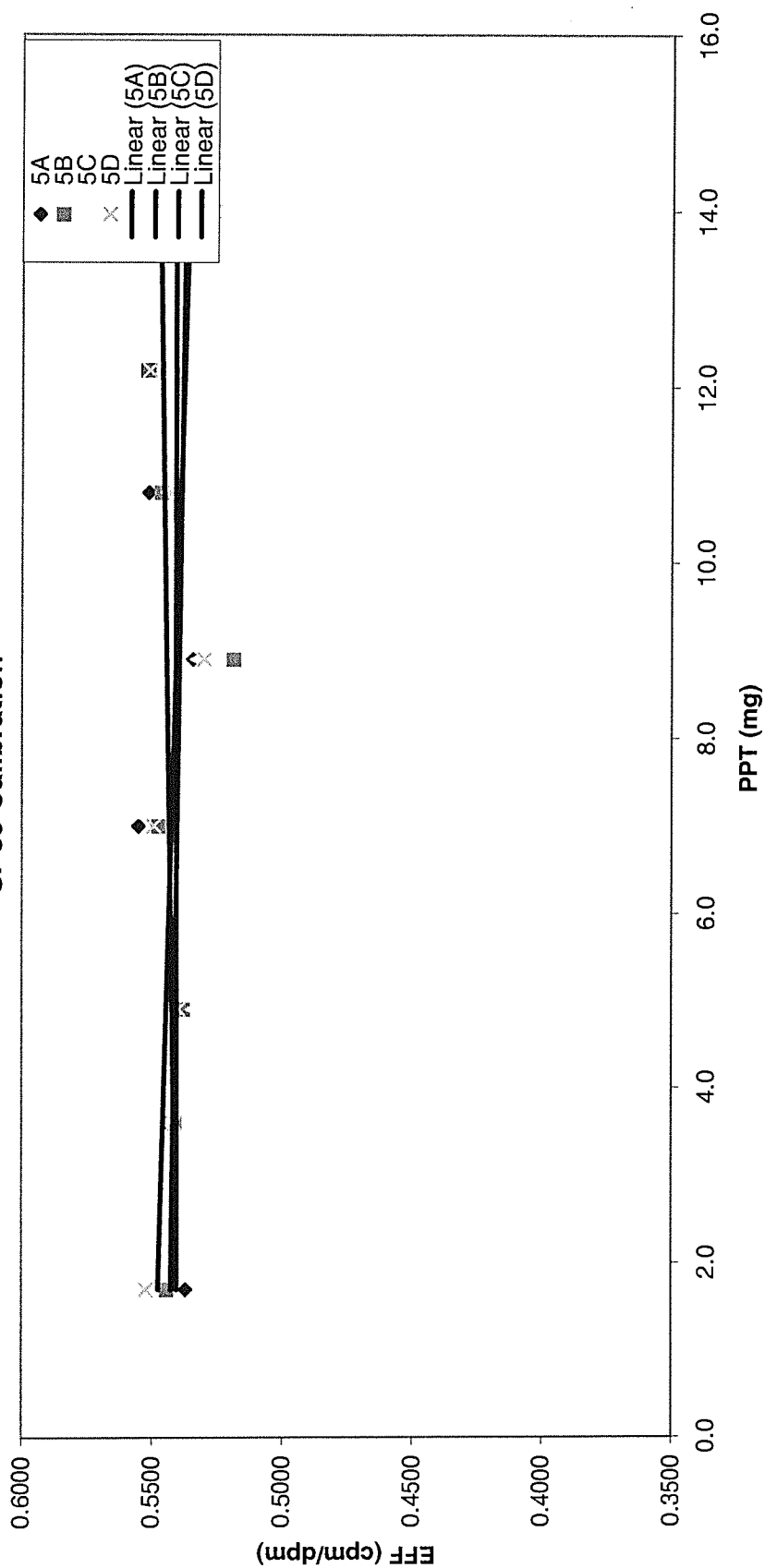
4A $y = 9.578653E-04x + 4.857303E-01$

4B $y = -1.896340E-04x + 5.378339E-01$

4C $y = -3.039450E-04x + 5.445981E-01$

4D $y = 5.621623E-04x + 5.242219E-01$

Sr-89 Calibration



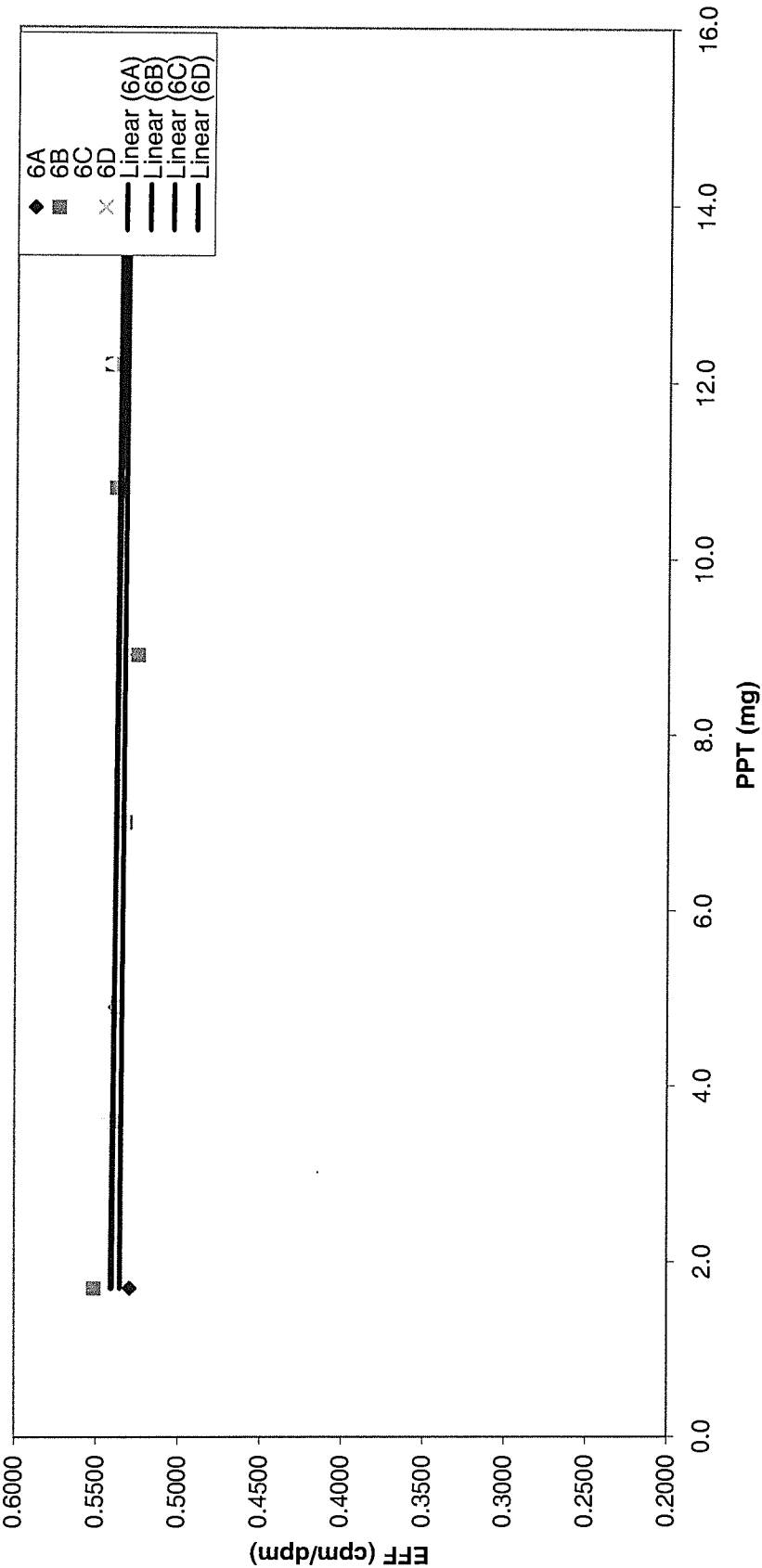
$$5A y = 5.321721E-04x + 5.397702E-01$$

$$5B y = 6.229218E-05x + 5.403352E-01$$

$$5C y = -4.256179E-04x + 5.434629E-01$$

$$5D y = -9.368761E-04x + 5.492070E-01$$

Sr-89 Calibration



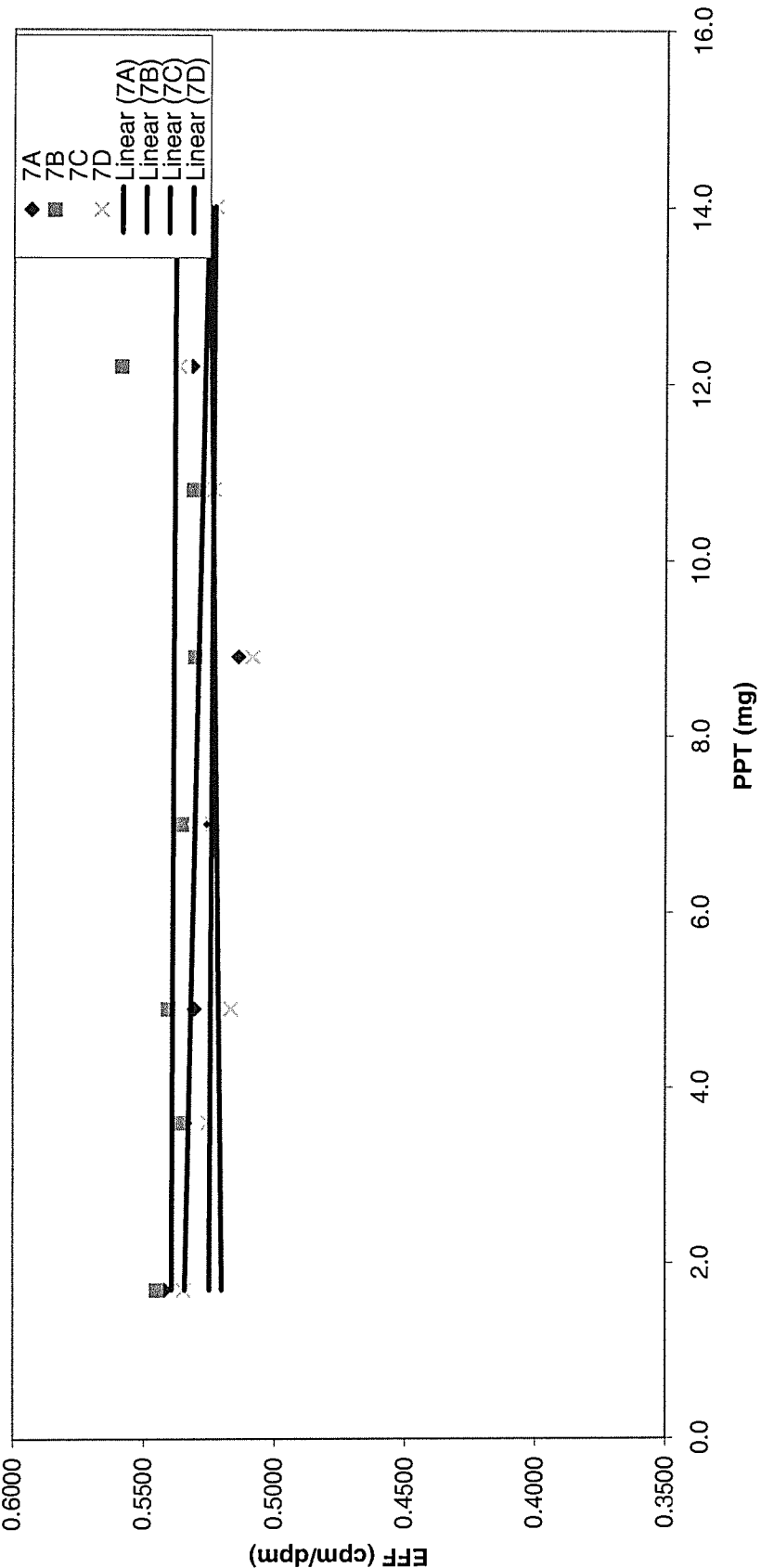
6A $y = -2.954615E-04x + 5.360409E-01$

6B $y = -5.486034E-04x + 5.421619E-01$

6C $y = -3.703655E-04x + 5.409769E-01$

6D

Sr-89 Calibration



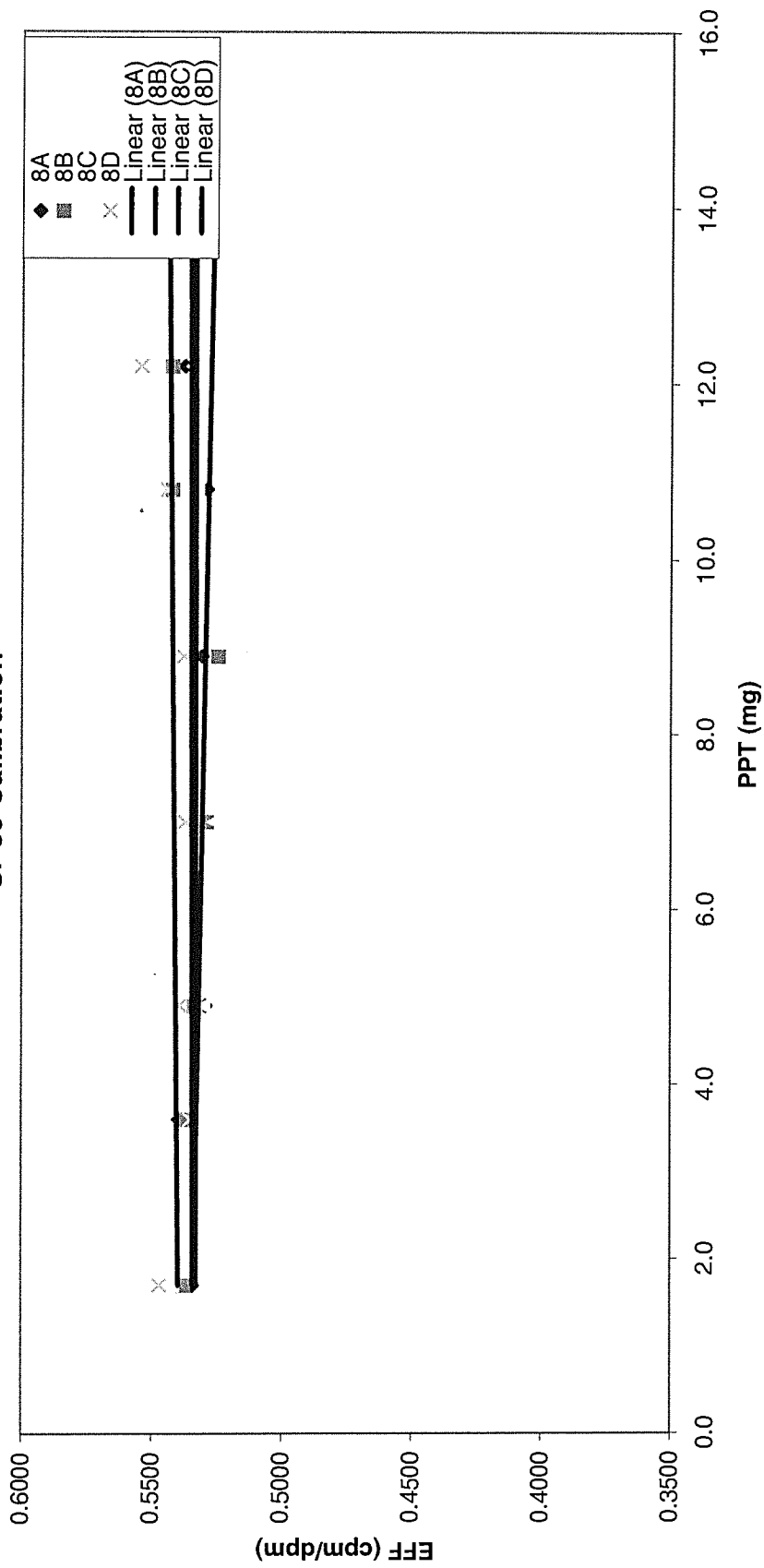
7Ay = -7.074090E-04x + 5.354467E-01

7By = -9.136013E-05x + 5.394258E-01

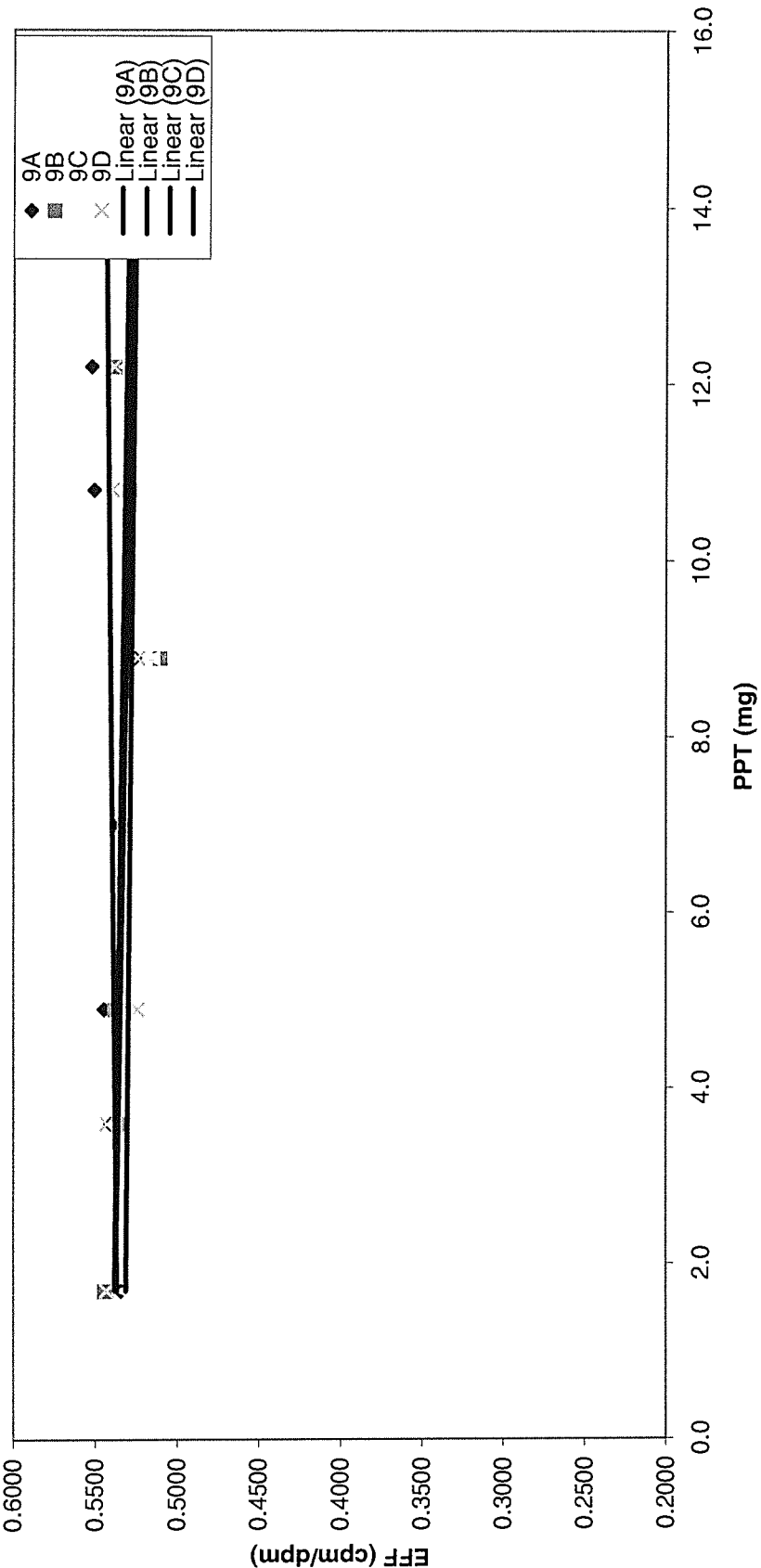
7Cy = 4.128261E-04x + 5.194104E-01

7Dy = -1.369024E-04x + 5.251294E-01

Sr-89 Calibration



Sr-89 Calibration



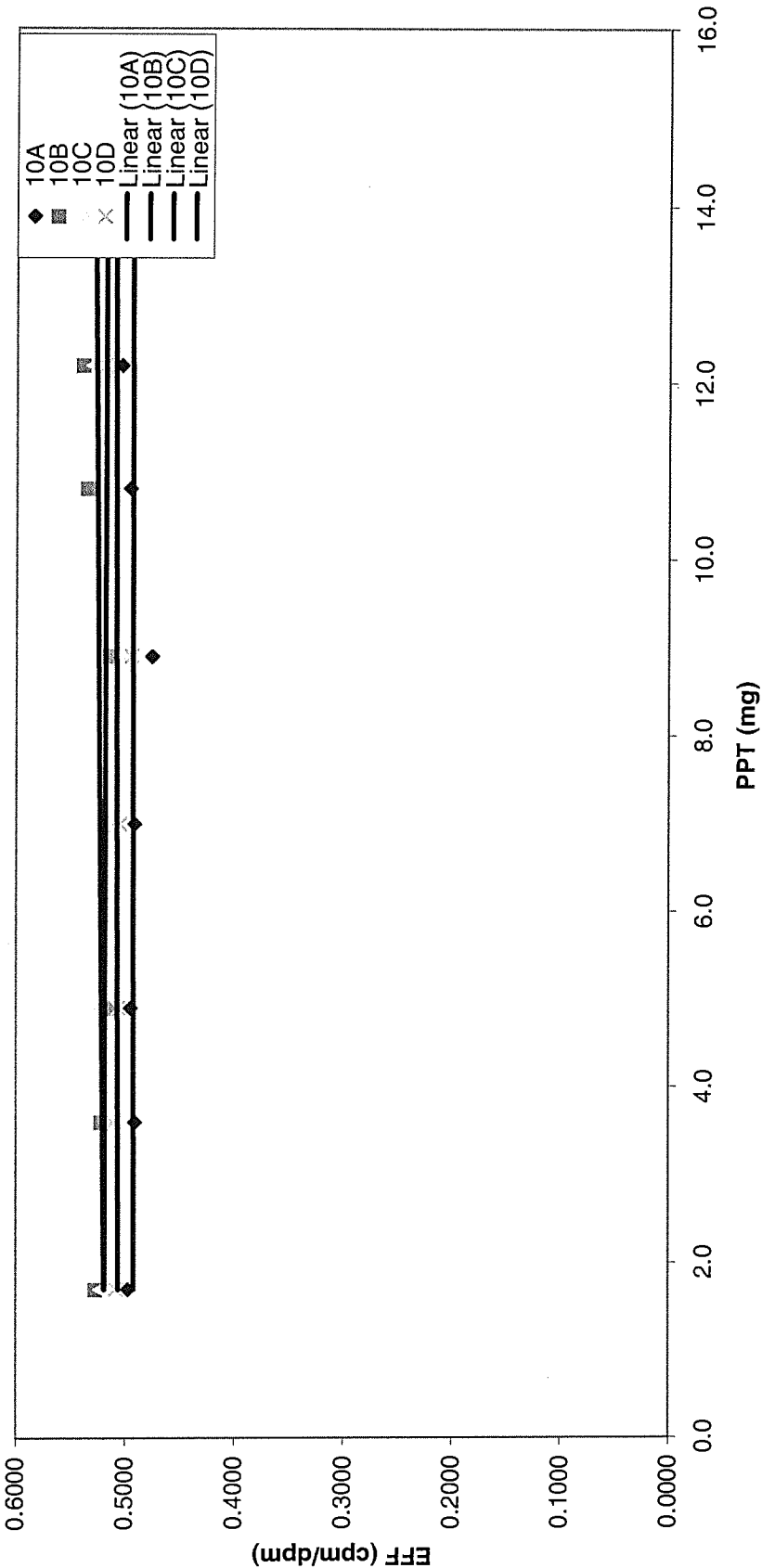
9A $y = 5.669070E-04x + 5.358253E-01$

9B $y = -9.242080E-04x + 5.392862E-01$

9C $y = -4.813122E-04x + 5.321824E-01$

9D $y = -6.958040E-04x + 5.393922E-01$

Sr-89 Calibration



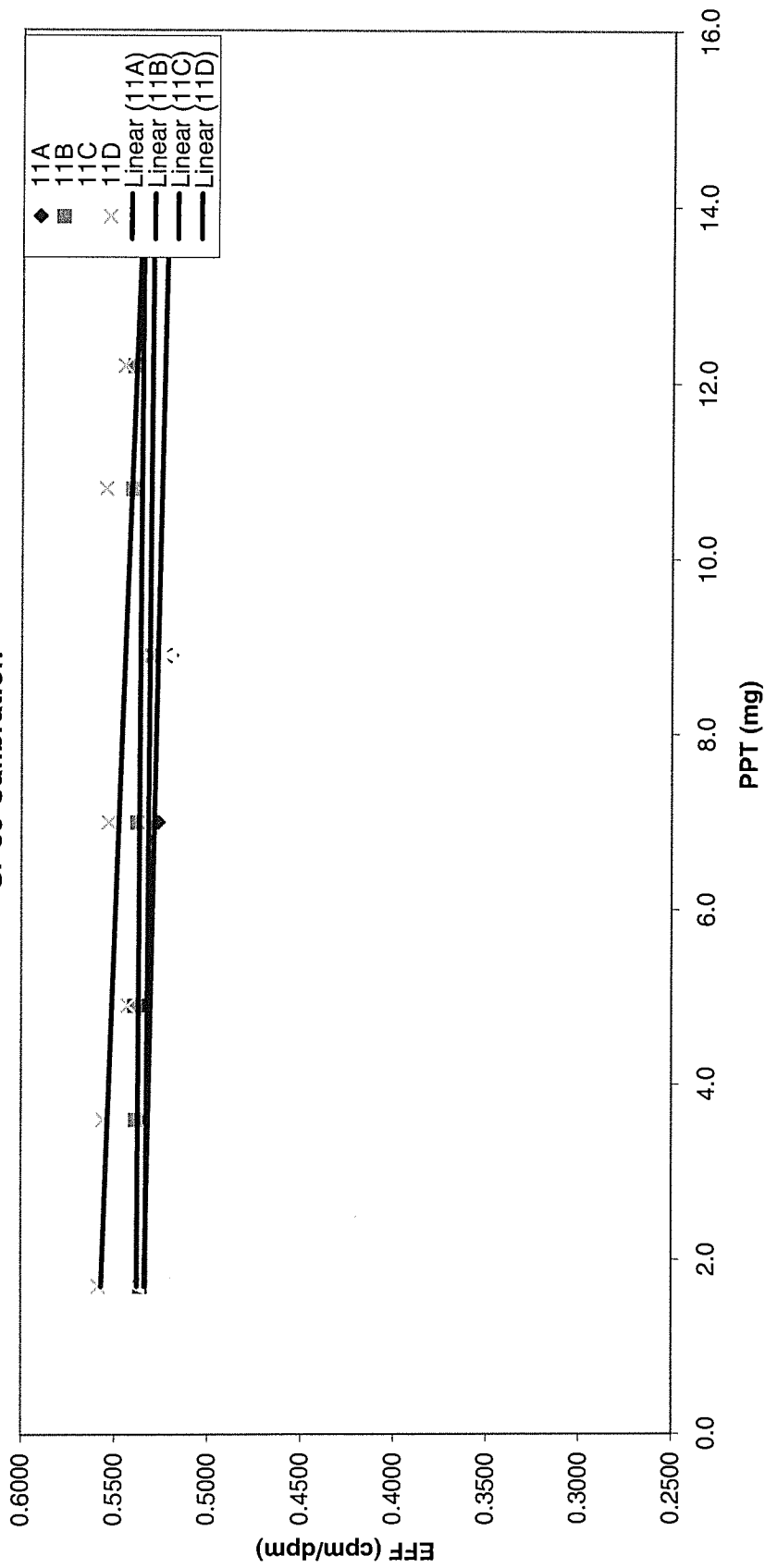
10A $y = 1.493597E-04x + 4.917867E-01$

10B $y = 7.339074E-04x + 5.180304E-01$

10C $y = -6.789001E-05x + 5.188094E-01$

10D $y = 2.808326E-04x + 5.056566E-01$

Sr-89 Calibration



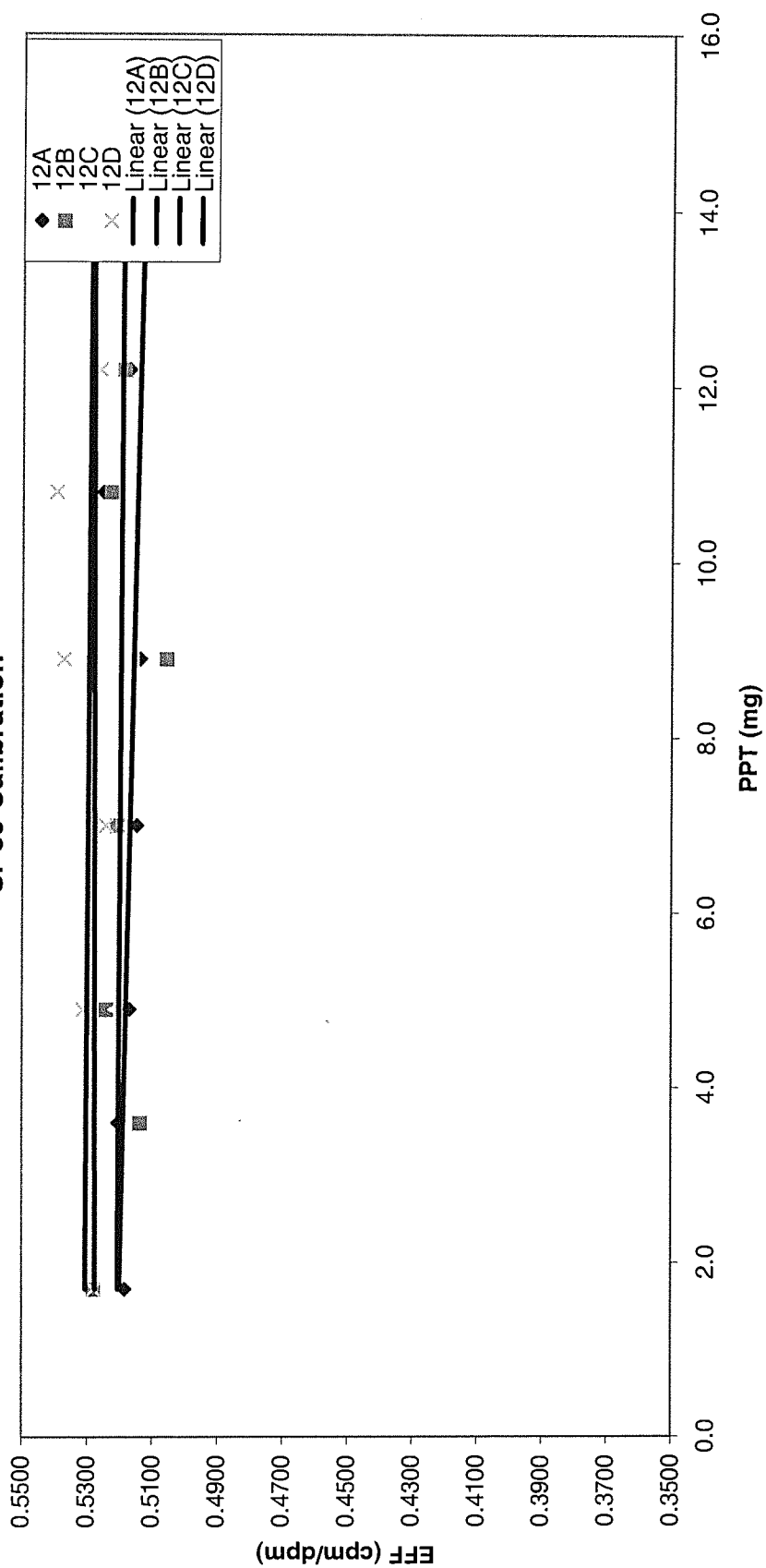
11A $y = -2.889431E-04x + 5.338425E-01$

11B $y = -2.058842E-04x + 5.382118E-01$

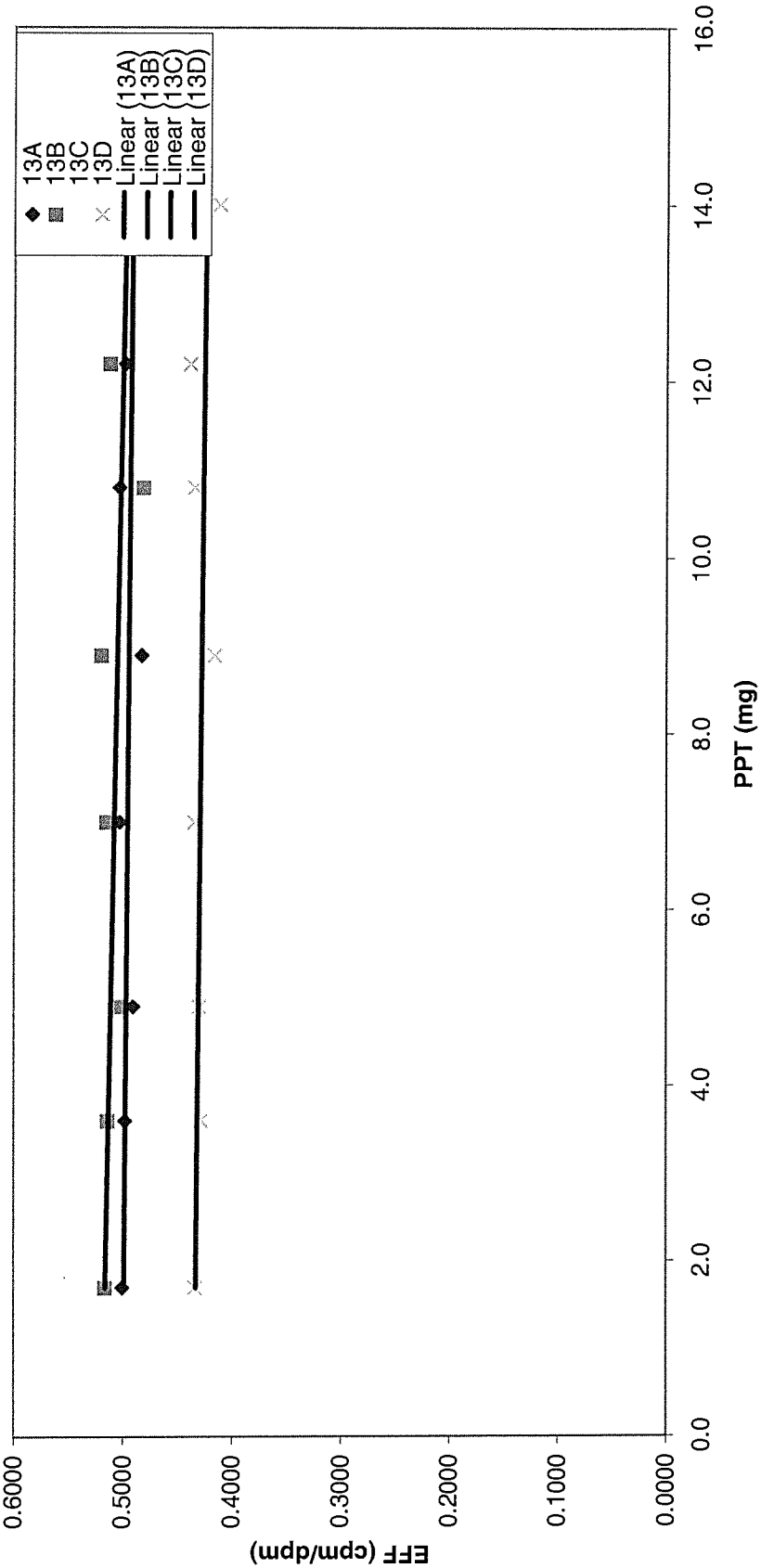
11C $y = -9.576148E-04x + 5.354543E-01$

11D $y = -1.720957E-03x + 5.598722E-01$

Sr-89 Calibration



Sr-89 Calibration



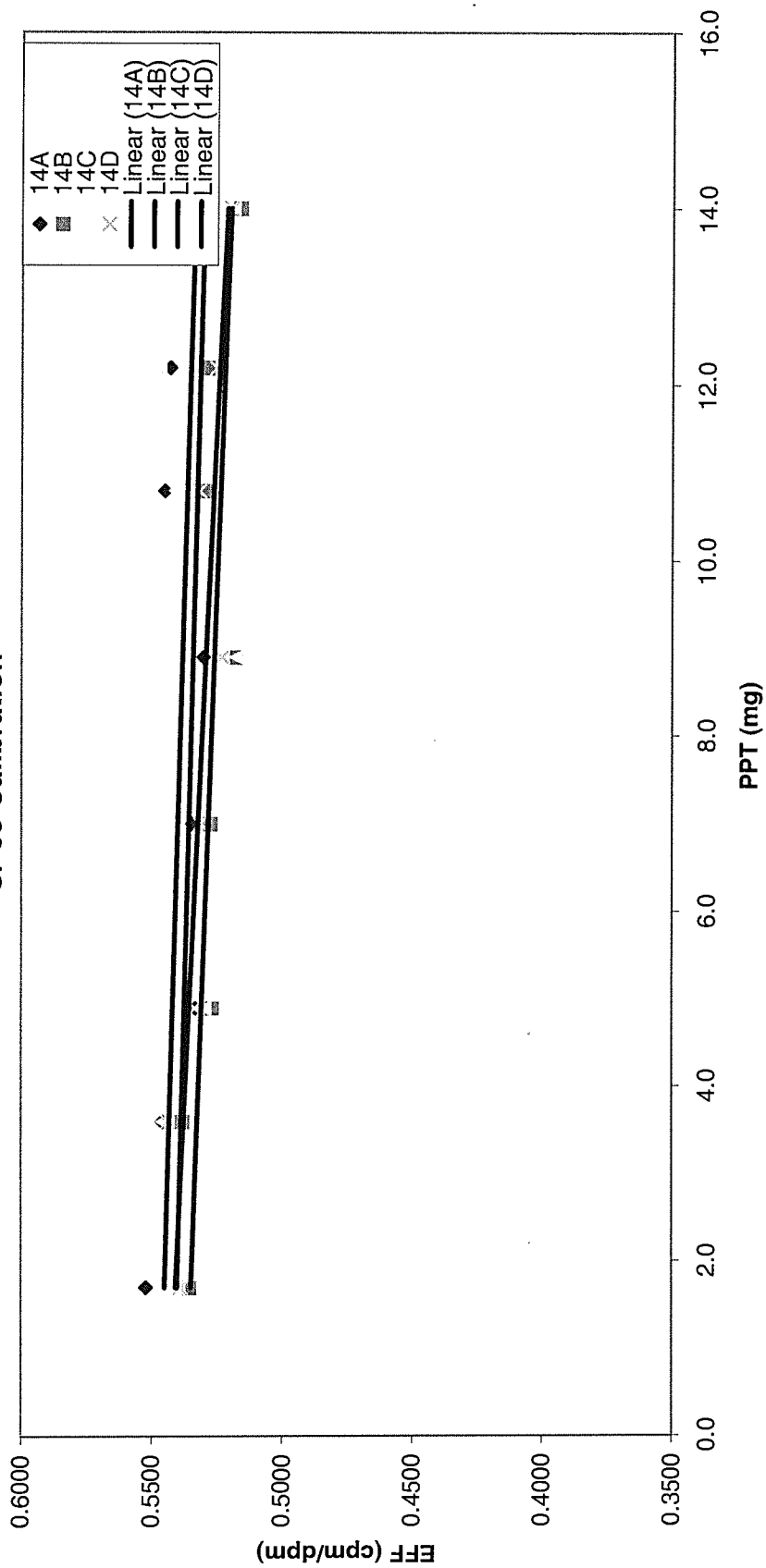
13A $y = -5.848099E-04x + 4.998331E-01$

13B $y = -1.510691E-03x + 5.185476E-01$

13C

13D $y = -6.950143E-04x + 4.340833E-01$

Sr-89 Calibration



$$14A \quad y = -9.256442E-04x + 5.465238E-01$$

$$14B \quad y = -1.210656E-03x + 5.369225E-01$$

$$14C \quad y = -8.225808E-04x + 5.415484E-01$$

$$14D \quad y = -1.579363E-03x + 5.434485E-01$$

Current Calibration - PIC

Geometry	Tuffryn Filter		4/1/2016 Exp Date		2/28/2017	
Sr-89	Cal Date					
Protean	A0	A1	A2	A3	A4	
1A	5.312753E-01	-1.823061E-04				
1B	5.337135E-01	-2.838927E-04				
1C	5.382307E-01	-3.407366E-05				
1D	5.322082E-01	-1.084148E-04				
2A	5.221775E-01	4.989765E-04				
2B	4.951047E-01	7.319898E-04				
2C	5.093624E-01	9.905720E-04				
2D	4.777639E-01	1.395366E-03				
3A	5.180758E-01	4.501234E-07				
3B	5.259466E-01	-5.611259E-05				
3C	5.151621E-01	-4.632474E-03				
3D	4.735880E-01	-2.314594E-03				
4A	4.857303E-01	9.578653E-04				
4B	5.378339E-01	-1.896340E-04				
4C	5.445981E-01	-3.039450E-04				
4D	5.242219E-01	5.621623E-04				
5A	5.397702E-01	5.321721E-04				
5B	5.403352E-01	6.229218E-05				
5C	5.434629E-01	-4.256179E-04				
5D	5.492070E-01	-9.368761E-04				
6A	5.360409E-01	-2.954615E-04				
6B	5.421619E-01	-5.486034E-04				
6C	5.409769E-01	-3.703655E-04				
6D	#N/A	#N/A				
7A	5.354467E-01	-7.074090E-04				
7B	5.394258E-01	-9.136013E-05				
7C	5.194104E-01	4.128261E-04				
7D	5.251294E-01	-1.369024E-04				
8A	5.327234E-01	5.558633E-05				
8B	5.339323E-01	1.046295E-04				
8C	5.348826E-01	-6.019048E-04				
8D	5.390479E-01	3.423211E-04				
9A	5.358253E-01	5.669070E-04				
9B	5.392862E-01	-9.242080E-04				
9C	5.321824E-01	-4.813122E-04				
9D	5.393922E-01	-6.958040E-04				
10A	4.917867E-01	1.493597E-04				
10B	5.180304E-01	7.339074E-04				
10C	5.188094E-01	-6.789001E-05				
10D	5.056566E-01	2.808326E-04				
11A	5.338425E-01	-2.889431E-04				
11B	5.382118E-01	-2.058842E-04				
11C	5.354543E-01	-9.576148E-04				
11D	5.598722E-01	-1.720957E-03				
12A	5.210444E-01	-5.813029E-04				
12B	5.207035E-01	-1.020456E-04				
12C	5.273823E-01	6.533601E-05				
12D	5.306928E-01	-1.218315E-04				
13A	4.998331E-01	-5.848099E-04				
13B	5.185476E-01	-1.510691E-03				
13C	#N/A	#N/A				
13D	4.340833E-01	-6.950143E-04				
14A	5.465238E-01	-9.256442E-04				
14B	5.369225E-01	-1.210656E-03				
14C	5.415484E-01	-8.225808E-04				
14D	5.434485E-01	-1.579363E-03				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
C1	10A	2	0	11343	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C2	10A	2	0	11861	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C3	10A	2	1	10851	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C4	10A	2	1	11547	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C5	10A	2	0	11374	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C6	10A	2	1	11975	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C7	10A	2	0	11786	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C8	10A	2	0	11597	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C1	10B	2	2	12025	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C2	10B	2	7	12608	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C3	10B	2	3	11275	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C4	10B	2	4	12156	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C5	10B	2	5	12288	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C6	10B	2	3	12928	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C7	10B	2	6	12615	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C8	10B	2	3	12246	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C1	10C	2	3	11924	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C2	10C	2	1	12409	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C3	10C	2	4	11567	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C4	10C	2	1	12180	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C5	10C	2	2	11909	2/13/2016 12:38	2/13/2016 12:40	PIC	SR89C16
C6	10C	2	6	12500	2/13/2016 12:35	2/13/2016 12:37	PIC	SR89C16
C7	10C	2	3	12404	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C8	10C	2	3	12165	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C1	10D	2	1	11599	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C2	10D	2	0	12344	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C3	10D	2	1	12527	2/13/2016 12:38	2/13/2016 12:40	PIC	SR89C16
C3	10D	2	0	11102	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C4	10D	2	0	11872	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C5	10D	2	0	11821	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C7	10D	2	0	12137	2/13/2016 12:35	2/13/2016 12:37	PIC	SR89C16
C8	10D	2	0	11972	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C1	11A	2	0	12240	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C2	11A	2	0	12864	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C3	11A	2	0	11721	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C4	11A	2	0	12367	2/13/2016 13:01	2/13/2016 13:03	PIC	SR89C16

C5	11A	2	0	12418	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C6	11A	2	1	13026	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C7	11A	2	1	12533	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C8	11A	2	0	12375	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C1	11B	2	0	12226	2/13/2016 13:01	2/13/2016 13:03	PIC	SR89C16
C2	11B	2	0	13006	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C3	11B	2	0	11817	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C4	11B	2	0	12632	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C5	11B	2	0	12659	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C6	11B	2	0	13058	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C7	11B	2	0	12620	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C8	11B	2	0	12472	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C1	11C	2	1	12263	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C2	11C	2	0	12809	2/13/2016 13:01	2/13/2016 13:03	PIC	SR89C16
C3	11C	2	0	11453	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C4	11C	2	0	12528	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C5	11C	2	0	12439	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C6	11C	2	0	12902	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C7	11C	2	0	12475	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C8	11C	2	0	12001	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C1	11D	2	0	12747	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C2	11D	2	0	13426	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C3	11D	2	1	11899	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C4	11D	2	1	12990	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C5	11D	2	0	12735	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C6	11D	2	0	13403	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C7	11D	2	0	12746	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C8	11D	2	0	12369	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C1	12A	2	0	11826	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C2	12A	2	0	12570	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C3	12A	2	1	11331	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C4	12A	2	0	12092	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16
C5	12A	2	1	12276	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C6	12A	2	0	12688	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C7	12A	2	0	12100	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C8	12A	2	0	11845	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C1	12B	2	0	12043	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16

C2	12B	2	0	12407	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C3	12B	2	0	11486	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C4	12B	2	0	12229	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C5	12B	2	0	12081	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C6	12B	2	0	12628	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C7	12B	2	0	12134	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C8	12B	2	1	12339	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C1	12C	2	0	12170	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C2	12C	2	2	12865	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16
C3	12C	2	0	11428	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C4	12C	2	0	12174	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C5	12C	2	0	12339	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C6	12C	2	2	13043	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C7	12C	2	0	12572	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C8	12C	2	0	12286	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C1	12D	2	0	12042	2/13/2016 13:23	2/13/2016 13:25	PIC	SR89C16
C2	12D	2	0	12787	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C3	12D	2	1	11643	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16
C4	12D	2	0	12314	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C5	12D	2	0	12837	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C6	12D	2	1	13037	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C7	12D	2	1	12313	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C8	12D	2	0	12244	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C1	13A	2	0	11415	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C2	13A	2	3	12024	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C3	13A	2	1	10754	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C4	13A	2	0	11814	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C5	13A	2	0	11536	2/13/2016 13:38	2/13/2016 13:40	PIC	SR89C16
C6	13A	2	4	12158	2/13/2016 13:49	2/13/2016 13:51	PIC	SR89C16
C7	13A	2	3	11644	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C8	13A	2	1	11382	2/13/2016 13:41	2/13/2016 13:43	PIC	SR89C16
C1	13B	2	2	11770	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C2	13B	2	1	12412	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C3	13B	2	0	10984	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C4	13B	2	0	12093	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C5	13B	2	0	12415	2/13/2016 13:38	2/13/2016 13:40	PIC	SR89C16
C6	13B	3	3	15859	2/20/2016 11:50	2/20/2016 11:53	PIC	SR89C16

C7	13B	2	1	11979	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C8	13B	2	1	11574	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C1	13D	2	5	9891	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C2	13D	2	4	10349	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C3	13D	2	1	9430	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C4	13D	2	0	10192	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C5	13D	2	10	9942	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C6	13D	2	9	10496	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C7	13D	2	7	10265	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C8	13D	2	0	9675	2/13/2016 13:38	2/13/2016 13:40	PIC	SR89C16
C1	14A	2	0	12594	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C2	14A	2	0	13180	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C3	14A	2	0	11684	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C4	14A	2	2	12548	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C5	14A	2	0	12664	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C6	14A	2	1	13167	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C7	14A	2	0	12700	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C8	14A	2	0	12428	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C1	14B	2	0	12207	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C2	14B	2	2	12992	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C3	14B	2	0	11542	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C4	14B	2	2	12382	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C5	14B	2	0	12355	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C6	14B	2	0	12776	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C7	14B	2	0	12365	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C8	14B	2	0	12122	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C1	14C	2	1	12309	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C2	14C	2	0	13176	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C3	14C	2	0	11611	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C4	14C	2	0	12686	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C5	14C	2	1	12353	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C6	14C	2	0	13062	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C7	14C	2	2	12801	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C8	14C	2	0	12190	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C1	14D	2	1	12285	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C2	14D	2	2	13132	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C3	14D	2	1	11689	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16

C4	14D	2	6	12477	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C5	14D	2	0	12497	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C6	14D	2	0	12844	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C7	14D	2	0	12286	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C8	14D	2	0	12206	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C1	1A	2	1	12427	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C2	1A	2	0	13208	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C3	1A	2	1	11754	2/12/2016 6:50	2/12/2016 6:52	PIC	SR89C16
C4	1A	2	2	12491	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C5	1A	2	2	12583	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16
C6	1A	2	4	13067	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C7	1A	2	2	12713	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C8	1A	2	0	12717	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C1	1B	2	12	12488	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C2	1B	2	6	13267	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C3	1B	2	4	11650	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C4	1B	2	13	12651	2/12/2016 6:50	2/12/2016 6:52	PIC	SR89C16
C5	1B	2	8	12841	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C6	1B	2	10	12903	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16
C7	1B	2	9	12701	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C8	1B	2	14	12779	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C1	1C	2	86	12525	2/12/2016 6:50	2/12/2016 6:52	PIC	SR89C16
C2	1C	2	88	13293	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C3	1C	2	84	11907	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C4	1C	2	89	12818	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C5	1C	2	85	13004	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C6	1C	2	91	13177	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C7	1C	2	93	13095	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16
C8	1C	2	85	12691	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C1	1D	2	74	12483	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C2	1D	2	68	12948	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C3	1D	2	60	11880	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C4	1D	2	67	12591	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C5	1D	2	65	12829	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C6	1D	2	63	13063	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C7	1D	2	60	12875	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C8	1D	2	46	12566	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16

C1	2A	2	6	12279	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C2	2A	2	5	12709	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C3	2A	2	2	11820	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C4	2A	2	5	12528	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C5	2A	2	6	12570	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C6	2A	2	1	12822	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C7	2A	2	5	12867	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C8	2A	2	3	12631	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C1	2B	2	0	11795	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C2	2B	2	0	12190	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C3	2B	2	0	11039	2/12/2016 7:13	2/12/2016 7:15	PIC	SR89C16
C4	2B	2	0	11792	2/12/2016 7:08	2/12/2016 7:10	PIC	SR89C16
C5	2B	2	0	11966	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C6	2B	2	0	12226	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C7	2B	2	0	12210	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C8	2B	2	0	12216	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C1	2C	2	9	12076	2/12/2016 7:08	2/12/2016 7:10	PIC	SR89C16
C2	2C	2	6	12701	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C3	2C	2	12	11357	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C4	2C	2	8	12114	2/12/2016 7:13	2/12/2016 7:15	PIC	SR89C16
C5	2C	2	12	12228	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C6	2C	2	9	12933	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C7	2C	2	15	12558	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C8	2C	2	5	12588	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C1	2D	2	0	11364	2/12/2016 7:13	2/12/2016 7:15	PIC	SR89C16
C2	2D	2	0	12029	2/12/2016 7:08	2/12/2016 7:10	PIC	SR89C16
C3	2D	2	0	10628	2/12/2016 7:04	2/12/2016 7:06	PIC	SR89C16
C4	2D	2	0	11391	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C5	2D	2	0	11786	2/12/2016 6:56	2/12/2016 6:58	PIC	SR89C16
C6	2D	2	0	11842	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C7	2D	2	0	12068	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C8	2D	2	0	12036	2/12/2016 6:37	2/12/2016 6:39	PIC	SR89C16
C1	3A	2	195	12099	2/12/2016 7:17	2/12/2016 7:19	PIC	SR89C16
C2	3A	2	158	12697	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C3	3A	2	171	11515	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C4	3A	2	197	12412	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C5	3A	2	160	12472	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16

C6	3A	2	176	12621	2/12/2016 7:47	2/12/2016 7:49	PIC	SR89C16
C7	3A	2	201	12498	2/12/2016 7:44	2/12/2016 7:46	PIC	SR89C16
C8	3A	2	151	12362	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C1	3B	2	81	12341	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C2	3B	2	86	12861	2/12/2016 7:17	2/12/2016 7:19	PIC	SR89C16
C3	3B	2	65	11526	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C4	3B	2	76	12573	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C5	3B	2	89	12877	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C6	3B	2	81	12819	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16
C7	3B	2	60	12635	2/12/2016 7:47	2/12/2016 7:49	PIC	SR89C16
C8	3B	2	84	12471	2/12/2016 7:44	2/12/2016 7:46	PIC	SR89C16
C1	3C	3	63	15683	2/20/2016 11:56	2/20/2016 11:59	PIC	SR89C16
C2	3C	2	45	10521	2/20/2016 11:25	2/20/2016 11:27	PIC	SR89C16
C3	3C	3	83	14628	2/20/2016 12:13	2/20/2016 12:16	PIC	SR89C16
C4	3C	3	69	15762	2/20/2016 12:19	2/20/2016 12:22	PIC	SR89C16
C5	3C	3	82	16928	2/20/2016 11:35	2/20/2016 11:38	PIC	SR89C16
C6	3C	3	60	16450	2/20/2016 11:40	2/20/2016 11:43	PIC	SR89C16
C7	3C	3	34	12123	2/20/2016 11:46	2/20/2016 11:49	PIC	SR89C16
C8	3C	3	63	14890	2/20/2016 11:50	2/20/2016 11:53	PIC	SR89C16
C1	3D	2	16	9525	2/20/2016 11:26	2/20/2016 11:28	PIC	SR89C16
C2	3D	3	21	13991	2/20/2016 11:56	2/20/2016 11:59	PIC	SR89C16
C3	3D	3	20	14344	2/20/2016 12:19	2/20/2016 12:22	PIC	SR89C16
C4	3D	3	33	15478	2/20/2016 12:13	2/20/2016 12:16	PIC	SR89C16
C5	3D	3	30	16293	2/20/2016 11:40	2/20/2016 11:43	PIC	SR89C16
C6	3D	3	27	15808	2/20/2016 11:36	2/20/2016 11:39	PIC	SR89C16
C7	3D	3	24	11821	2/20/2016 11:50	2/20/2016 11:53	PIC	SR89C16
C8	3D	3	18	14240	2/20/2016 11:46	2/20/2016 11:49	PIC	SR89C16
C1	4A	3	55	15827	2/20/2016 11:40	2/20/2016 11:43	PIC	SR89C16
C2	4A	3	50	14499	2/20/2016 11:46	2/20/2016 11:49	PIC	SR89C16
C3	4A	3	38	14629	2/20/2016 11:51	2/20/2016 11:54	PIC	SR89C16
C4	4A	3	54	15998	2/20/2016 11:56	2/20/2016 11:59	PIC	SR89C16
C5	4A	3	67	16942	2/20/2016 12:13	2/20/2016 12:16	PIC	SR89C16
C6	4A	3	49	16472	2/20/2016 12:19	2/20/2016 12:22	PIC	SR89C16
C7	4A	2	41	12633	2/12/2016 7:29	2/12/2016 7:31	PIC	SR89C16
C8	4A	3	56	14634	2/20/2016 11:36	2/20/2016 11:39	PIC	SR89C16
C1	4B	2	0	12496	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C2	4B	2	0	13353	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16

C3	4B	2	0	11968	2/12/2016 7:48	2/12/2016 7:50	PIC	SR89C16
C4	4B	2	0	12643	2/12/2016 7:45	2/12/2016 7:47	PIC	SR89C16
C5	4B	2	0	12727	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C6	4B	2	0	13327	2/12/2016 7:17	2/12/2016 7:19	PIC	SR89C16
C7	4B	2	0	12883	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C8	4B	2	0	12764	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C1	4C	2	14	12761	2/12/2016 7:45	2/12/2016 7:47	PIC	SR89C16
C2	4C	2	20	13234	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C3	4C	2	25	11973	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16
C4	4C	2	17	13178	2/12/2016 7:48	2/12/2016 7:50	PIC	SR89C16
C5	4C	2	18	12993	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C6	4C	2	23	13186	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C7	4C	2	17	13083	2/12/2016 7:20	2/12/2016 7:22	PIC	SR89C16
C8	4C	2	20	12861	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C1	4D	2	87	12214	2/12/2016 7:48	2/12/2016 7:50	PIC	SR89C16
C2	4D	2	111	12985	2/12/2016 7:45	2/12/2016 7:47	PIC	SR89C16
C3	4D	2	100	11710	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C4	4D	2	91	12689	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16
C5	4D	2	104	12641	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C6	4D	2	98	12926	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C7	4D	2	100	12778	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C8	4D	2	99	12754	2/12/2016 7:20	2/12/2016 7:22	PIC	SR89C16
C1	5A	2	22	12457	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C2	5A	2	24	13359	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C3	5A	2	20	11998	2/12/2016 7:58	2/12/2016 8:00	PIC	SR89C16
C4	5A	2	19	13258	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C5	5A	2	20	12979	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
C6	5A	2	27	13542	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16
C7	5A	2	22	13110	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C8	5A	2	10	12894	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C1	5B	2	22	12623	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C2	5B	2	26	13294	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C3	5B	2	18	11991	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C4	5B	2	31	13073	2/12/2016 7:59	2/12/2016 8:01	PIC	SR89C16
C5	5B	2	24	12595	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C6	5B	2	25	13425	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
C7	5B	2	23	13122	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16

C8	5B	2	21	12858	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C1	5C	2	26	12800	2/12/2016 7:59	2/12/2016 8:01	PIC	SR89C16
C2	5C	2	31	13380	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C3	5C	2	21	11910	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C4	5C	2	32	12654	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C5	5C	2	34	12938	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C6	5C	2	28	13368	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C7	5C	2	16	12990	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
C8	5C	2	31	12811	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16
C1	5D	2	27	12811	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C2	5D	2	30	13302	2/12/2016 7:59	2/12/2016 8:01	PIC	SR89C16
C3	5D	2	27	12034	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C4	5D	2	38	13117	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C5	5D	2	38	12876	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16
C6	5D	2	34	13332	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C7	5D	2	37	13112	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C8	5D	2	26	12580	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
C1	6A	2	27	12279	2/12/2016 8:08	2/12/2016 8:10	PIC	SR89C16
C2	6A	2	39	13280	2/12/2016 8:20	2/12/2016 8:22	PIC	SR89C16
C3	6A	2	33	12002	2/12/2016 8:16	2/12/2016 8:18	PIC	SR89C16
C4	6A	2	29	12744	2/12/2016 8:12	2/12/2016 8:14	PIC	SR89C16
C5	6A	2	22	12775	2/12/2016 7:53	2/12/2016 7:55	PIC	SR89C16
C6	6A	2	32	13076	2/12/2016 8:04	2/12/2016 8:06	PIC	SR89C16
C7	6A	2	36	12916	2/12/2016 8:00	2/12/2016 8:02	PIC	SR89C16
C8	6A	2	31	12551	2/12/2016 7:57	2/12/2016 7:59	PIC	SR89C16
C1	6B	2	37	12782	2/12/2016 8:12	2/12/2016 8:14	PIC	SR89C16
C2	6B	2	35	13217	2/12/2016 8:08	2/12/2016 8:10	PIC	SR89C16
C3	6B	2	44	11967	2/12/2016 8:20	2/12/2016 8:22	PIC	SR89C16
C4	6B	2	60	12723	2/12/2016 8:16	2/12/2016 8:18	PIC	SR89C16
C5	6B	2	48	12759	2/12/2016 7:57	2/12/2016 7:59	PIC	SR89C16
C6	6B	2	67	13236	2/12/2016 7:53	2/12/2016 7:55	PIC	SR89C16
C7	6B	2	38	12890	2/12/2016 8:04	2/12/2016 8:06	PIC	SR89C16
C8	6B	2	39	12827	2/12/2016 8:00	2/12/2016 8:02	PIC	SR89C16
C1	6C	2	59	12525	2/12/2016 8:16	2/12/2016 8:18	PIC	SR89C16
C2	6C	2	75	13400	2/12/2016 8:12	2/12/2016 8:14	PIC	SR89C16
C3	6C	2	64	11967	2/12/2016 8:08	2/12/2016 8:10	PIC	SR89C16
C4	6C	2	60	12767	2/12/2016 8:20	2/12/2016 8:22	PIC	SR89C16

C5	6C	2	84	13001	2/12/2016 8:00	2/12/2016 8:02	PIC	SR89C16
C6	6C	2	50	13069	2/12/2016 7:57	2/12/2016 7:59	PIC	SR89C16
C7	6C	2	69	12943	2/12/2016 7:53	2/12/2016 7:55	PIC	SR89C16
C8	6C	2	46	12783	2/12/2016 8:04	2/12/2016 8:06	PIC	SR89C16
C1	7A	2	5	12376	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C2	7A	2	6	12913	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C3	7A	2	5	11638	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C4	7A	2	7	12323	2/13/2016 12:06	2/13/2016 12:08	PIC	SR89C16
C5	7A	2	3	12280	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C6	7A	2	4	12839	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C7	7A	2	6	12446	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C8	7A	2	9	12459	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C1	7B	2	9	12440	2/13/2016 12:06	2/13/2016 12:08	PIC	SR89C16
C2	7B	2	7	12952	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C3	7B	2	6	11854	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C4	7B	2	5	12584	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C5	7B	2	11	12675	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C6	7B	2	6	12838	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C7	7B	2	6	13073	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C8	7B	2	14	12507	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C1	7C	2	1	11936	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C2	7C	2	2	12584	2/13/2016 12:06	2/13/2016 12:08	PIC	SR89C16
C3	7C	2	0	11367	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C4	7C	2	2	12463	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C5	7C	2	1	12111	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C6	7C	2	4	12684	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C7	7C	2	2	12526	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C8	7C	2	2	12265	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C1	7D	2	6	12204	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C2	7D	2	3	12695	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C3	7D	2	1	11335	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C4	7D	2	1	12308	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C5	7D	2	2	12153	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C6	7D	2	3	12650	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C7	7D	2	1	12559	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C8	7D	2	2	12289	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C1	8A	2	10	12192	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16

C2	8A	2	11	13036	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C3	8A	2	11	11605	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C4	8A	2	8	12419	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C5	8A	2	10	12685	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C6	8A	2	9	12787	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C7	8A	2	6	12579	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C8	8A	2	10	12606	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C1	8B	2	0	12269	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C2	8B	2	0	12968	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C3	8B	2	0	11698	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C4	8B	2	0	12424	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C5	8B	2	0	12536	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C6	8B	2	0	13107	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C7	8B	2	0	12693	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C8	8B	2	2	12509	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C1	8C	2	2	12367	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C2	8C	2	0	12879	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C3	8C	2	2	11626	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C4	8C	2	3	12360	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C5	8C	2	0	12282	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C6	8C	2	4	12880	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C7	8C	2	2	12507	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C8	8C	2	3	12424	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C1	8D	2	23	12480	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C2	8D	2	33	12937	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C3	8D	2	34	11828	2/13/2016 12:20	2/13/2016 12:22	PIC	SR89C16
C4	8D	2	34	12626	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C5	8D	2	31	12853	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C6	8D	2	42	13155	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C7	8D	2	34	12972	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C8	8D	2	26	12656	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C1	9A	2	9	12191	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C2	9A	2	10	13057	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C3	9A	2	9	11939	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C4	9A	2	6	12613	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C5	9A	2	11	12569	2/13/2016 12:43	2/13/2016 12:45	PIC	SR89C16
C6	9A	2	5	13313	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16

C7	9A	2	8	12928	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C8	9A	2	10	12602	2/13/2016 12:46	2/13/2016 12:48	PIC	SR89C16
C1	9B	2	9	12418	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C2	9B	2	8	12913	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C3	9B	2	14	11796	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C4	9B	2	9	12501	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C5	9B	2	7	12192	2/13/2016 12:46	2/13/2016 12:48	PIC	SR89C16
C6	9B	2	8	12780	2/13/2016 12:43	2/13/2016 12:45	PIC	SR89C16
C7	9B	2	8	12593	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C8	9B	2	11	12439	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C1	9C	2	16	12142	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C2	9C	2	21	13005	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C3	9C	2	12	11557	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C4	9C	2	25	12333	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C5	9C	2	13	12303	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C6	9C	2	20	12863	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C7	9C	2	12	12446	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C8	9C	2	12	12337	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C1	9D	2	17	12393	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C2	9D	2	24	13114	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C3	9D	2	17	11494	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C4	9D	2	15	12530	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C5	9D	2	32	12524	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C6	9D	2	25	13041	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C7	9D	2	21	12605	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C8	9D	2	16	12330	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16

Sr-90 Calibration - PIC - Feb 2016

Standard Data	Isotope	
	Standard ID number	1244-A
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)	21333.9626
	Reference Date	10/1/2008
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	8935.10
Decay Date		2/20/2016

Separation Date/Time 2/19/2016 14:15

Y-90 Half Life (days) 2.668875

The following detectors were not calibrated:

6D, 13C

Carrier Data		Std ID	2338630	
		Std weight	18.68 mg/mL	
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	2.0	0.1	1.87	100.0%
2	4.2	0.2	3.74	100.0%
3	5.7	0.3	5.60	100.0%
4	7.6	0.4	7.47	100.0%
5	9.4	0.5	9.34	100.0%
6	11.3	0.6	11.21	100.0%
7	13.8	0.7	13.08	100.0%
8	15.4	0.8	14.94	100.0%

***Recovery values exceeding 100% will be evaluated at 100%.

***Recovery values exceeding 100% will be evaluated at 100%.

*Background is considered negligible.

**Decay corrected to mid-point of cou

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
1A	1	2/20/2016 12:31	3	14186	4728.67	100.0%	0.54774	0.21443	3679.27	8934.79	0.4118	0.4265
1A	2	2/20/2016 12:45	3	14822	4940.67	100.0%	0.54774	0.21637	3881.76	8934.79	0.4345	0.4247
1A	3	2/20/2016 12:40	3	14984	4994.67	100.0%	0.54774	0.21571	3939.01	8934.79	0.4409	0.4235
1A	4	2/20/2016 12:35	3	14662	4887.33	100.0%	0.54774	0.21504	3834.94	8934.79	0.4292	0.4219
1A	5	2/20/2016 12:50	3	13922	4640.67	100.0%	0.54774	0.21704	3578.50	8934.79	0.4005	0.4205
1A	6	2/20/2016 13:06	3	14305	4768.33	100.0%	0.54774	0.21928	3695.18	8934.78	0.4136	0.4189
1A	7	2/20/2016 13:01	3	14466	4822.00	100.0%	0.54774	0.21864	3751.99	8934.78	0.4199	0.4168
1A	8	2/20/2016 12:54	3	14401	4800.33	100.0%	0.54774	0.21764	3735.22	8934.79	0.4181	0.4155
1B	1	2/20/2016 12:36	3	14674	4891.33	100.0%	0.54973	0.21505	3835.07	8934.79	0.4292	0.4342
1B	2	2/20/2016 12:31	3	14781	4927.00	100.0%	0.54973	0.21445	3873.67	8934.79	0.4335	0.4304
1B	3	2/20/2016 12:45	3	14814	4938.00	100.0%	0.54973	0.21638	3875.18	8934.79	0.4337	0.4277
1B	4	2/20/2016 12:40	3	14913	4971.00	100.0%	0.54973	0.21572	3911.46	8934.79	0.4378	0.4244
1B	5	2/20/2016 12:54	3	13971	4657.00	100.0%	0.54973	0.21765	3587.96	8934.79	0.4016	0.4212
1B	6	2/20/2016 12:50	3	14284	4761.33	100.0%	0.54973	0.21705	3695.24	8934.79	0.4136	0.4179
1B	7	2/20/2016 13:06	3	14398	4799.33	100.0%	0.54973	0.21930	3722.20	8934.78	0.4166	0.4135
1B	8	2/20/2016 13:01	3	14322	4774.00	100.0%	0.54973	0.21865	3700.02	8934.78	0.4141	0.4107
1C	1	2/20/2016 12:40	3	14441	4813.67	100.0%	0.56336	0.21573	3727.82	8934.79	0.4172	0.4339
1C	2	2/20/2016 12:36	3	14838	4946.00	100.0%	0.56336	0.21506	3863.50	8934.79	0.4324	0.4304
1C	3	2/20/2016 12:31	3	15277	5092.33	100.0%	0.56336	0.21446	4012.84	8934.79	0.4491	0.4280
1C	4	2/20/2016 12:45	3	15212	5070.67	100.0%	0.56336	0.21639	3981.46	8934.79	0.4456	0.4249
1C	5	2/20/2016 13:01	3	13997	4665.67	100.0%	0.56336	0.21867	3565.01	8934.78	0.3990	0.4220
1C	6	2/20/2016 12:54	3	14326	4775.33	100.0%	0.56336	0.21765	3679.78	8934.79	0.4118	0.4190
1C	7	2/20/2016 12:50	3	14430	4810.00	100.0%	0.56336	0.21706	3717.44	8934.79	0.4161	0.4150
1C	8	2/20/2016 13:06	3	14415	4805.00	100.0%	0.56336	0.21930	3701.14	8934.78	0.4142	0.4124
1D	1	2/20/2016 12:45	3	14200	4733.33	100.0%	0.55457	0.21640	3661.08	8934.79	0.4098	0.4221
1D	2	2/20/2016 12:40	3	14506	4835.33	100.0%	0.55457	0.21573	3766.39	8934.79	0.4215	0.4209
1D	3	2/20/2016 12:36	3	14976	4992.00	100.0%	0.55457	0.21507	3926.35	8934.79	0.4394	0.4201
1D	4	2/20/2016 12:31	3	14726	4908.67	100.0%	0.55457	0.21448	3845.94	8934.79	0.4304	0.4192
1D	5	2/20/2016 13:06	3	13845	4615.00	100.0%	0.55457	0.21931	3528.32	8934.78	0.3949	0.4182
1D	6	2/20/2016 13:01	3	14442	4814.00	100.0%	0.55457	0.21868	3730.47	8934.78	0.4175	0.4172
1D	7	2/20/2016 12:54	3	14742	4914.00	100.0%	0.55457	0.21766	3835.49	8934.79	0.4293	0.4159
1D	8	2/20/2016 12:50	3	14106	4702.00	100.0%	0.55457	0.21707	3626.43	8934.79	0.4059	0.4151
2A	1	2/20/2016 12:50	3	14104	4701.33	100.0%	0.54062	0.21708	3652.76	8934.79	0.4088	0.4181
2A	2	2/20/2016 13:06	3	14228	4742.67	100.0%	0.54062	0.21934	3683.20	8934.78	0.4122	0.4161
2A	3	2/20/2016 13:01	3	14755	4918.33	100.0%	0.54062	0.21869	3862.01	8934.78	0.4322	0.4148
2A	4	2/20/2016 12:54	3	14565	4855.00	100.0%	0.54062	0.21767	3803.55	8934.79	0.4257	0.4130
2A	5	2/20/2016 12:32	3	13802	4600.67	100.0%	0.54062	0.21449	3564.61	8934.79	0.3990	0.4114
2A	6	2/20/2016 12:45	3	13922	4640.67	100.0%	0.54062	0.21641	3595.31	8934.79	0.4024	0.4097
2A	7	2/20/2016 12:41	3	14117	4705.67	100.0%	0.54062	0.21577	3663.43	8934.79	0.4100	0.4074
2A	8	2/20/2016 12:36	3	14004	4668.00	100.0%	0.54062	0.21508	3629.08	8934.79	0.4062	0.4060
2B	1	2/20/2016 12:54	3	13494	4498.00	100.0%	0.50913	0.21769	3507.76	8934.79	0.3926	0.4002
2B	2	2/20/2016 12:50	3	13735	4578.33	100.0%	0.50913	0.21709	3590.81	8934.79	0.4019	0.4004
2B	3	2/20/2016 13:06	3	14086	4695.33	100.0%	0.50913	0.21935	3697.55	8934.78	0.4138	0.4005
2B	4	2/20/2016 13:01	3	14101	4700.33	100.0%	0.50913	0.21869	3705.52	8934.78	0.4147	0.4007
2B	5	2/20/2016 12:36	3	13254	4418.00	100.0%	0.50913	0.21509	3439.56	8934.79	0.3850	0.4008
2B	6	2/20/2016 12:32	3	13299	4433.00	100.0%	0.50913	0.21450	3457.26	8934.79	0.3869	0.4010
2B	7	2/20/2016 12:45	3	13703	4567.67	100.0%	0.50913	0.21643	3583.16	8934.79	0.4010	0.4012
2B	8	2/20/2016 12:41	3	13940	4646.67	100.0%	0.50913	0.21578	3665.09	8934.79	0.4102	0.4013
2C	1	2/20/2016 13:01	3	13901	4633.67	100.0%	0.53312	0.21870	3591.93	8934.78	0.4020	0.4108
2C	2	2/20/2016 12:54	3	13916	4638.67	100.0%	0.53312	0.21770	3601.69	8934.79	0.4031	0.4102
2C	3	2/20/2016 12:50	3	14632	4877.33	100.0%	0.53312	0.21710	3843.22	8934.79	0.4301	0.4097
2C	4	2/20/2016 13:06	3	14370	4790.00	100.0%	0.53312	0.21936	3745.12	8934.78	0.4192	0.4092
2C	5	2/20/2016 12:41	3	13642	4547.33	100.0%	0.53312	0.21580	3519.42	8934.79	0.3939	0.4087
2C	6	2/20/2016 12:36	3	14059	4686.33	100.0%	0.53312	0.21510	3661.73	8934.79	0.4098	0.4082
2C	7	2/20/2016 12:32	3	14045	4681.67	100.0%	0.53312	0.21451	3659.89	8934.79	0.4096	0.4076
2C	8	2/20/2016 12:45	3	13916	4638.67	100.0%	0.53312	0.21643	3607.72	8934.79	0.4038	0.4071
2D	1	2/20/2016 13:06	3	13327	4442.33	100.0%	0.49743	0.21936	3467.38	8934.78	0.3881	0.3950
2D	2	2/20/2016 13:01	3	13308	4436.00	100.0%	0.49743	0.21871	3463.95	8934.78	0.3877	0.3926
2D	3	2/20/2016 12:54	3	13789	4596.33	100.0%	0.49743	0.21771	3628.73	8934.79	0.4061	0.3909
2D	4	2/20/2016 12:50	3	13740	4580.00	100.0%	0.49743	0.21711	3615.06	8934.79	0.4046	0.3888
2D	5	2/20/2016 12:45	3	12936	4312.00	100.0%	0.49743	0.21645	3350.02	8934.79	0.3749	0.3869
2D	6	2/20/2016 12:41	3	12858	4286.00	100.0%	0.49743	0.21589	3326.51	8934.79	0.3723	0.3848
2D	7	2/20/2016 12:36	3	13095	4365.00	100.0%	0.49743	0.21512	3408.92	8934.79	0.3815	0.3820
2D	8	2/20/2016 12:32	3	13204	4401.33	100.0%	0.49743	0.21452	3447.90	8934.79	0.3859	0.3802
3A	1	2/20/2016 13:11	3	13797	4599.00	100.0%	0.54222	0.22000	3533.16	8934.78	0.3954	0.4095
3A	2	2/20/2016 13:25	3	14321	4773.67	100.0%	0.54222	0.22203	3698.02	8934.77	0.4139	0.4081
3A	3	2/20/2016 13:20	3	14736	4912.00	100.0%	0.54222	0.22133	3839.72	8934.77	0.4298	0.4071
3A	4	2/20/2016 13:16	3	14372	4790.67	100.0%	0.54222	0.22070	3721.46	8934.78	0.4165	0.4059
3A	5	2/20/2016 13:30	3	13423	4474.33	100.0%	0.54222	0.22274	3395.23	8934.77	0.3800	0.4047
3A	6	2/20/2016 13:44	3	13811	4603.67	100.0%	0.54222	0.22470	3515.10	8934.77	0.3934	0.4034
3A	7	2/20/2016 13:39	3	14196	4732.00	100.0%	0.54222	0.22405	3646.56	8934.77	0.4081	0.4018

Raw Count Data						Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)									
3A	8	2/20/2016 13:36	3	14078	4692.67	100.0%	0.54222	0.22351	3609.86	8934.77	0.4040	0.4007	
3B	1	2/20/2016 13:16	3	14105	4701.67	100.0%	0.55092	0.22071	3615.27	8934.78	0.4046	0.4132	
3B	2	2/20/2016 13:11	3	14272	4757.33	100.0%	0.55092	0.22001	3674.36	8934.78	0.4112	0.4102	
3B	3	2/20/2016 13:25	3	14645	4881.67	100.0%	0.55092	0.22204	3788.73	8934.77	0.4240	0.4081	
3B	4	2/20/2016 13:20	3	14570	4856.67	100.0%	0.55092	0.22134	3767.15	8934.77	0.4216	0.4055	
3B	5	2/20/2016 13:36	3	13437	4479.00	100.0%	0.55092	0.22352	3378.77	8934.77	0.3782	0.4031	
3B	6	2/20/2016 13:30	3	13829	4609.67	100.0%	0.55092	0.22275	3513.21	8934.77	0.3932	0.4005	
3B	7	2/20/2016 13:44	3	14009	4669.67	100.0%	0.55092	0.22471	3563.58	8934.77	0.3988	0.3971	
3B	8	2/20/2016 13:40	3	14053	4684.33	100.0%	0.55092	0.22406	3581.45	8934.77	0.4008	0.3949	
3C	1	2/20/2016 13:20	3	14272	4757.33	100.0%	0.55628	0.22135	3657.15	8934.77	0.4093	0.4211	
3C	2	2/20/2016 13:16	3	14536	4845.33	100.0%	0.55628	0.22072	3748.30	8934.78	0.4195	0.4195	
3C	3	2/20/2016 13:11	3	14950	4983.33	100.0%	0.55628	0.22002	3889.78	8934.78	0.4354	0.4184	
3C	4	2/20/2016 13:25	3	14801	4933.67	100.0%	0.55628	0.22205	3830.04	8934.77	0.4287	0.4170	
3C	5	2/20/2016 13:40	3	14033	4677.67	100.0%	0.55628	0.22407	3563.99	8934.77	0.3989	0.4157	
3C	6	2/20/2016 13:36	3	14429	4809.67	100.0%	0.55628	0.22353	3698.68	8934.77	0.4140	0.4143	
3C	7	2/20/2016 13:30	3	14445	4815.00	100.0%	0.55628	0.22276	3707.82	8934.77	0.4150	0.4125	
3C	8	2/20/2016 13:44	3	14314	4771.33	100.0%	0.55628	0.22472	3654.40	8934.77	0.4090	0.4113	
3D	1	2/20/2016 13:25	3	13779	4593.00	100.0%	0.53948	0.22205	3522.68	8934.77	0.3943	0.4046	
3D	2	2/20/2016 13:20	3	13975	4658.33	100.0%	0.53948	0.22136	3591.34	8934.77	0.4020	0.4039	
3D	3	2/20/2016 13:16	3	14441	4813.67	100.0%	0.53948	0.22073	3749.73	8934.78	0.4197	0.4034	
3D	4	2/20/2016 13:11	3	14382	4794.00	100.0%	0.53948	0.22003	3733.43	8934.78	0.4179	0.4028	
3D	5	2/20/2016 13:44	3	13657	4552.33	100.0%	0.53948	0.22473	3469.10	8934.77	0.3883	0.4022	
3D	6	2/20/2016 13:40	3	13772	4590.67	100.0%	0.53948	0.22408	3510.59	8934.77	0.3929	0.4015	
3D	7	2/20/2016 13:36	3	14025	4675.00	100.0%	0.53948	0.22354	3597.52	8934.77	0.4026	0.4007	
3D	8	2/20/2016 13:30	3	13986	4662.00	100.0%	0.53948	0.22277	3588.23	8934.77	0.4016	0.4002	
4A	1	2/20/2016 13:30	3	14530	4843.33	100.0%	0.55034	0.22278	3747.90	8934.77	0.4195	0.4258	
4A	2	2/20/2016 13:44	3	14683	4894.33	100.0%	0.55034	0.22474	3789.25	8934.77	0.4221	0.4226	
4A	3	2/20/2016 13:40	3	14940	4980.00	100.0%	0.55034	0.22409	3878.13	8934.77	0.4340	0.4204	
4A	4	2/20/2016 13:36	3	14768	4922.67	100.0%	0.55034	0.22355	3823.45	8934.77	0.4279	0.4176	
4A	5	2/20/2016 13:11	3	13835	4611.67	100.0%	0.55034	0.22004	3529.70	8934.78	0.3951	0.4150	
4A	6	2/20/2016 13:26	3	14118	4706.00	100.0%	0.55034	0.22210	3613.93	8934.77	0.4045	0.4123	
4A	7	2/20/2016 13:20	3	14335	4778.33	100.0%	0.55034	0.22137	3689.80	8934.77	0.4130	0.4086	
4A	8	2/20/2016 13:16	3	14262	4754.00	100.0%	0.55034	0.22074	3668.61	8934.78	0.4106	0.4063	
4B	1	2/20/2016 13:36	3	14554	4851.33	100.0%	0.55780	0.22356	3737.15	8934.77	0.4183	0.4266	
4B	2	2/20/2016 13:30	3	14783	4927.67	100.0%	0.55780	0.22278	3817.34	8934.77	0.4272	0.4254	
4B	3	2/20/2016 13:44	3	15145	5048.33	100.0%	0.55780	0.22475	3928.22	8934.77	0.4397	0.4245	
4B	4	2/20/2016 13:40	3	15002	5000.67	100.0%	0.55780	0.22410	3883.79	8934.77	0.4347	0.4234	
4B	5	2/20/2016 13:16	3	14038	4679.33	100.0%	0.55780	0.22074	3579.17	8934.78	0.4006	0.4224	
4B	6	2/20/2016 13:11	3	14504	4834.67	100.0%	0.55780	0.22005	3737.98	8934.78	0.4184	0.4213	
4B	7	2/20/2016 13:26	3	14552	4850.67	100.0%	0.55780	0.22210	3743.73	8934.77	0.4190	0.4198	
4B	8	2/20/2016 13:20	3	14686	4895.33	100.0%	0.55780	0.22138	3792.00	8934.77	0.4244	0.4189	
4C	1	2/20/2016 13:40	3	14802	4934.00	100.0%	0.56130	0.22411	3810.08	8934.77	0.4264	0.4305	
4C	2	2/20/2016 13:36	3	14933	4977.67	100.0%	0.56130	0.22356	3856.46	8934.77	0.4316	0.4284	
4C	3	2/20/2016 13:30	3	15052	5017.33	100.0%	0.56130	0.22279	3900.01	8934.77	0.4365	0.4269	
4C	4	2/20/2016 13:45	3	15038	5012.67	100.0%	0.56130	0.22476	3885.45	8934.76	0.4349	0.4251	
4C	5	2/20/2016 13:21	3	13935	4645.00	100.0%	0.56130	0.22139	3534.69	8934.77	0.3956	0.4234	
4C	6	2/20/2016 13:16	3	14667	4889.00	100.0%	0.56130	0.22075	3781.89	8934.78	0.4233	0.4215	
4C	7	2/20/2016 13:11	3	14693	4897.67	100.0%	0.56130	0.22006	3794.04	8934.78	0.4246	0.4191	
4C	8	2/20/2016 13:26	3	14589	4863.00	100.0%	0.56130	0.22212	3749.05	8934.77	0.4196	0.4176	
4D	1	2/20/2016 13:45	3	14220	4740.00	100.0%	0.55358	0.22477	3628.26	8934.76	0.4061	0.4183	
4D	2	2/20/2016 13:40	3	14624	4874.67	100.0%	0.55358	0.22412	3766.15	8934.77	0.4215	0.4161	
4D	3	2/20/2016 13:36	3	14908	4969.33	100.0%	0.55358	0.22357	3863.52	8934.77	0.4324	0.4145	
4D	4	2/20/2016 13:31	3	14542	4847.33	100.0%	0.55358	0.22281	3745.32	8934.77	0.4192	0.4126	
4D	5	2/20/2016 13:26	3	13834	4611.33	100.0%	0.55358	0.22213	3512.67	8934.77	0.3931	0.4108	
4D	6	2/20/2016 13:21	3	14095	4698.33	100.0%	0.55358	0.22141	3603.24	8934.77	0.4033	0.4089	
4D	7	2/20/2016 13:16	3	14286	4762.00	100.0%	0.55358	0.22077	3670.06	8934.78	0.4108	0.4064	
4D	8	2/20/2016 13:11	3	14146	4715.33	100.0%	0.55358	0.22007	3626.86	8934.78	0.4059	0.4047	
5A	1	2/20/2016 14:13	3	14812	4937.33	100.0%	0.56851	0.22876	3775.35	8934.75	0.4225	0.4394	
5A	2	2/20/2016 14:27	3	15454	5151.33	100.0%	0.56851	0.23060	3979.97	8934.75	0.4454	0.4365	
5A	3	2/20/2016 14:22	3	15712	5237.33	100.0%	0.56851	0.23003	4068.90	8934.75	0.4554	0.4345	
5A	4	2/20/2016 14:18	3	15152	5050.67	100.0%	0.56851	0.22942	3885.31	8934.75	0.4349	0.4320	
5A	5	2/20/2016 14:31	3	14660	4886.67	100.0%	0.56851	0.23119	3712.35	8934.75	0.4155	0.4297	
5A	6	2/20/2016 14:44	3	14925	4975.00	100.0%	0.56851	0.23305	3791.24	8934.74	0.4243	0.4272	
5A	7	2/20/2016 14:40	3	14859	4953.00	100.0%	0.56851	0.23248	3772.12	8934.74	0.4222	0.4239	
5A	8	2/20/2016 14:35	3	14915	4971.67	100.0%	0.56851	0.23184	3794.05	8934.74	0.4246	0.4218	
5B	1	2/20/2016 14:18	3	14929	4976.33	100.0%	0.56646	0.22943	3815.16	8934.75	0.4270	0.4382	
5B	2	2/20/2016 14:13	3	15222	5074.00	100.0%	0.56646	0.22876	3916.21	8934.75	0.4383	0.4346	
5B	3	2/20/2016 14:27	3	15764	5254.67	100.0%	0.56646	0.23062	4087.49	8934.75	0.4575	0.4322	
5B	4	2/20/2016 14:22	3	15240	5080.00	100.0%	0.56646	0.23004	3915.75	8934.75	0.4383	0.4291	
5B	5	2/20/2016 14:35	3	14104	4701.33	100.0%	0.56646	0.23185	3527.92	8934.74	0.3949	0.4261	
5B	6	2/20/2016 14:31	3	14557	4852.33	100.0%	0.56646	0.23120	3682.21	8934.75	0.4121	0.4230	
5B	7	2/20/2016 14:44	3	15162	5054.00	100.0%	0.56646	0.23305	3874.48	8934.74	0.4336	0.4189	
5B	8	2/20/2016 14:40	3	14698	4899.33	100.0%	0.56646	0.23249	3722.69	8934.74	0.4167	0.4163	
5C	1	2/20/2016 14:23	3	14607	4869.00	100.0%	0.56216	0.23005	3713.52	8934.75	0.4156	0.4222	
5C	2	2/20/2016 14:18	3	14641	4880.33	100.0%	0.56216	0.22944	3727.90	8934.75	0.4172	0.4213	
5C	3	2/20/2016 14:13	3	15261	5087.00	100.0%	0.56216	0.22876	3937.99	8934.75	0.4407	0.4207	
5C	4	2/20/2016 14:27	3	15007	5002.33	100.0%	0.56216	0.23063	3843.95	8934.75	0.4302	0.4200	
5C	5	2/20/2016 14:40	3	14145	4715.00	100.0%	0.56216	0.23250	3547.23	8934.74	0.3970	0.4192	
5C	6	2/20/2016 14:36	3	14630	4876.67	100.0%	0.56216	0.23186	3712.08	8934.74	0.4155	0.4185	
5C	7	2/20/2016 14:31	3	14766	4922.00	100.0%	0.56216	0.23121	3760.69	8934.75	0.4209	0.4174	
5C	8	2/20/2016 14:44	3	14741	4913.67	100.0%	0.56216	0.23308	3742.97	8934.74	0.4189	0.4168	
5D	1	2/20/2016 14:27	3	14865	4955.00	100.0%	0.56407	0					

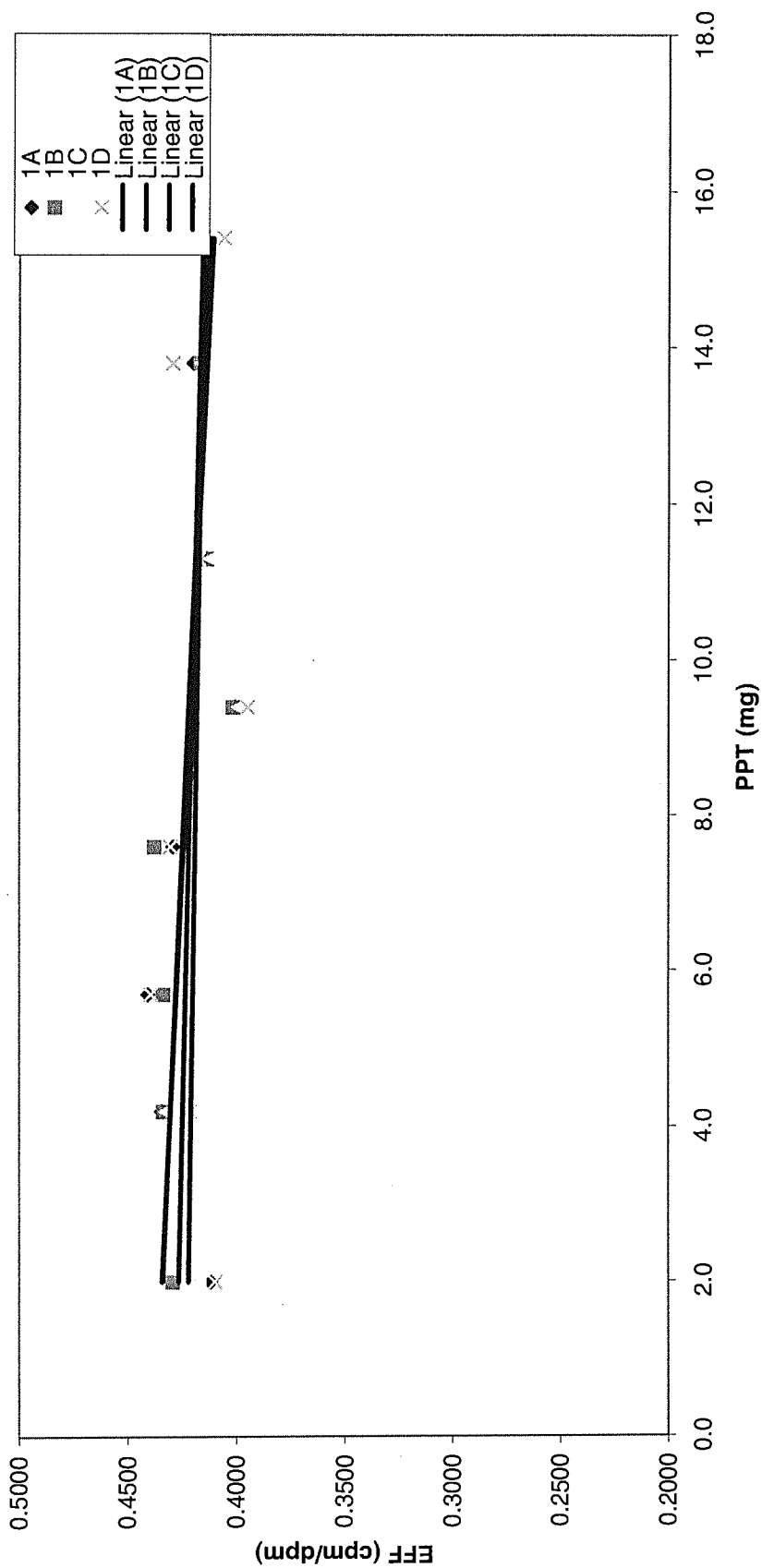
Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
6A	1	2/20/2016 14:33	3	14466	4822.00	100.0%	0.55722	0.23148	3669.57	8934.75	0.4107	0.4172
6A	2	2/20/2016 14:46	3	14472	4824.00	100.0%	0.55722	0.23334	3662.26	8934.74	0.4099	0.4154
6A	3	2/20/2016 14:42	3	14908	4969.33	100.0%	0.55722	0.23278	3810.42	8934.74	0.4265	0.4141
6A	4	2/20/2016 14:37	3	14922	4974.00	100.0%	0.55722	0.23213	3818.32	8934.74	0.4274	0.4125
6A	5	2/20/2016 14:15	3	14046	4682.00	100.0%	0.55722	0.22901	3541.86	8934.75	0.3964	0.4110
6A	6	2/20/2016 14:29	3	14394	4798.00	100.0%	0.55722	0.23089	3648.46	8934.75	0.4083	0.4094
6A	7	2/20/2016 14:25	3	14455	4818.33	100.0%	0.55722	0.23036	3671.47	8934.75	0.4109	0.4073
6A	8	2/20/2016 14:20	3	14232	4744.00	100.0%	0.55722	0.22971	3600.36	8934.75	0.4030	0.4060
6B	1	2/20/2016 14:38	3	14556	4852.00	100.0%	0.56163	0.23214	3687.10	8934.74	0.4127	0.4266
6B	2	2/20/2016 14:33	3	14963	4987.67	100.0%	0.56163	0.23149	3826.05	8934.75	0.4282	0.4243
6B	3	2/20/2016 14:46	3	15210	5070.00	100.0%	0.56163	0.23336	3899.01	8934.74	0.4364	0.4227
6B	4	2/20/2016 14:42	3	15205	5068.33	100.0%	0.56163	0.23279	3900.19	8934.74	0.4365	0.4208
6B	5	2/20/2016 14:20	3	14261	4753.67	100.0%	0.56163	0.22972	3600.94	8934.75	0.4030	0.4189
6B	6	2/20/2016 14:15	3	14449	4816.33	100.0%	0.56163	0.22901	3667.15	8934.75	0.4104	0.4169
6B	7	2/20/2016 14:29	3	14729	4909.67	100.0%	0.56163	0.23090	3750.98	8934.75	0.4198	0.4144
6B	8	2/20/2016 14:25	3	14482	4820.67	100.0%	0.56163	0.23036	3664.70	8934.75	0.4102	0.4127
6C	1	2/20/2016 14:42	3	14595	4865.00	100.0%	0.56171	0.23280	3696.63	8934.74	0.4137	0.4278
6C	2	2/20/2016 14:38	3	15094	5031.33	100.0%	0.56171	0.23215	3866.23	8934.74	0.4327	0.4255
6C	3	2/20/2016 14:33	3	15201	5067.00	100.0%	0.56171	0.23150	3905.16	8934.75	0.4371	0.4239
6C	4	2/20/2016 14:46	3	15278	5092.67	100.0%	0.56171	0.23337	3921.45	8934.74	0.4389	0.4218
6C	5	2/20/2016 14:25	3	14064	4688.00	100.0%	0.56171	0.23037	3531.81	8934.75	0.3953	0.4199
6C	6	2/20/2016 14:20	3	14589	4863.00	100.0%	0.56171	0.22973	3710.05	8934.75	0.4152	0.4178
6C	7	2/20/2016 14:15	3	14659	4886.33	100.0%	0.56171	0.22901	3736.99	8934.75	0.4183	0.4152
6C	8	2/20/2016 14:29	3	14577	4859.00	100.0%	0.56171	0.23092	3700.07	8934.75	0.4141	0.4134
7A	1	2/20/2016 14:52	3	14647	4882.33	100.0%	0.55455	0.23410	3722.42	8934.74	0.4166	0.4229
7A	2	2/20/2016 15:04	3	14683	4894.33	100.0%	0.55455	0.23579	3726.03	8934.73	0.4170	0.4216
7A	3	2/20/2016 15:00	3	15337	5112.33	100.0%	0.55455	0.23525	3946.73	8934.73	0.4417	0.4208
7A	4	2/20/2016 14:56	3	14916	4972.00	100.0%	0.55455	0.23467	3809.28	8934.74	0.4263	0.4197
7A	5	2/20/2016 15:08	3	14321	4773.67	100.0%	0.55455	0.23636	3602.56	8934.73	0.4032	0.4187
7A	6	2/20/2016 15:21	3	14526	4842.00	100.0%	0.55455	0.23812	3662.17	8934.73	0.4099	0.4176
7A	7	2/20/2016 15:16	3	14765	4921.67	100.0%	0.55455	0.23747	3745.07	8934.73	0.4192	0.4162
7A	8	2/20/2016 15:12	3	14749	4916.33	100.0%	0.55455	0.23693	3742.40	8934.73	0.4189	0.4153
7B	1	2/20/2016 14:56	3	14893	4964.33	100.0%	0.56315	0.23467	3783.55	8934.74	0.4235	0.4367
7B	2	2/20/2016 14:52	3	15359	5119.67	100.0%	0.56315	0.23411	3941.72	8934.74	0.4412	0.4338
7B	3	2/20/2016 15:04	3	15571	5190.33	100.0%	0.56315	0.23580	4003.86	8934.73	0.4481	0.4318
7B	4	2/20/2016 15:00	3	15404	5134.67	100.0%	0.56315	0.23526	3950.93	8934.73	0.4422	0.4294
7B	5	2/20/2016 15:12	3	14394	4798.00	100.0%	0.56315	0.23694	3605.81	8934.73	0.4036	0.4270
7B	6	2/20/2016 15:08	3	14760	4920.00	100.0%	0.56315	0.23637	3730.67	8934.73	0.4175	0.4245
7B	7	2/20/2016 15:21	3	14988	4996.00	100.0%	0.56315	0.23813	3797.81	8934.73	0.4251	0.4212
7B	8	2/20/2016 15:16	3	14909	4969.67	100.0%	0.56315	0.23748	3774.76	8934.73	0.4225	0.4191
7C	1	2/20/2016 15:00	3	14400	4800.00	100.0%	0.54150	0.23527	3661.73	8934.73	0.4098	0.4168
7C	2	2/20/2016 14:56	3	14617	4872.33	100.0%	0.54150	0.23468	3736.91	8934.74	0.4182	0.4159
7C	3	2/20/2016 14:52	3	15028	5009.33	100.0%	0.54150	0.23412	3876.62	8934.74	0.4339	0.4153
7C	4	2/20/2016 15:04	3	14779	4926.33	100.0%	0.54150	0.23581	3785.43	8934.73	0.4237	0.4145
7C	5	2/20/2016 15:16	3	13820	4606.67	100.0%	0.54150	0.23749	3457.65	8934.73	0.3870	0.4138
7C	6	2/20/2016 15:12	3	14385	4795.00	100.0%	0.54150	0.23695	3648.60	8934.73	0.4084	0.4130
7C	7	2/20/2016 15:08	3	14405	4801.67	100.0%	0.54150	0.23638	3658.03	8934.73	0.4094	0.4120
7C	8	2/20/2016 15:21	3	14776	4925.33	100.0%	0.54150	0.23814	3773.16	8934.73	0.4223	0.4113
7D	1	2/20/2016 15:04	3	14305	4768.33	100.0%	0.54553	0.23582	3618.88	8934.73	0.4050	0.4179
7D	2	2/20/2016 15:00	3	14672	4890.67	100.0%	0.54553	0.23527	3743.90	8934.73	0.4190	0.4158
7D	3	2/20/2016 14:56	3	15066	5022.00	100.0%	0.54553	0.23469	3878.07	8934.74	0.4340	0.4145
7D	4	2/20/2016 14:52	3	14822	4940.67	100.0%	0.54553	0.23413	3799.49	8934.74	0.4252	0.4127
7D	5	2/20/2016 15:21	3	13907	4635.67	100.0%	0.54553	0.23815	3474.87	8934.73	0.3889	0.4111
7D	6	2/20/2016 15:16	3	14305	4768.33	100.0%	0.54553	0.23750	3610.72	8934.73	0.4041	0.4094
7D	7	2/20/2016 15:13	3	14430	4810.00	100.0%	0.54553	0.23696	3655.01	8934.73	0.4091	0.4071
7D	8	2/20/2016 15:08	3	14408	4802.67	100.0%	0.54553	0.23639	3650.47	8934.73	0.4086	0.4056
8A	1	2/20/2016 15:08	3	14423	4807.67	100.0%	0.55727	0.23640	3630.63	8934.73	0.4064	0.4191
8A	2	2/20/2016 15:21	3	14724	4908.00	100.0%	0.55727	0.23817	3722.14	8934.73	0.4166	0.4161
8A	3	2/20/2016 15:17	3	15147	5049.00	100.0%	0.55727	0.23751	3866.41	8934.73	0.4327	0.4139
8A	4	2/20/2016 15:13	3	14871	4957.00	100.0%	0.55727	0.23697	3777.11	8934.73	0.4227	0.4113
8A	5	2/20/2016 14:52	3	13999	4666.33	100.0%	0.55727	0.23414	3500.55	8934.74	0.3918	0.4087
8A	6	2/20/2016 15:04	3	14350	4783.33	100.0%	0.55727	0.23584	3609.08	8934.73	0.4039	0.4061
8A	7	2/20/2016 15:00	3	14374	4791.33	100.0%	0.55727	0.23528	3619.83	8934.73	0.4051	0.4026
8A	8	2/20/2016 14:56	3	14195	4731.67	100.0%	0.55727	0.23470	3563.06	8934.74	0.3988	0.4003
8B	1	2/20/2016 15:13	3	14877	4959.00	100.0%	0.55670	0.23698	3780.26	8934.73	0.4231	0.4355
8B	2	2/20/2016 15:09	3	15242	5080.67	100.0%	0.55670	0.23641	3904.76	8934.73	0.4370	0.4327
8B	3	2/20/2016 15:21	3	15644	5214.67	100.0%	0.55670	0.23818	4029.98	8934.73	0.4510	0.4308
8B	4	2/20/2016 15:17	3	15353	5117.67	100.0%	0.55670	0.23752	3936.25	8934.73	0.4406	0.4284
8B	5	2/20/2016 14:56	3	14319	4773.00	100.0%	0.55670	0.23471	3605.57	8934.74	0.4035	0.4262
8B	6	2/20/2016 14:52	3	14609	4869.67	100.0%	0.55670	0.23415	3705.02	8934.74	0.4147	0.4238
8B	7	2/20/2016 15:04	3	14795	4931.67	100.0%	0.55670	0.23585	3758.58	8934.73	0.4207	0.4206
8B	8	2/20/2016 15:00	3	14930	4976.67	100.0%	0.55670	0.23529	3806.32	8934.73	0.4260	0.4186
8C	1	2/20/2016 15:17	3	14653	4884.33	100.0%	0.55141	0.23753	3714.07	8934.73	0.4157	0.4228
8C	2	2/20/2016 15:13	3	14695	4898.33	100.0%	0.55141	0.23699	3730.75	8934.73	0.4176	0.4201
8C	3	2/20/2016 15:09	3	15230	5076.67	100.0%	0.55141	0.23642	3911.88	8934.73	0.4378	0.4183
8C	4	2/20/2016 15:21	3	15016	5005.33	100.0%	0.55141	0.23819	3831.85	8934.73	0.4289	0.4159
8C	5	2/20/2016 15:01	3	13933	4644.33	100.0%	0.55141	0.23531	3485.04	8934.73	0.3901	0.4137
8C	6	2/20/2016 14:56	3	14256	4752.00	100.0%	0.55141	0.23472	3595.59	8934.74	0.4024	0.4114
8C	7	2/20/2016 14:52	3	14597	4865.67	100.0%	0.55141	0.23416	3712.04	8934.74	0.4155	0.4084
8C	8	2/20/2016 15:04	3	14450	4816.67	100.0%	0.55141	0.23585	3654.68	8934.73	0.4090	0.4064
8D	1	2/20/2016 15:21	3	14816	4938.67	100.0%	0.56737	0.23820	3731.19	8934.73	0.4176	0.4269
8D	2	2/20/2016 15:17	3	15164	5054.67	100.0%	0.56737	0.23754	3850.			

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
9A	2	2/20/2016 16:09	3	15041	5013.67	100.0%	0.55907	0.24475	3791.10	8934.71	0.4243	0.4256
9A	3	2/20/2016 16:04	3	15584	5194.67	100.0%	0.55907	0.24407	3975.54	8934.71	0.4450	0.4247
9A	4	2/20/2016 16:00	3	15300	5100.00	100.0%	0.55907	0.24342	3884.09	8934.71	0.4347	0.4236
9A	5	2/20/2016 16:15	3	14556	4852.00	100.0%	0.55907	0.24545	3625.94	8934.70	0.4058	0.4225
9A	6	2/20/2016 16:33	3	14685	4895.00	100.0%	0.55907	0.24798	3656.32	8934.70	0.4092	0.4213
9A	7	2/20/2016 16:26	3	15337	5112.33	100.0%	0.55907	0.24706	3878.23	8934.70	0.4341	0.4198
9A	8	2/20/2016 16:22	3	14784	4928.00	100.0%	0.55907	0.24645	3696.98	8934.70	0.4138	0.4188
9B	1	2/20/2016 16:00	3	14662	4887.33	100.0%	0.55703	0.24343	3675.83	8934.71	0.4114	0.4251
9B	2	2/20/2016 15:55	3	14896	4965.33	100.0%	0.55703	0.24284	3756.78	8934.71	0.4205	0.4229
9B	3	2/20/2016 16:10	3	15801	5267.00	100.0%	0.55703	0.24477	4048.83	8934.71	0.4532	0.4214
9B	4	2/20/2016 16:04	3	15011	5003.67	100.0%	0.55703	0.24407	3788.94	8934.71	0.4241	0.4196
9B	5	2/20/2016 16:22	3	14329	4776.33	100.0%	0.55703	0.24646	3549.75	8934.70	0.3973	0.4178
9B	6	2/20/2016 16:15	3	14696	4898.67	100.0%	0.55703	0.24546	3677.03	8934.70	0.4115	0.4159
9B	7	2/20/2016 16:33	3	14916	4972.00	100.0%	0.55703	0.24799	3737.81	8934.70	0.4183	0.4135
9B	8	2/20/2016 16:26	3	14724	4908.00	100.0%	0.55703	0.24707	3678.37	8934.70	0.4117	0.4119
9C	1	2/20/2016 16:05	3	14642	4860.67	100.0%	0.55261	0.24408	3675.52	8934.71	0.4114	0.4183
9C	2	2/20/2016 16:00	3	14781	4927.00	100.0%	0.55261	0.24344	3725.04	8934.71	0.4169	0.4165
9C	3	2/20/2016 15:55	3	15345	5115.00	100.0%	0.55261	0.24285	3915.96	8934.71	0.4383	0.4154
9C	4	2/20/2016 16:10	3	14841	4947.00	100.0%	0.55261	0.24478	3738.43	8934.71	0.4184	0.4139
9C	5	2/20/2016 16:27	3	14117	4705.67	100.0%	0.55261	0.24708	3485.72	8934.70	0.3901	0.4125
9C	6	2/20/2016 16:22	3	14469	4823.00	100.0%	0.55261	0.24646	3606.10	8934.70	0.4036	0.4110
9C	7	2/20/2016 16:15	3	14512	4837.33	100.0%	0.55261	0.24547	3625.34	8934.70	0.4058	0.4090
9C	8	2/20/2016 16:33	3	14925	4975.00	100.0%	0.55261	0.24802	3750.43	8934.70	0.4198	0.4077
9D	1	2/20/2016 16:10	3	14850	4950.00	100.0%	0.55962	0.24479	3726.07	8934.71	0.4170	0.4265
9D	2	2/20/2016 16:05	3	14953	4984.33	100.0%	0.55962	0.24409	3763.88	8934.71	0.4213	0.4241
9D	3	2/20/2016 16:00	3	15419	5139.67	100.0%	0.55962	0.24345	3922.43	8934.71	0.4390	0.4225
9D	4	2/20/2016 15:56	3	15387	5129.00	100.0%	0.55962	0.24286	3914.72	8934.71	0.4381	0.4205
9D	5	2/20/2016 16:34	3	14444	4814.67	100.0%	0.55962	0.24803	3574.52	8934.70	0.4001	0.4185
9D	6	2/20/2016 16:27	3	14687	4895.67	100.0%	0.55962	0.24709	3660.22	8934.70	0.4097	0.4165
9D	7	2/20/2016 16:22	3	14778	4926.00	100.0%	0.55962	0.24648	3693.63	8934.70	0.4134	0.4138
9D	8	2/20/2016 16:15	3	14829	4943.00	100.0%	0.55962	0.24548	3715.60	8934.70	0.4159	0.4121
10A	1	2/20/2016 16:15	3	12922	4307.33	100.0%	0.46076	0.24549	3296.70	8934.70	0.3690	0.3734
10A	2	2/20/2016 16:34	3	12861	4287.00	100.0%	0.46076	0.24804	3265.88	8934.70	0.3655	0.3726
10A	3	2/20/2016 16:27	3	13500	4500.00	100.0%	0.46076	0.24710	3482.76	8934.70	0.3898	0.3720
10A	4	2/20/2016 16:22	3	13160	4386.67	100.0%	0.46076	0.24648	3371.95	8934.70	0.3774	0.3712
10A	5	2/20/2016 15:56	3	12567	4189.00	100.0%	0.46076	0.24287	3189.17	8934.71	0.3569	0.3705
10A	6	2/20/2016 16:10	3	12886	4295.33	100.0%	0.46076	0.24479	3287.57	8934.71	0.3680	0.3698
10A	7	2/20/2016 16:05	3	13012	4337.33	100.0%	0.46076	0.24410	3332.42	8934.71	0.3730	0.3688
10A	8	2/20/2016 16:00	3	12844	4281.33	100.0%	0.46076	0.24346	3279.08	8934.71	0.3670	0.3682
10B	1	2/20/2016 16:22	3	14323	4774.33	100.0%	0.53252	0.24649	3601.55	8934.70	0.4031	0.4142
10B	2	2/20/2016 16:15	3	14603	4867.67	100.0%	0.53252	0.24550	3699.60	8934.70	0.4141	0.4121
10B	3	2/20/2016 16:34	3	14838	4946.00	100.0%	0.53252	0.24805	3765.83	8934.70	0.4215	0.4106
10B	4	2/20/2016 16:27	3	14943	4981.00	100.0%	0.53252	0.24711	3805.28	8934.70	0.4259	0.4088
10B	5	2/20/2016 16:00	3	13926	4642.00	100.0%	0.53252	0.24347	3483.62	8934.71	0.3899	0.4070
10B	6	2/20/2016 15:56	3	14266	4755.33	100.0%	0.53252	0.24288	3599.75	8934.71	0.4029	0.4052
10B	7	2/20/2016 16:10	3	14283	4761.00	100.0%	0.53252	0.24481	3596.22	8934.71	0.4025	0.4027
10B	8	2/20/2016 16:05	3	14256	4752.00	100.0%	0.53252	0.24411	3590.55	8934.71	0.4019	0.4012
10C	1	2/20/2016 16:27	3	14058	4686.00	100.0%	0.52374	0.24712	3529.63	8934.70	0.3950	0.4106
10C	2	2/20/2016 16:22	3	14516	4838.67	100.0%	0.52374	0.24650	3685.18	8934.70	0.4125	0.4085
10C	3	2/20/2016 16:15	3	14951	4983.67	100.0%	0.52374	0.24551	3834.84	8934.70	0.4292	0.4071
10C	4	2/20/2016 16:34	3	14842	4947.33	100.0%	0.52374	0.24806	3786.57	8934.70	0.4238	0.4053
10C	5	2/20/2016 16:05	3	13540	4513.33	100.0%	0.52374	0.24412	3370.99	8934.71	0.3773	0.4037
10C	6	2/20/2016 16:00	3	13892	4630.67	100.0%	0.52374	0.24347	3491.34	8934.71	0.3908	0.4019
10C	7	2/20/2016 15:56	3	14278	4759.33	100.0%	0.52374	0.24289	3622.76	8934.71	0.4055	0.3996
10C	8	2/20/2016 16:10	3	14177	4725.67	100.0%	0.52374	0.24482	3580.04	8934.71	0.4007	0.3981
10D	1	2/20/2016 16:34	3	14309	4769.67	100.0%	0.51644	0.24806	3625.04	8934.70	0.4057	0.4067
10D	2	2/20/2016 16:27	3	14103	4701.00	100.0%	0.51644	0.24712	3560.70	8934.70	0.3985	0.4061
10D	3	2/20/2016 16:22	3	14773	4924.33	100.0%	0.51644	0.24651	3786.87	8934.70	0.4238	0.4057
10D	4	2/20/2016 16:15	3	14526	4842.00	100.0%	0.51644	0.24552	3709.11	8934.70	0.4151	0.4052
10D	5	2/20/2016 16:10	3	13512	4504.00	100.0%	0.51644	0.24483	3374.30	8934.71	0.3777	0.4047
10D	6	2/20/2016 16:05	3	14175	4725.00	100.0%	0.51644	0.24413	3598.52	8934.71	0.4028	0.4041
10D	7	2/20/2016 16:00	3	14398	4799.33	100.0%	0.51644	0.24349	3675.81	8934.71	0.4114	0.4034
10D	8	2/20/2016 15:56	3	14188	4729.33	100.0%	0.51644	0.24290	3608.54	8934.71	0.4039	0.4030
11A	1	2/20/2016 16:42	3	14797	4932.33	100.0%	0.54729	0.24912	3714.18	8934.69	0.4157	0.4288
11A	2	2/20/2016 16:55	3	15262	5087.33	100.0%	0.54729	0.25100	3859.99	8934.69	0.4320	0.4267
11A	3	2/20/2016 16:52	3	15478	5159.33	100.0%	0.54729	0.25047	3934.56	8934.69	0.4404	0.4253
11A	4	2/20/2016 16:46	3	15433	5144.33	100.0%	0.54729	0.24974	3923.15	8934.69	0.4391	0.4235
11A	5	2/20/2016 17:00	3	14575	4858.33	100.0%	0.54729	0.25156	3628.25	8934.69	0.4061	0.4219
11A	6	2/20/2016 17:12	3	14644	4881.33	100.0%	0.54729	0.25329	3642.78	8934.68	0.4077	0.4201
11A	7	2/20/2016 17:08	3	14795	4931.67	100.0%	0.54729	0.25269	3696.05	8934.68	0.4137	0.4177
11A	8	2/20/2016 17:03	3	15105	5035.00	100.0%	0.54729	0.25208	3802.36	8934.68	0.4256	0.4162
11B	1	2/20/2016 16:46	3	15305	5101.67	100.0%	0.55895	0.24975	3854.40	8934.69	0.4314	0.4403
11B	2	2/20/2016 16:42	3	15420	5140.00	100.0%	0.55895	0.24913	3895.82	8934.69	0.4360	0.4364
11B	3	2/20/2016 16:56	3	16014	5338.00	100.0%	0.55895	0.25101	4084.46	8934.69	0.4571	0.4338
11B	4	2/20/2016 16:52	3	15514	5171.33	100.0%	0.55895	0.25048	3920.41	8934.69	0.4388	0.4305
11B	5	2/20/2016 17:04	3	14545	4848.33	100.0%	0.55895	0.25209	3589.39	8934.68	0.4017	0.4273
11B	6	2/20/2016 17:00	3	14961	4987.00	100.0%	0.55895	0.25157	3730.67	8934.69	0.4175	0.4240
11B	7	2/20/2016 17:13	3	15234	5078.00	100.0%	0.55895	0.25330	3813.02	8934.68	0.4268	0.4196
11B	8	2/20/2016 17:08	3	15022	5007.33	100.0%	0.55895	0.25270	3745.35	8934.68	0.4192	0.4168
11C	1	2/20/2016 16:52	3	14640	4880.00	100.0%	0.54966	0.25049	3649.83	8934.69	0.4085	0.4197
11C	2	2/20/2016 16:46	3	14953	4984.33	100.0%	0.54966	0.24976	3757.74	8934.69	0.4206	0.4185
11C	3	2/20/2016 16:42	3	15344								

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
11D	3	2/20/2016 16:46	3	15847	5282.33	100.0%	0.56991	0.24977	4010.51	8934.69	0.4489	0.4310
11D	4	2/20/2016 16:42	3	15521	5173.67	100.0%	0.56991	0.24915	3904.97	8934.69	0.4371	0.4287
11D	5	2/20/2016 17:13	3	14754	4918.00	100.0%	0.56991	0.25332	3628.08	8934.68	0.4061	0.4265
11D	6	2/20/2016 17:08	3	15205	5068.33	100.0%	0.56991	0.25272	3781.48	8934.68	0.4232	0.4242
11D	7	2/20/2016 17:04	3	15097	5032.33	100.0%	0.56991	0.25211	3748.57	8934.68	0.4196	0.4211
11D	8	2/20/2016 17:00	3	15174	5058.00	100.0%	0.56991	0.25159	3776.93	8934.69	0.4227	0.4192
12A	1	2/20/2016 17:00	3	14288	4762.67	100.0%	0.54096	0.25159	3546.64	8934.69	0.3970	0.4112
12A	2	2/20/2016 17:13	3	14780	4926.67	100.0%	0.54096	0.25333	3702.25	8934.68	0.4144	0.4083
12A	3	2/20/2016 17:08	3	15080	5026.67	100.0%	0.54096	0.25273	3805.14	8934.68	0.4259	0.4063
12A	4	2/20/2016 17:04	3	14890	4963.33	100.0%	0.54096	0.25213	3744.74	8934.68	0.4191	0.4038
12A	5	2/20/2016 16:42	3	13722	4574.00	100.0%	0.54096	0.24916	3369.72	8934.69	0.3772	0.4014
12A	6	2/20/2016 16:56	3	13985	4661.67	100.0%	0.54096	0.25104	3448.32	8934.69	0.3859	0.3989
12A	7	2/20/2016 16:52	3	14442	4814.00	100.0%	0.54096	0.25051	3603.22	8934.69	0.4033	0.3956
12A	8	2/20/2016 16:46	3	14248	4749.33	100.0%	0.54096	0.24978	3542.07	8934.69	0.3964	0.3935
12B	1	2/20/2016 17:04	3	14776	4925.33	100.0%	0.53735	0.25213	3714.82	8934.68	0.4158	0.4215
12B	2	2/20/2016 17:00	3	14767	4922.33	100.0%	0.53735	0.25160	3714.37	8934.69	0.4157	0.4195
12B	3	2/20/2016 17:13	3	15179	5059.67	100.0%	0.53735	0.25334	3843.36	8934.68	0.4302	0.4182
12B	4	2/20/2016 17:08	3	15305	5101.67	100.0%	0.53735	0.25274	3888.22	8934.68	0.4352	0.4165
12B	5	2/20/2016 16:47	3	14273	4757.67	100.0%	0.53735	0.24979	3558.41	8934.69	0.3983	0.4150
12B	6	2/20/2016 16:42	3	14352	4784.00	100.0%	0.53735	0.24917	3587.70	8934.69	0.4015	0.4133
12B	7	2/20/2016 16:56	3	14745	4915.00	100.0%	0.53735	0.25105	3709.69	8934.69	0.4152	0.4111
12B	8	2/20/2016 16:52	3	14677	4892.33	100.0%	0.53735	0.25052	3689.58	8934.69	0.4130	0.4097
12C	1	2/20/2016 17:09	3	14773	4924.33	100.0%	0.54563	0.25283	3691.80	8934.68	0.4132	0.4234
12C	2	2/20/2016 17:04	3	15021	5007.00	100.0%	0.54563	0.25214	3777.80	8934.68	0.4228	0.4218
12C	3	2/20/2016 17:00	3	15306	5102.00	100.0%	0.54563	0.25161	3875.39	8934.69	0.4337	0.4207
12C	4	2/20/2016 17:13	3	15413	5137.67	100.0%	0.54563	0.25335	3902.58	8934.68	0.4368	0.4193
12C	5	2/20/2016 16:52	3	14339	4779.67	100.0%	0.54563	0.25053	3558.35	8934.69	0.3983	0.4180
12C	6	2/20/2016 16:47	3	14668	4889.33	100.0%	0.54563	0.24980	3671.57	8934.69	0.4109	0.4166
12C	7	2/20/2016 16:42	3	14815	4938.33	100.0%	0.54563	0.24918	3723.57	8934.69	0.4168	0.4147
12C	8	2/20/2016 16:56	3	14808	4936.00	100.0%	0.54563	0.25106	3712.09	8934.69	0.4155	0.4136
12D	1	2/20/2016 17:13	3	14800	4933.33	100.0%	0.54872	0.25336	3691.20	8934.68	0.4131	0.4268
12D	2	2/20/2016 17:09	3	15289	5096.33	100.0%	0.54872	0.25284	3856.78	8934.68	0.4317	0.4243
12D	3	2/20/2016 17:04	3	15580	5193.33	100.0%	0.54872	0.25216	3957.07	8934.68	0.4429	0.4225
12D	4	2/20/2016 17:00	3	15090	5030.00	100.0%	0.54872	0.25162	3796.40	8934.69	0.4249	0.4203
12D	5	2/20/2016 16:56	3	14309	4769.67	100.0%	0.54872	0.25107	3538.77	8934.69	0.3961	0.4183
12D	6	2/20/2016 16:52	3	14777	4925.67	100.0%	0.54872	0.25053	3697.39	8934.69	0.4138	0.4161
12D	7	2/20/2016 16:47	3	14910	4970.00	100.0%	0.54872	0.24981	3745.28	8934.69	0.4192	0.4132
12D	8	2/20/2016 16:42	3	14683	4894.33	100.0%	0.54872	0.24919	3672.65	8934.69	0.4111	0.4113
13A	1	2/20/2016 17:19	3	14445	4815.00	100.0%	0.51126	0.25420	3653.85	8934.68	0.4090	0.4168
13A	2	2/20/2016 17:31	3	14462	4820.67	100.0%	0.51126	0.25579	3652.26	8934.67	0.4088	0.4151
13A	3	2/20/2016 17:27	3	15261	5087.00	100.0%	0.51126	0.25524	3921.10	8934.67	0.4389	0.4139
13A	4	2/20/2016 17:23	3	14764	4921.33	100.0%	0.51126	0.25471	3757.83	8934.68	0.4206	0.4123
13A	5	2/20/2016 17:35	3	14031	4677.00	100.0%	0.51126	0.25639	3505.85	8934.67	0.3924	0.4109
13A	6	2/20/2016 17:48	3	14343	4781.00	100.0%	0.51126	0.25809	3602.09	8934.67	0.4032	0.4094
13A	7	2/20/2016 17:43	3	14538	4846.00	100.0%	0.51126	0.25745	3669.98	8934.67	0.4108	0.4074
13A	8	2/20/2016 17:39	3	14467	4822.33	100.0%	0.51126	0.25691	3648.79	8934.67	0.4084	0.4061
13B	1	2/20/2016 17:23	3	14640	4880.00	100.0%	0.52143	0.25472	3693.32	8934.68	0.4134	0.4232
13B	2	2/20/2016 17:19	3	14968	4989.33	100.0%	0.52143	0.25420	3805.05	8934.68	0.4259	0.4215
13B	3	2/20/2016 17:31	3	15216	5072.00	100.0%	0.52143	0.25579	3880.32	8934.67	0.4343	0.4204
13B	4	2/20/2016 17:27	3	15115	5038.33	100.0%	0.52143	0.25525	3849.19	8934.67	0.4308	0.4189
13B	5	2/20/2016 17:39	3	14264	4754.67	100.0%	0.52143	0.25692	3557.74	8934.67	0.3982	0.4175
13B	6	2/20/2016 17:36	3	14475	4825.00	100.0%	0.52143	0.25640	3630.51	8934.67	0.4063	0.4160
13B	7	2/20/2016 17:48	3	14885	4961.67	100.0%	0.52143	0.25809	3759.27	8934.67	0.4208	0.4141
13B	8	2/20/2016 17:44	3	14716	4905.33	100.0%	0.52143	0.25746	3705.88	8934.67	0.4148	0.4128
13D	1	2/20/2016 17:31	3	12872	4290.67	100.0%	0.42969	0.25580	3308.61	8934.67	0.3703	0.3862
13D	2	2/20/2016 17:27	3	13301	4433.67	100.0%	0.42969	0.25526	3453.71	8934.67	0.3866	0.3836
13D	3	2/20/2016 17:23	3	13662	4554.00	100.0%	0.42969	0.25473	3576.07	8934.68	0.4002	0.3818
13D	4	2/20/2016 17:19	3	13376	4458.67	100.0%	0.42969	0.25422	3482.71	8934.68	0.3898	0.3796
13D	5	2/20/2016 17:48	3	12780	4260.00	100.0%	0.42969	0.25811	3269.11	8934.67	0.3659	0.3774
13D	6	2/20/2016 17:44	3	12940	4313.33	100.0%	0.42969	0.25747	3324.87	8934.67	0.3721	0.3752
13D	7	2/20/2016 17:40	3	12971	4323.67	100.0%	0.42969	0.25693	3337.30	8934.67	0.3735	0.3722
13D	8	2/20/2016 17:36	3	12811	4270.33	100.0%	0.42969	0.25640	3285.98	8934.67	0.3678	0.3703
14A	1	2/20/2016 17:36	3	15248	5082.67	100.0%	0.55824	0.25642	3803.72	8934.67	0.4257	0.4363
14A	2	2/20/2016 17:48	3	15506	5168.67	100.0%	0.55824	0.25812	3881.25	8934.67	0.4344	0.4338
14A	3	2/20/2016 17:44	3	15834	5278.00	100.0%	0.55824	0.25748	3993.76	8934.67	0.4470	0.4320
14A	4	2/20/2016 17:40	3	15730	5243.33	100.0%	0.55824	0.25694	3961.79	8934.67	0.4434	0.4298
14A	5	2/20/2016 17:19	3	14803	4934.33	100.0%	0.55824	0.25423	3666.32	8934.68	0.4103	0.4277
14A	6	2/20/2016 17:31	3	15115	5038.33	100.0%	0.55824	0.25582	3762.39	8934.67	0.4211	0.4255
14A	7	2/20/2016 17:27	3	15259	5086.33	100.0%	0.55824	0.25527	3813.14	8934.67	0.4268	0.4226
14A	8	2/20/2016 17:23	3	15067	5022.33	100.0%	0.55824	0.25474	3751.76	8934.68	0.4199	0.4208
14B	1	2/20/2016 17:40	3	14909	4969.67	100.0%	0.55237	0.25695	3701.55	8934.67	0.4143	0.4261
14B	2	2/20/2016 17:36	3	15150	5050.00	100.0%	0.55237	0.25643	3784.44	8934.67	0.4236	0.4245
14B	3	2/20/2016 17:48	3	15908	5302.67	100.0%	0.55237	0.25812	4028.76	8934.67	0.4509	0.4234
14B	4	2/20/2016 17:44	3	15248	5082.67	100.0%	0.55237	0.25749	3811.87	8934.67	0.4266	0.4220
14B	5	2/20/2016 17:23	3	14596	4865.33	100.0%	0.55237	0.25475	3608.08	8934.68	0.4038	0.4206
14B	6	2/20/2016 17:19	3	14700	4900.00	100.0%	0.55237	0.25424	3645.27	8934.68	0.4080	0.4192
14B	7	2/20/2016 17:31	3	15189	5063.00	100.0%	0.55237	0.25583	3800.42	8934.67	0.4254	0.4174
14B	8	2/20/2016 17:27	3	14952	4984.00	100.0%	0.55237	0.25528	3724.15	8934.67	0.4168	0.4162
14C	1	2/20/2016 17:44	3	15205	5068.33	100.0%	0.56455	0.25750	3769.49	8934.67	0.4219	0.4309
14C	2	2/20/2016 17:40	3	15225	5075.00	100.0%	0.56455	0.25696	3778.90	8934.67	0.4229	0.4288
14C	3	2/20/2016 17:36	3	15939	5313.00	100.0%	0.56455	0.25644	4019.51	8934.67	0.4499	0.4275
14C	4	2/20/										

Detector (#)	Source ID (#)	Raw Count Data			Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
		Start Time	Count Time (min)	Beta (counts)								
14D	4	2/20/2016 17:36	3	15552	5184.00	100.0%	0.55708	0.25645	3907.55	8934.67	0.4373	0.4224
14D	5	2/20/2016 17:31	3	14468	4822.67	100.0%	0.55708	0.25585	3549.22	8934.67	0.3972	0.4206
14D	6	2/20/2016 17:27	3	15017	5005.67	100.0%	0.55708	0.25530	3734.97	8934.67	0.4180	0.4188
14D	7	2/20/2016 17:23	3	15176	5058.67	100.0%	0.55708	0.25477	3790.60	8934.68	0.4243	0.4163
14D	8	2/20/2016 17:20	3	14830	4943.33	100.0%	0.55708	0.25426	3677.80	8934.68	0.4116	0.4148

Sr-90 Calibration



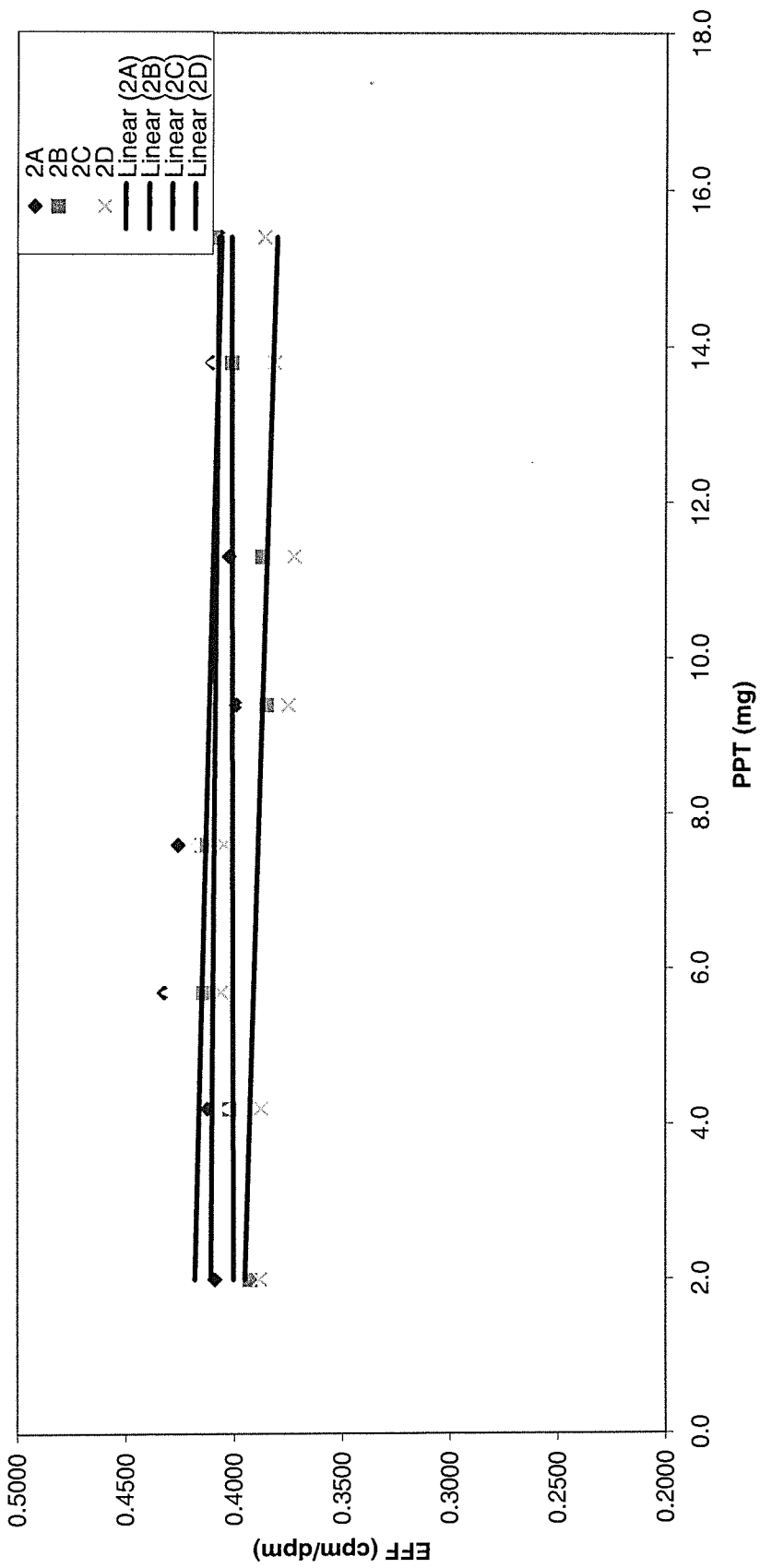
1A $y = -8.228737E-04x + 4.281876E-01$

1B $y = -1.755067E-03x + 4.377424E-01$

1C $y = -1.607365E-03x + 4.371351E-01$

1D $y = -5.194364E-04x + 4.231015E-01$

Sr-90 Calibration



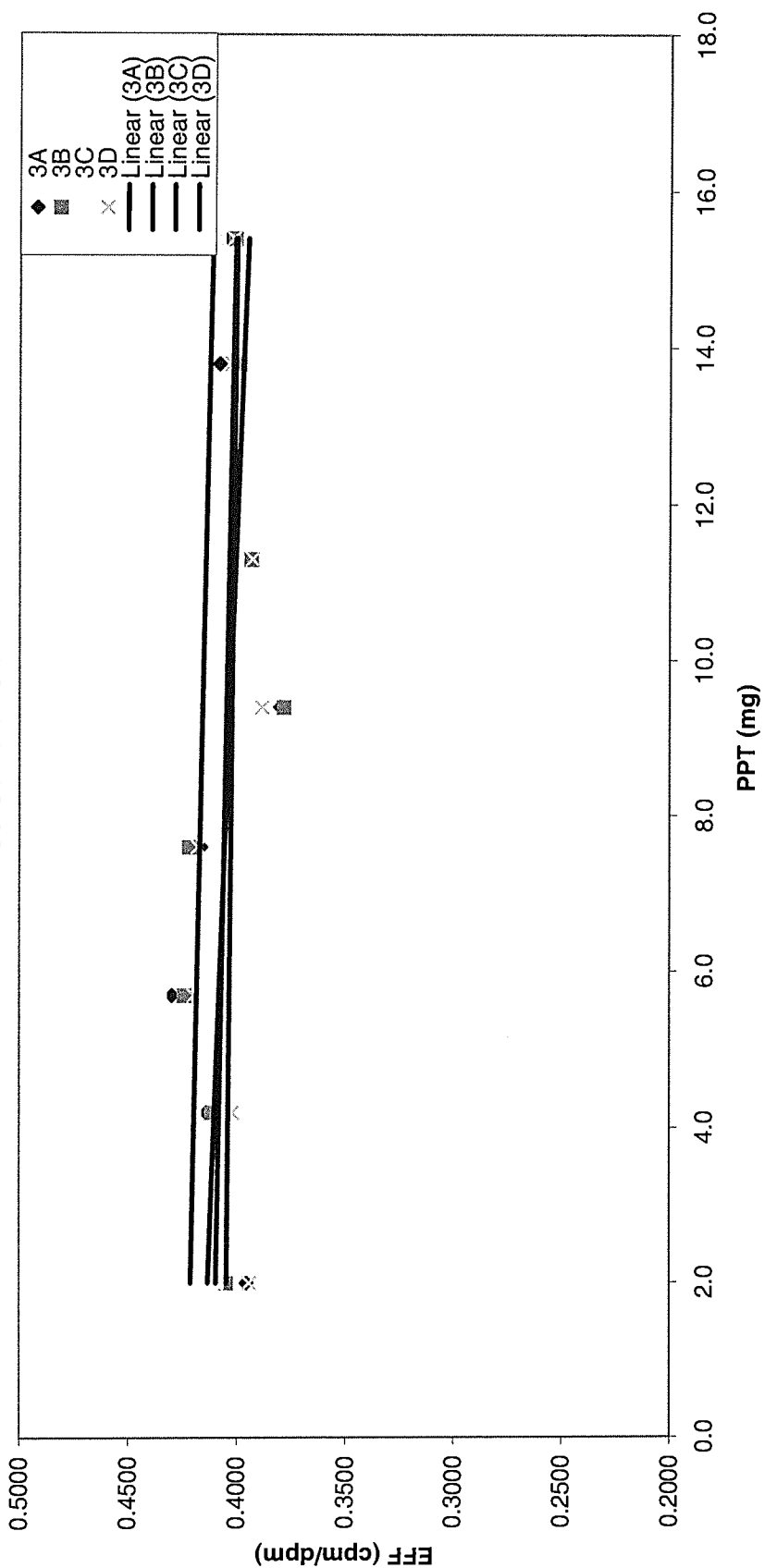
2A $y = -9.042596E-04x + 4.199130E-01$

2B $y = 8.281956E-05x + 4.000563E-01$

2C $y = -2.704466E-04x + 4.112915E-01$

2D $y = -1.100277E-03x + 3.971936E-01$

Sr-90 Calibration



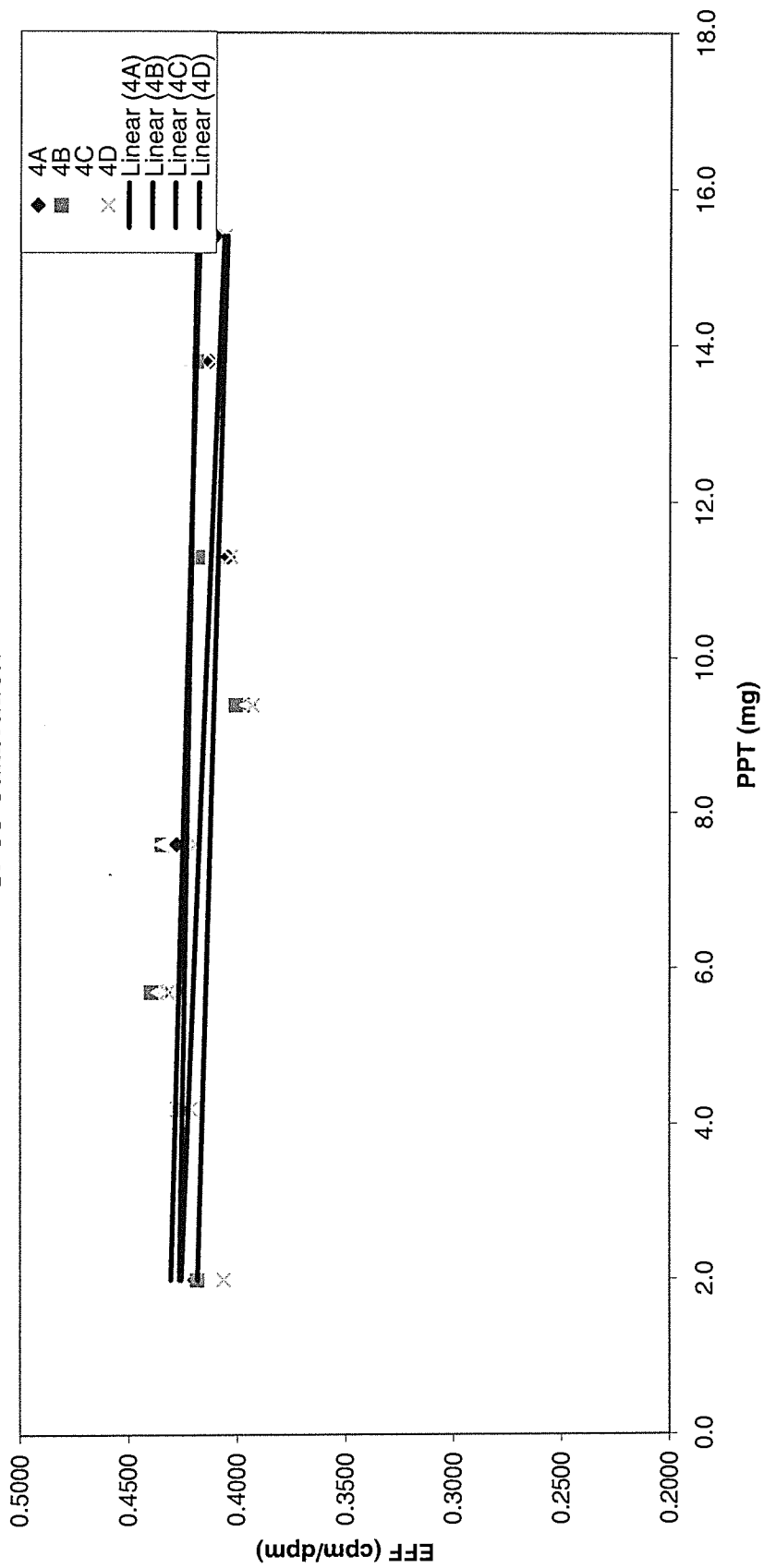
3A $y = -6.581329E-04x + 4.108555E-01$

3B $y = -1.367469E-03x + 4.159376E-01$

3C $y = -7.314480E-04x + 4.225585E-01$

3D $y = -3.320990E-04x + 4.052781E-01$

Sr-90 Calibration



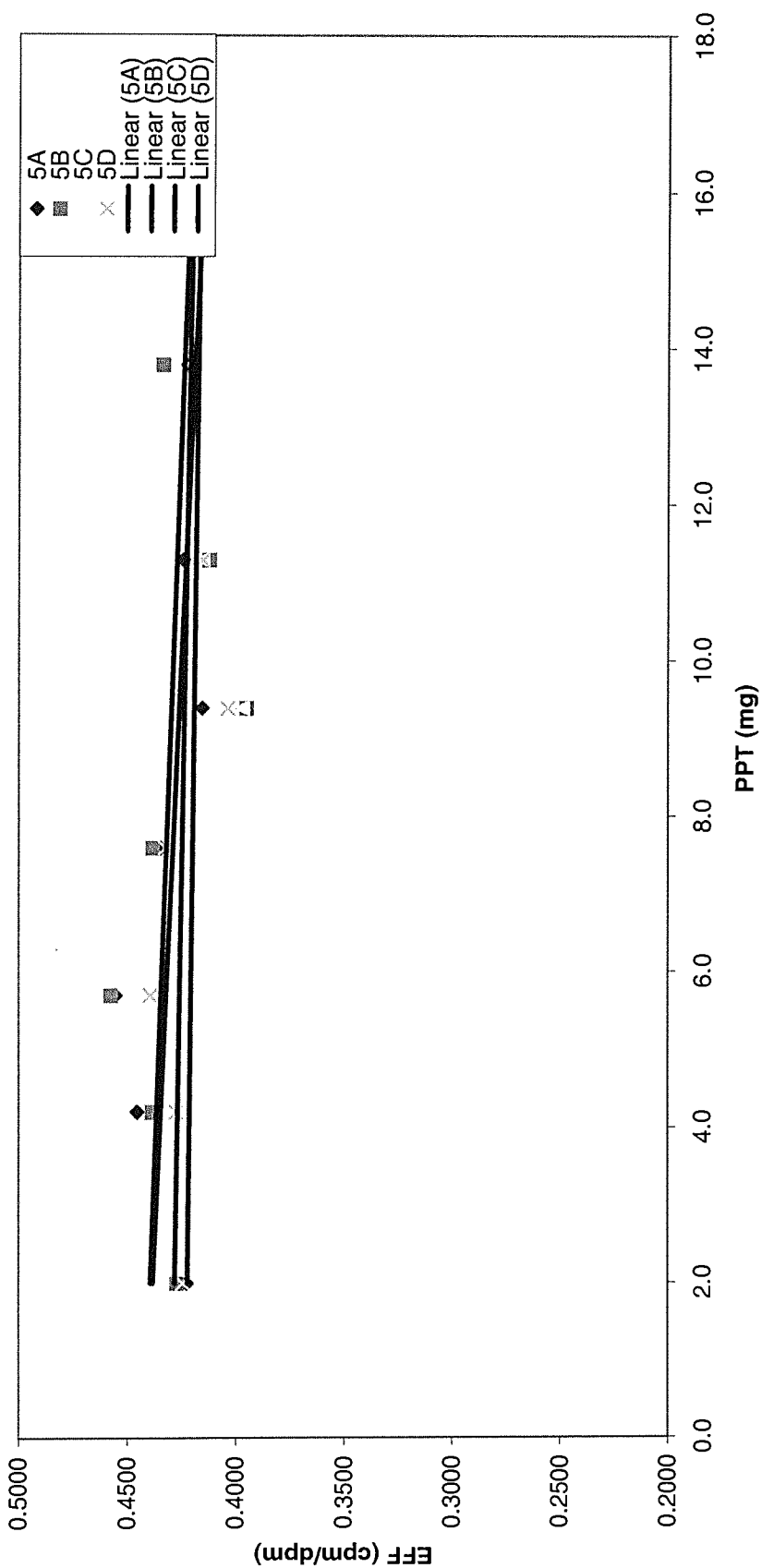
4A $y = -1.454402E-03x + 4.286988E-01$

4B $y = -5.794616E-04x + 4.278046E-01$

4C $y = -9.643192E-04x + 4.324343E-01$

4D $y = -1.011721E-03x + 4.203162E-01$

Sr-90 Calibration



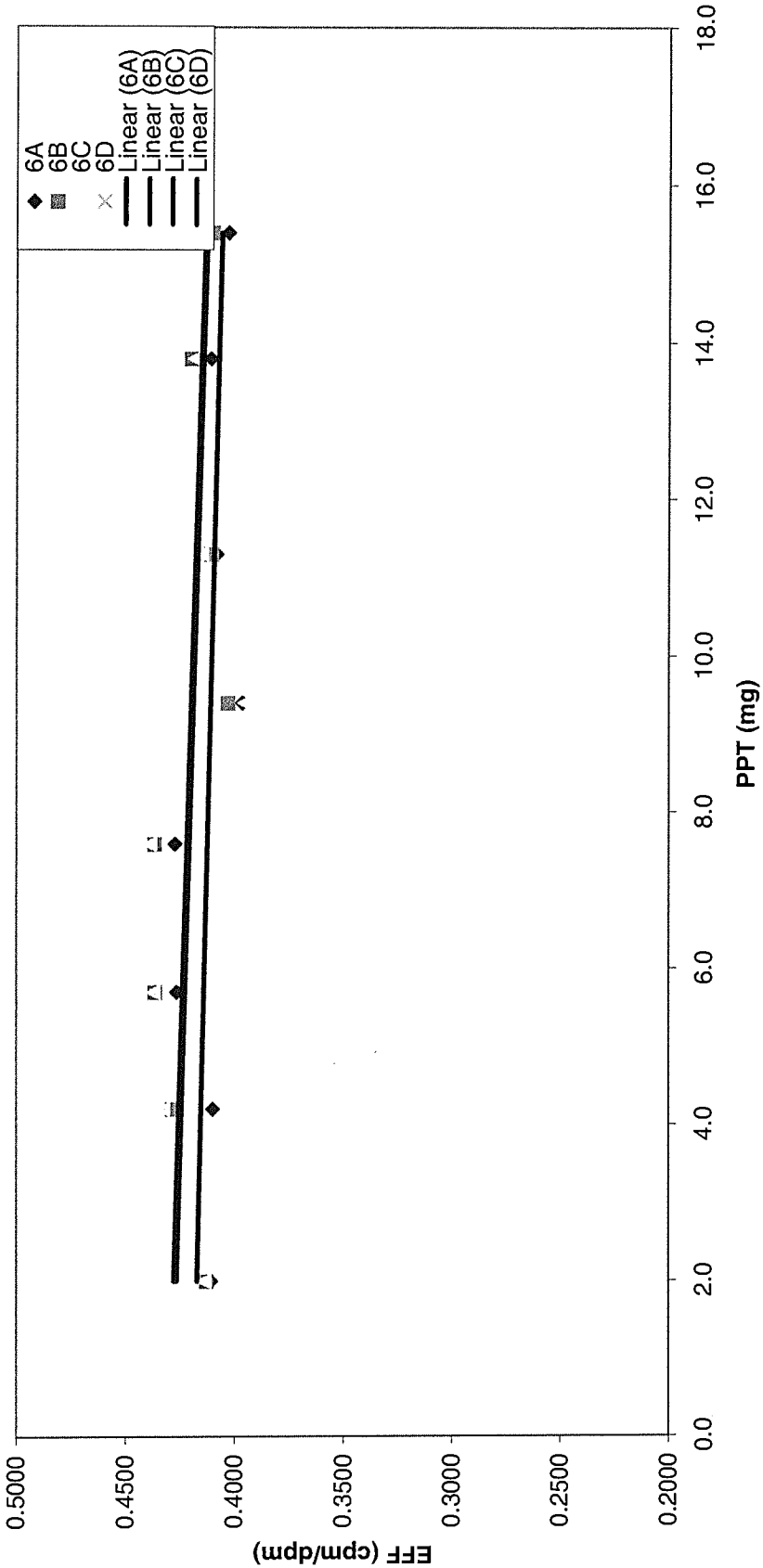
5A $y = -1.313849E-03x + 4.420099E-01$

5B $y = -1.637392E-03x + 4.414956E-01$

5C $y = -4.060476E-04x + 4.230409E-01$

5D $y = -5.926161E-04x + 4.292586E-01$

Sr-90 Calibration



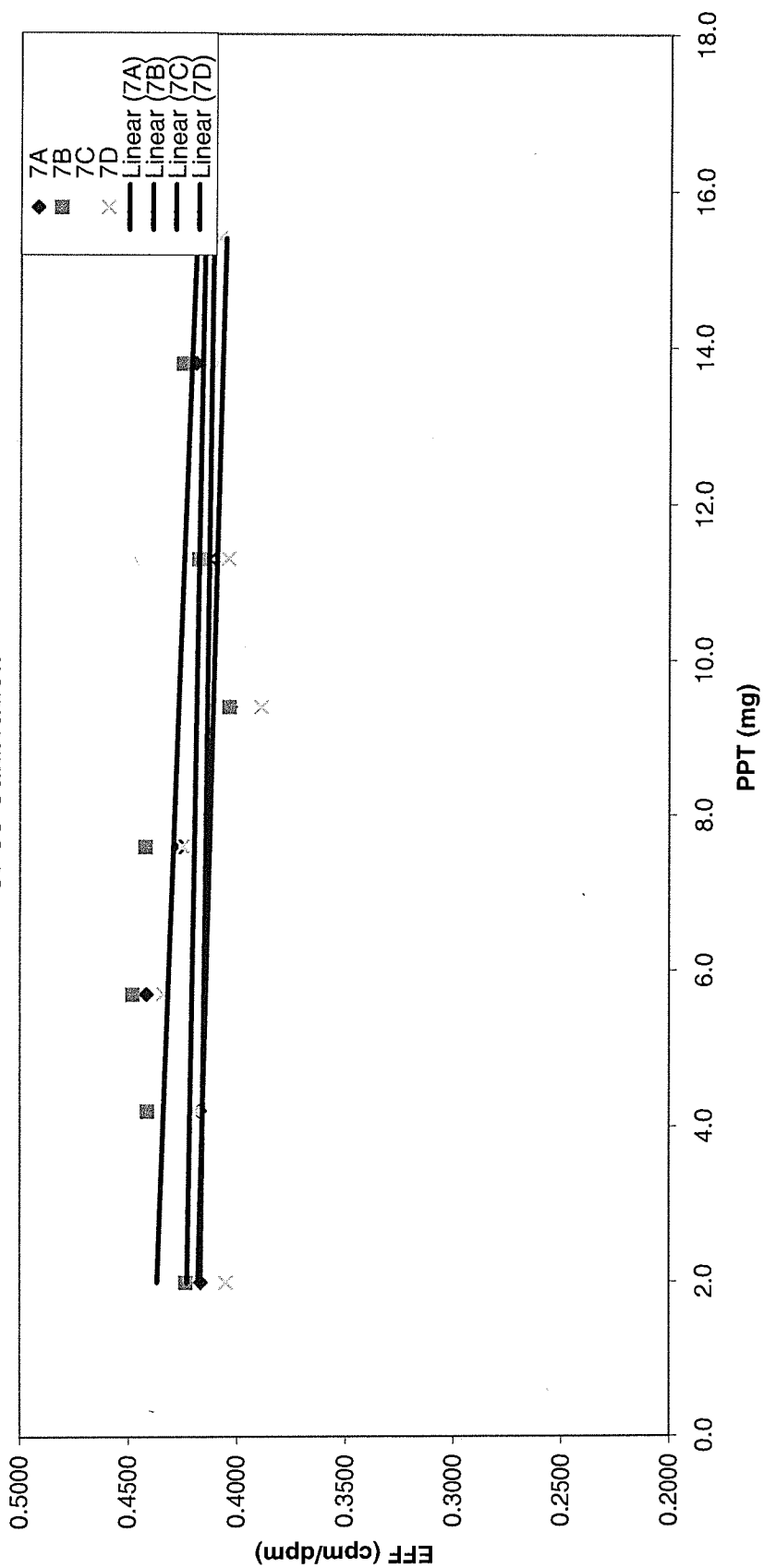
6A $y = -8.384785E-04x + 4.189072E-01$

6B $y = -1.034978E-03x + 4.286339E-01$

6C $y = -1.075743E-03x + 4.299989E-01$

6D

Sr-90 Calibration



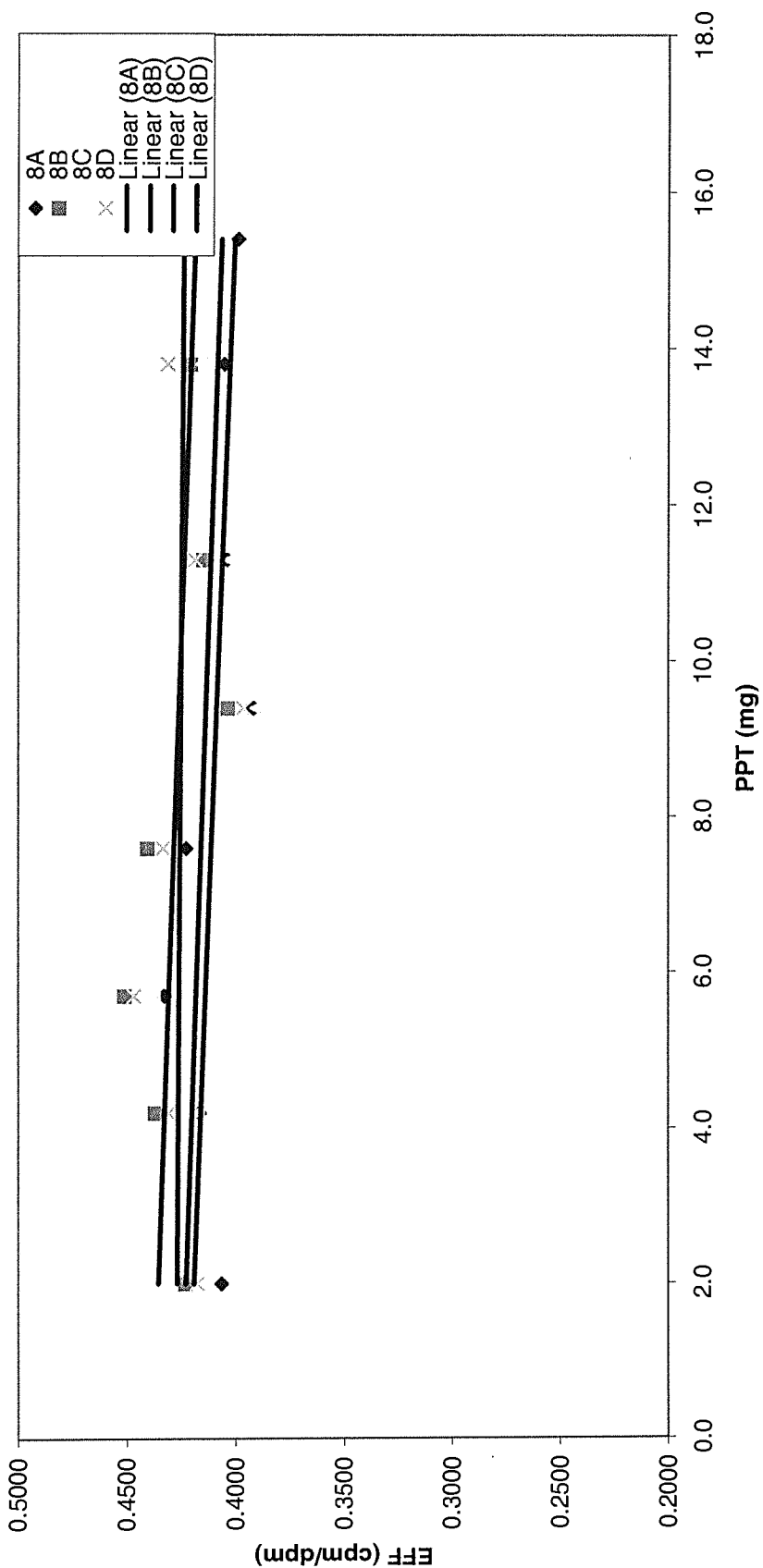
7A $y = -5.624966E-04x + 4.239837E-01$

7B $y = -1.310130E-03x + 4.393176E-01$

7C $y = -4.088183E-04x + 4.176348E-01$

7D $y = -9.135731E-04x + 4.196809E-01$

Sr-90 Calibration



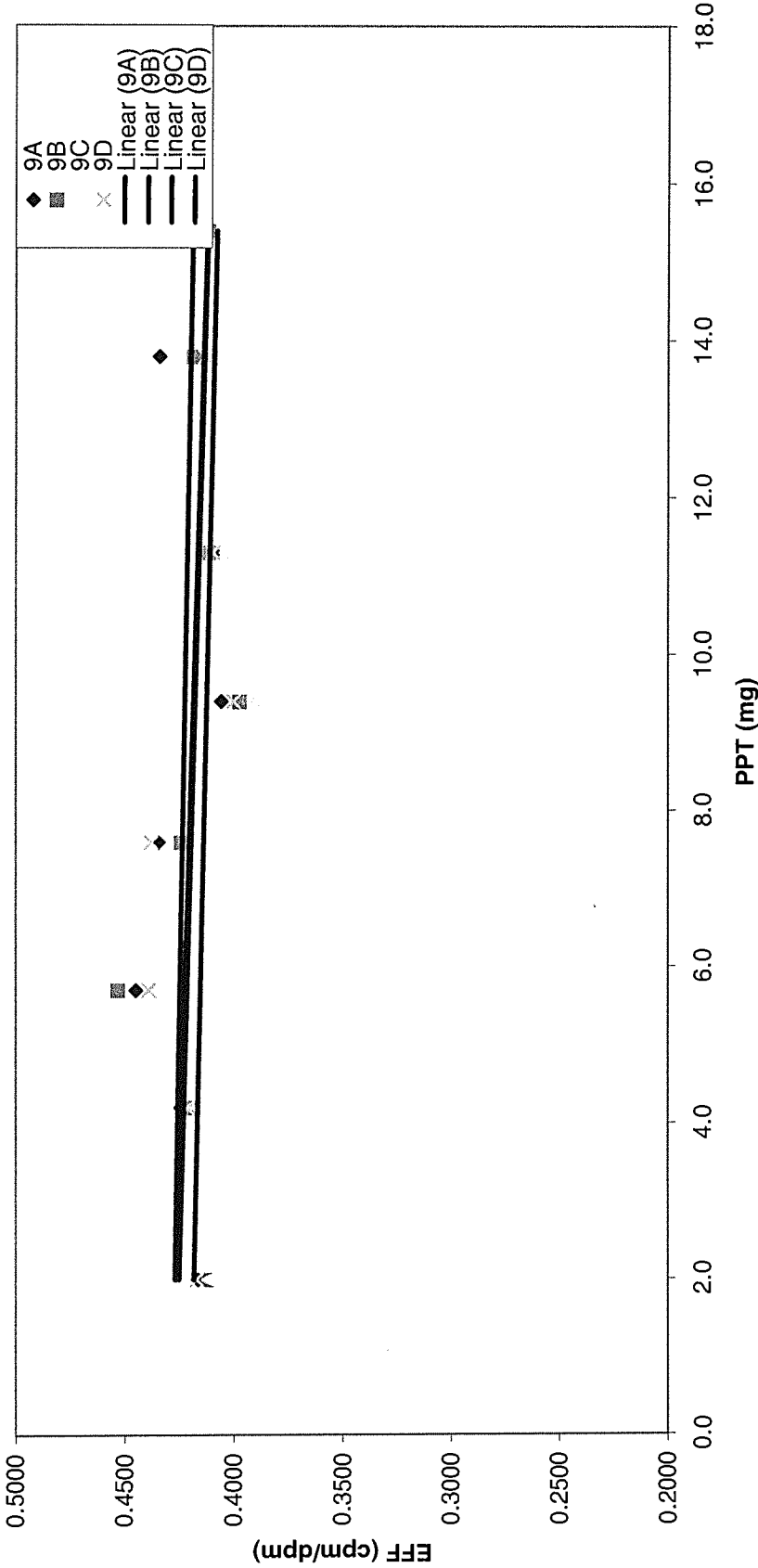
8A $y = -1.406602E-03x + 4.219628E-01$

8B $y = -1.259831E-03x + 4.380086E-01$

8C $y = -1.222559E-03x + 4.252222E-01$

8D $y = -2.293344E-04x + 4.273960E-01$

Sr-90 Calibration



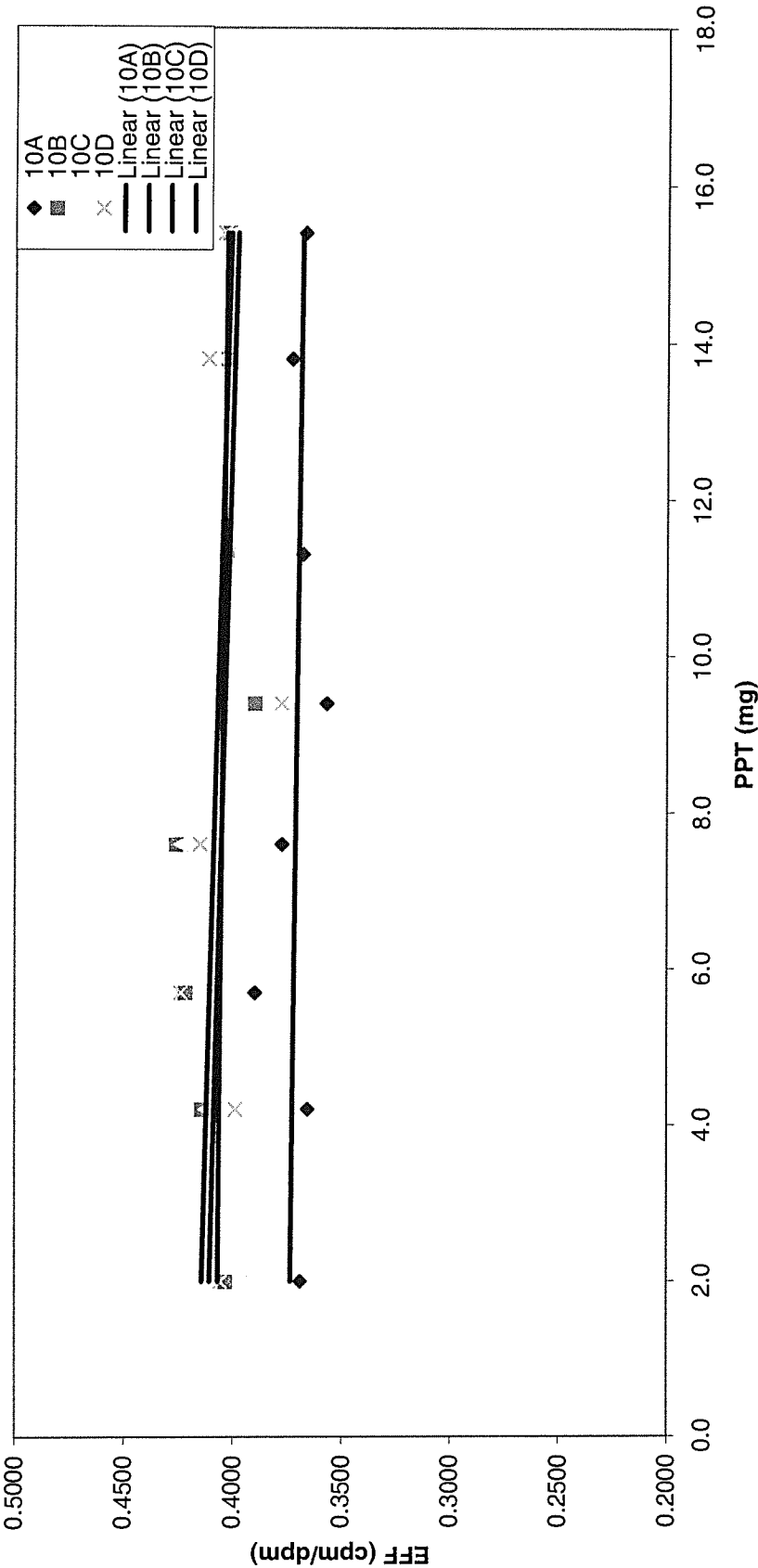
9A $y = -6.083237E-04x + 4.281823E-01$

9B $y = -9.821921E-04x + 4.270197E-01$

9C $y = -7.858394E-04x + 4.198491E-01$

9D $y = -1.075914E-03x + 4.286406E-01$

Sr-90 Calibration



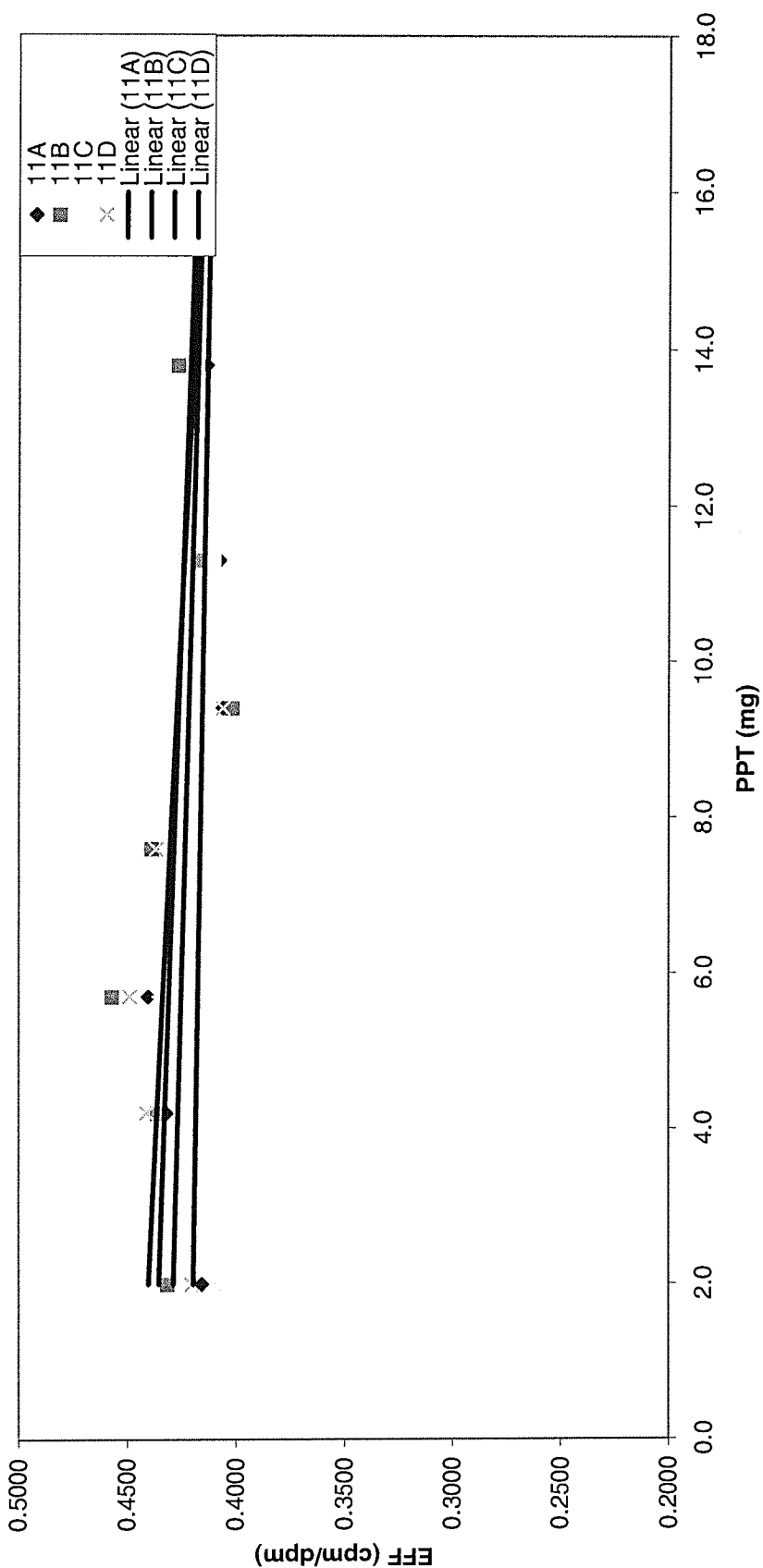
10A $y = -3.893197E-04x + 3.742001E-01$

10B $y = -9.756952E-04x + 4.161778E-01$

10C $y = -9.330272E-04x + 4.124353E-01$

10D $y = -2.815846E-04x + 4.073091E-01$

Sr-90 Calibration



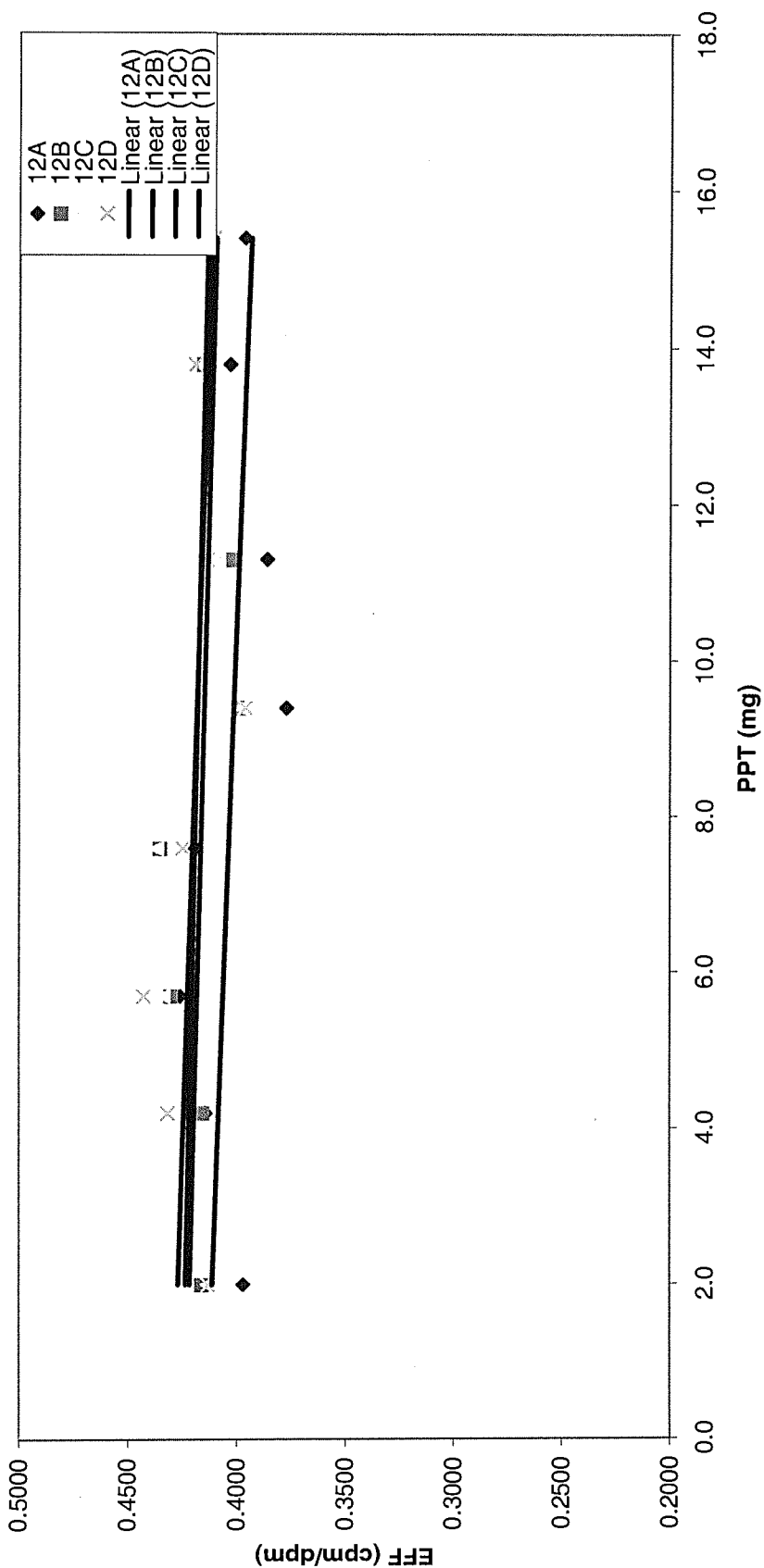
11A $y = -9.350527E-04x + 4.306408E-01$

11B $y = -1.752265E-03x + 4.437766E-01$

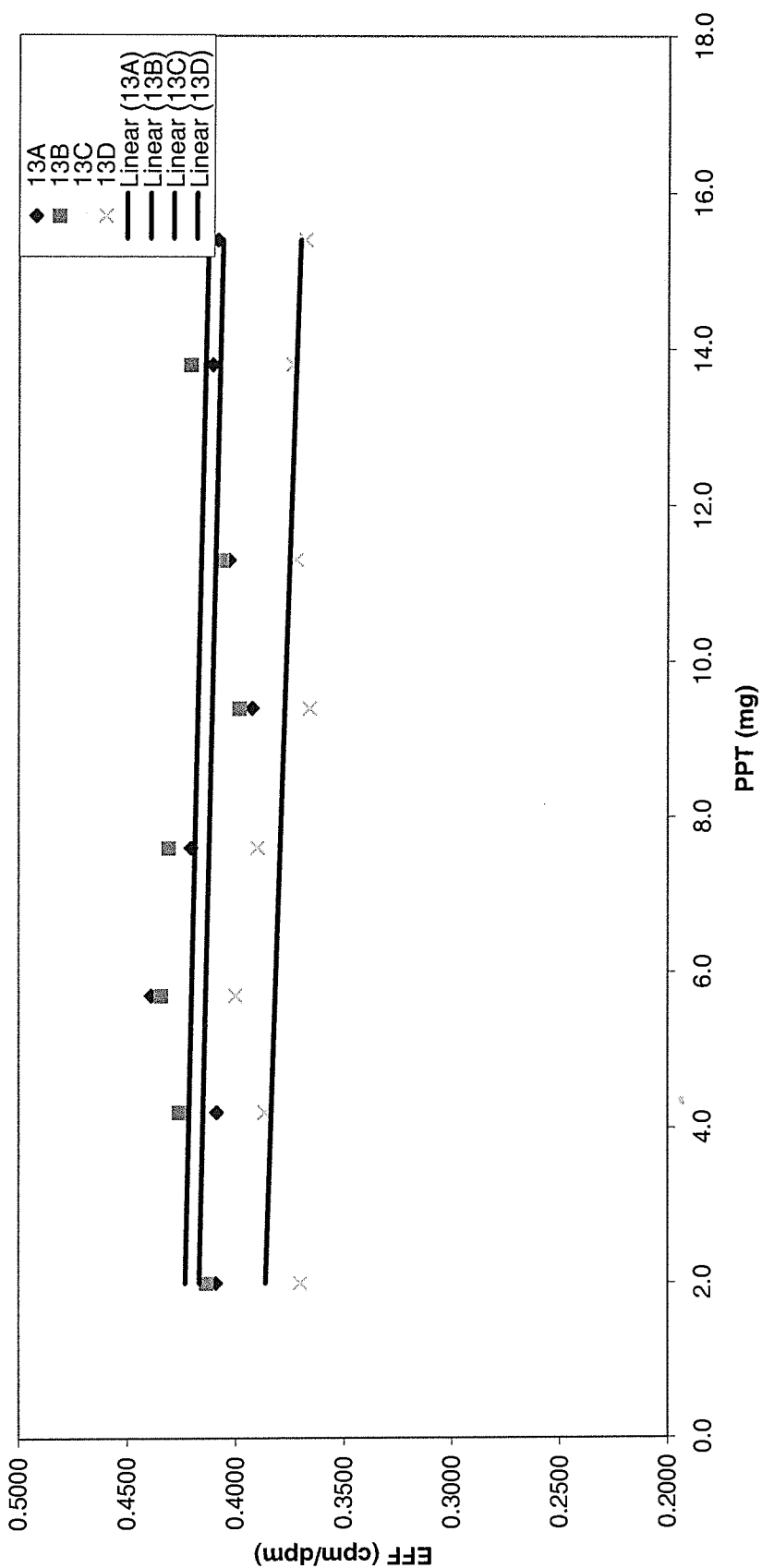
11C $y = -5.397978E-04x + 4.207411E-01$

11D $y = -1.218421E-03x + 4.379456E-01$

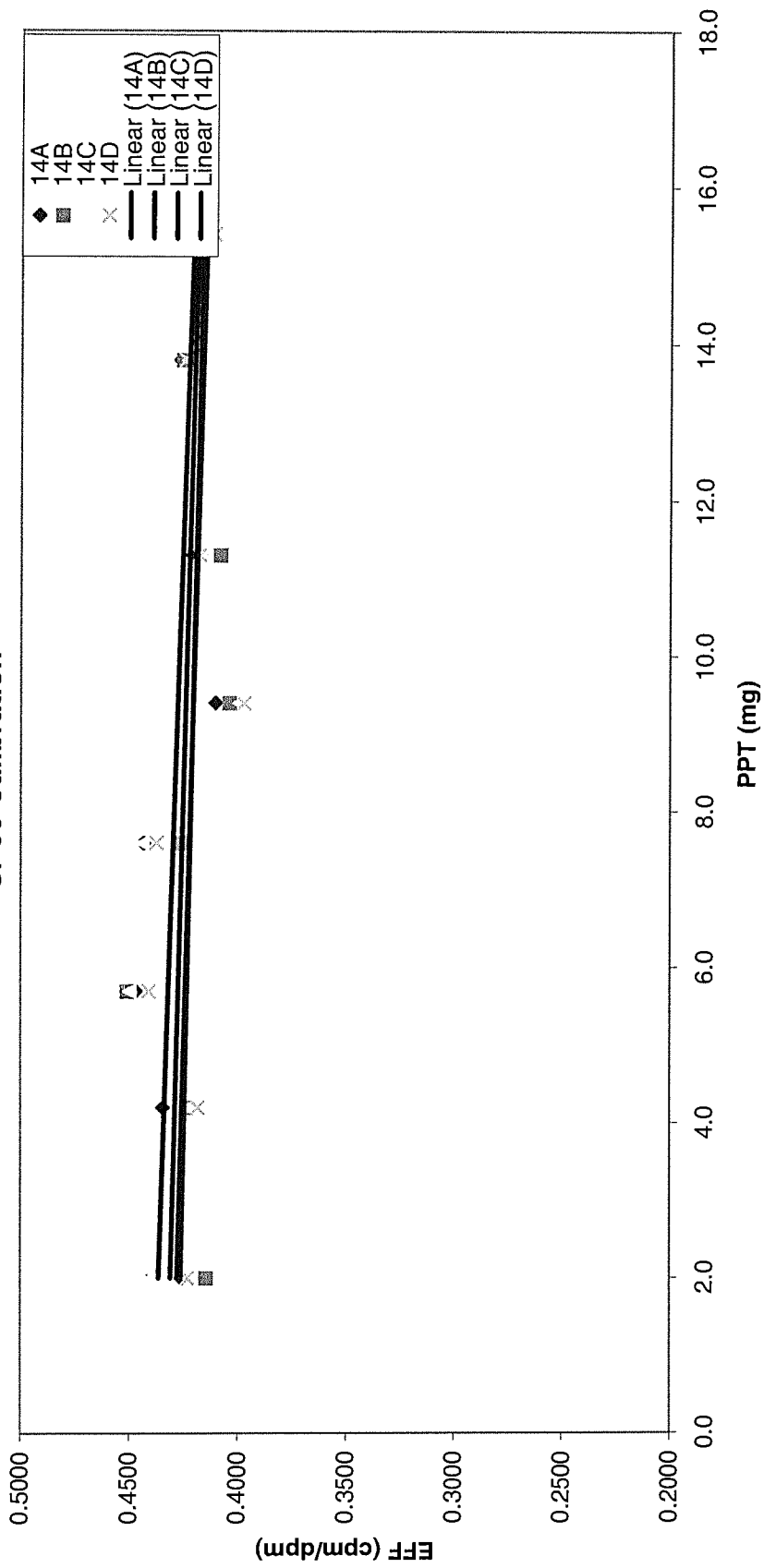
Sr-90 Calibration



Sr-90 Calibration



Sr-90 Calibration



14A $y = -1.160524E-03x + 4.386526E-01$

14B $y = -7.436219E-04x + 4.276269E-01$

14C $y = -9.176519E-04x + 4.327007E-01$

14D $y = -9.758274E-04x + 4.298086E-01$

Current Calibration - PIC

Geometry	Tuffryn Filter		4/1/2016	Exp Date	2/28/2017	
Sr-90	Cal Date					
Protean	A0	A1	A2	A3	A4	
1A	0.42818758	-0.000822874				
1B	0.437742392	-0.001755067				
1C	0.437135072	-0.001607365				
1D	0.423101465	-0.000519436				
2A	0.419912966	-0.00090426				
2B	0.400056346	8.28196E-05				
2C	0.411291508	-0.000270447				
2D	0.397193638	-0.001100277				
3A	0.410855485	-0.000658133				
3B	0.415937606	-0.001367469				
3C	0.422558538	-0.000731448				
3D	0.405278098	-0.000332099				
4A	0.428698808	-0.001454402				
4B	0.427804603	-0.000579462				
4C	0.432434334	-0.000964319				
4D	0.420316176	-0.001011721				
5A	0.442009856	-0.001313849				
5B	0.441495563	-0.001637392				
5C	0.423040881	-0.000406048				
5D	0.429258595	-0.000592616				
6A	0.4189072	-0.000838479				
6B	0.428633875	-0.001034978				
6C	0.429998919	-0.001075743				
6D	#N/A	#N/A				
7A	0.423983729	-0.000562497				
7B	0.439317611	-0.00131013				
7C	0.417634818	-0.000408818				
7D	0.41968091	-0.000913573				
8A	0.42196284	-0.001406602				
8B	0.438008632	-0.001259831				
8C	0.425222242	-0.001222559				
8D	0.427396045	-0.000229334				
9A	0.428182297	-0.000608324				
9B	0.427019668	-0.000982192				
9C	0.419849088	-0.000785839				
9D	0.428640561	-0.001075914				
10A	0.374200057	-0.00038932				
10B	0.416177786	-0.000975695				
10C	0.412435251	-0.000933027				
10D	0.407309091	-0.000281585				
11A	0.430640813	-0.000935053				
11B	0.443776601	-0.001752265				
11C	0.420741068	-0.000539798				
11D	0.437945559	-0.001218421				
12A	0.413814738	-0.001316525				
12B	0.423255367	-0.000882285				
12C	0.424875251	-0.000735198				
12D	0.429128794	-0.001157148				
13A	0.418404589	-0.000797855				
13B	0.424786059	-0.000776219				
13C	#N/A	#N/A				
13D	0.388546529	-0.001183649				
14A	0.43865257	-0.001160524				
14B	0.427626909	-0.000743622				
14C	0.432700652	-0.000917652				
14D	0.429808582	-0.000975827				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
S1	10A	3	1	12922	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S2	10A	3	7	12861	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S3	10A	3	1	13500	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S4	10A	3	1	13160	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S5	10A	3	0	12567	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S6	10A	3	1	12886	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S7	10A	3	0	13012	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S8	10A	3	0	12844	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S1	10B	3	2	14323	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S2	10B	3	2	14603	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S3	10B	3	7	14838	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S4	10B	3	6	14943	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S5	10B	3	3	13926	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S6	10B	3	3	14266	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S7	10B	3	5	14283	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S8	10B	3	4	14256	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S1	10C	3	1	14058	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S2	10C	3	5	14516	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S3	10C	3	1	14951	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S4	10C	3	1	14842	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S5	10C	3	2	13540	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S6	10C	3	4	13892	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S7	10C	3	3	14278	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S8	10C	3	0	14177	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S1	10D	3	0	14309	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S2	10D	3	3	14103	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S3	10D	3	0	14773	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S4	10D	3	0	14526	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S5	10D	3	1	13512	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S6	10D	3	1	14175	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S7	10D	3	0	14398	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S8	10D	3	0	14188	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S1	11A	3	0	14797	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S2	11A	3	4	15262	2/20/2016 16:55	2/20/2016 16:58	PIC	SR90S16
S3	11A	3	1	15478	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S4	11A	3	0	15433	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16

S5	11A	3	0	14575	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S6	11A	3	0	14644	2/20/2016 17:12	2/20/2016 17:15	PIC	SR90S16
S7	11A	3	0	14795	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S8	11A	3	1	15105	2/20/2016 17:03	2/20/2016 17:06	PIC	SR90S16
S1	11B	3	1	15305	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S2	11B	3	2	15420	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S3	11B	3	1	16014	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S4	11B	3	0	15514	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S5	11B	3	0	14545	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S6	11B	3	0	14961	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S7	11B	3	1	15234	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S8	11B	3	3	15022	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S1	11C	3	1	14640	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S2	11C	3	4	14953	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S3	11C	3	0	15344	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S4	11C	3	0	15224	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S5	11C	3	0	14231	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S6	11C	3	0	14717	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S7	11C	3	0	14913	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S8	11C	3	0	14810	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S1	11D	3	1	15105	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S2	11D	3	8	15648	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S3	11D	3	1	15847	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S4	11D	3	0	15521	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S5	11D	3	0	14754	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S6	11D	3	0	15205	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S7	11D	3	0	15097	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S8	11D	3	0	15174	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S1	12A	3	0	14288	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S2	12A	3	3	14780	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S3	12A	3	0	15080	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S4	12A	3	0	14890	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S5	12A	3	0	13722	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S6	12A	3	0	13985	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S7	12A	3	0	14442	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S8	12A	3	0	14248	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S1	12B	3	0	14776	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16

S2	12B	3	4	14767	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S3	12B	3	1	15179	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S4	12B	3	0	15305	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S5	12B	3	0	14273	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90S16
S6	12B	3	1	14352	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S7	12B	3	0	14745	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S8	12B	3	0	14677	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S1	12C	3	0	14773	2/20/2016 17:09	2/20/2016 17:12	PIC	SR90S16
S2	12C	3	6	15021	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S3	12C	3	2	15306	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S4	12C	3	0	15413	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S5	12C	3	0	14339	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S6	12C	3	1	14668	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90S16
S7	12C	3	2	14815	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S8	12C	3	4	14808	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S1	12D	3	0	14800	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S2	12D	3	2	15289	2/20/2016 17:09	2/20/2016 17:12	PIC	SR90S16
S3	12D	3	0	15580	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S4	12D	3	0	15090	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S5	12D	3	0	14309	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S6	12D	3	0	14777	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S7	12D	3	0	14910	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90S16
S8	12D	3	2	14683	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S1	13A	3	0	14445	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S2	13A	3	2	14462	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S3	13A	3	0	15261	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S4	13A	3	1	14764	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S5	13A	3	0	14031	2/20/2016 17:35	2/20/2016 17:38	PIC	SR90S16
S6	13A	3	0	14343	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S7	13A	3	0	14538	2/20/2016 17:43	2/20/2016 17:46	PIC	SR90S16
S8	13A	3	0	14467	2/20/2016 17:39	2/20/2016 17:42	PIC	SR90S16
S1	13B	3	0	14640	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S2	13B	3	2	14968	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S3	13B	3	0	15216	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S4	13B	3	0	15115	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S5	13B	3	0	14264	2/20/2016 17:39	2/20/2016 17:42	PIC	SR90S16
S6	13B	3	0	14475	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16

S7	13B	3	0	14885	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S8	13B	3	1	14716	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
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S2	13D	3	5	13301	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S3	13D	3	0	13662	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S4	13D	3	0	13376	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S5	13D	3	0	12780	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S6	13D	3	0	12940	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S7	13D	3	0	12971	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S8	13D	3	1	12811	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S1	14A	3	0	15248	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S2	14A	3	3	15506	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S3	14A	3	1	15834	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S4	14A	3	1	15730	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S5	14A	3	1	14803	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S6	14A	3	0	15115	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S7	14A	3	0	15259	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S8	14A	3	0	15067	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S1	14B	3	1	14909	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S2	14B	3	5	15150	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S3	14B	3	1	15908	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S4	14B	3	0	15248	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S5	14B	3	0	14596	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S6	14B	3	0	14700	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S7	14B	3	1	15189	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S8	14B	3	1	14952	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S1	14C	3	0	15205	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S2	14C	3	2	15225	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S3	14C	3	1	15939	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S4	14C	3	0	15805	2/20/2016 17:49	2/20/2016 17:52	PIC	SR90S16
S5	14C	3	0	14564	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S6	14C	3	0	14987	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S7	14C	3	0	15187	2/20/2016 17:20	2/20/2016 17:23	PIC	SR90S16
S8	14C	3	0	15174	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S1	14D	3	1	15195	2/20/2016 17:49	2/20/2016 17:52	PIC	SR90S16
S2	14D	3	3	15057	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S3	14D	3	0	15654	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16

S4	14D	3	0	15552	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
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S6	14D	3	0	15017	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S7	14D	3	0	15176	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S8	14D	3	0	14830	2/20/2016 17:20	2/20/2016 17:23	PIC	SR90S16
S1	1A	3	1	14186	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S2	1A	3	4	14822	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S3	1A	3	5	14984	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S4	1A	3	4	14662	2/20/2016 12:35	2/20/2016 12:38	PIC	SR90S16
S5	1A	3	3	13922	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S6	1A	3	2	14305	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S7	1A	3	3	14466	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S8	1A	3	1	14401	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S1	1B	3	13	14674	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S2	1B	3	12	14781	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S3	1B	3	13	14814	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S4	1B	3	18	14913	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S5	1B	3	18	13971	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S6	1B	3	16	14284	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S7	1B	3	20	14398	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S8	1B	3	19	14322	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S1	1C	3	161	14441	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S2	1C	3	151	14838	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S3	1C	3	144	15277	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S4	1C	3	167	15212	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S5	1C	3	166	13997	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S6	1C	3	174	14326	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S7	1C	3	151	14430	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S8	1C	3	194	14415	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S1	1D	3	112	14200	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S2	1D	3	126	14506	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S3	1D	3	116	14976	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S4	1D	3	128	14726	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S5	1D	3	135	13845	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S6	1D	3	115	14442	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S7	1D	3	117	14742	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S8	1D	3	117	14106	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16

S1	2A	3	8	14104	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S2	2A	3	8	14228	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S3	2A	3	12	14755	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S4	2A	3	6	14565	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S5	2A	3	8	13802	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S6	2A	3	8	13922	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S7	2A	3	9	14117	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S8	2A	3	6	14004	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S1	2B	3	0	13494	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S2	2B	3	6	13735	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S3	2B	3	0	14086	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S4	2B	3	0	14101	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S5	2B	3	0	13254	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S6	2B	3	2	13299	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S7	2B	3	0	13703	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S8	2B	3	0	13940	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S1	2C	3	18	13901	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S2	2C	3	17	13916	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S3	2C	3	9	14632	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S4	2C	3	9	14370	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S5	2C	3	9	13642	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S6	2C	3	11	14059	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S7	2C	3	16	14045	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S8	2C	3	12	13916	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S1	2D	3	0	13327	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S2	2D	3	7	13308	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S3	2D	3	0	13789	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S4	2D	3	1	13740	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S5	2D	3	0	12936	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S6	2D	3	0	12858	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S7	2D	3	0	13095	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S8	2D	3	0	13204	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S1	3A	3	348	13797	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S2	3A	3	370	14321	2/20/2016 13:25	2/20/2016 13:28	PIC	SR90S16
S3	3A	3	370	14736	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S4	3A	3	332	14372	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S5	3A	3	343	13423	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16

S6	3A	3	356	13811	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S7	3A	3	352	14196	2/20/2016 13:39	2/20/2016 13:42	PIC	SR90S16
S8	3A	3	370	14078	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S1	3B	3	160	14105	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S2	3B	3	164	14272	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S3	3B	3	155	14645	2/20/2016 13:25	2/20/2016 13:28	PIC	SR90S16
S4	3B	3	164	14570	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S5	3B	3	157	13437	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S6	3B	3	146	13829	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S7	3B	3	153	14009	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S8	3B	3	149	14053	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S1	3C	3	111	14272	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S2	3C	3	103	14536	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S3	3C	3	122	14950	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S4	3C	3	104	14801	2/20/2016 13:25	2/20/2016 13:28	PIC	SR90S16
S5	3C	3	94	14033	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S6	3C	3	99	14429	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S7	3C	3	94	14445	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S8	3C	3	88	14314	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S1	3D	3	33	13779	2/20/2016 13:25	2/20/2016 13:28	PIC	SR90S16
S2	3D	3	43	13975	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S3	3D	3	31	14441	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S4	3D	3	28	14382	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S5	3D	3	39	13657	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S6	3D	3	26	13772	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S7	3D	3	34	14025	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S8	3D	3	33	13986	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S1	4A	3	83	14530	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S2	4A	3	72	14683	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S3	4A	3	70	14940	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S4	4A	3	73	14768	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S5	4A	3	76	13835	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S6	4A	3	83	14118	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S7	4A	3	84	14335	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S8	4A	3	62	14262	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S1	4B	3	1	14554	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S2	4B	3	2	14783	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16

S3	4B	3	0	15145	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S4	4B	3	2	15002	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S5	4B	3	0	14038	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S6	4B	3	2	14504	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S7	4B	3	0	14552	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S8	4B	3	0	14686	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S1	4C	3	42	14802	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S2	4C	3	40	14933	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S3	4C	3	28	15052	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S4	4C	3	32	15038	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90S16
S5	4C	3	16	13935	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90S16
S6	4C	3	50	14667	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S7	4C	3	38	14693	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S8	4C	3	45	14589	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S1	4D	3	227	14220	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90S16
S2	4D	3	234	14624	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S3	4D	3	232	14908	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S4	4D	3	234	14542	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90S16
S5	4D	3	207	13834	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S6	4D	3	186	14095	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90S16
S7	4D	3	206	14286	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S8	4D	3	198	14146	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S1	5A	3	43	14812	2/20/2016 14:13	2/20/2016 14:16	PIC	SR90S16
S2	5A	3	25	15454	2/20/2016 14:27	2/20/2016 14:30	PIC	SR90S16
S3	5A	3	35	15712	2/20/2016 14:22	2/20/2016 14:25	PIC	SR90S16
S4	5A	3	36	15152	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S5	5A	3	38	14660	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S6	5A	3	40	14925	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16
S7	5A	3	32	14859	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S8	5A	3	32	14915	2/20/2016 14:35	2/20/2016 14:38	PIC	SR90S16
S1	5B	3	49	14929	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S2	5B	3	44	15222	2/20/2016 14:13	2/20/2016 14:16	PIC	SR90S16
S3	5B	3	46	15764	2/20/2016 14:27	2/20/2016 14:30	PIC	SR90S16
S4	5B	3	41	15240	2/20/2016 14:22	2/20/2016 14:25	PIC	SR90S16
S5	5B	3	47	14104	2/20/2016 14:35	2/20/2016 14:38	PIC	SR90S16
S6	5B	3	41	14557	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S7	5B	3	51	15162	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16

S8	5B	3	42	14698	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S1	5C	3	44	14607	2/20/2016 14:23	2/20/2016 14:26	PIC	SR90S16
S2	5C	3	49	14641	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S3	5C	3	45	15261	2/20/2016 14:13	2/20/2016 14:16	PIC	SR90S16
S4	5C	3	47	15007	2/20/2016 14:27	2/20/2016 14:30	PIC	SR90S16
S5	5C	3	36	14145	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S6	5C	3	34	14630	2/20/2016 14:36	2/20/2016 14:39	PIC	SR90S16
S7	5C	3	38	14766	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S8	5C	3	59	14741	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16
S1	5D	3	57	14865	2/20/2016 14:27	2/20/2016 14:30	PIC	SR90S16
S2	5D	3	58	14939	2/20/2016 14:23	2/20/2016 14:26	PIC	SR90S16
S3	5D	3	61	15249	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S4	5D	3	58	15051	2/20/2016 14:13	2/20/2016 14:16	PIC	SR90S16
S5	5D	3	37	14346	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16
S6	5D	3	61	14646	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S7	5D	3	54	14739	2/20/2016 14:36	2/20/2016 14:39	PIC	SR90S16
S8	5D	3	55	15045	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S1	6A	3	71	14466	2/20/2016 14:33	2/20/2016 14:36	PIC	SR90S16
S2	6A	3	70	14472	2/20/2016 14:46	2/20/2016 14:49	PIC	SR90S16
S3	6A	3	66	14908	2/20/2016 14:42	2/20/2016 14:45	PIC	SR90S16
S4	6A	3	63	14922	2/20/2016 14:37	2/20/2016 14:40	PIC	SR90S16
S5	6A	3	57	14046	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90S16
S6	6A	3	74	14394	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90S16
S7	6A	3	80	14455	2/20/2016 14:25	2/20/2016 14:28	PIC	SR90S16
S8	6A	3	76	14232	2/20/2016 14:20	2/20/2016 14:23	PIC	SR90S16
S1	6B	3	84	14556	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90S16
S2	6B	3	81	14963	2/20/2016 14:33	2/20/2016 14:36	PIC	SR90S16
S3	6B	3	85	15210	2/20/2016 14:46	2/20/2016 14:49	PIC	SR90S16
S4	6B	3	98	15205	2/20/2016 14:42	2/20/2016 14:45	PIC	SR90S16
S5	6B	3	84	14261	2/20/2016 14:20	2/20/2016 14:23	PIC	SR90S16
S6	6B	3	95	14449	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90S16
S7	6B	3	89	14729	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90S16
S8	6B	3	65	14462	2/20/2016 14:25	2/20/2016 14:28	PIC	SR90S16
S1	6C	3	97	14595	2/20/2016 14:42	2/20/2016 14:45	PIC	SR90S16
S2	6C	3	121	15094	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90S16
S3	6C	3	124	15201	2/20/2016 14:33	2/20/2016 14:36	PIC	SR90S16
S4	6C	3	118	15278	2/20/2016 14:46	2/20/2016 14:49	PIC	SR90S16

S5	6C	3	101	14064	2/20/2016 14:25	2/20/2016 14:28	PIC	SR90S16
S6	6C	3	128	14589	2/20/2016 14:20	2/20/2016 14:23	PIC	SR90S16
S7	6C	3	109	14659	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90S16
S8	6C	3	110	14577	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90S16
S1	7A	3	4	14647	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S2	7A	3	13	14683	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S3	7A	3	7	15337	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S4	7A	3	10	14916	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S5	7A	3	6	14321	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S6	7A	3	6	14526	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S7	7A	3	11	14765	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S8	7A	3	5	14749	2/20/2016 15:12	2/20/2016 15:15	PIC	SR90S16
S1	7B	3	11	14893	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S2	7B	3	14	15359	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S3	7B	3	9	15571	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S4	7B	3	12	15404	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S5	7B	3	15	14394	2/20/2016 15:12	2/20/2016 15:15	PIC	SR90S16
S6	7B	3	17	14760	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S7	7B	3	15	14988	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S8	7B	3	14	14909	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S1	7C	3	2	14400	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S2	7C	3	8	14617	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S3	7C	3	0	15028	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S4	7C	3	1	14779	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S5	7C	3	1	13820	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S6	7C	3	4	14385	2/20/2016 15:12	2/20/2016 15:15	PIC	SR90S16
S7	7C	3	3	14405	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S8	7C	3	0	14776	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S1	7D	3	2	14305	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S2	7D	3	4	14672	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S3	7D	3	2	15066	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S4	7D	3	2	14822	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S5	7D	3	2	13907	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S6	7D	3	2	14305	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S7	7D	3	3	14430	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S8	7D	3	3	14408	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S1	8A	3	17	14423	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16

S2	8A	3	20	14724	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S3	8A	3	13	15147	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S4	8A	3	21	14871	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S5	8A	3	15	13999	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S6	8A	3	16	14350	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S7	8A	3	17	14374	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S8	8A	3	15	14195	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S1	8B	3	0	14877	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S2	8B	3	2	15242	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90S16
S3	8B	3	4	15644	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S4	8B	3	1	15353	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S5	8B	3	1	14319	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S6	8B	3	1	14609	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S7	8B	3	2	14795	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S8	8B	3	3	14930	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S1	8C	3	2	14653	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S2	8C	3	9	14695	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S3	8C	3	2	15230	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90S16
S4	8C	3	1	15016	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S5	8C	3	0	13933	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90S16
S6	8C	3	7	14256	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S7	8C	3	2	14597	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S8	8C	3	2	14450	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S1	8D	3	57	14816	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S2	8D	3	58	15164	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S3	8D	3	47	15580	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S4	8D	3	55	15210	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90S16
S5	8D	3	44	14216	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90S16
S6	8D	3	35	14800	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90S16
S7	8D	3	51	15132	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S8	8D	3	51	15035	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S1	9A	3	9	14799	2/20/2016 15:55	2/20/2016 15:58	PIC	SR90S16
S2	9A	3	8	15041	2/20/2016 16:09	2/20/2016 16:12	PIC	SR90S16
S3	9A	3	14	15584	2/20/2016 16:04	2/20/2016 16:07	PIC	SR90S16
S4	9A	3	6	15300	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S5	9A	3	9	14556	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S6	9A	3	14	14685	2/20/2016 16:33	2/20/2016 16:36	PIC	SR90S16

S7	9A	3	8	15337	2/20/2016 16:26	2/20/2016 16:29	PIC	SR90S16
S8	9A	3	15	14784	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S1	9B	3	20	14662	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S2	9B	3	24	14896	2/20/2016 15:55	2/20/2016 15:58	PIC	SR90S16
S3	9B	3	13	15801	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S4	9B	3	22	15011	2/20/2016 16:04	2/20/2016 16:07	PIC	SR90S16
S5	9B	3	18	14329	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S6	9B	3	17	14696	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S7	9B	3	18	14916	2/20/2016 16:33	2/20/2016 16:36	PIC	SR90S16
S8	9B	3	26	14724	2/20/2016 16:26	2/20/2016 16:29	PIC	SR90S16
S1	9C	3	21	14642	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S2	9C	3	17	14781	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S3	9C	3	21	15345	2/20/2016 15:55	2/20/2016 15:58	PIC	SR90S16
S4	9C	3	25	14841	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S5	9C	3	19	14117	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S6	9C	3	26	14469	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S7	9C	3	28	14512	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S8	9C	3	28	14925	2/20/2016 16:33	2/20/2016 16:36	PIC	SR90S16
S1	9D	3	43	14850	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S2	9D	3	48	14953	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S3	9D	3	46	15419	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S4	9D	3	41	15387	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S5	9D	3	29	14444	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S6	9D	3	31	14687	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S7	9D	3	36	14778	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S8	9D	3	39	14829	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16

Y-90 Calibration - PIC - Feb 2016

Standard Data	Isotope	Sr-90
	Standard ID number	1244-A
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)	21333.9626
	Reference Date	10/1/2008
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	8935.10
	Decay Date	2/20/2016

Separation Date/Time 2/19/2016 13:25
Y-90 Half Life (days) 2.668875

The following detectors were not calibrated:

6D, 13C

Carrier Data		Std ID	2354207	
		Std weight	31.78	mg/mL
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	15.9	0.5	15.89	100.0%
2	16.4	0.5	15.89	100.0%
3	16.3	0.5	15.89	100.0%
4	16.4	0.5	15.89	100.0%
5	15.8	0.5	15.89	99.4%
6	15.7	0.5	15.89	98.8%
7	16.1	0.5	15.89	100.0%
8	16.3	0.5	15.89	100.0%

***Recovery values exceeding 100% will be evaluated at 100%.

***Recovery values exceeding 100% will be evaluated at 100%.

*Background is considered negligible.

**Decay corrected to mid-point of count

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Sr-90		Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)				Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	
1A	1	2/20/2016 11:40	3	11488	3829.33	100.0%	0.78576	4873.42	8934.82	0.5454
1A	2	2/20/2016 11:57	3	11289	3763.00	100.0%	0.78337	4803.59	8934.81	0.5376
1A	3	2/20/2016 11:52	3	11459	3819.67	100.0%	0.78409	4871.47	8934.81	0.5452
1A	4	2/20/2016 11:48	3	11426	3808.67	100.0%	0.78467	4853.87	8934.81	0.5433
1A	5	2/20/2016 12:13	3	11352	3784.00	99.4%	0.78112	4871.94	8934.80	0.5453
1A	6	2/20/2016 12:26	3	11462	3820.67	98.8%	0.77931	4961.98	8934.80	0.5554
1A	7	2/20/2016 12:21	3	11527	3842.33	100.0%	0.77993	4926.48	8934.80	0.5514
1A	8	2/20/2016 12:17	3	11681	3893.67	100.0%	0.78049	4988.76	8934.80	0.5584
1B	1	2/20/2016 11:48	3	11409	3803.00	100.0%	0.78466	4846.71	8934.81	0.5425
1B	2	2/20/2016 11:40	3	11539	3846.33	100.0%	0.78576	4895.07	8934.82	0.5479
1B	3	2/20/2016 11:57	3	11612	3870.67	100.0%	0.78336	4941.09	8934.81	0.5530
1B	4	2/20/2016 11:52	3	11274	3758.00	100.0%	0.78408	4792.87	8934.81	0.5364
1B	5	2/20/2016 12:17	3	11426	3808.67	99.4%	0.78048	4907.71	8934.80	0.5493
1B	6	2/20/2016 12:13	3	11568	3856.00	98.8%	0.78111	4996.32	8934.80	0.5592
1B	7	2/20/2016 12:26	3	11471	3823.67	100.0%	0.77930	4906.54	8934.80	0.5491
1B	8	2/20/2016 12:21	3	11717	3905.67	100.0%	0.77993	5007.71	8934.80	0.5605
1C	1	2/20/2016 11:52	3	11651	3883.67	100.0%	0.78407	4953.22	8934.81	0.5544
1C	2	2/20/2016 11:48	3	12039	4013.00	100.0%	0.78465	5114.38	8934.81	0.5724
1C	3	2/20/2016 11:40	3	11920	3973.33	100.0%	0.78576	5056.70	8934.82	0.5660
1C	4	2/20/2016 11:57	3	11958	3986.00	100.0%	0.78335	5088.38	8934.81	0.5695
1C	5	2/20/2016 12:21	3	11406	3802.00	99.4%	0.77992	4902.62	8934.80	0.5487
1C	6	2/20/2016 12:17	3	11675	3891.67	98.8%	0.78047	5046.67	8934.80	0.5648
1C	7	2/20/2016 12:13	3	11909	3969.67	100.0%	0.78110	5082.14	8934.80	0.5688
1C	8	2/20/2016 12:26	3	11745	3915.00	100.0%	0.77929	5023.80	8934.80	0.5623
1D	1	2/20/2016 11:57	3	11531	3843.67	100.0%	0.78334	4906.76	8934.81	0.5492
1D	2	2/20/2016 11:52	3	11636	3878.67	100.0%	0.78406	4946.88	8934.81	0.5537
1D	3	2/20/2016 11:48	3	11610	3870.00	100.0%	0.78464	4932.21	8934.81	0.5520
1D	4	2/20/2016 11:40	3	11651	3883.67	100.0%	0.78576	4942.58	8934.82	0.5532
1D	5	2/20/2016 12:26	3	11243	3747.67	99.4%	0.77928	4836.53	8934.80	0.5413
1D	6	2/20/2016 12:21	3	11548	3849.33	98.8%	0.77991	4995.35	8934.80	0.5591
1D	7	2/20/2016 12:17	3	11712	3904.00	100.0%	0.78046	5002.18	8934.80	0.5599
1D	8	2/20/2016 12:13	3	11897	3965.67	100.0%	0.78109	5077.10	8934.80	0.5682
2A	1	2/20/2016 12:13	3	11215	3738.33	100.0%	0.78108	4786.11	8934.80	0.5357
2A	2	2/20/2016 12:26	3	11258	3752.67	100.0%	0.77927	4815.61	8934.80	0.5390
2A	3	2/20/2016 12:21	3	11174	3724.67	100.0%	0.77988	4775.93	8934.80	0.5345
2A	4	2/20/2016 12:17	3	11358	3786.00	100.0%	0.78045	4851.06	8934.80	0.5429
2A	5	2/20/2016 11:40	3	11096	3698.67	99.4%	0.78575	4734.00	8934.82	0.5298
2A	6	2/20/2016 11:57	3	11399	3799.67	98.8%	0.78333	4909.33	8934.81	0.5495
2A	7	2/20/2016 11:52	3	11522	3840.67	100.0%	0.78405	4898.49	8934.81	0.5482
2A	8	2/20/2016 11:48	3	11469	3823.00	100.0%	0.78463	4872.36	8934.81	0.5453
2B	1	2/20/2016 12:18	3	10681	3560.33	100.0%	0.78044	4561.98	8934.80	0.5106
2B	2	2/20/2016 12:13	3	10820	3606.67	100.0%	0.78107	4617.58	8934.80	0.5168
2B	3	2/20/2016 12:26	3	10681	3560.33	100.0%	0.77926	4568.87	8934.80	0.5114
2B	4	2/20/2016 12:21	3	10767	3589.00	100.0%	0.77988	4602.01	8934.80	0.5151
2B	5	2/20/2016 11:48	3	10490	3496.67	99.4%	0.78462	4481.90	8934.81	0.5016
2B	6	2/20/2016 11:40	3	10544	3514.67	98.8%	0.78575	4527.16	8934.82	0.5067
2B	7	2/20/2016 11:57	3	10580	3526.67	100.0%	0.78333	4502.17	8934.81	0.5039
2B	8	2/20/2016 11:52	3	10655	3551.67	100.0%	0.78404	4529.95	8934.81	0.5070
2C	1	2/20/2016 12:22	3	10973	3657.67	100.0%	0.77984	4690.29	8934.80	0.5249
2C	2	2/20/2016 12:18	3	11113	3704.33	100.0%	0.78043	4746.55	8934.80	0.5312
2C	3	2/20/2016 12:13	3	11053	3684.33	100.0%	0.78107	4717.06	8934.80	0.5279
2C	4	2/20/2016 12:26	3	11288	3762.67	100.0%	0.77925	4828.56	8934.80	0.5404
2C	5	2/20/2016 11:52	3	11069	3689.67	99.4%	0.78403	4732.82	8934.81	0.5297
2C	6	2/20/2016 11:48	3	11080	3693.33	98.8%	0.78461	4764.18	8934.81	0.5332
2C	7	2/20/2016 11:40	3	11217	3739.00	100.0%	0.78575	4758.53	8934.82	0.5326
2C	8	2/20/2016 11:57	3	11441	3813.67	100.0%	0.78331	4868.63	8934.81	0.5449
2D	1	2/20/2016 12:26	3	10272	3424.00	100.0%	0.77924	4394.02	8934.80	0.4918
2D	2	2/20/2016 12:22	3	10579	3526.33	100.0%	0.77983	4521.92	8934.80	0.5061
2D	3	2/20/2016 12:18	3	10303	3434.33	100.0%	0.78042	4400.62	8934.80	0.4925
2D	4	2/20/2016 12:13	3	10554	3518.00	100.0%	0.78105	4504.18	8934.80	0.5041
2D	5	2/20/2016 11:57	3	10233	3411.00	99.4%	0.78330	4379.44	8934.81	0.4902
2D	6	2/20/2016 11:52	3	10298	3432.67	98.8%	0.78402	4431.25	8934.81	0.4960

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency : (cpm/dpm)	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
2D	7	2/20/2016 11:48	3	10587	3529.00	100.0%	0.78460	4497.83	8934.81	0.5034	0.4974
2D	8	2/20/2016 11:40	3	10434	3478.00	100.0%	0.78575	4426.36	8934.82	0.4954	
3A	1	2/20/2016 12:30	3	11273	3757.67	100.0%	0.77863	4826.00	8934.80	0.5401	
3A	2	2/20/2016 12:47	3	11284	3761.33	100.0%	0.77627	4845.42	8934.79	0.5423	
3A	3	2/20/2016 12:43	3	11107	3702.33	100.0%	0.77681	4766.05	8934.79	0.5334	0.5422
3A	4	2/20/2016 12:39	3	11467	3822.33	100.0%	0.77742	4916.71	8934.79	0.5503	
3A	5	2/20/2016 12:52	3	11239	3746.33	99.4%	0.77559	4857.84	8934.79	0.5437	
3A	6	2/20/2016 13:06	3	11073	3691.00	98.8%	0.77362	4828.84	8934.78	0.5405	
3A	7	2/20/2016 13:02	3	11260	3753.33	100.0%	0.77425	4847.72	8934.78	0.5426	0.5509
3A	8	2/20/2016 12:56	3	11320	3773.33	100.0%	0.77503	4868.60	8934.78	0.5449	
3B	1	2/20/2016 12:39	3	11423	3807.67	100.0%	0.77741	4897.88	8934.79	0.5482	
3B	2	2/20/2016 12:30	3	11571	3857.00	100.0%	0.77863	4953.57	8934.80	0.5544	
3B	3	2/20/2016 12:47	3	11541	3847.00	100.0%	0.77625	4955.89	8934.79	0.5547	0.5563
3B	4	2/20/2016 12:43	3	11617	3872.33	100.0%	0.77680	4984.95	8934.79	0.5579	
3B	5	2/20/2016 12:56	3	11011	3670.33	99.4%	0.77502	4762.74	8934.78	0.5331	
3B	6	2/20/2016 12:52	3	11274	3758.00	98.8%	0.77557	4904.11	8934.79	0.5489	
3B	7	2/20/2016 13:06	3	11395	3798.33	100.0%	0.77360	4909.91	8934.78	0.5495	0.5395
3B	8	2/20/2016 13:02	3	11636	3878.67	100.0%	0.77424	5009.64	8934.78	0.5607	
3C	1	2/20/2016 12:43	3	11185	3728.33	100.0%	0.77679	4799.64	8934.79	0.5372	
3C	2	2/20/2016 12:39	3	11678	3892.67	100.0%	0.77740	5007.29	8934.79	0.5604	
3C	3	2/20/2016 12:35	3	11565	3855.00	100.0%	0.77801	4954.95	8934.79	0.5546	0.5503
3C	4	2/20/2016 12:47	3	11547	3849.00	100.0%	0.77624	4958.52	8934.79	0.5550	
3C	5	2/20/2016 13:02	3	11531	3843.67	99.4%	0.77423	4992.78	8934.78	0.5588	
3C	6	2/20/2016 12:56	3	11514	3838.00	98.8%	0.77501	5012.11	8934.78	0.5610	
3C	7	2/20/2016 12:52	3	11706	3902.00	100.0%	0.77556	5031.23	8934.79	0.5631	0.5578
3C	8	2/20/2016 13:06	3	11617	3872.33	100.0%	0.77360	5005.62	8934.78	0.5602	
3D	1	2/20/2016 12:47	3	11025	3675.00	100.0%	0.77623	4734.42	8934.79	0.5299	
3D	2	2/20/2016 12:44	3	11414	3804.67	100.0%	0.77678	4898.01	8934.79	0.5482	
3D	3	2/20/2016 12:39	3	11196	3732.00	100.0%	0.77739	4800.68	8934.79	0.5373	0.5613
3D	4	2/20/2016 12:30	3	11361	3787.00	100.0%	0.77863	4863.69	8934.80	0.5444	
3D	5	2/20/2016 13:06	3	11022	3674.00	99.4%	0.77359	4776.35	8934.78	0.5346	
3D	6	2/20/2016 13:02	3	11046	3682.00	98.8%	0.77422	4813.30	8934.78	0.5387	
3D	7	2/20/2016 12:57	3	11204	3734.67	100.0%	0.77492	4819.41	8934.78	0.5394	0.5685
3D	8	2/20/2016 12:52	3	11296	3765.33	100.0%	0.77554	4855.10	8934.79	0.5434	
4A	1	2/20/2016 12:52	3	11097	3699.00	100.0%	0.77553	4769.63	8934.79	0.5338	
4A	2	2/20/2016 13:07	3	11327	3775.67	100.0%	0.77357	4880.86	8934.78	0.5463	
4A	3	2/20/2016 13:02	3	11357	3785.67	100.0%	0.77421	4889.70	8934.78	0.5473	0.5578
4A	4	2/20/2016 12:56	3	11420	3806.67	100.0%	0.77499	4911.91	8934.78	0.5498	
4A	5	2/20/2016 12:30	3	11511	3837.00	99.4%	0.77862	4956.00	8934.80	0.5547	
4A	6	2/20/2016 12:48	3	11509	3836.33	98.8%	0.77622	5002.13	8934.79	0.5598	
4A	7	2/20/2016 12:44	3	11689	3896.33	100.0%	0.77677	5016.08	8934.79	0.5614	0.5613
4A	8	2/20/2016 12:39	3	11453	3817.67	100.0%	0.77738	4910.93	8934.79	0.5496	
4B	1	2/20/2016 12:56	3	11640	3880.00	100.0%	0.77498	5006.59	8934.78	0.5603	
4B	2	2/20/2016 12:53	3	11586	3862.00	100.0%	0.77552	4979.89	8934.79	0.5574	
4B	3	2/20/2016 13:07	3	11585	3861.67	100.0%	0.77355	4992.11	8934.78	0.5587	0.5536
4B	4	2/20/2016 13:02	3	11605	3868.33	100.0%	0.77420	4996.57	8934.78	0.5592	
4B	5	2/20/2016 12:39	3	11376	3792.00	99.4%	0.77737	4905.76	8934.79	0.5491	
4B	6	2/20/2016 12:30	3	11735	3911.67	98.8%	0.77862	5084.62	8934.80	0.5691	
4B	7	2/20/2016 12:48	3	11421	3807.00	100.0%	0.77621	4904.59	8934.79	0.5489	0.5613
4B	8	2/20/2016 12:44	3	11653	3884.33	100.0%	0.77676	5000.69	8934.79	0.5597	
4C	1	2/20/2016 13:02	3	11389	3796.33	100.0%	0.77419	4903.61	8934.78	0.5488	
4C	2	2/20/2016 12:57	3	11814	3938.00	100.0%	0.77496	5081.53	8934.78	0.5687	
4C	3	2/20/2016 12:53	3	11728	3909.33	100.0%	0.77551	5040.99	8934.79	0.5642	0.5685
4C	4	2/20/2016 13:07	3	11461	3820.33	100.0%	0.77354	4938.75	8934.78	0.5528	
4C	5	2/20/2016 12:44	3	11538	3846.00	99.4%	0.77675	4979.60	8934.79	0.5573	
4C	6	2/20/2016 12:39	3	11745	3915.00	98.8%	0.77736	5097.21	8934.79	0.5705	
4C	7	2/20/2016 12:30	3	11671	3890.33	100.0%	0.77862	4996.43	8934.80	0.5592	0.5613
4C	8	2/20/2016 12:48	3	11836	3945.33	100.0%	0.77620	5082.90	8934.79	0.5689	
4D	1	2/20/2016 13:07	3	11384	3794.67	100.0%	0.77353	4905.65	8934.78	0.5491	
4D	2	2/20/2016 13:02	3	11387	3795.67	100.0%	0.77418	4902.83	8934.78	0.5487	0.5536
4D	3	2/20/2016 12:57	3	11719	3906.33	100.0%	0.77496	5040.71	8934.78	0.5642	
4D	4	2/20/2016 12:53	3	11606	3868.67	100.0%	0.77550	4988.62	8934.79	0.5583	
4D	5	2/20/2016 12:48	3	11295	3765.00	99.4%	0.77619	4878.24	8934.79	0.5460	0.5685
4D	6	2/20/2016 12:44	3	11469	3823.00	98.8%	0.77674	4981.41	8934.79	0.5575	
4D	7	2/20/2016 12:39	3	11446	3815.33	100.0%	0.77735	4908.12	8934.79	0.5493	
4D	8	2/20/2016 12:30	3	11593	3864.33	100.0%	0.77862	4963.05	8934.80	0.5555	
5A	1	2/20/2016 13:10	3	11610	3870.00	100.0%	0.77302	5006.33	8934.78	0.5603	0.5685
5A	2	2/20/2016 13:26	3	11816	3938.67	100.0%	0.77085	5109.48	8934.77	0.5719	
5A	3	2/20/2016 13:21	3	11784	3928.00	100.0%	0.77158	5090.82	8934.77	0.5698	
5A	4	2/20/2016 13:16	3	11642	3880.67	100.0%	0.77222	5025.34	8934.78	0.5624	
5A	5	2/20/2016 13:31	3	11576	3858.67	99.4%	0.77021	5038.46	8934.77	0.5639	0.5685
5A	6	2/20/2016 13:45	3	11655	3885.00	98.8%	0.76819	5118.54	8934.76	0.5729	
5A	7	2/20/2016 13:40	3	11976	3992.00	100.0%	0.76885	5192.20	8934.77	0.5811	
5A	8	2/20/2016 13:36	3	11669	3889.67	100.0%	0.76944	5055.16	8934.77	0.5658	
5B	1	2/20/2016 13:16	3	11386	3795.33	100.0%	0.77221	4914.88	8934.78	0.5501	0.5685
5B	2	2/20/2016 13:10	3	11752	3917.33	100.0%	0.77303	5067.53	8934.78	0.5672	
5B	3	2/20/2016 13:26	3	11513	3837.67	100.0%	0.77084	4978.54	8934.77	0.5572	
5B	4	2/20/2016 13:21	3	11951	3983.67	100.0%	0.77158	5163.03	8934.77	0.5779	
5B	5	2/20/2016 13:36	3	11451	3817.00	99.4%	0.76943	4989.04	8934.77	0.5584	0.5685
5B	6	2/20/2016 13:31	3	11634	3878.00	98.8%	0.77020	5096.01	8934.77	0.5704	
5B	7	2/20/2016 13:45	3	12023	4007.67	100.0%	0.76818	5217.06	8934.76	0.5839	

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
5B	8	2/20/2016 13:41	3	11678	3892.67	100.0%	0.76883	5063.08	8934.77	0.5667	0.5665
5C	1	2/20/2016 13:21	3	11404	3801.33	100.0%	0.77157	4926.78	8934.77	0.5514	
5C	2	2/20/2016 13:16	3	11597	3865.67	100.0%	0.77220	5006.03	8934.78	0.5603	0.5622
5C	3	2/20/2016 13:10	3	11650	3883.33	100.0%	0.77303	5023.55	8934.78	0.5622	
5C	4	2/20/2016 13:26	3	11656	3885.33	100.0%	0.77083	5040.43	8934.77	0.5641	0.5641
5C	5	2/20/2016 13:41	3	11393	3797.67	99.4%	0.76882	4967.73	8934.77	0.5560	
5C	6	2/20/2016 13:36	3	11588	3862.67	98.8%	0.76943	5080.95	8934.77	0.5687	0.5641
5C	7	2/20/2016 13:31	3	11807	3935.67	100.0%	0.77019	5110.01	8934.77	0.5719	
5C	8	2/20/2016 13:45	3	11584	3861.33	100.0%	0.76817	5026.64	8934.76	0.5626	0.5572
5D	1	2/20/2016 13:26	3	11538	3846.00	100.0%	0.77082	4989.47	8934.77	0.5584	
5D	2	2/20/2016 13:21	3	11772	3924.00	100.0%	0.77156	5085.82	8934.77	0.5692	0.5616
5D	3	2/20/2016 13:16	3	11453	3817.67	100.0%	0.77219	4943.92	8934.78	0.5533	
5D	4	2/20/2016 13:10	3	11705	3901.67	100.0%	0.77303	5047.26	8934.78	0.5649	0.5572
5D	5	2/20/2016 13:45	3	11556	3852.00	99.4%	0.76816	5043.16	8934.76	0.5644	
5D	6	2/20/2016 13:41	3	11479	3826.33	98.8%	0.76881	5037.18	8934.77	0.5638	0.5572
5D	7	2/20/2016 13:36	3	11695	3898.33	100.0%	0.76941	5066.63	8934.77	0.5671	
5D	8	2/20/2016 13:31	3	11796	3932.00	100.0%	0.77018	5105.30	8934.77	0.5714	0.5572
6A	1	2/20/2016 13:33	3	11135	3711.67	100.0%	0.76992	4820.84	8934.77	0.5396	
6A	2	2/20/2016 13:47	3	11515	3838.33	100.0%	0.76790	4998.46	8934.76	0.5594	0.5572
6A	3	2/20/2016 13:43	3	11509	3836.33	100.0%	0.76856	4991.61	8934.77	0.5587	
6A	4	2/20/2016 13:38	3	11510	3836.67	100.0%	0.76916	4988.13	8934.77	0.5583	0.5572
6A	5	2/20/2016 13:14	3	11525	3841.67	99.4%	0.77259	5000.78	8934.78	0.5597	
6A	6	2/20/2016 13:28	3	11634	3878.00	98.8%	0.77056	5093.59	8934.77	0.5701	0.5572
6A	7	2/20/2016 13:23	3	11481	3827.00	100.0%	0.77130	4961.74	8934.77	0.5553	
6A	8	2/20/2016 13:18	3	11519	3839.67	100.0%	0.77193	4974.08	8934.78	0.5567	0.5572
6B	1	2/20/2016 13:38	3	11454	3818.00	100.0%	0.76915	4963.92	8934.77	0.5556	
6B	2	2/20/2016 13:33	3	11666	3888.67	100.0%	0.76991	5050.80	8934.77	0.5653	0.5616
6B	3	2/20/2016 13:47	3	11441	3813.67	100.0%	0.76789	4966.40	8934.76	0.5559	
6B	4	2/20/2016 13:43	3	11517	3839.00	100.0%	0.76855	4995.14	8934.77	0.5591	0.5616
6B	5	2/20/2016 13:18	3	11469	3823.00	99.4%	0.77192	4980.78	8934.78	0.5575	
6B	6	2/20/2016 13:14	3	11679	3893.00	98.8%	0.77258	5099.97	8934.78	0.5708	0.5616
6B	7	2/20/2016 13:28	3	11635	3878.33	100.0%	0.77055	5033.18	8934.77	0.5633	
6B	8	2/20/2016 13:23	3	11695	3898.33	100.0%	0.77129	5054.29	8934.77	0.5657	0.5616
6C	1	2/20/2016 13:43	3	11305	3768.33	100.0%	0.76854	4903.25	8934.77	0.5488	
6C	2	2/20/2016 13:38	3	11639	3879.67	100.0%	0.76914	5044.14	8934.77	0.5646	0.5616
6C	3	2/20/2016 13:33	3	11562	3854.00	100.0%	0.76990	5005.83	8934.77	0.5603	
6C	4	2/20/2016 13:47	3	11731	3910.33	100.0%	0.76788	5092.35	8934.76	0.5699	0.5616
6C	5	2/20/2016 13:23	3	11364	3788.00	99.4%	0.77128	4939.30	8934.77	0.5528	
6C	6	2/20/2016 13:18	3	11547	3849.00	98.8%	0.77191	5046.65	8934.78	0.5648	0.5616
6C	7	2/20/2016 13:14	3	11758	3919.33	100.0%	0.77255	5073.21	8934.78	0.5678	
6C	8	2/20/2016 13:28	3	11663	3887.67	100.0%	0.77053	5045.42	8934.77	0.5647	0.5616
7A	1	2/20/2016 14:15	3	11186	3728.67	100.0%	0.76406	4880.04	8934.75	0.5462	
7A	2	2/20/2016 14:29	3	11378	3792.67	100.0%	0.76209	4976.65	8934.75	0.5570	0.5616
7A	3	2/20/2016 14:26	3	11157	3719.00	100.0%	0.76263	4876.57	8934.75	0.5458	
7A	4	2/20/2016 14:21	3	11467	3822.33	100.0%	0.76328	5007.81	8934.75	0.5605	0.5616
7A	5	2/20/2016 14:34	3	11220	3740.00	99.4%	0.76151	4939.27	8934.74	0.5528	
7A	6	2/20/2016 14:47	3	11226	3742.00	98.8%	0.75968	4985.39	8934.74	0.5580	0.5616
7A	7	2/20/2016 14:43	3	11353	3784.33	100.0%	0.76023	4977.87	8934.74	0.5571	
7A	8	2/20/2016 14:38	3	11401	3800.33	100.0%	0.76088	4994.65	8934.74	0.5590	0.5616
7B	1	2/20/2016 14:21	3	11326	3775.33	100.0%	0.76326	4946.30	8934.75	0.5536	
7B	2	2/20/2016 14:15	3	11678	3892.67	100.0%	0.76406	5094.68	8934.75	0.5702	0.5616
7B	3	2/20/2016 14:29	3	11233	3744.33	100.0%	0.76209	4913.27	8934.75	0.5499	
7B	4	2/20/2016 14:26	3	11597	3865.67	100.0%	0.76262	5068.95	8934.75	0.5673	0.5616
7B	5	2/20/2016 14:38	3	11165	3721.67	99.4%	0.76087	4919.16	8934.74	0.5506	
7B	6	2/20/2016 14:34	3	12008	4002.67	98.8%	0.76150	5319.91	8934.74	0.5954	0.5616
7B	7	2/20/2016 14:47	3	11458	3819.33	100.0%	0.75967	5027.64	8934.74	0.5627	
7B	8	2/20/2016 14:43	3	11319	3773.00	100.0%	0.76022	4963.03	8934.74	0.5555	0.5616
7C	1	2/20/2016 14:26	3	10736	3578.67	100.0%	0.76261	4692.66	8934.75	0.5252	
7C	2	2/20/2016 14:21	3	11144	3714.67	100.0%	0.76325	4866.88	8934.75	0.5447	0.5616
7C	3	2/20/2016 14:15	3	11211	3737.00	100.0%	0.76406	4890.95	8934.75	0.5474	
7C	4	2/20/2016 14:30	3	11002	3667.33	100.0%	0.76206	4812.38	8934.75	0.5386	0.5616
7C	5	2/20/2016 14:43	3	10826	3608.67	99.4%	0.76021	4773.96	8934.74	0.5343	
7C	6	2/20/2016 14:38	3	10956	3652.00	98.8%	0.76087	4857.89	8934.74	0.5437	0.5616
7C	7	2/20/2016 14:34	3	11283	3761.00	100.0%	0.76149	4939.00	8934.74	0.5528	
7C	8	2/20/2016 14:47	3	11102	3700.67	100.0%	0.75966	4871.50	8934.74	0.5452	0.5616
7D	1	2/20/2016 14:30	3	10933	3644.33	100.0%	0.76205	4782.26	8934.75	0.5352	
7D	2	2/20/2016 14:26	3	11299	3766.33	100.0%	0.76260	4938.82	8934.75	0.5528	0.5616
7D	3	2/20/2016 14:21	3	10989	3663.00	100.0%	0.76324	4799.30	8934.75	0.5372	
7D	4	2/20/2016 14:15	3	11334	3778.00	100.0%	0.76406	4944.62	8934.75	0.5534	0.5616
7D	5	2/20/2016 14:47	3	10896	3632.00	99.4%	0.75965	4808.40	8934.74	0.5382	
7D	6	2/20/2016 14:43	3	10916	3638.67	98.8%	0.76020	4844.37	8934.74	0.5422	0.5616
7D	7	2/20/2016 14:38	3	11388	3796.00	100.0%	0.76085	4989.13	8934.74	0.5584	
7D	8	2/20/2016 14:34	3	11163	3721.00	100.0%	0.76148	4886.55	8934.74	0.5469	0.5616
8A	1	2/20/2016 14:34	3	11275	3758.33	100.0%	0.76147	4935.65	8934.74	0.5524	
8A	2	2/20/2016 14:47	3	11432	3810.67	100.0%	0.75964	5016.44	8934.74	0.5615	0.5616
8A	3	2/20/2016 14:43	3	11321	3773.67	100.0%	0.76019	4964.10	8934.74	0.5556	
8A	4	2/20/2016 14:38	3	11461	3820.33	100.0%	0.76084	5021.19	8934.74	0.5620	0.5616
8A	5	2/20/2016 14:15	3	11128	3709.33	99.4%	0.76406	4882.43	8934.75	0.5465	
8A	6	2/20/2016 14:30	3	11400	3800.00	98.8%	0.76204	5046.98	8934.75	0.5649	0.5616
8A	7	2/20/2016 14:26	3	11477	3825.67	100.0%	0.76258	5016.71	8934.75	0.5615	
8A	8	2/20/2016 14:21	3	11332	3777.33	100.0%	0.76322	4949.19	8934.75	0.5539	0.5573

Raw Count Data											
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency : (cpm/dpm)	Average Efficiency : (cpm/dpm)
8B	1	2/20/2016 14:39	3	11227	3742.33	100.0%	0.76083	4918.73	8934.74	0.5505	
8B	2	2/20/2016 14:34	3	11388	3796.00	100.0%	0.76146	4985.19	8934.74	0.5580	
8B	3	2/20/2016 14:47	3	11464	3821.33	100.0%	0.75963	5030.53	8934.74	0.5630	
8B	4	2/20/2016 14:43	3	11355	3785.00	100.0%	0.76018	4979.06	8934.74	0.5573	
8B	5	2/20/2016 14:21	3	11165	3721.67	99.4%	0.76321	4904.10	8934.75	0.5489	
8B	6	2/20/2016 14:15	3	11308	3769.33	98.8%	0.76406	4993.01	8934.75	0.5588	
8B	7	2/20/2016 14:30	3	11392	3797.33	100.0%	0.76203	4983.19	8934.75	0.5577	
8B	8	2/20/2016 14:26	3	11434	3811.33	100.0%	0.76258	4997.97	8934.75	0.5594	0.5567
8C	1	2/20/2016 14:43	3	11197	3732.33	100.0%	0.76017	4909.85	8934.74	0.5495	
8C	2	2/20/2016 14:39	3	11018	3672.67	100.0%	0.76082	4827.22	8934.74	0.5403	
8C	3	2/20/2016 14:34	3	11236	3745.33	100.0%	0.76144	4918.75	8934.74	0.5505	
8C	4	2/20/2016 14:47	3	11473	3824.33	100.0%	0.75962	5034.54	8934.74	0.5635	
8C	5	2/20/2016 14:26	3	10971	3657.00	99.4%	0.76257	4822.96	8934.75	0.5398	
8C	6	2/20/2016 14:21	3	11097	3699.00	98.8%	0.76320	4905.33	8934.75	0.5490	
8C	7	2/20/2016 14:15	3	11455	3818.33	100.0%	0.76406	4997.44	8934.75	0.5593	
8C	8	2/20/2016 14:40	3	11425	3808.33	100.0%	0.76202	4997.67	8934.75	0.5594	0.5514
8D	1	2/20/2016 14:37	3	11365	3788.33	100.0%	0.75961	4987.20	8934.74	0.5582	
8D	2	2/20/2016 14:43	3	11521	3840.33	100.0%	0.76016	5051.98	8934.74	0.5654	
8D	3	2/20/2016 14:39	3	11493	3831.00	100.0%	0.76081	5035.41	8934.74	0.5636	
8D	4	2/20/2016 14:34	3	11713	3904.33	100.0%	0.76143	5127.65	8934.74	0.5739	
8D	5	2/20/2016 14:30	3	11399	3799.67	99.4%	0.76201	5014.76	8934.75	0.5613	
8D	6	2/20/2016 14:26	3	11590	3863.33	98.8%	0.76256	5127.58	8934.75	0.5739	
8D	7	2/20/2016 14:21	3	11685	3895.00	100.0%	0.76319	5103.55	8934.75	0.5712	
8D	8	2/20/2016 14:15	3	11704	3901.33	100.0%	0.76406	5106.07	8934.75	0.5715	0.5674
9A	1	2/20/2016 14:51	3	11268	3756.00	100.0%	0.75909	4948.00	8934.74	0.5538	
9A	2	2/20/2016 15:05	3	11327	3775.67	100.0%	0.75720	4986.38	8934.73	0.5581	
9A	3	2/20/2016 15:01	3	11409	3803.00	100.0%	0.75774	5018.90	8934.73	0.5617	
9A	4	2/20/2016 14:57	3	11425	3808.33	100.0%	0.75833	5022.03	8934.74	0.5621	
9A	5	2/20/2016 15:09	3	11114	3704.67	99.4%	0.75662	4924.25	8934.73	0.5511	
9A	6	2/20/2016 15:22	3	11250	3750.00	98.8%	0.75488	5027.78	8934.73	0.5627	
9A	7	2/20/2016 15:18	3	11367	3789.00	100.0%	0.75548	5015.34	8934.73	0.5613	
9A	8	2/20/2016 15:13	3	11382	3794.00	100.0%	0.75606	5018.13	8934.73	0.5616	0.5591
9B	1	2/20/2016 14:57	3	11078	3692.67	100.0%	0.75831	4869.58	8934.74	0.5450	
9B	2	2/20/2016 14:51	3	11497	3832.33	100.0%	0.75909	5048.56	8934.74	0.5650	
9B	3	2/20/2016 15:05	3	11216	3738.67	100.0%	0.75718	4937.59	8934.73	0.5526	
9B	4	2/20/2016 15:01	3	11260	3753.33	100.0%	0.75772	4953.43	8934.73	0.5544	
9B	5	2/20/2016 15:14	3	11136	3712.00	99.4%	0.75605	4937.71	8934.73	0.5526	
9B	6	2/20/2016 15:09	3	11184	3728.00	98.8%	0.75660	4986.90	8934.73	0.5581	
9B	7	2/20/2016 15:22	3	11480	3826.67	100.0%	0.75487	5069.30	8934.73	0.5674	
9B	8	2/20/2016 15:18	3	11359	3786.33	100.0%	0.75547	5011.89	8934.73	0.5609	0.5570
9C	1	2/20/2016 15:01	3	10936	3645.33	100.0%	0.75772	4810.95	8934.73	0.5385	
9C	2	2/20/2016 14:57	3	11269	3756.33	100.0%	0.75831	4953.59	8934.74	0.5544	
9C	3	2/20/2016 14:51	3	11335	3778.33	100.0%	0.75909	4977.42	8934.74	0.5571	
9C	4	2/20/2016 15:05	3	11112	3704.00	100.0%	0.75718	4891.86	8934.73	0.5475	
9C	5	2/20/2016 15:18	3	10955	3651.67	99.4%	0.75546	4861.22	8934.73	0.5441	
9C	6	2/20/2016 15:14	3	11548	3849.33	98.8%	0.75604	5153.05	8934.73	0.5767	
9C	7	2/20/2016 15:10	3	11191	3730.33	100.0%	0.75659	4930.43	8934.73	0.5518	
9C	8	2/20/2016 15:22	3	11144	3714.67	100.0%	0.75486	4920.99	8934.73	0.5508	0.5526
9D	1	2/20/2016 15:05	3	11296	3765.33	100.0%	0.75717	4972.92	8934.73	0.5566	
9D	2	2/20/2016 15:01	3	11464	3821.33	100.0%	0.75770	5043.31	8934.73	0.5645	
9D	3	2/20/2016 14:57	3	11324	3774.67	100.0%	0.75829	4977.84	8934.74	0.5571	
9D	4	2/20/2016 14:51	3	11305	3768.33	100.0%	0.75909	4964.26	8934.74	0.5556	
9D	5	2/20/2016 15:22	3	11180	3726.67	99.4%	0.75485	4965.06	8934.73	0.5557	
9D	6	2/20/2016 15:18	3	11235	3745.00	98.8%	0.75545	5017.29	8934.73	0.5615	
9D	7	2/20/2016 15:14	3	11398	3799.33	100.0%	0.75603	5025.38	8934.73	0.5625	
9D	8	2/20/2016 15:10	3	11426	3808.67	100.0%	0.75658	5034.03	8934.73	0.5634	0.5596
10A	1	2/20/2016 15:10	3	9194	3064.67	100.0%	0.75658	4050.70	8934.73	0.4534	
10A	2	2/20/2016 15:22	3	9308	3102.67	100.0%	0.75484	4110.38	8934.73	0.4600	
10A	3	2/20/2016 15:18	3	9298	3099.33	100.0%	0.75544	4102.69	8934.73	0.4592	
10A	4	2/20/2016 15:14	3	9314	3104.67	100.0%	0.75602	4106.60	8934.73	0.4596	
10A	5	2/20/2016 14:51	3	9303	3101.00	99.4%	0.75909	4108.44	8934.74	0.4598	
10A	6	2/20/2016 15:05	3	9405	3135.00	98.8%	0.75716	4190.61	8934.73	0.4690	
10A	7	2/20/2016 15:01	3	9408	3136.00	100.0%	0.75770	4138.86	8934.73	0.4632	
10A	8	2/20/2016 14:57	3	9386	3128.67	100.0%	0.75829	4125.98	8934.74	0.4618	0.4608
10B	1	2/20/2016 15:14	3	10723	3574.33	100.0%	0.75600	4727.93	8934.73	0.5292	
10B	2	2/20/2016 15:10	3	10731	3577.00	100.0%	0.75656	4727.97	8934.73	0.5292	
10B	3	2/20/2016 15:23	3	10752	3584.00	100.0%	0.75482	4748.13	8934.73	0.5314	
10B	4	2/20/2016 15:18	3	10831	3610.33	100.0%	0.75543	4779.19	8934.73	0.5349	
10B	5	2/20/2016 14:57	3	10593	3531.00	99.4%	0.75828	4683.13	8934.74	0.5241	
10B	6	2/20/2016 14:51	3	10847	3615.67	98.8%	0.75909	4820.82	8934.74	0.5396	
10B	7	2/20/2016 15:06	3	10908	3636.00	100.0%	0.75714	4802.26	8934.73	0.5375	
10B	8	2/20/2016 15:02	3	10851	3617.00	100.0%	0.75768	4773.76	8934.73	0.5343	0.5325
10C	1	2/20/2016 15:18	3	10070	3356.67	100.0%	0.75540	4443.57	8934.73	0.4973	
10C	2	2/20/2016 15:14	3	10511	3503.67	100.0%	0.75600	4634.51	8934.73	0.5187	
10C	3	2/20/2016 15:10	3	10578	3526.00	100.0%	0.75655	4660.62	8934.73	0.5216	
10C	4	2/20/2016 15:23	3	10677	3559.00	100.0%	0.75481	4715.06	8934.73	0.5277	
10C	5	2/20/2016 15:02	3	10589	3529.67	99.4%	0.75767	4685.09	8934.73	0.5244	
10C	6	2/20/2016 14:57	3	10719	3573.00	98.8%	0.75826	4769.10	8934.74	0.5338	
10C	7	2/20/2016 14:51	3	10916	3638.67	100.0%	0.75909	4793.47	8934.74	0.5365	
10C	8	2/20/2016 15:06	3	10753	3584.33	100.0%	0.75713	4734.09	8934.73	0.5299	0.5237
10D	1	2/20/2016 15:23	3	10091	3363.67	100.0%	0.75480	4456.35	8934.72	0.4988	

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
10D	2	2/20/2016 15:18	3	10482	3494.00	100.0%	0.75538	4625.47	8934.73	0.5177	0.5164
10D	3	2/20/2016 15:14	3	10388	3462.67	100.0%	0.75594	4580.60	8934.73	0.5127	
10D	4	2/20/2016 15:10	3	10604	3534.67	100.0%	0.75654	4672.15	8934.73	0.5229	
10D	5	2/20/2016 15:06	3	10371	3457.00	99.4%	0.75712	4591.99	8934.73	0.5139	
10D	6	2/20/2016 15:02	3	10496	3498.67	98.8%	0.75766	4673.60	8934.73	0.5231	
10D	7	2/20/2016 14:57	3	10739	3579.67	100.0%	0.75826	4720.92	8934.74	0.5284	
10D	8	2/20/2016 14:51	3	10460	3486.67	100.0%	0.75909	4593.25	8934.74	0.5141	
11A	1	2/20/2016 15:56	3	10780	3593.33	100.0%	0.75025	4789.50	8934.71	0.5361	
11A	2	2/20/2016 16:12	3	11079	3693.00	100.0%	0.74818	4935.96	8934.71	0.5524	
11A	3	2/20/2016 16:06	3	10985	3661.67	100.0%	0.74888	4889.52	8934.71	0.5473	
11A	4	2/20/2016 16:02	3	10980	3660.00	100.0%	0.74951	4883.17	8934.71	0.5465	0.5473
11A	5	2/20/2016 16:17	3	10839	3613.00	99.4%	0.74744	4861.35	8934.70	0.5441	
11A	6	2/20/2016 16:35	3	10844	3614.67	98.8%	0.74498	4910.74	8934.70	0.5496	
11A	7	2/20/2016 16:28	3	11160	3720.00	100.0%	0.74591	4987.23	8934.70	0.5582	
11A	8	2/20/2016 16:24	3	10887	3629.00	100.0%	0.74652	4861.21	8934.70	0.5441	
11B	1	2/20/2016 16:02	3	11062	3687.33	100.0%	0.74950	4919.74	8934.71	0.5506	
11B	2	2/20/2016 15:56	3	11452	3817.33	100.0%	0.75025	5088.07	8934.71	0.5695	
11B	3	2/20/2016 16:12	3	10954	3651.33	100.0%	0.74817	4880.33	8934.71	0.5462	
11B	4	2/20/2016 16:06	3	11196	3732.00	100.0%	0.74887	4983.50	8934.71	0.5578	
11B	5	2/20/2016 16:24	3	10932	3644.00	99.4%	0.74651	4909.16	8934.70	0.5494	0.5589
11B	6	2/20/2016 16:17	3	11261	3753.67	98.8%	0.74743	5082.85	8934.70	0.5689	
11B	7	2/20/2016 16:35	3	11099	3699.67	100.0%	0.74497	4966.19	8934.70	0.5558	
11B	8	2/20/2016 16:28	3	11462	3820.67	100.0%	0.74590	5122.23	8934.70	0.5733	
11C	1	2/20/2016 16:07	3	10836	3612.00	100.0%	0.74886	4823.35	8934.71	0.5398	
11C	2	2/20/2016 16:02	3	11131	3710.33	100.0%	0.74949	4950.48	8934.71	0.5541	
11C	3	2/20/2016 15:56	3	10920	3640.00	100.0%	0.75025	4851.70	8934.71	0.5430	
11C	4	2/20/2016 16:12	3	11187	3729.00	100.0%	0.74816	4984.20	8934.71	0.5578	
11C	5	2/20/2016 16:29	3	10831	3610.33	99.4%	0.74589	4867.86	8934.70	0.5448	
11C	6	2/20/2016 16:24	3	10786	3595.33	98.8%	0.74650	4874.51	8934.70	0.5456	0.5497
11C	7	2/20/2016 16:17	3	11203	3734.33	100.0%	0.74742	4996.30	8934.70	0.5592	
11C	8	2/20/2016 16:35	3	11041	3680.33	100.0%	0.74496	4940.31	8934.70	0.5529	
11D	1	2/20/2016 16:12	3	11130	3710.00	100.0%	0.74815	4958.88	8934.71	0.5550	
11D	2	2/20/2016 16:07	3	11439	3813.00	100.0%	0.74885	5091.80	8934.71	0.5699	
11D	3	2/20/2016 16:02	3	11507	3835.67	100.0%	0.74948	5117.76	8934.71	0.5728	
11D	4	2/20/2016 15:56	3	11475	3825.00	100.0%	0.75025	5098.30	8934.71	0.5706	
11D	5	2/20/2016 16:36	3	11186	3728.67	99.4%	0.74495	5033.75	8934.70	0.5634	
11D	6	2/20/2016 16:29	3	11347	3782.33	98.8%	0.74588	5132.33	8934.70	0.5744	
11D	7	2/20/2016 16:24	3	11653	3884.33	100.0%	0.74650	5203.41	8934.70	0.5824	0.5699
11D	8	2/20/2016 16:17	3	11435	3811.67	100.0%	0.74741	5099.82	8934.70	0.5708	
12A	1	2/20/2016 16:17	3	10628	3542.67	100.0%	0.74740	4739.99	8934.70	0.5305	
12A	2	2/20/2016 16:36	3	10921	3640.33	100.0%	0.74494	4886.73	8934.70	0.5469	
12A	3	2/20/2016 16:29	3	10604	3534.67	100.0%	0.74587	4738.99	8934.70	0.5304	
12A	4	2/20/2016 16:24	3	11049	3683.00	100.0%	0.74649	4933.78	8934.70	0.5522	
12A	5	2/20/2016 15:56	3	10630	3543.33	99.4%	0.75024	4749.82	8934.71	0.5316	
12A	6	2/20/2016 16:12	3	10768	3589.33	98.8%	0.74814	4855.72	8934.70	0.5435	
12A	7	2/20/2016 16:07	3	10908	3636.00	100.0%	0.74884	4855.51	8934.71	0.5434	
12A	8	2/20/2016 16:02	3	11030	3676.67	100.0%	0.74947	4905.69	8934.71	0.5491	0.5410
12B	1	2/20/2016 16:24	3	10555	3518.33	100.0%	0.74648	4713.25	8934.70	0.5275	
12B	2	2/20/2016 16:17	3	10887	3629.00	100.0%	0.74739	4855.57	8934.70	0.5435	
12B	3	2/20/2016 16:36	3	10540	3513.33	100.0%	0.74493	4716.31	8934.70	0.5279	
12B	4	2/20/2016 16:29	3	10768	3589.33	100.0%	0.74586	4812.34	8934.70	0.5386	
12B	5	2/20/2016 16:02	3	10634	3544.67	99.4%	0.74946	4756.56	8934.71	0.5324	
12B	6	2/20/2016 15:56	3	10782	3594.00	98.8%	0.75024	4848.44	8934.71	0.5427	
12B	7	2/20/2016 16:12	3	10830	3610.00	100.0%	0.74813	4825.35	8934.70	0.5401	
12B	8	2/20/2016 16:07	3	10965	3655.00	100.0%	0.74883	4880.96	8934.71	0.5463	0.5374
12C	1	2/20/2016 16:29	3	10678	3559.33	100.0%	0.74585	4772.17	8934.70	0.5341	
12C	2	2/20/2016 16:24	3	11015	3671.67	100.0%	0.74647	4918.72	8934.70	0.5505	
12C	3	2/20/2016 16:17	3	10969	3656.33	100.0%	0.74738	4892.20	8934.70	0.5476	
12C	4	2/20/2016 16:36	3	10878	3626.00	100.0%	0.74493	4867.60	8934.70	0.5448	
12C	5	2/20/2016 16:07	3	10601	3533.67	99.4%	0.74882	4745.85	8934.71	0.5312	
12C	6	2/20/2016 16:02	3	11030	3676.67	98.8%	0.74945	4965.18	8934.71	0.5557	
12C	7	2/20/2016 15:56	3	10984	3661.33	100.0%	0.75024	4880.21	8934.71	0.5462	
12C	8	2/20/2016 16:12	3	11128	3709.33	100.0%	0.74812	4958.18	8934.70	0.5549	0.5456
12D	1	2/20/2016 16:36	3	10743	3581.00	100.0%	0.74491	4807.29	8934.70	0.5380	
12D	2	2/20/2016 16:29	3	11032	3677.33	100.0%	0.74584	4930.44	8934.70	0.5518	
12D	3	2/20/2016 16:24	3	10861	3620.33	100.0%	0.74646	4850.02	8934.70	0.5428	
12D	4	2/20/2016 16:18	3	11084	3694.67	100.0%	0.74737	4943.58	8934.70	0.5533	
12D	5	2/20/2016 16:12	3	10958	3652.67	99.4%	0.74811	4910.31	8934.70	0.5496	
12D	6	2/20/2016 16:07	3	10838	3612.67	98.8%	0.74881	4882.94	8934.71	0.5465	
12D	7	2/20/2016 16:02	3	11248	3749.33	100.0%	0.74944	5002.86	8934.71	0.5599	
12D	8	2/20/2016 15:56	3	11014	3671.33	100.0%	0.75024	4893.54	8934.71	0.5477	0.5487
13A	1	2/20/2016 16:41	3	10111	3370.33	100.0%	0.74417	4528.98	8934.69	0.5069	
13A	2	2/20/2016 16:57	3	10271	3423.67	100.0%	0.74213	4613.32	8934.69	0.5163	
13A	3	2/20/2016 16:52	3	10171	3390.33	100.0%	0.74271	4564.78	8934.69	0.5109	
13A	4	2/20/2016 16:47	3	10219	3406.33	100.0%	0.74345	4581.81	8934.69	0.5128	
13A	5	2/20/2016 17:01	3	9850	3283.33	99.4%	0.74155	4452.85	8934.68	0.4984	
13A	6	2/20/2016 17:14	3	10178	3392.67	98.8%	0.73985	4641.08	8934.68	0.5194	
13A	7	2/20/2016 17:10	3	10054	3351.33	100.0%	0.74038	4526.51	8934.68	0.5066	
13A	8	2/20/2016 17:05	3	10302	3434.00	100.0%	0.74104	4634.04	8934.68	0.5187	0.5113
13B	1	2/20/2016 16:47	3	10109	3369.67	100.0%	0.74344	4532.56	8934.69	0.5073	
13B	2	2/20/2016 16:41	3	10408	3469.33	100.0%	0.74417	4662.02	8934.69	0.5218	

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm) i	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
13B	3	2/20/2016 16:57	3	10328	3442.67	100.0%	0.74211	4639.04	8934.69	0.5192	0.5214
13B	4	2/20/2016 16:52	3	10574	3524.67	100.0%	0.74271	4745.69	8934.69	0.5312	
13B	5	2/20/2016 17:05	3	10176	3392.00	99.4%	0.74103	4603.51	8934.68	0.5152	
13B	6	2/20/2016 17:01	3	10424	3474.67	98.8%	0.74155	4742.41	8934.68	0.5308	
13B	7	2/20/2016 17:14	3	10270	3423.33	100.0%	0.73984	4627.10	8934.68	0.5179	
13B	8	2/20/2016 17:10	3	10479	3493.00	100.0%	0.74037	4717.91	8934.68	0.5280	
13D	1	2/20/2016 16:57	3	8446	2815.33	100.0%	0.74209	3793.78	8934.69	0.4246	
13D	2	2/20/2016 16:52	3	8686	2895.33	100.0%	0.74269	3898.42	8934.69	0.4363	
13D	3	2/20/2016 16:47	3	8626	2875.33	100.0%	0.74342	3867.73	8934.69	0.4329	
13D	4	2/20/2016 16:41	3	8359	2786.33	100.0%	0.74417	3744.22	8934.69	0.4191	
13D	5	2/20/2016 17:14	3	8277	2759.00	99.4%	0.73983	3750.47	8934.68	0.4198	0.4297
13D	6	2/20/2016 17:10	3	8759	2919.67	98.8%	0.74036	3991.30	8934.68	0.4467	
13D	7	2/20/2016 17:05	3	8397	2799.00	100.0%	0.74101	3777.28	8934.68	0.4228	
13D	8	2/20/2016 17:01	3	8653	2884.33	100.0%	0.74154	3889.67	8934.68	0.4353	
14A	1	2/20/2016 17:01	3	11001	3667.00	100.0%	0.74152	4945.22	8934.68	0.5535	
14A	2	2/20/2016 17:14	3	11281	3760.33	100.0%	0.73981	5082.81	8934.68	0.5689	
14A	3	2/20/2016 17:10	3	10981	3660.33	100.0%	0.74035	4944.06	8934.68	0.5534	
14A	4	2/20/2016 17:05	3	11108	3702.67	100.0%	0.74100	4996.87	8934.68	0.5593	
14A	5	2/20/2016 16:41	3	10721	3573.67	99.4%	0.74417	4829.60	8934.69	0.5405	
14A	6	2/20/2016 16:57	3	11075	3691.67	98.8%	0.74208	5034.97	8934.69	0.5635	0.5582
14A	7	2/20/2016 16:52	3	11186	3728.67	100.0%	0.74268	5020.55	8934.69	0.5619	
14A	8	2/20/2016 16:47	3	11257	3752.33	100.0%	0.74337	5047.75	8934.69	0.5650	
14B	1	2/20/2016 17:05	3	10706	3568.67	100.0%	0.74099	4816.09	8934.68	0.5390	
14B	2	2/20/2016 17:01	3	11009	3669.67	100.0%	0.74152	4948.86	8934.68	0.5539	
14B	3	2/20/2016 17:14	3	10979	3659.67	100.0%	0.73981	4946.78	8934.68	0.5537	
14B	4	2/20/2016 17:10	3	11120	3706.67	100.0%	0.74034	5006.72	8934.68	0.5604	
14B	5	2/20/2016 16:47	3	10794	3598.00	99.4%	0.74336	4867.77	8934.69	0.5448	
14B	6	2/20/2016 16:41	3	11040	3680.00	98.8%	0.74416	5005.00	8934.69	0.5602	
14B	7	2/20/2016 16:57	3	11067	3689.00	100.0%	0.74207	4971.21	8934.69	0.5564	0.5524
14B	8	2/20/2016 16:53	3	10961	3653.67	100.0%	0.74267	4919.65	8934.69	0.5506	
14C	1	2/20/2016 17:10	3	11116	3705.33	100.0%	0.74033	5004.99	8934.68	0.5602	
14C	2	2/20/2016 17:05	3	11307	3769.00	100.0%	0.74098	5086.54	8934.68	0.5693	
14C	3	2/20/2016 17:01	3	10892	3630.67	100.0%	0.74151	4896.34	8934.68	0.5480	
14C	4	2/20/2016 17:14	3	11292	3764.00	100.0%	0.73980	5087.89	8934.68	0.5695	
14C	5	2/20/2016 16:53	3	11049	3683.00	99.4%	0.74266	4987.44	8934.69	0.5582	
14C	6	2/20/2016 16:47	3	11282	3760.67	98.8%	0.74335	5120.31	8934.69	0.5731	
14C	7	2/20/2016 16:41	3	11437	3812.33	100.0%	0.74416	5122.98	8934.69	0.5734	
14C	8	2/20/2016 16:57	3	11233	3744.33	100.0%	0.74206	5045.89	8934.69	0.5648	0.5645
14D	1	2/20/2016 17:14	3	10807	3602.33	100.0%	0.73978	4869.43	8934.68	0.5450	
14D	2	2/20/2016 17:10	3	11068	3689.33	100.0%	0.74032	4983.45	8934.68	0.5578	
14D	3	2/20/2016 17:05	3	10977	3659.00	100.0%	0.74096	4938.16	8934.68	0.5527	
14D	4	2/20/2016 17:01	3	11209	3736.33	100.0%	0.74150	5038.89	8934.68	0.5640	
14D	5	2/20/2016 16:57	3	11107	3702.33	99.4%	0.74205	5017.77	8934.69	0.5616	
14D	6	2/20/2016 16:53	3	11072	3690.67	98.8%	0.74265	5029.75	8934.69	0.5629	
14D	7	2/20/2016 16:48	3	11087	3695.67	100.0%	0.74334	4971.72	8934.69	0.5565	
14D	8	2/20/2016 16:41	3	11095	3698.33	100.0%	0.74416	4969.79	8934.69	0.5562	0.5571

Current Calibration - PIC

Geometry	Tuffryn Filter	4/1/2016	Exp Date	2/28/2017	
Y-90	Cal Date	A1	A2	A3	A4
Protean	A0				
1A	0.547738654				
1B	0.549732395				
1C	0.563357513				
1D	0.554567001				
2A	0.540622834				
2B	0.509127127				
2C	0.53312029				
2D	0.497431303				
3A	0.542223164				
3B	0.550918206				
3C	0.55628251				
3D	0.539477667				
4A	0.550338286				
4B	0.557803313				
4C	0.561303485				
4D	0.553575475				
5A	0.568513858				
5B	0.566455055				
5C	0.5621594				
5D	0.564070701				
6A	0.557222468				
6B	0.561632649				
6C	0.561712056				
6D	#N/A				
7A	0.554551868				
7B	0.563151918				
7C	0.541498557				
7D	0.545531				
8A	0.557272426				
8B	0.556700081				
8C	0.551411455				
8D	0.567366508				
9A	0.559065424				
9B	0.55702501				
9C	0.552611935				
9D	0.559615087				
10A	0.460761521				
10B	0.532517046				
10C	0.523735808				
10D	0.516444501				
11A	0.547285616				
11B	0.558945191				
11C	0.549664322				
11D	0.569913355				
12A	0.54095571				
12B	0.537353683				
12C	0.545626738				
12D	0.548716815				
13A	0.511257326				
13B	0.521426145				
13C	#N/A				
13D	0.429685721				
14A	0.558243255				
14B	0.552370848				
14C	0.564546641				
14D	0.557083867				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
Y1	10A	3	1	9194	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y2	10A	3	9	9308	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y3	10A	3	0	9298	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y4	10A	3	1	9314	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y5	10A	3	2	9303	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y6	10A	3	0	9405	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y7	10A	3	0	9408	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y8	10A	3	0	9386	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y1	10B	3	2	10723	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y2	10B	3	5	10731	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y3	10B	3	4	10752	2/20/2016 15:23	2/20/2016 15:26	PIC	SR90Y16
Y4	10B	3	3	10831	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y5	10B	3	5	10593	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y6	10B	3	3	10847	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y7	10B	3	2	10908	2/20/2016 15:06	2/20/2016 15:09	PIC	SR90Y16
Y8	10B	3	3	10851	2/20/2016 15:02	2/20/2016 15:05	PIC	SR90Y16
Y1	10C	3	0	10070	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y2	10C	3	4	10511	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y3	10C	3	3	10578	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y4	10C	3	2	10677	2/20/2016 15:23	2/20/2016 15:26	PIC	SR90Y16
Y5	10C	3	2	10589	2/20/2016 15:02	2/20/2016 15:05	PIC	SR90Y16
Y6	10C	3	0	10719	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y7	10C	3	2	10916	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y8	10C	3	1	10753	2/20/2016 15:06	2/20/2016 15:09	PIC	SR90Y16
Y1	10D	3	1	10091	2/20/2016 15:23	2/20/2016 15:26	PIC	SR90Y16
Y2	10D	3	8	10482	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y3	10D	3	0	10388	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y4	10D	3	1	10604	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y5	10D	3	3	10371	2/20/2016 15:06	2/20/2016 15:09	PIC	SR90Y16
Y6	10D	3	0	10496	2/20/2016 15:02	2/20/2016 15:05	PIC	SR90Y16
Y7	10D	3	0	10739	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y8	10D	3	0	10460	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y1	11A	3	0	10780	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y2	11A	3	9	11079	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y3	11A	3	0	10985	2/20/2016 16:06	2/20/2016 16:09	PIC	SR90Y16
Y4	11A	3	0	10980	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16

Y5	11A	3	1	10839	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y6	11A	3	0	10844	2/20/2016 16:35	2/20/2016 16:38	PIC	SR90Y16
Y7	11A	3	1	11160	2/20/2016 16:28	2/20/2016 16:31	PIC	SR90Y16
Y8	11A	3	1	10887	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y1	11B	3	0	11062	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y2	11B	3	2	11452	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y3	11B	3	1	10954	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y4	11B	3	1	11196	2/20/2016 16:06	2/20/2016 16:09	PIC	SR90Y16
Y5	11B	3	0	10932	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y6	11B	3	1	11261	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y7	11B	3	2	11099	2/20/2016 16:35	2/20/2016 16:38	PIC	SR90Y16
Y8	11B	3	0	11462	2/20/2016 16:28	2/20/2016 16:31	PIC	SR90Y16
Y1	11C	3	2	10836	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y2	11C	3	4	11131	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y3	11C	3	0	10920	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y4	11C	3	1	11187	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y5	11C	3	7	10831	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y6	11C	3	0	10786	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y7	11C	3	0	11203	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y8	11C	3	2	11041	2/20/2016 16:35	2/20/2016 16:38	PIC	SR90Y16
Y1	11D	3	0	11130	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y2	11D	3	1	11439	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y3	11D	3	2	11507	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y4	11D	3	0	11475	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y5	11D	3	4	11186	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y6	11D	3	0	11347	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y7	11D	3	0	11653	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y8	11D	3	0	11435	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y1	12A	3	1	10628	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y2	12A	3	5	10921	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y3	12A	3	1	10604	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y4	12A	3	0	11049	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y5	12A	3	0	10630	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y6	12A	3	0	10768	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y7	12A	3	1	10908	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y8	12A	3	2	11030	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y1	12B	3	0	10555	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16

Y2	12B	3	4	10887	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y3	12B	3	0	10540	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y4	12B	3	0	10768	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y5	12B	3	2	10634	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y6	12B	3	0	10782	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y7	12B	3	0	10830	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y8	12B	3	0	10965	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y1	12C	3	0	10678	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y2	12C	3	6	11015	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y3	12C	3	0	10969	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y4	12C	3	1	10878	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y5	12C	3	2	10601	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y6	12C	3	0	11030	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y7	12C	3	0	10984	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y8	12C	3	1	11128	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y1	12D	3	0	10743	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y2	12D	3	7	11032	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y3	12D	3	2	10861	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y4	12D	3	0	11084	2/20/2016 16:18	2/20/2016 16:21	PIC	SR90Y16
Y5	12D	3	1	10958	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y6	12D	3	3	10838	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y7	12D	3	0	11248	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y8	12D	3	1	11014	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y1	13A	3	1	10111	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y2	13A	3	7	10271	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y3	13A	3	0	10171	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y4	13A	3	0	10219	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y5	13A	3	5	9850	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y6	13A	3	1	10178	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y7	13A	3	0	10054	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y8	13A	3	1	10302	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y1	13B	3	0	10109	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y2	13B	3	6	10408	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y3	13B	3	0	10328	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y4	13B	3	0	10574	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y5	13B	3	0	10176	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y6	13B	3	0	10424	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16

Y7	13B	3	1	10270	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y8	13B	3	1	10479	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y1	13D	3	1	8446	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y2	13D	3	23	8686	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y3	13D	3	0	8626	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y4	13D	3	0	8359	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y5	13D	3	5	8277	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y6	13D	3	0	8759	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y7	13D	3	0	8397	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y8	13D	3	1	8653	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y1	14A	3	1	11001	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y2	14A	3	2	11281	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y3	14A	3	0	10981	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y4	14A	3	0	11108	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y5	14A	3	1	10721	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y6	14A	3	0	11075	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y7	14A	3	0	11186	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y8	14A	3	0	11257	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y1	14B	3	1	10706	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y2	14B	3	8	11009	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y3	14B	3	0	10979	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y4	14B	3	0	11120	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y5	14B	3	1	10794	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y6	14B	3	0	11040	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y7	14B	3	0	11067	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y8	14B	3	0	10961	2/20/2016 16:53	2/20/2016 16:56	PIC	SR90Y16
Y1	14C	3	0	11116	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y2	14C	3	7	11307	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y3	14C	3	0	10892	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y4	14C	3	0	11292	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y5	14C	3	4	11049	2/20/2016 16:53	2/20/2016 16:56	PIC	SR90Y16
Y6	14C	3	0	11282	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y7	14C	3	1	11437	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y8	14C	3	0	11233	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y1	14D	3	0	10807	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y2	14D	3	4	11068	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y3	14D	3	1	10977	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16

Y4	14D	3	0	11209	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y5	14D	3	2	11107	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y6	14D	3	0	11072	2/20/2016 16:53	2/20/2016 16:56	PIC	SR90Y16
Y7	14D	3	0	11087	2/20/2016 16:48	2/20/2016 16:51	PIC	SR90Y16
Y8	14D	3	0	11095	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y1	1A	3	3	11488	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y2	1A	3	6	11289	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y3	1A	3	1	11459	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y4	1A	3	1	11426	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y5	1A	3	5	11352	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y6	1A	3	2	11462	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y7	1A	3	0	11527	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y8	1A	3	0	11681	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y1	1B	3	6	11409	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y2	1B	3	17	11539	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y3	1B	3	6	11612	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y4	1B	3	4	11274	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y5	1B	3	11	11426	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y6	1B	3	8	11568	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y7	1B	3	9	11471	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y8	1B	3	7	11717	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y1	1C	3	55	11651	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y2	1C	3	52	12039	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y3	1C	3	52	11920	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y4	1C	3	42	11958	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y5	1C	3	67	11406	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y6	1C	3	76	11675	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y7	1C	3	57	11909	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y8	1C	3	60	11745	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y1	1D	3	41	11531	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y2	1D	3	56	11636	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y3	1D	3	41	11610	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y4	1D	3	38	11651	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y5	1D	3	35	11243	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y6	1D	3	42	11548	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y7	1D	3	40	11712	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y8	1D	3	44	11897	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16

Y1	2A	3	4	11215	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y2	2A	3	10	11258	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y3	2A	3	2	11174	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y4	2A	3	1	11358	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y5	2A	3	10	11096	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y6	2A	3	3	11399	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y7	2A	3	5	11522	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y8	2A	3	1	11469	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y1	2B	3	1	10681	2/20/2016 12:18	2/20/2016 12:21	PIC	SR90Y16
Y2	2B	3	11	10820	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y3	2B	3	1	10681	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y4	2B	3	0	10767	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y5	2B	3	5	10490	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y6	2B	3	0	10544	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y7	2B	3	0	10580	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y8	2B	3	1	10655	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y1	2C	3	10	10973	2/20/2016 12:22	2/20/2016 12:25	PIC	SR90Y16
Y2	2C	3	14	11113	2/20/2016 12:18	2/20/2016 12:21	PIC	SR90Y16
Y3	2C	3	9	11053	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y4	2C	3	7	11288	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y5	2C	3	10	11069	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y6	2C	3	6	11080	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y7	2C	3	3	11217	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y8	2C	3	5	11441	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y1	2D	3	0	10272	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y2	2D	3	1	10579	2/20/2016 12:22	2/20/2016 12:25	PIC	SR90Y16
Y3	2D	3	0	10303	2/20/2016 12:18	2/20/2016 12:21	PIC	SR90Y16
Y4	2D	3	0	10554	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y5	2D	3	0	10233	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y6	2D	3	2	10298	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y7	2D	3	0	10587	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y8	2D	3	0	10434	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y1	3A	3	125	11273	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y2	3A	3	120	11284	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y3	3A	3	111	11107	2/20/2016 12:43	2/20/2016 12:46	PIC	SR90Y16
Y4	3A	3	119	11467	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y5	3A	3	115	11239	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16

Y6	3A	3	113	11073	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y7	3A	3	105	11260	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y8	3A	3	116	11320	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y1	3B	3	59	11423	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y2	3B	3	62	11571	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y3	3B	3	51	11541	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y4	3B	3	45	11617	2/20/2016 12:43	2/20/2016 12:46	PIC	SR90Y16
Y5	3B	3	54	11011	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y6	3B	3	46	11274	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y7	3B	3	52	11395	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y8	3B	3	57	11636	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y1	3C	3	33	11185	2/20/2016 12:43	2/20/2016 12:46	PIC	SR90Y16
Y2	3C	3	40	11678	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y3	3C	3	38	11565	2/20/2016 12:35	2/20/2016 12:38	PIC	SR90Y16
Y4	3C	3	41	11547	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y5	3C	3	50	11531	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y6	3C	3	40	11514	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y7	3C	3	35	11706	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y8	3C	3	44	11617	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y1	3D	3	11	11025	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y2	3D	3	15	11414	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y3	3D	3	12	11196	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y4	3D	3	14	11361	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y5	3D	3	15	11022	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y6	3D	3	13	11046	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y7	3D	3	11	11204	2/20/2016 12:57	2/20/2016 13:00	PIC	SR90Y16
Y8	3D	3	12	11296	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y1	4A	3	34	11097	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y2	4A	3	28	11327	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
Y3	4A	3	25	11357	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y4	4A	3	40	11420	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y5	4A	3	30	11511	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y6	4A	3	30	11509	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y7	4A	3	25	11689	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y8	4A	3	35	11453	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y1	4B	3	0	11640	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y2	4B	3	2	11586	2/20/2016 12:53	2/20/2016 12:56	PIC	SR90Y16

Y3	4B	3	0	11585	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
Y4	4B	3	0	11605	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y5	4B	3	4	11376	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y6	4B	3	0	11735	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y7	4B	3	0	11421	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y8	4B	3	1	11653	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y1	4C	3	25	11389	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y2	4C	3	12	11814	2/20/2016 12:57	2/20/2016 13:00	PIC	SR90Y16
Y3	4C	3	16	11728	2/20/2016 12:53	2/20/2016 12:56	PIC	SR90Y16
Y4	4C	3	20	11461	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
Y5	4C	3	11	11538	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y6	4C	3	19	11745	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y7	4C	3	19	11671	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y8	4C	3	10	11836	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y1	4D	3	77	11384	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
Y2	4D	3	76	11387	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y3	4D	3	74	11719	2/20/2016 12:57	2/20/2016 13:00	PIC	SR90Y16
Y4	4D	3	77	11606	2/20/2016 12:53	2/20/2016 12:56	PIC	SR90Y16
Y5	4D	3	84	11295	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y6	4D	3	71	11469	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y7	4D	3	78	11446	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y8	4D	3	87	11593	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y1	5A	3	16	11610	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
Y2	5A	3	17	11816	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90Y16
Y3	5A	3	16	11784	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90Y16
Y4	5A	3	14	11642	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90Y16
Y5	5A	3	15	11576	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y6	5A	3	16	11655	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16
Y7	5A	3	12	11976	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90Y16
Y8	5A	3	22	11669	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90Y16
Y1	5B	3	11	11386	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90Y16
Y2	5B	3	19	11752	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
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Y6	5B	3	20	11634	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y7	5B	3	22	12023	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16

Y8	5B	3	20	11678	2/20/2016 13:41	2/20/2016 13:44	PIC	SR90Y16
Y1	5C	3	17	11404	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90Y16
Y2	5C	3	24	11597	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90Y16
Y3	5C	3	17	11650	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
Y4	5C	3	22	11656	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90Y16
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Y6	5C	3	24	11588	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90Y16
Y7	5C	3	20	11807	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y8	5C	3	21	11584	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16
Y1	5D	3	21	11538	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90Y16
Y2	5D	3	18	11772	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90Y16
Y3	5D	3	27	11453	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90Y16
Y4	5D	3	21	11705	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
Y5	5D	3	29	11556	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16
Y6	5D	3	24	11479	2/20/2016 13:41	2/20/2016 13:44	PIC	SR90Y16
Y7	5D	3	26	11695	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90Y16
Y8	5D	3	14	11796	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y1	6A	3	27	11135	2/20/2016 13:33	2/20/2016 13:36	PIC	SR90Y16
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Y3	6A	3	27	11509	2/20/2016 13:43	2/20/2016 13:46	PIC	SR90Y16
Y4	6A	3	29	11510	2/20/2016 13:38	2/20/2016 13:41	PIC	SR90Y16
Y5	6A	3	26	11525	2/20/2016 13:14	2/20/2016 13:17	PIC	SR90Y16
Y6	6A	3	30	11634	2/20/2016 13:28	2/20/2016 13:31	PIC	SR90Y16
Y7	6A	3	21	11481	2/20/2016 13:23	2/20/2016 13:26	PIC	SR90Y16
Y8	6A	3	23	11519	2/20/2016 13:18	2/20/2016 13:21	PIC	SR90Y16
Y1	6B	3	33	11454	2/20/2016 13:38	2/20/2016 13:41	PIC	SR90Y16
Y2	6B	3	38	11666	2/20/2016 13:33	2/20/2016 13:36	PIC	SR90Y16
Y3	6B	3	43	11441	2/20/2016 13:47	2/20/2016 13:50	PIC	SR90Y16
Y4	6B	3	25	11517	2/20/2016 13:43	2/20/2016 13:46	PIC	SR90Y16
Y5	6B	3	32	11469	2/20/2016 13:18	2/20/2016 13:21	PIC	SR90Y16
Y6	6B	3	28	11679	2/20/2016 13:14	2/20/2016 13:17	PIC	SR90Y16
Y7	6B	3	25	11635	2/20/2016 13:28	2/20/2016 13:31	PIC	SR90Y16
Y8	6B	3	28	11695	2/20/2016 13:23	2/20/2016 13:26	PIC	SR90Y16
Y1	6C	3	30	11305	2/20/2016 13:43	2/20/2016 13:46	PIC	SR90Y16
Y2	6C	3	42	11639	2/20/2016 13:38	2/20/2016 13:41	PIC	SR90Y16
Y3	6C	3	41	11562	2/20/2016 13:33	2/20/2016 13:36	PIC	SR90Y16
Y4	6C	3	41	11731	2/20/2016 13:47	2/20/2016 13:50	PIC	SR90Y16

Y5	6C	3	44	11364	2/20/2016 13:23	2/20/2016 13:26	PIC	SR90Y16
Y6	6C	3	38	11547	2/20/2016 13:18	2/20/2016 13:21	PIC	SR90Y16
Y7	6C	3	33	11758	2/20/2016 13:14	2/20/2016 13:17	PIC	SR90Y16
Y8	6C	3	44	11663	2/20/2016 13:28	2/20/2016 13:31	PIC	SR90Y16
Y1	7A	3	7	11186	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y2	7A	3	16	11378	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90Y16
Y3	7A	3	5	11157	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y4	7A	3	4	11467	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
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Y8	7A	3	6	11401	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y1	7B	3	6	11326	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y2	7B	3	12	11678	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y3	7B	3	8	11233	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90Y16
Y4	7B	3	4	11597	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y5	7B	3	10	11165	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y6	7B	3	3	12008	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y7	7B	3	6	11458	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y8	7B	3	8	11319	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y1	7C	3	1	10736	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y2	7C	3	9	11144	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y3	7C	3	2	11211	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y4	7C	3	0	11002	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y5	7C	3	4	10826	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y6	7C	3	1	10956	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y7	7C	3	1	11283	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
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Y4	7D	3	0	11334	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y5	7D	3	7	10896	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y6	7D	3	2	10916	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y7	7D	3	1	11388	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y8	7D	3	2	11163	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y1	8A	3	11	11275	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16

Y2	8A	3	11	11432	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y3	8A	3	3	11321	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y4	8A	3	10	11461	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
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Y6	8A	3	3	11400	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y7	8A	3	7	11477	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y8	8A	3	7	11332	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y1	8B	3	3	11227	2/20/2016 14:39	2/20/2016 14:42	PIC	SR90Y16
Y2	8B	3	3	11388	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y3	8B	3	0	11464	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y4	8B	3	0	11355	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y5	8B	3	5	11165	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y6	8B	3	3	11308	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y7	8B	3	3	11392	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y8	8B	3	2	11434	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y1	8C	3	1	11197	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y2	8C	3	13	11018	2/20/2016 14:39	2/20/2016 14:42	PIC	SR90Y16
Y3	8C	3	1	11236	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y4	8C	3	4	11473	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y5	8C	3	5	10971	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y6	8C	3	1	11097	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y7	8C	3	2	11455	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y8	8C	3	1	11425	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y1	8D	3	11	11365	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y2	8D	3	17	11521	2/20/2016 14:39	2/20/2016 14:42	PIC	SR90Y16
Y3	8D	3	12	11493	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y4	8D	3	26	11713	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y5	8D	3	19	11399	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y6	8D	3	14	11590	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y7	8D	3	15	11685	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y8	8D	3	14	11704	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y1	9A	3	4	11268	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y2	9A	3	6	11327	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y3	9A	3	4	11409	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y4	9A	3	6	11425	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90Y16
Y5	9A	3	5	11114	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y6	9A	3	6	11250			PIC	SR90Y16

Y7	9A	3	3	11367	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y8	9A	3	6	11382	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90Y16
Y1	9B	3	5	11078	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y2	9B	3	14	11497	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y3	9B	3	8	11216	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y4	9B	3	7	11260	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y5	9B	3	13	11136	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y6	9B	3	6	11184	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90Y16
Y7	9B	3	5	11480	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y8	9B	3	9	11359	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y1	9C	3	9	10936	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y2	9C	3	12	11269	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y3	9C	3	11	11335	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y4	9C	3	16	11112	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y5	9C	3	14	10955	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y6	9C	3	9	11548	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y7	9C	3	16	11191	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y8	9C	3	10	11144	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y1	9D	3	12	11296	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y2	9D	3	21	11464	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y3	9D	3	9	11324	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y4	9D	3	9	11305	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y5	9D	3	15	11180	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y6	9D	3	18	11235	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y7	9D	3	17	11398	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y8	9D	3	19	11426	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16

Sr Strontium-89 & 90 Liquid

Filename : SR8990.XLS
File type : Excel
Version # : 1.3.9

Batch : 1082959
Analyst : KSD1
Prep Date : 2/26/2016
Sr-89 Method Uncertainty : 0.0829
Sr-90 Method Uncertainty : 0.0821

Geometry: Tuffryn Filter

Sr Carrier S/N : 2370334
Carrier Exp Date : 2/23/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 15.53
Carrier Weight StDev.: 0.15

Y Carrier S/N : 2354207
Carrier Exp Date : 1/12/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 31.78
Carrier Weight StDev.: 0.05

Procedure Code : GFCGANBL
Parmname1 : Strontium-89
Parmname2 : Strontium-90
Required MDA Sr-89 : 1 pCi/L
Required MDA Sr-90 : 1 pCi/L
Sr-89 Abundance : 1.00
Sr-90 Abundance : 1.00
Half-life of Sr-89 : 50.53 days
Half-life of Sr-90 : 28.9 years
Half-life of Y-90 : 64.053 hours

Sample Characteristics				Carrier Calculations			
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Net Weight (mg) Sr	Net Weight StDev. (mg) Y	Carrier Aliquot (mL) Sr Y
1	1202347886.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
2	1202347887.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
3	1202347888.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
4	1202347889.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
5	1202347890.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
6	1202347891.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
7	1202347892.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
8	1202347893.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
9	1202347894.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
10	1202347895.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
11	1202347896.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
12	1202347897.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
13	1202347898.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
14	1202347899.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
15	1202347900.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
16	1202347901.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
17	1202347902.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
18	1202347903.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
19	1202347904.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
20	1202347905.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
21	1202347906.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
22	1202347907.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
23	1202347908.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
24	1202347909.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
25	1202347910.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
26	1202347911.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
27	1202347912.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
28	1202347913.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
29	1202347914.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
30	1202347915.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
31	1202347916.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
32	1202347917.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
33	1202347918.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
34	1202347919.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
35	1202347920.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
36	1202347921.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
37	1202347922.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
38	1202347923.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
39	1202347924.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
40	1202347925.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000

Pipet, 0.1 ml Sidev : +/- 0.000200 ml
 Pipet, 0.5 ml Sidev : +/- 0.001000 ml
 Pipet, 1 ml Sidev : +/- 0.002000 ml
 Pipet, 5 ml Sidev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-001
 Instrument SOP: GL-RAD-I-016

1st Count Raw Data							1st Count Calibration Data					Detector Efficiency					Weekly Bkg	
Pos.	Detector ID	Counting Time (min.)	Gross Alpha	Gross Beta	Count Rate CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Efficiency Sr-89 (cpm/dpm)	Efficiency Sr-90 (cpm/dpm)	Detector Error (cpm/dpm)	Alpha X-Talk	Weekly CPM	Count Start Date/Time	Count Time (min.)		
1	1A	10	6	6035	603.450	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5299	0.4219	0.00738	0.08306	0.762	2/26/2016 18:27	500		
2	1B	10	13	5803	580.190	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5316	0.4248	0.00711	0.08433	0.796	2/26/2016 18:27	500		
3	1C	10	47	6156	615.358	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5380	0.4249	0.00847	0.04240	1.426	2/26/2016 18:51	500		
4	1D	10	55	5732	572.975	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5314	0.4193	0.00692	0.05002	1.058	2/26/2016 18:31	500		
5	2A	10	8	5971	596.992	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5259	0.4132	0.01914	0.13467	0.566	2/26/2016 18:28	500		
6	2B	10	0	5989	598.900	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5008	0.4007	0.02111	0.28043	1.504	2/26/2016 18:31	500		
7	2C	10	10	5623	562.235	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5171	0.4092	0.01274	0.06541	0.484	2/26/2016 18:28	500		
8	2D	10	1	5631	563.085	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.4882	0.3889	0.00745	0.15461	1.526	2/26/2016 18:28	500		
9	3A	10	132	5656	565.161	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.5181	0.4059	0.01401	0.03329	0.502	2/26/2016 18:28	500		
10	3B	10	66	5676	567.308	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.5255	0.4058	0.01614	0.04428	1.590	2/26/2016 18:28	500		
11	3C	10	53	5907	590.572	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.4800	0.4170	0.00988	0.04300	0.474	2/26/2016 18:28	500		
12	3D	10	17	5885	588.398	2/29/2016 13:23	PIC	2/1/2016	3/15/2017	0.4565	0.4028	0.02297	0.06027	0.550	2/26/2016 18:31	500		
13	4A	10	45	5990	598.780	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.4928	0.4179	0.01123	0.04880	0.704	2/26/2016 18:28	500		
14	4B	10	1	6427	642.686	2/29/2016 11:39	PIC	2/1/2016	3/15/2017	0.5364	0.4233	0.01519	0.13819	1.654	2/26/2016 18:31	500		
15	4C	10	23	5813	581.191	2/29/2016 11:39	PIC	2/1/2016	3/15/2017	0.5422	0.4249	0.00889	0.04737	0.780	2/26/2016 18:31	500		
16	4D	10	90	5662	565.826	2/29/2016 11:39	PIC	2/1/2016	3/15/2017	0.5284	0.4127	0.00773	0.04161	1.650	2/26/2016 18:31	500		
17	5A	10	20	5979	597.795	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5438	0.4320	0.00851	0.05241	1.350	2/26/2016 18:29	500		
18	5B	10	21	5903	590.209	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5408	0.4294	0.00426	0.04330	0.418	2/26/2016 18:29	500		
19	5C	10	20	6106	610.511	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5402	0.4249	0.00657	0.04445	0.664	2/26/2016 18:29	500		
20	5D	10	30	6351	634.960	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5423	0.4249	0.00925	0.04680	0.786	2/26/2016 18:29	500		
21	6A	10	37	6003	600.061	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5339	0.4127	0.02228	0.06461	1.692	2/26/2016 17:18	500		
22	6B	10	39	6275	627.317	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5379	0.4206	0.00851	0.04699	0.796	2/26/2016 17:18	500		
23	6C	10	35	5828	582.639	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5381	0.4216	0.01970	0.04586	1.170	2/26/2016 17:18	500		
24	6D	40	0	0.000	0.000	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5381	0.4216	0.01970	0.04586	1.170	2/26/2016 17:18	500		
25	7A	10	7	5998	599.744	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5301	0.4197	0.00594	0.07982	0.860	2/26/2016 17:18	500		
26	7B	10	2	5932	593.189	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5387	0.4296	0.00627	0.05433	0.534	2/26/2016 17:18	500		
27	7C	10	4	6068	606.753	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5225	0.4145	0.00790	0.11870	0.484	2/26/2016 17:18	500		
28	7D	10	1	6107	610.692	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5241	0.4129	0.01113	0.08122	0.698	2/26/2016 17:19	500		
29	8A	10	17	6176	617.489	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5331	0.4116	0.01579	0.06550	0.756	2/26/2016 17:19	500		
30	8B	10	2	6369	636.884	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5347	0.4282	0.02148	0.07770	0.388	2/26/2016 17:19	500		
31	8C	10	6	5812	581.102	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5302	0.4157	0.01955	0.16360	1.388	2/26/2016 17:19	500		
32	8D	10	21	5841	583.988	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5416	0.4257	0.00609	0.05310	0.548	2/26/2016 17:19	500		
33	9A	10	11	5988	598.659	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5401	0.4236	0.00758	0.12801	0.790	2/26/2016 17:19	500		
34	9B	10	11	5825	582.432	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5324	0.4198	0.00754	0.06171	0.728	2/26/2016 17:19	500		
35	9C	10	15	5947	594.595	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5285	0.4139	0.00584	0.06991	0.680	2/26/2016 17:19	500		
36	9D	10	13	6227	622.622	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5342	0.4207	0.02610	0.06030	0.902	2/26/2016 17:19	500		
37	10A	10	3	5297	529.541	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.4929	0.3713	0.00651	0.53165	0.412	2/26/2016 17:19	500		
38	10B	10	3	6193	619.247	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5238	0.4086	0.00652	0.17540	0.708	2/26/2016 17:19	500		
39	10C	10	2	5487	548.651	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5183	0.4052	0.00638	0.24341	0.572	2/26/2016 17:19	500		
40	10D	10	3	5510	550.871	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5078	0.4052	0.00557	0.42900	0.782	2/26/2016 17:20	500		

2nd Count Raw Data							2nd Count Calibration Data					Detector Efficiency				Weekly Bkg Count	
Pos.	Detector ID	Counting Time (min.)	Gross Alpha	Gross Beta	Gross CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Y-90 (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)		
1	1A	20	20	1523	76.067	3/5/2016 13:38	PIC	2/1/2016	3/15/2017	0.5477	0.00738	0.08306	0.774	3/4/2016 17:55	1000		
2	1B	20	4	1209	60.433	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5497	0.00711	0.08433	0.754	3/4/2016 17:55	1000		
3	1C	20	19	1571	78.510	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5634	0.00847	0.04240	1.882	3/4/2016 17:55	1000		
4	1D	20	9	1382	69.077	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5546	0.00692	0.05002	1.044	3/4/2016 17:55	1000		
5	2A	20	5	1322	66.066	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5406	0.01914	0.13467	0.606	3/4/2016 17:55	1000		
6	2B	20	3	1486	74.258	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5091	0.02111	0.28043	1.378	3/4/2016 17:55	1000		
7	2C	20	5	1344	67.184	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5331	0.01274	0.06541	0.519	3/4/2016 17:55	1000		
8	2D	20	7	1441	71.996	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.4974	0.00745	0.15461	1.425	3/4/2016 17:55	1000		
9	3A	20	38	1411	70.487	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5422	0.01401	0.03329	0.396	3/4/2016 17:55	1000		
10	3B	20	16	1202	60.065	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5509	0.01614	0.04428	1.376	3/4/2016 17:56	1000		
11	3C	20	19	1477	73.809	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5563	0.00988	0.04300	0.470	3/4/2016 17:56	1000		
12	3D	20	3	1359	67.941	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5395	0.02297	0.06027	0.563	3/4/2016 17:56	1000		
13	4A	20	4	1324	66.190	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5503	0.01123	0.04880	0.634	3/4/2016 17:56	1000		
14	4B	20	3	1539	76.929	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5578	0.01519	0.13819	1.754	3/4/2016 17:56	1000		
15	4C	20	6	1340	66.986	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5613	0.00889	0.04737	0.676	3/4/2016 17:56	1000		
16	4D	20	20	1429	71.408	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5536	0.00773	0.04161	1.718	3/4/2016 17:56	1000		
17	5A	20	22	1491	74.492	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5685	0.00851	0.05241	1.204	3/4/2016 17:56	1000		
18	5B	20	8	1268	63.383	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5665	0.00426	0.04330	0.418	2/26/2016 18:29	500		
19	5C	20	12	1533	76.623	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5622	0.00657	0.04445	0.542	3/4/2016 17:56	1000		
20	5D	20	4	1358	67.891	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5641	0.00925	0.04680	0.832	3/4/2016 17:56	1000		
21	6A	20	6	1346	67.281	3/5/2016 14:26	PIC	2/1/2016	3/15/2017	0.5572	0.02228	0.06461	1.678	3/4/2016 17:56	1000		
22	6B	20	7	1466	73.284	3/5/2016 14:26	PIC	2/1/2016	3/15/2017	0.5616	0.00851	0.04699	0.977	3/4/2016 17:56	1000		
23	6C	20	16	1396	69.763	3/5/2016 14:26	PIC	2/1/2016	3/15/2017	0.5617	0.01970	0.04586	1.614	3/4/2016 17:56	1000		
24	6D	20	0	0	0.000	3/5/2016-14:26	PIC	2/1/2016	3/15/2017	0.0000	0.04341	0.00000	FAIL	12:00:00-AM	6		
25	7A	20	27	1445	72.142	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5546	0.00594	0.07982	0.775	3/4/2016 17:56	1000		
26	7B	20	1	1233	61.647	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5632	0.00827	0.05433	0.384	3/4/2016 17:56	1000		
27	7C	20	8	1456	72.753	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5415	0.00790	0.11870	0.455	3/4/2016 17:56	1000		
28	7D	20	0	1345	67.250	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5455	0.01113	0.08122	0.690	3/4/2016 17:56	1000		
29	8A	20	6	1380	68.980	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5573	0.01579	0.06550	0.852	3/4/2016 17:57	1000		
30	8B	20	5	1483	74.131	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5567	0.02148	0.07770	0.388	2/26/2016 17:19	500		
31	8C	20	10	1344	67.118	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5514	0.01955	0.16360	1.517	3/4/2016 17:57	1000		
32	8D	20	8	1373	68.629	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5674	0.00609	0.05310	0.539	3/4/2016 17:57	1000		
33	9A	20	25	1473	73.490	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5591	0.00758	0.12801	0.695	3/4/2016 17:57	1000		
34	9B	20	5	1187	59.335	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5570	0.00754	0.06171	0.823	3/4/2016 16:51	1000		
35	9C	20	6	1511	75.529	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5526	0.00584	0.06991	0.656	3/4/2016 16:51	1000		
36	9D	20	1	1291	64.547	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5596	0.02610	0.06030	0.962	3/4/2016 16:51	1000		
37	10A	20	0	1154	57.700	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.4608	0.00651	0.53165	0.412	2/26/2016 17:19	500		
38	10B	20	2	1507	75.332	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5325	0.00652	0.17540	0.768	3/4/2016 16:52	1000		
39	10C	20	4	1225	61.201	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5237	0.00638	0.24341	0.608	3/4/2016 16:52	1000		
40	10D	20	2	1360	67.957	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5164	0.00557	0.42900	0.759	3/4/2016 16:52	1000		

Correction Factors																			
Pos.	Strontium	Separation Date/Time		Yttrium		Yttrium Ingrowth		Yttrium Decay		Decay from Sample Date		Net Count Rate		Gross CPM		Calculated		Sample Recovery	
		Strontium	Yttrium	(Sr-89 calc)	(Sr-90 calc)	Yttrium	Decay	Sr-89	Sr-90	Y-90	Sr-90	Y-90	Sr-90	Sr-89	Sr	Y	Sr	Y	
1	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7770	0.9535	0.9998	62.4727	88.9225	452.054959	97.9%	100%	1.24%	0.72%				
2	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7770	0.9535	0.9998	50.8572	73.9537	455.379491	95.3%	95.7%	1.24%	0.72%				
3	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7770	0.9535	0.9998	63.7494	92.9397	458.669267	97.9%	95.7%	1.24%	0.72%				
4	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7769	0.9535	0.9998	57.9793	75.9943	439.001346	95.3%	104%	1.24%	0.72%				
5	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7769	0.9535	0.9998	55.7875	77.2031	464.001636	95.3%	99.4%	1.24%	0.72%				
6	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7769	0.9535	0.9998	58.9268	86.3223	453.650881	100%	102%	1.23%	0.72%				
7	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7769	0.9535	0.9998	53.9031	86.0333	422.298236	100%	91.3%	1.23%	0.73%				
8	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.7769	0.9535	0.9998	59.3461	87.3614	416.377047	96.6%	96.9%	1.24%	0.72%				
9	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.7739	0.9533	0.9998	58.6211	80.7549	425.784579	97.9%	100%	1.24%	0.72%				
10	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.7739	0.9533	0.9998	50.4122	69.6095	447.286122	95.3%	95.7%	1.24%	0.72%				
11	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.7739	0.9533	0.9998	61.3402	88.5210	440.710925	97.9%	95.7%	1.24%	0.72%				
12	2/26/2016 13:40	3/4/2016 14:30		0.5402	0.8391	0.7739	0.9533	0.9998	58.8280	74.6256	454.943917	95.3%	104%	1.24%	0.72%				
13	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.7739	0.9533	0.9998	56.3133	77.1169	465.35018	95.3%	99.4%	1.24%	0.72%				
14	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.7739	0.9533	0.9998	61.2654	86.1835	495.237221	100%	102%	1.23%	0.72%				
15	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.7739	0.9533	0.9998	54.0415	84.7275	442.422086	100%	91.3%	1.23%	0.73%				
16	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.7739	0.9533	0.9998	59.0698	82.5757	424.180077	96.6%	96.9%	1.24%	0.72%				
17	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.7707	0.9534	0.9998	61.4396	86.0808	450.27485	97.9%	100%	1.24%	0.72%				
18	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.7707	0.9534	0.9998	54.2117	77.1669	458.830474	95.3%	95.7%	1.24%	0.72%				
19	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.7707	0.9534	0.9998	63.7814	91.8925	454.83728	97.9%	95.7%	1.24%	0.72%				
20	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.7707	0.9534	0.9998	57.7374	75.2313	501.990898	95.3%	104%	1.24%	0.72%				
21	2/26/2016 13:40	3/4/2016 14:30		0.5307	0.8391	0.7704	0.9534	0.9998	56.5249	75.6058	467.930284	95.3%	99.4%	1.24%	0.72%				
22	2/26/2016 13:40	3/4/2016 14:30		0.5307	0.8391	0.7704	0.9534	0.9998	59.1066	82.1718	486.038312	100%	102%	1.23%	0.72%				
23	2/26/2016 13:40	3/4/2016 14:30		0.5307	0.8391	0.7704	0.9534	0.9998	55.7086	86.7306	440.200315	100%	91.3%	1.23%	0.73%				
24	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	#VALUE!	#VALUE!	#VALUE!	96.6%	96.9%	1.24%	0.72%				
25	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	53.1943	75.9068	464.089087	95.3%	100%	1.24%	0.72%				
26	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	61.1236	89.8876	455.741378	97.9%	95.7%	1.24%	0.72%				
27	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	57.7937	75.3772	477.52101	95.3%	104%	1.24%	0.72%				
28	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	59.1548	78.6124	479.721456	95.3%	99.4%	1.24%	0.72%				
29	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	60.7460	86.4313	489.707125	100%	102%	1.23%	0.72%				
30	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	54.0393	84.1966	442.864369	96.6%	96.9%	1.24%	0.73%				
31	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	58.3329	81.8912	423.764369	96.6%	96.9%	1.24%	0.72%				
32	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.7673	0.9531	0.9998	62.4513	86.7351	449.47278	97.9%	100%	1.24%	0.72%				
33	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7575	0.9530	0.9998	51.5539	72.5362	458.342011	95.3%	95.7%	1.24%	0.72%				
34	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7575	0.9530	0.9998	64.2337	92.2512	438.110258	97.9%	95.7%	1.24%	0.72%				
35	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7575	0.9530	0.9998	56.0240	72.4388	494.158827	95.3%	104%	1.24%	0.72%				
36	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7575	0.9530	0.9998	50.4782	73.0702	405.992015	95.3%	99.4%	1.24%	0.72%				
37	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7574	0.9530	0.9998	62.3315	88.3100	468.605911	100%	102%	1.23%	0.72%				
38	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7574	0.9530	0.9998	50.6522	80.8409	417.158221	100%	91.3%	1.23%	0.73%				
39	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7574	0.9530	0.9998	58.4203	85.6134	406.837598	96.6%	96.9%	1.24%	0.72%				
40	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.7574	0.9530	0.9998											

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-89 Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Sr-89 LCS S/N : 1758-A
 LCS Exp Date : 5/10/2016
 LCS Activity (dpm/ml): 5282.88
 LCS Volume Added: 0.20

SR-89 Results										2 SIGMA		2 SIGMA		Total Prop.					
Pos.	Decision	Critical	Required	MDA	Sample Act.	Sample Act.	Net Count	Net Count	Rate Error	Counting	Uncertainty	Sample	Sample	QC	Type	RPD	RER	Nominal	Recovery
	pCi/L	Level	pCi/L	MDA	Conc.	%	CPM	Rate	CPM	pCi/L	pCi/L	QC	Type					pCi/L	
1	1.9723	1.3925	1	3.6959	1370.2719	2.07%	451.2930	6.7236	40.0136	230.6418	LCS	1586.4497	86.4%						
2	2.0636	1.4569	1	3.8464	1412.9732	2.06%	454.5835	6.7483	41.1122	237.6178	LCS	1586.4497	89.1%						
3	2.6576	1.8763	1	4.6498	1367.4820	2.11%	457.2433	6.7727	39.7003	230.6683	LCS	1586.4497	86.2%						
4	2.3801	1.6803	1	4.2935	1361.7808	2.07%	437.9433	6.6259	40.3821	229.1124	LCS	1586.4497	85.8%						
5	1.7591	1.2420	1	3.4266	1456.2189	2.71%	463.4356	6.8118	41.9525	255.1230	LCS	1586.4497	91.8%						
6	2.8566	2.0168	1	4.9727	1415.3230	2.86%	452.1469	6.7356	41.3245	250.5177	LCS	1586.4497	89.2%						
7	1.5895	1.1081	1	3.1257	1278.8178	2.35%	421.8142	6.4985	38.6152	218.5866	LCS	1586.4497	80.6%						
8	3.0697	2.1672	1	5.3363	1385.3340	2.12%	414.8510	6.4530	42.2355	233.5613	LCS	1586.4497	87.3%						
9	1.6378	1.1563	1	3.2444	1321.0465	2.42%	425.2826	6.5253	39.7280	226.8019	LCS	1586.4497	83.3%						
10	2.9510	2.0835	1	5.1104	1401.7135	2.53%	445.6961	6.6882	41.2273	242.4358	LCS	1586.4497	88.4%						
11	1.7178	1.2128	1	3.4315	1476.1259	2.19%	440.2369	6.6387	43.6289	250.0000	LCS	1586.4497	93.0%						
12	2.0003	1.4122	1	3.9117	1646.9508	3.00%	454.3939	6.7450	47.9169	294.4018	LCS	1586.4497	103.8%						
13	2.0940	1.4784	1	3.9629	1558.3152	2.22%	464.6462	6.8218	44.8421	264.6646	LCS	1586.4497	98.2%						
14	2.7979	1.9753	1	4.8277	1442.9981	2.42%	493.5832	7.0375	40.3258	248.2660	LCS	1586.4497	91.0%						
15	1.9006	1.3418	1	3.5512	1277.1652	2.14%	441.6421	6.6516	37.7015	215.7227	LCS	1586.4497	80.5%						
16	2.9498	2.0826	1	5.0910	1303.9335	2.12%	422.5301	6.5132	39.3954	219.8859	LCS	1586.4497	82.2%						
17	2.5584	1.8062	1	4.5001	1328.3533	2.12%	448.9249	6.7105	38.9178	224.1465	LCS	1586.4497	83.7%						
18	1.4702	1.0380	1	2.9928	1400.8628	1.97%	458.4125	6.7738	40.5719	234.5183	LCS	1586.4497	88.3%						
19	1.8061	1.2752	1	3.4439	1352.8051	2.04%	454.1733	6.7443	39.3735	227.3273	LCS	1586.4497	85.3%						
20	2.0106	1.4195	1	3.7532	1527.4590	2.09%	501.2049	7.0852	42.3219	257.7168	LCS	1586.4497	96.3%						
21	2.9965	2.1156	1	5.1598	1443.3321	2.94%	466.2383	6.8408	41.5069	256.9351	LCS	1586.4497	91.0%						
22	1.9353	1.3663	1	3.6071	1414.4560	2.08%	485.2423	6.9718	39.8317	238.3483	LCS	1586.4497	89.2%						
23	2.3454	1.6559	1	4.1859	1279.2626	2.77%	439.0303	6.6349	37.8929	224.9312	LCS	1586.4497	80.6%						
24	#DIV/0!	#DIV/0!	4	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	LCS	1586.4497	#VALUE!						
25	2.0954	1.4794	1	3.8696	1380.6039	2.02%	454.6836	6.7495	40.1688	231.7290	LCS	1586.4497	87.0%						
26	1.6685	1.1779	1	3.2764	1422.2911	2.02%	463.5541	6.8125	40.9684	238.7453	LCS	1586.4497	89.7%						
27	1.5946	1.1258	1	3.1756	1402.2462	2.09%	455.2574	6.7509	40.7556	236.2248	LCS	1586.4497	88.4%						
28	1.9608	1.3843	1	3.7148	1503.8508	2.21%	476.8230	6.9104	42.7175	255.2377	LCS	1586.4497	94.8%						
29	2.0061	1.4163	1	3.7628	1485.0541	2.47%	478.9655	6.9263	42.0916	256.2178	LCS	1586.4497	93.6%						
30	1.3594	0.9597	1	2.7992	1435.0098	2.86%	489.3191	6.9980	40.2245	254.1923	LCS	1586.4497	90.5%						
31	2.5932	1.8308	1	4.5490	1305.8443	2.76%	441.4779	6.6550	38.5823	229.3997	LCS	1586.4497	82.3%						
32	1.6588	1.1711	1	3.2457	1274.4330	2.07%	423.2164	6.5098	38.4219	214.2263	LCS	1586.4497	80.3%						
33	1.9711	1.3916	1	3.6773	1337.1445	2.08%	448.6828	6.7044	39.1611	225.1703	LCS	1586.4497	84.3%						
34	1.9714	1.3918	1	3.7151	1420.8392	2.07%	457.6140	6.7702	41.2006	239.1117	LCS	1586.4497	89.6%						
35	1.8689	1.3195	1	3.5526	1332.2445	2.04%	437.4303	6.6191	39.5121	223.7422	LCS	1586.4497	84.0%						
36	2.1870	1.5440	1	4.0164	1526.3569	3.22%	493.2568	7.0298	42.6364	277.4988	LCS	1586.4497	96.2%						
37	1.6020	1.1311	1	3.2683	1360.3377	2.10%	405.5800	6.3718	41.8880	228.9700	LCS	1586.4497	85.7%						
38	1.8750	1.3238	1	3.5459	1401.1412	2.02%	467.8979	6.8456	40.1788	235.2959	LCS	1586.4497	88.3%						
39	1.7031	1.2024	1	3.3127	1260.6639	2.08%	416.5862	6.4589	38.3095	212.0356	LCS	1586.4497	79.5%						
40	2.1139	1.4925	1	3.9486	1304.4177	2.08%	406.0556	6.3785	40.1611	219.2595	LCS	1586.4497	82.2%						

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-90 Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Sr-90 LCS S/N : 1243-N
 LCS Exp Date : 5/6/2016
 LCS Activity (dpm/ml): 477.42
 LCS Volume Added: 0.50

SR-90 Results										2 SIGMA				2 SIGMA				Total Prop.			
Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate	Net Count Rate Error	Counting Uncertainty	2 SIGMA Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/L	Recovery				
1	1.9878	1.4034	1	3.4510	323.3114	2.79%	75.2929	1.9504	10.7026	54.9441			LCS			358.4235	90.2%				
2	2.1002	1.4828	1	3.6550	274.3198	3.08%	59.6791	1.7385	10.2117	47.1547			LCS			358.4235	76.5%				
3	2.9805	2.1042	1	4.8636	335.5432	2.81%	76.8277	1.9817	11.0597	57.0677			LCS			358.4235	93.6%				
4	2.2569	1.5934	1	3.8164	285.5849	2.91%	68.0335	1.8587	9.9700	48.7532			LCS			358.4235	79.7%				
5	1.8420	1.3005	1	3.2754	294.3660	3.45%	65.4603	1.8177	10.4443	48.7532			LCS			358.4235	82.1%				
6	2.7292	1.9268	1	4.5164	322.0134	3.46%	72.8799	1.9272	10.8805	56.2279			LCS			358.4235	89.8%				
7	1.7871	1.2617	1	3.2306	314.2843	3.12%	66.6646	1.8329	11.0410	54.0931			LCS			358.4235	87.7%				
8	3.1079	2.1942	1	5.1306	349.1733	2.88%	70.5709	1.8977	11.9965	59.5490			LCS			358.4235	97.4%				
9	1.4421	1.0181	1	2.6895	305.2481	3.11%	70.0907	1.8774	10.4069	52.5198			LCS			358.4235	85.2%				
10	2.8423	2.0067	1	4.7041	270.2541	3.44%	58.6886	1.7334	10.1596	47.1561			LCS			358.4235	75.4%				
11	1.6018	1.1309	1	2.9279	325.6600	2.89%	73.3392	1.9212	10.8583	55.5584			LCS			358.4235	90.9%				
12	1.7104	1.2075	1	3.0649	291.8851	3.64%	67.3780	1.8433	10.1636	51.3865			LCS			358.4235	81.4%				
13	1.8580	1.3118	1	3.2887	290.7203	3.08%	65.5562	1.8194	10.2696	49.9637			LCS			358.4235	81.1%				
14	2.8213	1.9918	1	4.5910	304.3436	3.10%	75.1753	1.9617	10.1085	52.3567			LCS			358.4235	84.9%				
15	1.9446	1.3729	1	3.4201	298.0555	2.99%	66.3098	1.8303	10.4714	51.0418			LCS			358.4235	83.2%				
16	3.0780	2.1731	1	5.0157	311.0240	2.91%	69.6904	1.8900	10.7362	53.1012			LCS			358.4235	86.8%				
17	2.4081	1.7001	1	4.0259	305.6689	2.86%	73.2884	1.9302	10.2048	52.0857			LCS			358.4235	85.3%				
18	1.5448	1.0906	1	2.8559	283.1559	2.95%	62.9647	1.7804	10.1492	48.4154			LCS			358.4235	79.0%				
19	1.7092	1.2067	1	3.0752	335.6841	2.75%	76.0813	1.9575	10.9478	56.9708			LCS			358.4235	93.7%				
20	1.9967	1.4097	1	3.4435	278.9812	2.99%	67.0586	1.8427	9.7172	47.7712			LCS			358.4235	77.8%				
21	2.9989	2.1173	1	4.8945	288.6379	3.65%	65.6026	1.8346	10.2274	50.8232			LCS			358.4235	80.5%				
22	2.1008	1.4832	1	3.5722	292.0563	2.87%	72.3066	1.9145	9.7978	49.7900			LCS			358.4235	81.5%				
23	3.0162	2.1295	1	4.9358	307.4936	3.45%	68.1493	1.8681	10.6799	53.6788			LCS			358.4235	85.8%				
24	#DIV/0!	#DIV/0!	4	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS			358.4235	#VALUE!				
25	1.9896	1.4047	1	3.4537	306.5336	2.82%	71.3672	1.8994	10.2949	52.1555			LCS			358.4235	85.5%				
26	1.4816	1.0460	1	2.7736	278.3741	3.02%	61.2633	1.7558	10.0673	47.7320			LCS			358.4235	77.7%				
27	1.6331	1.1530	1	2.9962	332.6593	2.85%	72.2975	1.9074	11.0746	56.6577			LCS			358.4235	92.8%				
28	1.8887	1.3334	1	3.3150	287.6133	3.06%	66.5600	1.8339	9.9997	49.3859			LCS			358.4235	80.2%				
29	2.1455	1.5148	1	3.6921	300.9537	3.23%	68.1284	1.8574	10.3536	52.0454			LCS			358.4235	84.0%				
30	1.3542	0.9561	1	2.5258	301.7279	3.46%	73.7426	1.9254	9.9413	52.6811			LCS			358.4235	84.2%				
31	2.9910	2.1117	1	4.9157	302.7621	3.49%	65.6012	1.8323	10.6712	52.9280			LCS			358.4235	84.5%				
32	1.6967	1.1979	1	3.0547	299.0641	2.88%	68.0898	1.8526	10.2677	50.9991			LCS			358.4235	83.4%				
33	1.8931	1.3365	1	3.3204	314.1483	2.83%	72.7950	1.9171	10.3066	53.4774			LCS			358.4235	87.6%				
34	2.2213	1.5682	1	3.8344	272.2691	3.12%	58.5116	1.7227	9.9861	46.8765			LCS			358.4235	76.0%				
35	1.9464	1.3741	1	3.4333	341.9437	2.76%	74.8730	1.9435	11.0573	58.0437			LCS			358.4235	95.4%				
36	2.2021	1.5547	1	3.7494	271.3039	3.91%	63.5850	1.7968	9.5506	48.3615			LCS			358.4235	75.7%				
37	1.8457	1.3031	1	3.4180	310.0479	3.12%	57.2880	1.6988	11.4529	53.3732			LCS			358.4235	86.5%				
38	1.9981	1.4106	1	3.4712	323.0865	2.78%	74.5645	1.9410	10.4767	54.8856			LCS			358.4235	90.1%				
39	2.0195	1.4258	1	3.5899	298.2497	3.04%	60.5933	1.7495	10.7271	51.1867			LCS			358.4235	83.2%				
40	2.2407	1.5820	1	3.8971	328.4592	2.89%	67.1981	1.8435	11.2252	56.0353			LCS			358.4235	91.6%				

Strontium-89 & 90 Liquid

Filename : SR8990.XLS
File type : Excel
Version # : 1.3.9

Batch : 1082959
Analyst : KSD1
Prep Date : 2/26/2016
Sr-89 Method Uncertainty : 0.0829
Sr-90 Method Uncertainty : 0.0821

Geometry: Tuffryn Filter

Sr Carrier S/N : 2370334
Carrier Exp Date : 2/23/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 15.53
Carrier Weight StDev.: 0.15

Y Carrier S/N : 2354207
Carrier Exp Date : 1/12/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 31.78
Carrier Weight StDev.: 0.05

Procedure Code : GFCGANBL
Parmname1 : Strontium-89
Parmname2 : Strontium-90
Required MDA Sr-89 : 1 pCi/L
Required MDA Sr-90 : 1 pCi/L
Sr-89 Abundance : 1.00
Sr-90 Abundance : 1.00
Half-life of Sr-89 : 50.53 days
Half-life of Sr-90 : 28.9 years
Half-life of Y-90 : 64.053 hours

Sample Characteristics			Carrier Calculations				Carrier Aliquot			
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Net Weight (mg) Sr	Net Weight StDev. (mg) Y	Carrier Aliquot (mL) Sr	Carrier Aliquot (mL) Y	Carrier Aliquot StDev. (mL) Sr	Carrier Aliquot StDev. (mL) Y
1	1202347886.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	15.9	0.039995	0.075668	0.001000	0.001000
2	1202347887.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.2	0.039135	0.072660	0.001000	0.001000
3	1202347888.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	15.2	0.039995	0.072660	0.001000	0.001000
4	1202347889.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	16.5	0.039135	0.078247	0.001000	0.001000
5	1202347890.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.8	0.039135	0.075238	0.001000	0.001000
6	1202347891.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	16.2	0.040854	0.076958	0.001000	0.001000
7	1202347892.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	14.5	0.040854	0.069651	0.001000	0.001000
8	1202347893.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	15.4	0.039565	0.073519	0.001000	0.001000
9	1202347894.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	15.9	0.039995	0.075668	0.001000	0.001000
10	1202347895.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.2	0.039135	0.072660	0.001000	0.001000
11	1202347896.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	16.2	0.039995	0.072660	0.001000	0.001000
12	1202347897.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	16.5	0.039135	0.078247	0.001000	0.001000
13	1202347898.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.8	0.039135	0.075238	0.001000	0.001000
14	1202347899.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	16.2	0.040854	0.076958	0.001000	0.001000
15	1202347900.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	14.5	0.040854	0.069651	0.001000	0.001000
16	1202347901.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	15.4	0.039565	0.073519	0.001000	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml
 Pipet, 5 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-001
 Instrument SOP: GL-RAD-I-016

1st Count Raw Data							1st Count Calibration Data							Detector		Weekly Bkg	
Pos.	Detector ID	Counting Time (min.)	Gross Alpha	Gross Beta	Gross CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Sr-89	Detector Efficiency (cpm/dpm) Sr-90	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)	
1	11A	10	1	6147	614.689	2/29/2016 12:17	PIC	2/1/2016	3/15/2017	0.5316	0.4235	0.01317	0.10871	1.108	2/26/2016 18:23	500	
2	11B	10	3	5819	581.878	2/29/2016 12:17	PIC	2/1/2016	3/15/2017	0.5367	0.4308	0.00697	0.07284	0.944	2/26/2016 18:19	500	
3	11C	10	4	5992	599.133	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5282	0.4166	0.01278	0.16742	0.378	2/26/2016 18:19	500	
4	11D	10	1	6337	633.693	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5471	0.4289	0.01068	0.06838	0.790	2/26/2016 18:19	500	
5	12A	10	3	5784	578.357	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5167	0.4041	0.01964	0.14245	1.094	2/26/2016 18:19	500	
6	12B	10	1	6186	618.586	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5199	0.4164	0.01114	0.13938	1.426	2/26/2016 18:20	500	
7	12C	10	1	5867	586.693	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5279	0.4191	0.01666	0.07486	0.672	2/26/2016 18:20	500	
8	12D	10	1	5789	578.890	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5298	0.4205	0.01845	0.10410	1.050	2/26/2016 18:23	500	
9	13A	10	1	5510	550.986	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.4954	0.4123	0.00714	0.14032	0.855	2/27/2016 11:52	1000	
10	13B	10	0	5768	576.800	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5074	0.4190	0.00967	0.13254	1.461	2/27/2016 11:52	1000	
11	13C	10	0	0	0.000	2/29/2016 12:30	PIC	2/4/2016	3/15/2017	0.0000	0.0000	0.01708	0.00000	0.000	12-00-00-AM	0	
12	13D	10	1	5177	517.677	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.4289	0.3798	0.01144	0.23434	0.674	2/27/2016 11:52	1000	
13	14A	10	0	6269	626.900	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5397	0.4301	0.02119	0.18416	0.570	2/27/2016 11:52	1000	
14	14B	10	1	6445	644.489	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5275	0.4218	0.01028	0.10699	1.050	2/27/2016 11:52	1000	
15	14C	10	3	5888	588.753	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5351	0.4255	0.01828	0.15520	1.911	2/27/2016 11:52	1000	
16	14D	10	0	5708	570.800	2/29/2016 12:31	PIC	2/1/2016	3/15/2017	0.5316	0.4225	0.00738	0.26095	0.746	2/27/2016 11:52	1000	

2nd Count Raw Data							2nd Count Calibration Data							Weekly Bkg Count		
Pos.	Detector ID	Counting Time (min.)	Gross Alpha	Gross Beta	Gross CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Y-90 (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)	
1	11A	20	13	1425	71.179	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5473	0.01317	0.10871	1.101	3/4/2016 16:53	1000	
2	11B	20	4	1266	63.285	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5589	0.00697	0.07284	0.852	3/4/2016 16:53	1000	
3	11C	20	2	1435	71.733	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5497	0.01278	0.16742	0.378	2/26/2016 18:19	500	
4	11D	20	4	1391	69.536	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5699	0.01068	0.06838	0.732	3/4/2016 16:53	1000	
5	12A	20	1	1333	66.643	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5410	0.01964	0.14245	1.024	3/4/2016 16:53	1000	
6	12B	20	1	1323	66.143	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5374	0.01114	0.13938	1.191	3/4/2016 16:54	1000	
7	12C	20	3	1298	64.889	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5456	0.01666	0.07486	0.636	3/4/2016 16:54	1000	
8	12D	20	1	1427	71.345	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5487	0.01845	0.10410	1.002	3/4/2016 16:54	1000	
9	13A	20	30	1333	66.440	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5113	0.00714	0.14032	0.868	3/4/2016 16:54	1000	
10	13B	20	1	1173	58.643	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5214	0.00967	0.13254	1.332	3/4/2016 16:54	1000	
11	13C	20	0	0	0.000	3/5/2016 16:44	PIC	2/4/2016	3/4/5/2017	0.0000	0.01708	0.00000	FAIL	12:00:00AM	0	
12	13D	20	0	1053	52.650	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.4297	0.01144	0.23434	0.651	3/4/2016 16:54	1000	
13	14A	20	2	1326	66.282	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5582	0.02119	0.18416	0.540	3/4/2016 16:55	1000	
14	14B	20	0	1448	72.400	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5524	0.01028	0.10699	1.323	3/4/2016 16:55	1000	
15	14C	20	5	1354	67.661	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5645	0.01828	0.15520	1.843	3/4/2016 16:55	1000	
16	14D	20	2	1370	68.474	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5571	0.00738	0.26095	0.900	3/4/2016 16:55	1000	

Correction Factors																
Pos.	Separation Date/Time		Yttrium Ingrowth		Yttrium Decay	Decay from Sample Date		Net Count Rate		Gross CPM	Calculated Sample Recovery %		Sample Recovery % Error			
	Strontium	Yttrium	(Sr-89 calc)	(Sr-90 calc)		Sr-89	Sr-90	Y-90	Sr-90		Sr	Y	Sr	Y		
1	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	60.5126	85.6559	468.52062	97.9%	100%	1.24%	0.72%		
2	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	55.3696	79.5037	447.004846	95.3%	95.7%	1.24%	0.72%		
3	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	61.6181	89.3597	448.155203	97.9%	95.7%	1.24%	0.72%		
4	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	61.0224	78.8145	493.856302	95.3%	104%	1.24%	0.72%		
5	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	58.2011	77.9090	442.2472	95.3%	99.4%	1.24%	0.72%		
6	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	54.6564	78.0223	485.907312	100%	102%	1.23%	0.72%		
7	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	54.0696	85.4885	447.134443	100%	91.3%	1.23%	0.73%		
8	2/26/2016 13:40	3/4/2016 14:30	0.5348	0.8391	0.7542	0.9529	0.9998	61.5635	87.8992	429.426937	96.6%	96.9%	1.24%	0.72%		
9	2/26/2016 13:40	3/4/2016 14:30	0.5358	0.8391	0.7514	0.9528	0.9998	56.9462	83.8433	410.196516	97.9%	100%	1.24%	0.72%		
10	2/26/2016 13:40	3/4/2016 14:30	0.5358	0.8391	0.7514	0.9528	0.9998	51.1187	76.3828	449.298532	95.3%	95.7%	1.24%	0.72%		
11	2/26/2016 13:40	3/4/2016 14:30	0.5358	0.8391	0.7514	0.9528	0.9998	#VALUE!	#VALUE!	#VALUE!	97.9%	95.7%	1.24%	0.72%		
12	2/26/2016 13:40	3/4/2016 14:30	0.5358	0.8391	0.7514	0.9528	0.9998	46.3814	70.2157	401.079439	95.3%	104%	1.24%	0.72%		
13	2/26/2016 13:40	3/4/2016 14:30	0.5358	0.8391	0.7514	0.9528	0.9998	58.6399	80.8019	487.458214	95.3%	99.4%	1.24%	0.72%		
14	2/26/2016 13:40	3/4/2016 14:30	0.5359	0.8391	0.7514	0.9528	0.9998	60.1492	84.4592	499.880971	100%	102%	1.23%	0.72%		
15	2/26/2016 13:40	3/4/2016 14:30	0.5359	0.8391	0.7514	0.9528	0.9998	55.6999	86.2484	446.805143	100%	91.3%	1.23%	0.73%		
16	2/26/2016 13:40	3/4/2016 14:30	0.5359	0.8391	0.7514	0.9528	0.9998	59.4744	83.8848	427.440796	96.6%	96.9%	1.24%	0.72%		

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-89 Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Sr-89 LCS S/N : 1758-A
 LCS Exp Date : 5/10/2016
 LCS Activity (dpm/ml): 5282.88
 LCS Volume Added: 0.20

SR-89 Results															
Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate	Counting Uncertainty	2 SIGMA Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Recovery
	pCi/L	pCi/L	MDA pCi/L	MDA pCi/L	pCi/L	%	CPM	CPM	pCi/L	pCi/L					
1	2.3719	1.6746	1	4.2576	1415.3904	2.33%	467.4126	6.8450	40.6262	241.8907		LCS			89.2%
2	2.2274	1.5726	1	4.0694	1374.2104	2.07%	446.0608	6.8860	40.3720	231.1254		LCS			86.6%
3	1.3945	0.9845	1	2.8835	1364.8437	2.32%	447.7772	6.6945	39.9940	233.1021		LCS			86.0%
4	1.9987	1.4111	1	3.7288	1490.0181	2.17%	493.0663	7.0276	41.6245	252.4307		LCS			93.9%
5	2.4904	1.7583	1	4.4764	1411.5553	2.77%	441.1532	6.6503	41.7069	248.0980		LCS			89.0%
6	2.6811	1.8929	1	4.6909	1461.7444	2.20%	484.4813	6.9709	41.2230	248.0201		LCS			92.1%
7	1.8127	1.2798	1	3.4510	1326.6645	2.56%	446.4624	6.8869	38.9456	229.9464		LCS			83.6%
8	2.3481	1.6578	1	4.2393	1319.1264	2.70%	428.3769	6.5532	39.5523	230.6665		LCS			83.1%
9	2.2254	1.5711	1	4.1173	1330.4247	2.12%	409.3415	6.4047	40.8001	224.1917		LCS			83.9%
10	2.9171	2.0595	1	5.0967	1459.5864	2.17%	447.8375	6.7031	42.8193	246.9461		LCS			92.0%
11	#DIV/0!	#DIV/0!	4	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS			#VALUE!
12	2.3436	1.6546	1	4.4657	1543.6068	2.31%	400.4054	6.3331	47.8533	262.9536		LCS			97.3%
13	1.7130	1.2094	1	3.3380	1491.8725	2.84%	486.8882	6.9819	41.9305	263.8741		LCS			94.0%
14	2.2567	1.5933	1	4.0788	1483.6094	2.14%	498.8310	7.0703	41.2155	251.0134		LCS			93.5%
15	3.0009	2.1187	1	5.1169	1304.2706	2.67%	444.8941	6.6845	38.4092	227.7291		LCS			82.2%
16	1.9629	1.3858	1	3.6924	1309.5912	2.10%	426.6948	6.5380	39.3293	220.6245		LCS			82.5%

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-90 Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Sr-90 LCS S/N : 1243-N
 LCS Exp Date : 5/6/2016
 LCS Activity (dpm/ml): 477.42
 LCS Volume Added: 0.50

SR-90 Results													
Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	Counting Uncertainty pCi/L	Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	Recovery
1	2.4444	1.7258	1	4.1156	310.2575	3.08%	70.0783	1.8868	10.3622	53.3283		LCS	86.6%
2	2.2619	1.5969	1	3.8925	290.7617	3.02%	62.4334	1.7791	10.2778	49.8556		LCS	81.1%
3	1.5063	1.0635	1	2.8186	329.0303	3.03%	71.3553	1.8940	10.8339	56.4441		LCS	91.8%
4	1.8942	1.3374	1	3.3059	289.5048	3.00%	68.8043	1.8648	9.7333	49.5990		LCS	80.8%
5	2.4651	1.7403	1	4.1751	303.7832	3.48%	65.6189	1.8257	10.4840	53.0959		LCS	84.8%
6	2.4764	1.7483	1	4.1435	280.0969	3.10%	64.9520	1.8189	9.7293	48.1750		LCS	78.1%
7	1.9911	1.4058	1	3.5232	304.8740	3.34%	64.2528	1.8014	10.6023	52.9656		LCS	85.1%
8	2.4335	1.7181	1	4.1292	324.9946	3.34%	70.3428	1.8890	10.8254	56.4515		LCS	90.7%
9	2.3321	1.6465	1	4.0066	311.9360	2.96%	65.5715	1.8229	10.7165	53.3563		LCS	87.0%
10	3.0432	2.1485	1	5.0487	287.1926	3.22%	57.3114	1.7127	10.6065	49.6474		LCS	80.1%
11	#DIV/0!	#DIV/0!	4	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS	#VALUE!
12	2.3783	1.6791	1	4.1985	291.2923	3.40%	51.9990	1.6227	11.2336	50.7345		LCS	81.3%
13	1.7411	1.2292	1	3.1339	296.0215	3.56%	65.7416	1.8206	10.1310	51.9219		LCS	82.6%
14	2.5485	1.7992	1	4.2301	299.2853	2.96%	71.0770	1.9030	9.9024	51.1875		LCS	83.5%
15	3.2880	2.3214	1	5.3332	302.9565	3.42%	65.8182	1.8398	10.4655	52.8063		LCS	84.5%
16	2.2801	1.6098	1	3.9047	308.6549	2.93%	67.5739	1.8506	10.4460	52.7289		LCS	86.1%

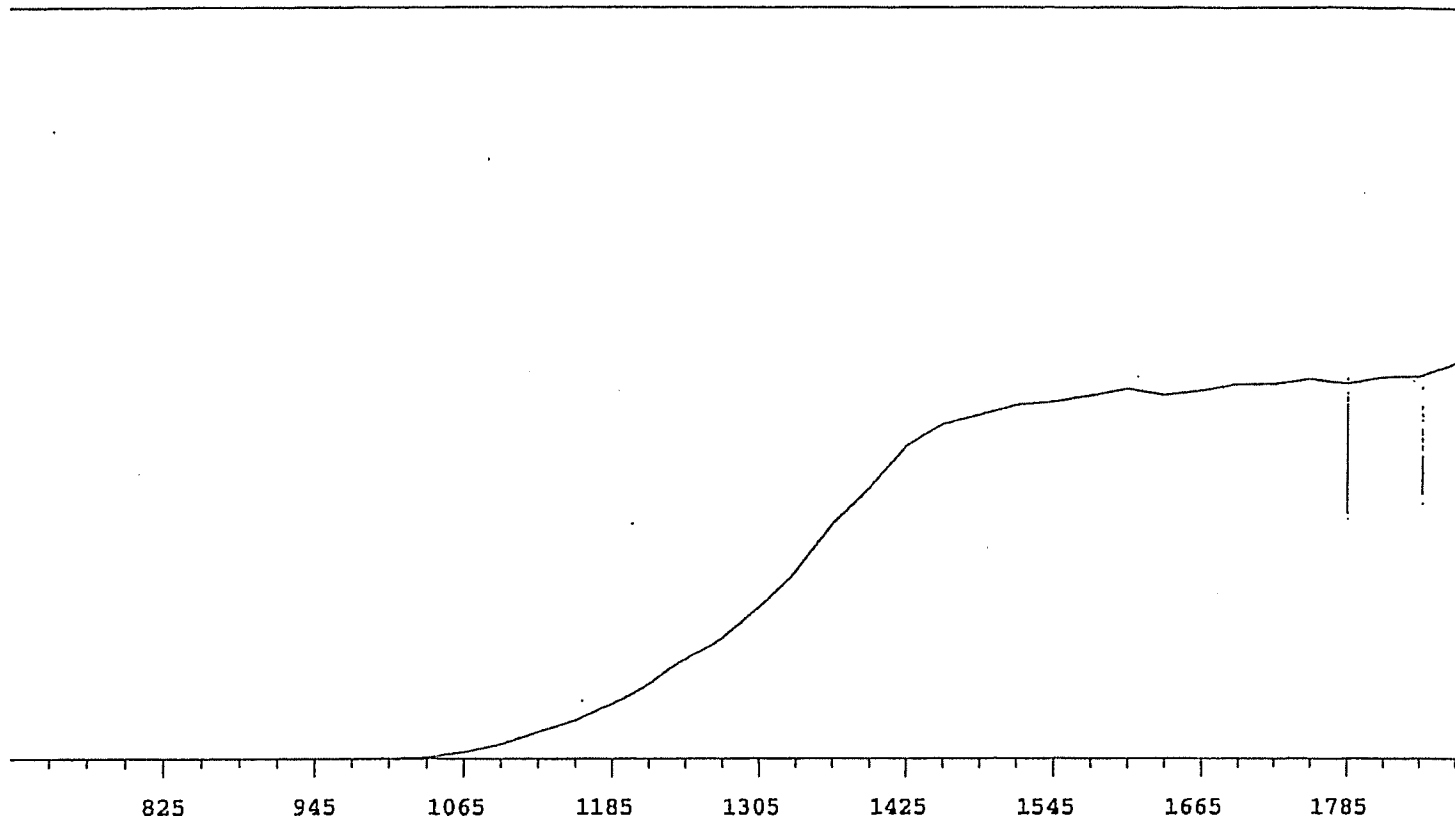
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1st Count									
V1	1A	10	6	6035		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V2	1B	10	13	5803		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V3	1C	10	57	6156		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V4	1D	10	45	5732		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V5	2A	10	8	5971		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V6	2B	10	0	5989		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V7	2C	10	10	5623		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V8	2D	10	1	5631		2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V1	3A	10	132	5656		2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V2	3B	10	66	5676		2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V3	3C	10	53	5908		2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V4	3D	10	17	5885		2/29/2016 13:23	2/29/2016 13:33	PIC	Sr8990
V5	4A	10	45	5990		2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V6	4B	10	1	6427		2/29/2016 11:39	2/29/2016 11:49	PIC	Sr8990
V7	4C	10	23	5813		2/29/2016 11:39	2/29/2016 11:49	PIC	Sr8990
V8	4D	10	90	5662		2/29/2016 11:39	2/29/2016 11:49	PIC	Sr8990
V1	5A	10	20	5979		2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V2	5B	10	21	5903		2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V3	5C	10	20	6106		2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V4	5D	10	30	6351		2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V5	6A	10	37	6003		2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V6	6B	10	39	6275		2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V7	6C	10	35	5828		2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V8	6D	10	0	0		2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V1	7A	10	7	5998		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V2	7B	10	2	5932		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V3	7C	10	4	6068		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V4	7D	10	1	6107		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V5	8A	10	17	6176		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V6	8B	10	2	6369		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V7	8C	10	6	5812		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V8	8D	10	21	5641		2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V1	9A	10	11	5988		2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V2	9B	10	11	5825		2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990

V3	9C	10	15	5947	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V4	9D	10	13	6227	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V5	10A	10	3	5297	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V6	10B	10	3	6193	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V7	10C	10	2	5487	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V8	10D	10	3	5510	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V1	11A	10	1	6147	2/29/2016 12:17	2/29/2016 12:27	PIC	Sr8990
V2	11B	10	3	5819	2/29/2016 12:17	2/29/2016 12:27	PIC	Sr8990
V3	11C	10	4	5992	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V4	11D	10	1	6337	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V5	12A	10	3	5784	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V6	12B	10	1	6186	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V7	12C	10	1	5867	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V8	12D	10	1	5789	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V1	13A	10	1	5510	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V2	13B	10	0	5768	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V3	13C	10	0	0	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V4	13D	10	1	5177	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V5	14A	10	0	6269	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V6	14B	10	1	6445	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V7	14C	10	3	5888	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V8	14D	10	0	5708	2/29/2016 12:31	2/29/2016 12:41	PIC	Sr8990

SampleID	Instr	Time (min.)	Alpha Counts		Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
2nd Count									
V1	1A	20	20	1523		3/5/2016 13:38	3/5/2016 13:58	PIC	8990VER16
V2	1B	20	4	1209		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V3	1C	20	19	1571		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V4	1D	20	9	1382		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V5	2A	20	5	1322		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V6	2B	20	3	1486		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V7	2C	20	5	1344		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V8	2D	20	7	1441		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V1	3A	20	38	1411		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V2	3B	20	16	1202		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V3	3C	20	19	1477		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V4	3D	20	3	1359		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V5	4A	20	4	1324		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V6	4B	20	3	1539		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V7	4C	20	6	1340		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V8	4D	20	20	1429		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V1	5A	20	22	1491		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V2	5B	20	8	1268		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V3	5C	20	12	1533		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V4	5D	20	4	1358		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V5	6A	20	6	1346		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V6	6B	20	7	1466		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V7	6C	20	16	1396		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V8	6D	20	0	0		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V1	7A	20	27	1445		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V2	7B	20	1	1233		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V3	7C	20	8	1456		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V4	7D	20	0	1345		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V5	8A	20	6	1380		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V6	8B	20	5	1483		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V7	8C	20	10	1344		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V8	8D	20	8	1373		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V1	9A	20	25	1473		3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V2	9B	20	5	1187		3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16

V3	9C	20	6	1511	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V4	9D	20	1	1291	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V5	10A	20	0	1154	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V6	10B	20	2	1507	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V7	10C	20	4	1225	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V8	10D	20	2	1360	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V1	11A	20	13	1425	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V2	11B	20	4	1266	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V3	11C	20	2	1435	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V4	11D	20	4	1391	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V5	12A	20	1	1333	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V6	12B	20	1	1323	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V7	12C	20	3	1298	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V8	12D	20	1	1427	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V1	13A	20	30	1333	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V2	13B	20	1	1173	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V3	13C	20	0	0	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V4	13D	20	0	1053	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V5	14A	20	2	1326	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V6	14B	20	0	1448	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V7	14C	20	5	1354	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V8	14D	20	2	1370	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16

MPC 9600 Plateau Instrument 1 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 1575 Beta Volts: 1575



VOLTS COUNTS %/100 Volts

705	1	
735	1	
765	0	
795	0	+0.00
825	0	>100
855	1	>100
885	0	+55.56
915	2	+66.67
945	0	>100
975	2	>100
1005	42	>100
1035	145	>100
1065	544	>100
1095	1136	>100
1125	1967	>100
1155	2845	>100
1185	4078	>100
1215	5483	+93.18
1245	7400	+83.35
1275	9328	+75.40

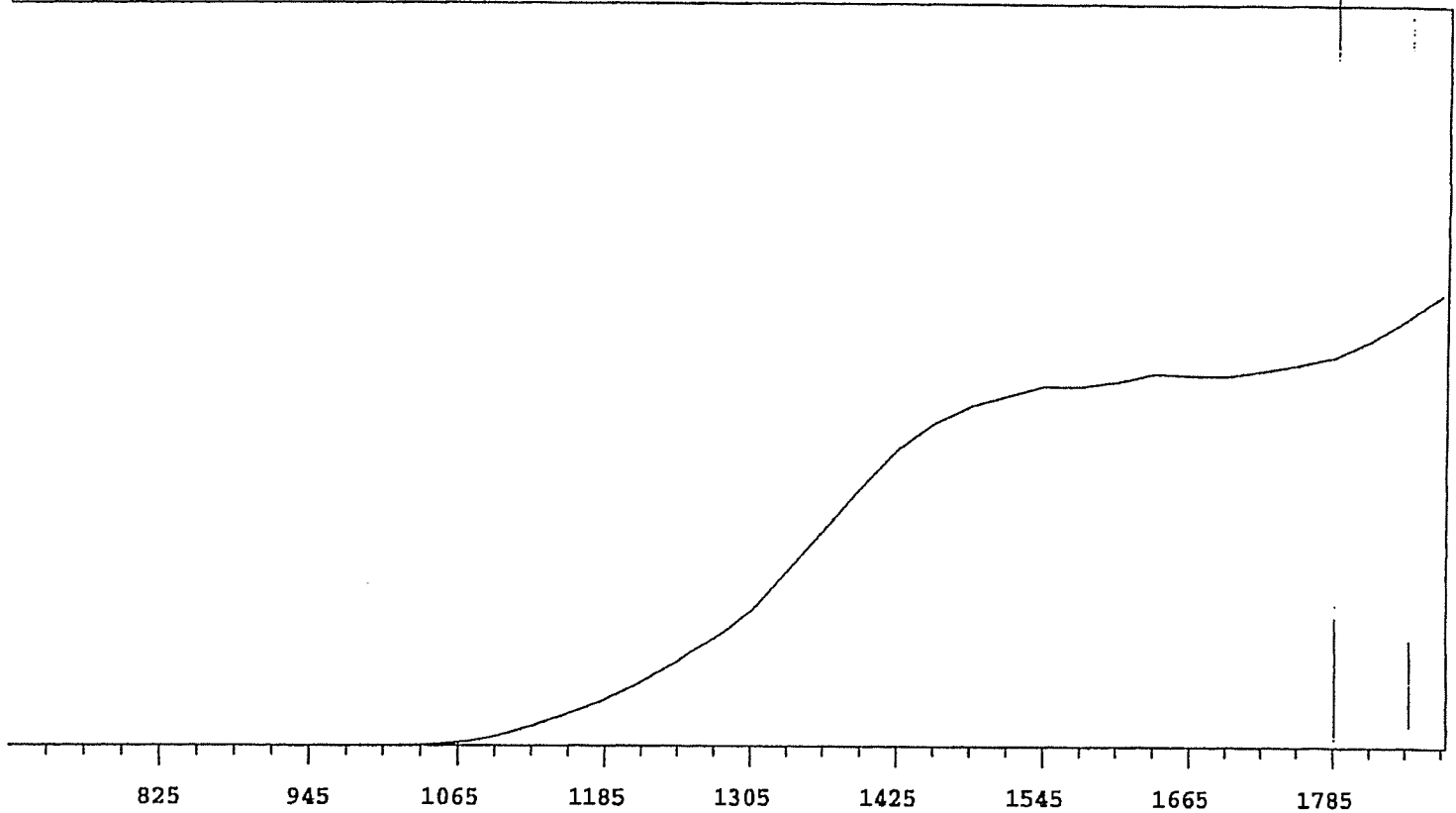
VOLTS COUNTS %/100 Volts

1305	11640	+69.78
1335	14241	+62.88
1365	17534	+55.91
1395	20127	+45.04
1425	23254	+31.29
1455	24902	+20.41
1485	25605	+10.49
1515	26310	+6.44
1545	26535	+5.31
1575	26953	+2.79
1605	27399	+1.83
1635	27000	+1.71
1665	27255	+1.62
1695	27723	+3.14
1725	27705	+1.56
1755	28072	+1.15
1785	27729	+1.43
1815	28194	+3.24
1845	28243	
1875	29191	

8
9/1/09

over 1510

MPC 9600 Plateau Instrument 1 MPC 9604 Detector B 7/1/2009
Alpha Volts: 1575 Beta Volts: 1575



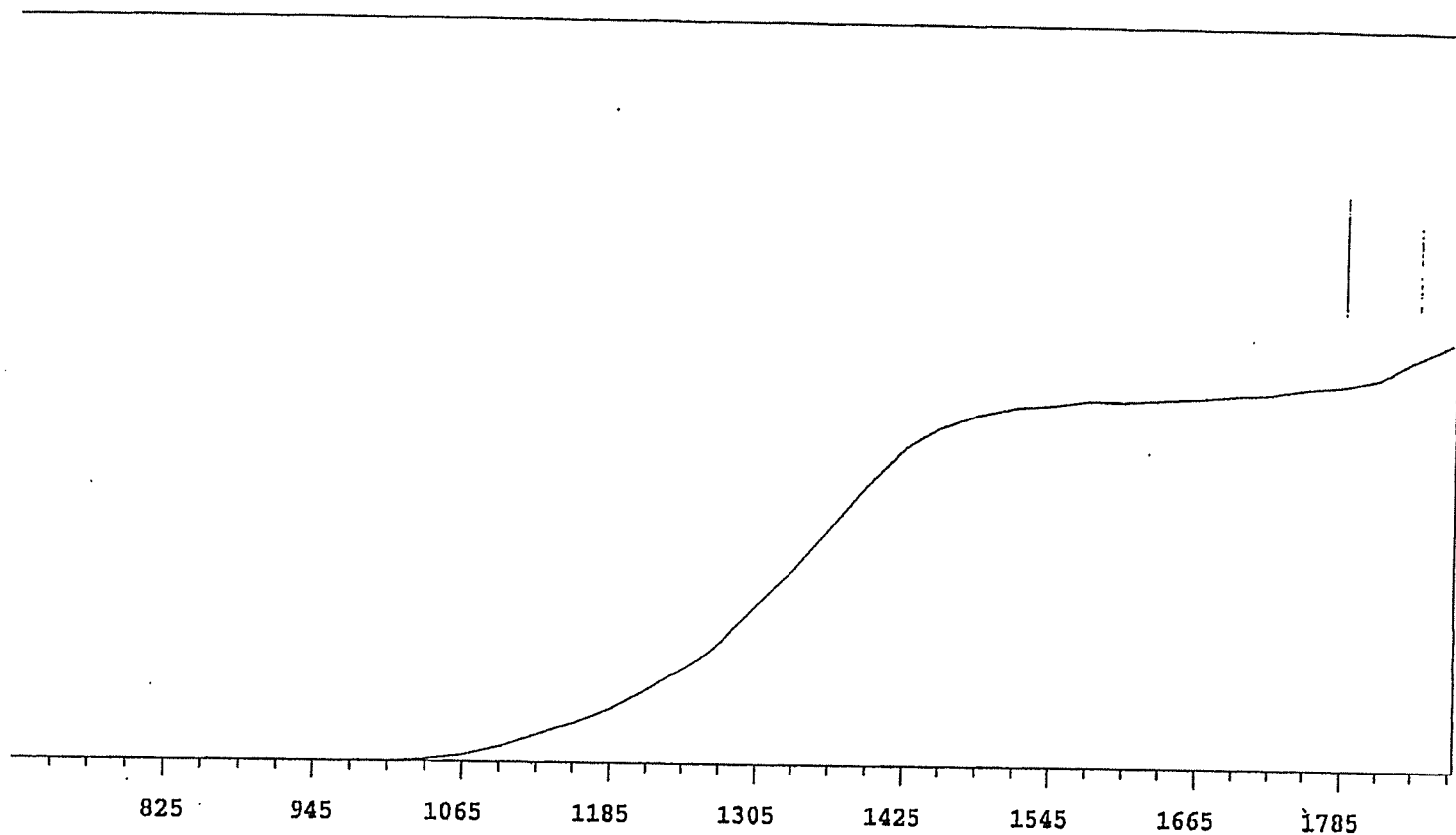
VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	+55.56
795	1	+83.33
825	1	+55.56
855	0	>100
885	1	+0.00
915	0	+0.00
945	1	>100
975	0	>100
1005	4	>100
1035	56	>100
1065	292	>100
1095	890	>100
1125	1841	>100
1155	2936	>100
1185	4179	>100
1215	5837	>100
1245	7821	+91.28
1275	10638	+83.88

VOLTS COUNTS %/100 Volts

1305	13188	+75.92
1335	16818	+67.60
1365	20420	+59.86
1395	24341	+47.85
1425	27854	+35.51
1455	30288	+23.26
1485	31798	+14.54
1515	32622	+8.32
1545	33496	+5.11
1575	33475	+4.43
1605	33903	+3.09
1635	34654	+2.46
1665	34485	+1.74
1695	34445	+1.84
1725	34908	+3.91
1755	35401	+6.80
1785	36062	+10.27
1815	37505	+14.30
1845	39508	
1875	41843	

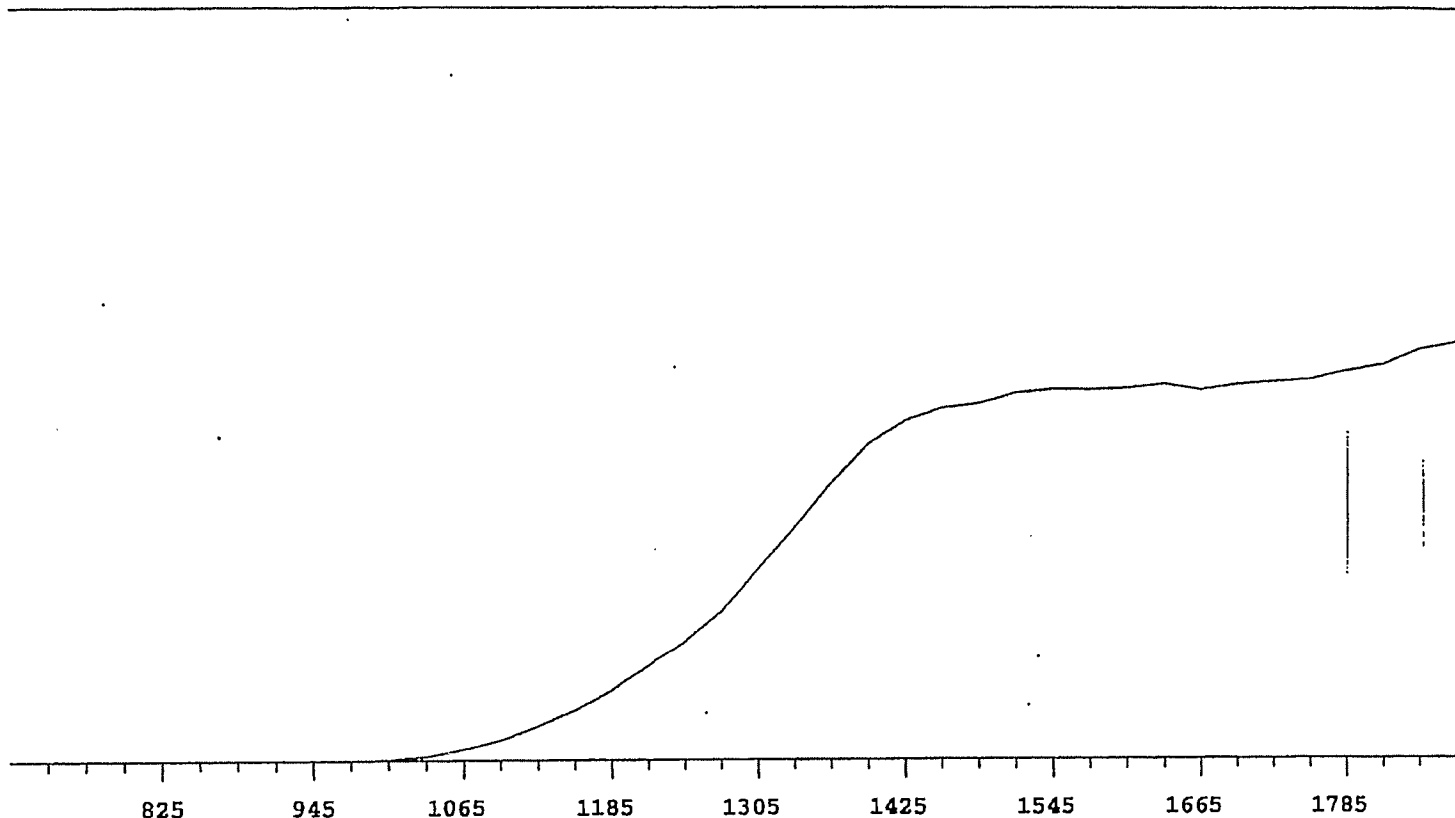
MPC 9600 Plateau Instrument 1 MPC 9604 Detector C 7/1/2009
Alpha Volts: 1575 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	1	+0.00
795	0	>100
825	1	-55.56
855	1	+55.56
885	0	>100
915	1	>100
945	0	>100
975	4	>100
1005	32	>100
1035	206	>100
1065	639	>100
1095	1416	>100
1125	2551	>100
1155	3619	>100
1185	5037	+98.68
1215	6875	+91.19
1245	8915	+85.53
1275	11519	+77.28

VOLTS	COUNTS	%/100 Volts
1305	14817	+71.06
1335	17823	+63.34
1365	21704	+53.63
1395	25422	+42.55
1425	28424	+29.21
1455	30244	+18.11
1485	31305	+10.10
1515	31989	+6.07
1545	32223	+3.43
1575	32671	+2.15
1605	32621	+1.68
1635	32837	+1.52
1665	32961	+2.01
1695	33249	+2.64
1725	33409	+3.21
1755	33931	+4.07
1785	34234	+7.20
1815	34909	+10.28
1845	36660	
1875	38205	

MPC 9600 Plateau Instrument 1 MPC 9604 Detector D 7/1/2009
Alpha Volts: 1575 Beta Volts: 1575



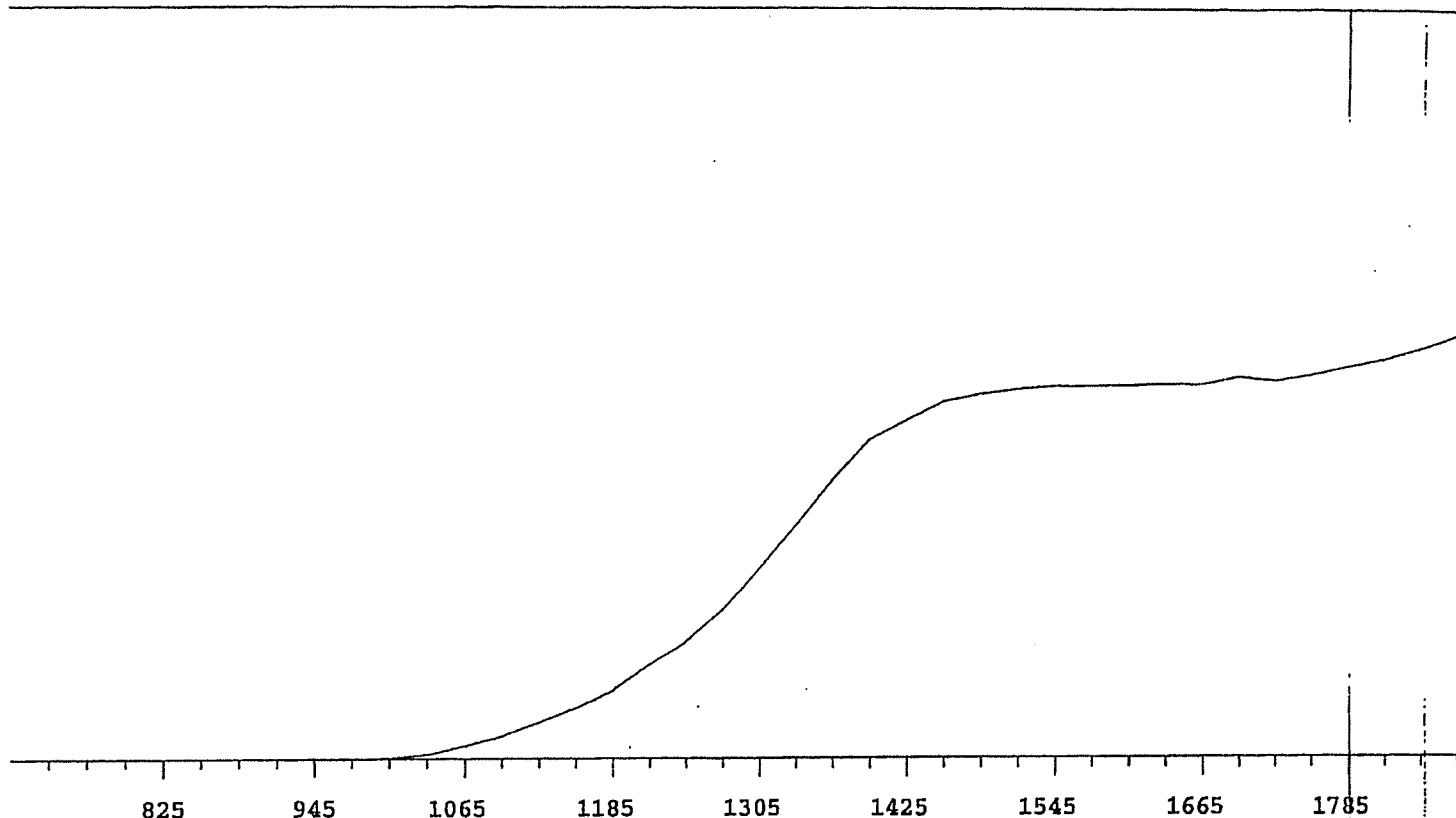
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	+0.00
795	1	+0.00
825	0	+0.00
855	1	>100
885	0	>100
915	0	>100
945	0	>100
975	8	>100
1005	75	>100
1035	303	>100
1065	872	>100
1095	1656	>100
1125	2729	>100
1155	3862	>100
1185	5425	+98.19
1215	7256	+88.82
1245	9510	+81.89
1275	11944	+74.07

VOLTS COUNTS %/100 Volts

1305	15202	+66.36
1335	18216	+57.86
1365	21597	+45.58
1395	24648	+32.96
1425	26505	+19.92
1455	27475	+11.42
1485	27836	+7.08
1515	28609	+4.51
1545	28896	+2.93
1575	28862	+1.66
1605	28969	+0.36
1635	29292	+0.80
1665	28836	+1.06
1695	29279	+1.48
1725	29439	+3.59
1755	29642	+4.07
1785	30243	+6.51
1815	30699	+7.79
1845	31876	
1875	32444	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



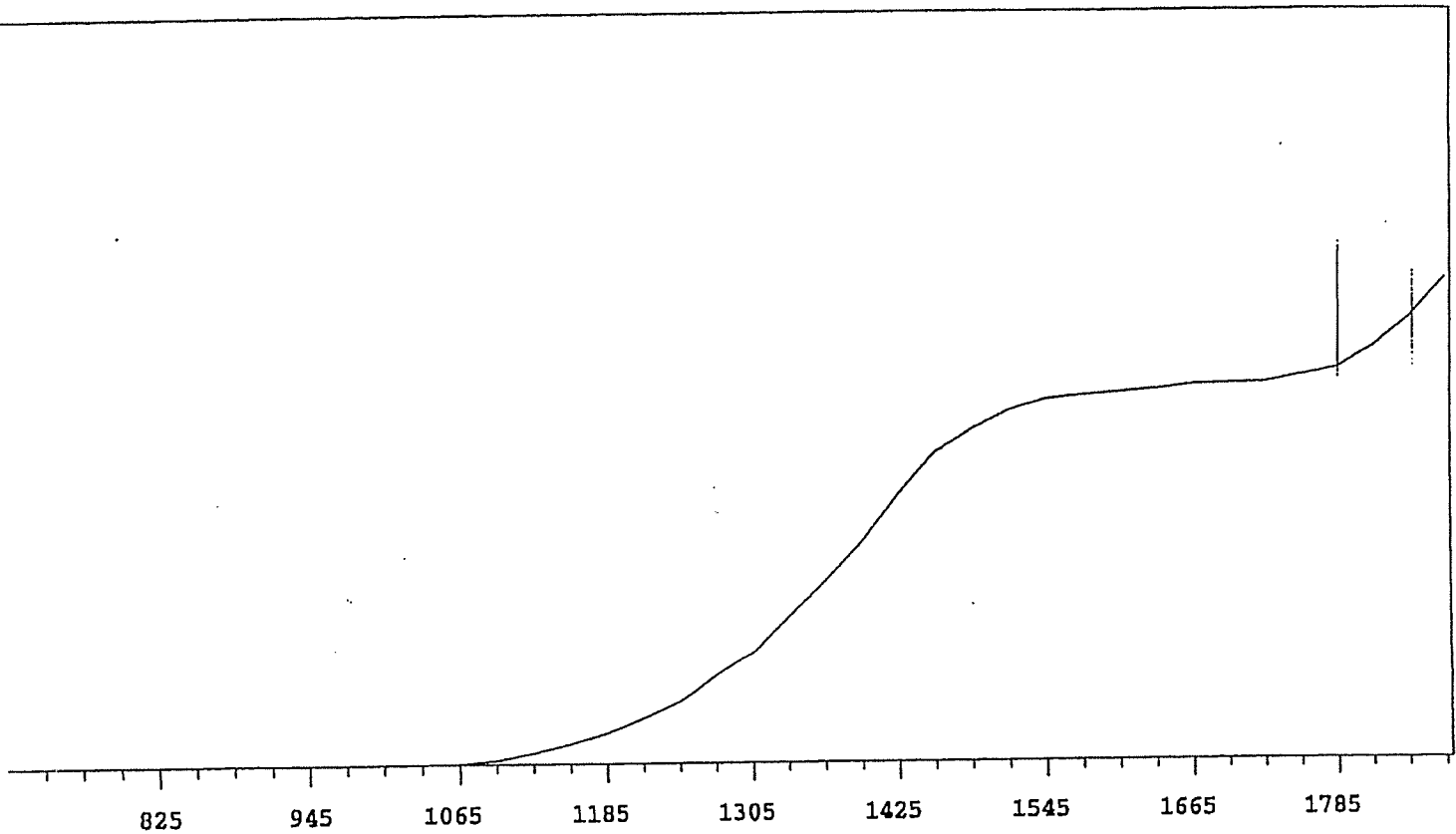
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	+83.33
795	0	-83.33
825	1	>100
855	0	>100
885	1	+100.00
915	1	>100
945	2	>100
975	12	>100
1005	91	>100
1035	421	>100
1065	1239	>100
1095	2155	>100
1125	3527	>100
1155	4974	>100
1185	6647	+97.44
1215	9250	+89.00
1245	12041	+82.15
1275	15094	+73.81

VOLTS COUNTS %/100 Volts

1305	19017	+67.45
1335	23157	+59.23
1365	27625	+45.78
1395	31465	+32.72
1425	33352	+20.41
1455	35084	+11.74
1485	35819	+7.11
1515	36292	+3.35
1545	36527	+1.63
1575	36540	+0.87
1605	36585	+0.48
1635	36742	+1.76
1665	36691	+1.53
1695	37461	+1.89
1725	37073	+3.07
1755	37603	+4.02
1785	38346	+6.58
1815	39111	+7.95
1845	40115	
1875	41409	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



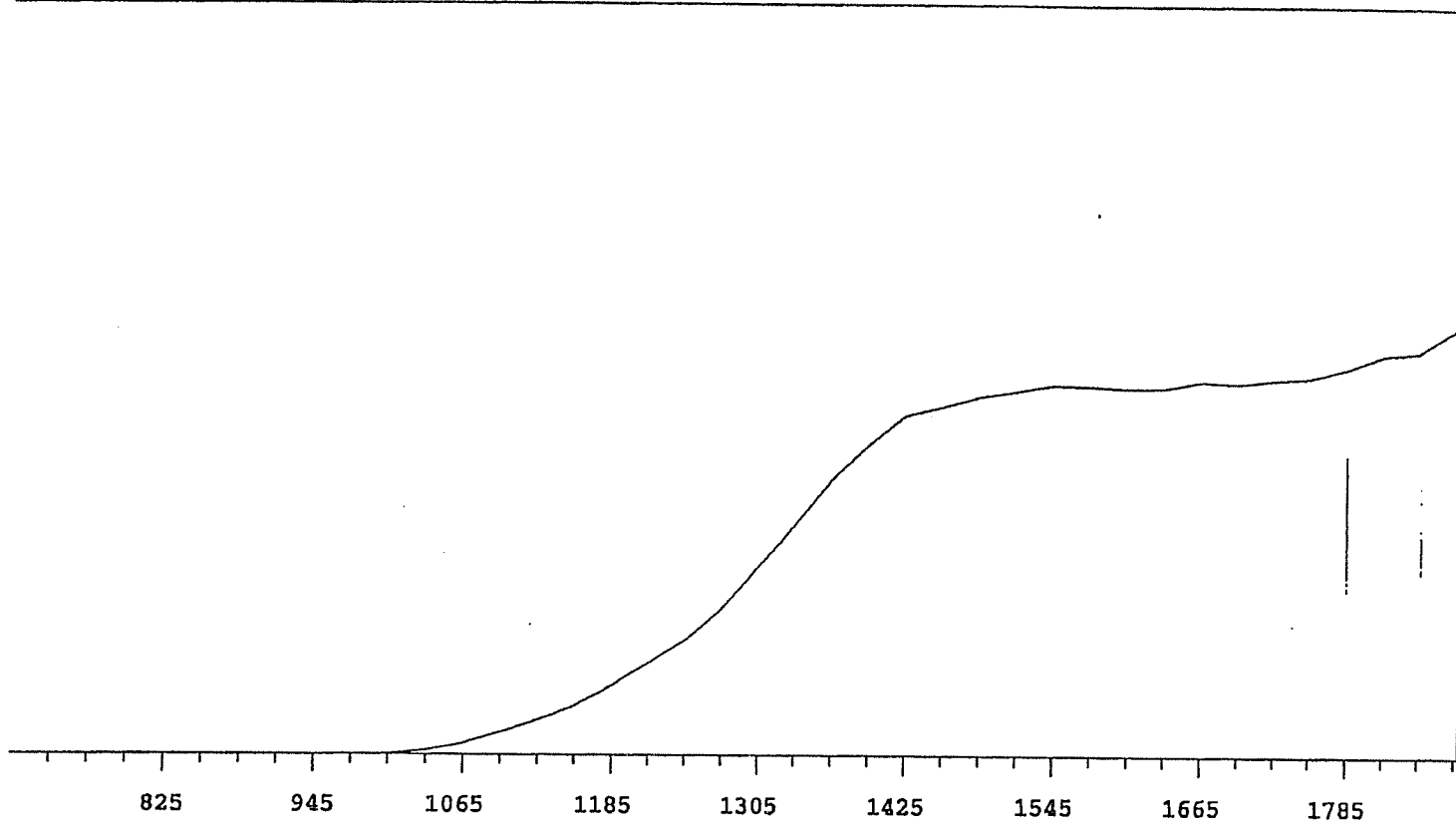
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	2	>100
1005	3	>100
1035	14	>100
1065	127	>100
1095	500	>100
1125	1332	>100
1155	2373	>100
1185	3614	>100
1215	5227	>100
1245	7060	+97.33
1275	9574	+90.30

VOLTS COUNTS %/100 Volts

1305	12541	+83.18
1335	16192	+74.48
1365	20083	+67.17
1395	24273	+58.43
1425	29090	+46.86
1455	33223	+34.56
1485	35608	+22.67
1515	37581	+13.63
1545	38762	+8.18
1575	39185	+4.42
1605	39484	+3.06
1635	39806	+2.61
1665	40264	+2.03
1695	40353	+2.32
1725	40431	+3.28
1755	41127	+7.09
1785	41882	+12.40
1815	44049	+18.52
1845	46950	
1875	51097	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



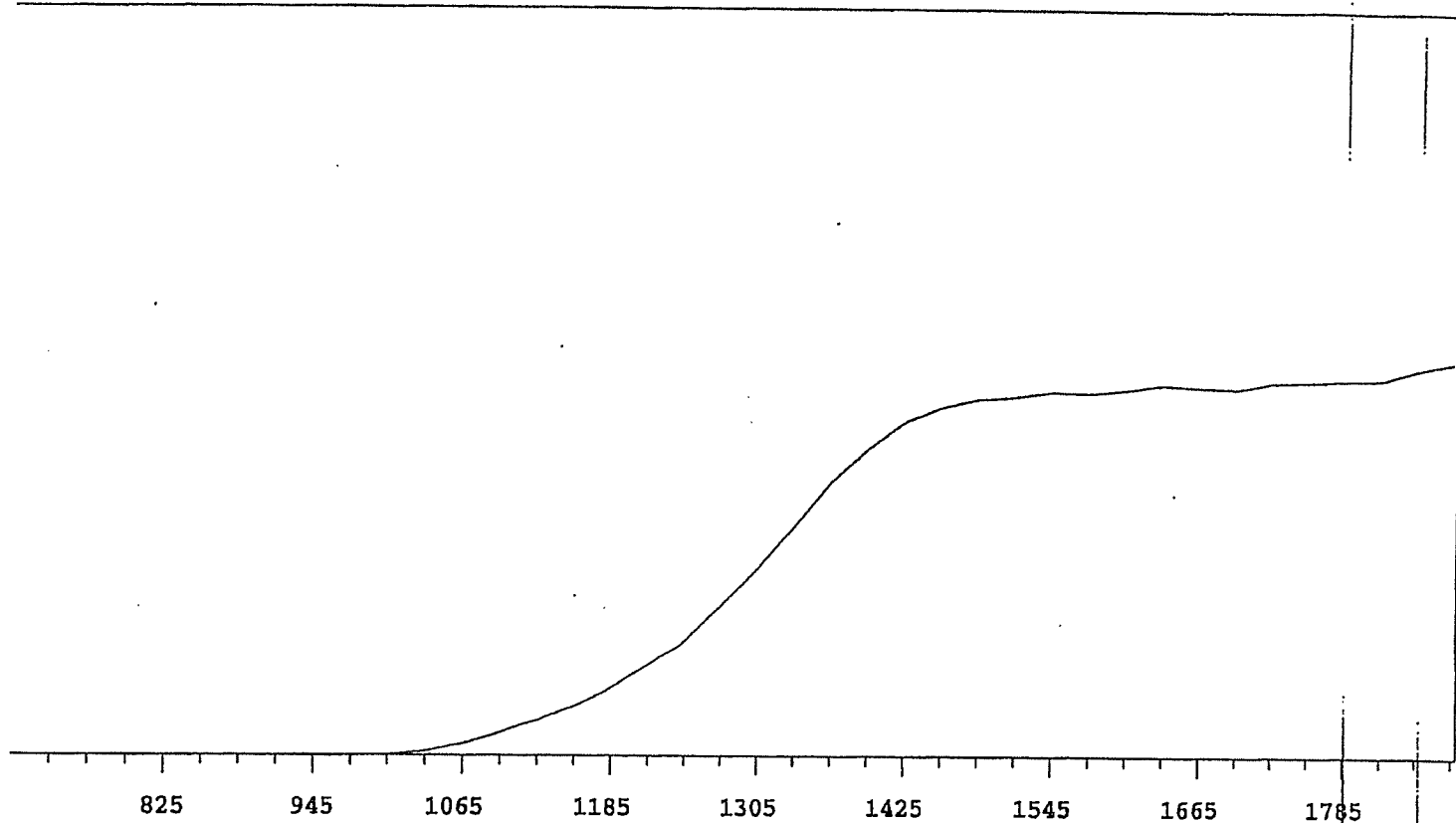
VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	17	>100
1005	87	>100
1035	438	>100
1065	1055	>100
1095	2114	>100
1125	3282	>100
1155	4625	>100
1185	6554	+97.66
1215	8743	+88.09
1245	11345	+81.31
1275	14261	+74.60

VOLTS COUNTS %/100 Volts

1305	18216	+67.74
1335	21995	+58.11
1365	26173	+46.11
1395	29479	+32.75
1425	32186	+20.62
1455	33022	+12.13
1485	33981	+7.22
1515	34520	+4.95
1545	35095	+2.07
1575	35014	+0.38
1605	34812	+0.55
1635	34859	+1.11
1665	35460	+1.94
1695	35273	+1.95
1725	35629	+2.73
1755	35811	+5.77
1785	36656	+6.44
1815	37896	+9.21
1845	38145	
1875	40283	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



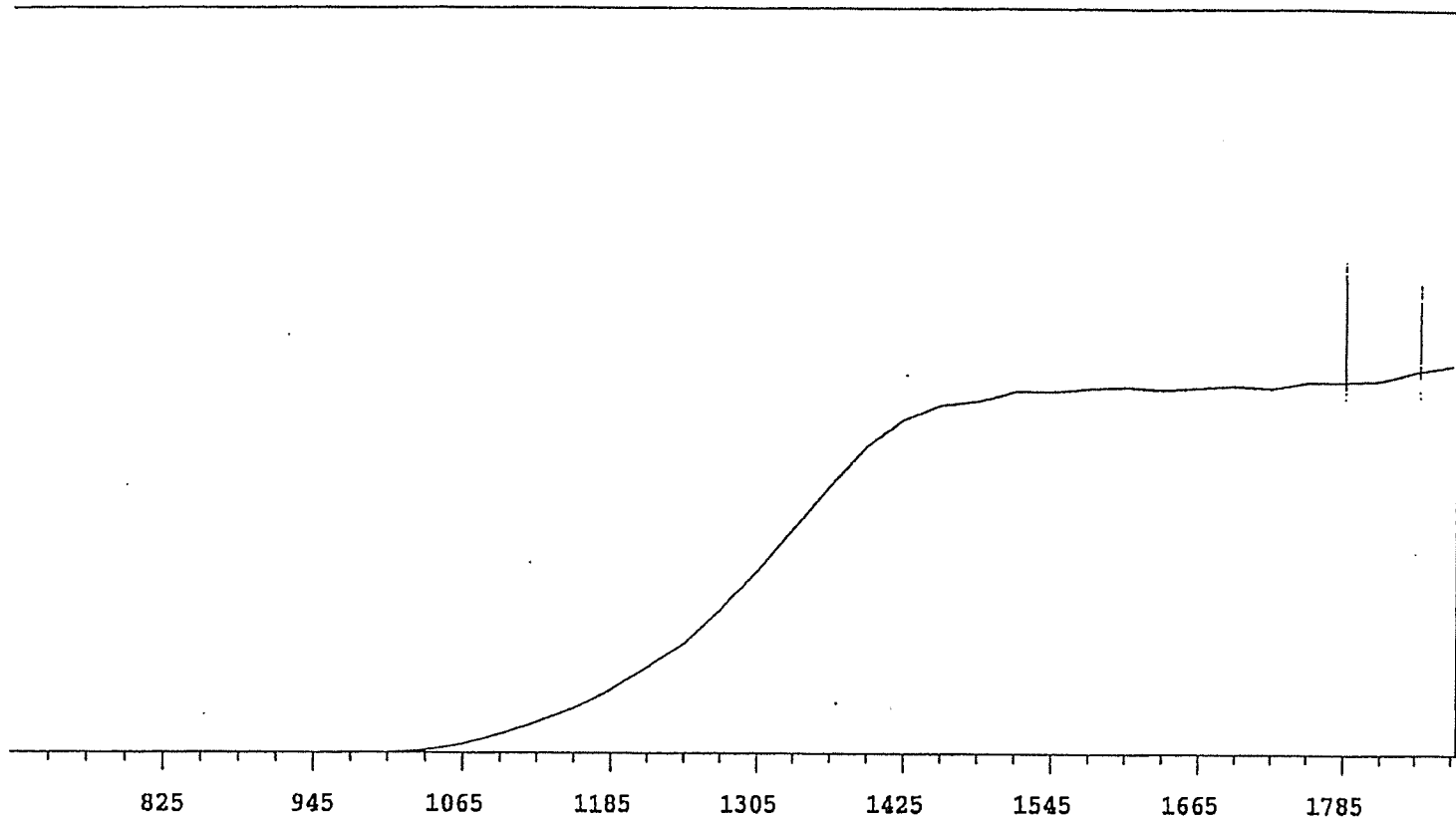
VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	+83.33
795	2	+55.56
825	1	>100
855	0	>100
885	0	>100
915	0	>100
945	2	>100
975	9	>100
1005	89	>100
1035	439	>100
1065	1198	>100
1095	2164	>100
1125	3436	>100
1155	4917	>100
1185	6762	+96.59
1215	9006	+89.14
1245	11800	+81.34
1275	15132	+73.59

VOLTS COUNTS %/100 Volts

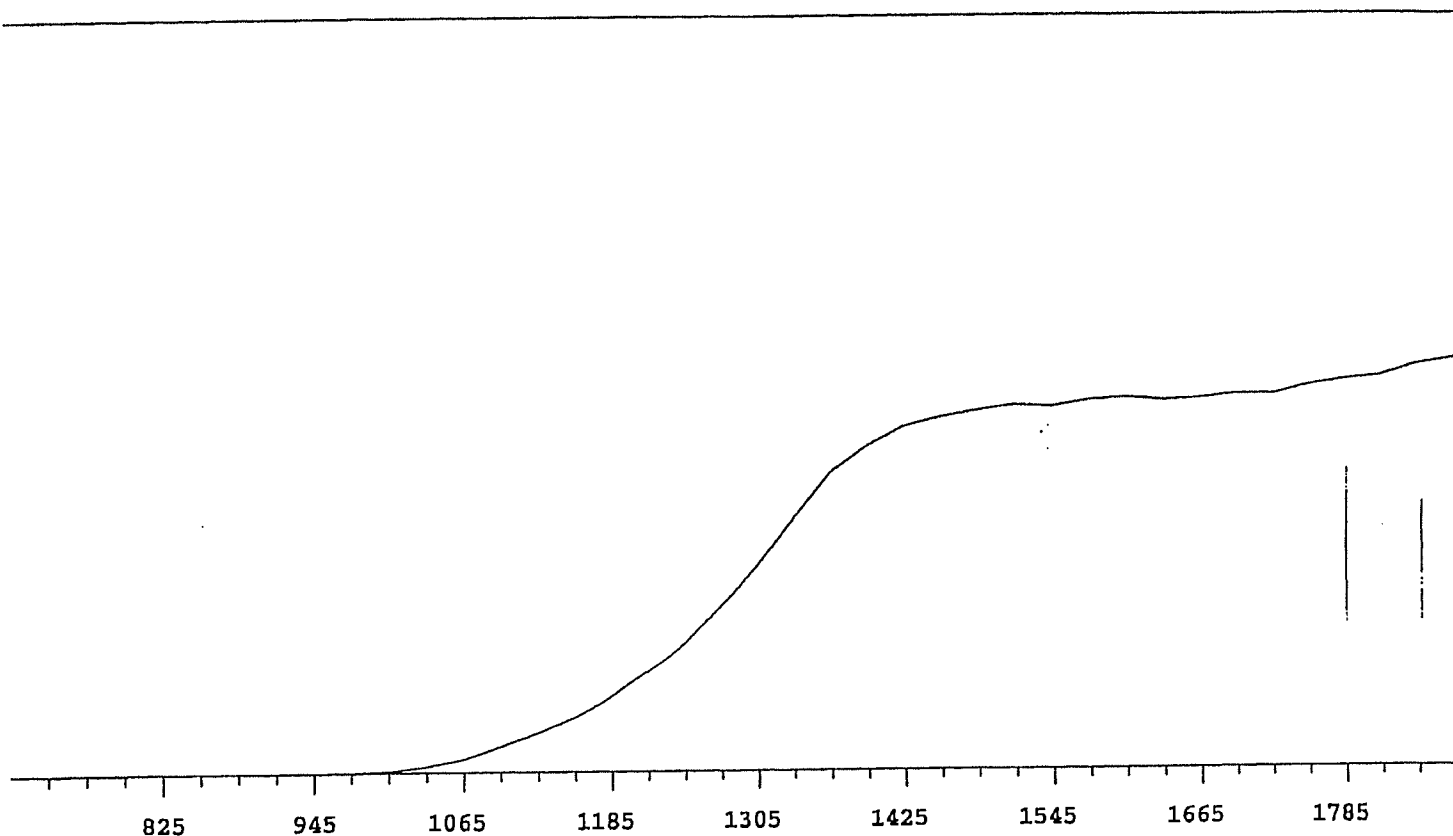
1305	18675	+65.94
1335	22620	+55.69
1365	26869	+44.63
1395	29957	+32.08
1425	32494	+20.49
1455	33836	+11.98
1485	34627	+6.45
1515	34849	+3.22
1545	35298	+1.98
1575	35180	+2.37
1605	35503	+1.57
1635	36006	+0.99
1665	35722	+0.89
1695	35597	+0.93
1725	36188	+1.86
1755	36272	+1.90
1785	36389	+2.55
1815	36529	+4.39
1845	37459	
1875	38170	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector A 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



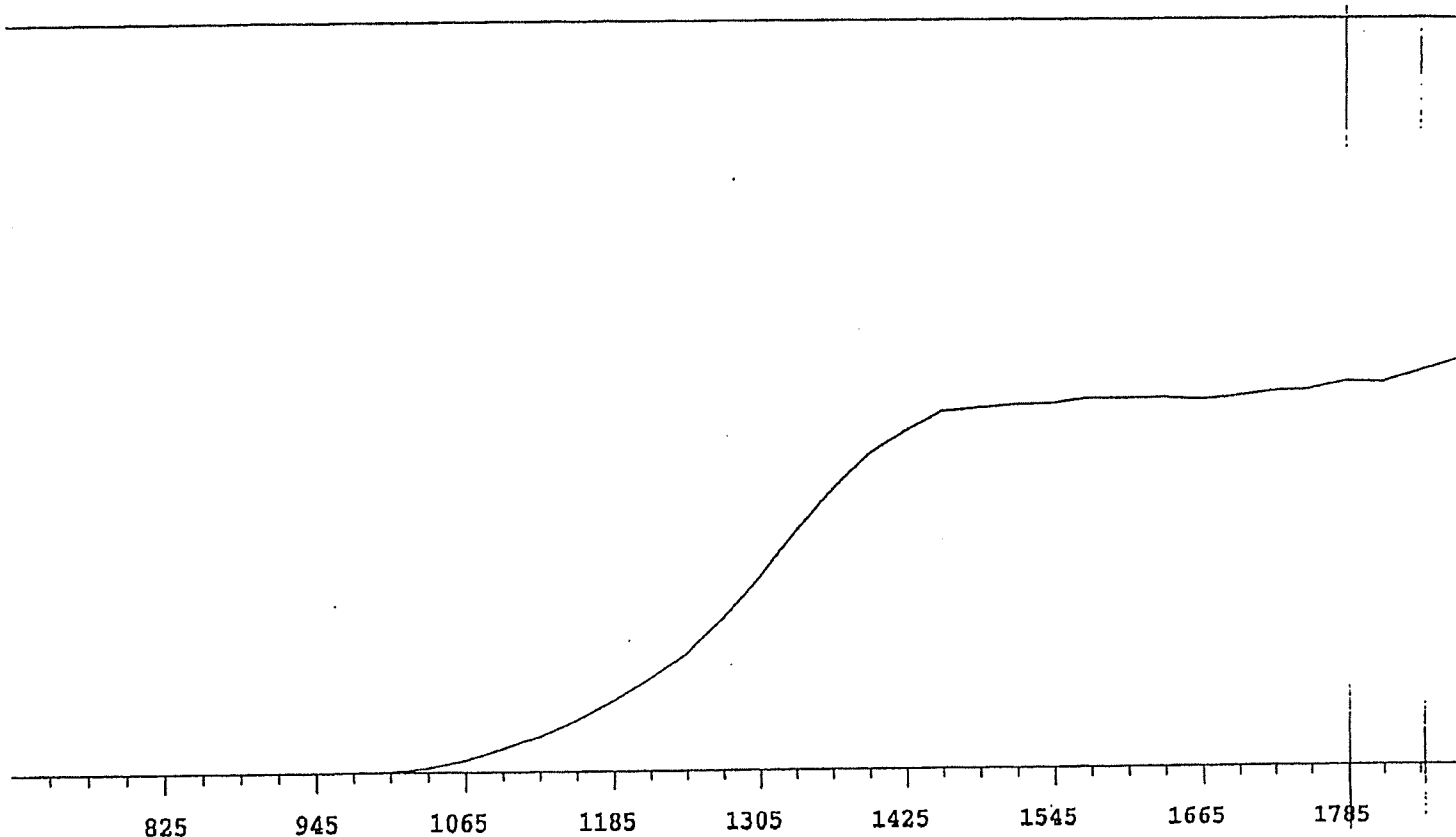
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	16654	+68.57
735	0		1335	20416	+59.26
765	0	+55.56	1365	24191	+47.28
795	1	>100	1395	27643	+34.04
825	1	+0.00	1425	29891	+21.08
855	1	>100	1455	31183	+12.30
885	0	>100	1485	31558	+6.67
915	0	>100	1515	32444	+4.05
945	0	>100	1545	32413	+2.90
975	9	>100	1575	32704	+0.81
1005	53	>100	1605	32837	+0.71
1035	302	>100	1635	32629	+0.49
1065	878	>100	1665	32797	+0.16
1095	1805	>100	1695	32964	+1.32
1125	2887	>100	1725	32746	+1.40
1155	4163	>100	1755	33308	+1.56
1185	5842	+99.81	1785	33318	+3.21
1215	7959	+90.90	1815	33456	+3.92
1245	10323	+83.03	1845	34283	
1275	13250	+75.91	1875	34815	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



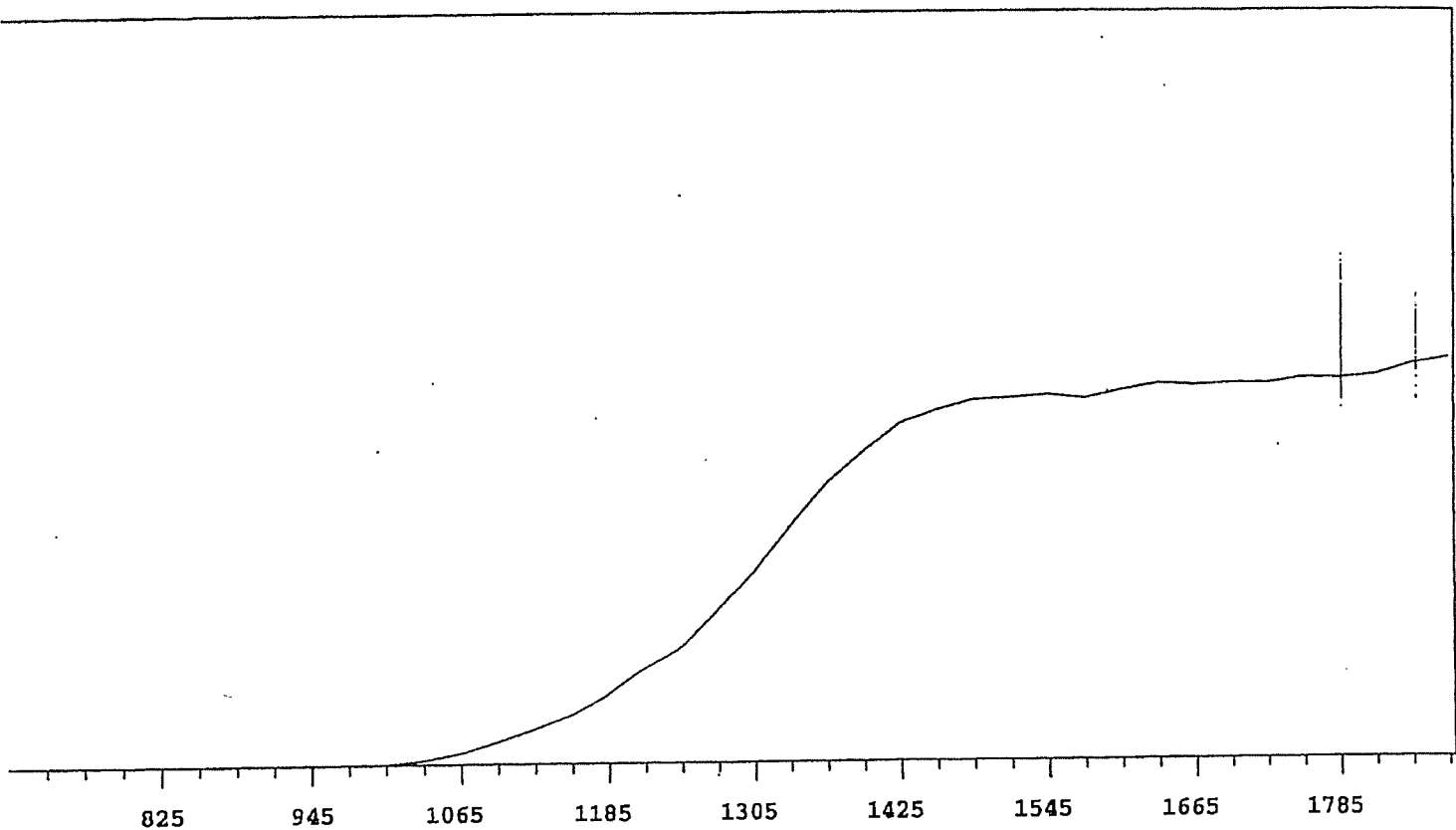
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	19810	+64.73
735	1		1335	23962	+52.62
765	0	-55.56	1365	28091	+39.27
795	0	>100	1395	30594	+25.61
825	1	>100	1425	32381	+14.86
855	3	+33.33	1455	33206	+8.91
885	0	+0.00	1485	33832	+4.41
915	1	>100	1515	34260	+3.01
945	2	>100	1545	34071	+2.33
975	29	>100	1575	34623	+1.34
1005	165	>100	1605	34848	+1.22
1035	613	>100	1635	34564	+0.89
1065	1394	>100	1665	34733	+1.01
1095	2558	>100	1695	35144	+2.76
1125	3702	>100	1725	35084	+3.66
1155	5222	>100	1755	35839	+3.97
1185	7161	+96.06	1785	36332	+5.39
1215	9507	+89.18	1815	36654	+5.35
1245	12552	+81.52	1845	37609	
1275	16030	+73.64	1875	38164	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



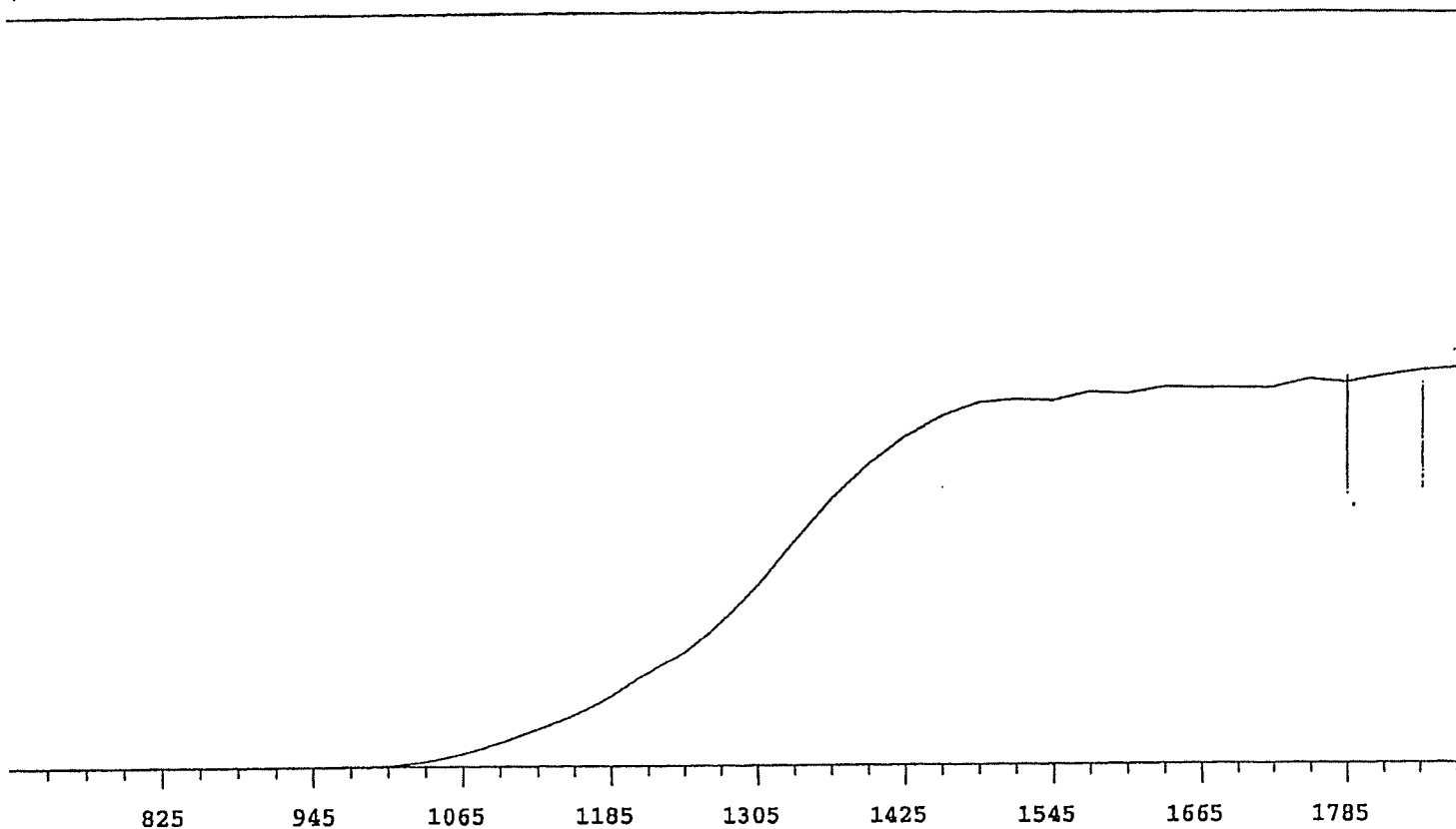
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	21412	+66.80
735	1		1335	26262	+56.32
765	1		1365	30679	+43.71
795	0	>100	1395	34466	+31.61
825	0	+0.00	1425	36949	+20.14
855	0	>100	1455	38998	+11.16
885	1	>100	1485	39313	+5.34
915	1	>100	1515	39625	+2.44
945	1	>100	1545	39751	+2.04
975	17	>100	1575	40227	+1.45
1005	122	>100	1605	40228	+0.56
1035	533	>100	1635	40255	+0.13
1065	1287	>100	1665	40075	+1.22
1095	2493	>100	1695	40384	+1.95
1125	3753	>100	1725	40900	+3.50
1155	5482	>100	1755	41028	+3.05
1185	7538	+99.39	1785	41899	+3.71
1215	10305	+90.31	1815	41767	+5.64
1245	13415	+82.57	1845	42852	
1275	17141	+75.13	1875	44132	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14171	+66.45
735	1		1335	17362	+54.90
765	0	+0.00	1365	20310	+43.83
795	1	>100	1395	22647	+30.82
825	0	+83.33	1425	24551	+20.19
855	0	-83.33	1455	25440	+11.69
885	1	>100	1485	26124	+5.90
915	0	>100	1515	26245	+2.21
945	1	>100	1545	26428	+1.39
975	12	>100	1575	26151	+2.69
1005	51	>100	1605	26721	+2.72
1035	298	>100	1635	27168	+2.80
1065	848	>100	1665	27007	+0.87
1095	1649	>100	1695	27135	+0.70
1125	2535	>100	1725	27089	+1.24
1155	3602	>100	1755	27414	+1.43
1185	5036	+98.31	1785	27373	+3.21
1215	6880	+91.37	1815	27581	+4.34
1245	8822	+82.29	1845	28332	
1275	11546	+74.61	1875	28750	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



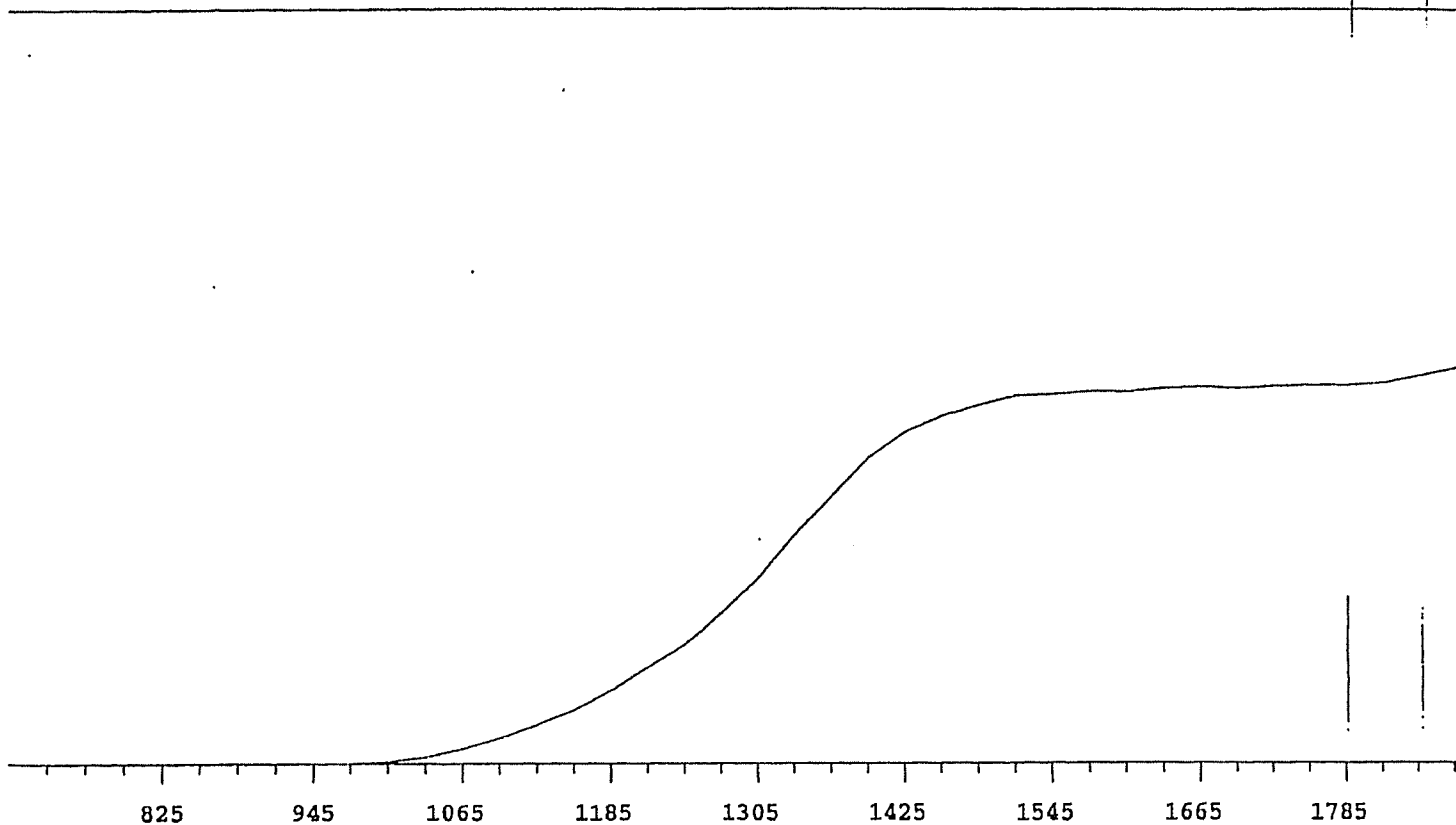
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	2	+55.56
855	1	>100
885	0	-55.56
915	3	>100
945	0	>100
975	16	>100
1005	114	>100
1035	451	>100
1065	1100	>100
1095	2068	>100
1125	3189	>100
1155	4386	>100
1185	6094	+94.81
1215	8184	+87.09
1245	10489	+78.88
1275	13273	+72.66

VOLTS COUNTS %/100 Volts

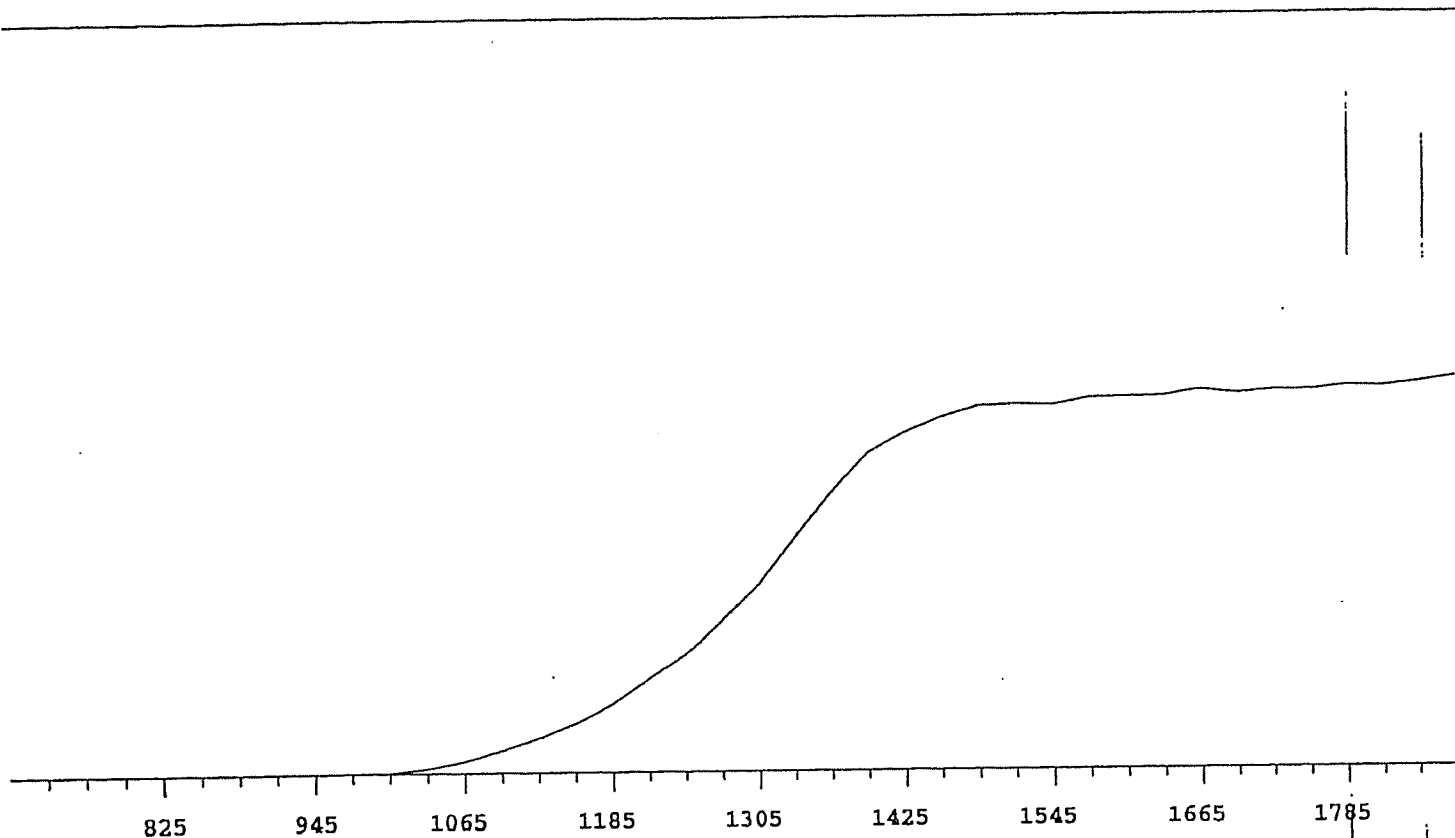
1305	16442	+66.24
1335	20146	+57.40
1365	23769	+46.40
1395	26926	+34.68
1425	29276	+24.40
1455	31037	+15.28
1485	32197	+7.91
1515	32425	+4.33
1545	32314	+2.14
1575	33071	+2.66
1605	32918	+2.52
1635	33435	+1.02
1665	33382	+0.73
1695	33349	+1.07
1725	33324	+1.28
1755	34001	+2.26
1785	33701	+3.08
1815	34304	+2.97
1845	34744	
1875	35012	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



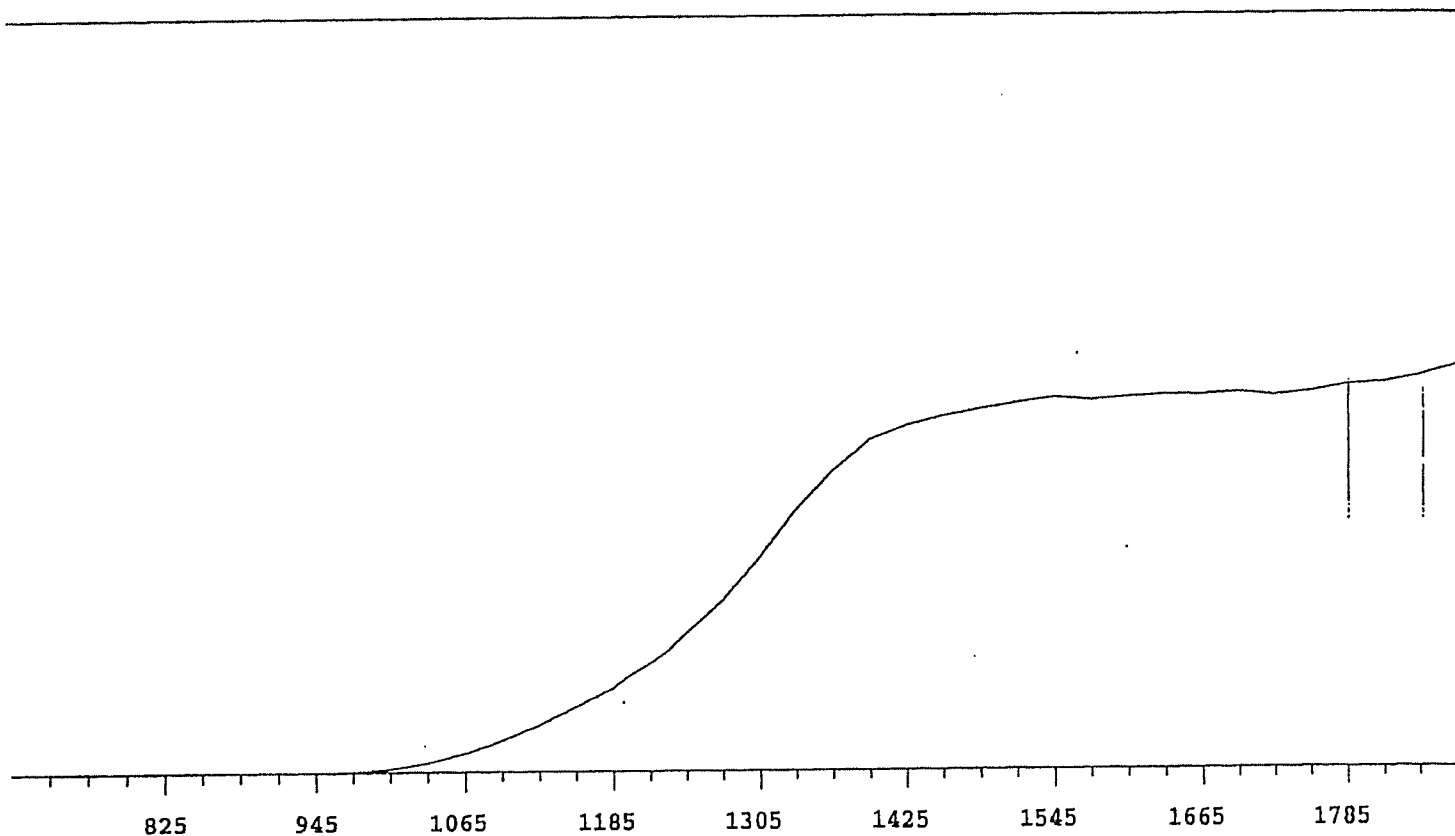
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15747	+62.38
735	1		1335	19230	+54.19
765	0	+0.00	1365	22255	+44.46
795	1	>100	1395	25299	+32.45
825	0	>100	1425	27370	+22.24
855	0	>100	1455	28625	+14.10
885	0	>100	1485	29467	+8.56
915	0	>100	1515	30213	+5.29
945	2	>100	1545	30326	+2.77
975	31	>100	1575	30564	+1.57
1005	176	>100	1605	30548	+1.52
1035	550	>100	1635	30820	+0.85
1065	1218	>100	1665	30898	+0.79
1095	2114	>100	1695	30779	+0.44
1125	3212	>100	1725	30934	+0.45
1155	4416	>100	1755	31008	+0.96
1185	6066	+92.28	1785	30991	+2.01
1215	7936	+85.60	1815	31196	+3.80
1245	10288	+76.79	1845	31781	
1275	13020	+70.59	1875	32406	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19796	+65.77
735	1		1335	24338	+57.55
765	0	+55.56	1365	28686	+45.86
795	2	+0.00	1395	32750	+32.27
825	0	-55.56	1425	34919	+20.83
855	1	>100	1455	36434	+11.45
885	0	>100	1485	37487	+5.80
915	0	>100	1515	37623	+3.32
945	2	>100	1545	37528	+2.07
975	24	>100	1575	38277	+2.12
1005	134	>100	1605	38338	+2.70
1035	558	>100	1635	38426	+1.12
1065	1361	>100	1665	39007	+1.06
1095	2511	>100	1695	38592	+0.64
1125	3762	>100	1725	38870	+0.63
1155	5246	>100	1755	38868	+1.30
1185	7268	+96.29	1785	39238	+1.45
1215	9733	+88.98	1815	39169	+2.34
1245	12701	+79.94	1845	39570	
1275	16176	+73.13	1875	40086	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	+0.00
795	0	>100
825	1	+83.33
855	1	+55.56
885	0	+0.00
915	1	>100
945	1	>100
975	60	>100
1005	297	>100
1035	855	>100
1065	1647	>100
1095	2700	>100
1125	3921	>100
1155	5471	+96.54
1185	7042	+90.21
1215	9405	+82.23
1245	12266	+76.33
1275	14989	+69.38

VOLTS COUNTS %/100 Volts

1305	18491	+61.09
1335	22444	+51.56
1365	25756	+37.44
1395	28379	+23.82
1425	29517	+14.00
1455	30309	+8.08
1485	30874	+6.03
1515	31345	+3.66
1545	31782	+2.17
1575	31567	+1.31
1605	31789	+0.78
1635	31963	+1.34
1665	31956	+0.29
1695	32123	+0.20
1725	31850	+1.46
1755	32114	+2.39
1785	32665	+3.95
1815	32876	+4.96
1845	33399	
1875	34206	

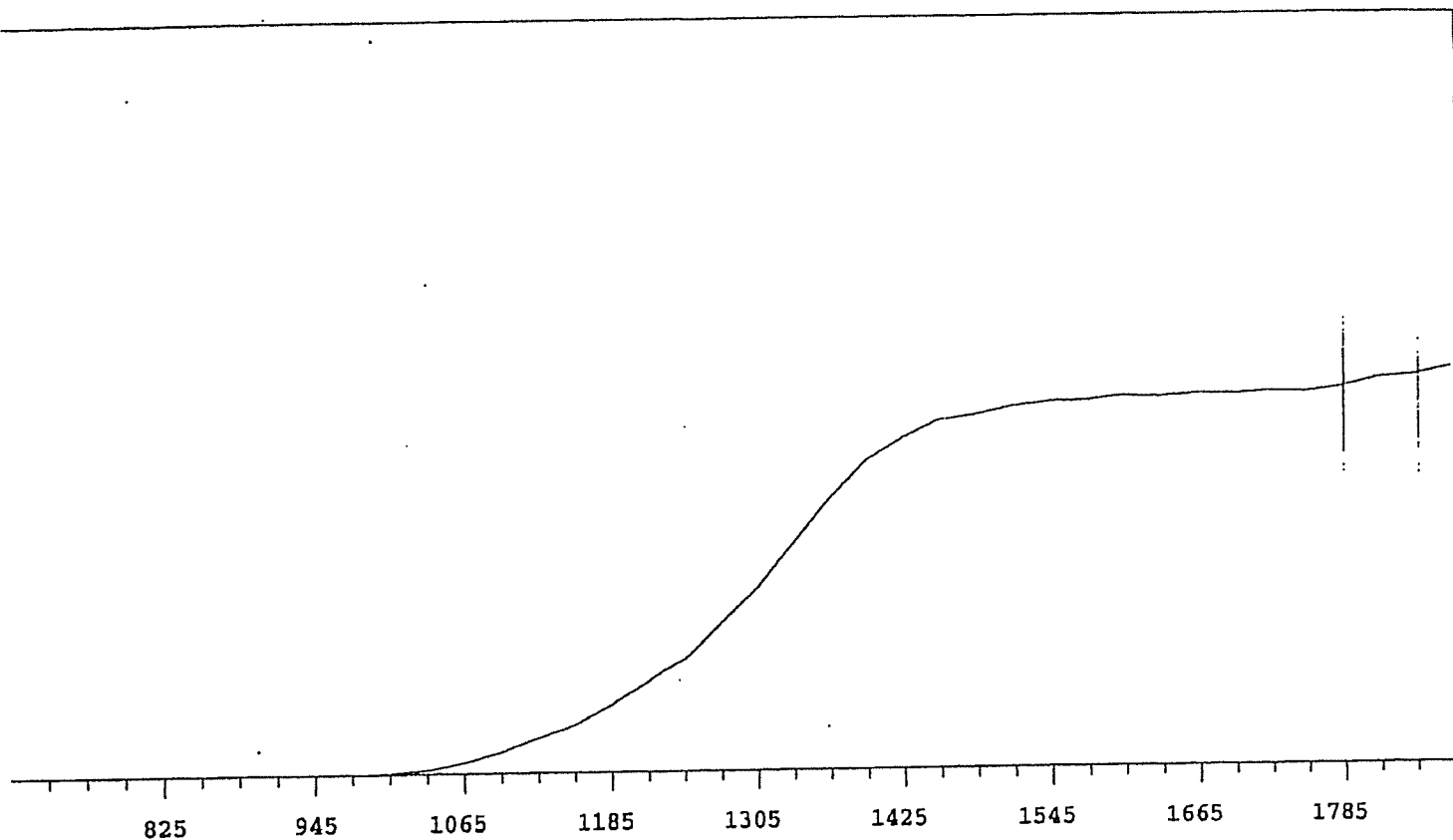
MPC 9600 Plateau

Instrument 5 MPC 9604 Detector A

7/1/2009

Alpha Volts: 705

Beta Volts: 1575



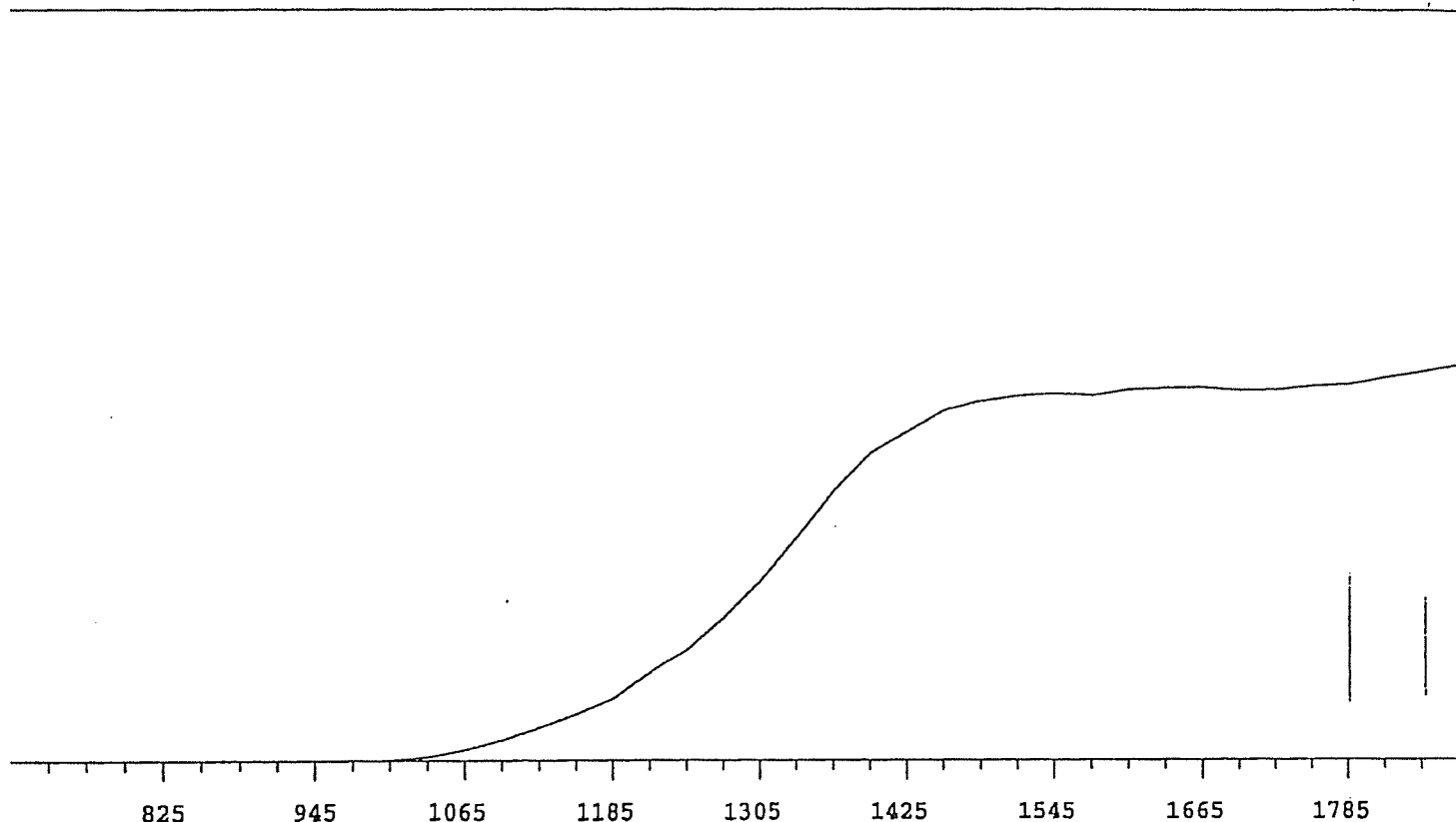
VOLTS COUNTS %/100 Volts

VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	1	
795	1	+83.33
825	1	-83.33
855	1	>100
885	0	-55.56
915	0	>100
945	1	>100
975	9	>100
1005	76	>100
1035	308	>100
1065	814	>100
1095	1600	>100
1125	2598	>100
1155	3596	>100
1185	5065	+96.05
1215	6773	+90.23
1245	8717	+81.43
1275	11391	+74.83

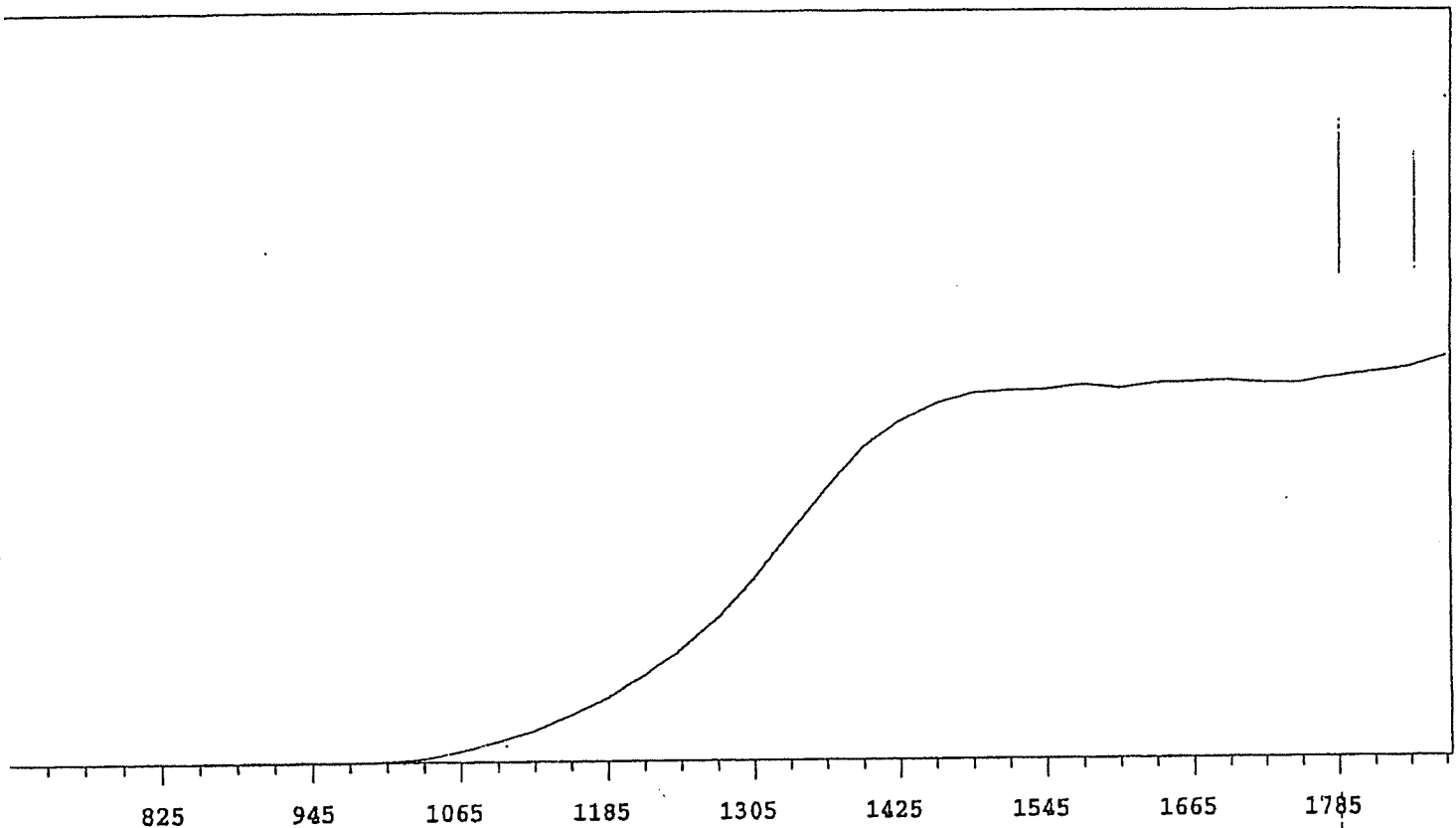
1305	13974	+68.00
1335	17170	+58.62
1365	20456	+47.04
1395	23332	+33.83
1425	24996	+21.10
1455	26290	+12.40
1485	26683	+7.74
1515	27270	+4.43
1545	27590	+3.48
1575	27635	+1.71
1605	27932	+1.20
1635	27807	+0.88
1665	28006	+0.62
1695	27964	+0.63
1725	28112	+0.98
1755	28020	+2.84
1785	28392	+3.76
1815	29028	+5.17
1845	29220	
1875	29849	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



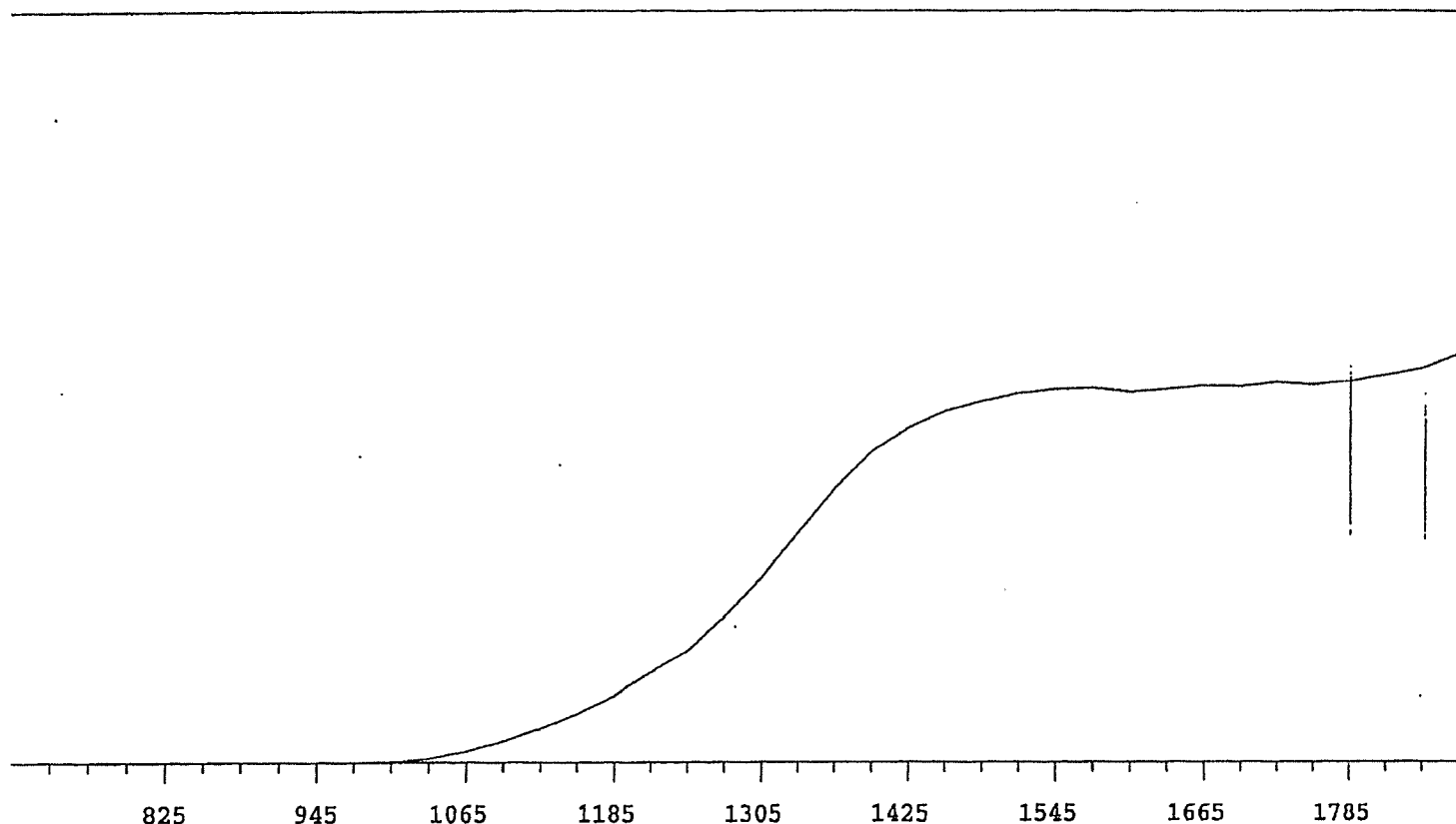
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17414	+68.46
735	0		1335	21540	+59.98
765	0		1365	25854	+46.75
795	0	>100	1395	29222	+33.38
825	1	>100	1425	31128	+21.52
855	1	+41.67	1455	32995	+13.26
885	2	-33.33	1485	33846	+8.09
915	0	>100	1515	34289	+3.25
945	1	>100	1545	34528	+2.00
975	17	>100	1575	34311	+1.78
1005	87	>100	1605	34866	+1.78
1035	336	>100	1635	35046	+1.14
1065	1010	>100	1665	35087	-0.26
1095	1955	>100	1695	34795	+0.11
1125	3124	>100	1725	34857	+0.93
1155	4486	>100	1755	35220	+2.81
1185	6017	>100	1785	35363	+3.98
1215	8507	+91.20	1815	36028	+4.79
1245	11148	+82.59	1845	36577	
1275	14003	+74.21	1875	37207	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17085	+68.24
735	0		1335	21135	+59.99
765	0		1365	25066	+47.39
795	0	>100	1395	28530	+33.93
825	0	>100	1425	30823	+22.30
855	1	>100	1455	32287	+12.93
885	0	>100	1485	33217	+6.71
915	1	>100	1515	33474	+3.57
945	2	>100	1545	33517	+1.17
975	7	>100	1575	33921	+1.13
1005	56	>100	1605	33584	+1.27
1035	305	>100	1635	34014	+1.12
1065	982	>100	1665	34116	+0.98
1095	1874	>100	1695	34225	-0.22
1125	2890	>100	1725	33980	+0.58
1155	4260	>100	1755	33971	+1.96
1185	6001	>100	1785	34541	+3.64
1215	8050	+91.54	1815	34954	+5.38
1245	10895	+82.98	1845	35375	
1275	13556	+76.26	1875	36384	

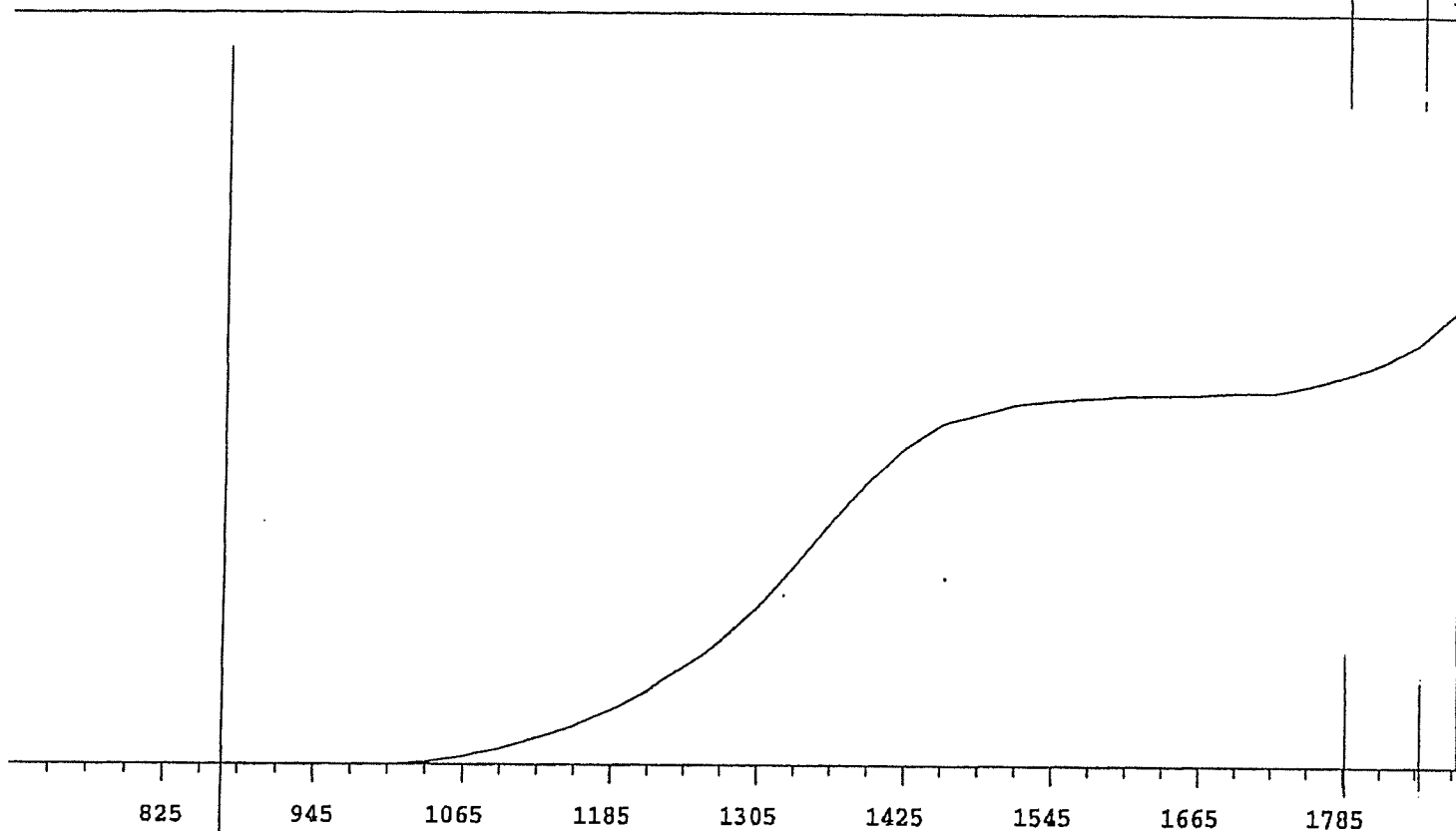
MPC 9600 Plateau Instrument 5 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15025	+68.87
735	0		1335	18640	+58.97
765	0		1365	22048	+45.84
795	0	>100	1395	24877	+32.08
825	0	>100	1425	26653	+20.83
855	0	>100	1455	27899	+13.08
885	0	>100	1485	28670	+8.43
915	0	>100	1515	29257	+5.13
945	0	>100	1545	29568	+2.06
975	6	>100	1575	29683	+0.52
1005	81	>100	1605	29362	+0.57
1035	318	>100	1635	29589	+0.80
1065	897	>100	1665	29870	+1.82
1095	1710	>100	1695	29783	+0.90
1125	2714	>100	1725	30077	+0.75
1155	3925	>100	1755	29889	+2.02
1185	5395	+97.31	1785	30152	+3.33
1215	7282	+88.49	1815	30656	+6.54
1245	9426	+81.36	1845	31211	
1275	12007	+75.65	1875	32389	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector A 7/1/2009

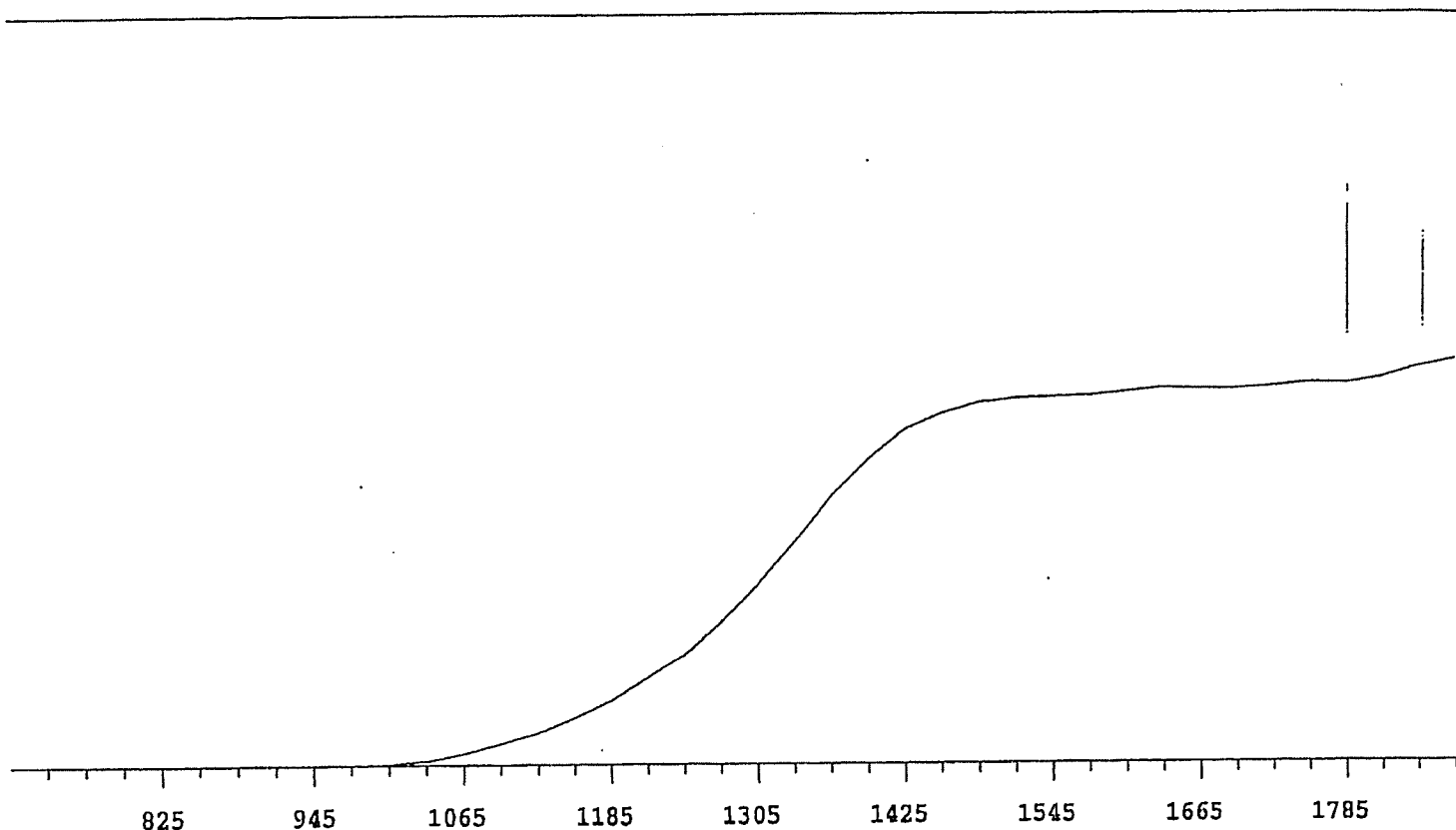
Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	7	>100
1005	31	>100
1035	238	>100
1065	810	>100
1095	1637	>100
1125	2743	>100
1155	3932	>100
1185	5579	>100
1215	7602	+94.41
1245	10078	+84.86
1275	13091	+77.67

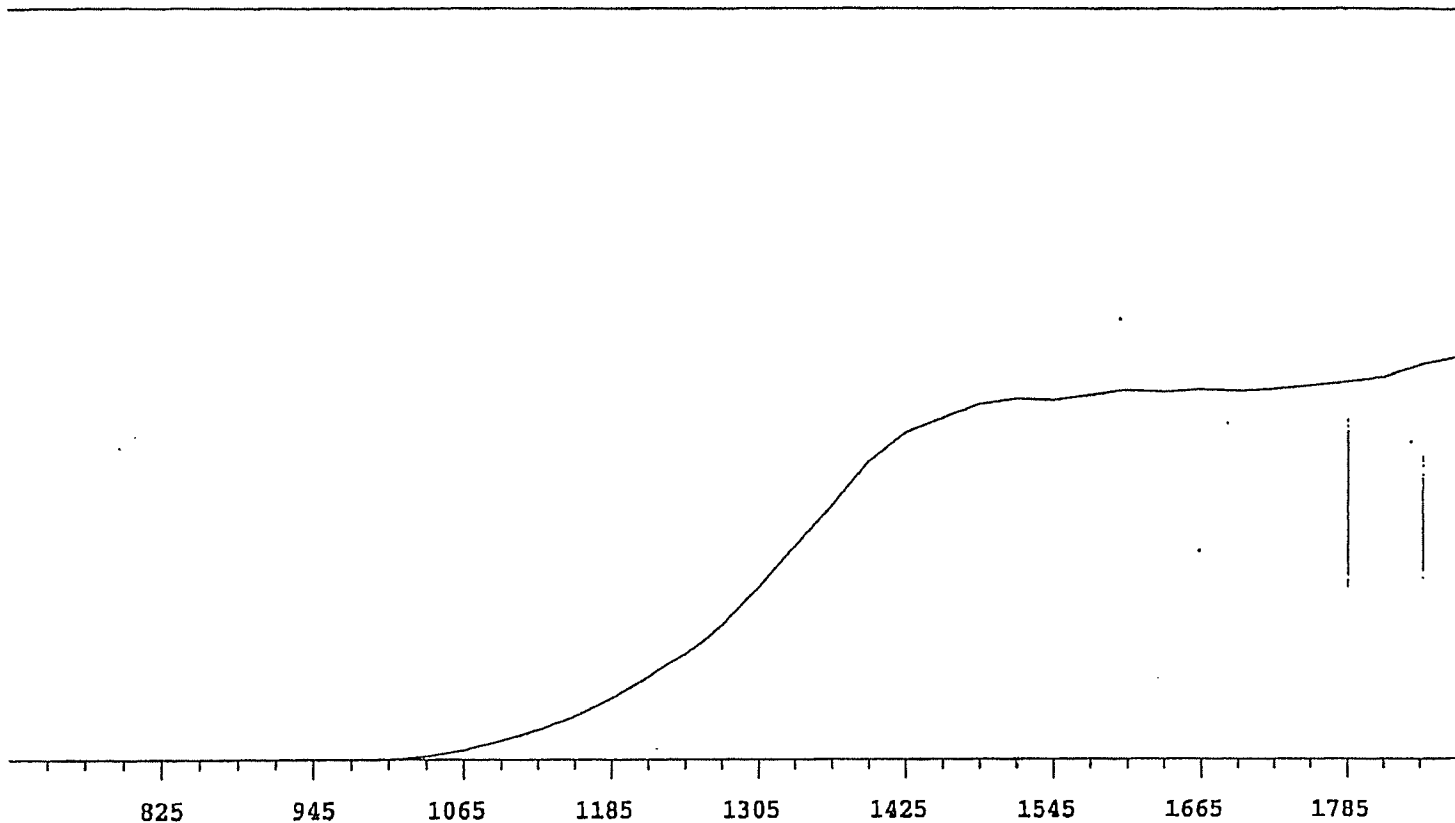
VOLTS	COUNTS	%/100 Volts
1305	16217	+71.57
1335	20184	+63.76
1365	24605	+53.98
1395	28528	+41.40
1425	31675	+28.02
1455	33899	+17.93
1485	34826	+10.65
1515	35815	+6.13
1545	36225	+4.15
1575	36456	+2.28
1605	36747	+1.47
1635	36801	+1.26
1665	36859	+0.85
1695	37095	+1.85
1725	37072	+4.01
1755	37724	+6.65
1785	38802	+10.33
1815	40036	+14.71
1845	41975	
1875	45123	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



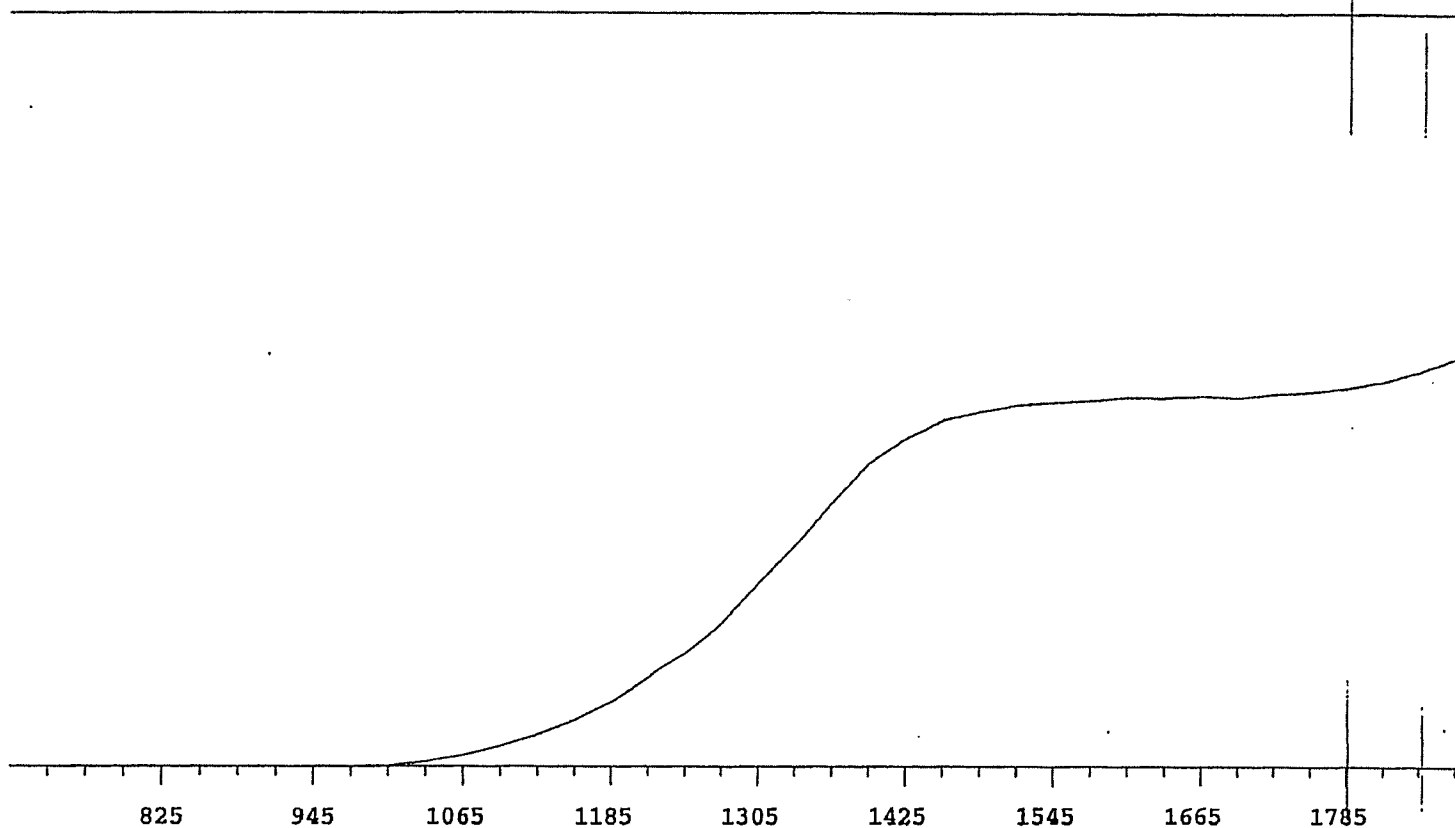
VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	1	+83.33
855	1	-83.33
885	0	>100
915	0	>100
945	5	>100
975	18	>100
1005	125	>100
1035	482	>100
1065	1255	>100
1095	2318	>100
1125	3540	>100
1155	5288	>100
1185	7168	+98.51
1215	9760	+88.48
1245	12656	+81.52
1275	16065	+74.58
1305	20094	+68.67
1335	24665	+59.40
1365	29591	+47.86
1395	33376	+34.51
1425	36440	+22.50
1455	38024	+13.58
1485	39187	+7.04
1515	39608	+3.63
1545	39722	+2.10
1575	39894	+2.32
1605	40298	+2.09
1635	40711	+1.41
1665	40574	+0.80
1695	40608	+1.02
1725	40839	+1.28
1755	41201	+1.97
1785	41065	+3.74
1815	41711	+5.42
1845	42917	
1875	43699	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



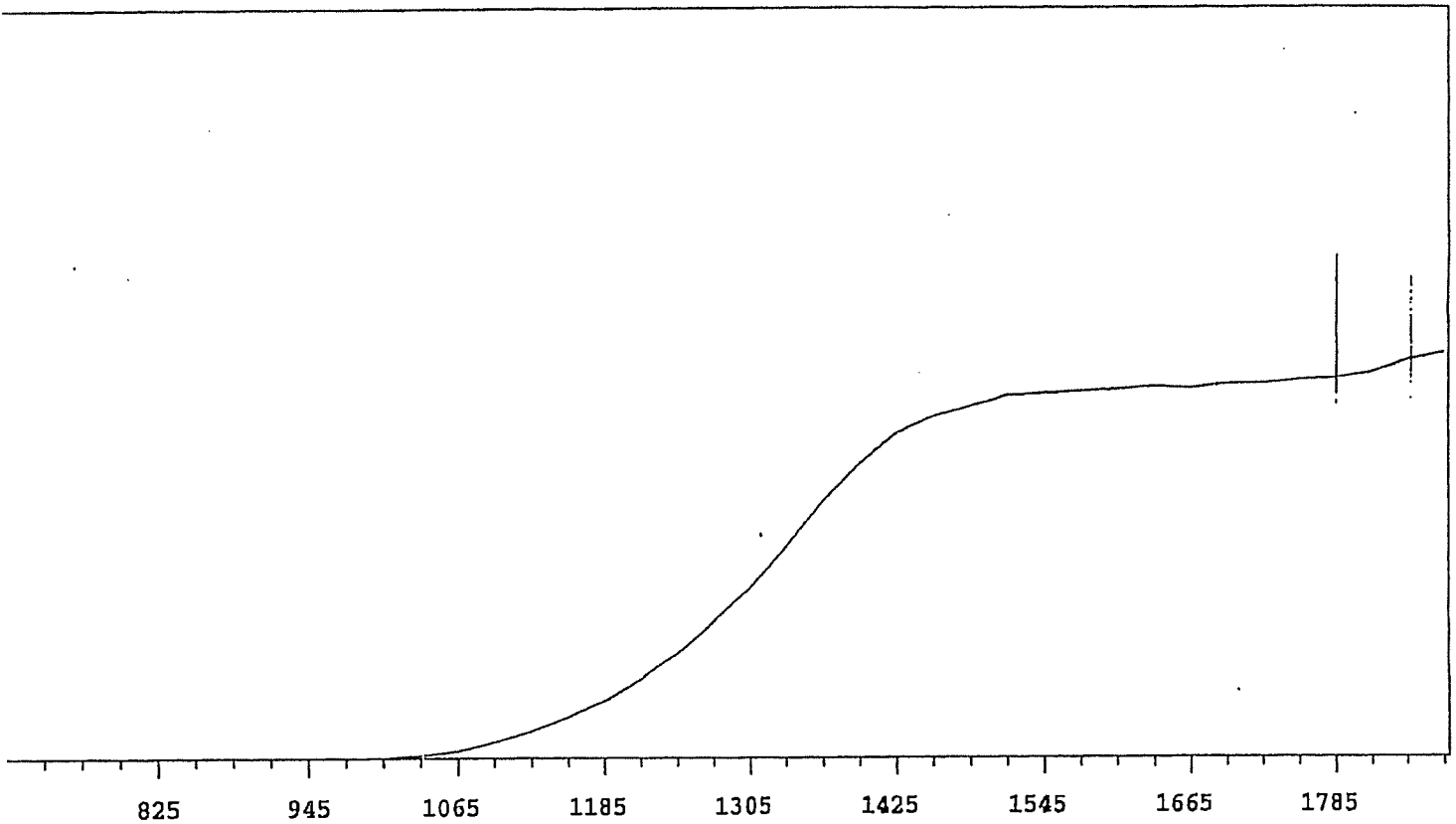
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17350	+67.80
735	0		1335	21371	+60.27
765	1	+0.00	1365	25084	+49.32
795	0	>100	1395	29177	+36.15
825	0	+0.00	1425	31927	+24.86
855	0	>100	1455	33217	+14.70
885	1	>100	1485	34545	+7.74
915	1	>100	1515	35097	+4.64
945	2	>100	1545	34927	+2.96
975	8	>100	1575	35439	+2.21
1005	70	>100	1605	35939	+2.41
1035	353	>100	1635	35763	+0.94
1065	990	>100	1665	36053	+0.35
1095	1956	>100	1695	35886	+1.15
1125	3024	>100	1725	36066	+1.77
1155	4400	>100	1755	36379	+3.03
1185	6173	+99.75	1785	36768	+4.80
1215	8230	+89.85	1815	37193	+6.14
1245	10904	+82.36	1845	38320	
1275	13747	+76.18	1875	39061	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



.VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17954	+65.82
735	0		1335	21482	+57.64
765	0		1365	25373	+45.78
795	1	+0.00	1395	29042	+34.80
825	0	>100	1425	31373	+23.29
855	0	+0.00	1455	33143	+14.25
885	0	>100	1485	34006	+8.49
915	1	>100	1515	34662	+4.71
945	0	>100	1545	34892	+3.14
975	14	>100	1575	35129	+1.86
1005	109	>100	1605	35411	+1.49
1035	481	>100	1635	35380	+0.62
1065	1177	>100	1665	35554	+0.65
1095	2133	>100	1695	35385	+1.18
1125	3243	>100	1725	35755	+1.89
1155	4554	>100	1755	35907	+3.26
1185	6285	+98.38	1785	36305	+4.62
1215	8468	+89.75	1815	36870	+6.98
1245	11266	+83.13	1845	37807	
1275	14088	+74.43	1875	39047	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector A 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	13228	+70.36
735	0		1335	16271	+60.12
765	0		1365	19506	+49.19
795	0	>100	1395	22188	+36.46
825	1	+83.33	1425	24373	+24.43
855	1	-83.33	1455	25649	+15.99
885	0	-55.56	1485	26433	+9.58
915	0	>100	1515	27195	+5.74
945	1	>100	1545	27367	+3.24
975	3	>100	1575	27490	+1.86
1005	42	>100	1605	27608	+1.22
1035	242	>100	1635	27841	+1.33
1065	613	>100	1665	27695	+1.11
1095	1353	>100	1695	27999	+1.42
1125	2213	>100	1725	27992	+2.04
1155	3256	>100	1755	28289	+2.52
1185	4474	>100	1785	28408	+4.56
1215	5932	+94.10	1815	28863	+5.70
1245	8072	+87.32	1845	29664	
1275	10579	+79.61	1875	30148	

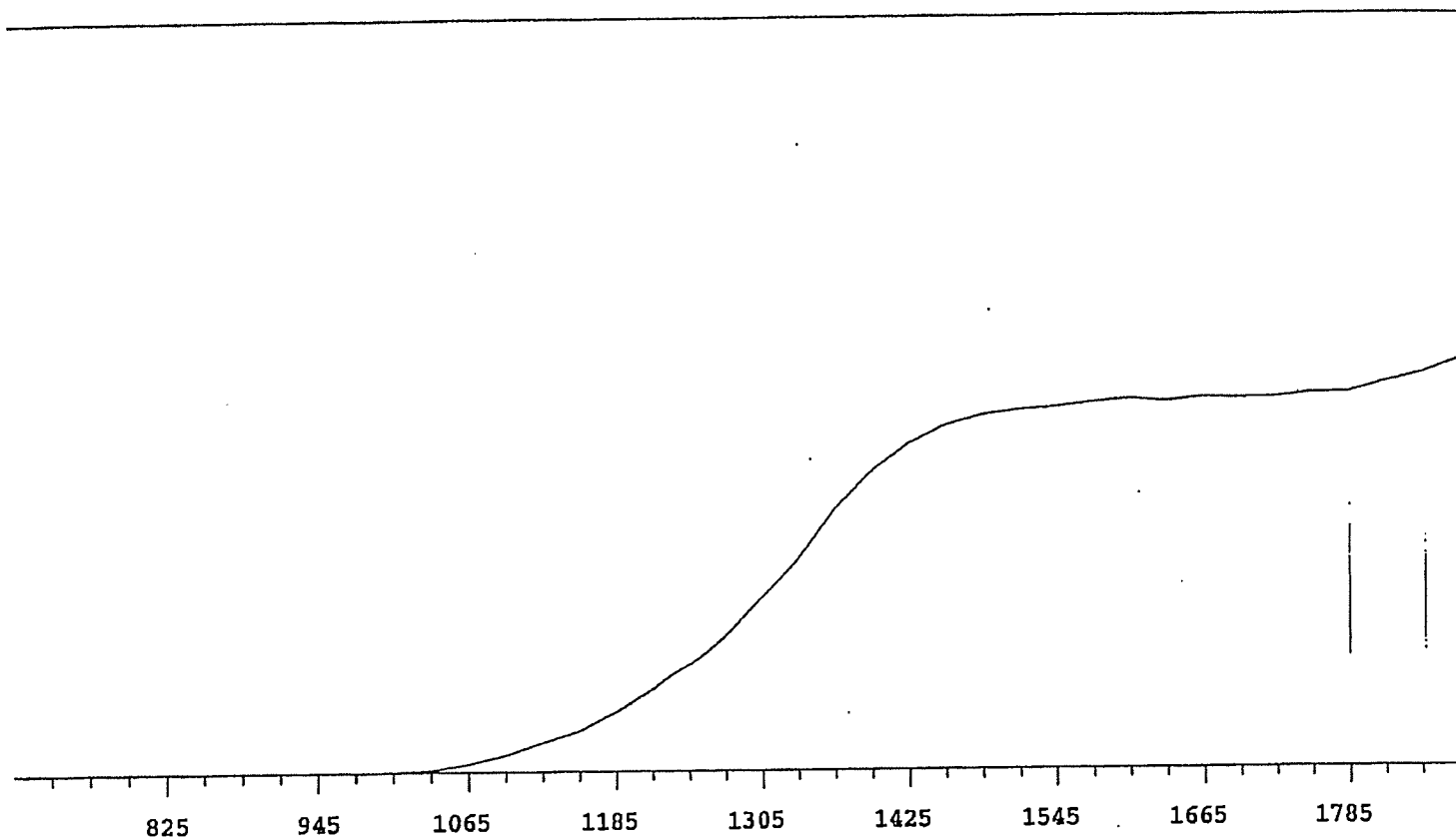
MPC 9600 Plateau

Instrument 7 MPC 9604 Detector B

7/1/2009

Alpha Volts: 705

Beta Volts: 1575



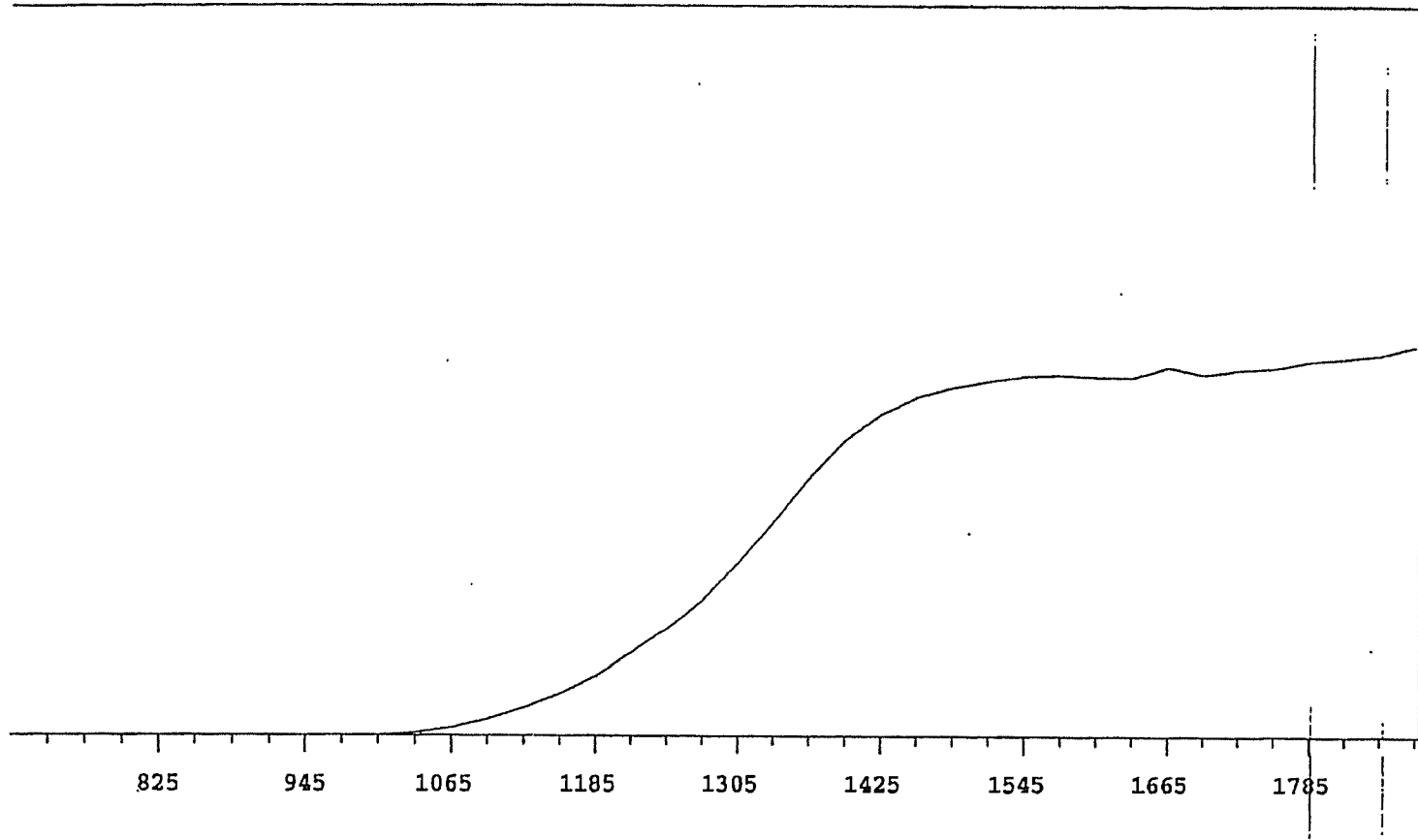
VOLTS COUNTS %/100 Volts

VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	1	>100
975	3	>100
1005	34	>100
1035	221	>100
1065	825	>100
1095	1709	>100
1125	2873	>100
1155	4078	>100
1185	5858	>100
1215	7809	+91.82
1245	10336	+85.02
1275	13215	+77.79

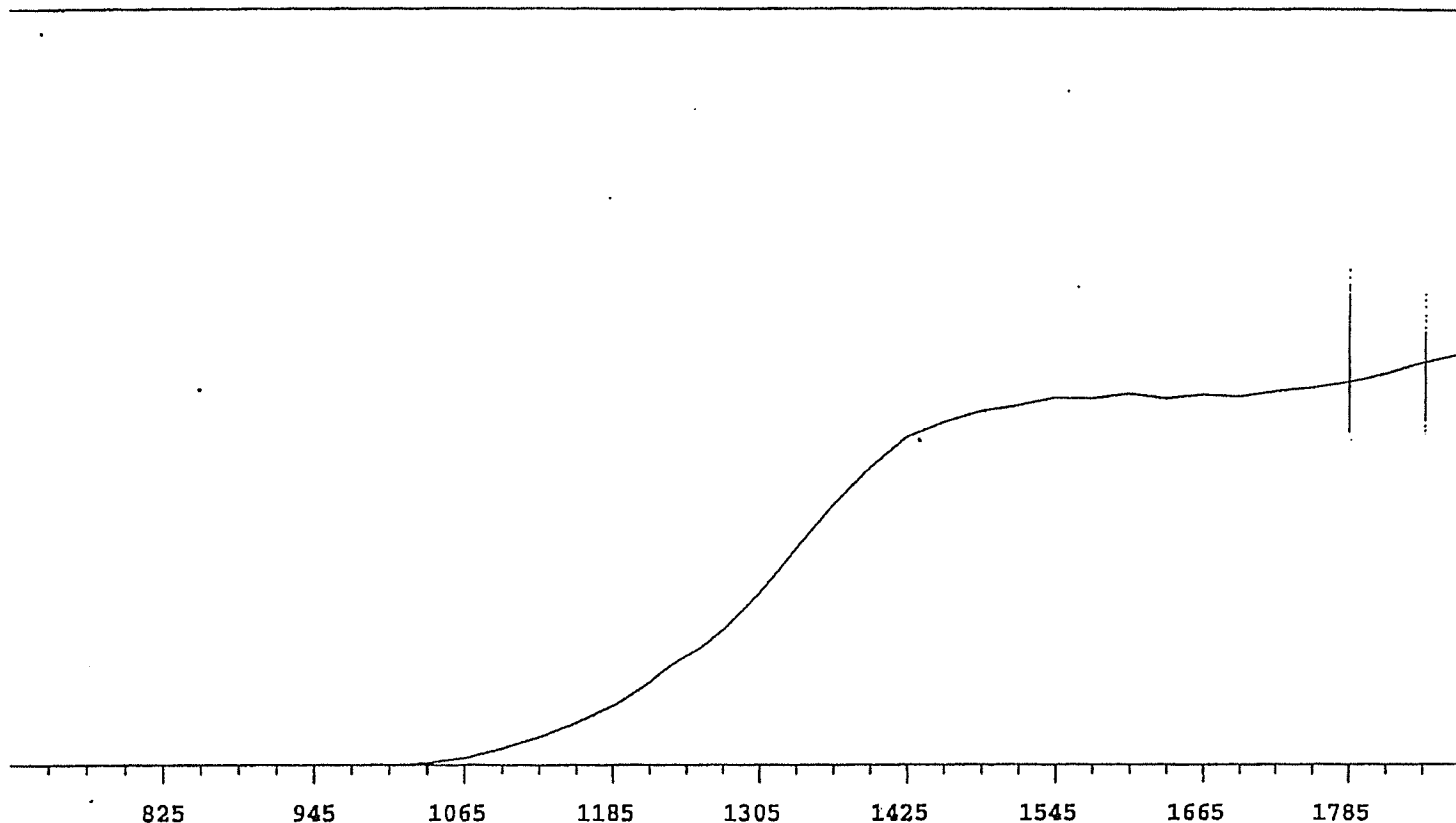
1305	16978	+70.97
1335	20569	+61.39
1365	24989	+48.97
1395	28389	+36.69
1425	30977	+24.05
1455	32727	+14.93
1485	33697	+8.42
1515	34195	+4.89
1545	34437	+3.49
1575	34850	+2.11
1605	35174	+1.62
1635	34923	+0.68
1665	35250	+0.35
1695	35171	+1.24
1725	35237	+1.02
1755	35584	+2.79
1785	35587	+4.59
1815	36485	+6.74
1845	37270	
1875	38453	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



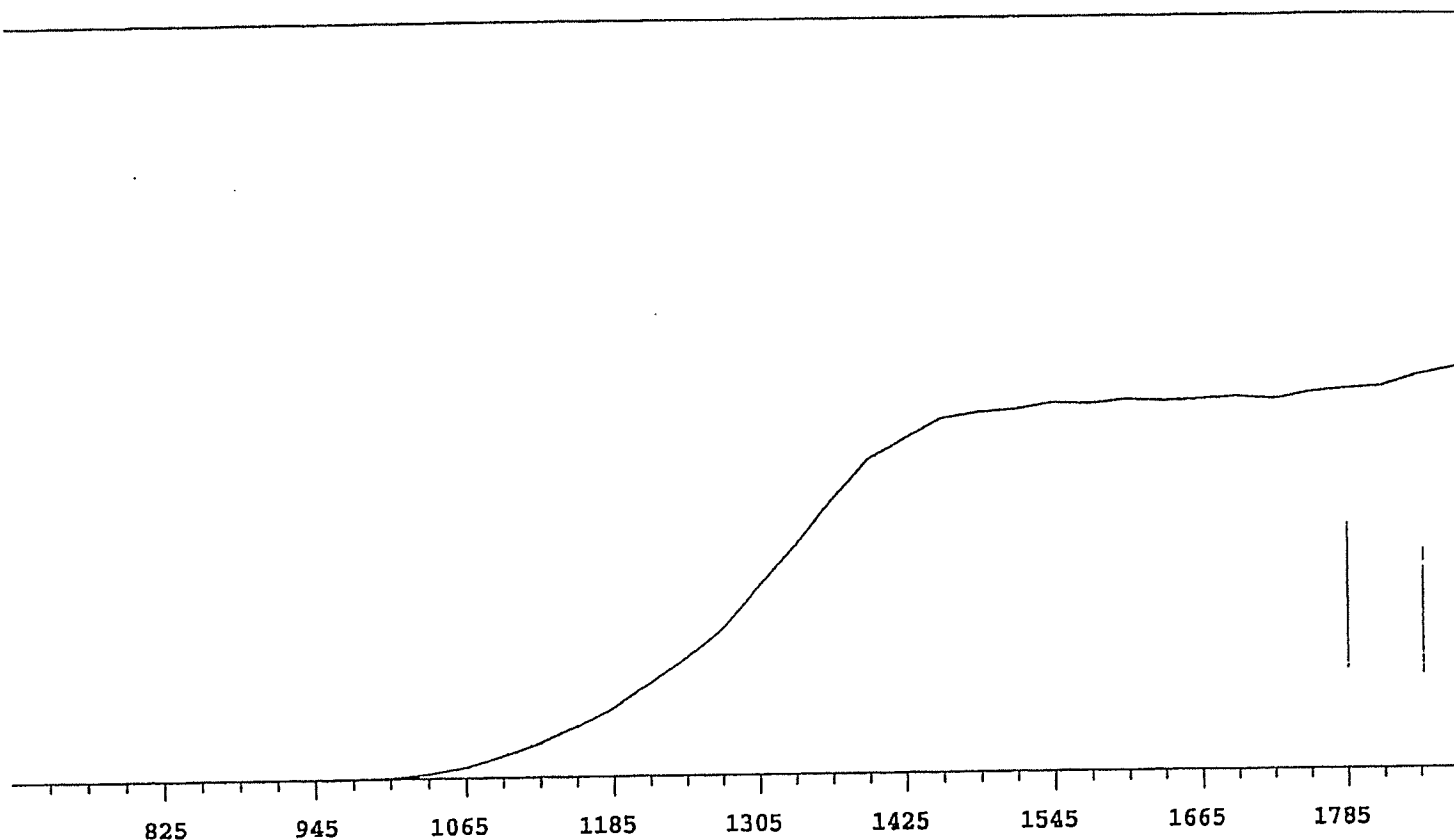
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16543	+70.03
735	0		1335	20257	+60.71
765	0		1365	24245	+48.17
795	0	>100	1395	27602	+35.50
825	0	>100	1425	30019	+23.48
855	0	>100	1455	31614	+14.53
885	0	>100	1485	32522	+8.91
915	0	>100	1515	33103	+5.28
945	0	>100	1545	33572	+2.60
975	4	>100	1575	33695	+0.70
1005	57	>100	1605	33525	+1.48
1035	277	>100	1635	33477	+0.99
1065	817	>100	1665	34432	+1.49
1095	1666	>100	1695	33745	+1.43
1125	2766	>100	1725	34149	+1.60
1155	4077	>100	1755	34350	+3.69
1185	5667	>100	1785	34955	+3.62
1215	7694	+91.50	1815	35251	+4.44
1245	10209	+84.83	1845	35592	
1275	12950	+77.50	1875	36382	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



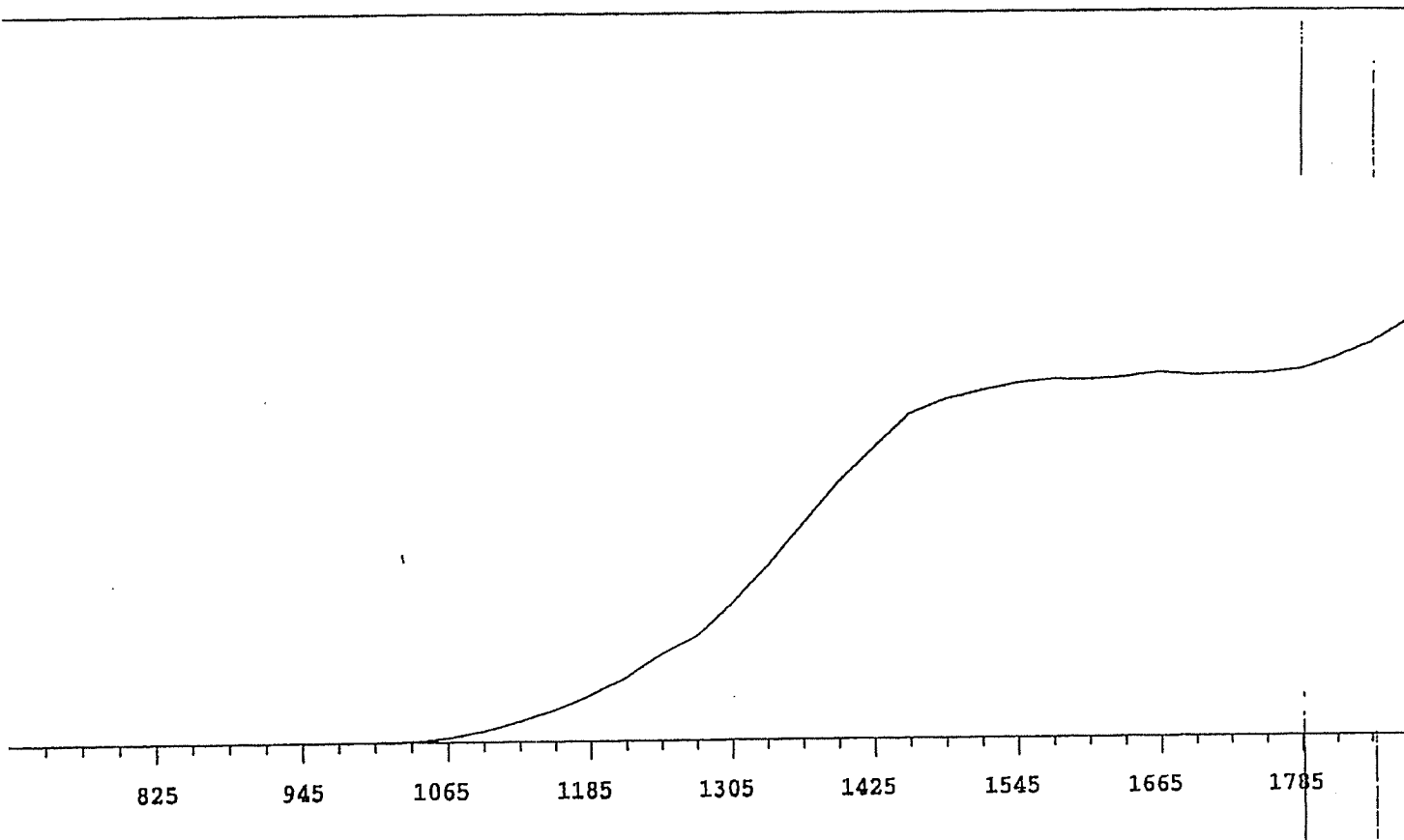
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14016	+71.42
735	0		1335	17436	+62.21
765	0		1365	20814	+50.32
795	0	>100	1395	23760	+36.91
825	0	>100	1425	26302	+24.91
855	0	>100	1455	27519	+15.17
885	0	>100	1485	28410	+8.91
915	0	>100	1515	28843	+5.41
945	0	>100	1545	29396	+3.58
975	5	>100	1575	29357	+1.54
1005	29	>100	1605	29719	+0.51
1035	204	>100	1635	29358	+0.23
1065	609	>100	1665	29623	+0.57
1095	1354	>100	1695	29509	+2.12
1125	2316	>100	1725	29896	+2.84
1155	3418	>100	1755	30165	+4.42
1185	4654	>100	1785	30570	+5.65
1215	6455	+92.99	1815	31180	+6.95
1245	8669	+86.45	1845	31995	
1275	10931	+79.15	1875	32717	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19482	+67.45
735	0		1335	23344	+59.35
765	0		1365	27793	+45.86
795	0	>100	1395	31916	+34.29
825	0	>100	1425	33979	+21.61
855	0	>100	1455	35993	+11.71
885	0	>100	1485	36530	+7.04
915	0	>100	1515	36796	+3.11
945	1	>100	1545	37393	+2.44
975	9	>100	1575	37279	+1.41
1005	96	>100	1605	37650	+0.49
1035	468	>100	1635	37458	+0.91
1065	1084	>100	1665	37579	+0.12
1095	2286	>100	1695	37828	+1.10
1125	3479	>100	1725	37535	+1.72
1155	4912	>100	1755	38104	+2.18
1185	6819	+98.23	1785	38416	+4.12
1215	9153	+89.05	1815	38633	+4.92
1245	12105	+83.21	1845	39649	
1275	15122	+75.24	1875	40366	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



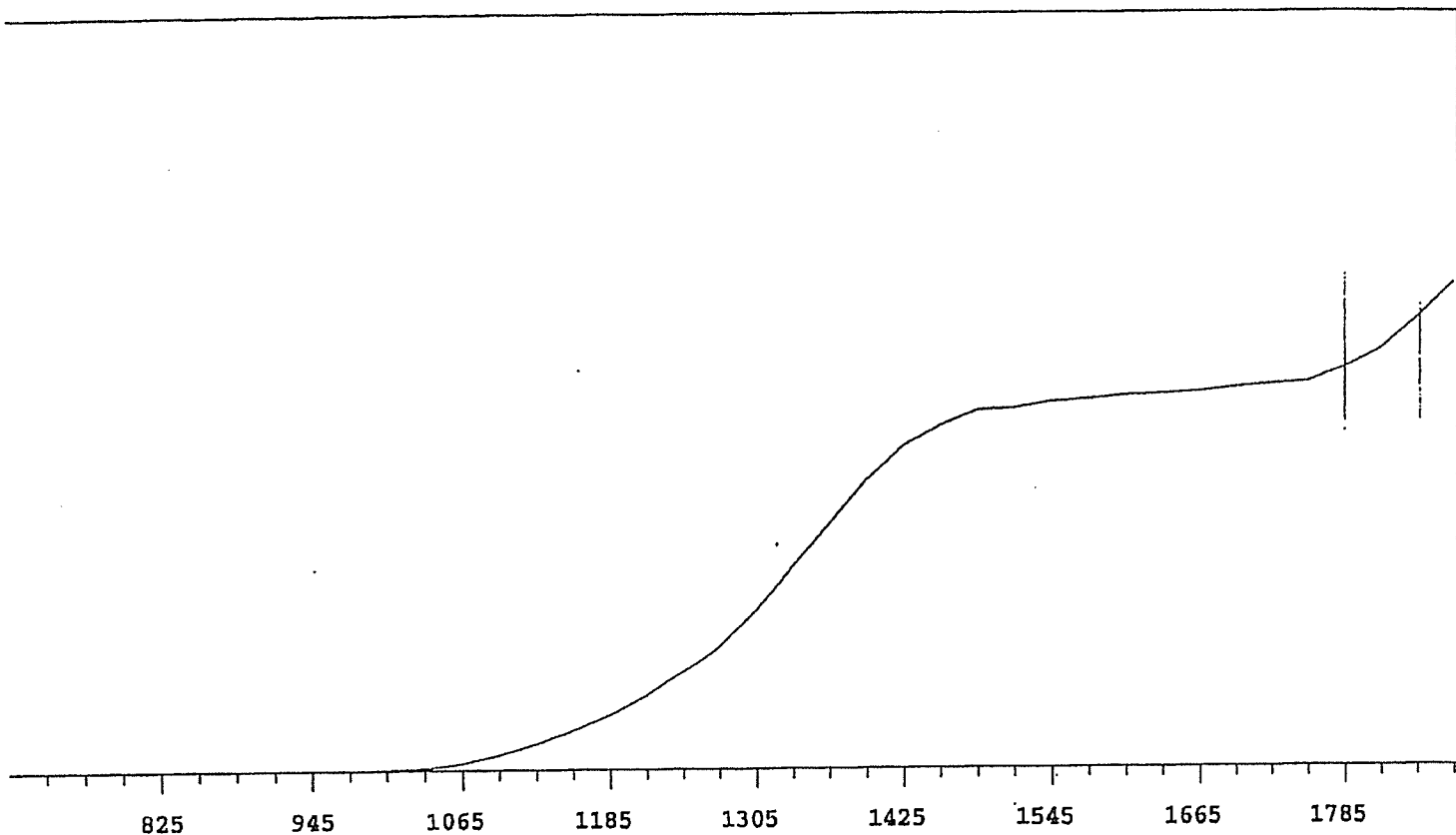
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	0	>100
1005	20	>100
1035	122	>100
1065	511	>100
1095	1263	>100
1125	2390	>100
1155	3641	>100
1185	5246	>100
1215	7212	+98.32
1245	9897	+89.80
1275	12742	+82.40

VOLTS COUNTS %/100 Volts

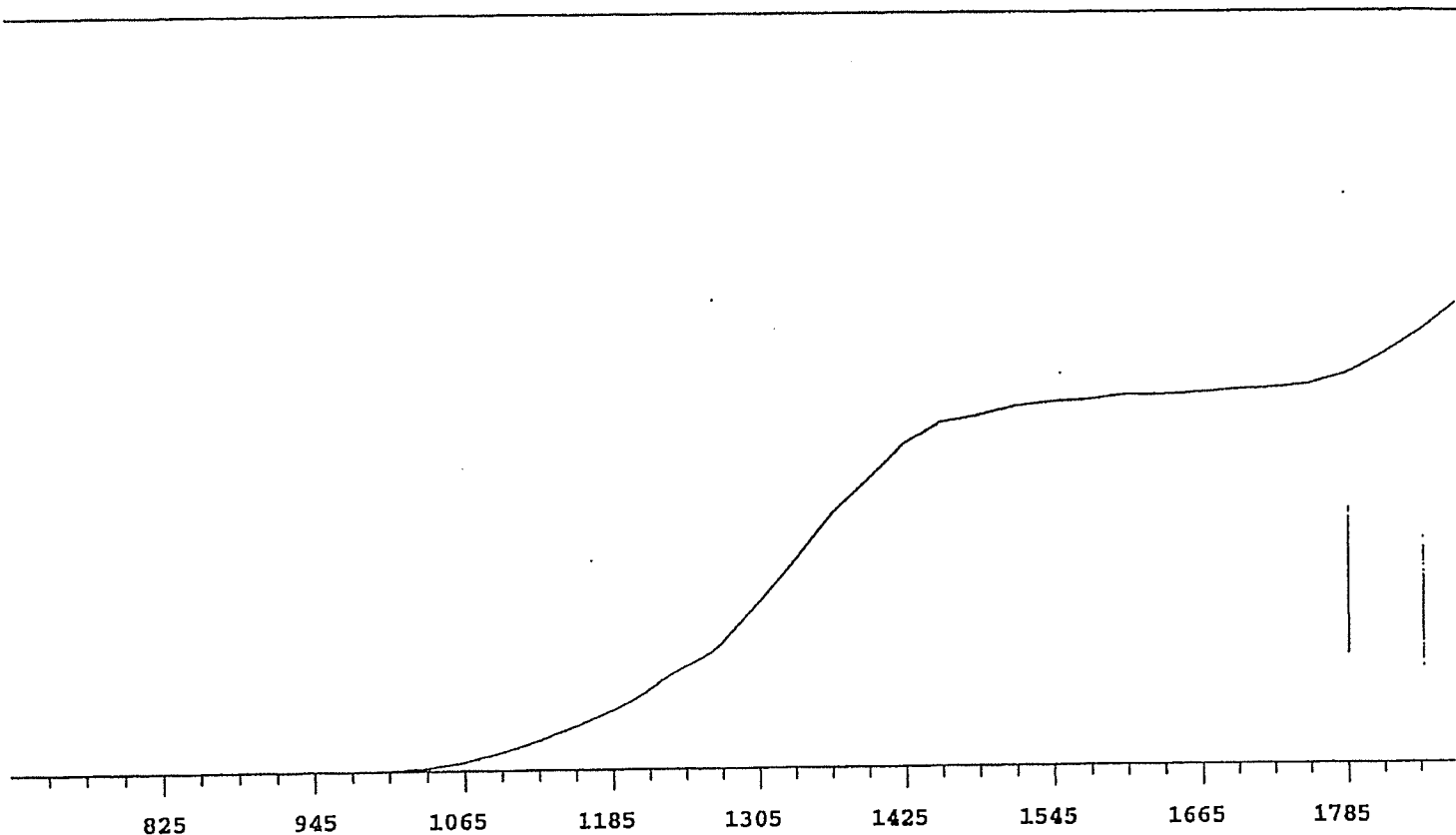
1305	16337	+74.91
1335	20471	+68.07
1365	25012	+57.86
1395	29694	+47.48
1425	33409	+35.17
1455	37013	+23.27
1485	38629	+14.35
1515	39529	+7.69
1545	40284	+4.34
1575	40711	+2.52
1605	40642	+1.97
1635	40879	+1.11
1665	41405	+0.98
1695	41011	+0.30
1725	41182	+0.41
1755	41178	+3.28
1785	41573	+6.47
1815	42858	+10.82
1845	44440	
1875	46780	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector C 7/1/2009 .
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16303	+72.82
735	0		1335	20309	+64.32
765	0		1365	24364	+53.82
795	0	>100	1395	28527	+40.95
825	0	>100	1425	31774	+28.74
855	0	>100	1455	33631	+16.87
885	0	>100	1485	35030	+9.25
915	0	>100	1515	35208	+5.21
945	0	>100	1545	35741	+3.27
975	4	>100	1575	36019	+2.95
1005	46	>100	1605	36373	+2.21
1035	202	>100	1635	36484	+2.27
1065	697	>100	1665	36713	+2.28
1095	1532	>100	1695	37093	+2.46
1125	2614	>100	1725	37325	+4.17
1155	3953	>100	1755	37543	+7.52
1185	5474	>100	1785	38833	+13.43
1215	7466	+93.09	1815	40656	+19.49
1245	9842	+86.73	1845	43753	
1275	12814	+80.29	1875	47246	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



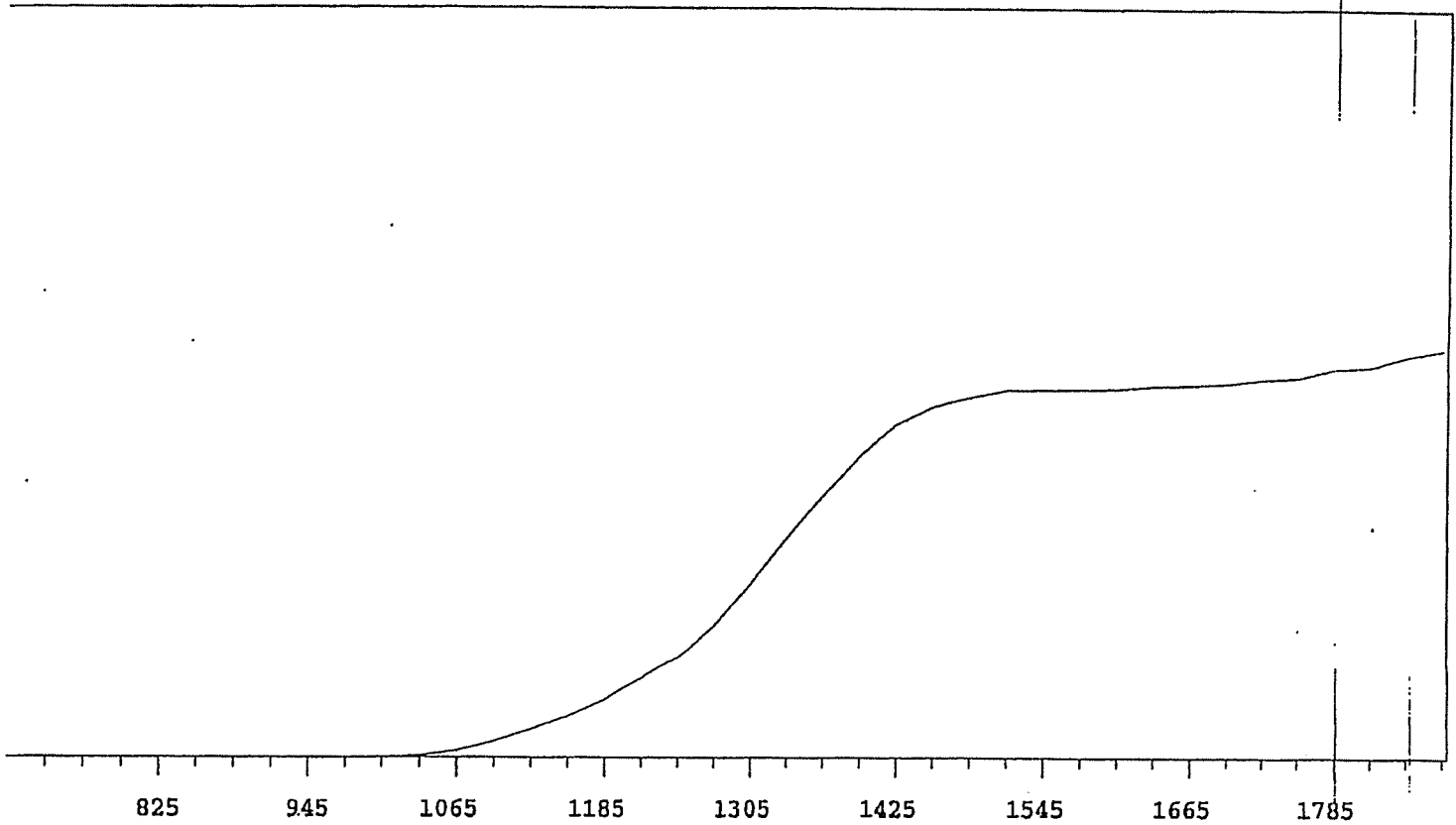
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	5	>100
1005	47	>100
1035	243	>100
1065	792	>100
1095	1744	>100
1125	2933	>100
1155	4123	>100
1185	5780	>100
1215	7791	+91.58
1245	10478	+84.93
1275	13118	+77.50

VOLTS COUNTS %/100 Volts

1305	16889	+70.18
1335	20600	+61.29
1365	24824	+50.40
1395	28208	+38.85
1425	31539	+25.79
1455	33391	+16.06
1485	33991	+8.60
1515	34782	+5.01
1545	35201	+4.10
1575	35380	+2.50
1605	35849	+1.87
1635	35784	+1.79
1665	36000	+1.43
1695	36269	+2.10
1725	36381	+3.46
1755	36733	+6.86
1785	37669	+11.78
1815	39465	+16.64
1845	41803	
1875	44665	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 870 Beta Volts: 1530



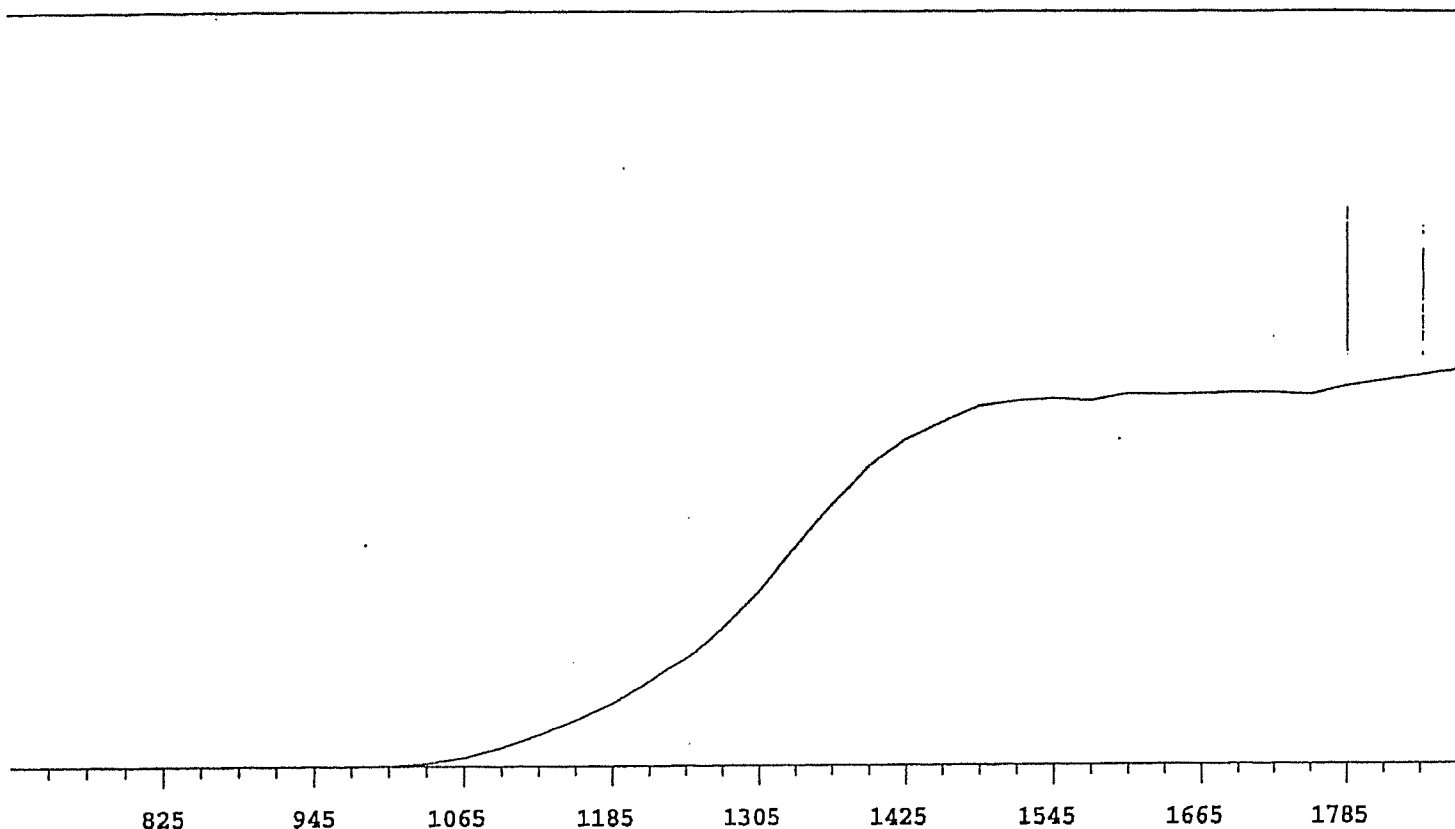
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	2	>100
1005	33	>100
1035	203	>100
1065	668	>100
1095	1403	>100
1125	2545	>100
1155	3800	>100
1185	5363	>100
1215	7355	+95.00
1245	9807	+87.69
1275	12700	+80.28

VOLTS COUNTS %/100 Volts

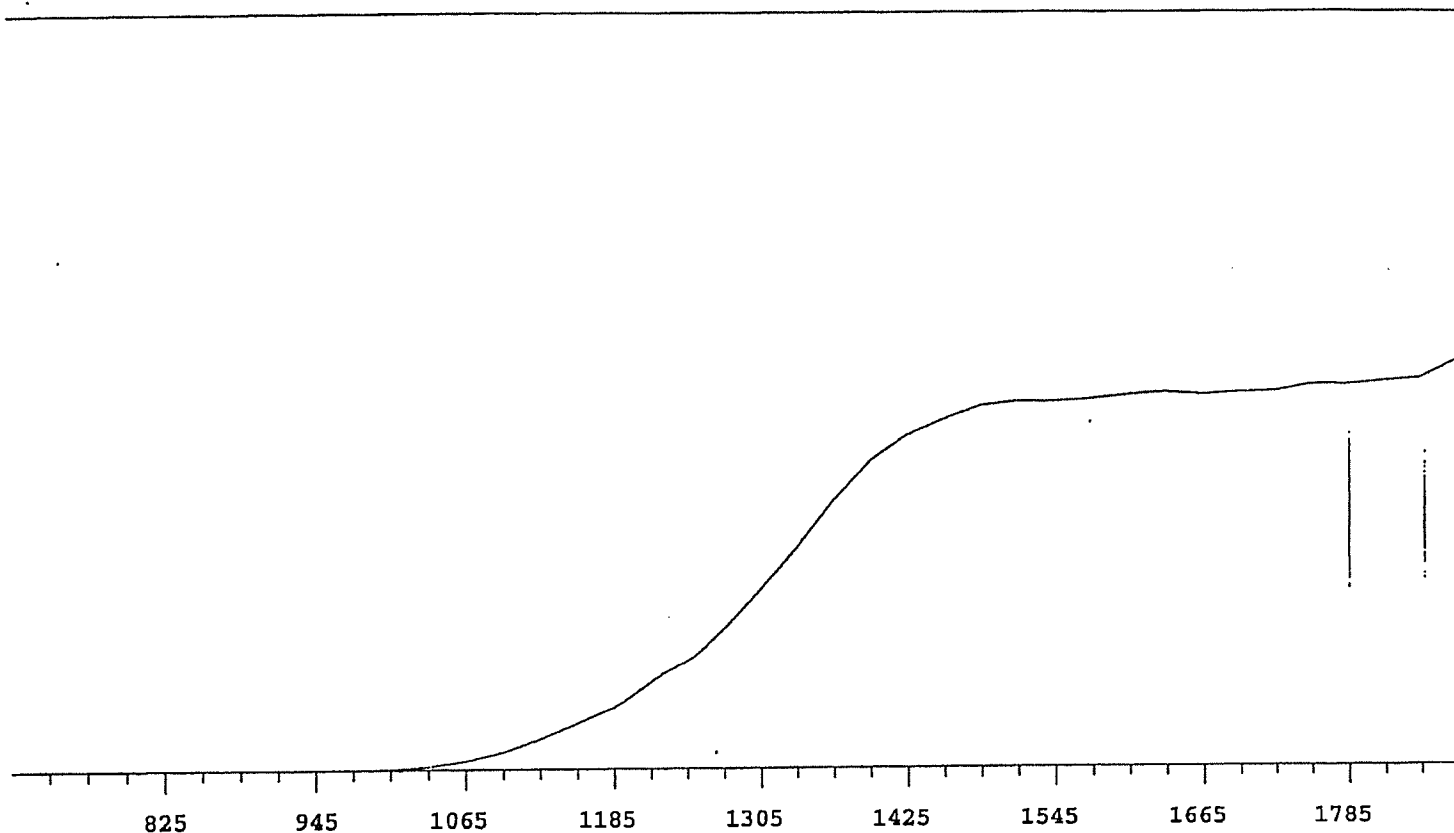
1305	16226	+71.71
1335	20083	+61.95
1365	23913	+49.99
1395	27526	+36.97
1425	30193	+24.54
1455	31747	+14.71
1485	32544	+7.71
1515	33198	+3.66
1545	33188	+1.51
1575	33227	+0.73
1605	33278	+1.04
1635	33518	+1.38
1665	33565	+1.95
1695	33774	+1.99
1725	34135	+3.30
1755	34244	+3.67
1785	35022	+4.84
1815	35229	+5.93
1845	36179	
1875	36821	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 870 Beta Volts: 1530



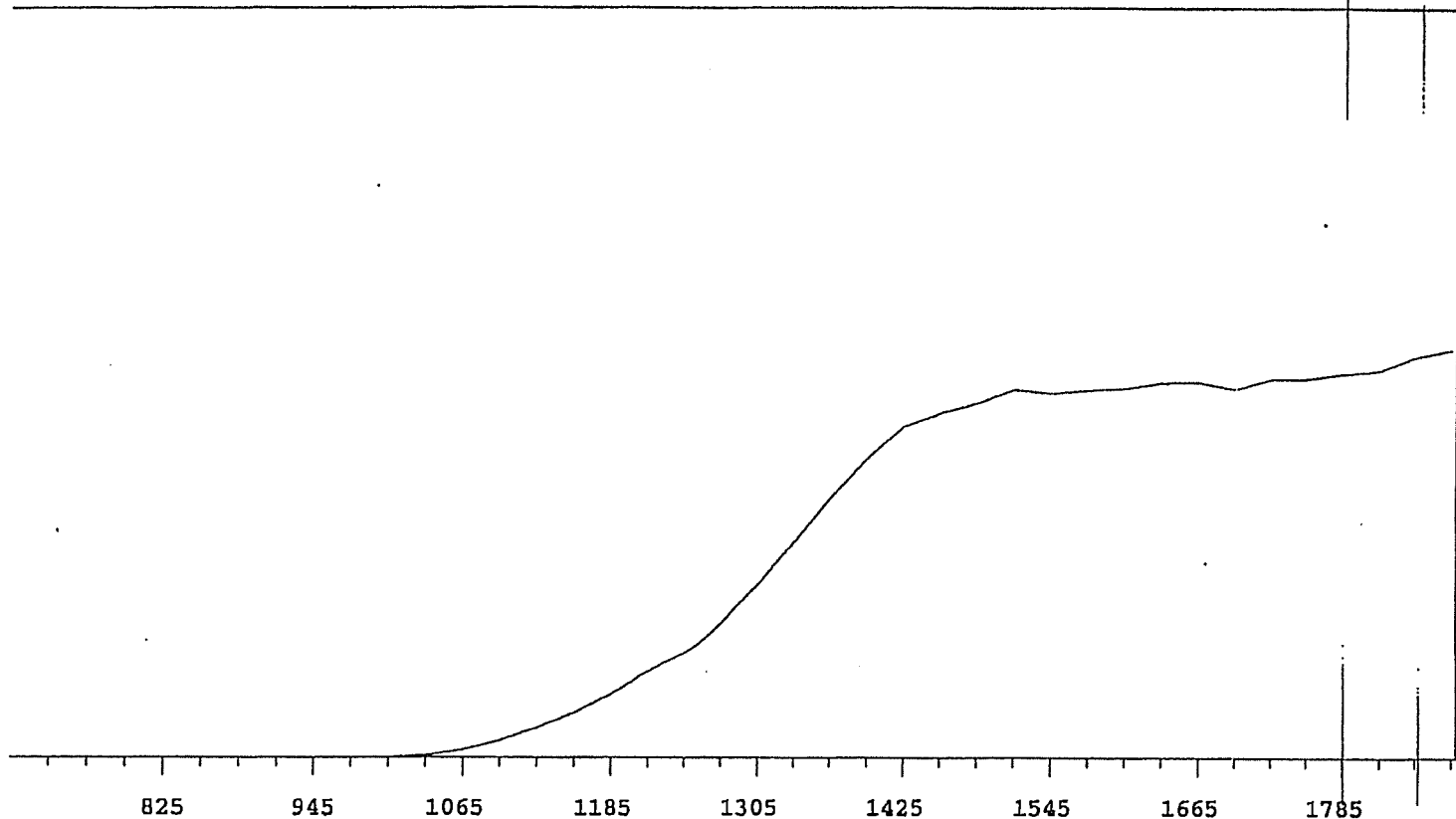
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16723	+68.78
735	0		1335	20749	+60.55
765	0		1365	24686	+48.78
795	0	>100	1395	28343	+35.24
825	0	>100	1425	30657	+24.31
855	0	>100	1455	32208	+15.22
885	0	>100	1485	33662	+9.32
915	0	>100	1515	34098	+4.47
945	0	>100	1545	34326	+2.17
975	4	>100	1575	34133	+1.60
1005	45	>100	1605	34758	+1.41
1035	300	>100	1635	34706	+1.35
1065	836	>100	1665	34769	+0.30
1095	1742	>100	1695	34830	-0.10
1125	2896	>100	1725	34850	+0.90
1155	4198	>100	1755	34613	+2.41
1185	5849	>100	1785	35351	+3.87
1215	7887	+92.20	1815	35849	+4.97
1245	10561	+83.55	1845	36285	
1275	13442	+76.62	1875	36814	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector C 7/1/2009
Alpha Volts: 870 Beta Volts: 1530



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	20192	+70.39
735	0		1335	24524	+60.97
765	0		1365	29650	+48.44
795	0	>100	1395	33904	+35.09
825	0	>100	1425	36549	+22.73
855	0	>100	1455	38217	+13.58
885	1	>100	1485	39628	+7.51
915	1	>100	1515	40035	+3.73
945	2	>100	1545	40020	+1.92
975	3	>100	1575	40236	+2.06
1005	64	>100	1605	40680	+1.62
1035	349	>100	1635	40953	+1.03
1065	970	>100	1665	40643	+0.43
1095	1982	>100	1695	40882	+1.41
1125	3328	>100	1725	40979	+2.18
1155	5012	>100	1755	41654	+2.20
1185	6669	>100	1785	41602	+2.27
1215	9448	+92.67	1815	41935	+4.50
1245	12293	+86.58	1845	42259	
1275	15917	+76.99	1875	44183	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector D 7/1/2009
Alpha Volts: 870 Beta Volts: 1530



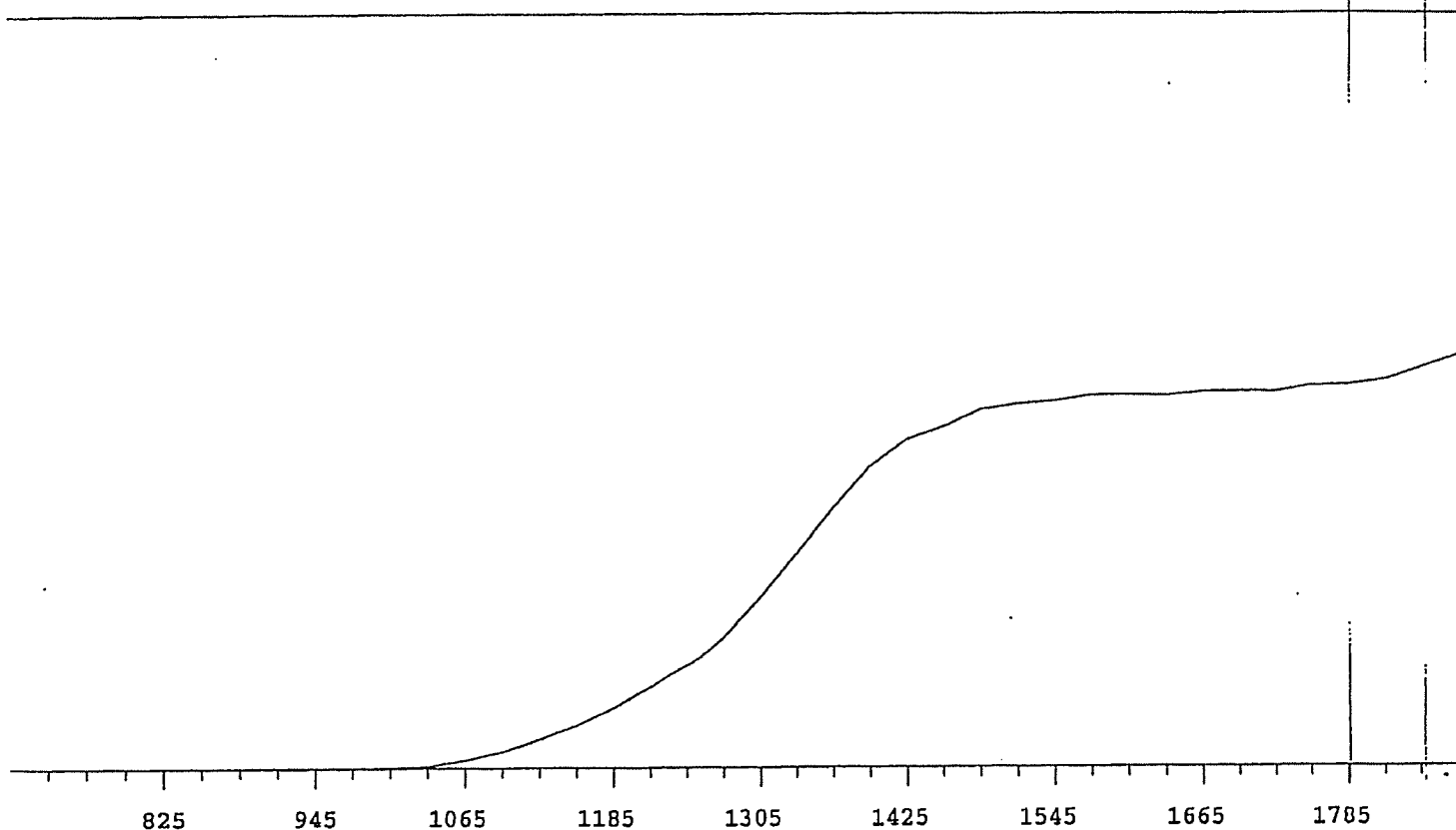
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	5	>100
1005	35	>100
1035	186	>100
1065	618	>100
1095	1280	>100
1125	2141	>100
1155	3268	>100
1185	4659	>100
1215	6343	+90.68
1245	8064	+83.46
1275	10497	+77.03

VOLTS COUNTS %/100 Volts

1305	13319	+70.94
1335	16319	+61.35
1365	19577	+50.27
1395	22498	+36.85
1425	24782	+23.90
1455	25761	+15.37
1485	26486	+8.38
1515	27503	+5.11
1545	27223	+2.67
1575	27453	+1.71
1605	27604	+2.70
1635	28021	+0.78
1665	28059	+1.05
1695	27548	+0.90
1725	28280	+2.16
1755	28290	+3.51
1785	28600	+4.46
1815	28879	+6.35
1845	29913	
1875	30417	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector A 7/1/2009
Alpha Volts: 870 Beta Volts: 1552



VOLTS COUNTS %/100.Volts

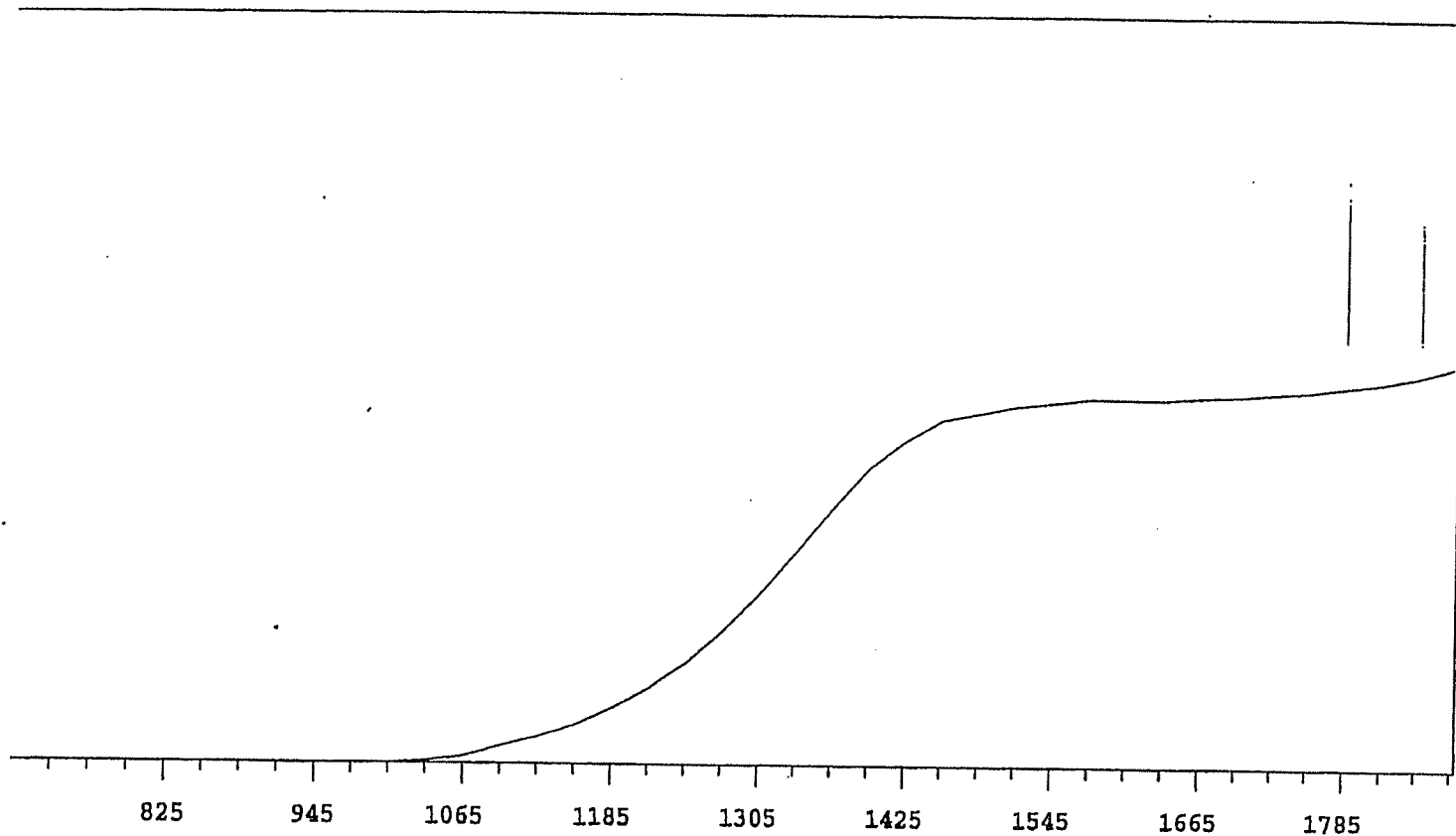
705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	37	>100
1035	198	>100
1065	687	>100
1095	1491	>100
1125	2580	>100
1155	3920	>100
1185	5588	>100
1215	7384	+91.32
1245	9794	+84.81
1275	12572	+79.73

VOLTS COUNTS %/100.Volts

1305	16076	+72.76
1335	19985	+63.85
1365	24102	+50.95
1395	27819	+36.01
1425	30228	+23.86
1455	31343	+14.40
1485	32811	+8.77
1515	33243	+6.10
1545	33518	+3.25
1575	34010	+1.98
1605	34061	+1.59
1635	33973	+0.97
1665	34346	+0.93
1695	34366	+1.72
1725	34341	+1.54
1755	34860	+2.47
1785	34897	+4.50
1815	35377	+6.60
1845	36458	
1875	37630	

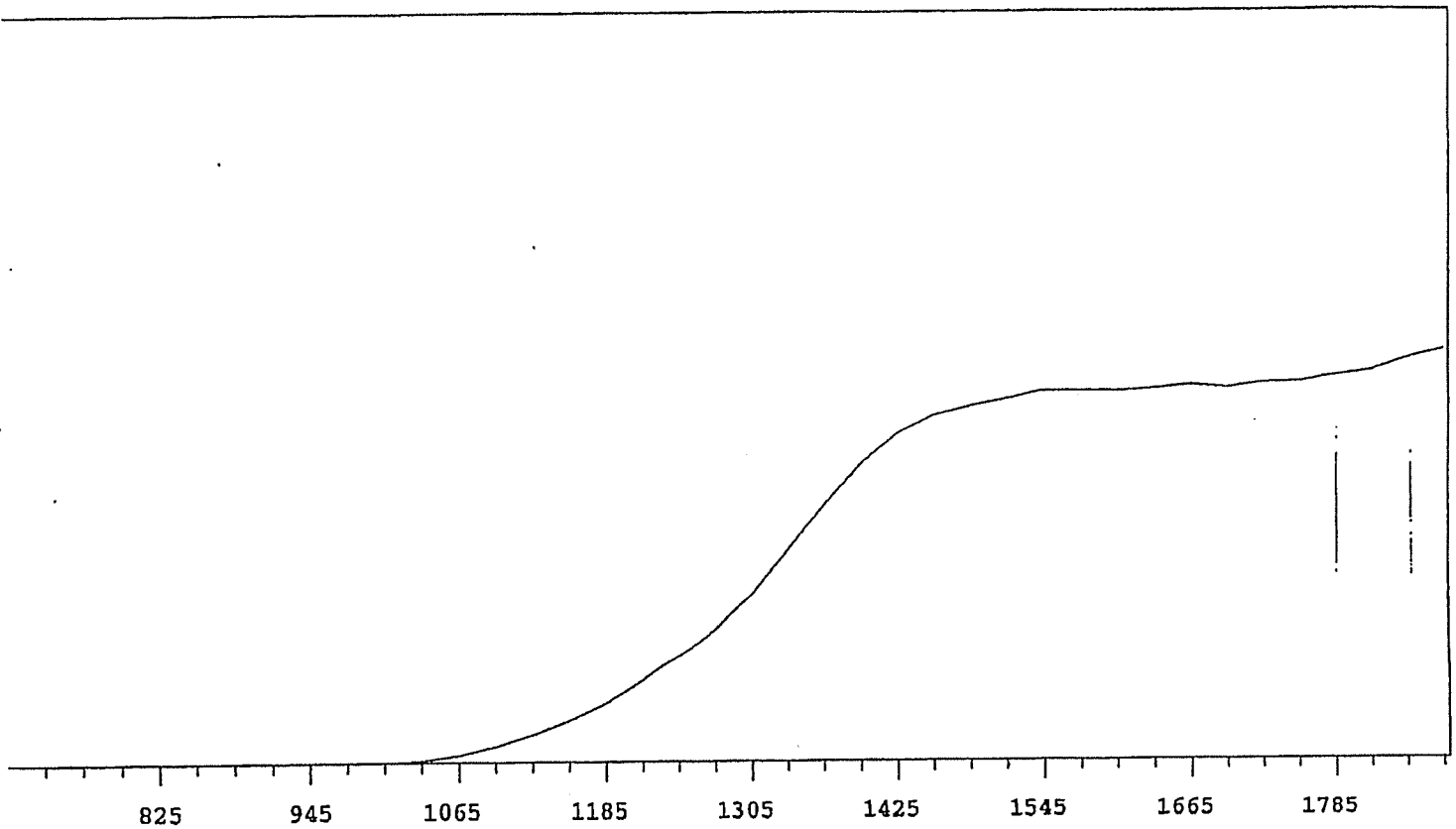
MPC 9600 Plateau Instrument 10 MPC 9604 Detector B 7/1/2009

Alpha Volts: 870 Beta Volts: 1552



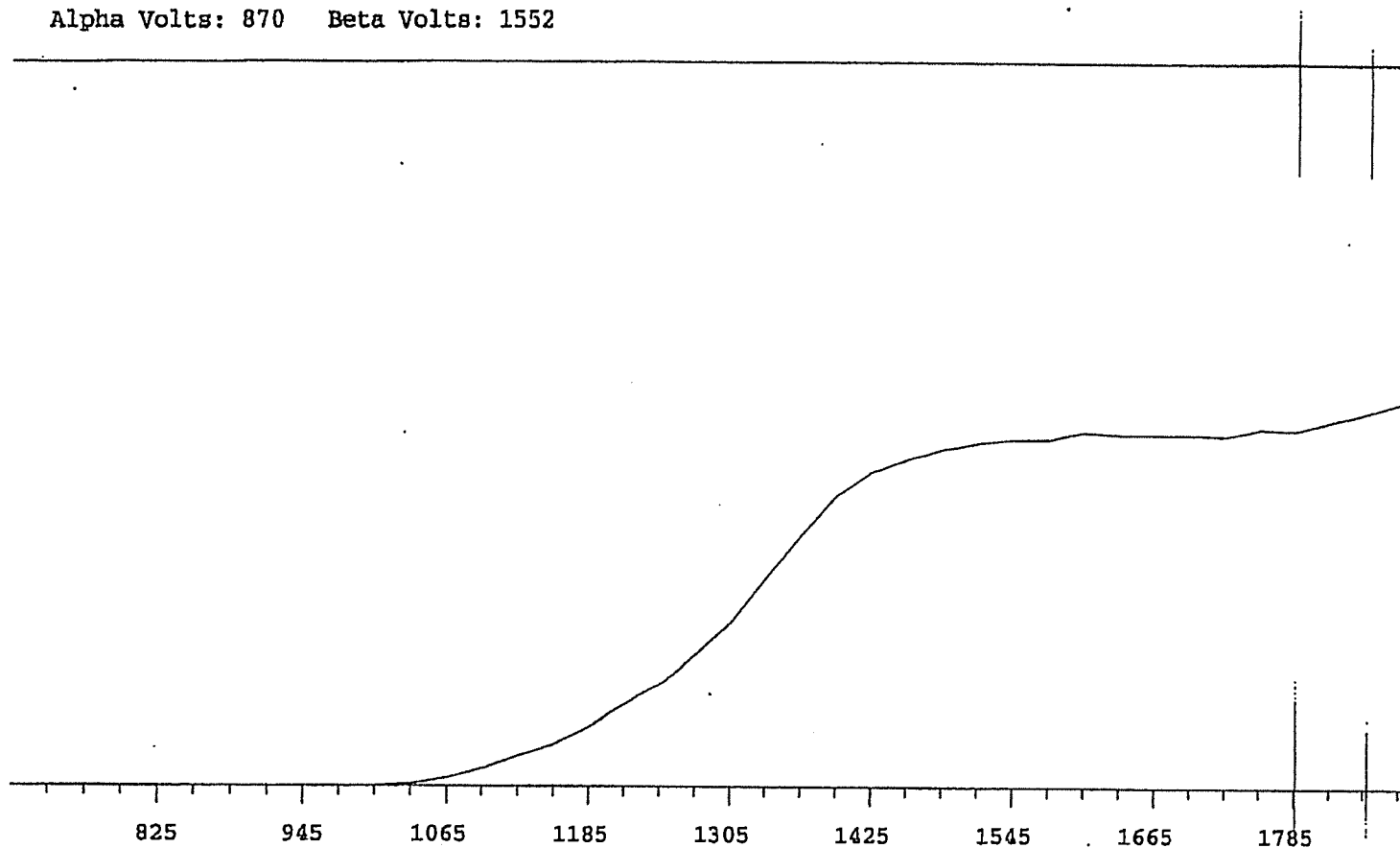
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14469	+71.08
735	0		1335	17904	+63.07
765	0		1365	21677	+51.20
795	0	>100	1395	25027	+38.06
825	0	>100	1425	27237	+24.55
855	0	>100	1455	28914	+14.61
885	0	>100	1485	29480	+8.48
915	0	>100	1515	30075	+5.06
945	1	>100	1545	30374	+3.42
975	7	>100	1575	30738	+1.68
1005	28	>100	1605	30703	+1.08
1035	190	>100	1635	30679	+0.77
1065	597	>100	1665	30902	+1.46
1095	1474	>100	1695	30992	+1.89
1125	2383	>100	1725	31224	+2.40
1155	3680	>100	1755	31397	+3.27
1185	5131	>100	1785	31826	+4.13
1215	6808	+89.95	1815	32236	+5.59
1245	8990	+83.03	1845	32782	
1275	11493	+77.30	1875	33632	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 870 Beta Volts: 1552



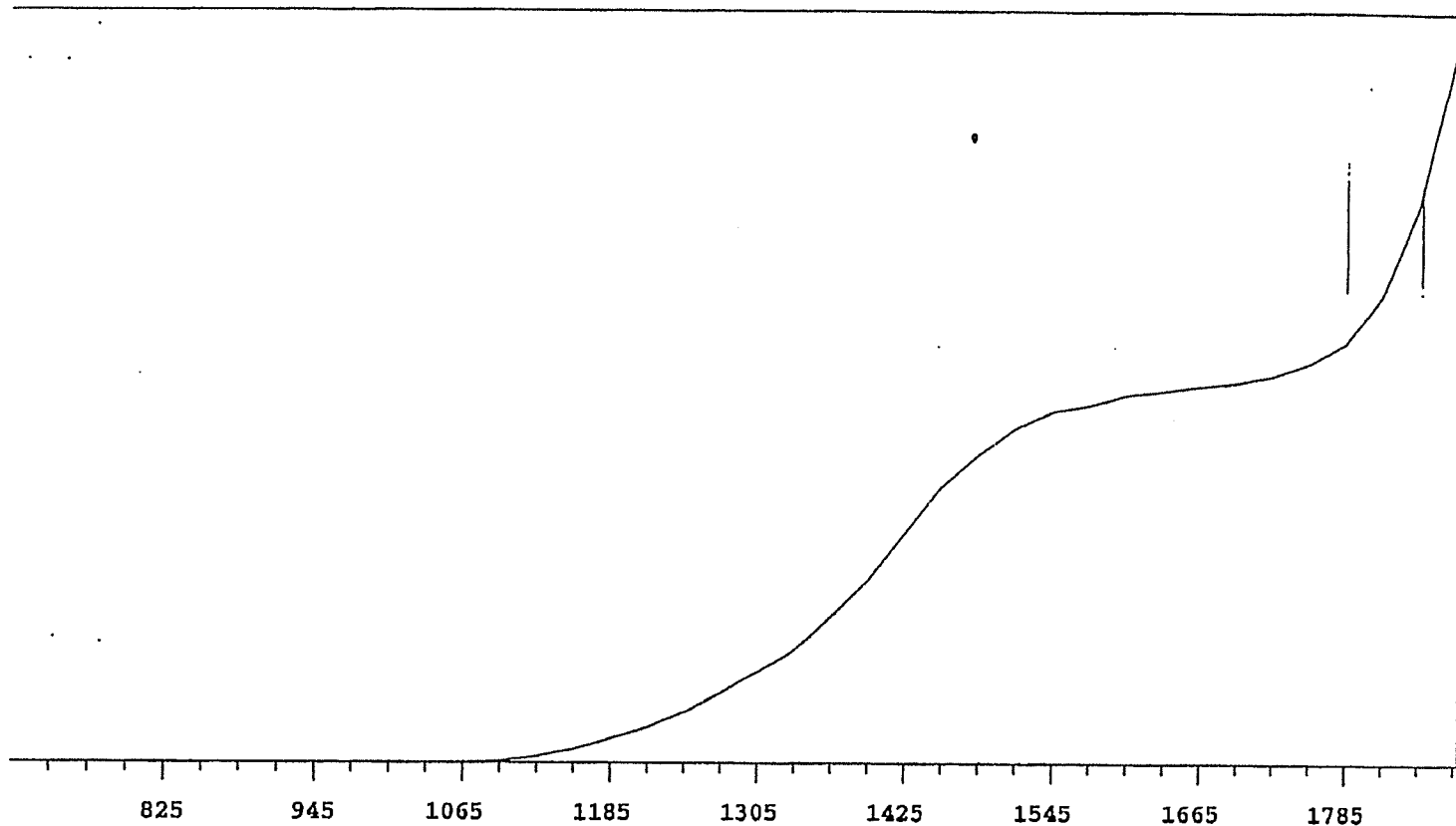
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18051	+71.16
735	0		1335	22586	+62.34
765	0		1365	26973	+51.47
795	0	>100	1395	31137	+38.24
825	0	>100	1425	34321	+25.70
855	0	>100	1455	36267	+15.37
885	1	>100	1485	37197	+9.21
915	0	>100	1515	37851	+5.38
945	2	>100	1545	38622	+3.00
975	2	>100	1575	38600	+1.55
1005	36	>100	1605	38538	+1.03
1035	220	>100	1635	38786	+0.91
1065	780	>100	1665	39129	+1.38
1095	1712	>100	1695	38832	+1.20
1125	2926	>100	1725	39323	+2.00
1155	4297	>100	1755	39390	+3.35
1185	6097	>100	1785	40031	+4.86
1215	8397	+95.11	1815	40466	+6.64
1245	11155	+85.84	1845	41713	
1275	14430	+78.79	1875	42620	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 870 Beta Volts: 1552



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15430	+69.87
735	0		1335	19258	+61.49
765	0		1365	23018	+50.06
795	0	>100	1395	26562	+35.34
825	0	>100	1425	28750	+22.67
855	0	>100	1455	29911	+13.20
885	0	>100	1485	30798	+8.01
915	0	>100	1515	31375	+4.83
945	0	>100	1545	31684	+3.74
975	3	>100	1575	31721	+2.38
1005	49	>100	1605	32398	+1.44
1035	244	>100	1635	32154	+0.64
1065	764	>100	1665	32157	-0.77
1095	1584	>100	1695	32152	+0.99
1125	2677	>100	1725	32029	+1.41
1155	3763	>100	1755	32699	+3.00
1185	5395	>100	1785	32566	+4.71
1215	7350	+93.71	1815	33351	+5.92
1245	8655	+83.52	1845	34031	
1275	12504	+76.82	1875	34941	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector A 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



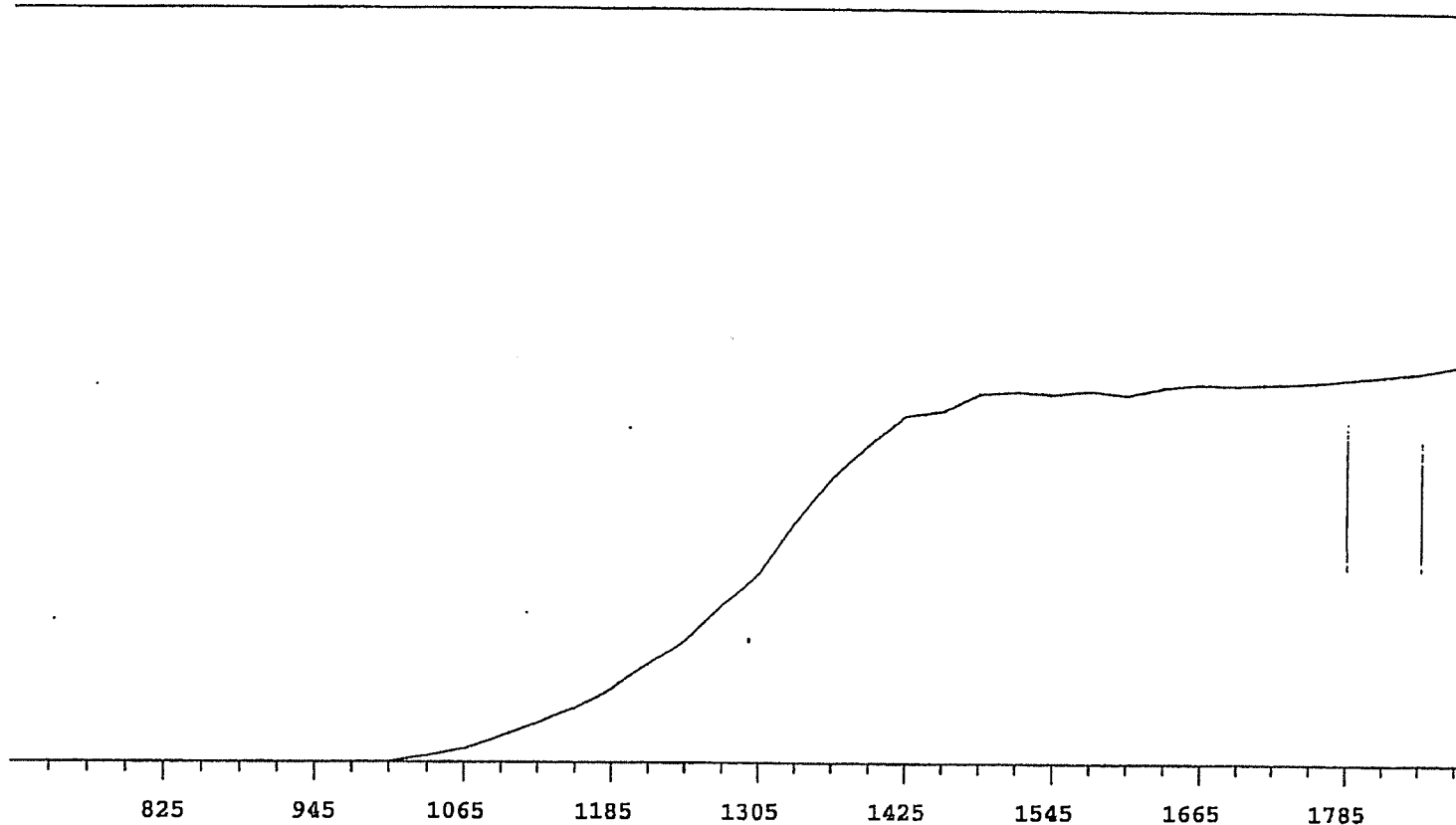
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	+0.00
975	0	>100
1005	0	>100
1035	2	>100
1065	9	>100
1095	61	>100
1125	248	>100
1155	528	>100
1185	882	>100
1215	1270	>100
1245	1786	>100
1275	2478	+93.67

VOLTS COUNTS %/100 Volts

1305	3225	+87.64
1335	4189	+80.15
1365	5428	+75.12
1395	6662	+68.60
1425	8241	+58.14
1455	9857	+46.65
1485	11018	+33.24
1515	11953	+21.01
1545	12538	+13.57
1575	12760	+8.35
1605	13114	+5.84
1635	13258	+4.78
1665	13430	+3.99
1695	13551	+5.46
1725	13771	+8.65
1755	14204	+16.44
1785	14916	+30.03
1815	16579	+48.74
1845	19717	
1875	25029	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector B 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	11	>100
1005	47	>100
1035	280	>100
1065	610	>100
1095	1192	>100
1125	1789	>100
1155	2466	>100
1185	3337	+94.91
1215	4526	+88.85
1245	5885	+78.40
1275	7518	+72.09

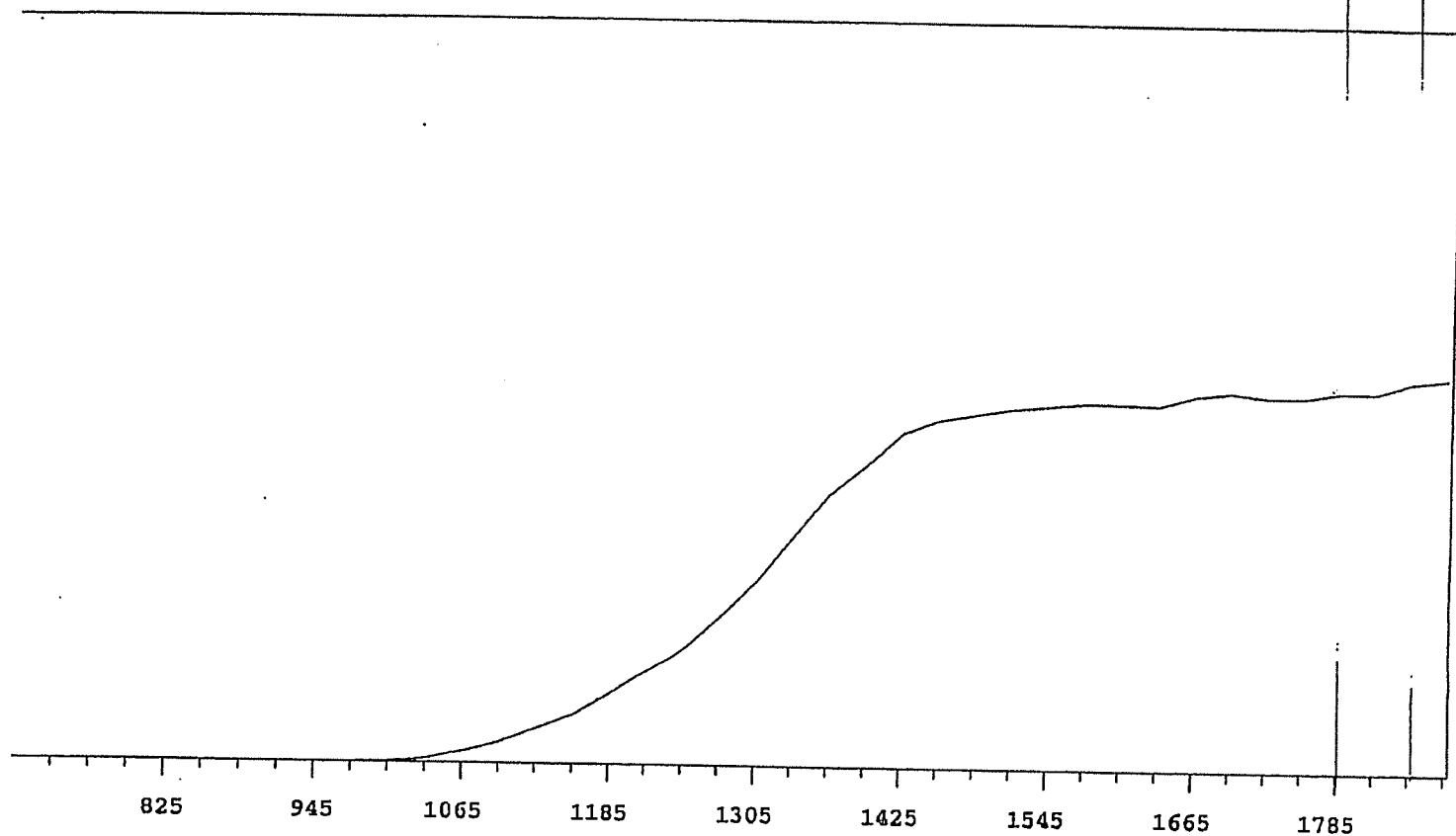
VOLTS COUNTS %/100 Volts

1305	8947	+65.63
1335	11238	+56.58
1365	13246	+46.66
1395	14838	+30.69
1425	16166	+20.11
1455	16396	+11.95
1485	17161	+5.61
1515	17274	+3.59
1545	17144	-0.00
1575	17323	+0.80
1605	17136	+2.21
1635	17484	+1.94
1665	17638	+2.16
1695	17580	+0.85
1725	17655	+1.05
1755	17700	+1.98
1785	17857	+2.38
1815	18006	+3.36
1845	18140	
1875	18468	

Plateau 7/1/09

Instrument 11 MPC 9604 Detector C 7/1/2009

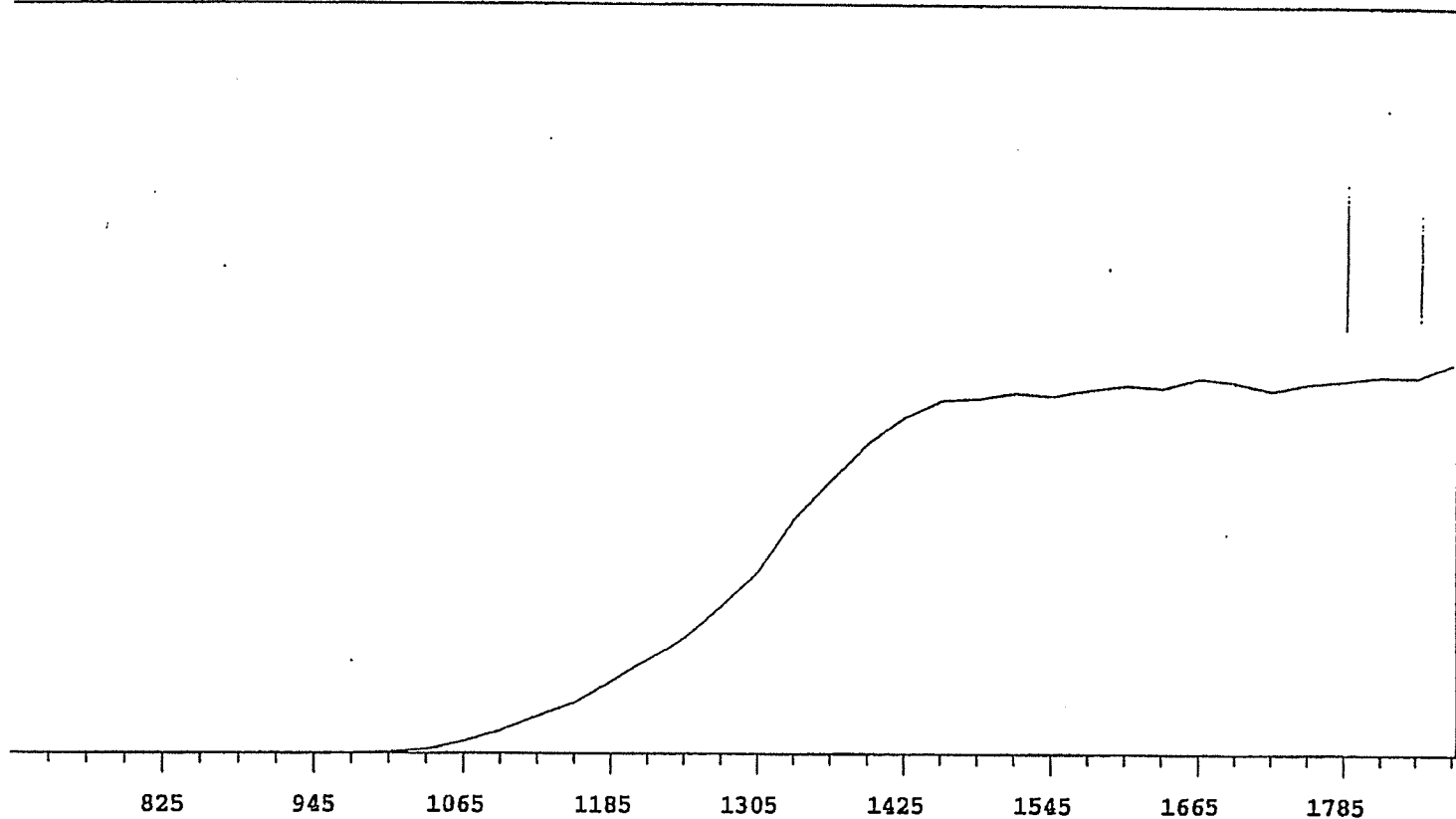
Alpha Volts: 1515 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	0	+0.00
795	0	>100
825	1	+0.00
855	0	>100
885	0	+0.00
915	0	>100
945	1	>100
975	7	>100
1005	46	>100
1035	191	>100
1065	540	>100
1095	957	>100
1125	1597	>100
1155	2217	>100
1185	3154	+98.74
1215	4239	+89.75
1245	5550	+79.98
1275	6980	+73.12

VOLTS	COUNTS	%/100 Volts
1305	8636	+66.44
1335	10593	+56.56
1365	12582	+46.23
1395	13957	+33.45
1425	15443	+21.49
1455	16048	+13.14
1485	16331	+6.45
1515	16603	+4.19
1545	16736	+2.73
1575	16884	+1.11
1605	16875	+1.91
1635	16813	+2.86
1665	17257	+2.60
1695	17425	+1.58
1725	17238	+0.49
1755	17230	+0.63
1785	17482	+3.27
1815	17468	+4.46
1845	17977	
1875	18163	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector D 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



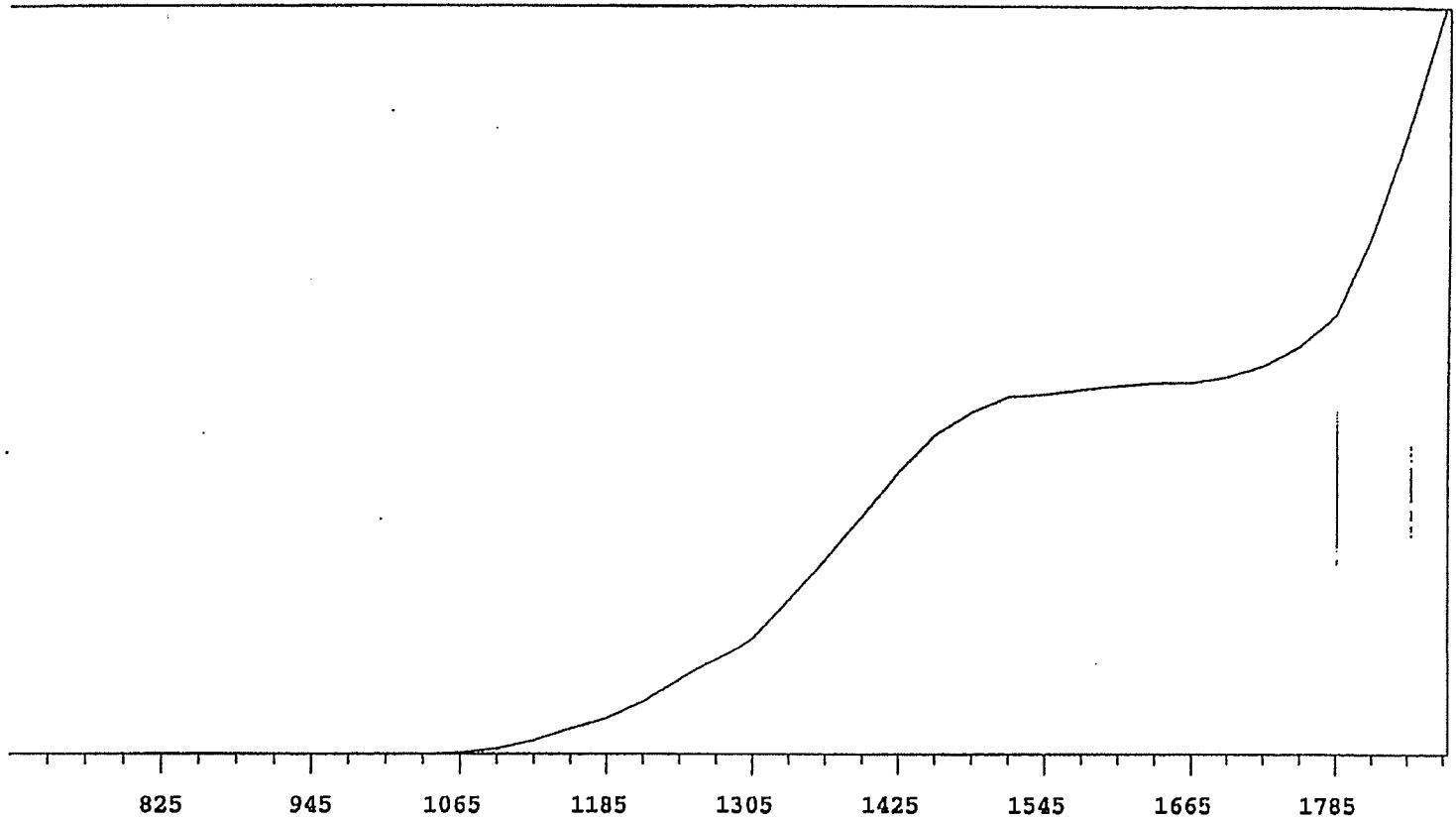
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	+83.33
885	1	+55.56
915	0	>100
945	1	>100
975	9	>100
1005	60	>100
1035	173	>100
1065	480	>100
1095	911	>100
1125	1508	>100
1155	2024	>100
1185	2872	+97.38
1215	3858	+89.30
1245	5070	+78.02
1275	6322	+73.30

VOLTS COUNTS %/100 Volts

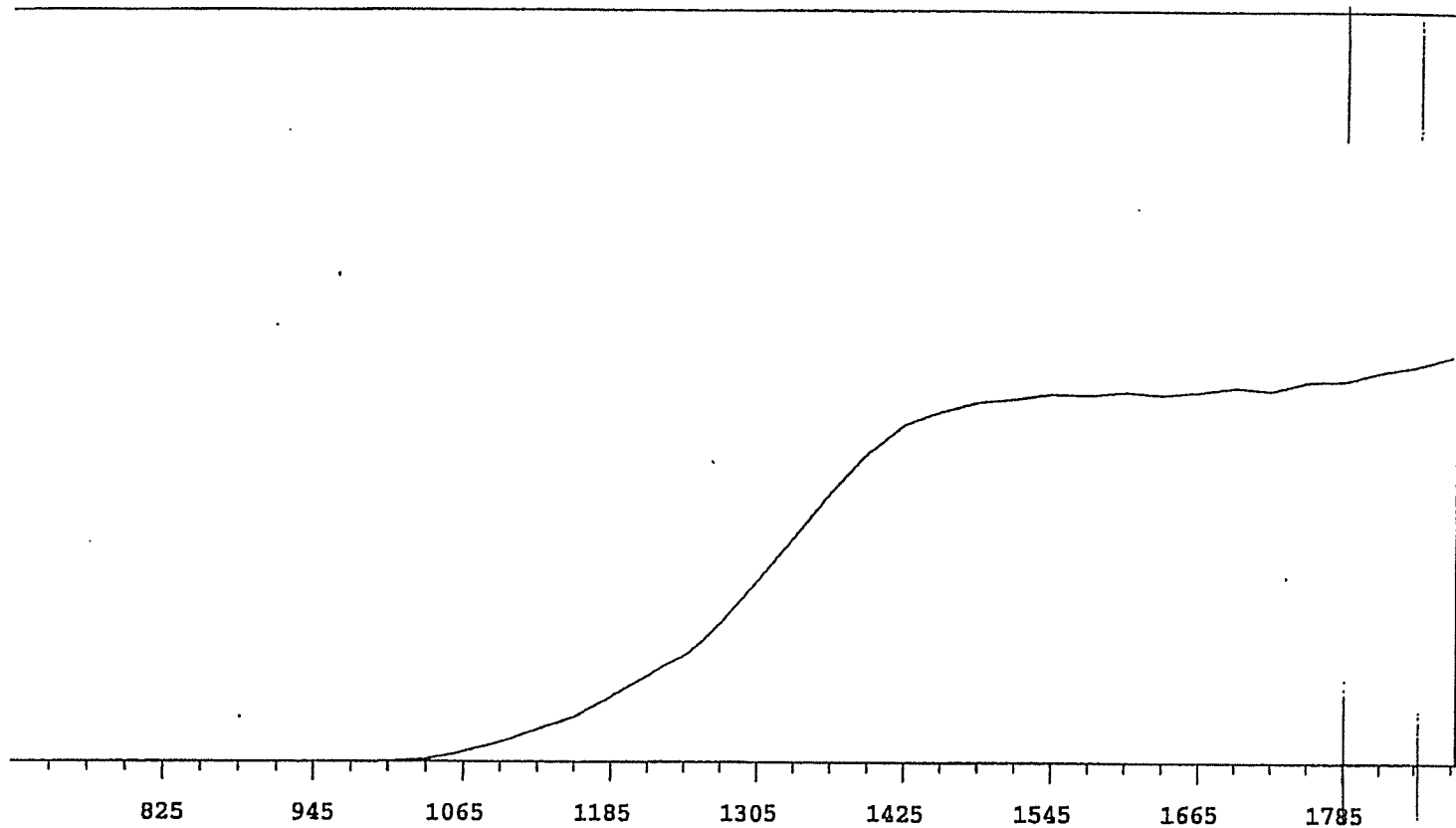
1305	7679	+65.97
1335	9737	+57.57
1365	11301	+45.87
1395	12767	+31.71
1425	13767	+19.90
1455	14399	+10.72
1485	14467	+4.38
1515	14671	+2.12
1545	14576	+2.61
1575	14808	+1.80
1605	14974	+3.15
1635	14872	+1.76
1665	15248	-0.41
1695	15067	-0.27
1725	14784	-0.43
1755	15044	+2.01
1785	15163	+2.82
1815	15333	+3.61
1845	15278	
1875	15817	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



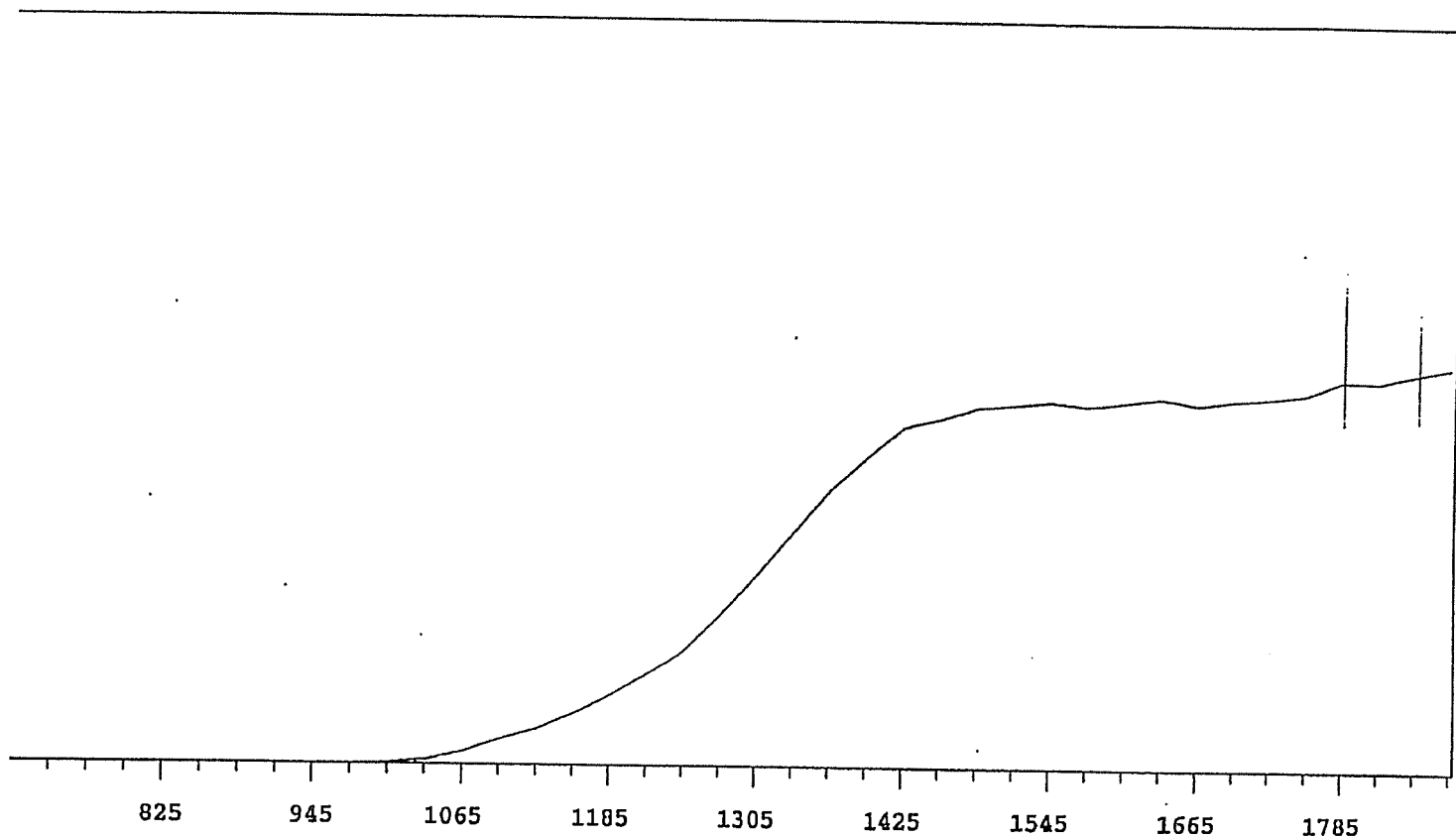
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	6302	+80.03
735	1		1335	8191	+73.78
765	0		1365	10140	+66.18
795	0	>100	1395	12247	+55.83
825	0	>100	1425	14468	+43.92
855	0	>100	1455	16303	+31.28
885	0	>100	1485	17411	+18.64
915	0	>100	1515	18150	+9.87
945	0	>100	1545	18275	+5.30
975	1	>100	1575	18496	+3.16
1005	3	>100	1605	18685	+2.66
1035	17	>100	1635	18820	+2.63
1065	84	>100	1665	18855	+4.16
1095	267	>100	1695	19152	+7.70
1125	709	>100	1725	19706	+13.90
1155	1299	>100	1755	20640	+26.51
1185	1813	>100	1785	22308	+40.92
1215	2638	>100	1815	26460	+51.46
1245	3777	+96.47	1845	31616	
1275	4915	+87.98	1875	37348	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 . Beta Volts: 1515



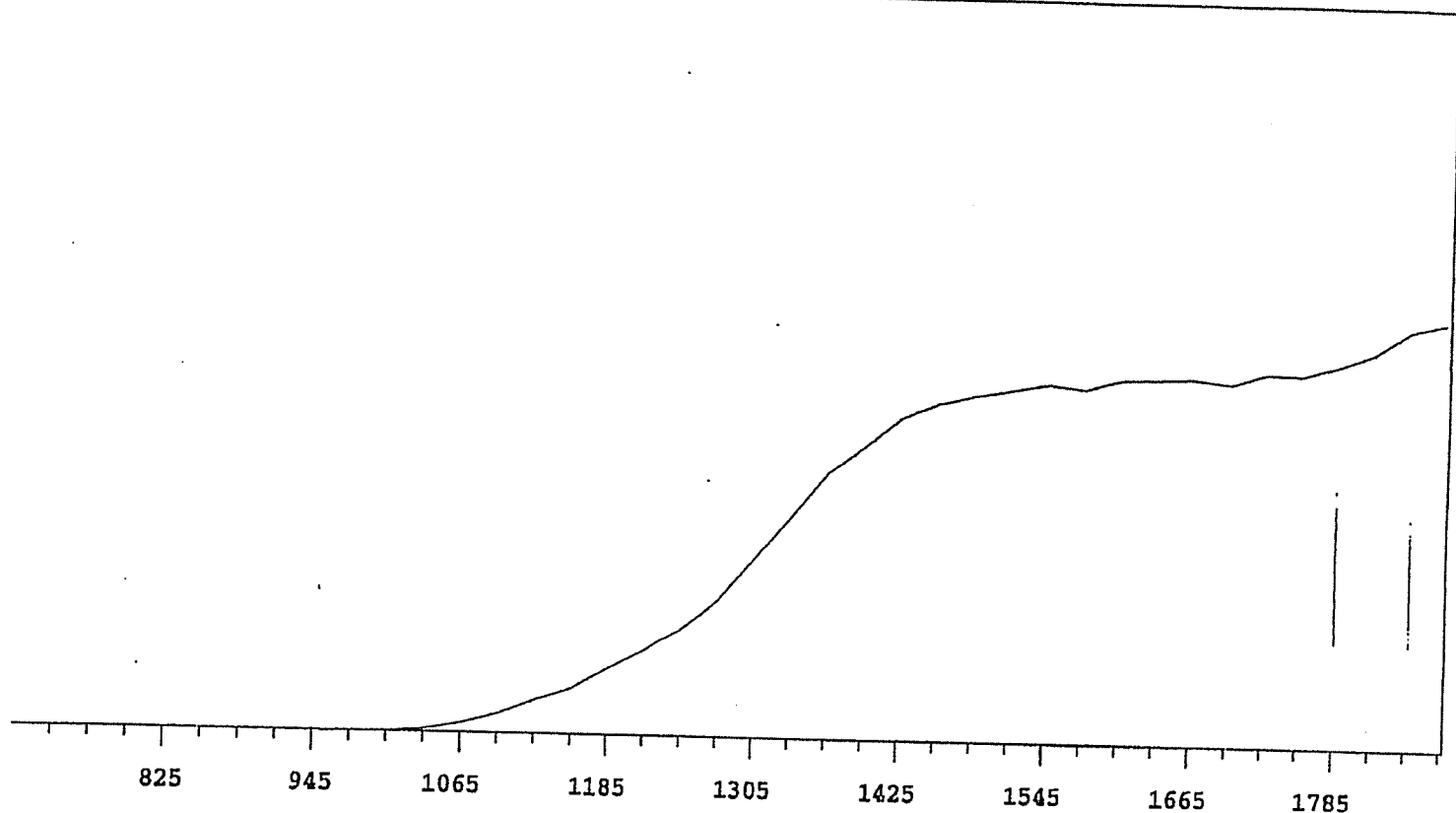
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10207	+70.42
735	0		1335	12473	+60.75
765	0		1365	14900	+48.87
795	0	>100	1395	17101	+35.36
825	0	>100	1425	18643	+22.53
855	1	+83.33	1455	19350	+12.34
885	1	-83.33	1485	19848	+6.68
915	0	-55.56	1515	20014	+3.51
945	0	>100	1545	20278	+2.03
975	1	>100	1575	20186	+0.80
1005	43	>100	1605	20375	+0.32
1035	165	>100	1635	20209	+1.36
1065	557	>100	1665	20364	+0.83
1095	1055	>100	1695	20607	+2.43
1125	1775	>100	1725	20429	+2.51
1155	2470	>100	1755	20924	+3.64
1185	3617	+98.46	1785	20984	+5.11
1215	4757	+90.95	1815	21470	+5.63
1245	6186	+83.59	1845	21773	
1275	8021	+77.85	1875	22346	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	9543	+67.01
735	0		1335	11617	+56.47
765	0		1365	13791	+45.47
795	0	>100	1395	15387	+31.66
825	0	>100	1425	16819	+20.02
855	0	>100	1455	17210	+11.63
885	1	+0.00	1485	17742	+6.05
915	0	>100	1515	17892	+3.04
945	0	>100	1545	18070	+1.09
975	7	>100	1575	17856	+1.43
1005	52	>100	1605	18054	+0.42
1035	214	>100	1635	18287	+1.06
1065	590	>100	1665	17969	+0.78
1095	1201	>100	1695	18187	+1.48
1125	1759	>100	1725	18317	+4.89
1155	2569	>100	1755	18518	+4.76
1185	3440	+95.13	1785	19156	+5.18
1215	4583	+87.74	1815	19100	+5.18
1245	5985	+81.67	1845	19496	
1275	7682	+74.54	1875	19842	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



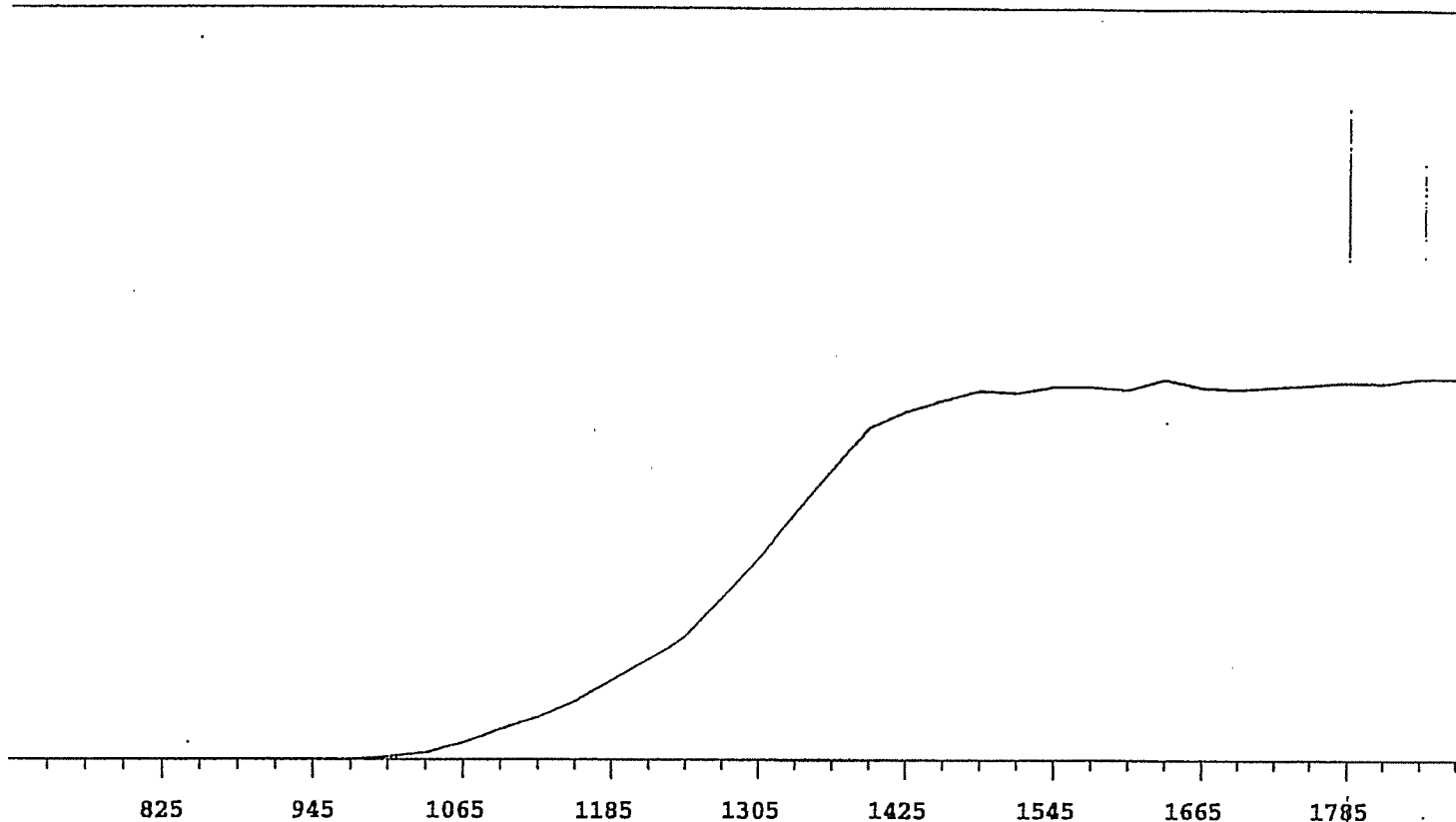
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	26	>100
1035	169	>100
1065	483	>100
1095	955	>100
1125	1639	>100
1155	2233	>100
1185	3262	+98.61
1215	4306	+89.77
1245	5662	+82.36
1275	7113	+76.36

VOLTS COUNTS %/100 Volts

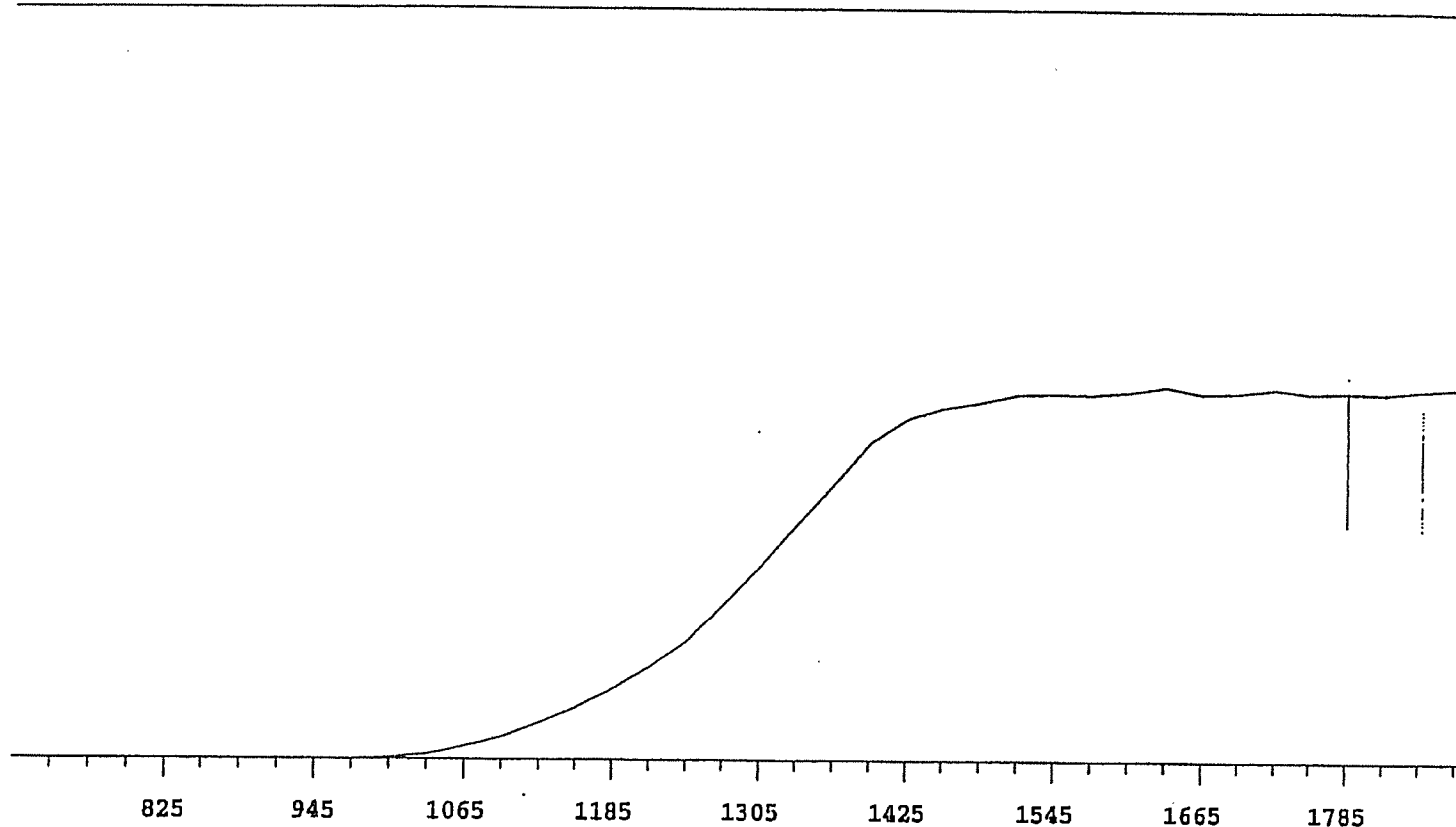
1305	9144	+69.92
1335	11120	+58.43
1365	13399	+45.40
1395	14711	+32.57
1425	16134	+20.69
1455	16805	+13.46
1485	17209	+7.90
1515	17500	+4.31
1545	17812	+3.48
1575	17629	+2.80
1605	18066	+2.23
1635	18122	+1.44
1665	18166	+1.20
1695	17967	+1.60
1725	18469	+3.41
1755	18409	+6.35
1785	18884	+9.47
1815	19535	+11.98
1845	20630	
1875	21076	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9209	+64.55
735	1		1335	11200	+55.94
765	0	+55.56	1365	13123	+43.27
795	2	>100	1395	14957	+29.04
825	0	+0.00	1425	15658	+17.41
855	0	>100	1455	16123	+8.01
885	1	>100	1485	16530	+4.92
915	0	>100	1515	16437	+2.71
945	1	>100	1545	16704	+0.83
975	14	>100	1575	16707	+2.14
1005	104	>100	1605	16602	+0.55
1035	281	>100	1635	17024	-0.28
1065	720	>100	1665	16684	-0.42
1095	1302	>100	1695	16597	-0.85
1125	1834	>100	1725	16711	+1.27
1155	2544	>100	1755	16796	+1.51
1185	3485	+92.28	1785	16903	+1.57
1215	4624	+85.50	1815	16880	+1.46
1245	5878	+77.82	1845	17066	
1275	7515	+71.49	1875	17085	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515

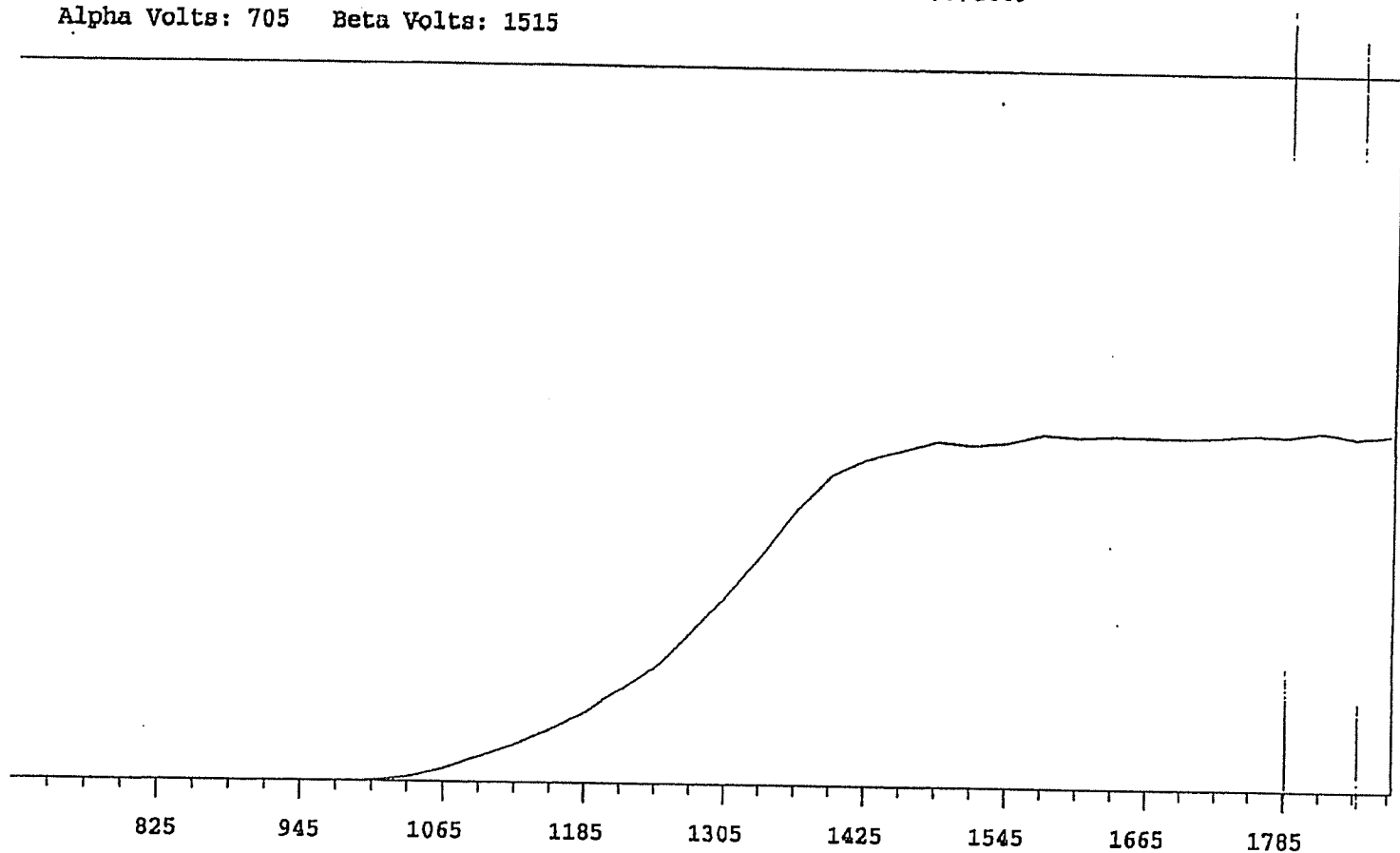


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9666	+64.39
735	0		1335	11722	+55.91
765	0		1365	13680	+44.91
795	0	>100	1395	15677	+31.56
825	0	>100	1425	16786	+19.46
855	0	>100	1455	17283	+10.57
885	0	>100	1485	17608	+5.95
915	1	>100	1515	17972	+3.32
945	0	>100	1545	18006	+1.84
975	4	>100	1575	17970	+1.58
1005	70	>100	1605	18104	+0.74
1035	257	>100	1635	18351	+0.24
1065	648	>100	1665	18016	+0.16
1095	1116	>100	1695	18080	-0.63
1125	1784	>100	1725	18283	+0.29
1155	2560	>100	1755	18047	-0.47
1185	3531	+96.11	1785	18110	-0.32
1215	4568	+89.22	1815	18040	+1.17
1245	6137	+81.65	1845	18200	
1275	7855	+74.42	1875	18320	

Plateau 7/1/09

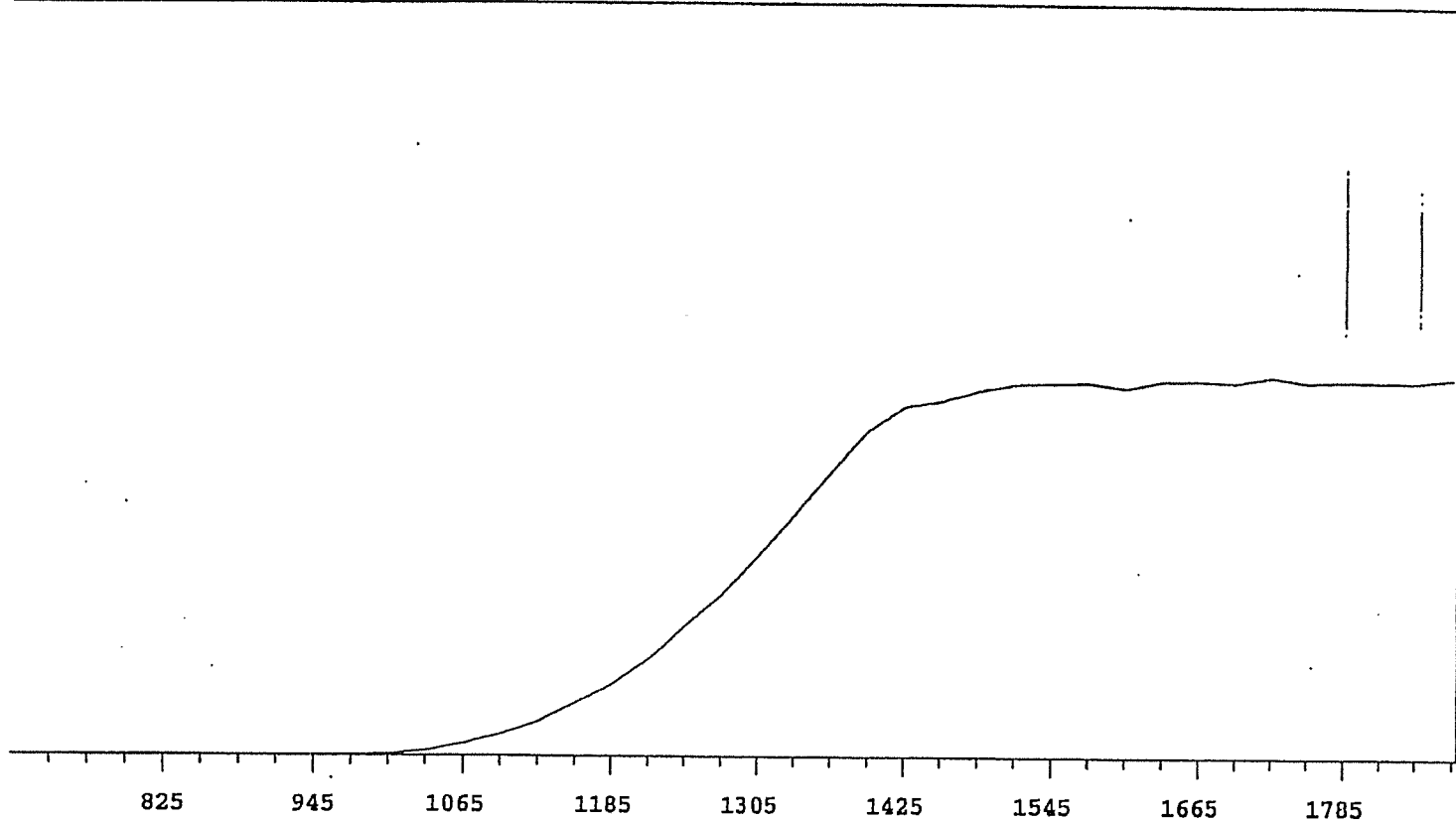
Instrument 13 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1515



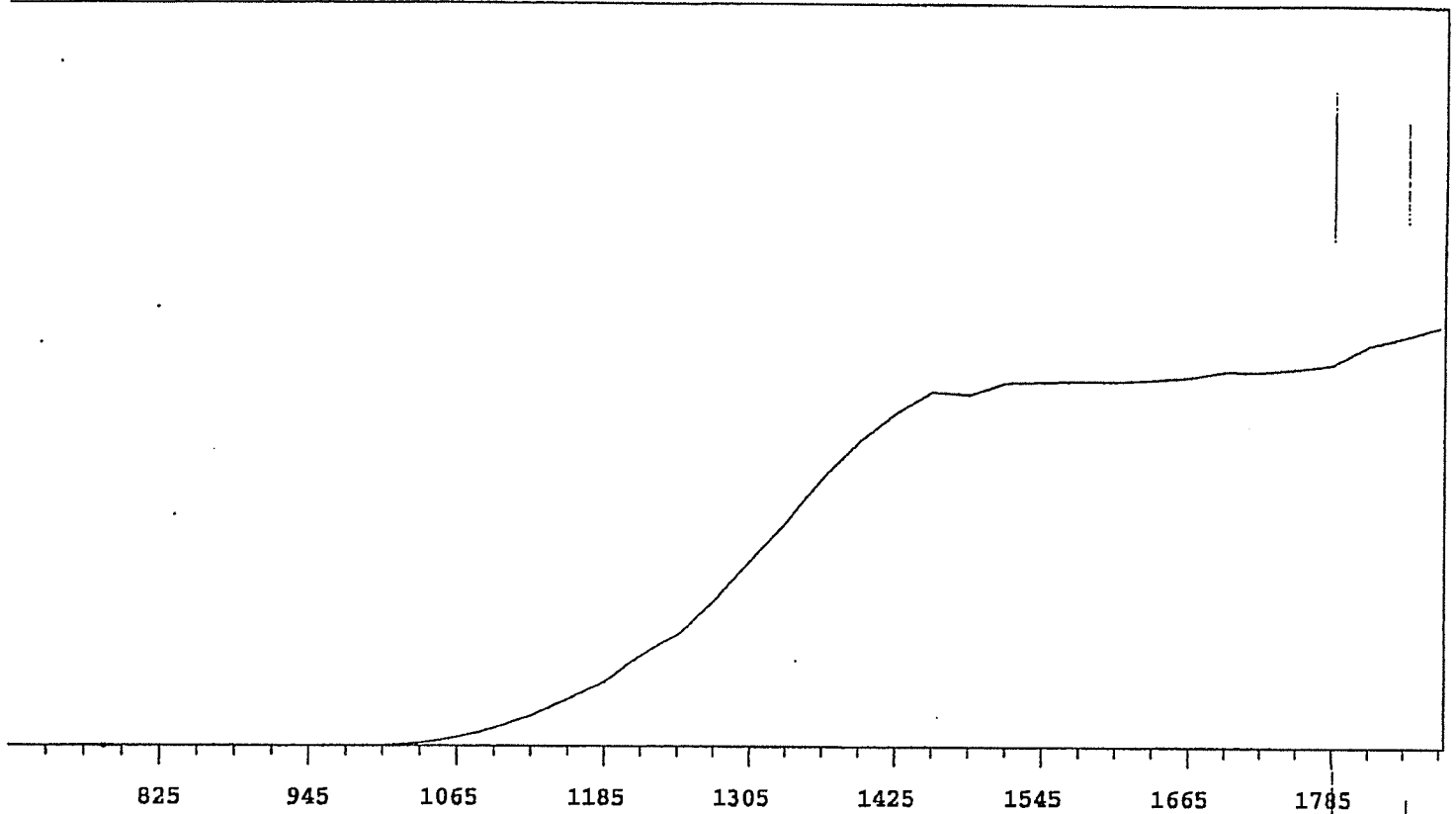
VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	93	>100
1035	325	>100
1065	834	>100
1095	1525	>100
1125	2318	>100
1155	3233	>100
1185	4357	+92.07
1215	5755	+85.64
1245	7438	+78.35
1275	9463	+70.89

VOLTS	COUNTS	%/100 Volts
1305	11573	+64.95
1335	13929	+56.47
1365	16726	+43.82
1395	18834	+29.38
1425	19743	+16.84
1455	20314	+7.95
1485	20860	+4.16
1515	20670	+3.23
1545	20844	+2.09
1575	21330	+2.48
1605	21188	+1.16
1635	21280	-0.32
1665	21237	+0.08
1695	21202	+0.42
1725	21254	+0.60
1755	21406	+1.41
1785	21326	+0.42
1815	21619	+0.16
1845	21282	
1875	21478	



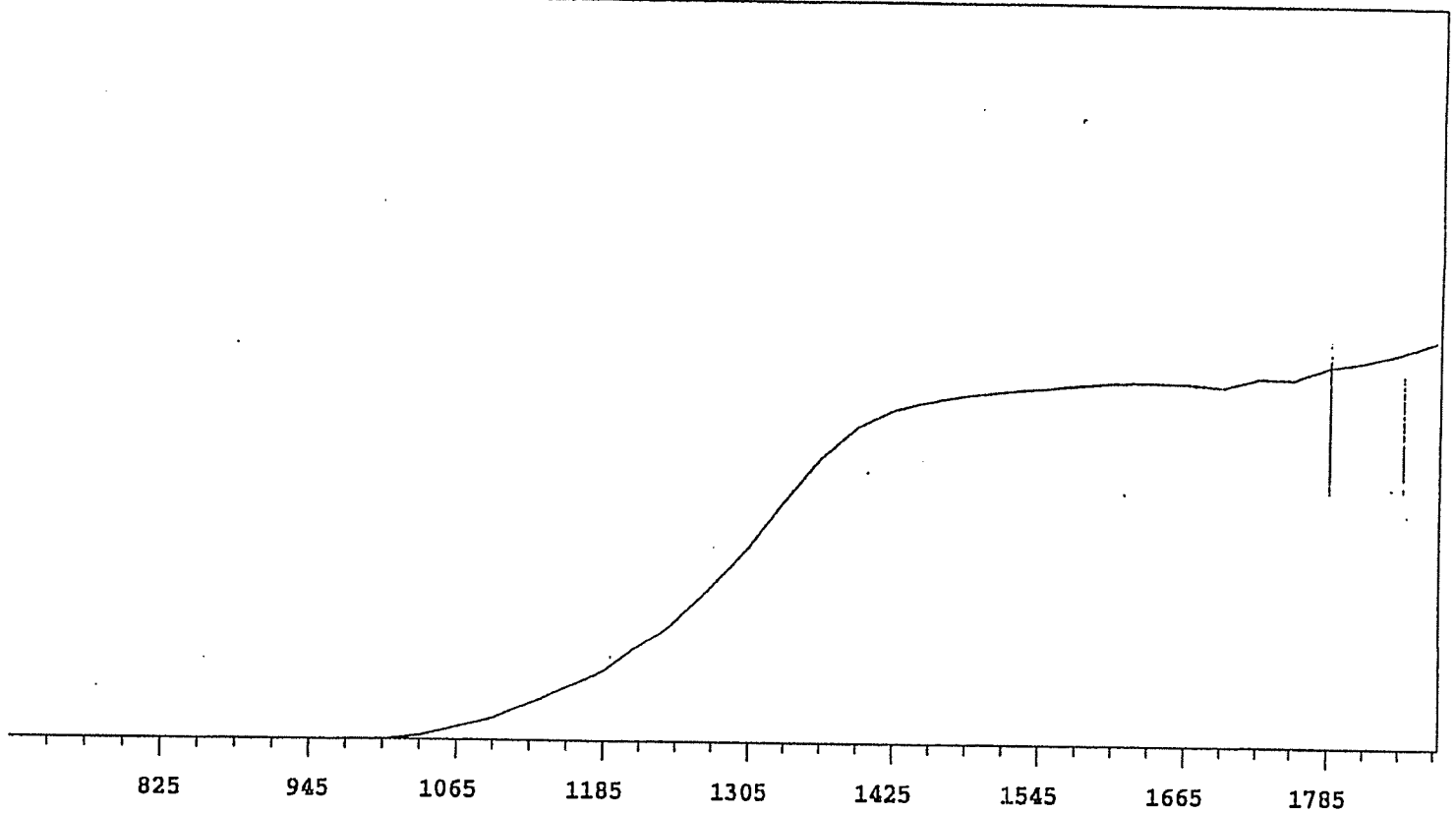
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	7524	+61.93
735	0		1335	9002	+55.36
765	0		1365	10542	+44.70
795	0	>100	1395	12064	+31.21
825	0	>100	1425	12981	+19.20
855	0	>100	1455	13192	+10.41
885	0	>100	1485	13570	+5.93
915	0	>100	1515	13820	+4.08
945	0	>100	1545	13866	+0.75
975	9	>100	1575	13880	+0.21
1005	58	>100	1605	13695	+0.59
1035	228	>100	1635	13950	+0.77
1065	544	>100	1665	13954	+1.92
1095	936	>100	1695	13911	+0.19
1125	1468	>100	1725	14116	+0.02
1155	2110	>100	1755	13908	-0.24
1185	2770	+94.71	1785	13960	-0.81
1215	3670	+85.91	1815	13939	+0.71
1245	4937	+79.46	1845	13931	
1275	6066	+70.79	1875	14071	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector A 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



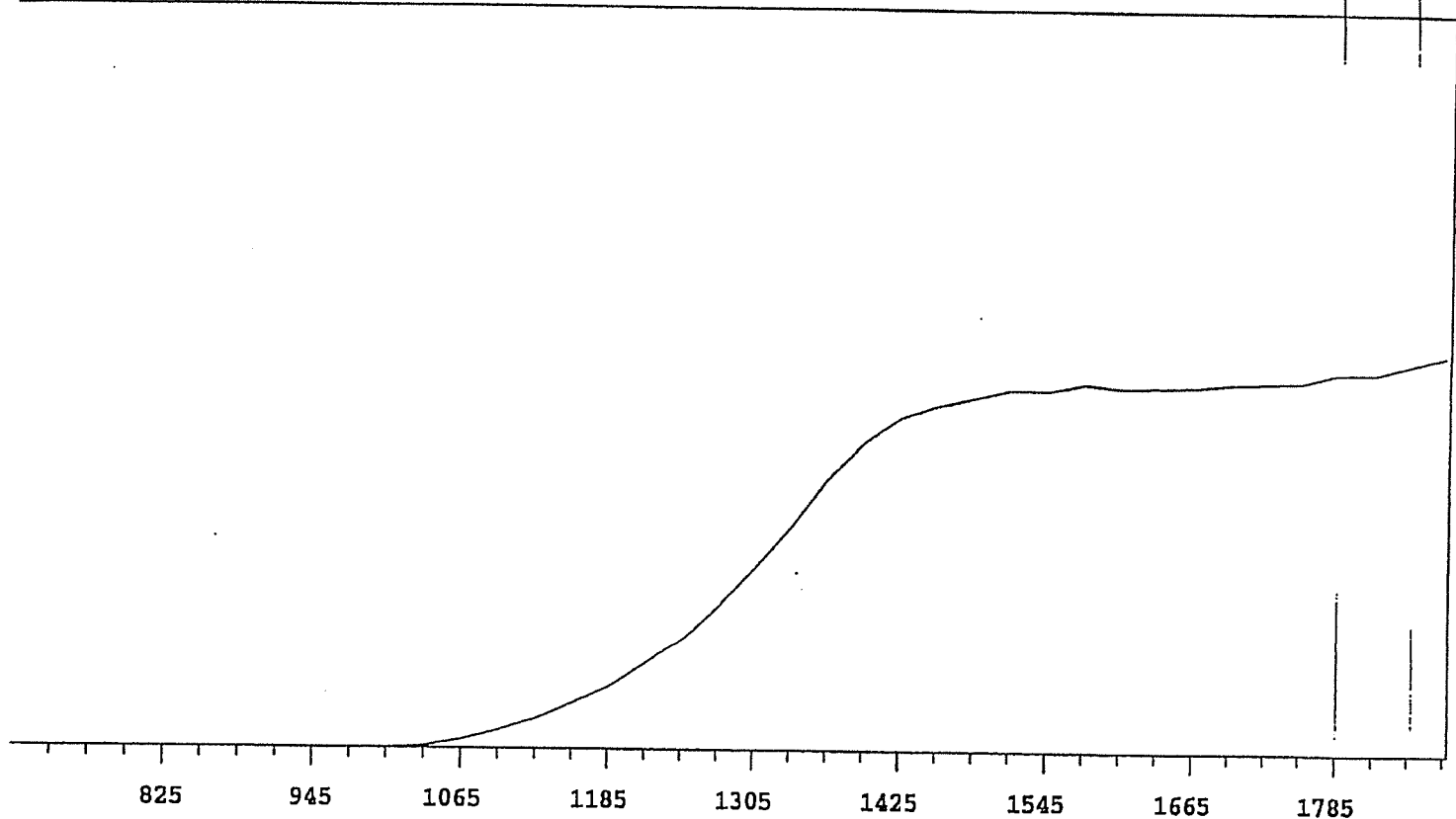
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8778	+67.49
735	0		1335	10502	+57.68
765	0		1365	12516	+46.36
795	0	>100	1395	14215	+35.88
825	0	>100	1425	15472	+22.01
855	0	>100	1455	16469	+12.99
885	1	+0.00	1485	16342	+6.70
915	0	>100	1515	16874	+3.07
945	0	>100	1545	16918	+2.53
975	0	>100	1575	16950	+0.58
1005	18	>100	1605	16943	+0.95
1035	137	>100	1635	17008	+2.13
1065	430	>100	1665	17130	+2.45
1095	865	>100	1695	17403	+2.43
1125	1444	>100	1725	17377	+2.43
1155	2151	>100	1755	17515	+4.88
1185	2981	>100	1785	17710	+7.54
1215	4168	+92.14	1815	18533	+9.04
1245	5377	+84.73	1845	18905	
1275	6924	+74.92	1875	19415	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



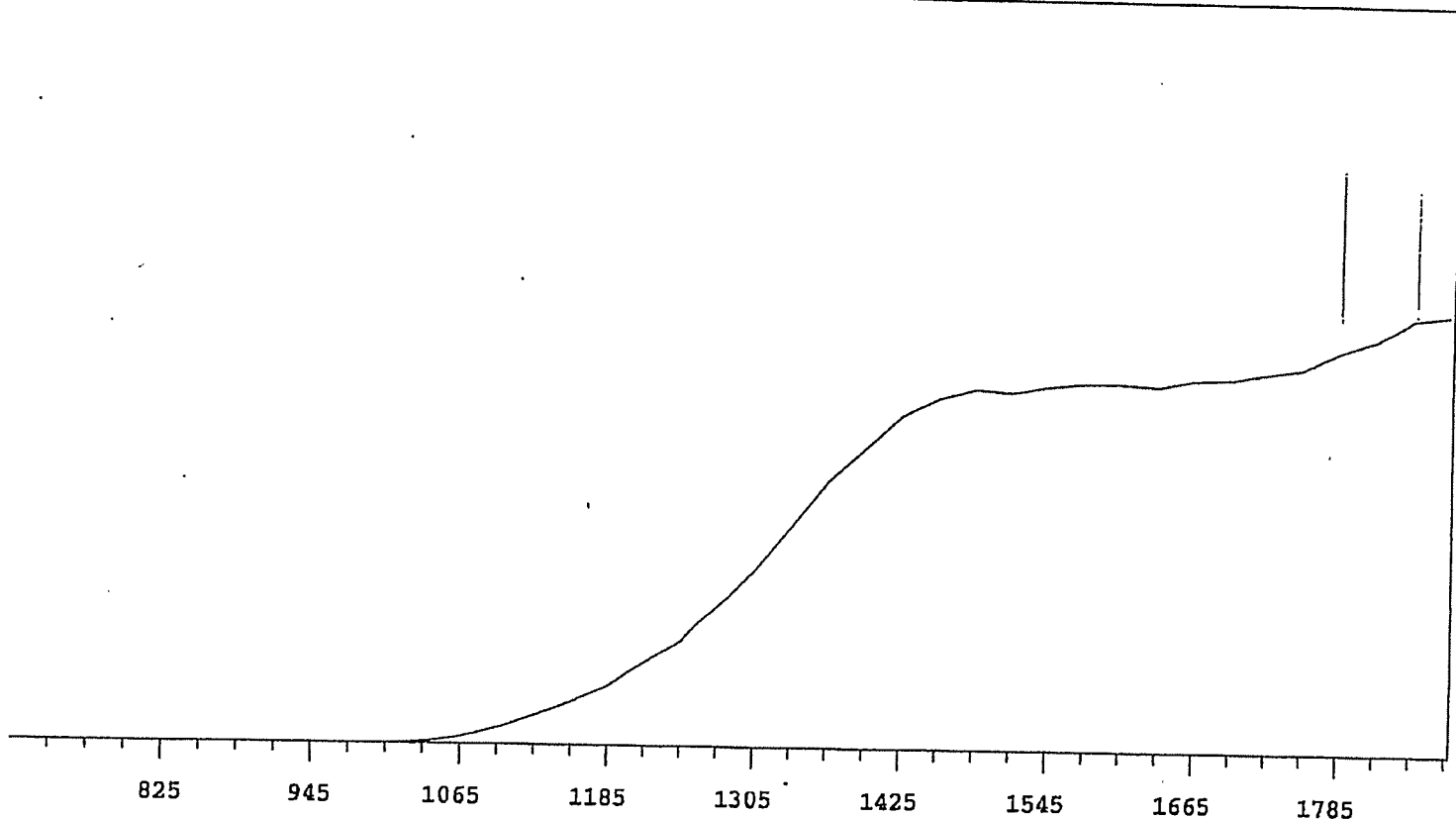
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8797	+65.44
735	0		1335	10726	+54.47
765	0		1365	12570	+41.11
795	0	>100	1395	13917	+26.79
825	0	>100	1425	14687	+15.44
855	1	+0.00	1455	15048	+8.47
885	0	>100	1485	15318	+5.00
915	0	>100	1515	15494	+3.76
945	0	>100	1545	15606	+3.04
975	3	>100	1575	15776	+2.35
1005	40	>100	1605	15889	+1.44
1035	210	>100	1635	15907	-0.16
1065	590	>100	1665	15881	+0.64
1095	983	>100	1695	15741	+1.21
1125	1645	>100	1725	16124	+3.63
1155	2342	>100	1755	16076	+5.41
1185	3045	+96.43	1785	16588	+5.79
1215	4201	+90.42	1815	16830	+7.53
1245	5579	+83.64	1845	17185	
1275	7121	+74.44	1875	17682	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10118	+69.76
735	0		1335	12269	+59.65
765	0		1365	14810	+47.35
795	0	>100	1395	16773	+33.46
825	0	>100	1425	18104	+20.13
855	0	>100	1455	18720	+11.98
885	1	+0.00	1485	19122	+6.50
915	0	>100	1515	19580	+4.77
945	0	>100	1545	19527	+2.48
975	2	>100	1575	19902	+0.81
1005	21	>100	1605	19690	+0.53
1035	132	>100	1635	19739	+0.23
1065	491	>100	1665	19765	+1.29
1095	1036	>100	1695	19932	+1.40
1125	1698	>100	1725	19976	+2.72
1155	2517	>100	1755	20051	+2.92
1185	3468	>100	1785	20523	+4.26
1215	4721	+91.83	1815	20542	+5.57
1245	6175	+85.13	1845	21035	
1275	8025	+76.82	1875	21528	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8095	+71.16
735	0		1335	10052	+58.38
765	0		1365	11990	+47.92
795	0	>100	1395	13400	+35.01
825	0	>100	1425	14808	+23.58
855	0	>100	1455	15554	+13.45
885	0	>100	1485	15987	+6.39
915	0	>100	1515	15861	+3.45
945	0	>100	1545	16156	+2.18
975	1	>100	1575	16297	+1.72
1005	14	>100	1605	16297	+1.33
1035	130	>100	1635	16208	+1.62
1065	363	>100	1665	16526	+2.92
1095	785	>100	1695	16581	+3.94
1125	1357	>100	1725	16832	+5.91
1155	1996	>100	1755	17039	+8.68
1185	2735	+99.45	1785	17800	+11.53
1215	3785	+94.20	1815	18351	+11.46
1245	4857	+86.43	1845	19265	
1275	6571	+78.80	1875	19468	

Standardization of Strontium Carrier 2338630

v1.2.1

Analyst	BXF1

Standard Information	
Isotope	Strontium
Serial Number	2338630
Amount of Std. (mL)	1.0
Standard Prepared	11/25/2015

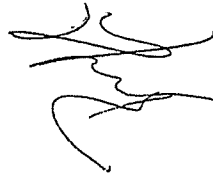
Parent Information	
Parent Serial #	2130145.4
Parent Exp. Date	11/25/2017

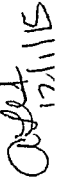
Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0200	0.0290	0.0478	0.0188	18.80	18.43
2	1.0500	0.0287	0.0474	0.0187	18.70	17.81
3	1.0200	0.0286	0.0472	0.0186	18.60	18.24
4	1.0100	0.0268	0.0454	0.0186	18.60	18.42

Mean Value (mg/mL) = 18.68
 Stdev (mg/mL) = ± 0.10
 1.0% of Mean Value = 0.186750
 Expiration Date 11/25/2016
 Pass
 Mean Value (mg/1.0mL) = 18.68

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

11-25-15


12.1.15


Standardization of Strontium Carrier 2370334

v1.2.1

Analyst	TC1

Standard Information	
Isotope	Strontium
Serial Number	2370334
Amount of Std. (mL)	1.0
Standard Prepared	2/23/2016

Parent Information	
Parent Serial #	2130145.4
Parent Exp. Date	11/25/2017

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0153	19.1705	19.1859	0.0154	15.40	15.17
2	1.0183	19.4966	19.5122	0.0156	15.60	15.32
3	1.0166	19.4284	19.4438	0.0154	15.40	15.15
4	1.0175	20.0355	20.0512	0.0157	15.70	15.43

Mean Value (mg/mL) = 15.53
 Stdev (mg/mL) = ± 0.15
 1.0% of Mean Value = 0.155250
 Pass

Expiration Date 2/23/2017

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

Mean Value (mg/1.0mL) = 15.53

Mean Value (mg/0.5 mL) = 7.76

Standardization Rule

Standardization of Yttrium Carrier 2354207

v1.2.1

Analyst	KSD1

Standard Information	
Isotope	Yttrium
Serial Number	2354207
Amount of Std. (mL)	1.0
Standard Prepared	1/12/2016

Parent Information	
Parent Serial #	2247023.2
Parent Exp. Date	9/18/2017

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Yttrium/mL	mg Yttrium/g
1	1.0334	0.0243	0.0561	0.0318	31.80	30.77
2	1.0327	0.0292	0.0610	0.0318	31.80	30.79
3	1.0322	0.0242	0.0559	0.0317	31.70	30.71
4	1.0311	0.0244	0.0562	0.0318	31.80	30.84

Mean Value (mg/mL) = 31.78
 Stdev (mg/mL) = ± 0.05
 1.0% of Mean Value = 0.317750
Pass
 Expiration Date 1/12/2017
 Mean Value (mg/1.0mL) = 31.78

Handwritten signature and date:
 1/12/16



Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION
Standard Reference Source

1758

101299

Sr-89 5 mL Liquid in Flame Sealed Vial

RECEIVED
R 9 11 15 D

Customer: GEL Laboratories, LLC
P.O. No.: GEL1511998, Item 9 Product Code: 8089

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
Sr-89	5.056E+01	2.042E+05	0.1	1.0	2.0	09/01/2015

*Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1%.
5.00976 g 0.1M HCl solution with approximately 30 $\mu\text{g/g}$ Sr carrier.

Source Prepared by:

Z. Dimitrova, Radiochemist

QC Approved:

J. S. Loh, Spectroscopist

Date: 28 April 15



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1758	Isotope:	Strontium-89 SPIKE
Prepared By:	Elizabeth Krouse	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCl	Prep Date:	11/18/2015
Reference Date:	09/01/2015	Verification Date:	11/18/2015
Ampoule Mass (g):	5.00976 g	Expiration Date:	05/10/2016
Uncertainty:	+/- 1 %	Primary Code:	1758-A
LogBook No:	GL-CED-297-051	Dilution(mL):	200 mL
		Mass of Parent(g):	4.9652 g
		Density(g/mL):	0.9999
		Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60715.1145 \text{ dpm/mL}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9999 \text{ g/mL}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60724.2231 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC

Version 1.0 9/18/2000

Verification for Sr-89 Standard 1758-A

v1.0.2

Instrument	Silver
Analyst	GXR1
Verification Prep Date	11/18/2015

Standard Information	
Isotope	Sr-89
Serial Number	1758-A
Isotope Half-life	50.5300 D
Reference Date	9/1/2015
Ref. Act. (DPM/mL)	60715.1145
Amount of Std. (mL)	0.1
Standard Prep Date	11/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	11/18/2015	91.00	2124.42	40.30
2	11/18/2015	92.00	2111.58	40.30
3	11/18/2015	91.90	2086.88	40.30

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2084.12	0.996898	20906.05	2090.60
2	2071.28	0.996898	20777.25	2077.72
3	2046.58	0.996898	20529.48	2052.95

Mean Value = 20737.59
 Stdev = 191.3905549
 Certificate Value* = 20826.5
 Two sigma = 382.781
 10 % of Mean = 2073.759
 Rule A (Pass/Fail) Pass
 % Recovery 99.57%
 Rule B (Pass/Fail) Pass
 Expiration Date 5/10/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-89 source 1758-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Sr-89 source standard verification. The Sr-89 efficiency calibration which was used for verification calculations was performed on 11/18/2015 using Sr-89 source 1733-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

11/19/15
 F. H. M. M. D. C. D. H. M. 11/23/15

**General Engineering Laboratories
GFC Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-004

Isotope Sr-89

Date Standards Prepared 2-11-16

Standard ID 1758-A

Matrix of Planchet/Filter Sr Carbonate on 25mm
0.45 mm filter

Amount Used (g or ml) 2.0

Standard Activity (DPM/g or mL) 60715.1145 *

Residue/Carrier Agent Sr Carrier 2338630

Reference Date 9/1/15

Pipette ID Used 1795419 / 2154115 / 1608465 DNF 2-11-16

Expiration Date 5/10/16

Balance ID Used 1113021618

* Not Decay Corrected

Separation Date/Time: AP 2/9/16

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	C ₁	0.1	0.0281	0.0298	1.7
	C ₂	0.2	0.0278	0.0314	3.6
	C ₃	0.3	0.0293	0.0342	4.9
	C ₄	0.4	0.0278	0.0348	7.0
	C ₅	0.5	0.0277	0.0366	8.9
	C ₆	0.6	0.0281	0.0389	10.8
	C ₇	0.7	0.0280	0.0402	12.2
	C ₈	0.8	0.0280	0.0420	14.0

Wt ✓

Prepared By: [Signature] Date 2-11-16

Reviewed By: [Signature] Date 3/29/16

Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

1244

78351-278

Sr-90 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 2

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.691 E4
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
5.01862 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved: D. M. Montgomery GALT
D. M. Montgomery, QA Manager

Date: 10/3/08

End of Certificate

Corporate Office

Laboratory

RECEIVED
10/7/08

RC-S-048-125



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1244	Isotope:	Strontium-90
Prepared By:	Daniel Roy	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCL	Prep Date:	02/12/2013
Reference Date:	10/01/2008	Verification Date:	12/18/2015
Ampoule Mass (g):	5.01862 g	Expiration Date:	12/18/2016
Uncertainty:	+/- 1.7 %	Primary Code:	1244-A
LogBook No:	RC-S-048-125	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8346 g
		Density(g/mL):	0.9984
		Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21333.9626 \text{ dpm/mL}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9984 \text{ g/mL}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21367.7236 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1244-A

v1.0.2

Instrument	BLUE
Analyst	BXF1
Verification Prep Date	12/18/2015

Standard Information	
Isotope	Sr-90
Serial Number	1244-A
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	21333.9626
Amount of Std. (mL)	0.1
Standard Prep Date	12/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	12/30/2015	89.50	3662.91	39.80
2	12/30/2015	88.90	3722.59	39.80
3	12/30/2015	87.80	3696.36	39.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	3623.11	2.056010	17622.05	1762.20
2	3682.79	2.056010	17912.32	1791.23
3	3656.56	2.056010	17784.74	1778.47

dpm/mL
 17773.03
 145.489087
 Mean Value =
 Stdev =
 Certificate Value* = 17931.3
 Two sigma = 290.978
 10 % of Mean = 1777.303
 Rule A (Pass/Fail) Pass
 % Recovery 99.12%
 Rule B (Pass/Fail) Pass
 Expiration Date 12/18/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1244-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 12/18/2015 using Sr-90 source 1243-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

12-30-15

Amendable 11/5/16

General Engineering Laboratories
GFC Calibration Source Preparation Sheet
Sr portion

Applicable SOP Number GL-RAD-A-004

Isotope Sr-90

Date Standards Prepared 2/19/16

Standard ID 1244-A

Matrix of Planchet/Filter Sr Carb. ppt on 25 mm 0.45 µm filter

Amount Used (g or ml) 0.5

Standard Activity (DPM/g or mL) 21333.9626 *

Residue/Carrier Agent Sr carrier 2338620 ^{0.5m = 9.2m}

Reference Date 10/1/08

Pipette ID Used 2154115

Expiration Date 12/18/16

Balance ID Used F30560

** Not Decay Corrected*

Separation Date/Time: 2/19/16 1415

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	S ₁	0.1	0.0271	0.0291	2.0
	S ₂	0.2	0.0276	0.0318	4.2
	S ₃	0.3	0.0276	0.0333	5.7
	S ₄	0.4	0.0276	0.0352	7.6
	S ₅	0.5	0.0280	0.0374	9.5
	S ₆	0.6	0.0286	0.0399	11.3
	S ₇	0.7	0.0287	0.0425	13.8
	AF 2/19/16 S ₈	0.8	0.0287	0.0441	15.4

9.4

wt ✓

ANL 2/25/16

Prepared By: [Signature] Date 2-18-16
 Reviewed By: [Signature] Date 3/29/16

Eckert & Ziegler

Analytics

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www.analytiscinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

1244

78351-278

Sr-90 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 2

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.691 E4
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
5.01862 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved: D. M. Montgomery QA MGT
D. M. Montgomery, QA Manager

Date: 10/3/08

End of Certificate

Corporate Office

Laboratory

24937 Avenue Tibbitts, Valencia, California 91355

1380 Seaboard Industrial Blvd, Atlanta, Georgia 30318

RECEIVED
10/7/08

RC-5-048-125



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1244	Isotope:	Strontium-90
Prepared By:	Daniel Roy	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCL	Prep Date:	02/12/2013
Reference Date:	10/01/2008	Verification Date:	12/18/2015
Ampoule Mass (g):	5.01862 g	Expiration Date:	12/18/2016
Uncertainty:	+/- 1.7 %	Primary Code:	1244-A
LogBook No:	RC-S-048-125	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8346 g
		Density(g/mL):	0.9984
		Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21333.9626 \text{ dpm/mL}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9984 \text{ g/mL}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21367.7236 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1244-A

v1.0.2

Instrument	BLUE
Analyst	BXF1
Verification Prep Date	12/18/2015

Standard Information	
Isotope	Sr-90
Serial Number	1244-A
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	21333.9626
Amount of Std. (mL)	0.1
Standard Prep Date	12/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	12/30/2015	89.50	3662.91	39.80
2	12/30/2015	88.90	3722.59	39.80
3	12/30/2015	87.80	3696.36	39.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	3623.11	2.056010	17622.05	1762.20
2	3682.79	2.056010	17912.32	1791.23
3	3656.56	2.056010	17784.74	1778.47

dpm/mL
17773.03
145.489087

Mean Value =
Stddev =

Certificate Value* = 17931.3
Two sigma = 290.978
10 % of Mean = 1777.303
Rule A (Pass/Fail) Pass
% Recovery 99.12%
Rule B (Pass/Fail) Pass
Expiration Date 12/18/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1244-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 12/18/2015 using Sr-90 source 1243-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

5-15-12
12-21
Rett
Amenda-Fish 11/5/16

Y# portion

Isotope Sr-90 (Y-90)

Standard ID 1244-A

Matrix of Planchett/Filter Yttrium oxalate
Sr Carb ppt. on
25 mm 0.45 μ m filter

Residue/Carrier Agent Sr V# 2354207 0.5mL
carrier = 15.89
mg

Residue/Carrier Agent ~~5~~ 11 carrier = 15.89 mg

Pipette ID Used 2154115

Balance ID Used F30560

*Not Decay Corrected

Separation Date/Time: 2/19/14 1325

16.3

15.8

15.7

ΔML 2/25/16

Date 2-18-16

Date 3/29/16



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Analytics

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CERTIFICATE OF CALIBRATION
Standard Reference Source

1758

101299

Sr-89 5 mL Liquid in Flame Sealed Vial

RECEIVED
9/1/15

Customer: GEL Laboratories, LLC
P.O. No.: GEL1511998, Item 9 **Product Code:** 8089

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u _A	u _B	U	
Sr-89	5.056E+01	2.042E+05	0.1	1.0	2.0	09/01/2015

*Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1%.
5.00976 g 0.1M HCl solution with approximately 30 $\mu\text{g/g}$ Sr carrier.

Source Prepared by:

Z. Dimitrova, Radiochemist

QC Approved:

J. S. Loh, Spectroscopist

Date: 28 April 15



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1758	Isotope:	Strontium-89 SPIKE
Prepared By:	Elizabeth Krouse	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCl	Prep Date:	11/18/2015
Reference Date:	09/01/2015	Verification Date:	11/18/2015
Ampoule Mass (g):	5.00976 g	Expiration Date:	05/10/2016
Uncertainty:	+/- 1 %	Primary Code:	1758-A
LogBook No:	GL-CED-297-051	Dilution(mL):	200 mL
		Mass of Parent(g):	4.9652 g
		Density(g/mL):	0.9999
		Balance ID:	C31514

Calculations Converting parent activity to dpm/mL/dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60715.1145 \text{ dpm/mL}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9999 \text{ g/mL}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60724.2231 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-89 Standard 1758-A

v1.0.2

Instrument	Silver
Analyst	GXR1
Verification Prep Date	11/18/2015

Standard Information	
Isotope	Sr-89
Serial Number	1758-A
Isotope Half-life	50.5300 D
Reference Date	9/1/2015
Ref. Act. (DPM/mL)	60715.1145
Amount of Std. (mL)	0.1
Standard Prep Date	11/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	11/18/2015	91.00	2124.42	40.30
2	11/18/2015	92.00	2111.58	40.30
3	11/18/2015	91.90	2086.88	40.30

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2084.12	0.996898	20906.05	2090.60
2	2071.28	0.996898	20777.25	2077.72
3	2046.58	0.996898	20529.48	2052.95

Mean Value = 20737.59
Stddev = 191.3905549

Certificate Value* = 20826.5
Two sigma = 382.781
10 % of Mean = 2073.759
Rule A (Pass/Fail) Pass
% Recovery 99.57%
Rule B (Pass/Fail) Pass
Expiration Date 5/10/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-89 source 1758-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Sr-89 source standard verification. The Sr-89 efficiency calibration which was used for verification calculations was performed on 11/18/2015 using Sr-89 source 1733-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

11/19/15
F. Annand
11/23/15



Eckert & Ziegler

Analytics

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CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
10.41484 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date:

10/3/08

RECEIVED



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1243	Isotope:	Strontium-90
Prepared By:	Daniel Roy	Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL	Prep Date:	12/19/2008
Reference Date:	10/01/2008	Verification Date:	12/18/2015
Ampoule Mass (g):	10.41484 g	Expiration Date:	12/18/2016
Uncertainty:	+/- .85 %	Primary Code:	1243-A
LogBook No:	RC-S-048-124	Dilution(mL):	100 mL
		Mass of Parent(g):	10.2164 g
		Density(g/mL):	0.9991
		Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (10.41484 \text{ g} * 100 \text{ mL}) = 226951.7634 \text{ dpm/mL}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9991 \text{ g/mL}) / (10.41484 \text{ g} * 100 \text{ mL}) = 227146.2010 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	03/26/2014	03/25/2015
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	03/26/2014	03/25/2015
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	03/19/2014	06/20/2014
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012

01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013
08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	01/15/2014	01/15/2015
12/04/2013	Gregory Ramsay	2.5347	1000	1243-L	575.747476 dpm/ml	12/04/2013	12/04/2014
08/11/2014	Gregory Ramsay	2.7006	1000	1243-M	613.431 dpm/mL	08/12/2014	08/12/2015
05/06/2015	Gregory Ramsay	2.5102	1000	1243-N	570.1824 dpm/mL	05/06/2015	05/06/2016
12/18/2015	Gregory Ramsay	2.5762	1000	1243-O	585.174 dpm/mL	12/18/2015	12/18/2016

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-N

v1.0.2

Instrument	Red
Analyst	BXF1
Verification Prep Date	5/6/2015

Standard Information	
Isotope	Sr-90
Serial Number	1243-N
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	570.1824
Amount of Std. (mL)	0.1
Standard Prep Date	5/6/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	5/6/2015	56.90	146.00	46.80
2	5/6/2015	56.20	142.60	46.80
3	5/6/2015	56.00	145.00	46.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	99.20	2.002163	495.46	49.55
2	95.80	2.002163	478.48	47.85
3	98.20	2.002163	490.47	49.05

dpm/mL
488.14
8.727454329

Mean Value =
Stddev =

Certificate Value* = 486.8

Two sigma = 17.455

10 % of Mean = 48.814

Rule A (Pass/Fail) Pass

% Recovery 100.28%

Rule B (Pass/Fail) Pass

Expiration Date 5/6/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1243-N by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCRed for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 5/6/2015 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

ms 6/16/15
Amanda Jahn 5/26/15

Strontium 89/90 Queue Sheet

Instrument Ver.

02/26/16

Batch #: 1548017 Analyst: KSD1 First Client Due Date: Internal Due Date: 03/13/2016 2/26/16 Comments

Sr-89/90 Spike Code(s): 1753-A / 1243-A Expiration Date: 5-10-16/5-10-16 Vol(s): 0.2 / 0.5

Sr-89/90 LCS Code(s): 2370334 Exp Date: 2-23-17 Vol: 0.5 Sdt Wt: 7.76 Y Carrier Code: 13542207 Exp Date: 11/17/14 Vol: 0.5 Sdt Wt: 11.84

Prep Date: 2-26-16 Initials: AMF Pipet ID: 1785419 / 2154015 Balance #: 51204863 Analytical Scale #: 380500 Witness: NA

Sample ID	Client Description	Type	RDL	Date Collected	Matrix	Client	Rad	Pos #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)	Initial Y wt (g)	Final Y wt (g)	Net Y wt (mg)
1203497468-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			1	300	11A	0.0241	0.0347	7.6	0.0241	0.0347	15.9
1203497469-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			2	300	11B	0.0286	0.0300	7.4	0.0286	0.0300	15.7
1203497470-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			3	300	11C	0.0281	0.0357	7.0	0.0281	0.0357	15.7
1203497471-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			4	300	11D	0.0274	0.0318	7.4	0.0274	0.0318	15.5
1203497472-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			5	300	11A	0.0280	0.0300	7.4	0.0280	0.0300	15.8
1203497473-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			6	300	11B	0.0286	0.0316	4.8	0.0286	0.0316	16.2
1203497474-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			7	300	11C	0.0280	0.0314	4.8	0.0280	0.0314	14.5
1203497475-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			8	300	11D	0.0285	0.0340	4.5	0.0285	0.0340	15.4

12-3/26/16

GEL Laboratories LLC, Radiochemistry Division

Solid Sample Dissolution by: LEACH or DIGESTION

Data Reviewed By:

Michael V. H.

Circle One

Continuing Calibration Data

Gas Flow Proportional Counter Checks for 24-Jun-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100A2	Above	Alpha bkg	24-Jun 05:08	60	0.317	-2.12E-2	0.324	+2.88
LB4100C1	Above	Alpha bkg	24-Jun 05:29	60	0.500	0.149	0.367	+6.64
LB4100C4	Above	Alpha bkg	24-Jun 05:29	60	0.367	4.08E-6	0.304	+4.24
LB4100C4	need 2nd	Beta bkg	24-Jun 05:29	60	1.817	0.686	2.113	+1.75
LB4100E3	Above	Beta bkg	24-Jun 05:08	60	2.700	0.401	2.311	+4.22
LB4100F3	Above	Alpha bkg	24-Jun 05:08	60	0.400	-8.91E-2	0.322	+4.14
LB4100F3	Below	Alpha eff	24-Jun 06:35	5	18312	19270	21960	-5.14
LB4100F3	Above	Beta bkg	24-Jun 05:08	60	1.800	0.579	1.652	+3.83
LB4100F4	Above	Beta bkg	24-Jun 05:08	60	2.033	1.327	2.176	+1.99
LB4100F4	Below	Beta eff	24-Jun 06:27	5	36874	37500	39290	-5.10
LB4100G1	Below	Alpha eff	24-Jun 06:27	5	6537	8145	10050	-8.06
LB4100G2	Above	Beta bkg	24-Jun 06:50	60	2.117	0.608	1.561	+6.50
LB4100H4	need 2nd	Alpha eff	24-Jun 06:27	5	11539	11490	13890	-2.88
LB4100H4	Above	Alpha XTalk	24-Jun 06:27	5	0.382	0.307	0.379	+3.27
LB4100H4	Below	Beta eff	24-Jun 06:35	5	34854	35210	36600	-4.54
LB4100I2	Above	Beta bkg	24-Jun 05:08	60	2.133	0.408	2.304	+2.46
LB4100I3	Above	Beta bkg	24-Jun 05:08	60	2.100	0.091	2.093	+3.02
LB4100J2	Below	Alpha eff	24-Jun 06:13	5	9647	9684	10310	-3.35
LB4100J2	need 2nd	Alpha XTalk	24-Jun 06:13	5	0.166	0.134	0.168	+2.66
LB4100J3	Below	Beta eff	24-Jun 06:20	5	20016	20130	22000	-3.37
PIC1D	Above	Alpha bkg	24-Jun 05:38	60	0.317	-1.49E-4	0.357	+2.32
PIC2A	Above	Alpha bkg	24-Jun 05:38	60	0.400	-2.85E-2	0.318	+4.43
PIC2C	Above	Alpha bkg	24-Jun 05:38	60	0.317	-8.03E-3	0.376	+2.08
PIC2C	Above	Alpha XTalk	24-Jun 05:23	5	0.318	0.231	0.315	+3.24
PIC3A	Above	Alpha bkg	24-Jun 05:39	60	0.567	-1.09E-1	0.333	+6.17
PIC3A	Above	Beta bkg	24-Jun 05:39	60	6.500	-1.30E-1	1.970	+15.94
PIC4A	Below	Alpha eff	24-Jun 05:30	5	10419	10430	11040	-3.10

PIC4D	Above	Beta bkg	24-Jun 07:54	60	2.250	1.235	2.253	+2.98
PIC5B	Above	Alpha bkg	24-Jun 07:30	60	0.317	-3.15E-2	0.362	+2.31
PIC5D	Above	Alpha bkg	24-Jun 07:30	60	0.450	0.015	0.356	+4.65
PIC5D	need 2nd	Beta eff	24-Jun 05:44	5	25086	25030	26640	-2.79
PIC6B	need 2nd	Alpha bkg	24-Jun 05:55	60	0.250	-1.82E-2	0.339	+1.51
PIC10D	Above	Alpha eff	24-Jun 05:54	5	15780	12350	14940	+4.95
PIC10D	need 2nd	Beta XTalk	24-Jun 06:01	5	2.82E-4	6.80E-5	3.57E-4	+1.45
PIC12A	Above	Alpha bkg	24-Jun 06:14	60	0.683	0.069	0.375	+9.02
PIC12B	need 2nd	Alpha bkg	24-Jun 06:14	60	0.217	0.015	0.358	+0.53
PIC12B	need 2nd	Alpha eff	24-Jun 06:05	5	9609	9530	9897	-1.71
PIC14A	Above	Alpha bkg	24-Jun 07:39	60	0.333	-6.03E-2	0.330	+3.05
PIC14D	Above	Alpha bkg	24-Jun 08:42	60	0.550	-3.96E-2	0.348	+6.12

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R. Dink-Harmon

Date 6/24/16

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 29-Jun-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100C1	Above	Alpha bkg	29-Jun 06:21	60	0.417	0.149	0.367	+4.35
LB4100C2	Above	Alpha bkg	29-Jun 07:25	60	0.317	-4.14E-2	0.367	+2.26
LB4100C4	Above	Beta bkg	29-Jun 07:25	60	2.050	0.686	2.113	+2.74
LB4100E3	Above	Beta bkg	29-Jun 06:02	60	2.883	0.401	2.311	+4.80
LB4100F1	Above	Alpha bkg	29-Jun 07:40	60	0.317	0.059	0.384	+1.76
LB4100F3	Above	Alpha bkg	29-Jun 06:02	60	0.383	-8.91E-2	0.322	+3.90
LB4100F3	Below	Alpha eff	29-Jun 07:25	5	18499	19270	21960	-4.72
LB4100F3	need 2nd	Beta bkg	29-Jun 06:02	60	1.500	0.579	1.652	+2.15
LB4100F4	need 2nd	Alpha bkg	29-Jun 06:02	60	0.233	0.013	0.357	+0.84
LB4100F4	Above	Beta bkg	29-Jun 06:02	60	2.350	1.327	2.176	+4.23
LB4100F4	Below	Beta eff	29-Jun 07:18	5	36959	37500	39290	-4.81
LB4100G1	Below	Alpha eff	29-Jun 07:18	5	6816	8145	10050	-7.19
LB4100G4	Above	Beta XTalk	29-Jun 07:48	5	2.57E-4	1.94E-5	2.50E-4	+3.17
LB4100H4	Below	Alpha eff	29-Jun 07:18	5	11450	11490	13890	-3.10
LB4100H4	Above	Alpha XTalk	29-Jun 07:18	5	0.383	0.307	0.379	+3.34
LB4100H4	Below	Beta eff	29-Jun 07:24	5	34895	35210	36600	-4.36
LB4100I2	Above	Beta bkg	29-Jun 06:02	60	2.067	0.408	2.304	+2.25
LB4100I3	need 2nd	Alpha bkg	29-Jun 06:02	60	0.167	-4.11E-2	0.337	+0.30
LB4100I3	Above	Beta bkg	29-Jun 06:02	60	2.500	0.091	2.093	+4.22
LB4100J2	Below	Alpha eff	29-Jun 07:32	5	9625	9684	10310	-3.57
LB4100J2	Above	Alpha XTalk	29-Jun 07:32	5	0.170	0.134	0.168	+3.31
LB4100J3	Below	Beta eff	29-Jun 07:11	5	19951	20130	22000	-3.57
PIC1A	Above	Alpha bkg	29-Jun 06:29	60	0.417	-3.73E-2	0.349	+4.04
PIC1A	Below	Alpha eff	29-Jun 06:15	5	10411	10450	10850	-3.58
PIC1A	need 2nd	Beta XTalk	29-Jun 06:22	5	8.13E-4	1.90E-4	9.28E-4	+2.07
PIC1C	Above	Alpha bkg	29-Jun 07:44	60	0.417	0.013	0.373	+3.72
PIC1C	need 2nd	Beta bkg	29-Jun 07:44	60	1.450	-1.72E-1	2.166	+1.16
PIC3A	Above	Beta bkg	29-Jun 06:30	60	5.433	-1.30E-1	1.970	+12.89

PIC4A	Below	Alpha eff	29-Jun 07:46	5	10400	10430	11040	-3.29
PIC5A	Below	Beta eff	29-Jun 10:51	5	16781	16810	17690	-3.20
PIC5B	Above	Alpha bkg	29-Jun 06:42	60	0.817	-3.15E-2	0.362	+9.94
PIC6C	Above	Alpha bkg	29-Jun 06:45	60	0.583	-1.21E-2	0.376	+6.20
PIC7A	Above	Alpha bkg	29-Jun 07:49	60	0.317	0.020	0.372	+2.06
PIC8A	Above	Alpha bkg	29-Jun 09:47	60	0.333	0.050	0.372	+2.28
PIC8C	Above	Alpha bkg	29-Jun 07:50	60	0.317	0.079	0.379	+1.76
PIC9A	Above	Alpha bkg	29-Jun 08:08	60	0.317	-3.92E-2	0.376	+2.14
PIC10D	Above	Alpha eff	29-Jun 06:44	5	15874	12350	14940	+5.16
PIC11D	Above	Alpha bkg	29-Jun 08:12	60	0.433	-6.39E-2	0.347	+4.26
PIC11D	Above	Beta bkg	29-Jun 08:12	60	1.867	-2.09E-1	1.714	+3.48
PIC12A	Above	Alpha bkg	29-Jun 07:06	60	0.417	0.069	0.375	+3.81
PIC12B	need 2nd	Alpha bkg	29-Jun 07:06	60	0.283	0.015	0.358	+1.69
PIC12C	Above	Alpha bkg	29-Jun 08:12	60	0.417	-8.91E-2	0.437	+2.76
PIC13A	Above	Alpha bkg	29-Jun 07:28	60	0.467	-4.45E-2	0.391	+4.04
PIC13B	Above	Alpha bkg	29-Jun 07:28	60	0.350	-5.05E-2	0.410	+2.21
PIC14B	Below	Alpha eff	29-Jun 06:06	5	8525	8786	10030	-4.26
PIC14B	Above	Alpha XTalk	29-Jun 06:06	5	0.406	0.242	0.396	+3.39
PIC14B	Below	Beta eff	29-Jun 06:13	5	19402	21030	22930	-8.14
PIC14D	Above	Alpha bkg	29-Jun 06:21	60	0.433	-3.96E-2	0.348	+4.32

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

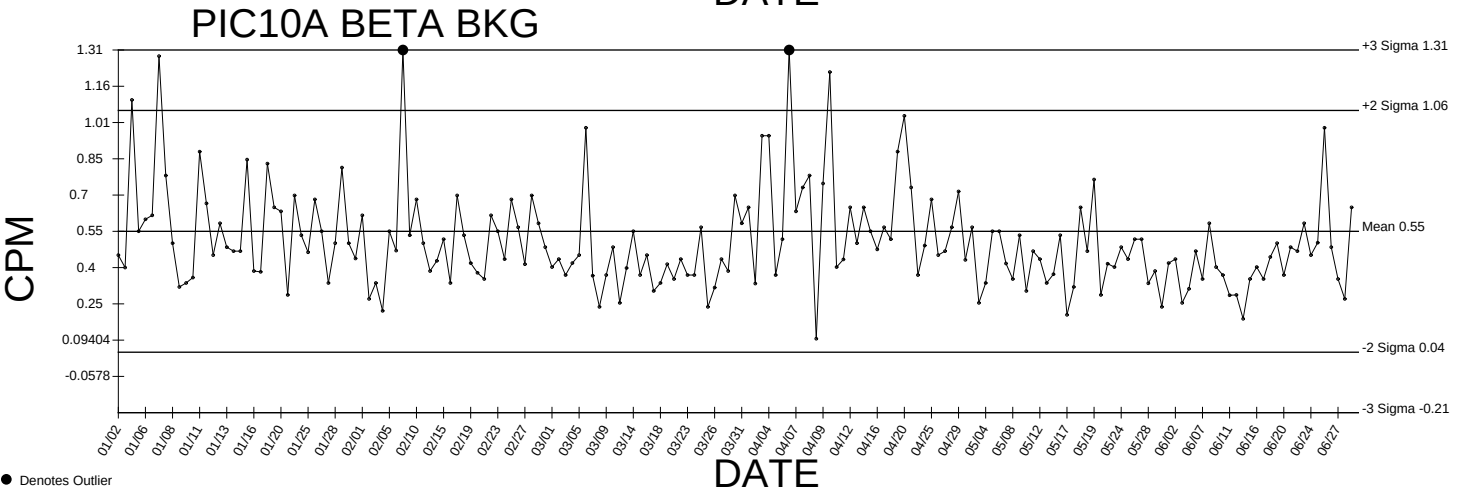
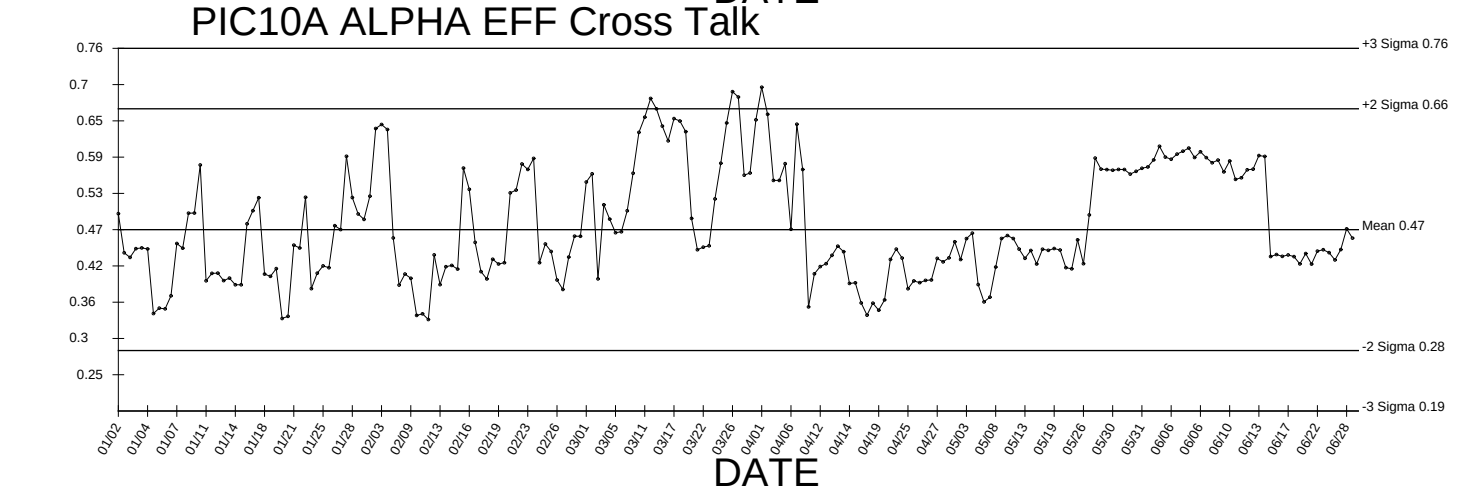
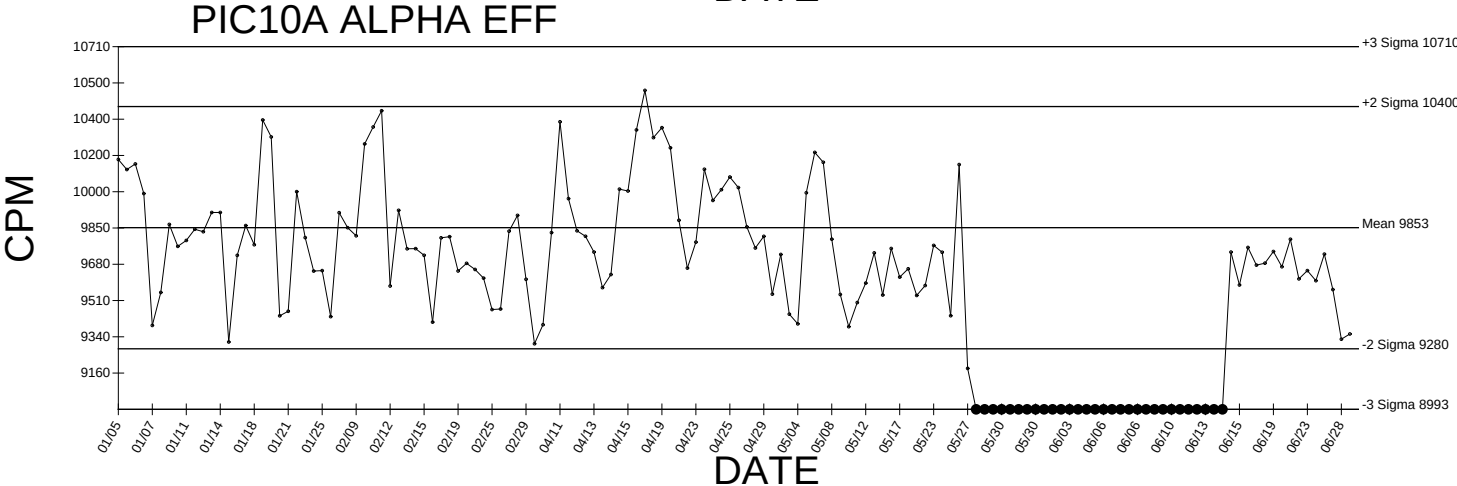
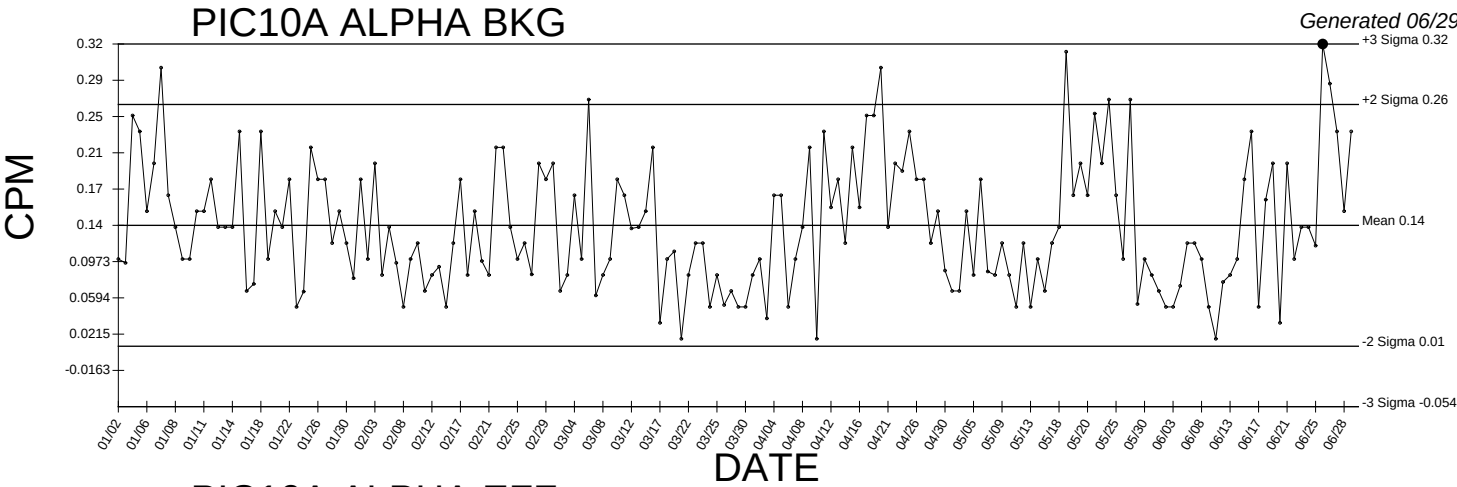
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LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R. Brink Haunver

Date 6/29/14

GEL Laboratories LLC

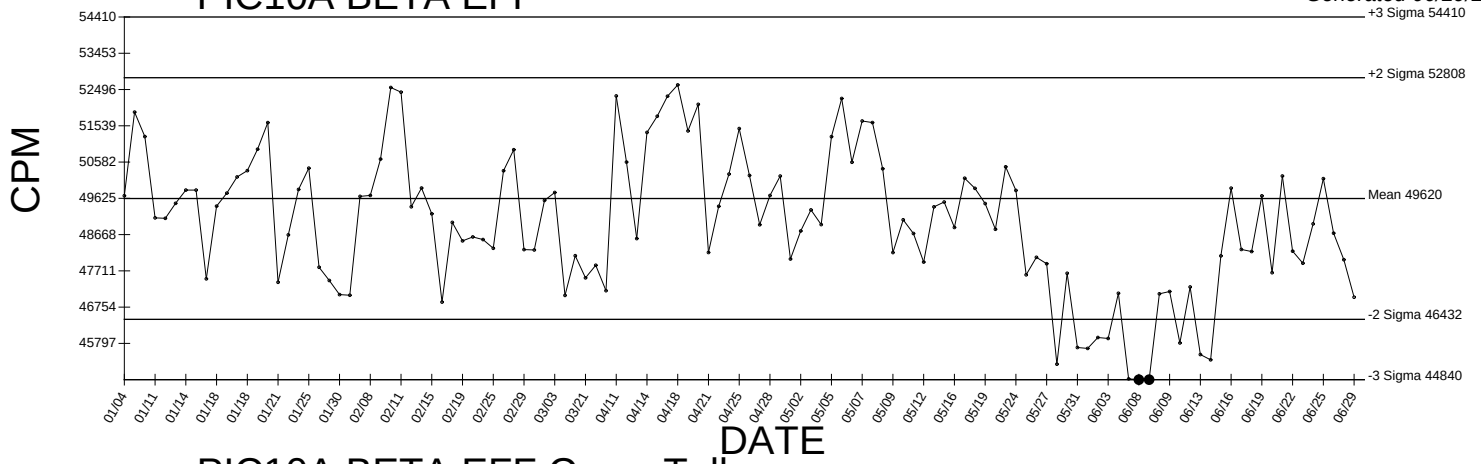
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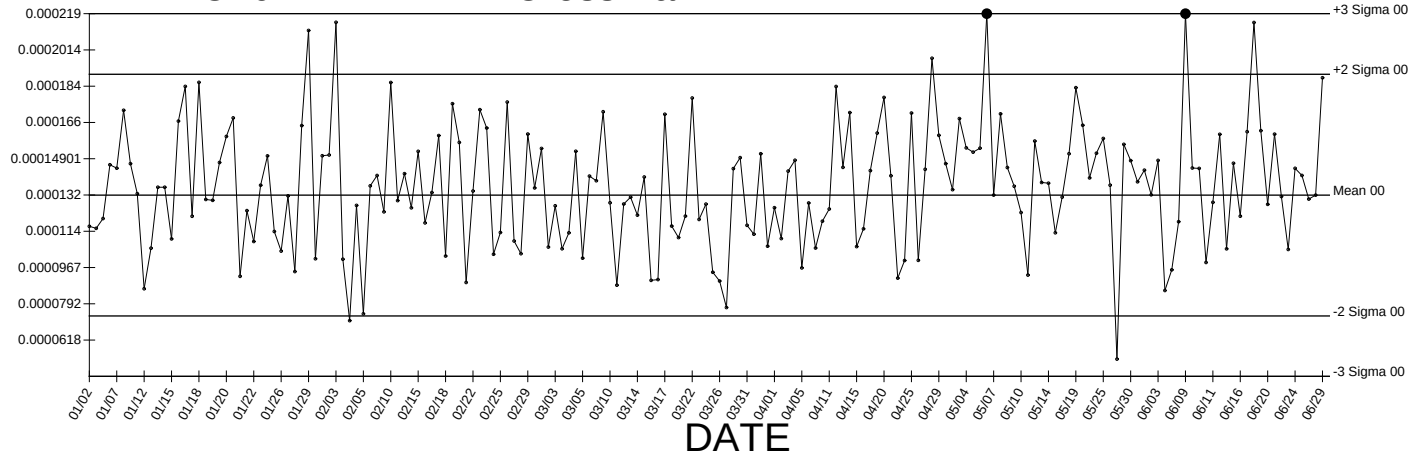
● Denotes Outlier

PIC10A BETA EFF

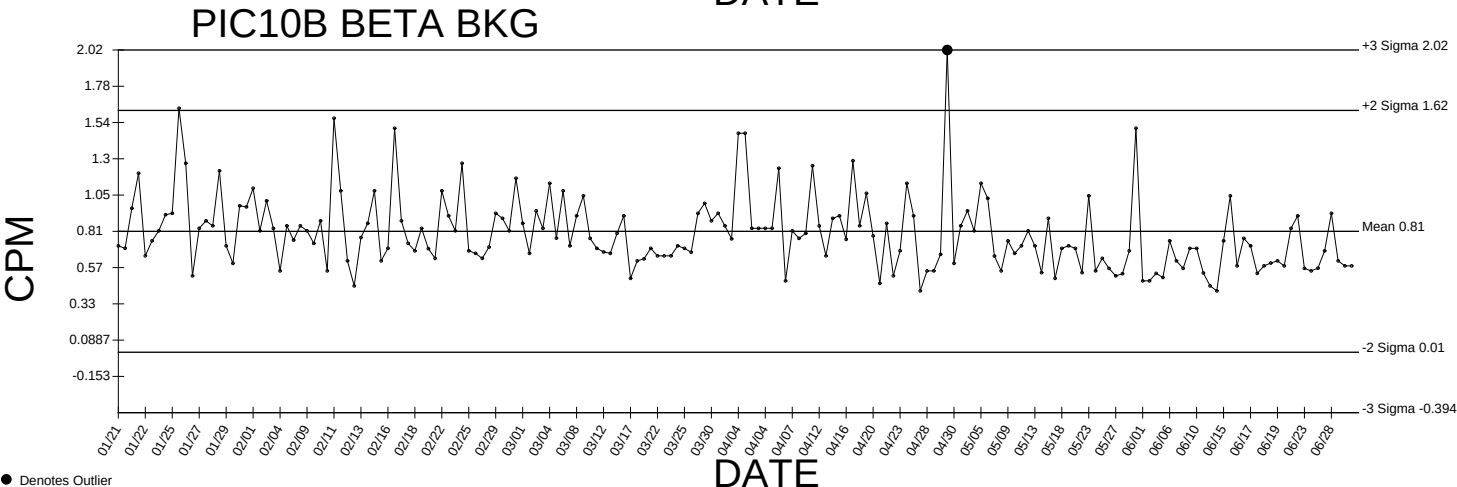
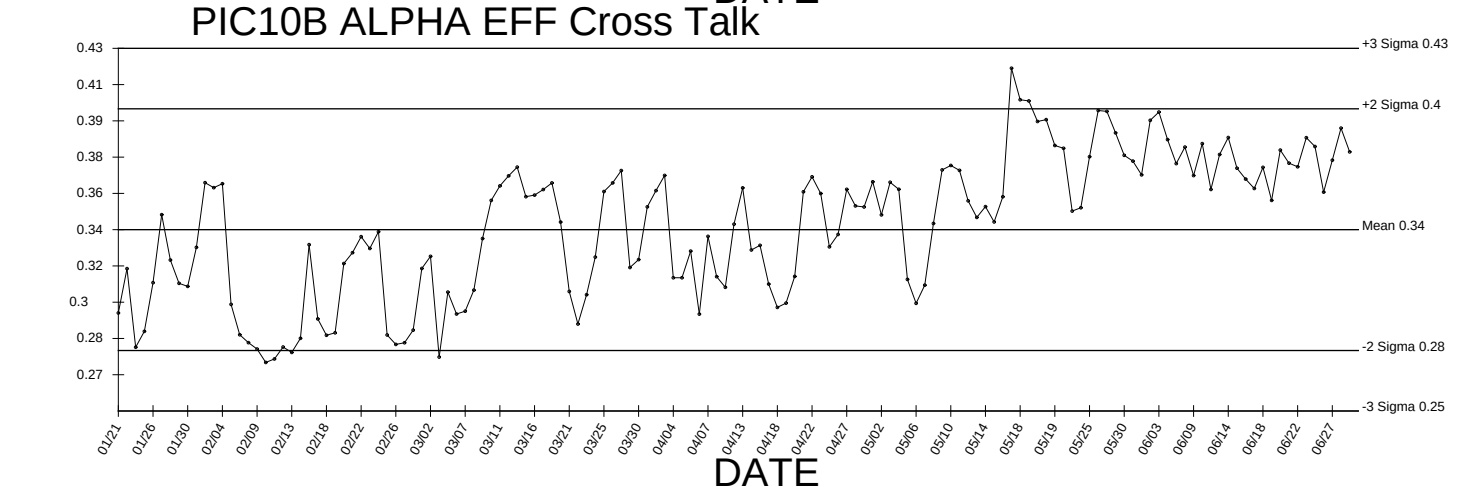
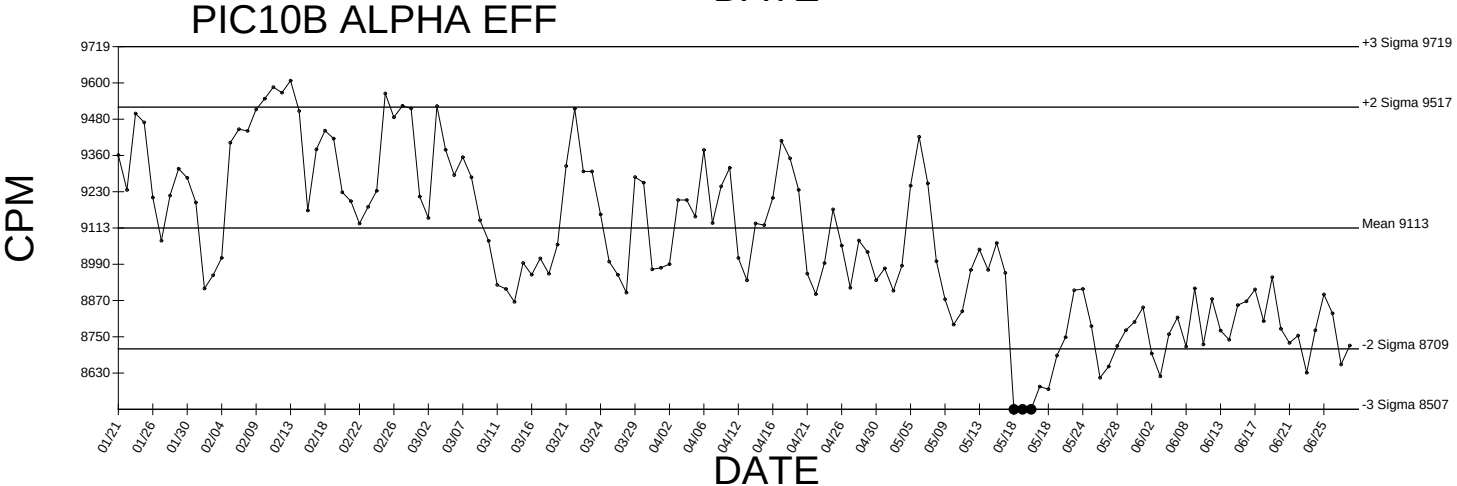
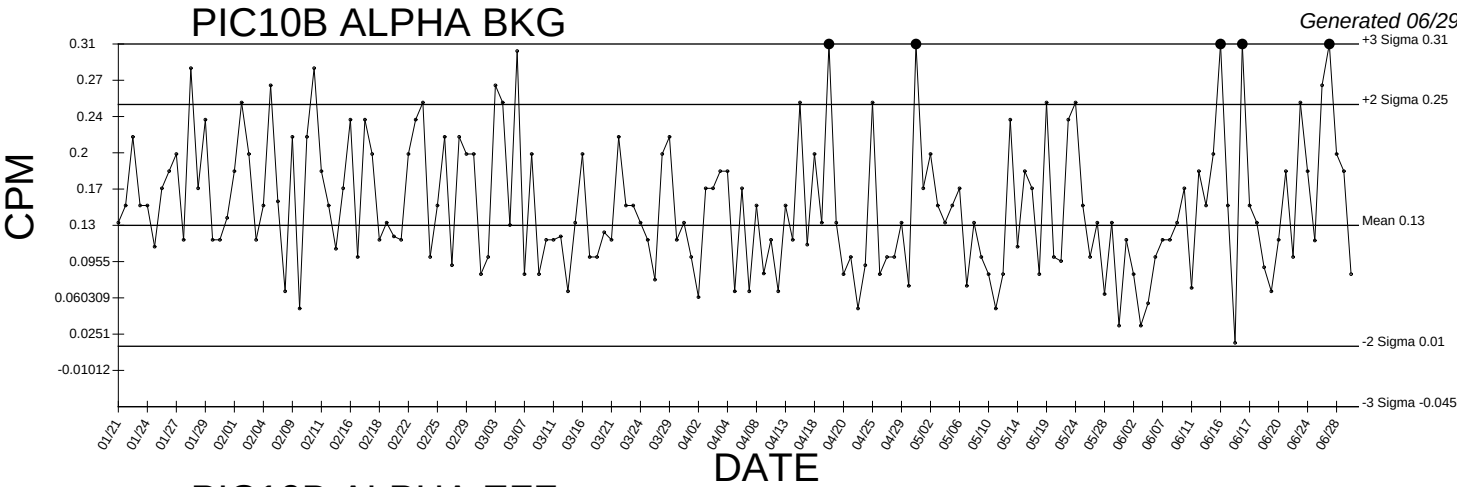
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+3 Sigma 54410



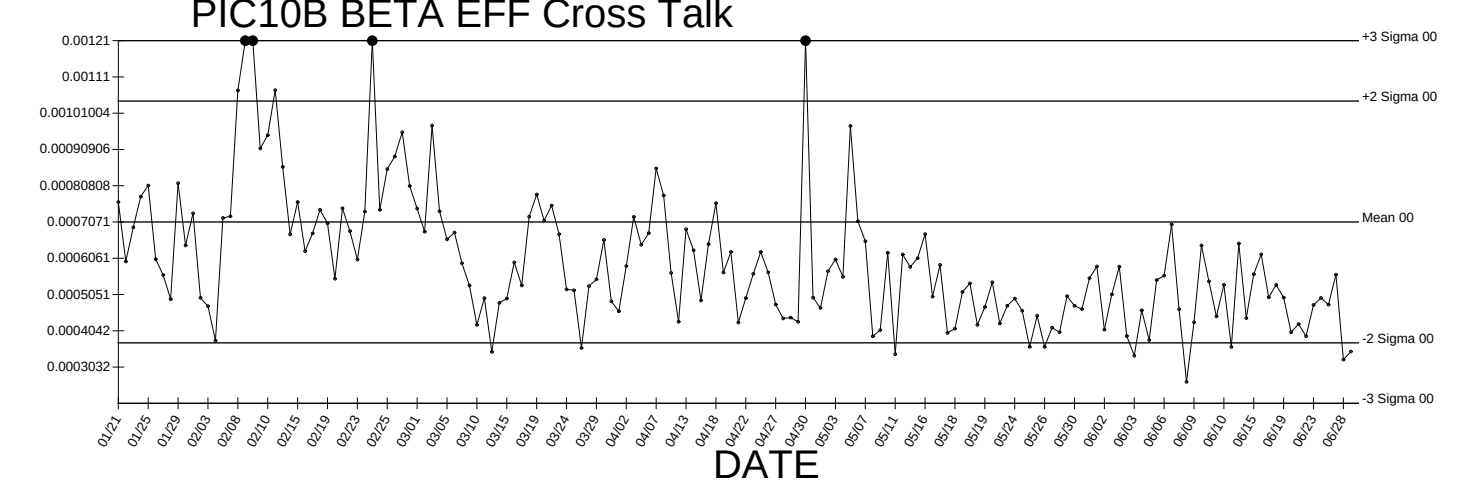
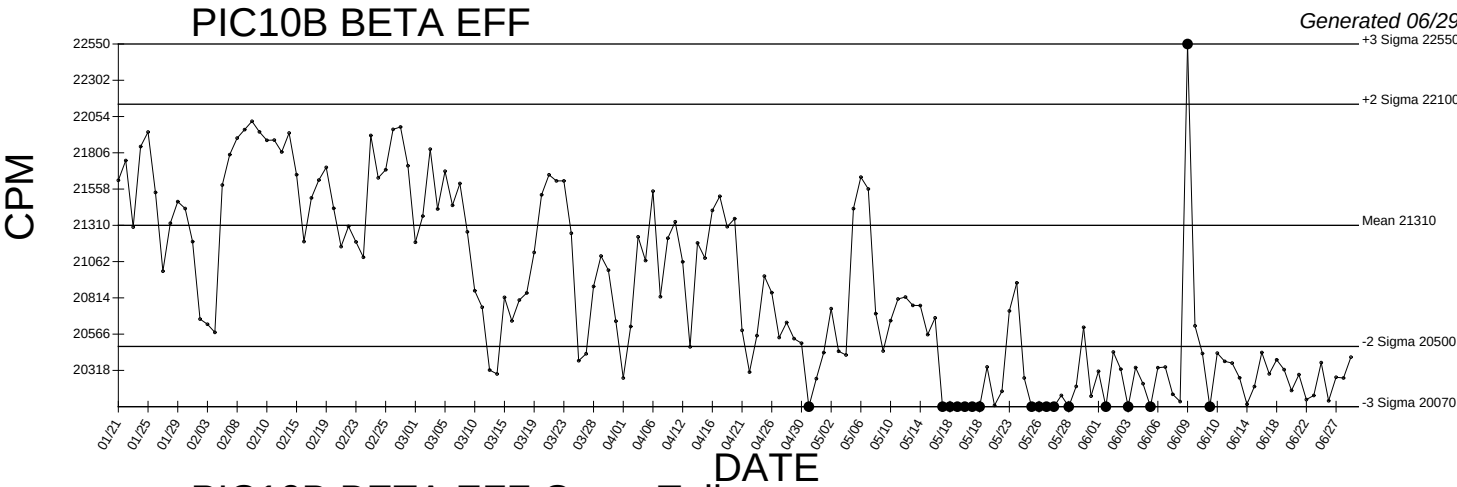
PIC10A BETA EFF Cross Talk



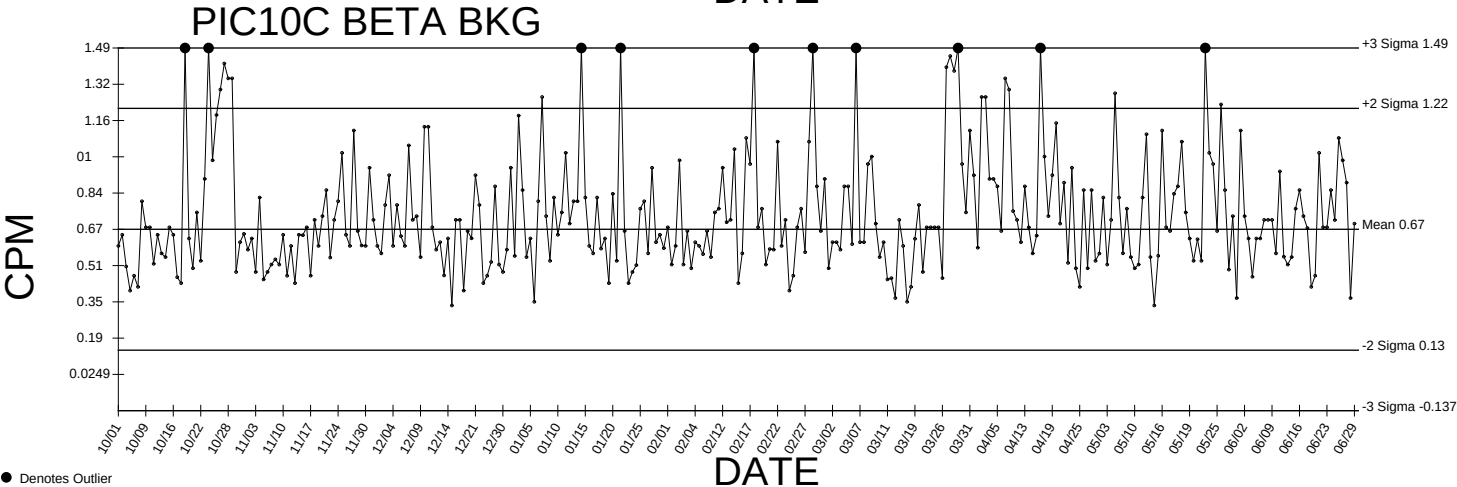
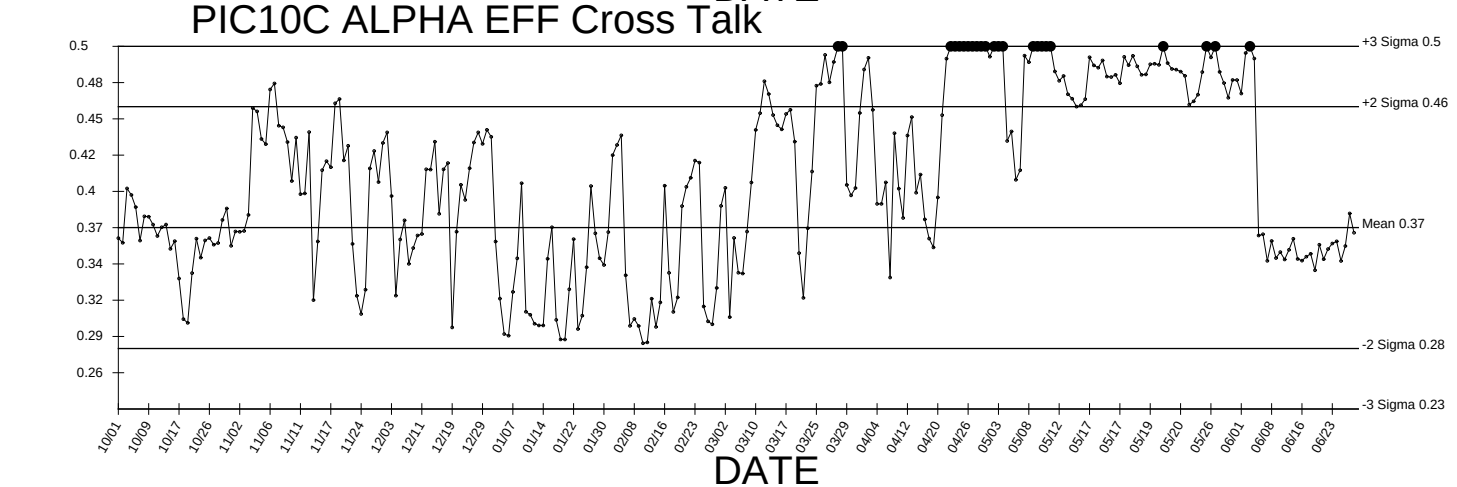
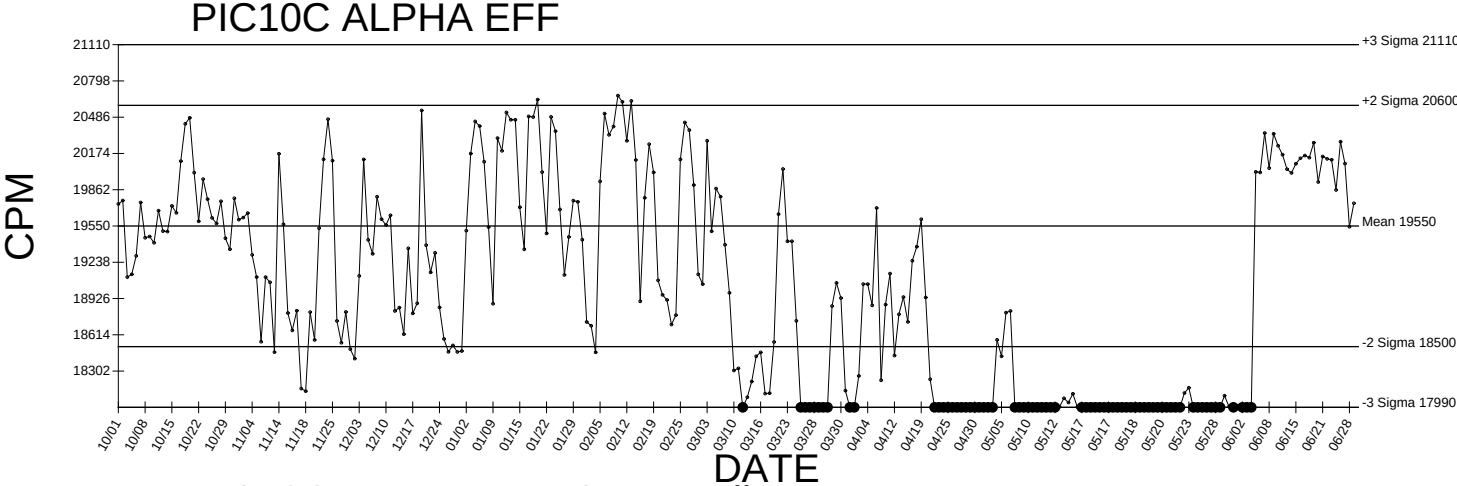
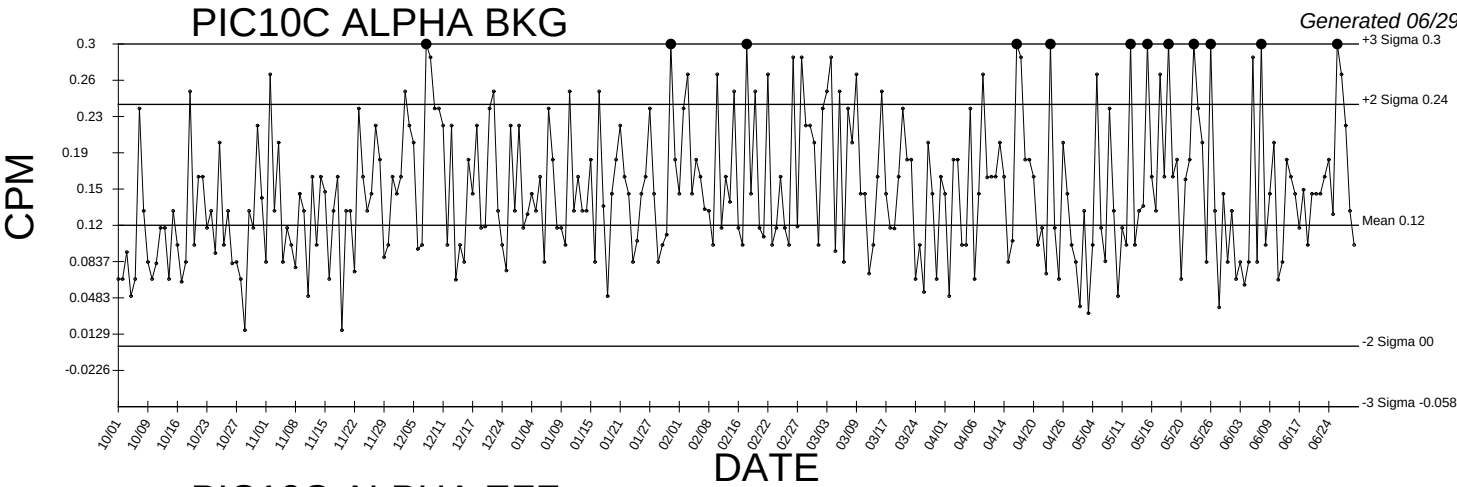
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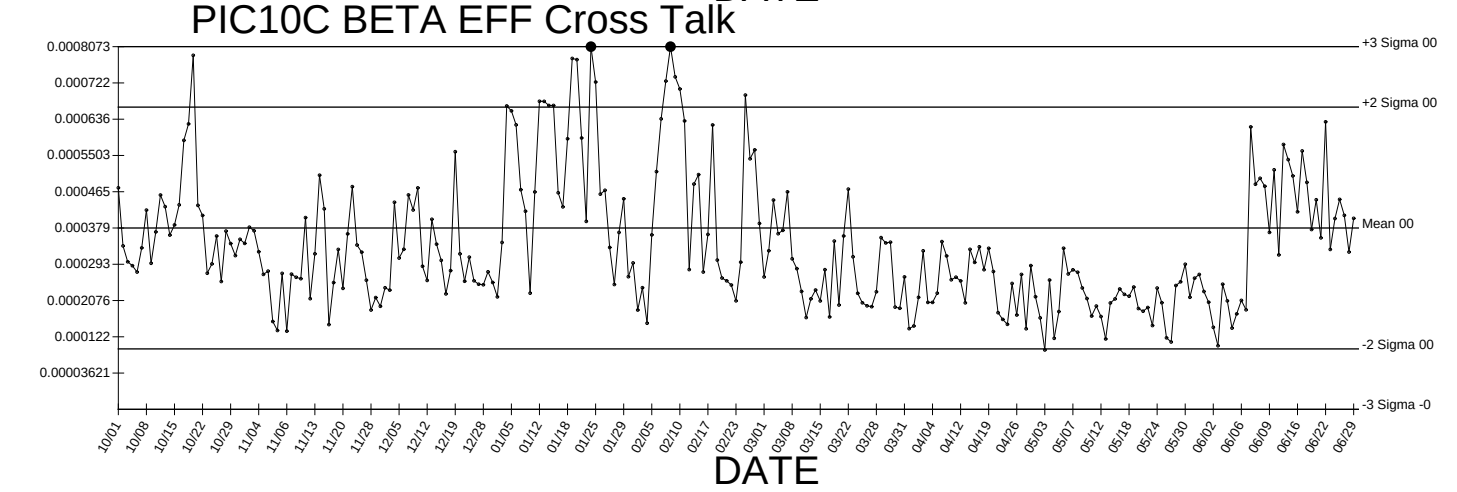
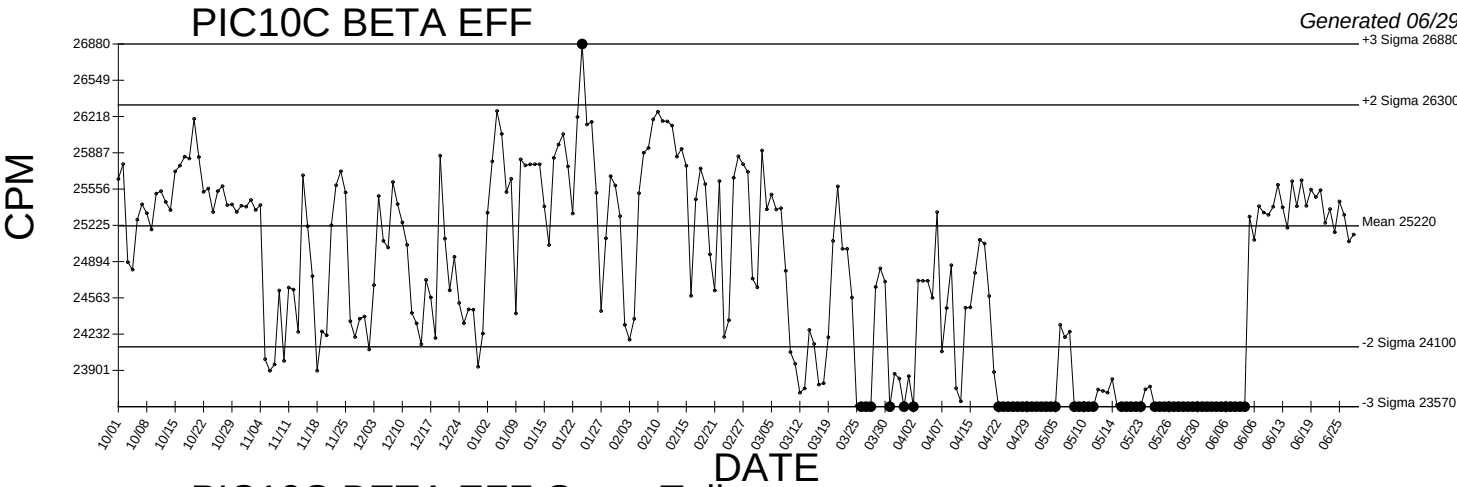
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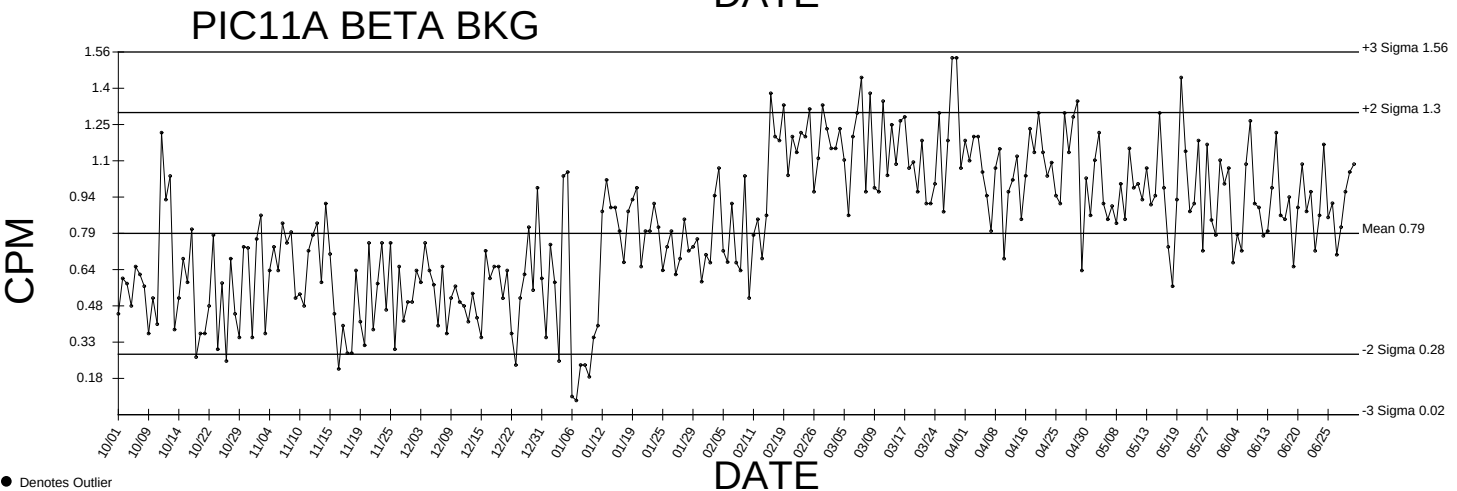
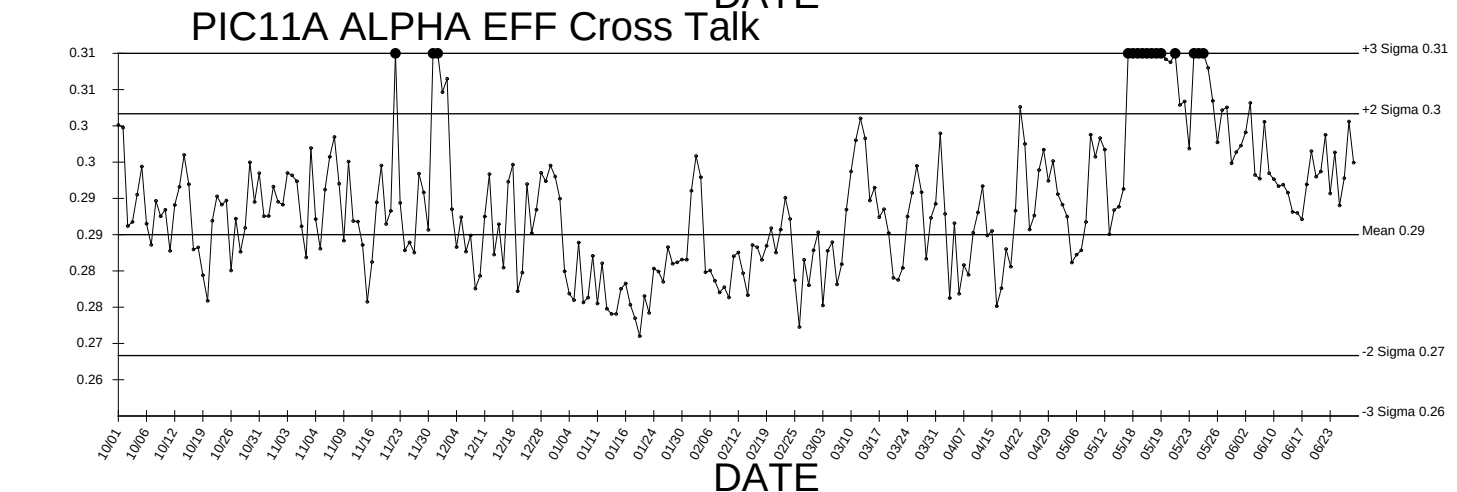
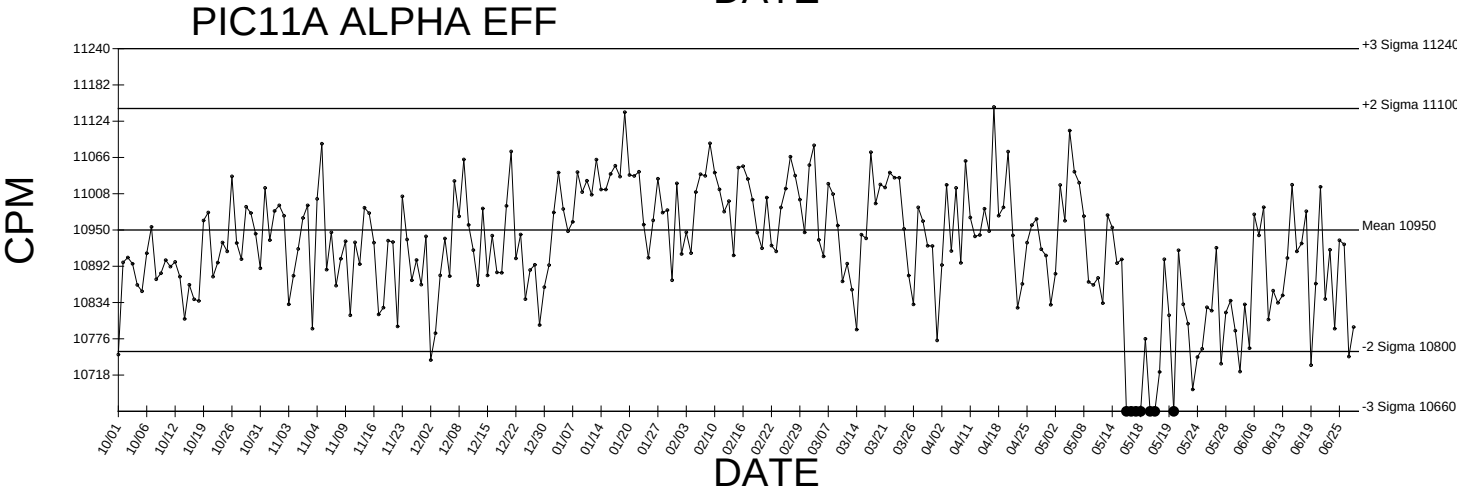
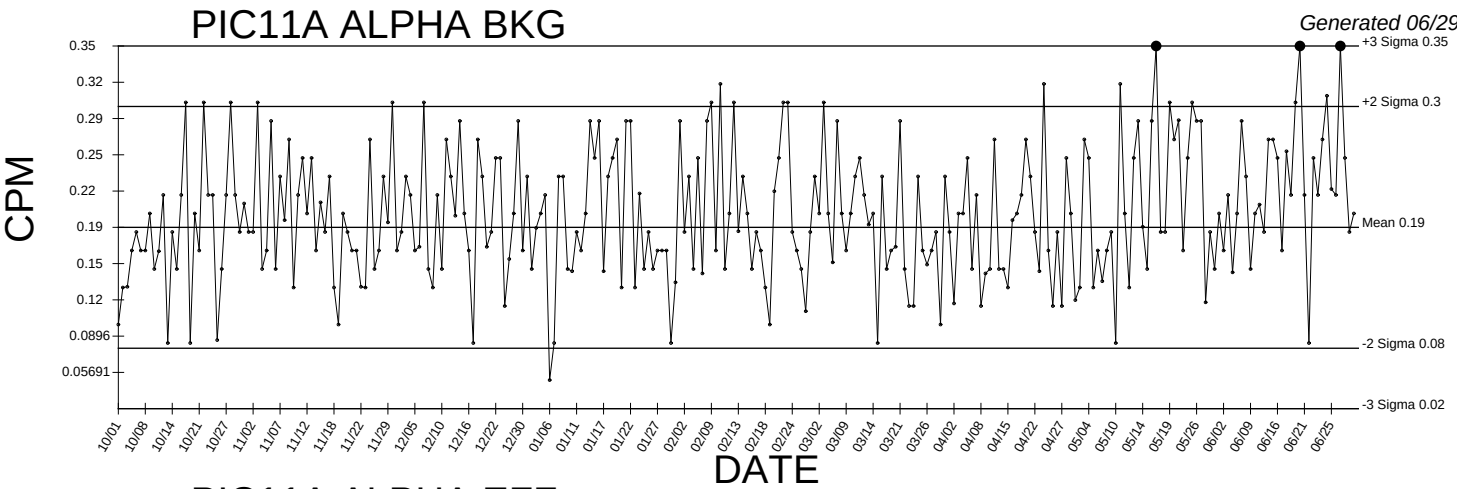
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● Denotes Outlier



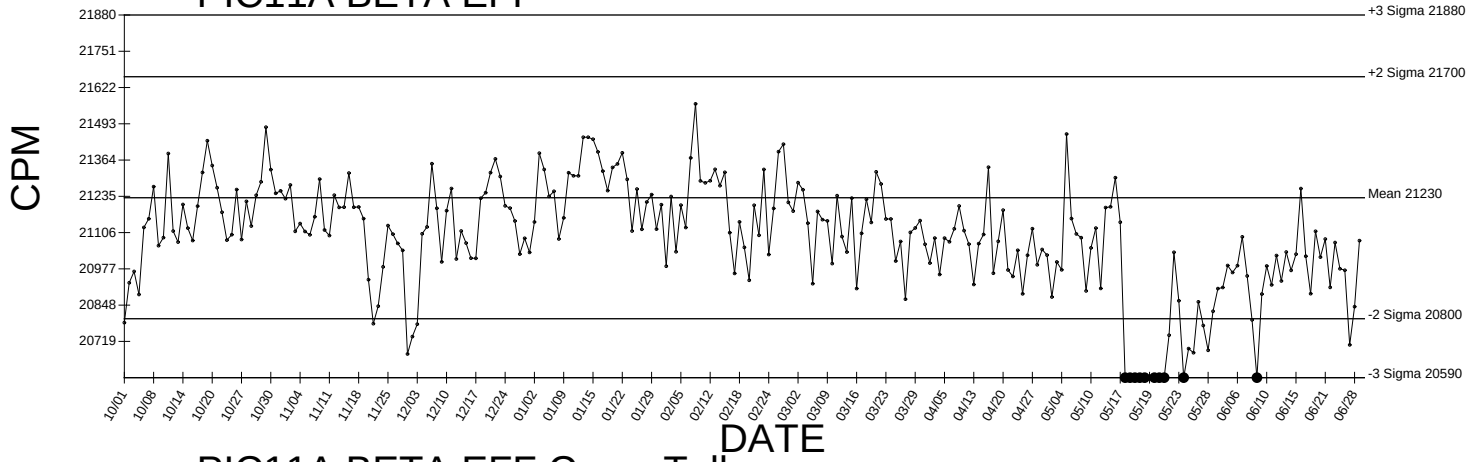
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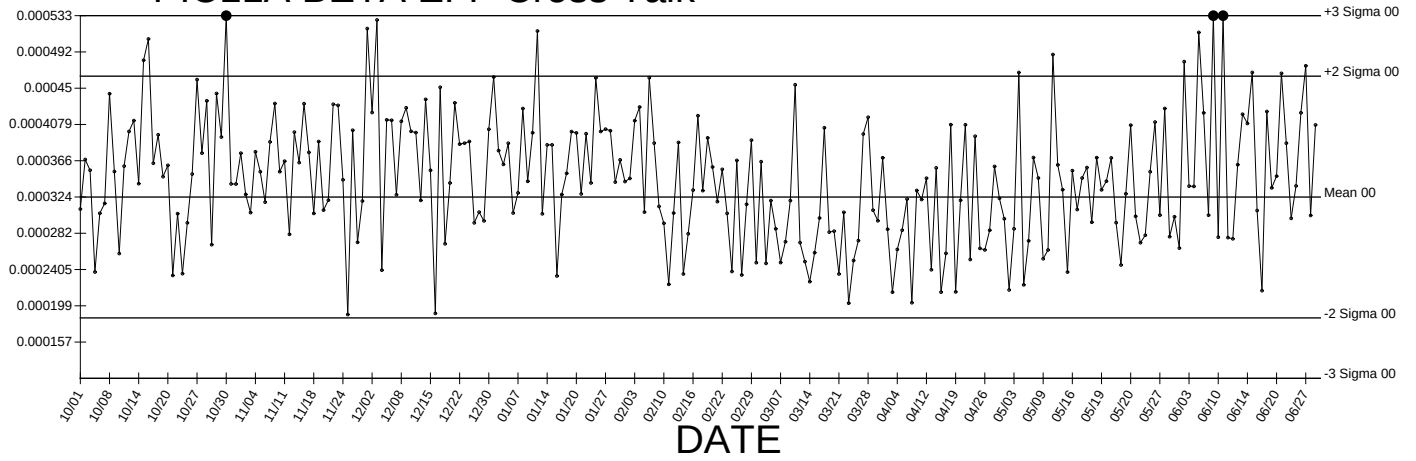
● Denotes Outlier

PIC11A BETA EFF

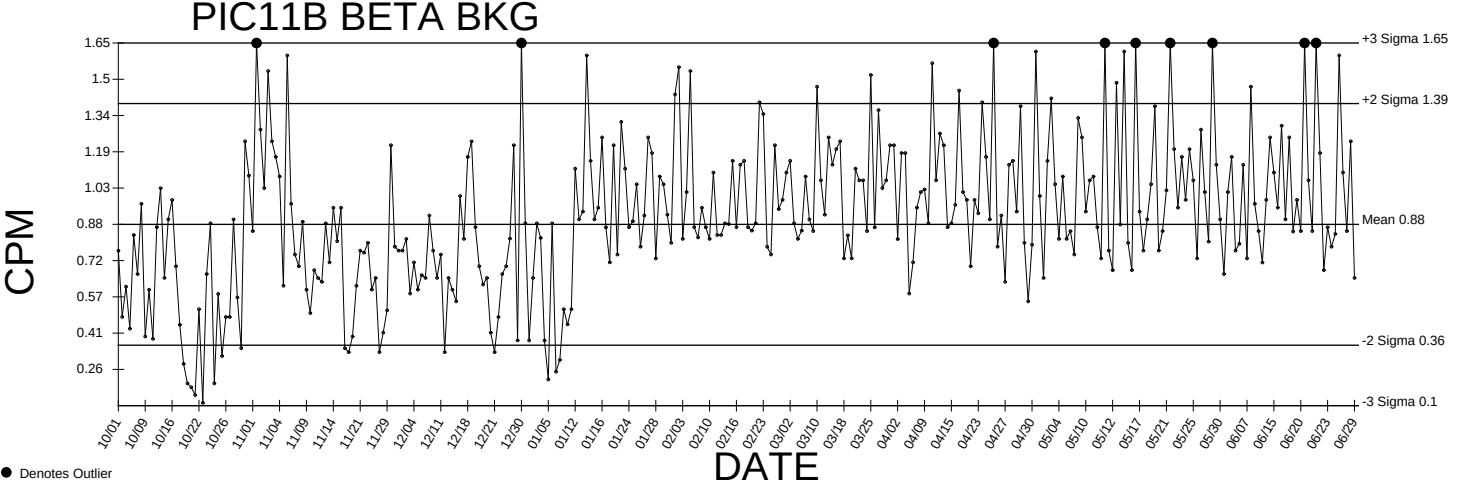
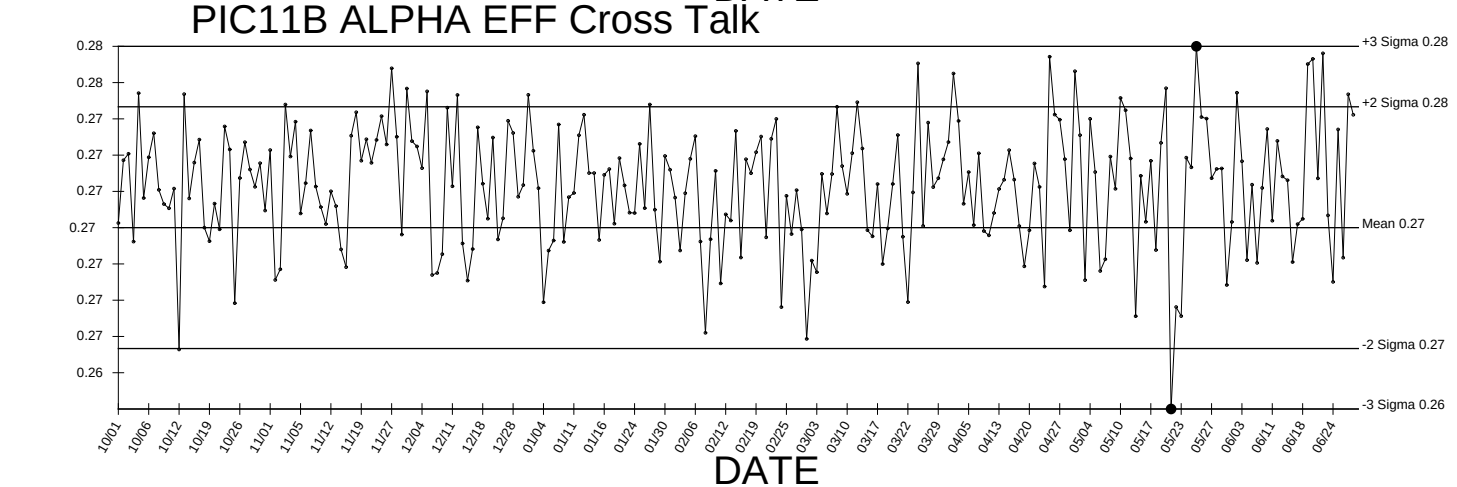
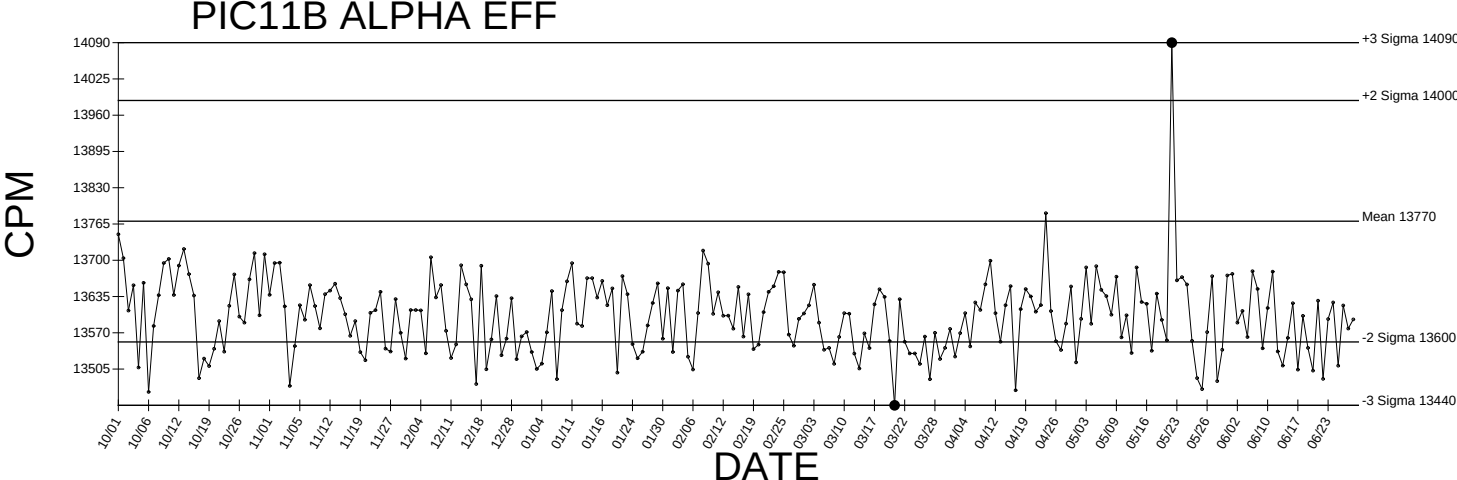
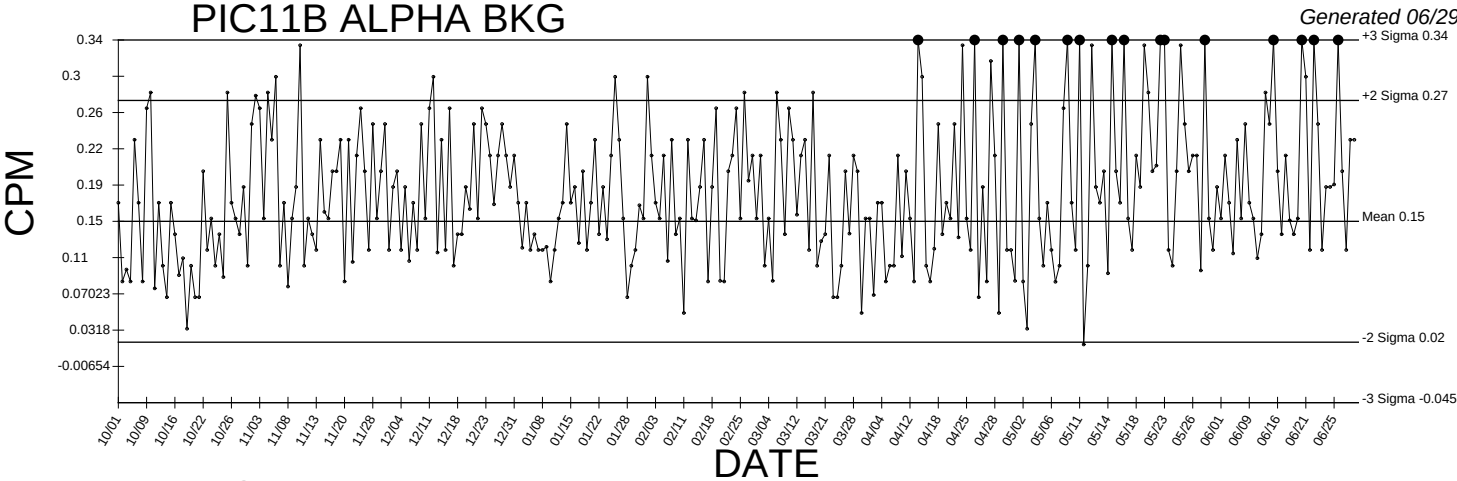
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+3 Sigma 21880



PIC11A BETA EFF Cross Talk

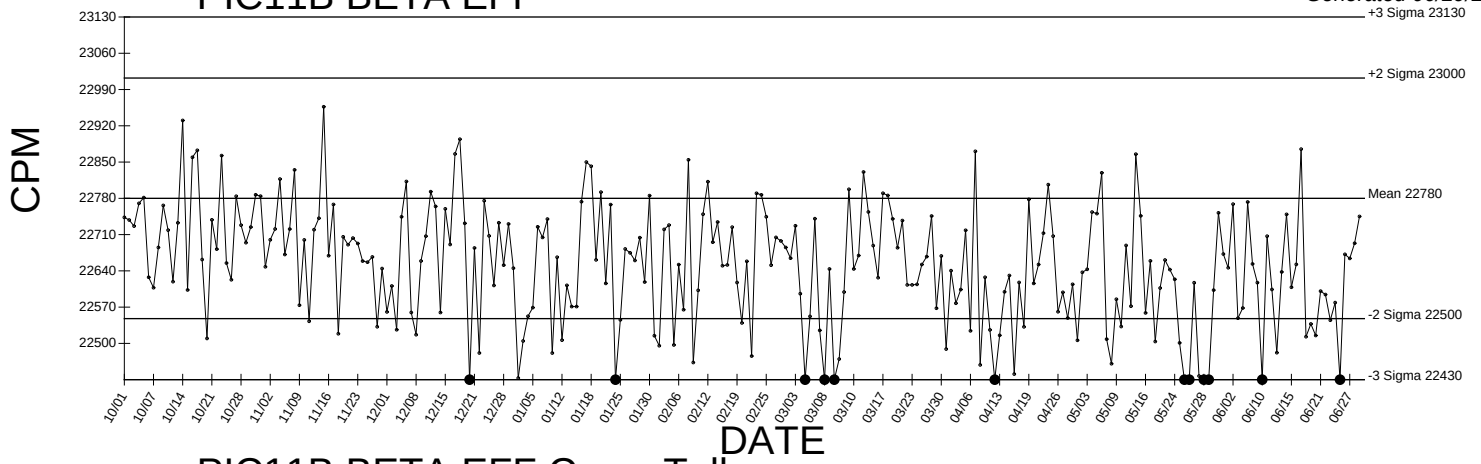


● Denotes Outlier

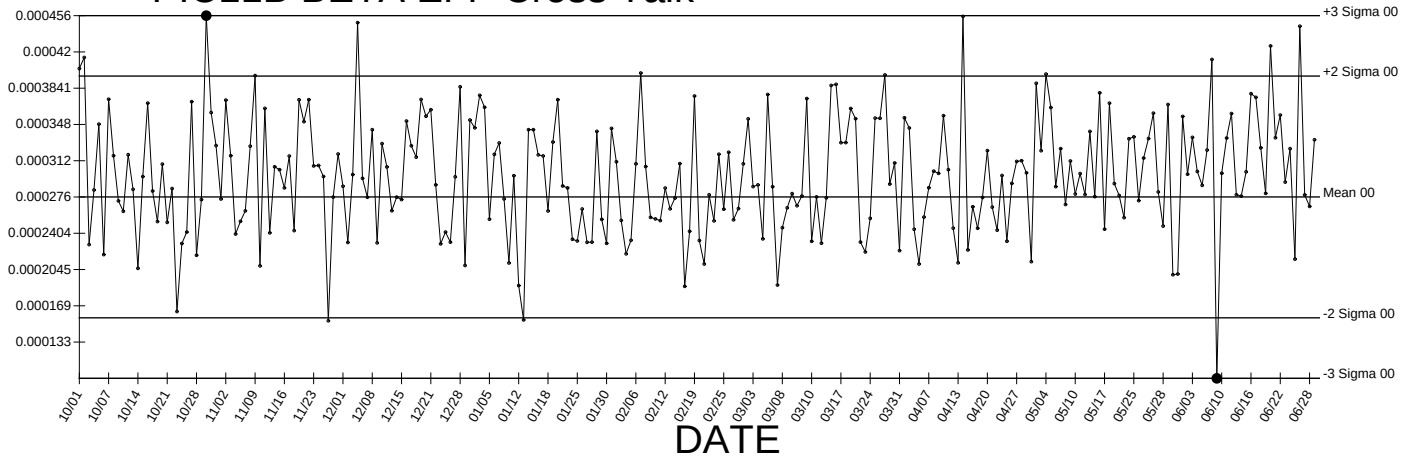


PIC11B BETA EFF

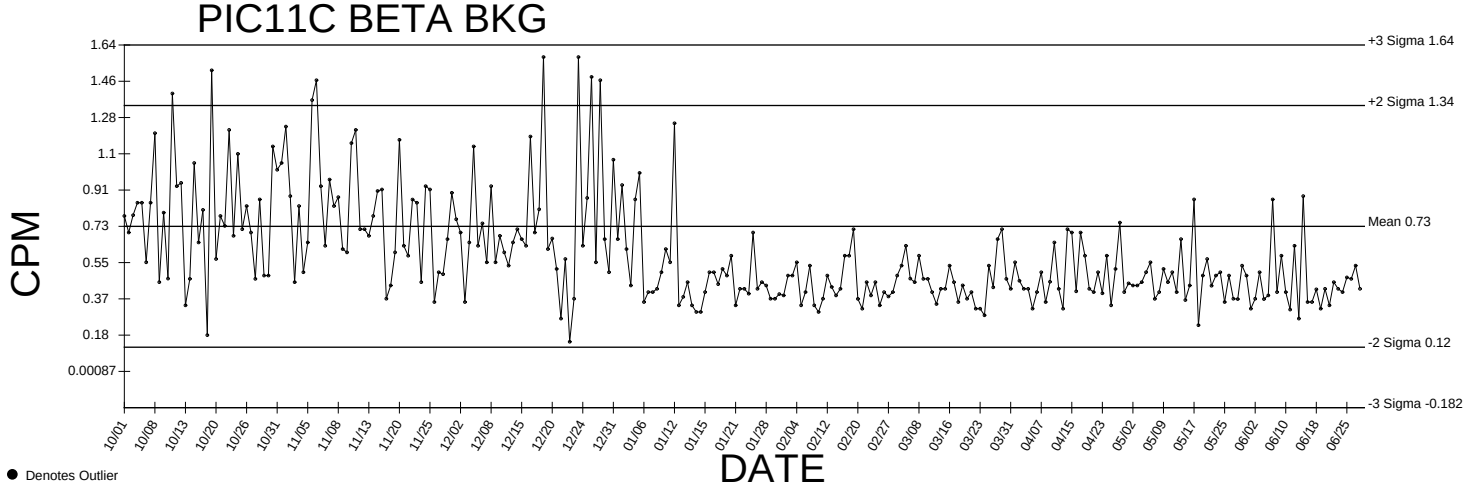
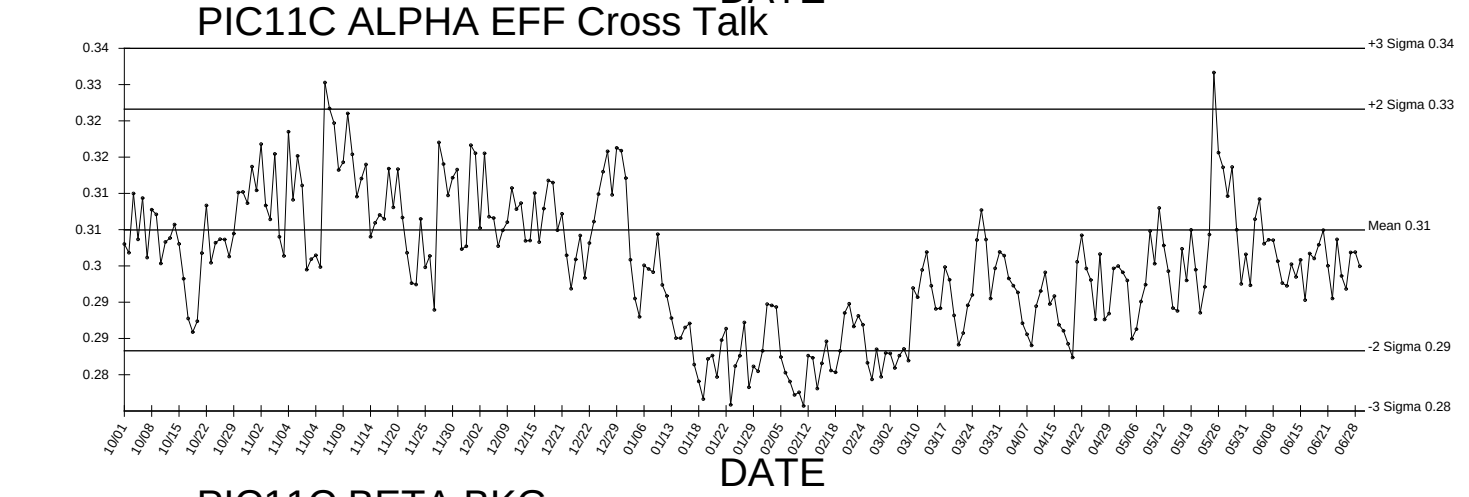
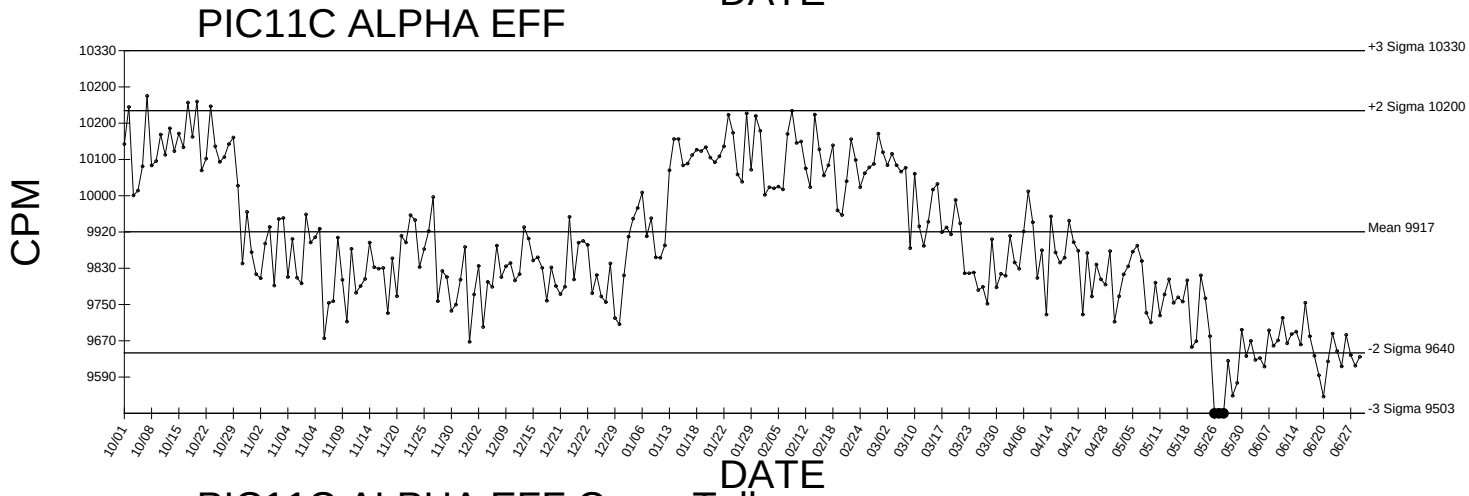
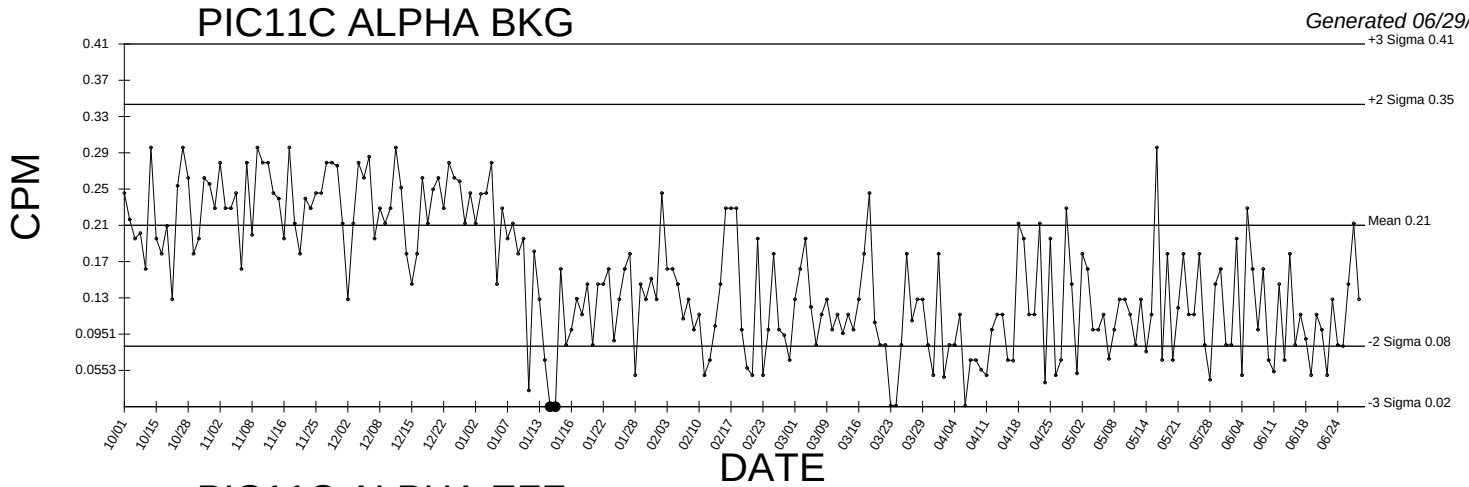
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+3 Sigma 23130



PIC11B BETA EFF Cross Talk



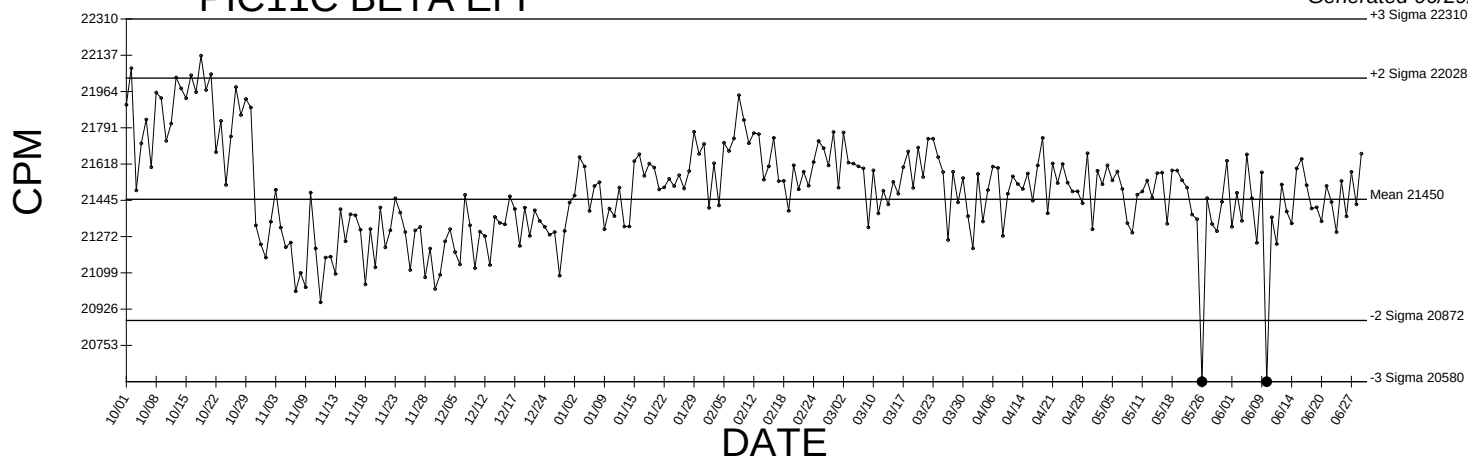
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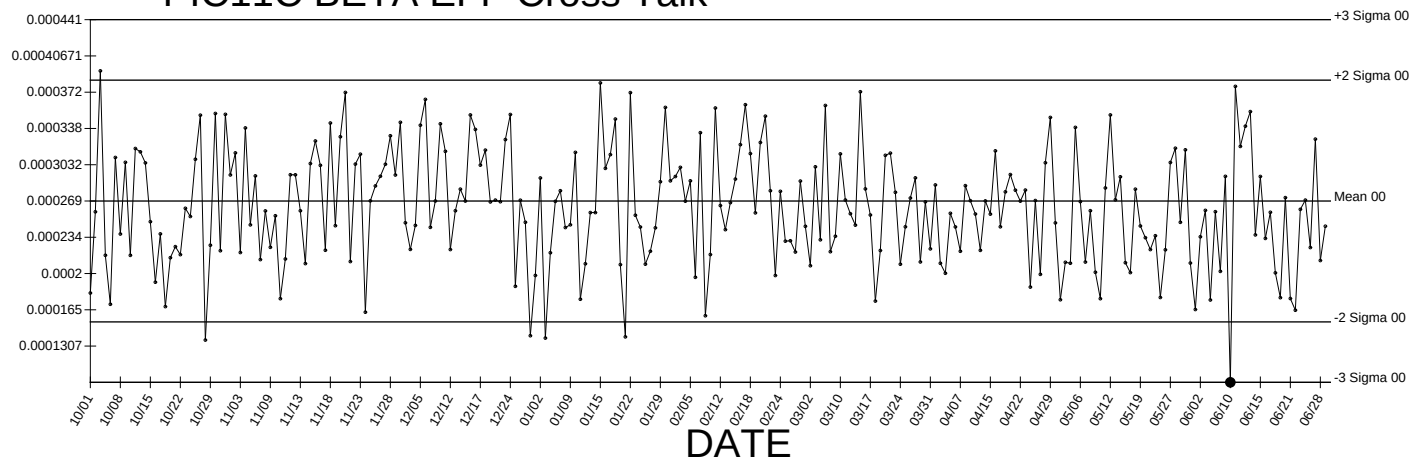
● Denotes Outlier

PIC11C BETA EFF

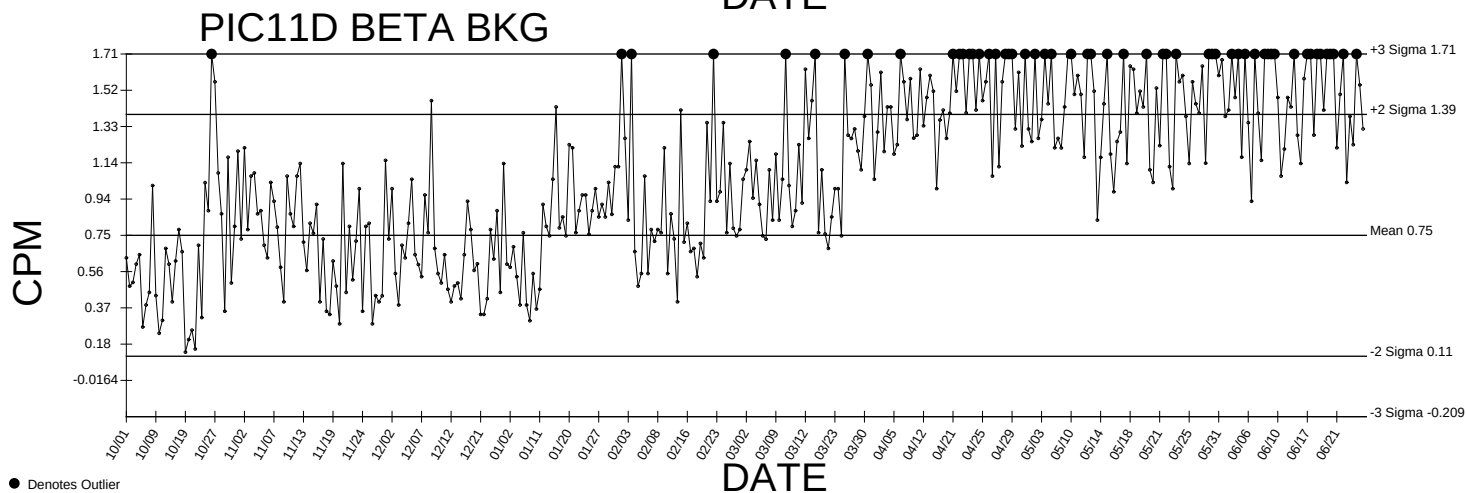
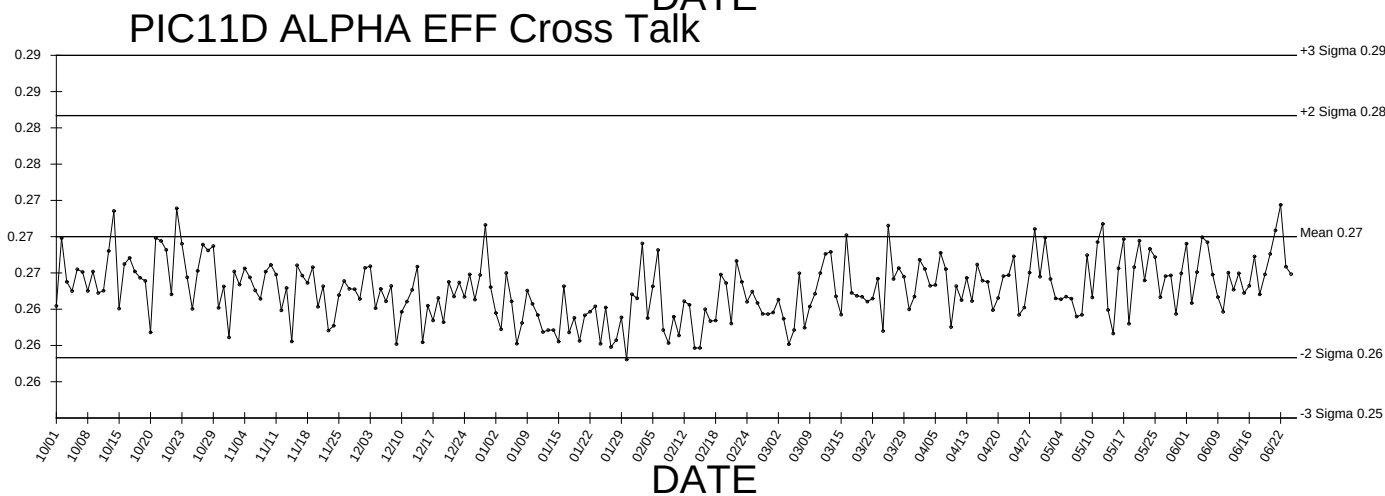
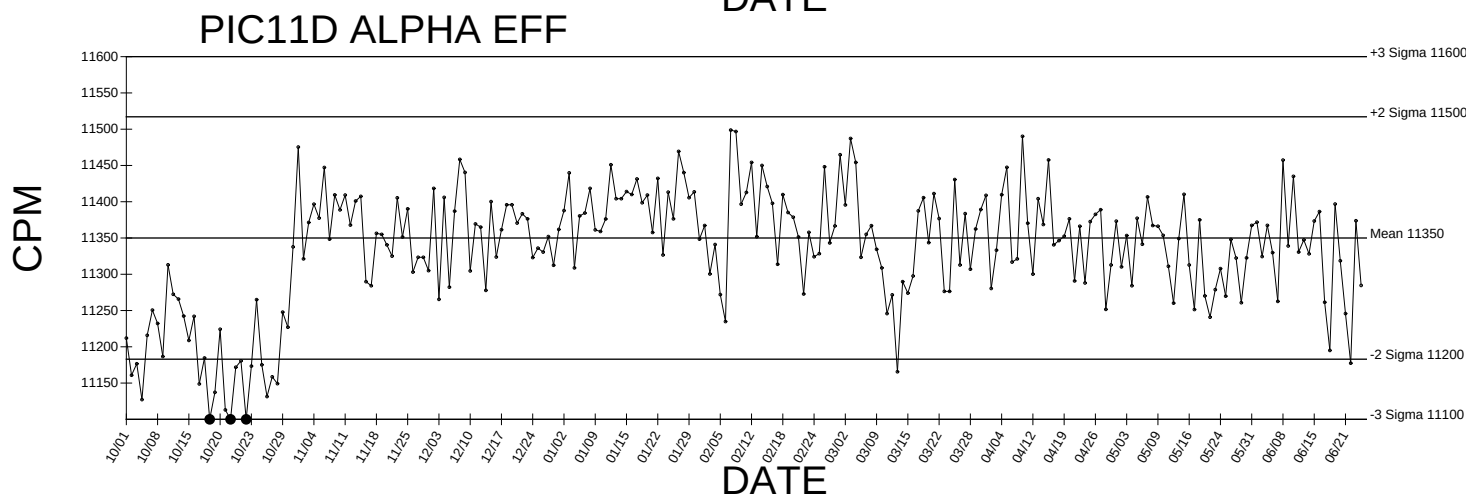
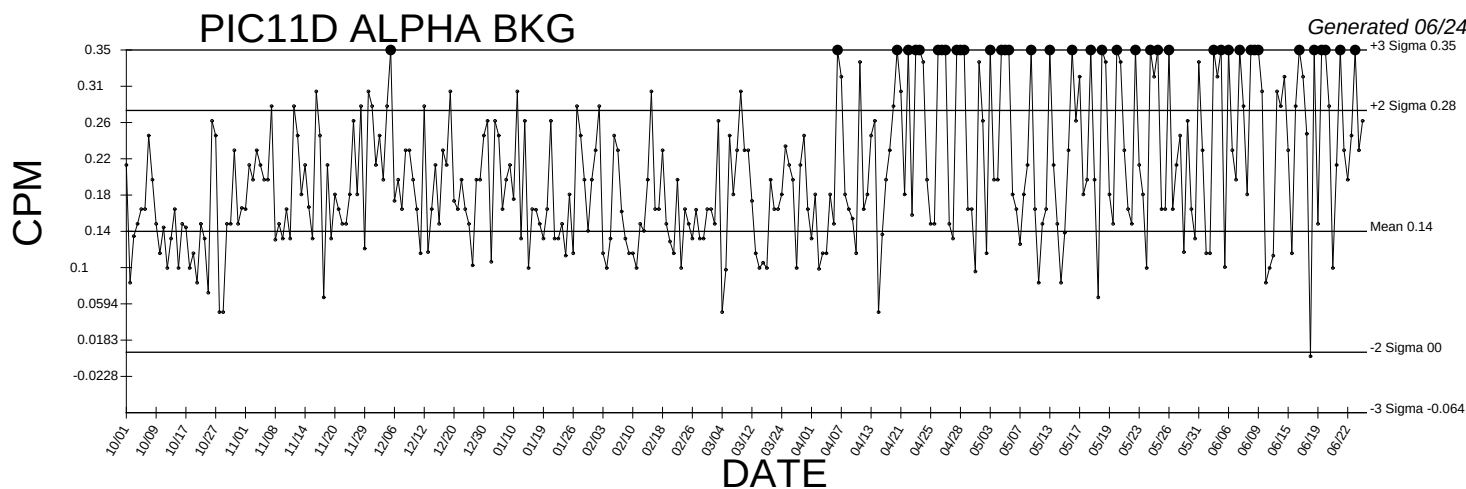
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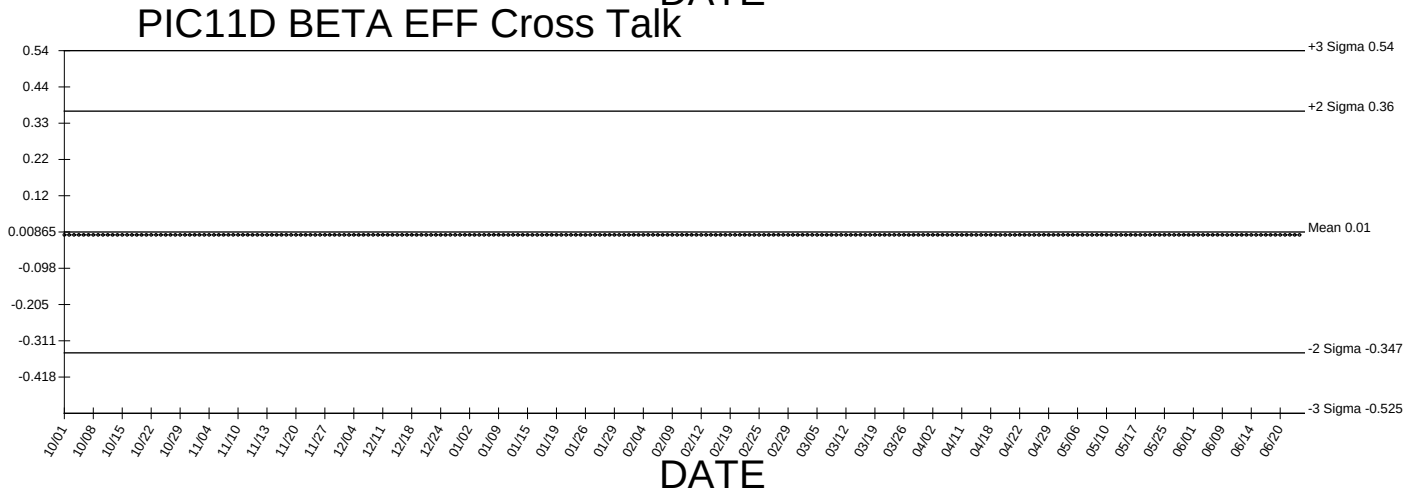
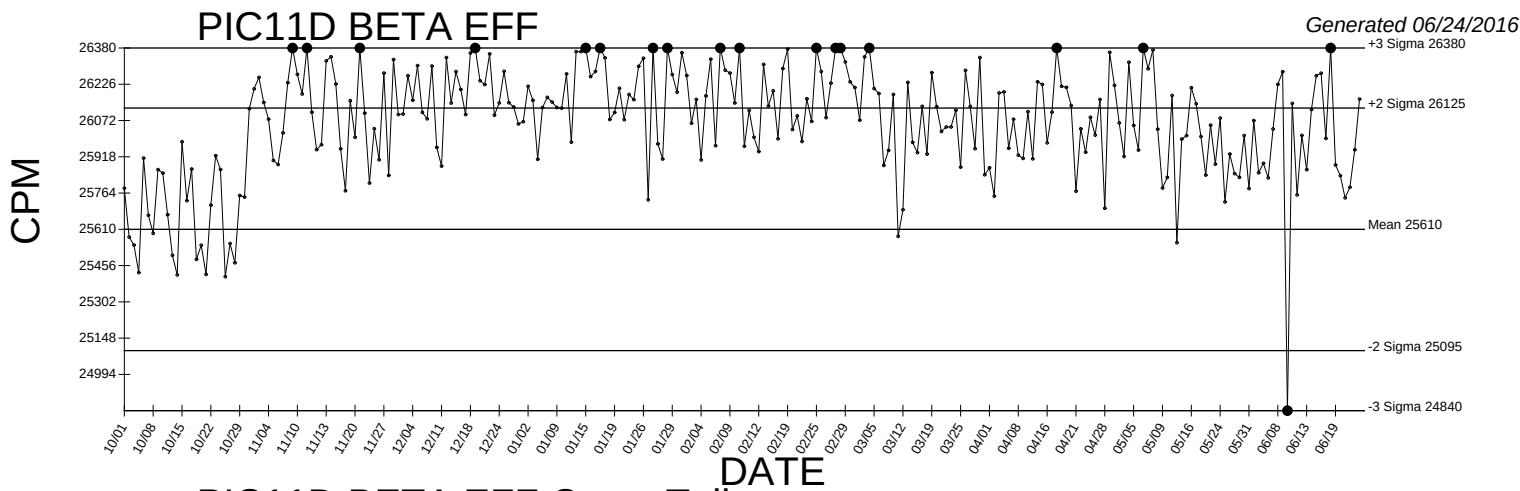


PIC11C BETA EFF Cross Talk

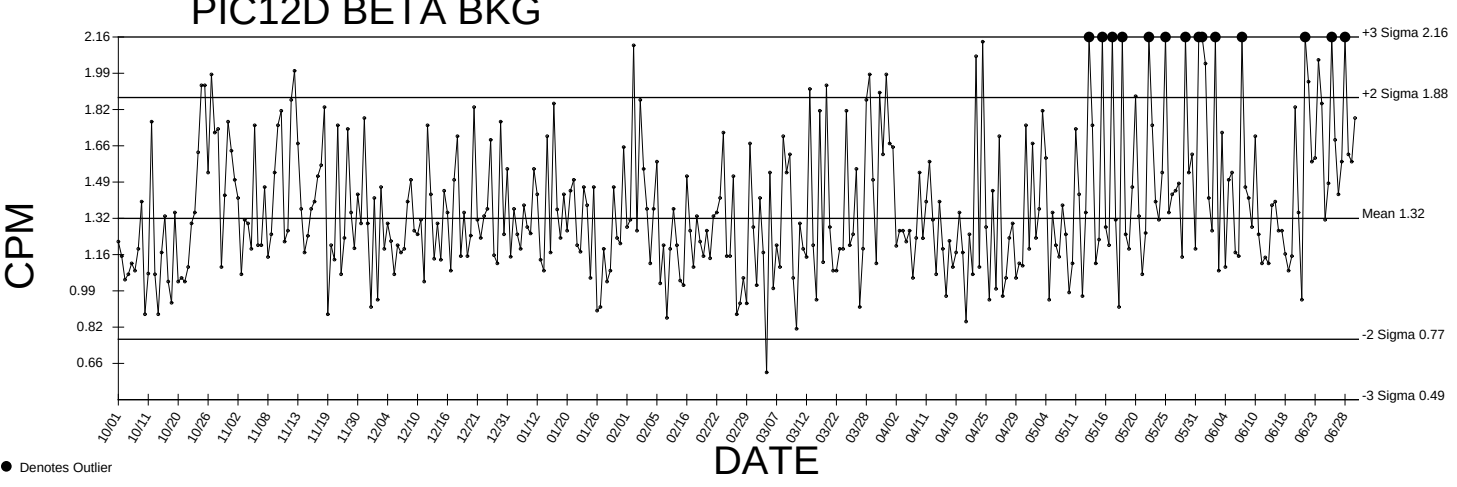
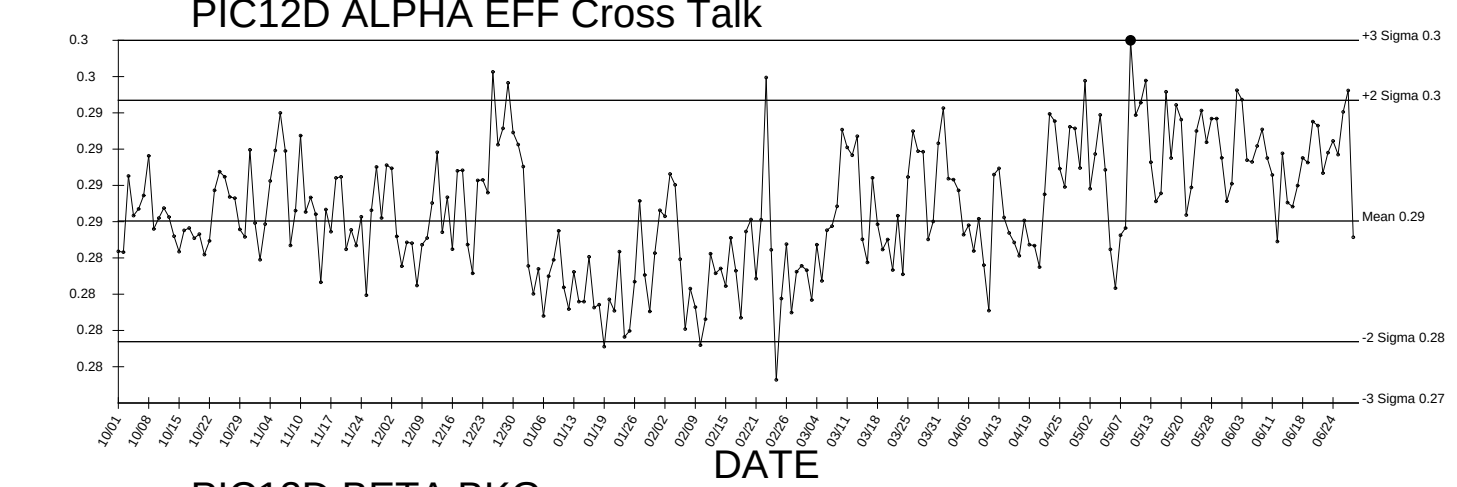
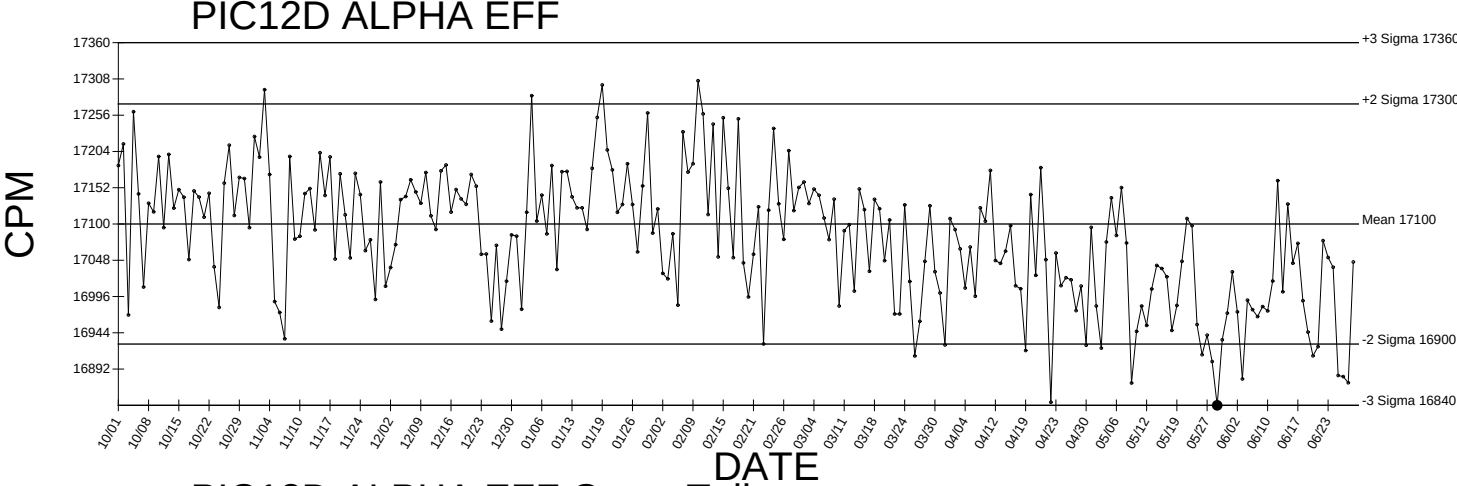
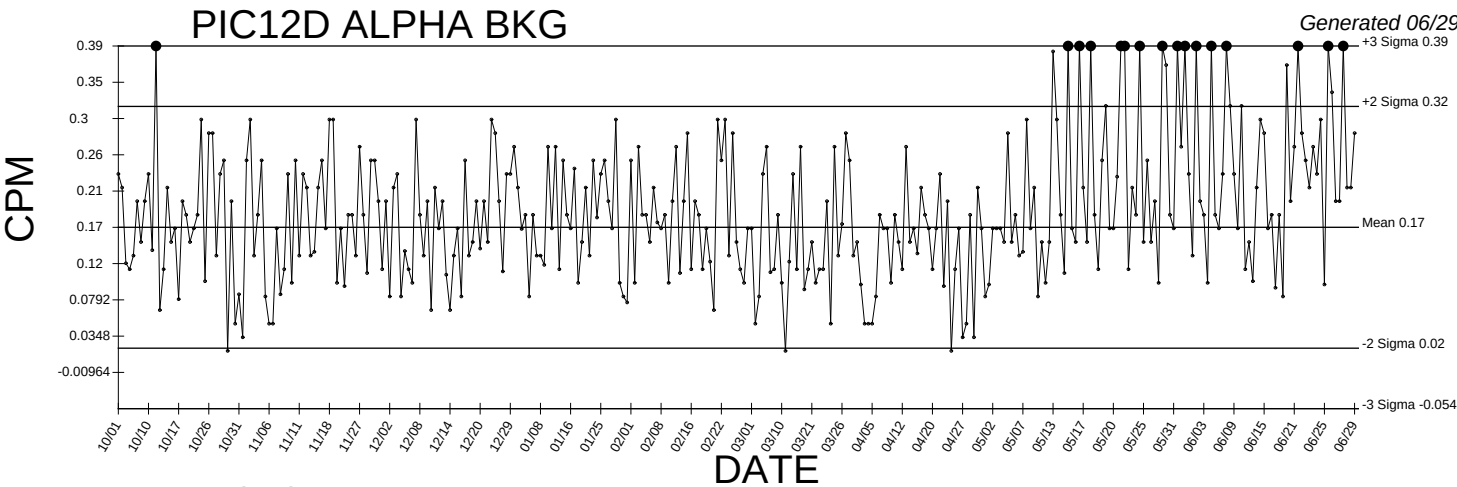


● Denotes Outlier

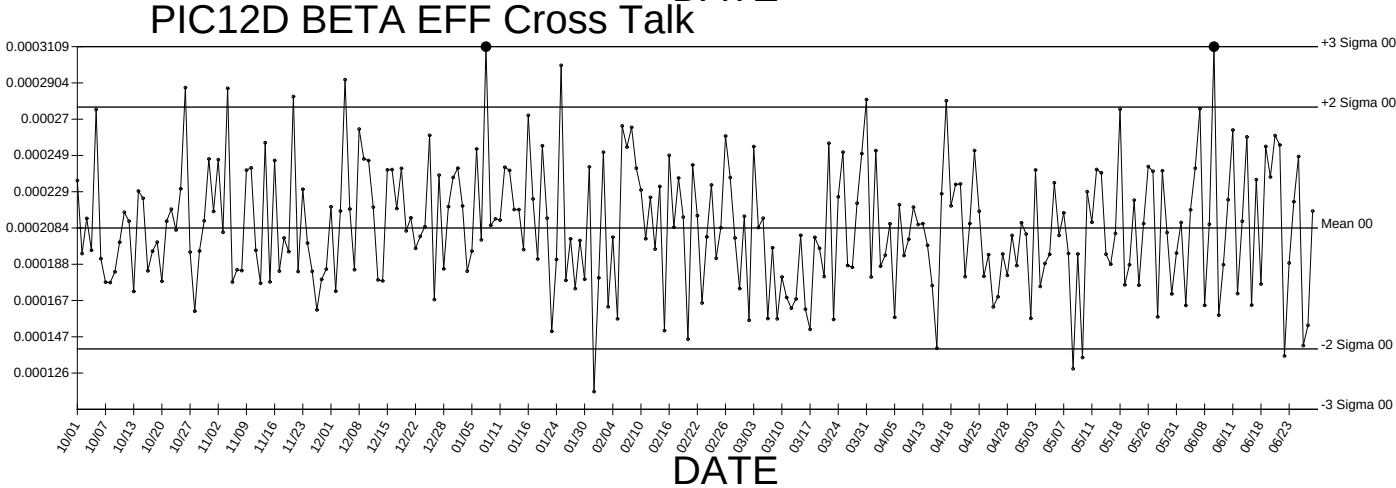
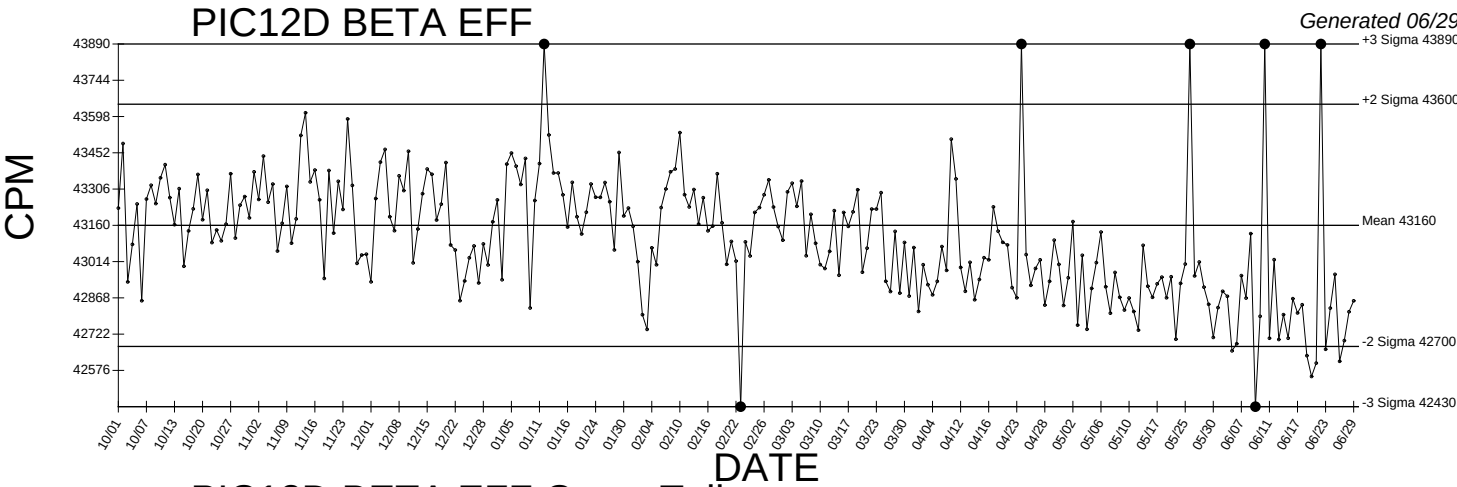




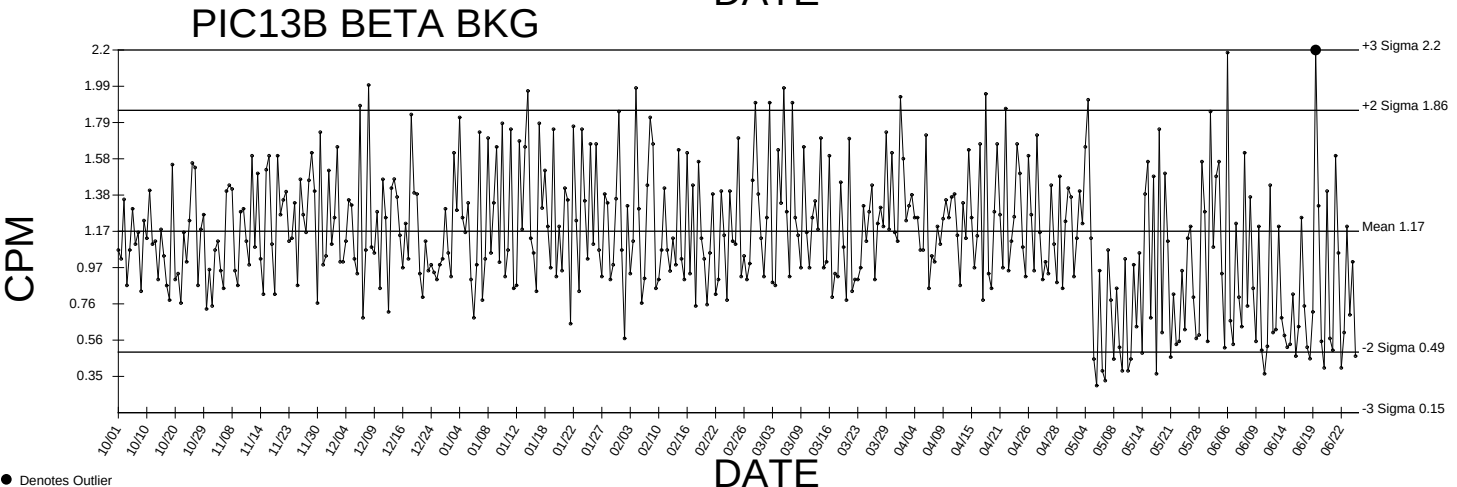
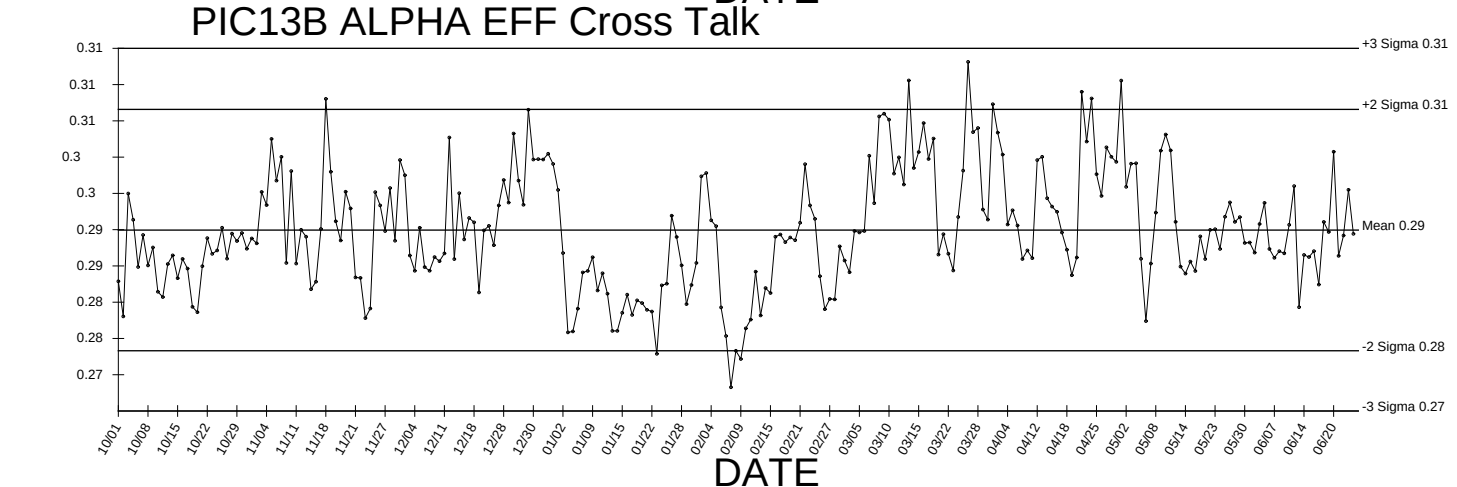
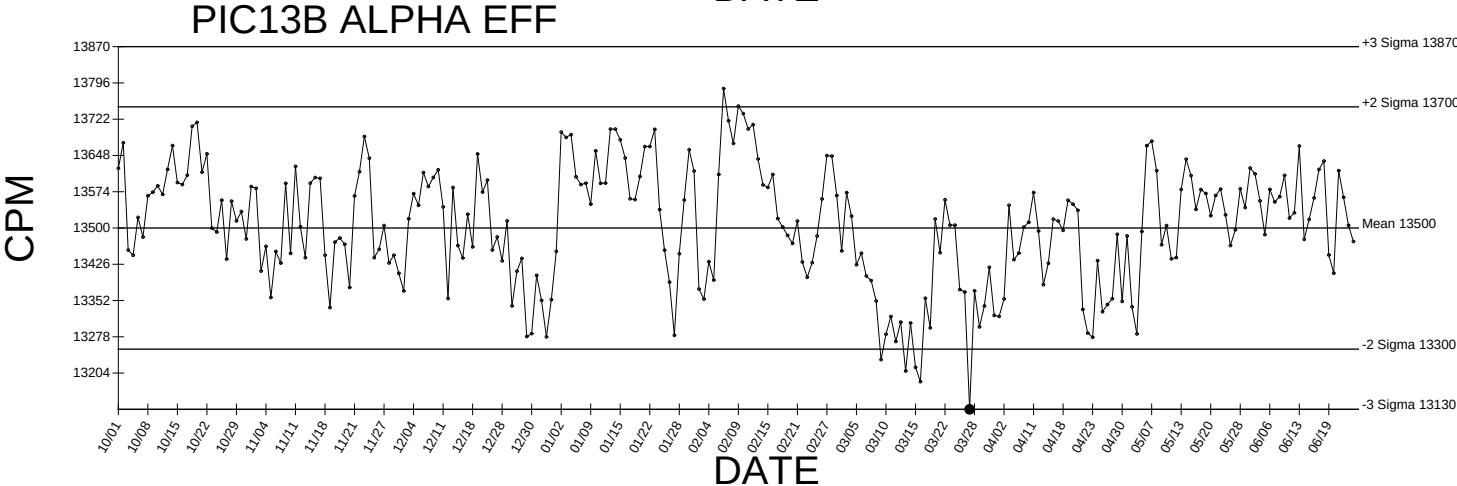
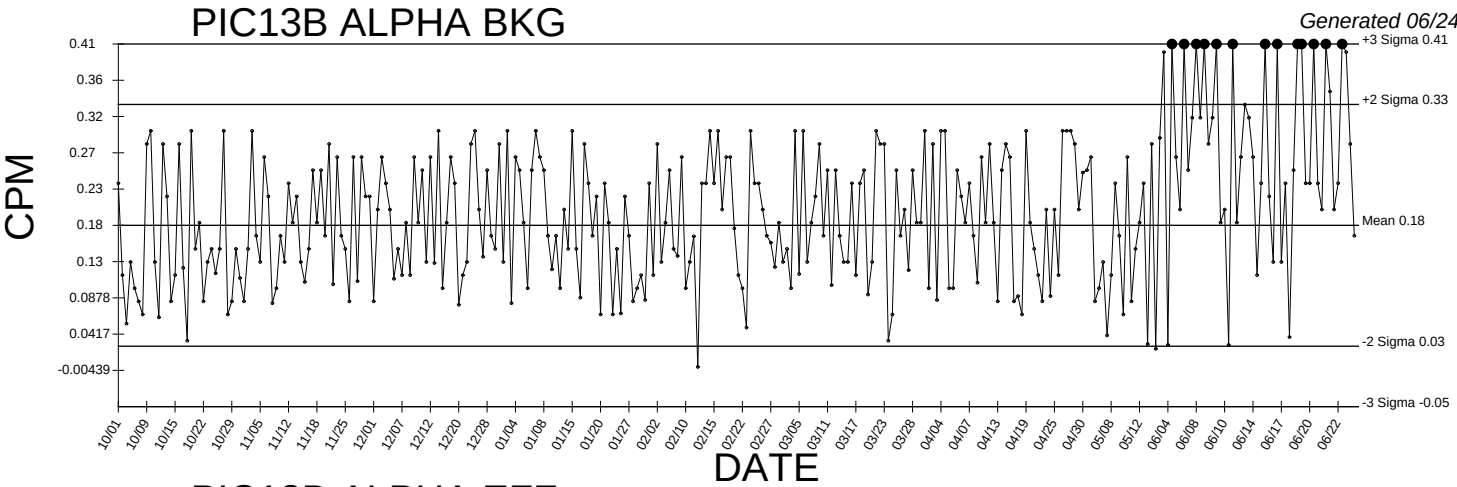
● Denotes Outlier



● Denotes Outlier



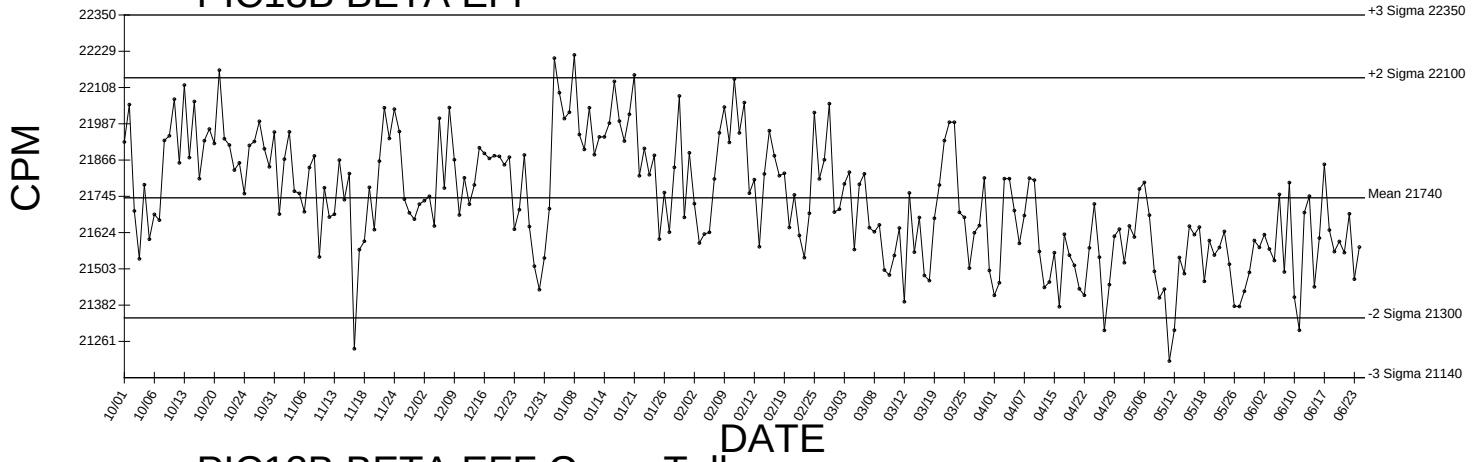
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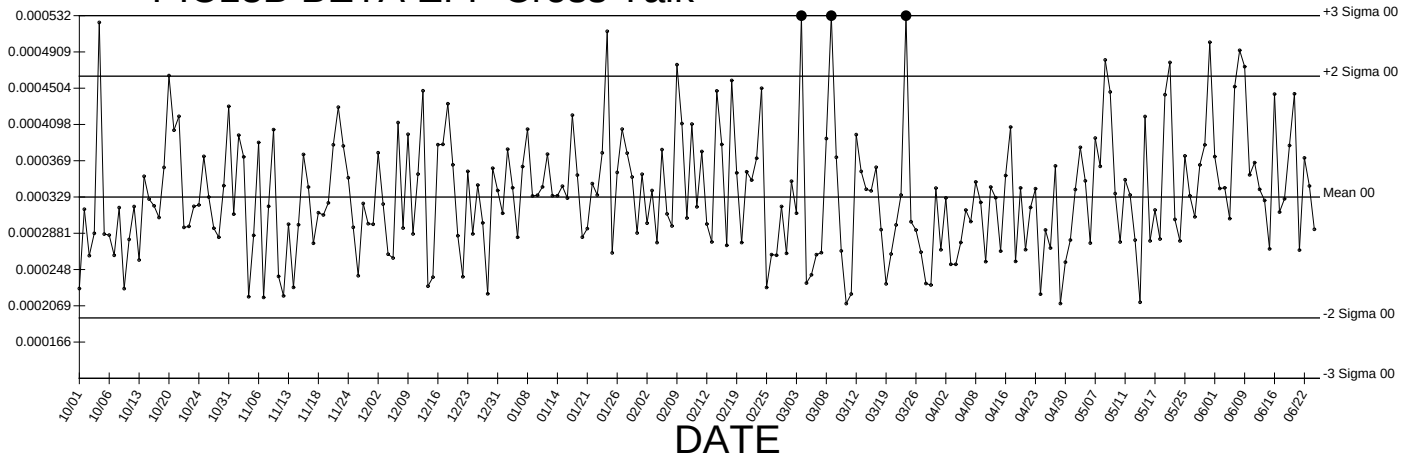
● Denotes Outlier

PIC13B BETA EFF

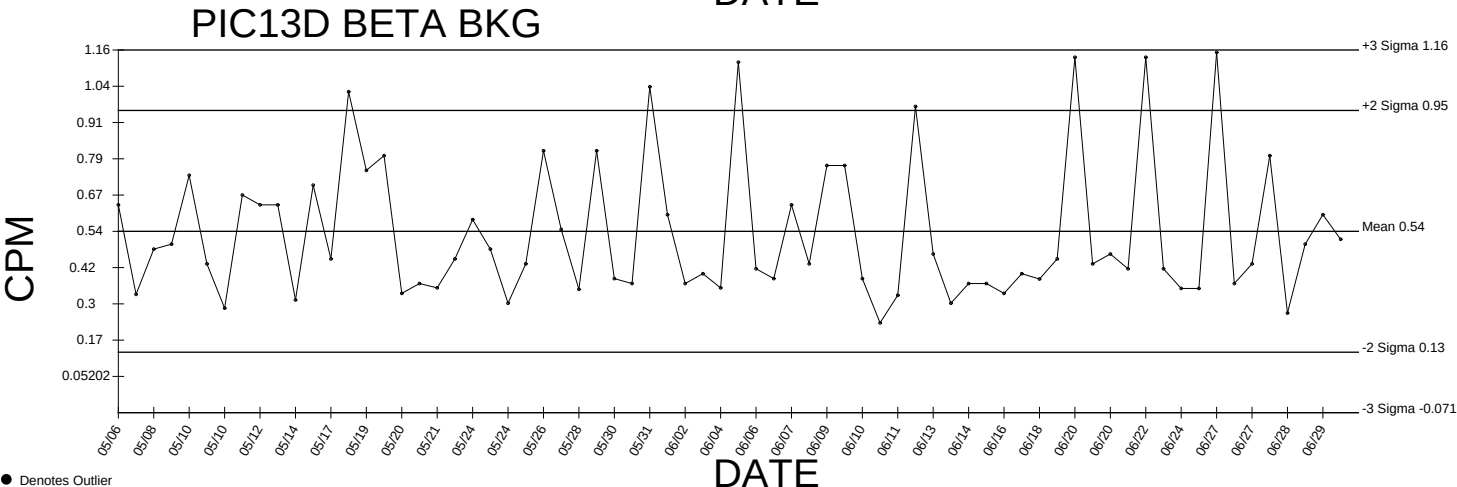
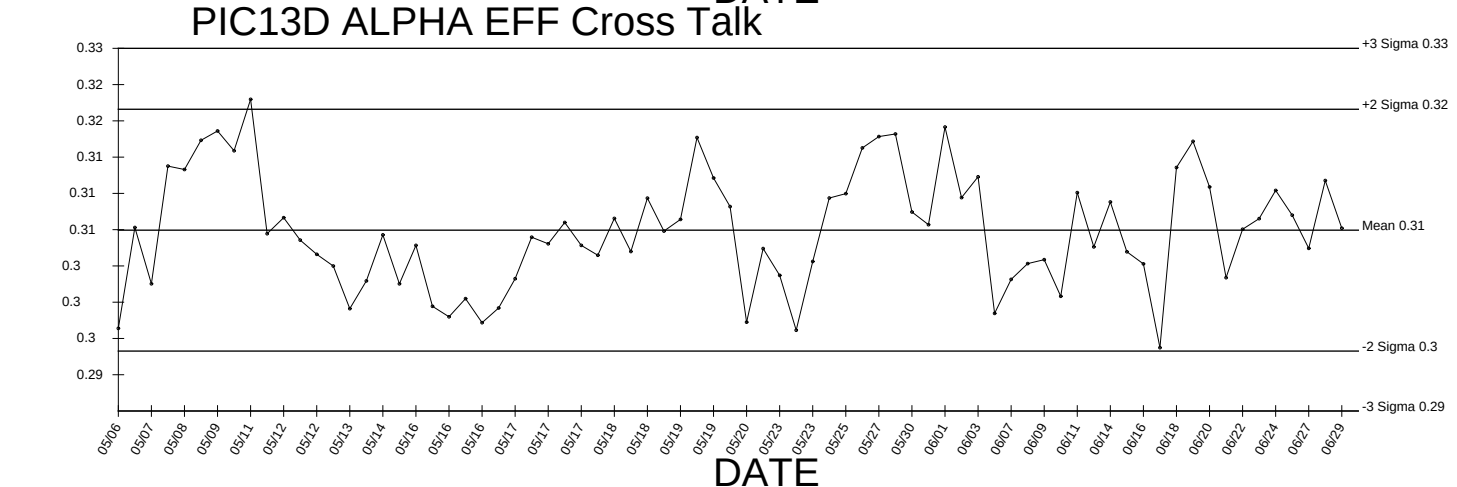
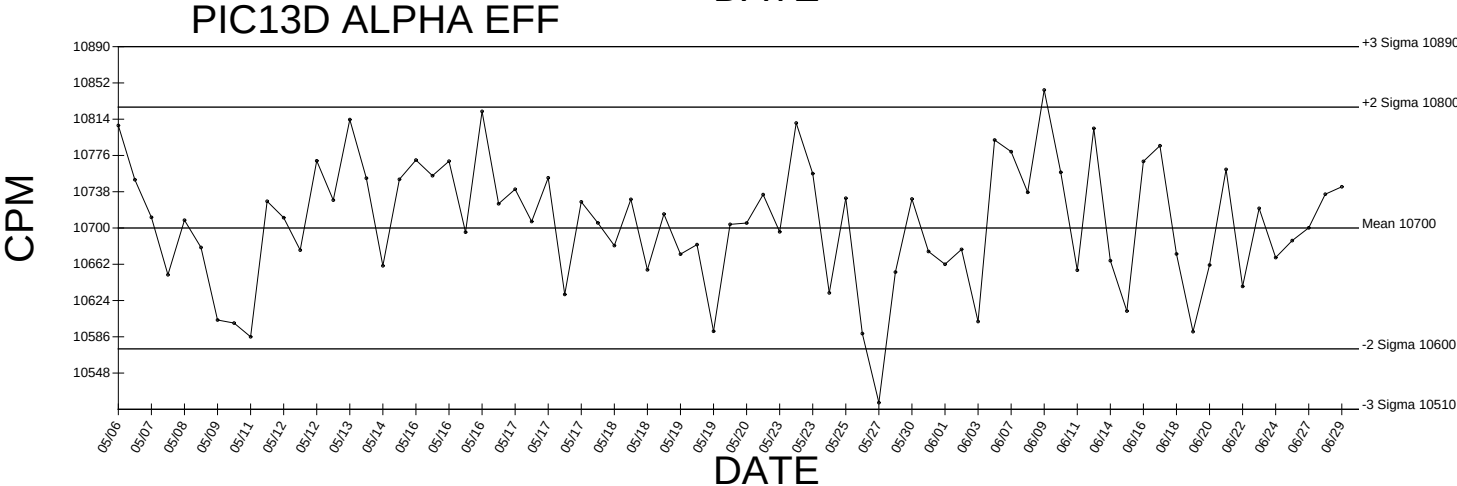
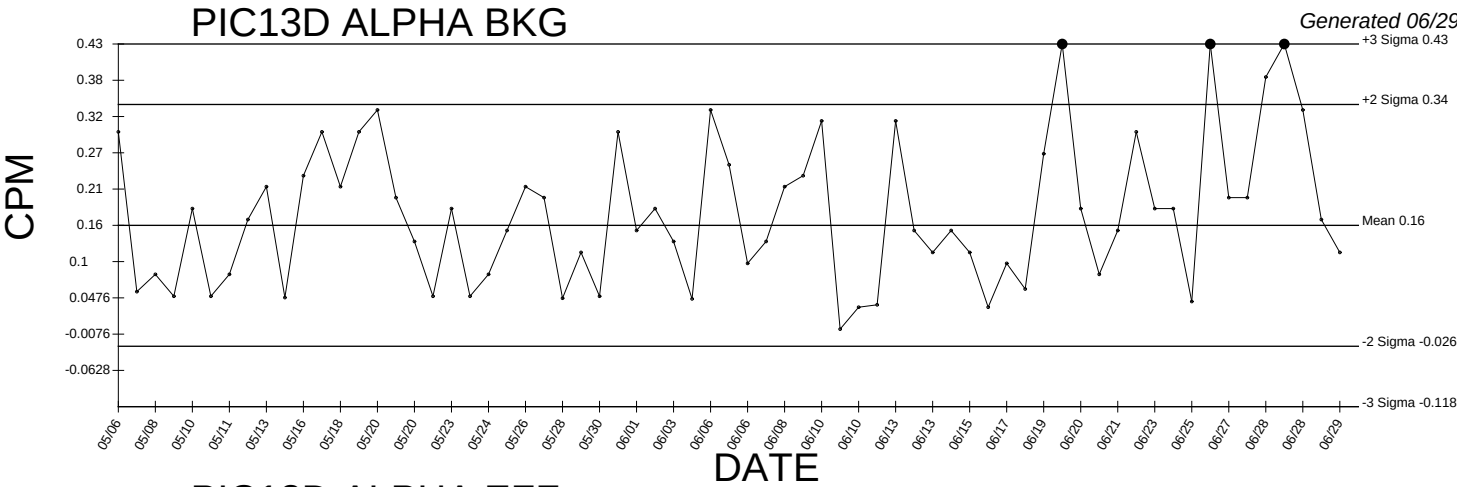
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+3 Sigma 22350



PIC13B BETA EFF Cross Talk



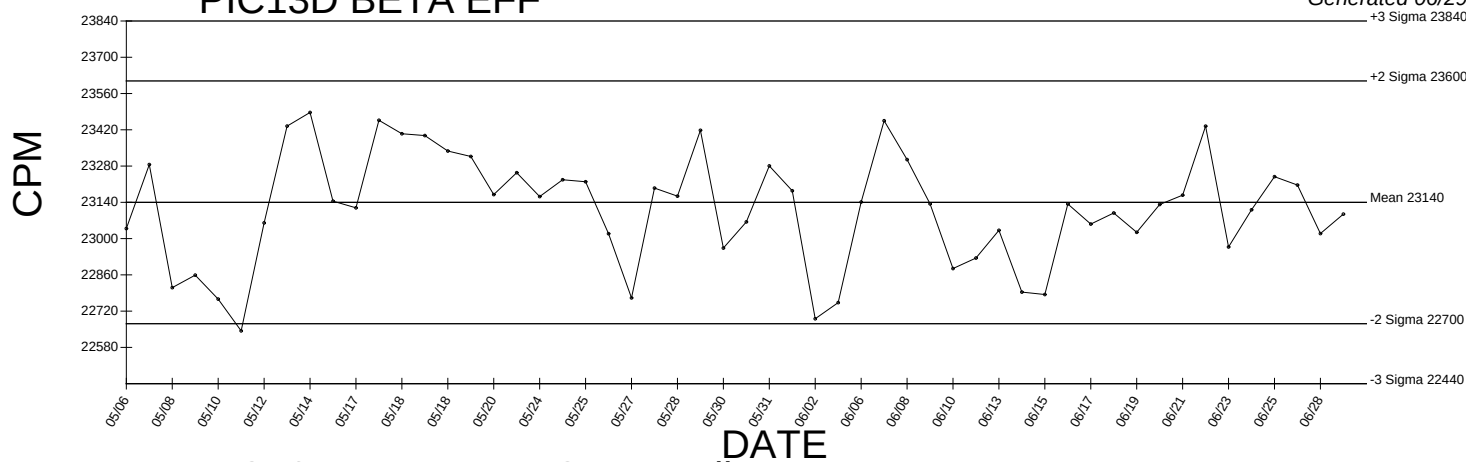
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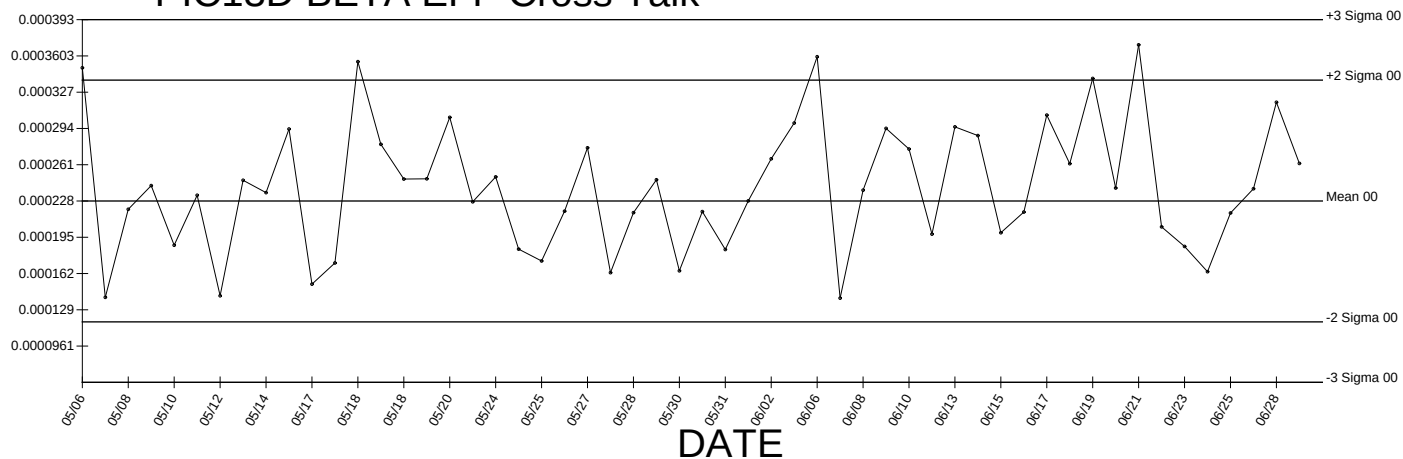
● Denotes Outlier

PIC13D BETA EFF

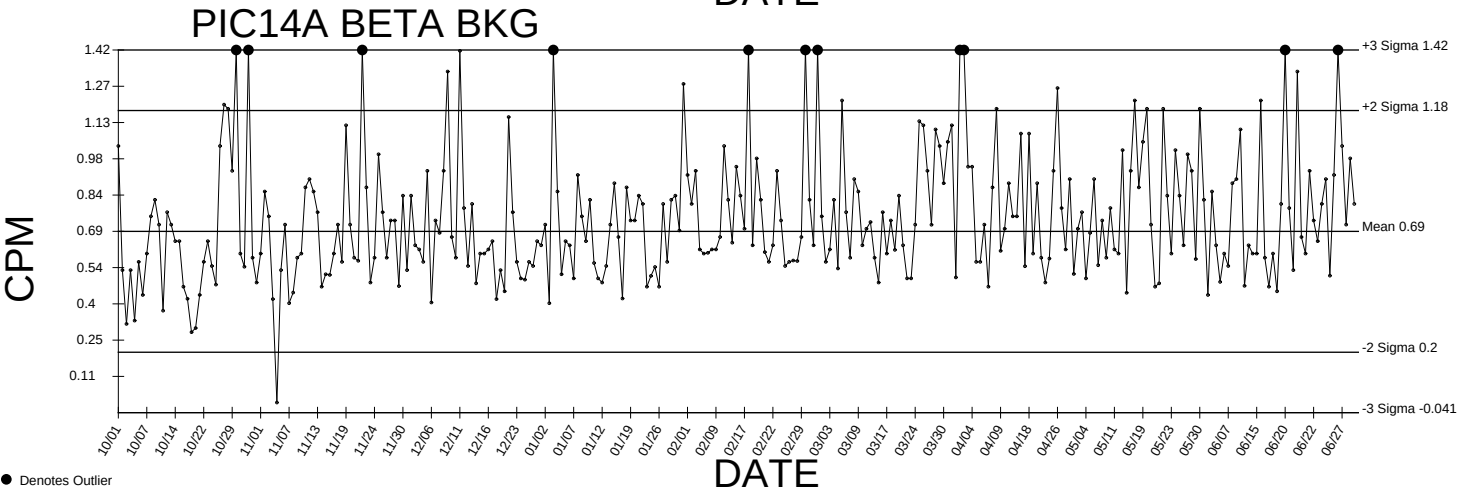
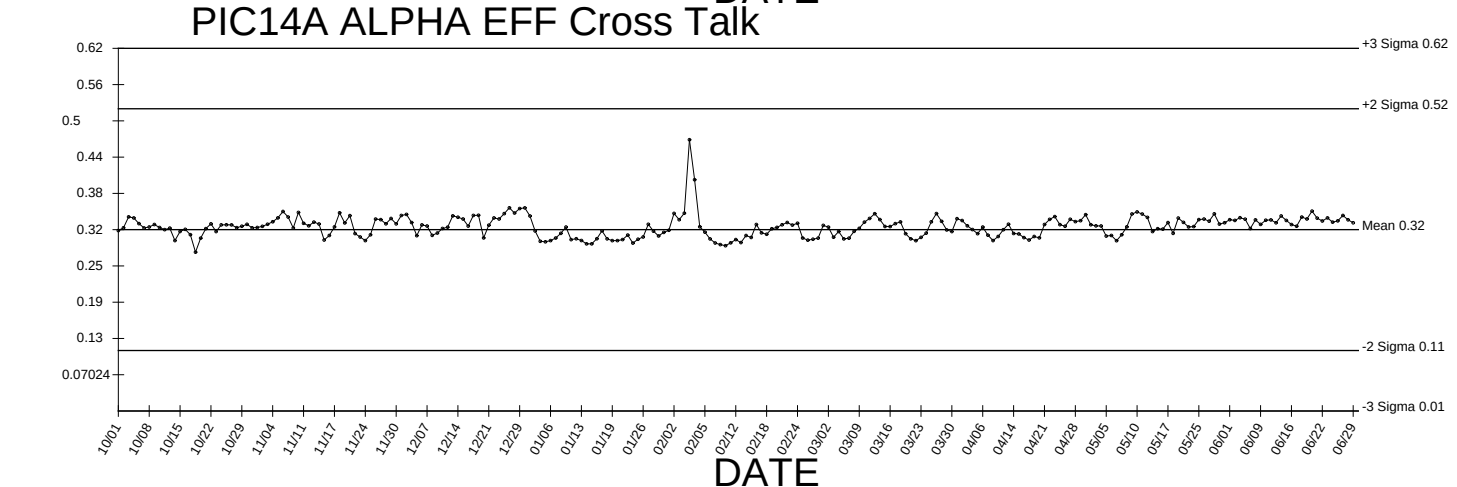
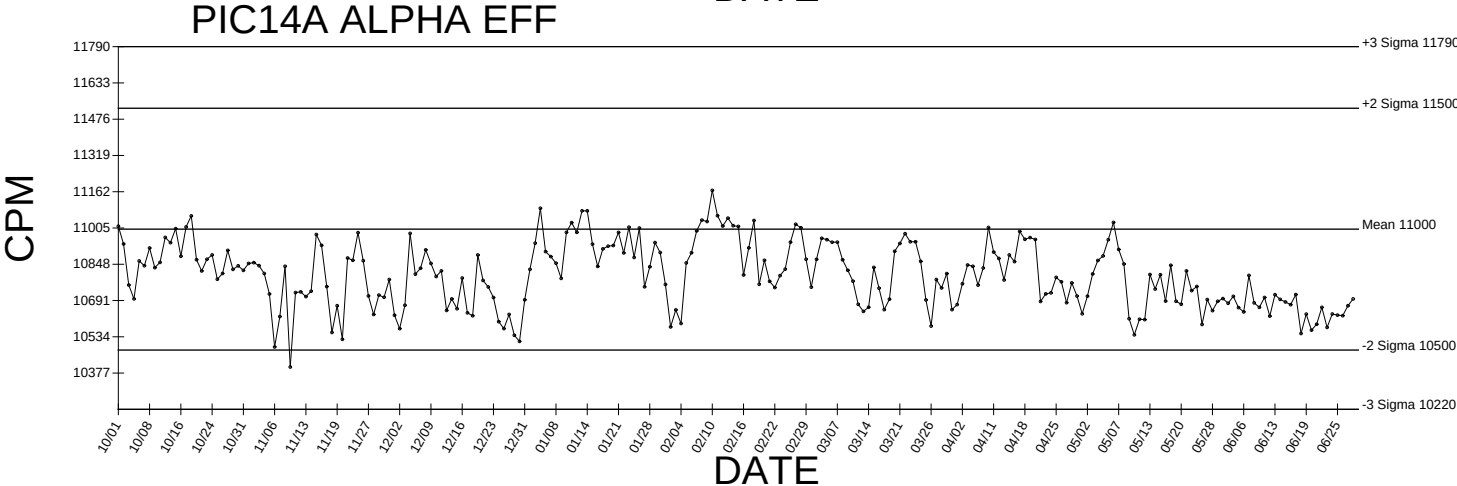
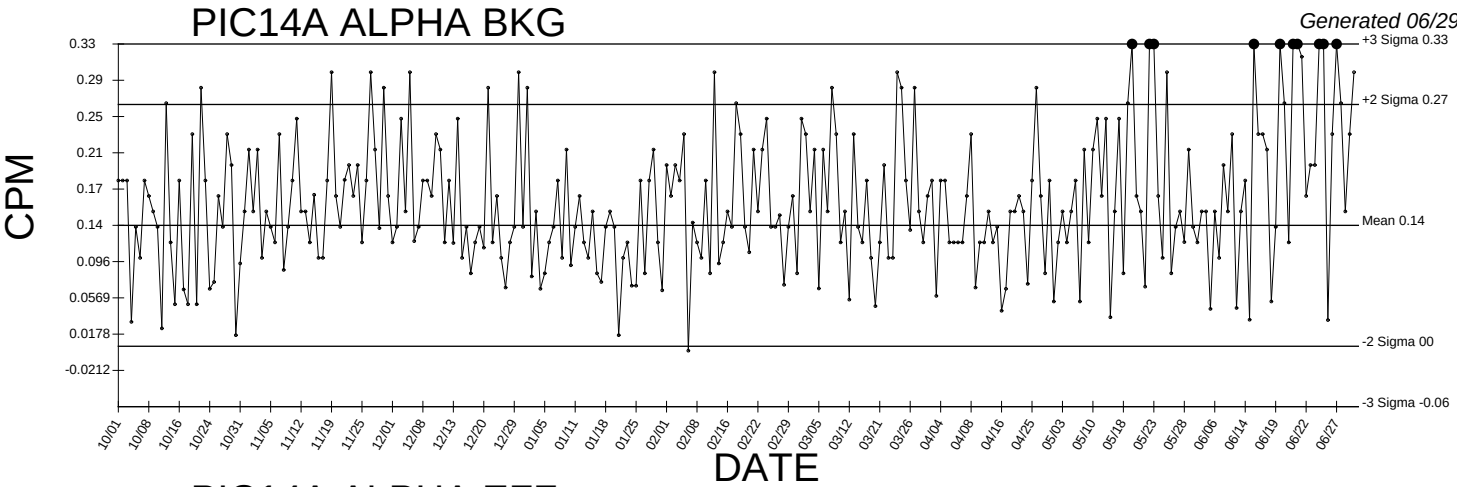
Generated 06/29/2016



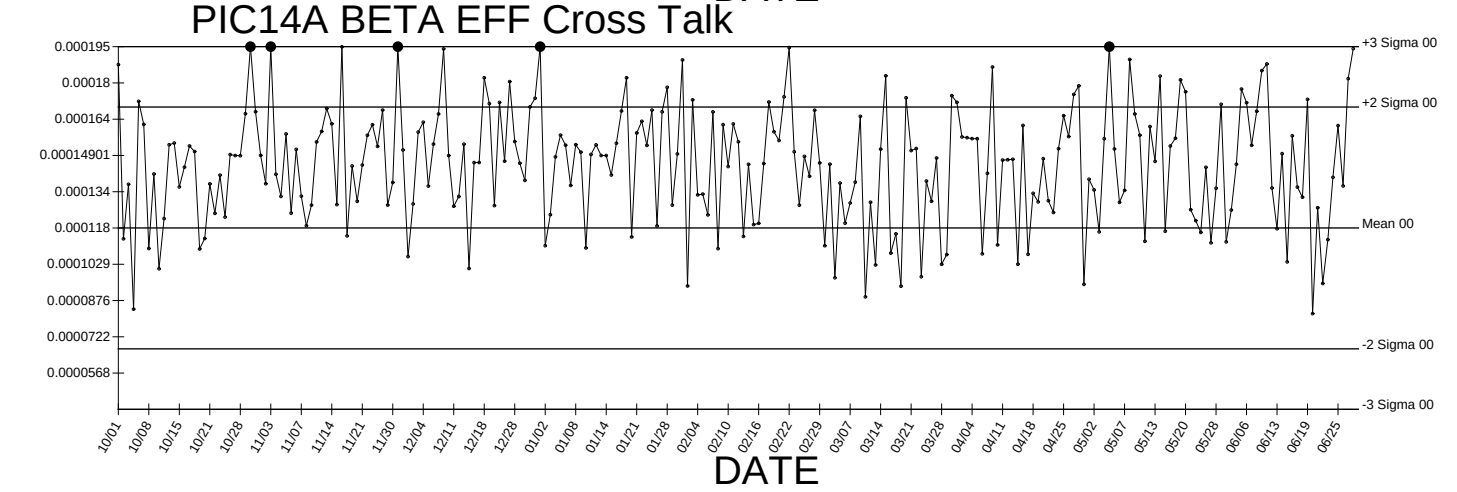
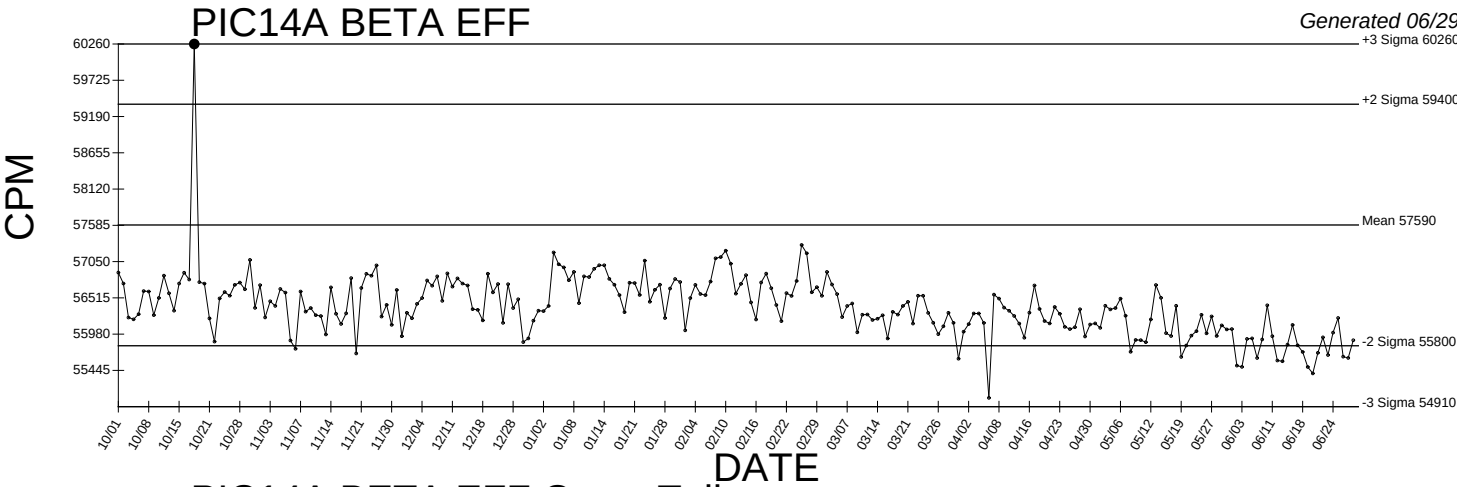
PIC13D BETA EFF Cross Talk



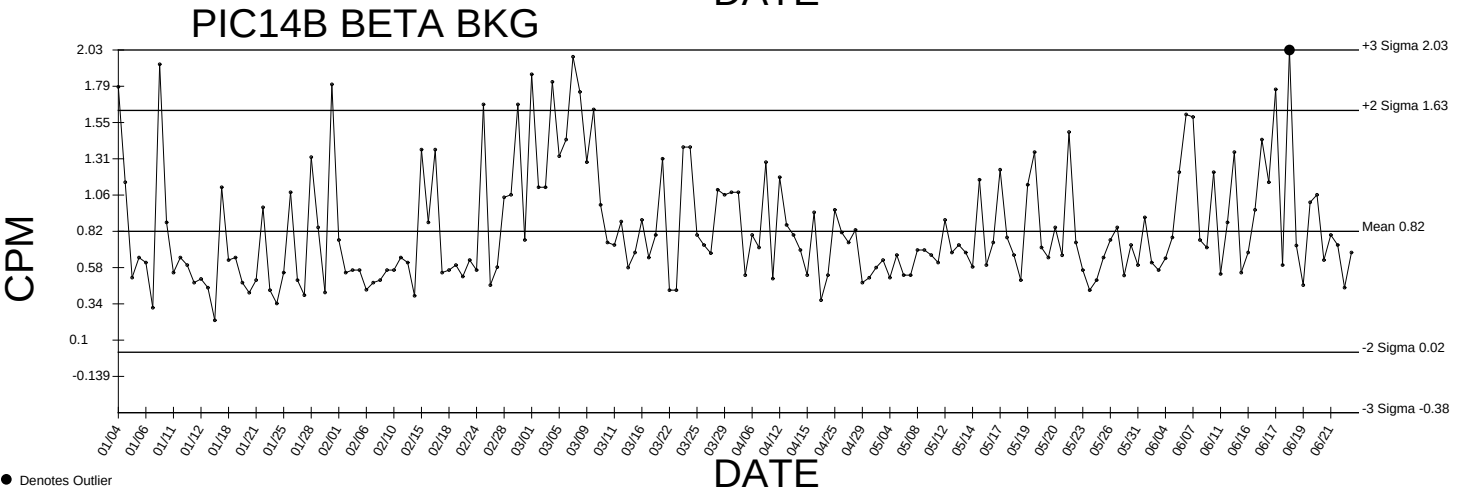
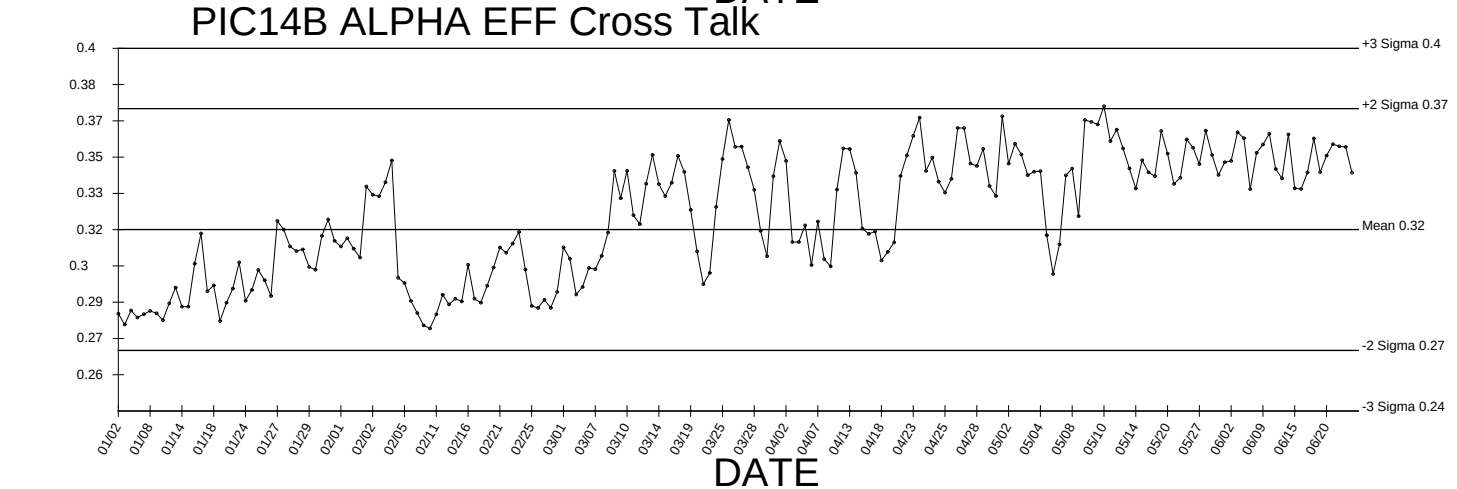
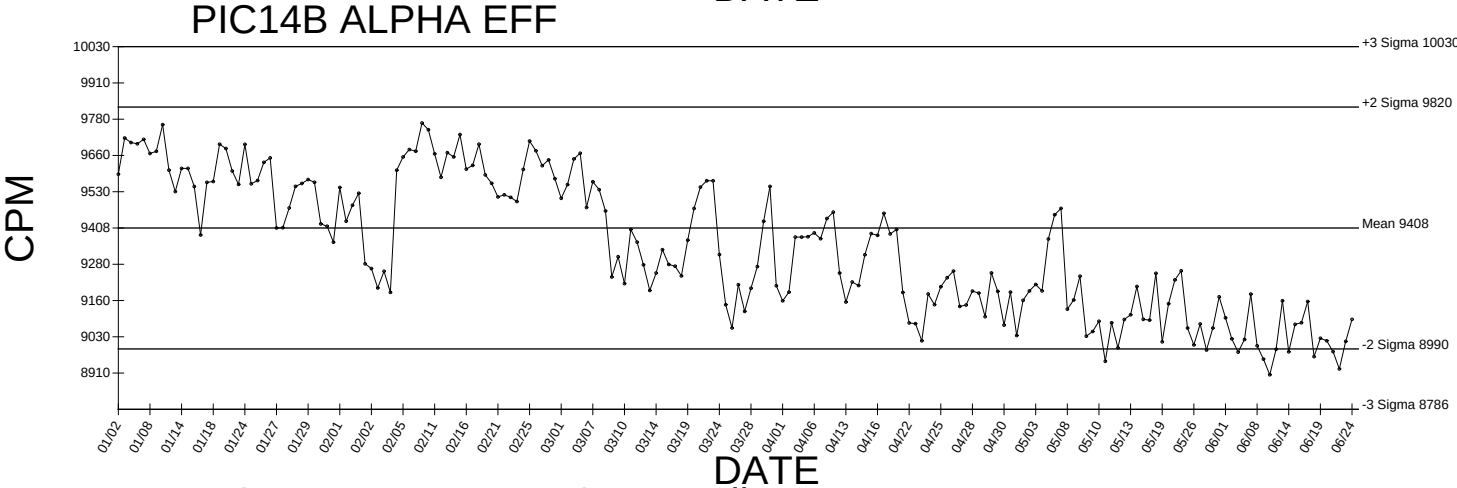
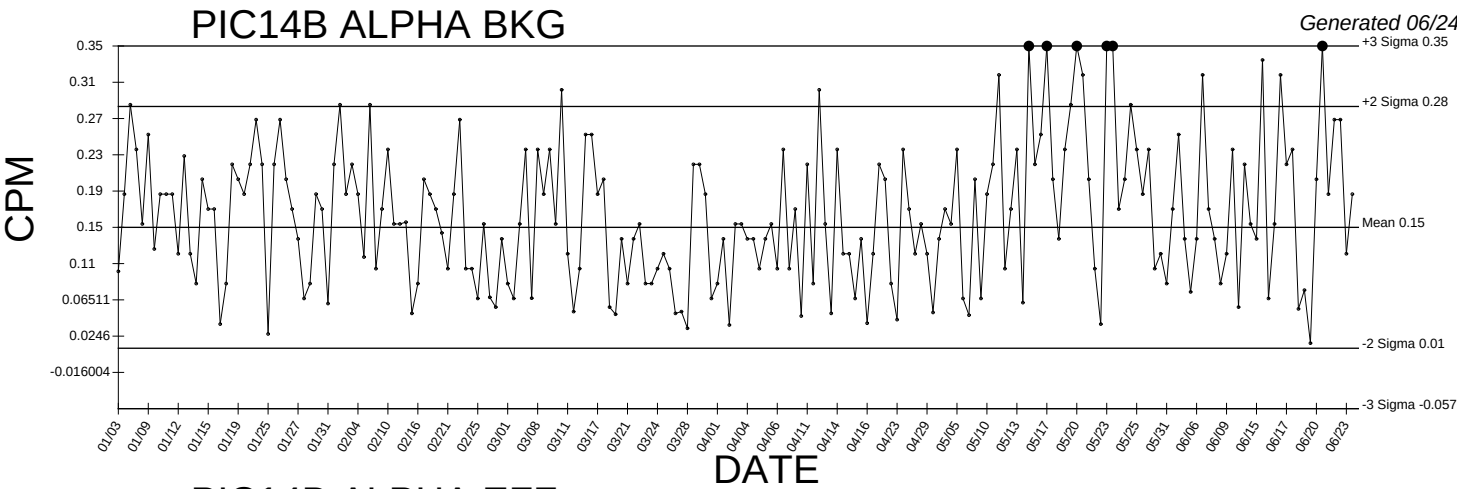
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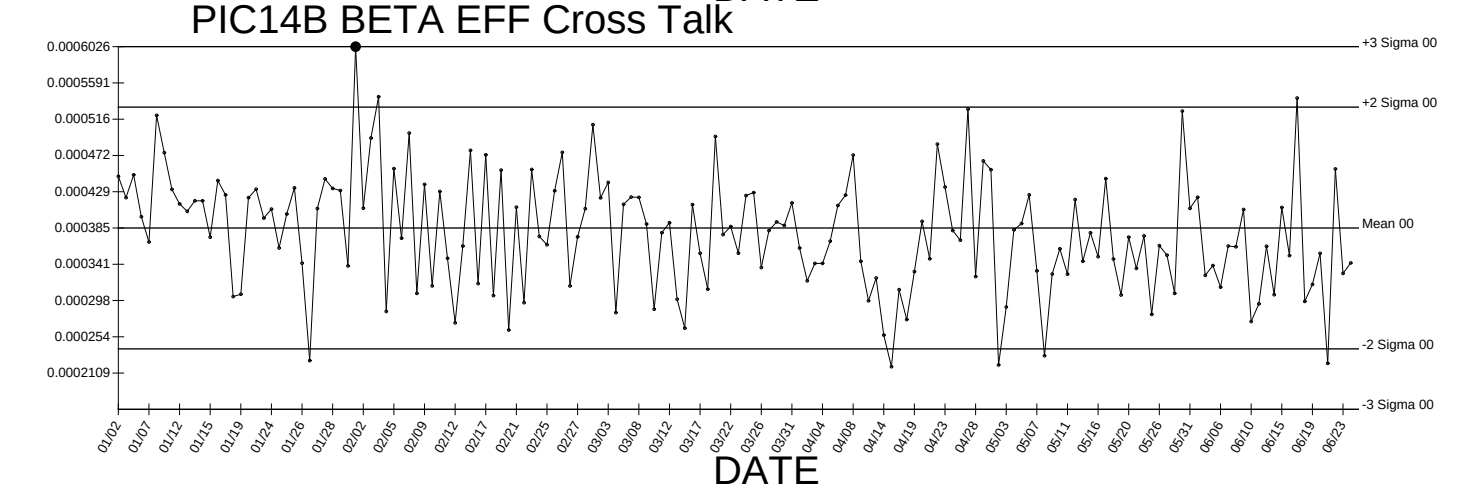
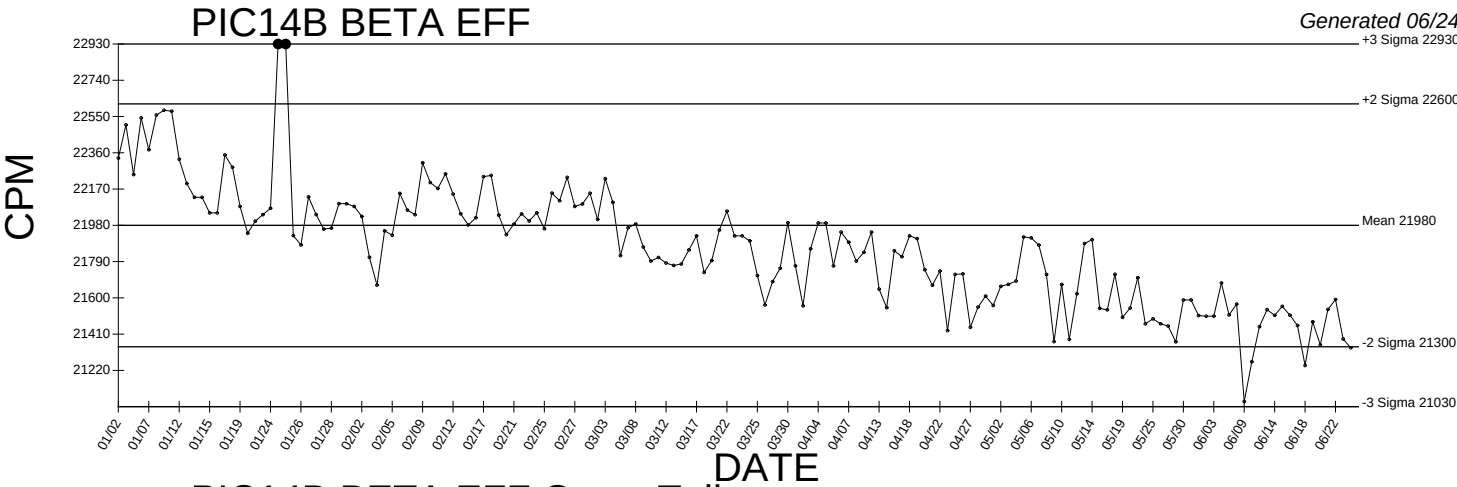
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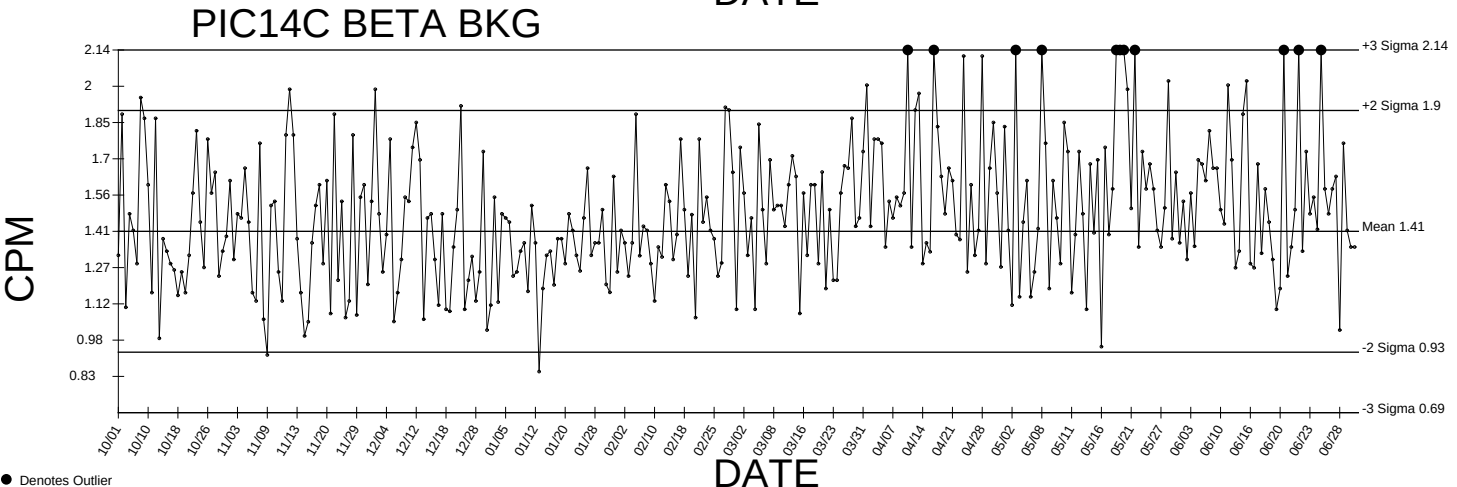
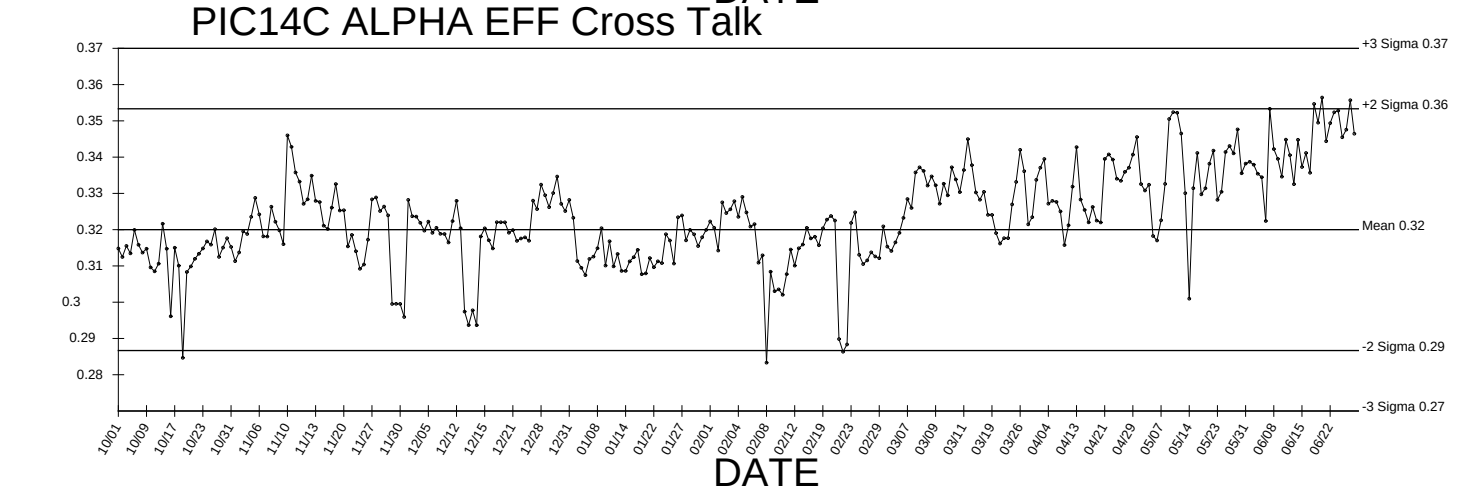
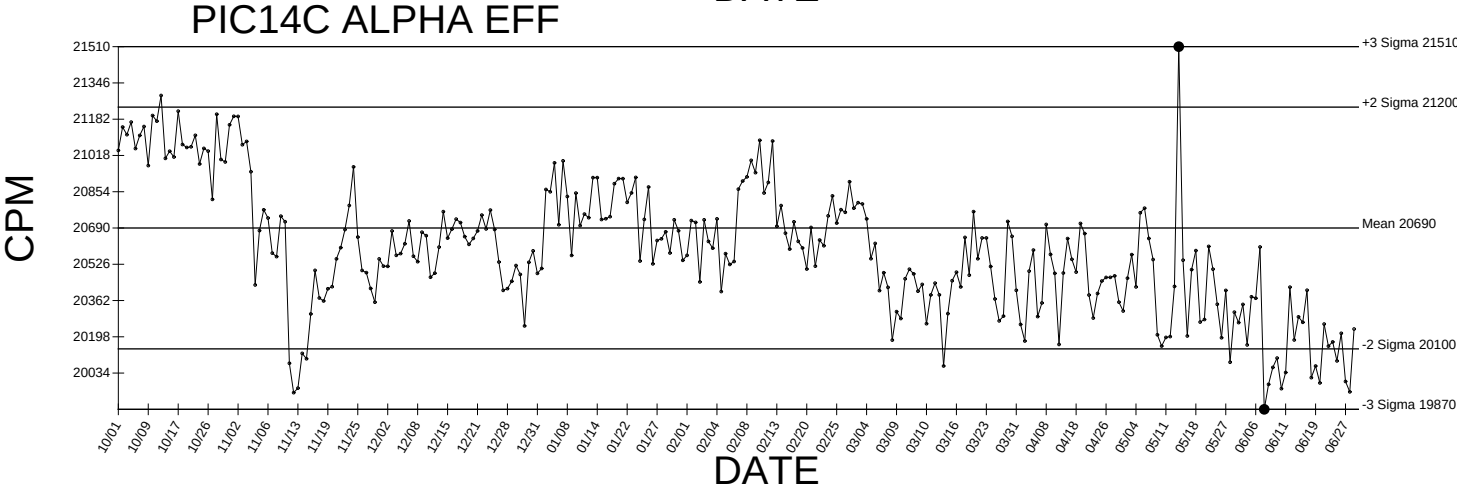
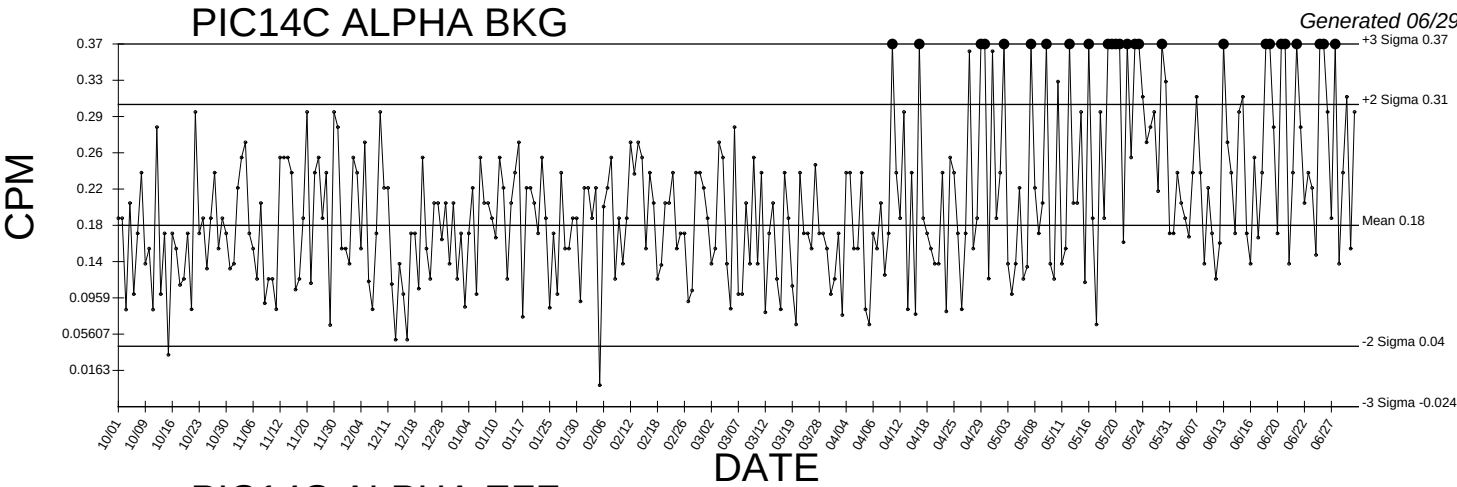
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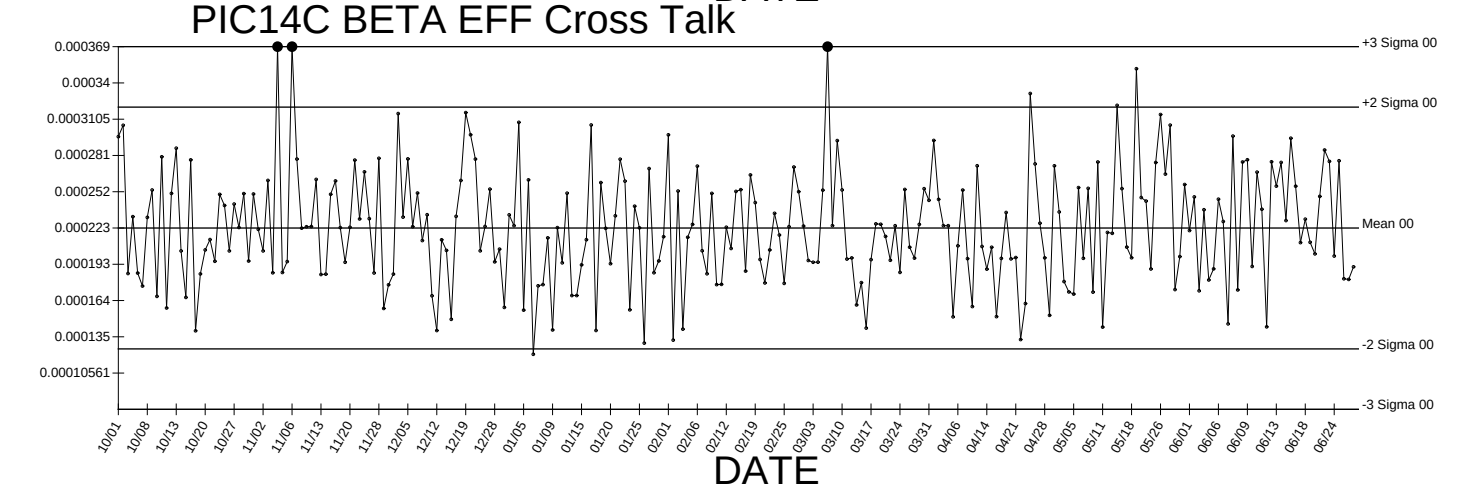
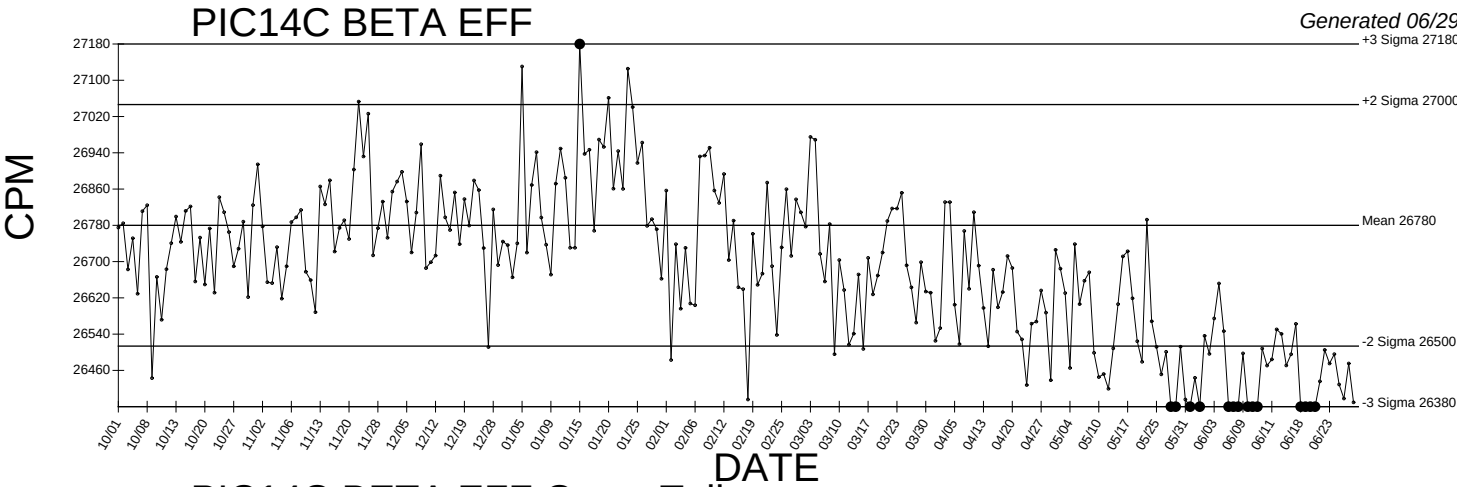
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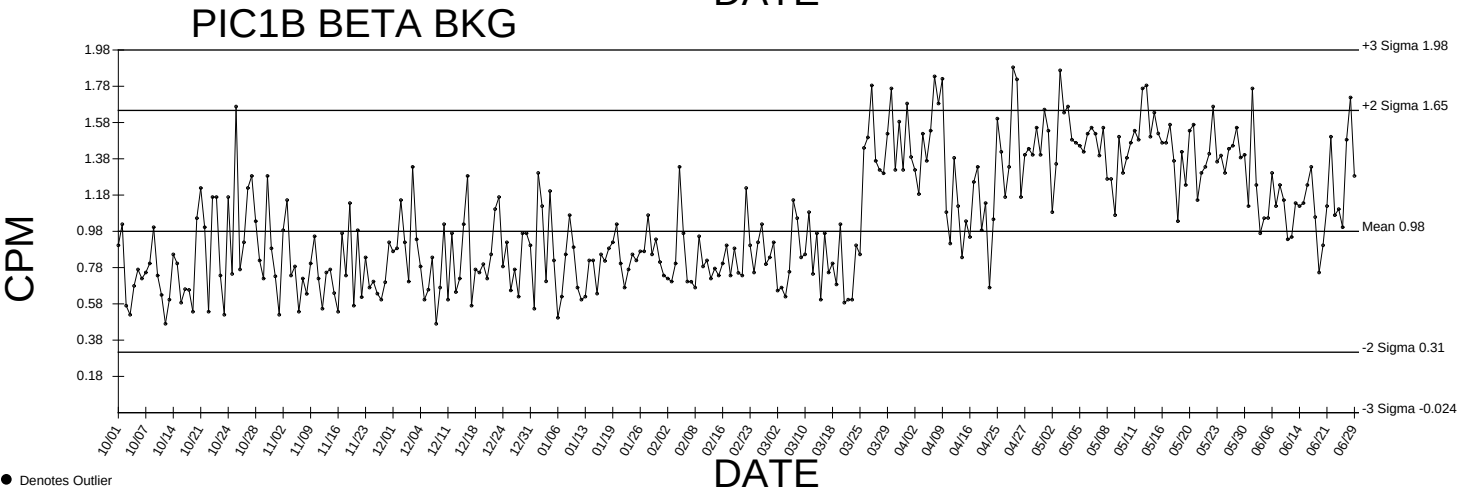
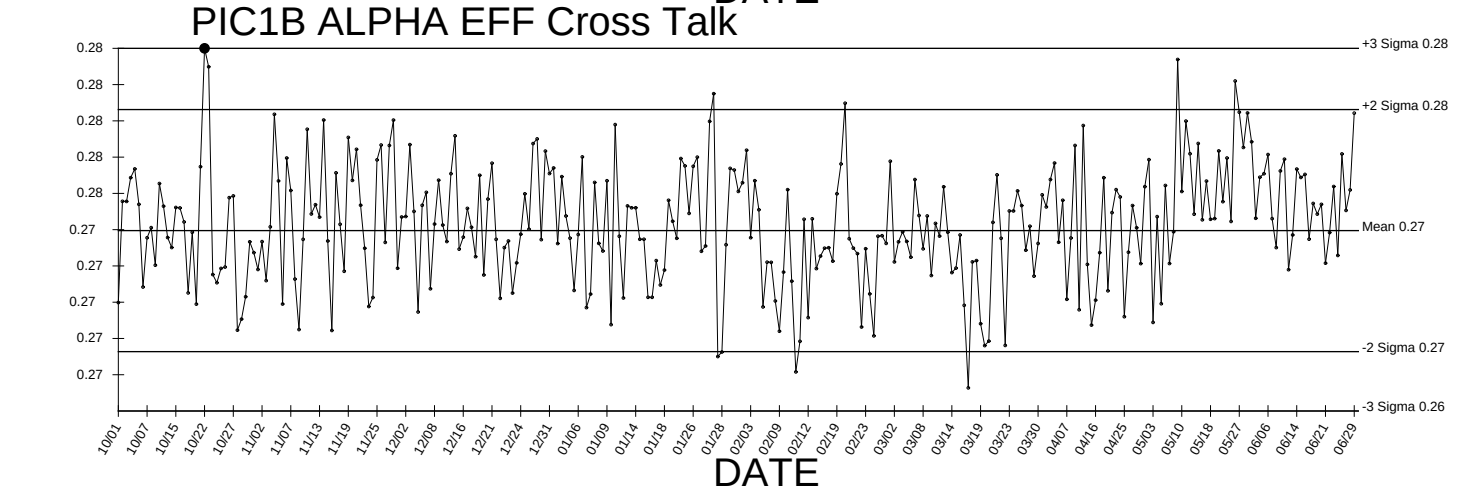
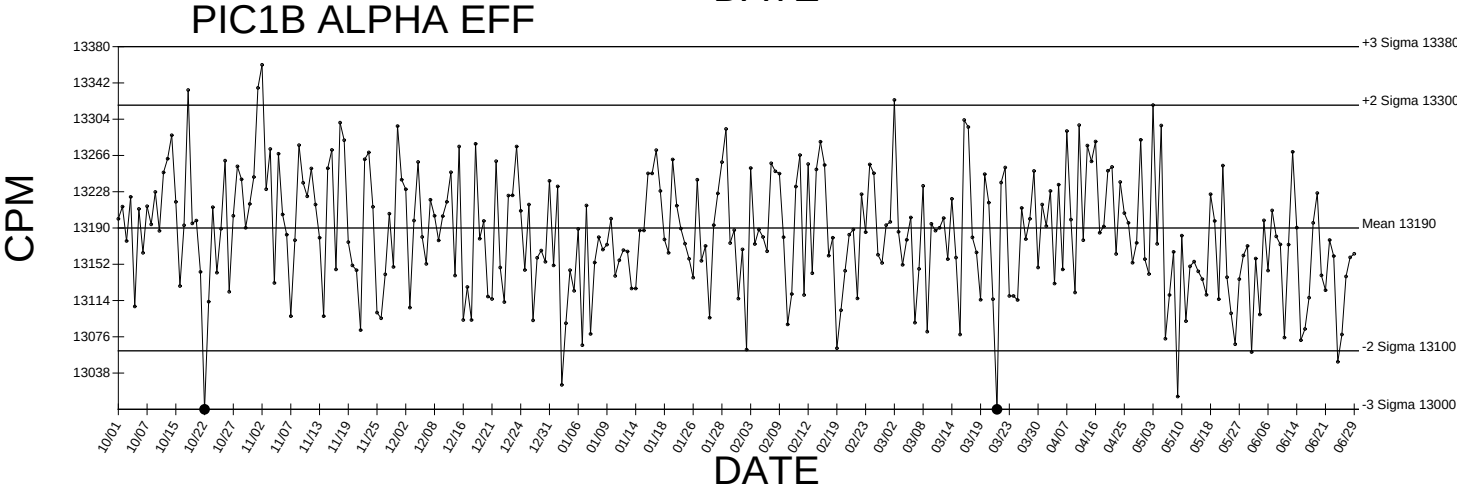
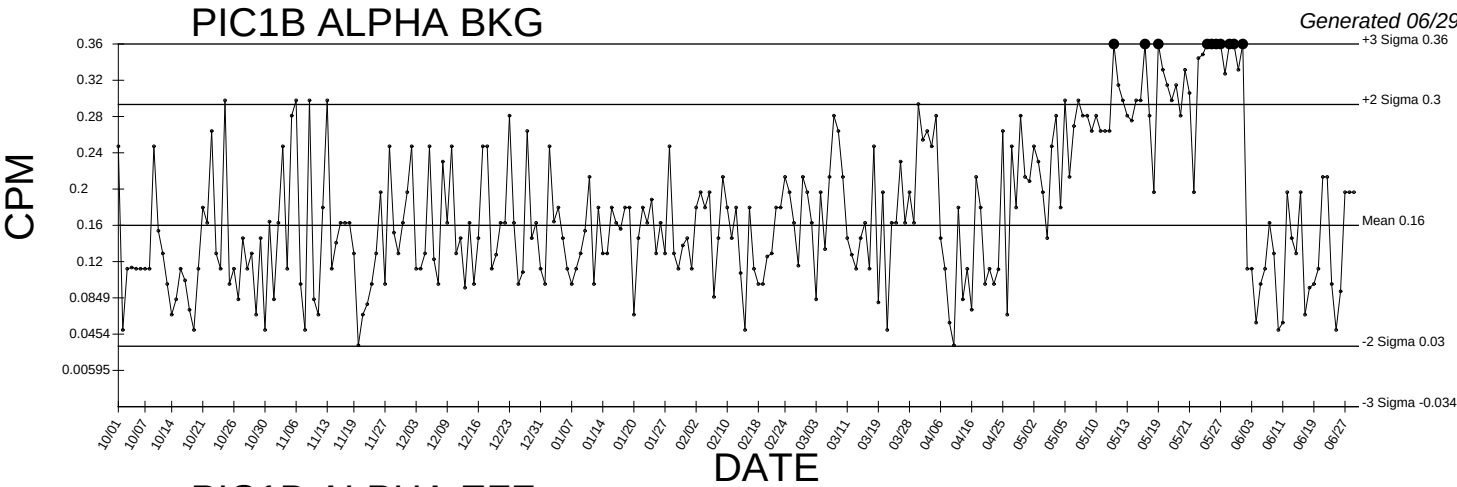
● Denotes Outlier



● Denotes Outlier



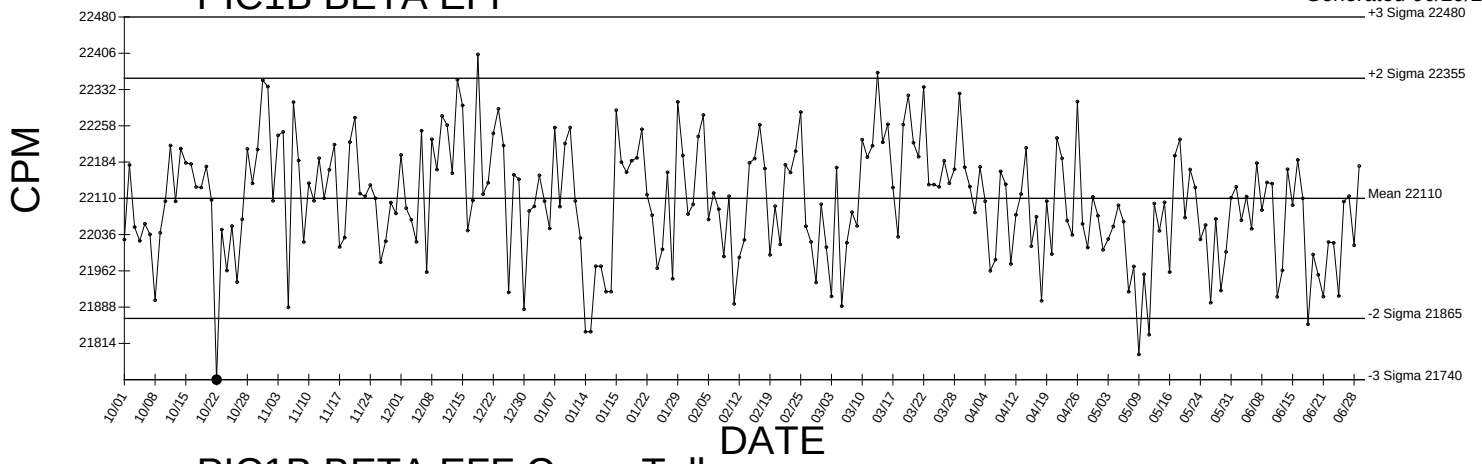
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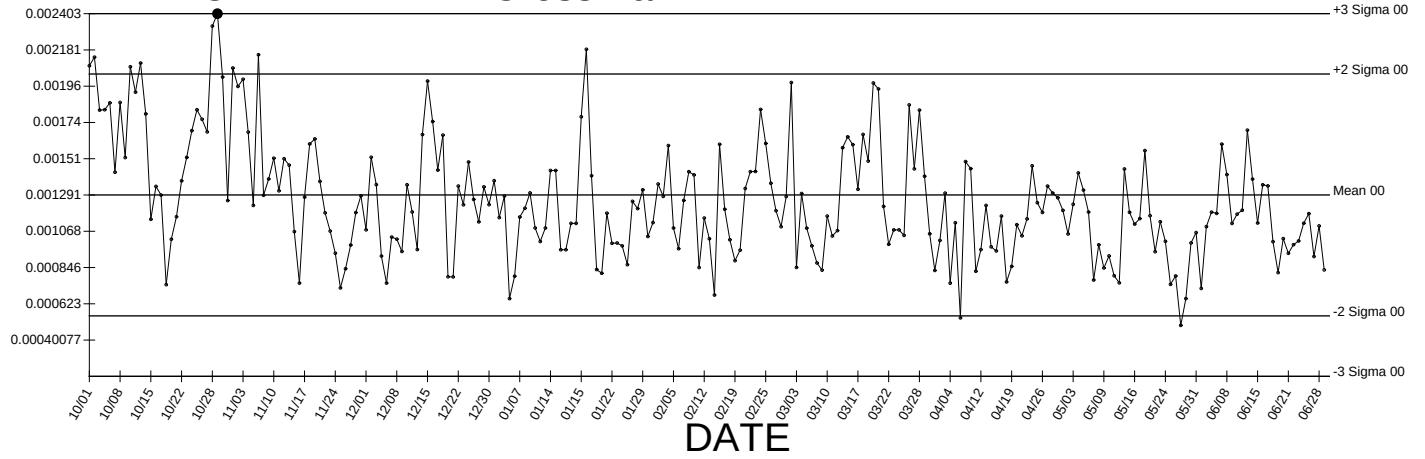
● Denotes Outlier

PIC1B BETA EFF

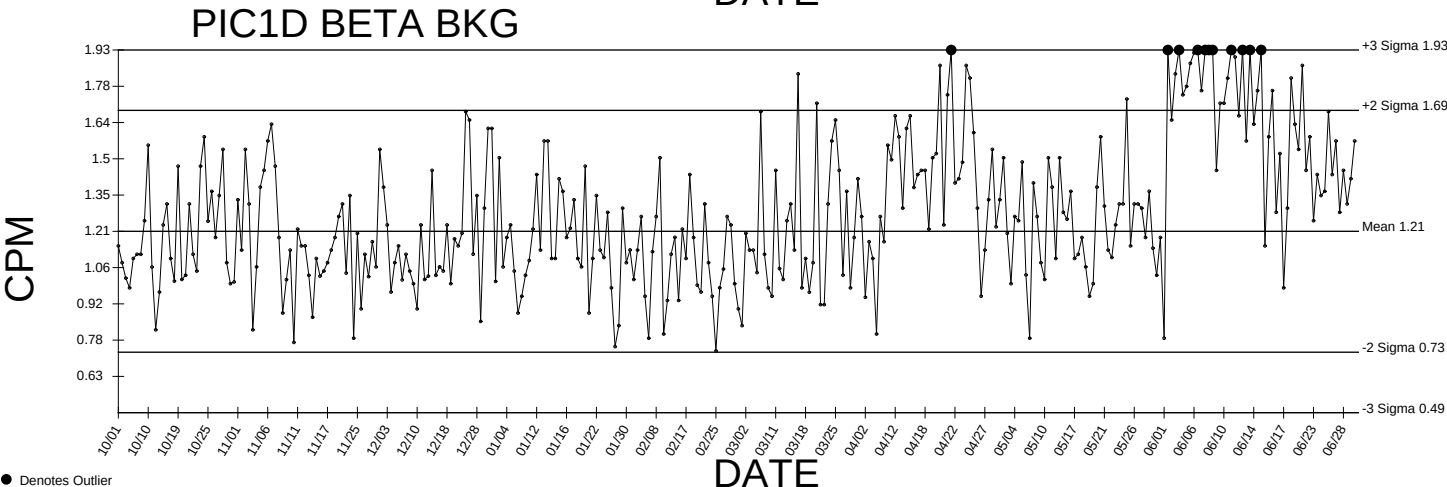
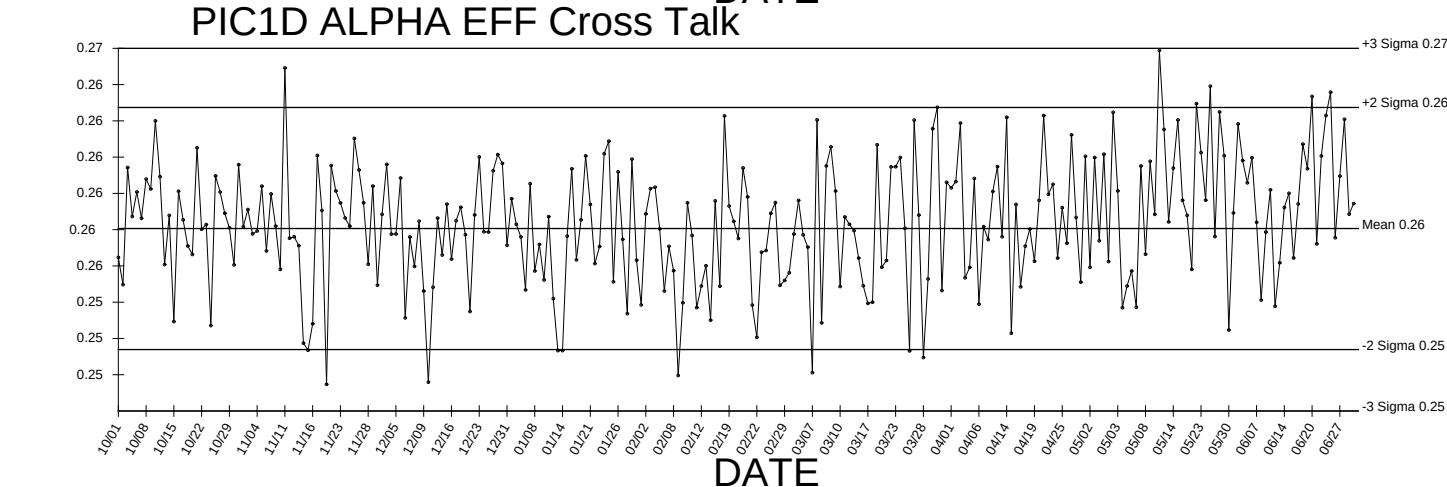
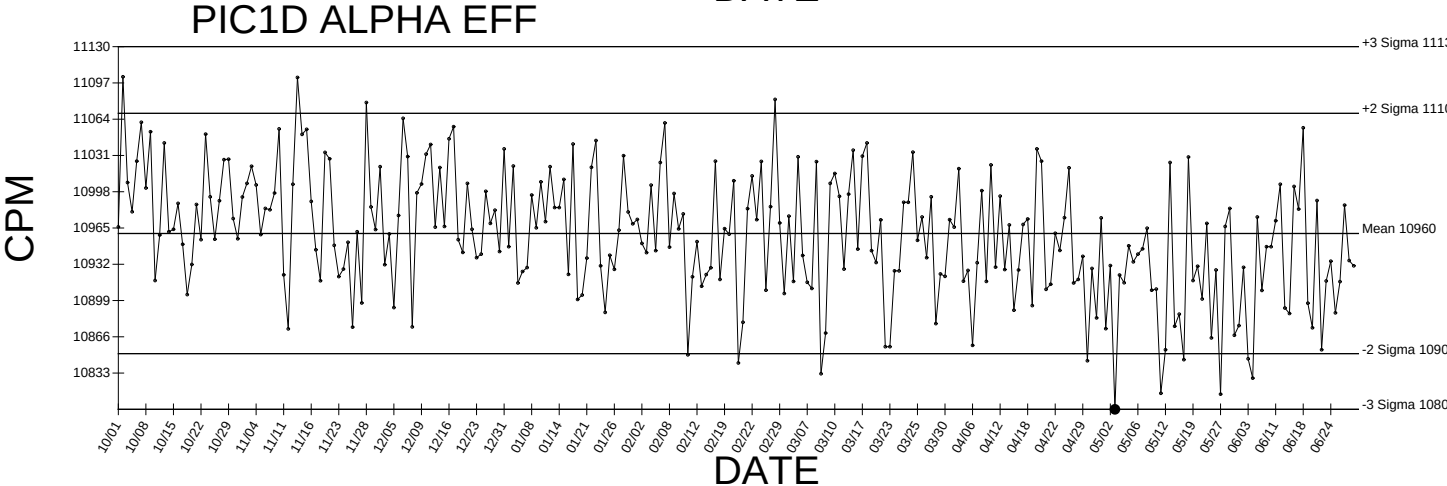
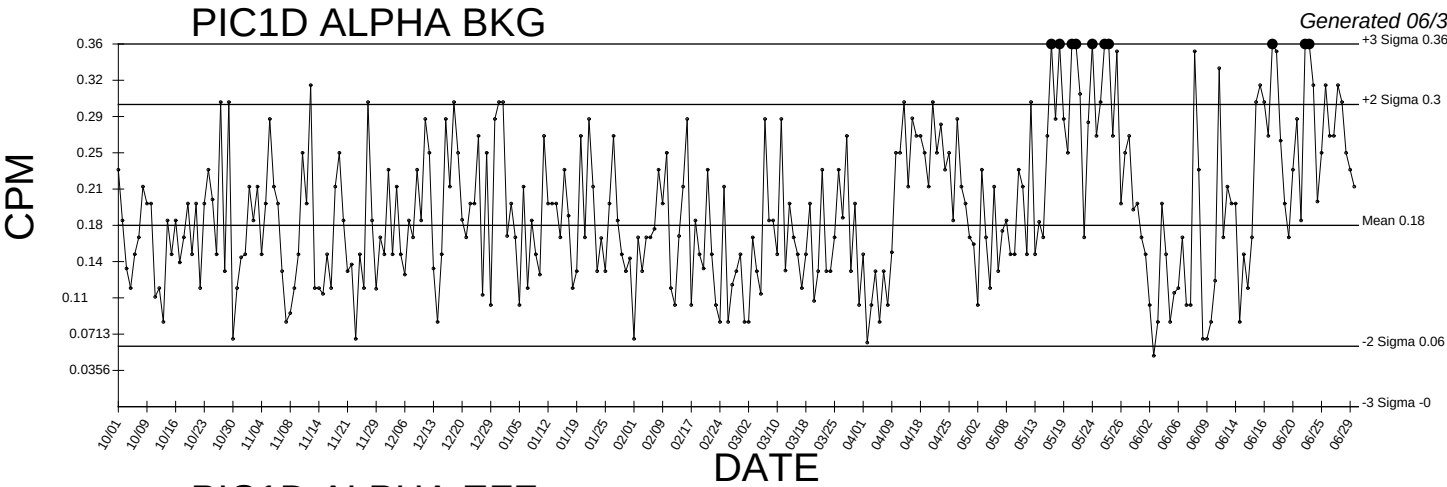
Generated 06/29/2016



PIC1B BETA EFF Cross Talk



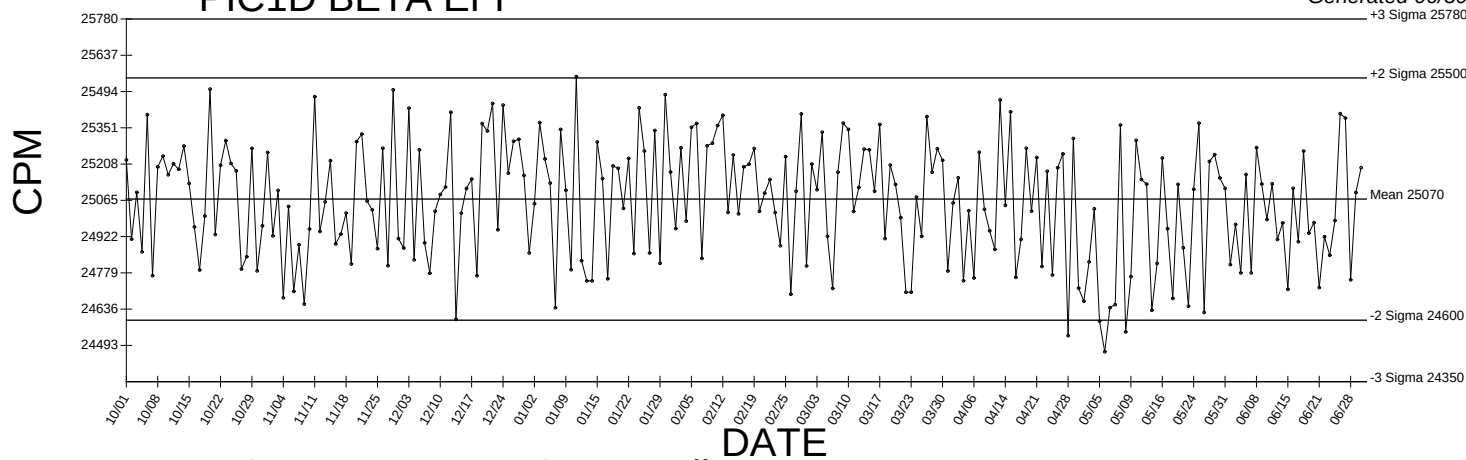
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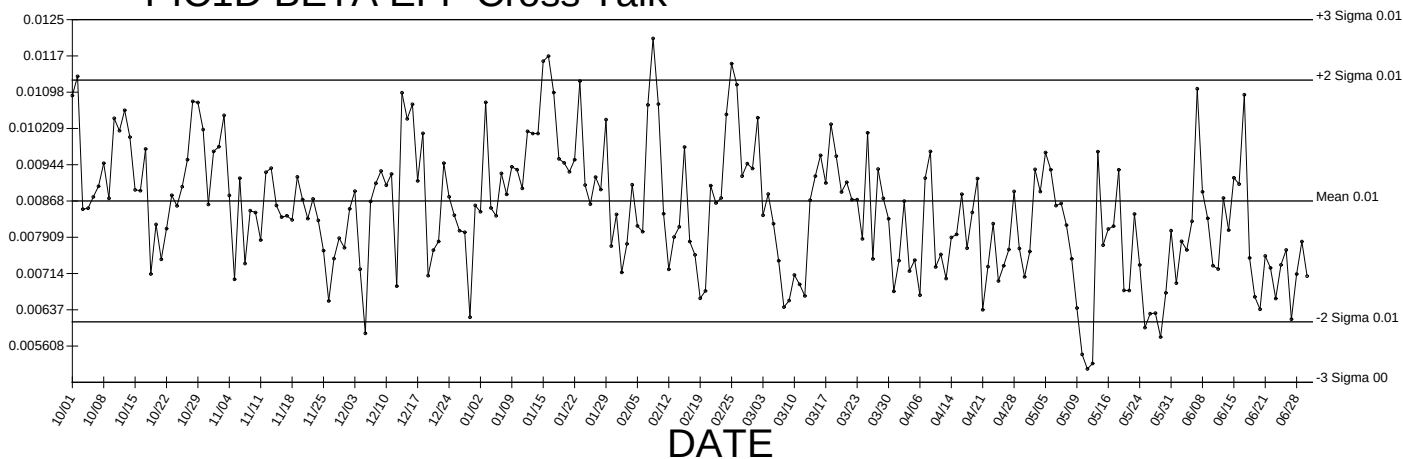
● Denotes Outlier

PIC1D BETA EFF

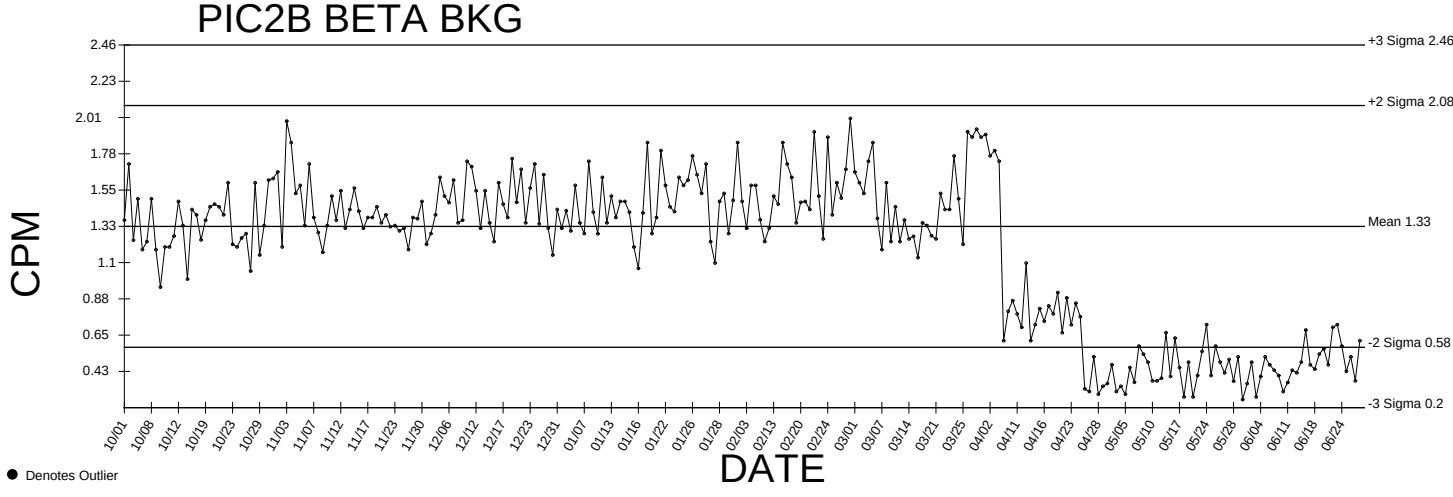
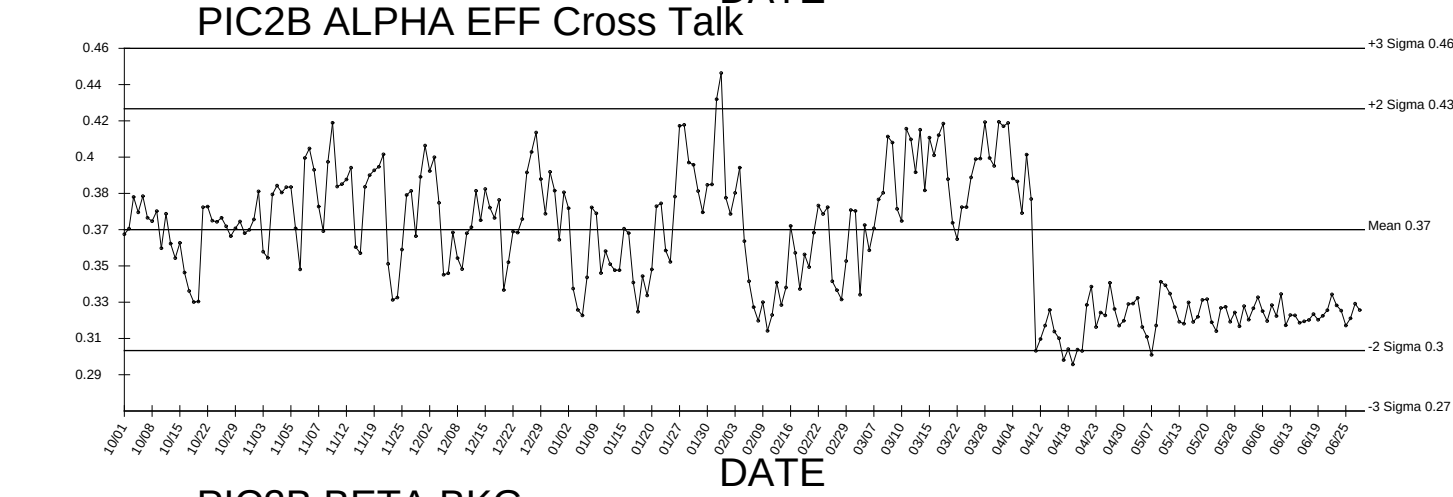
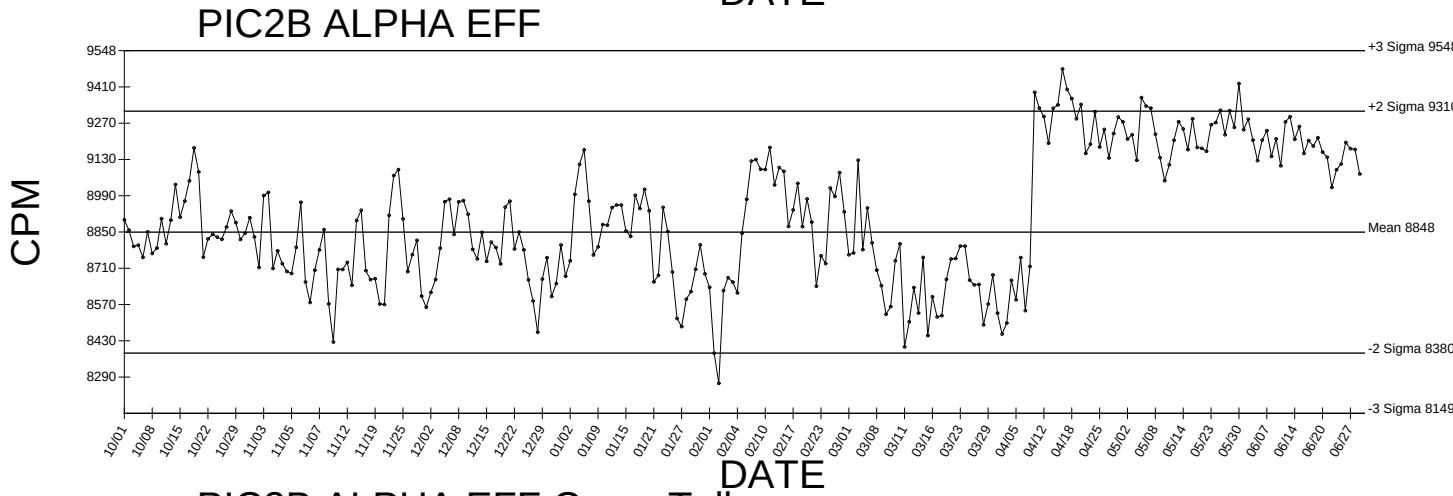
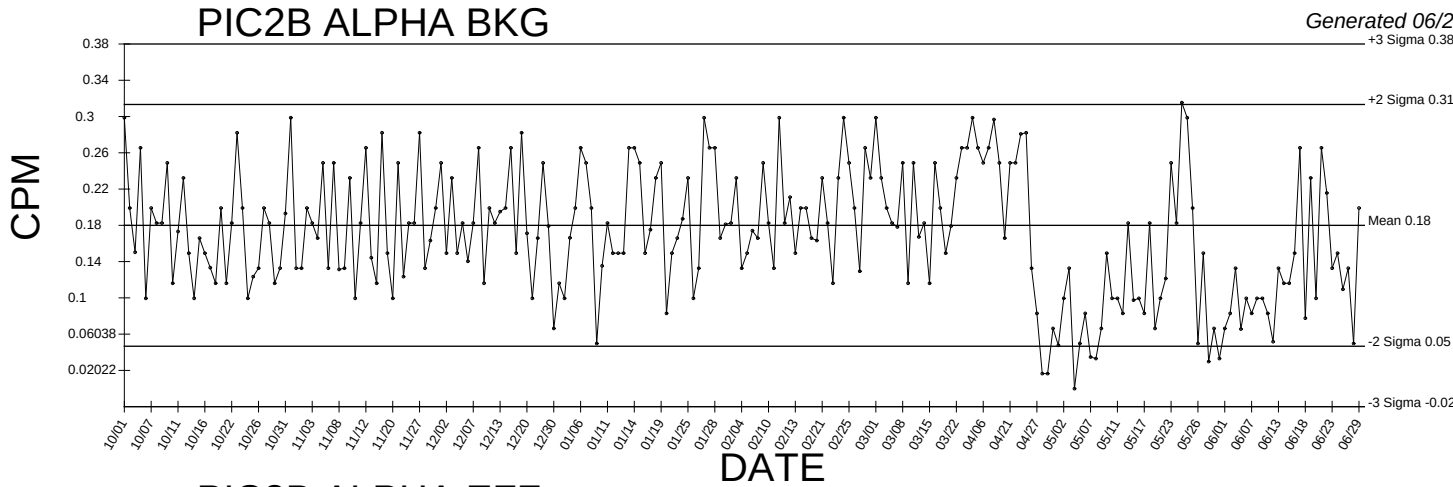
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+3 Sigma 25780



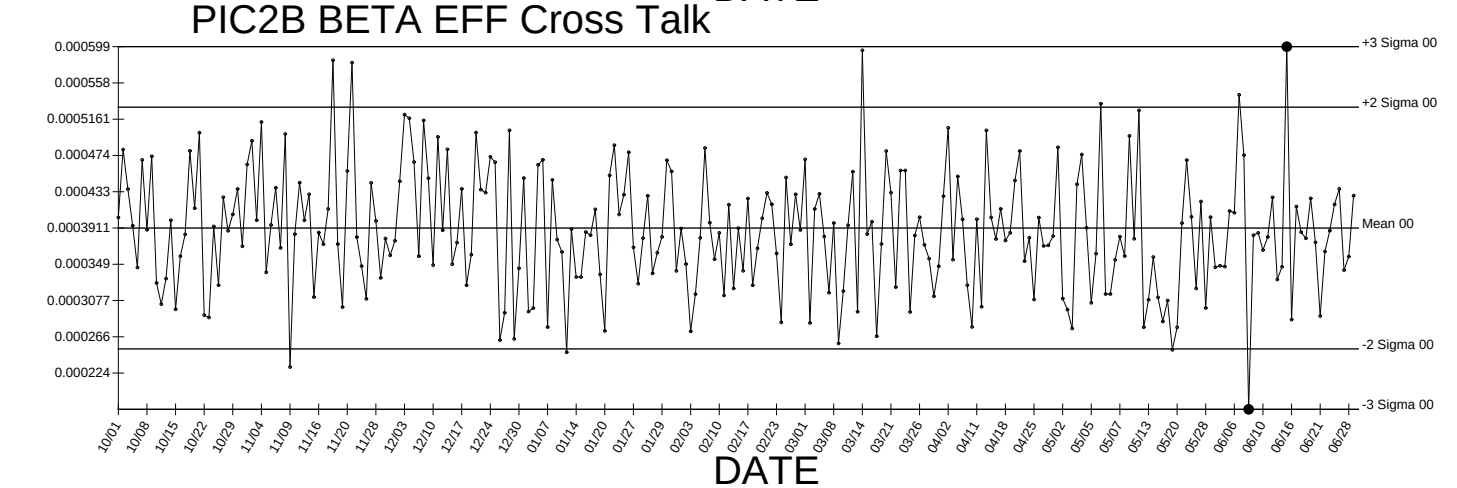
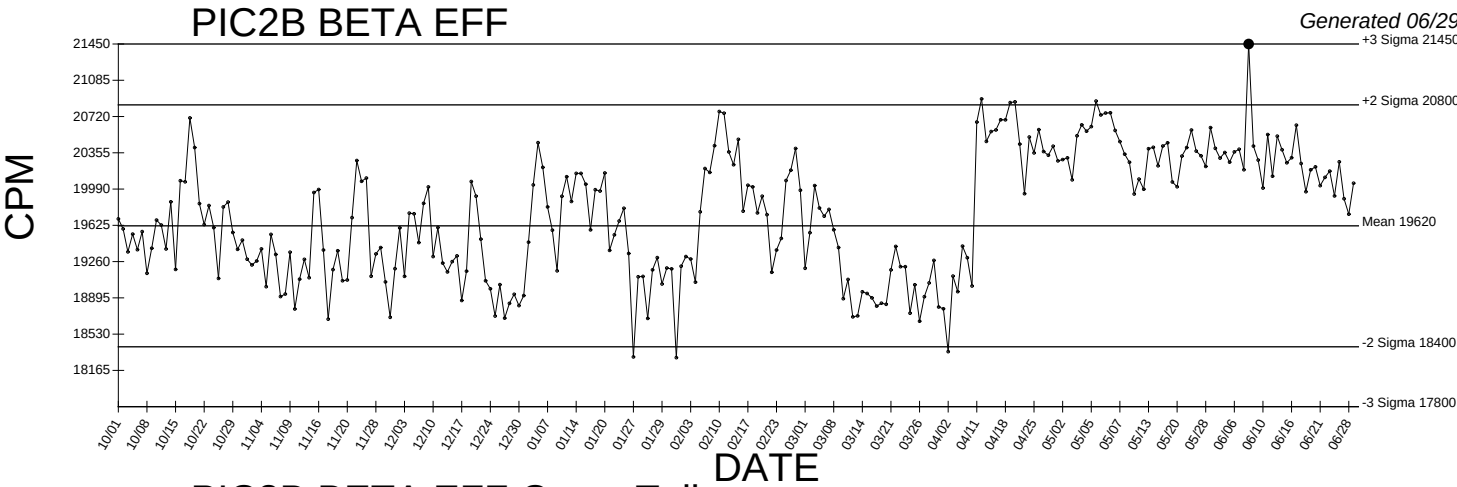
PIC1D BETA EFF Cross Talk



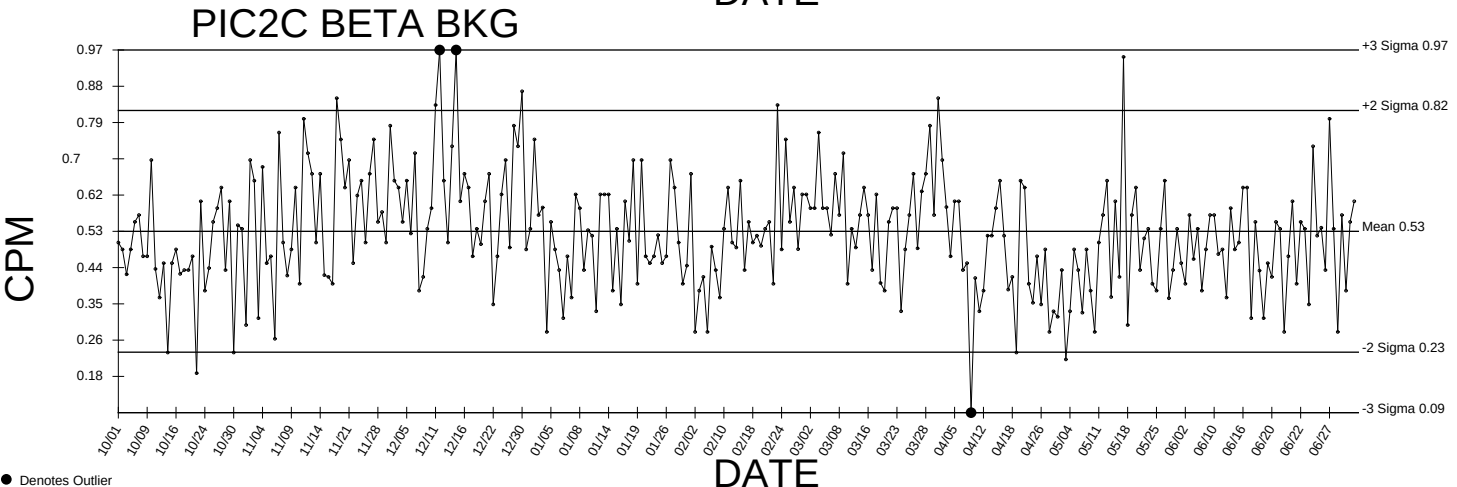
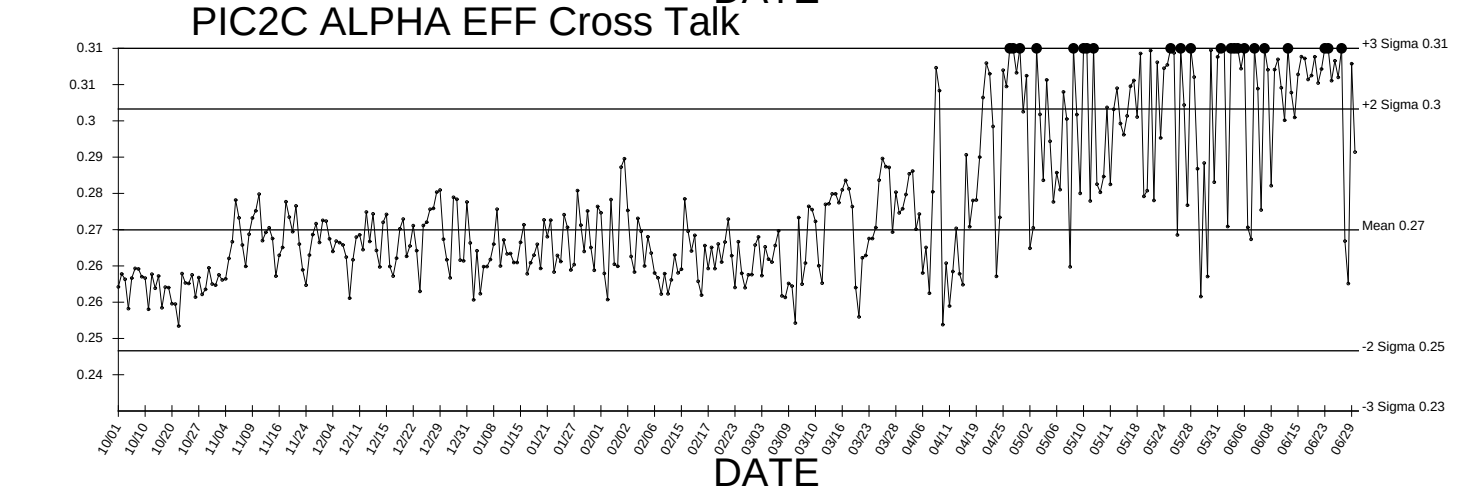
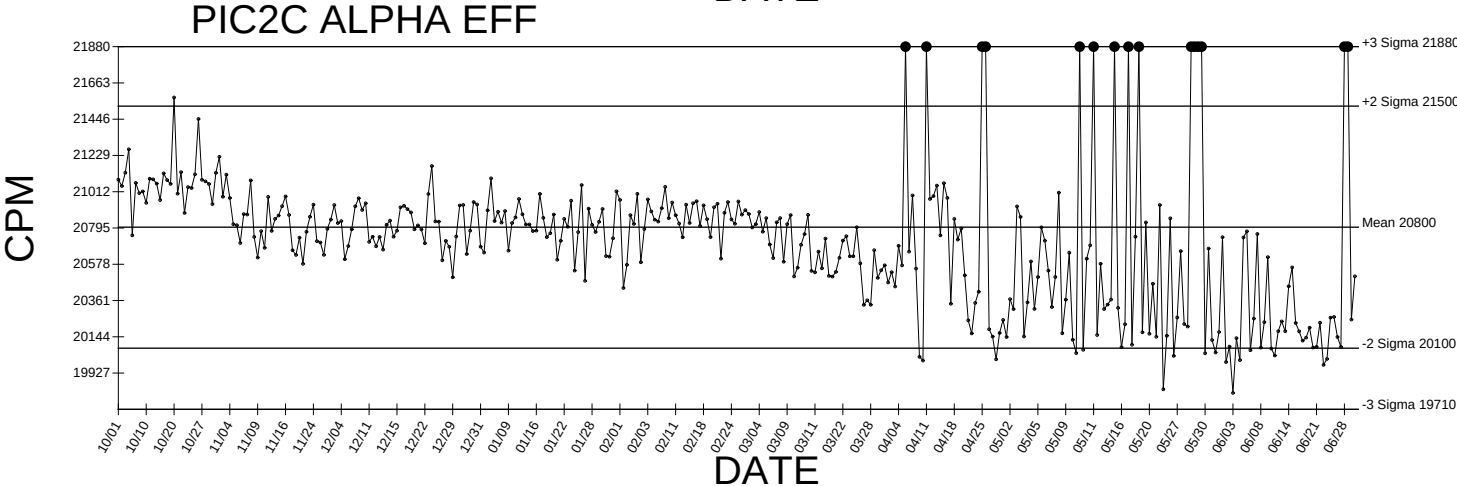
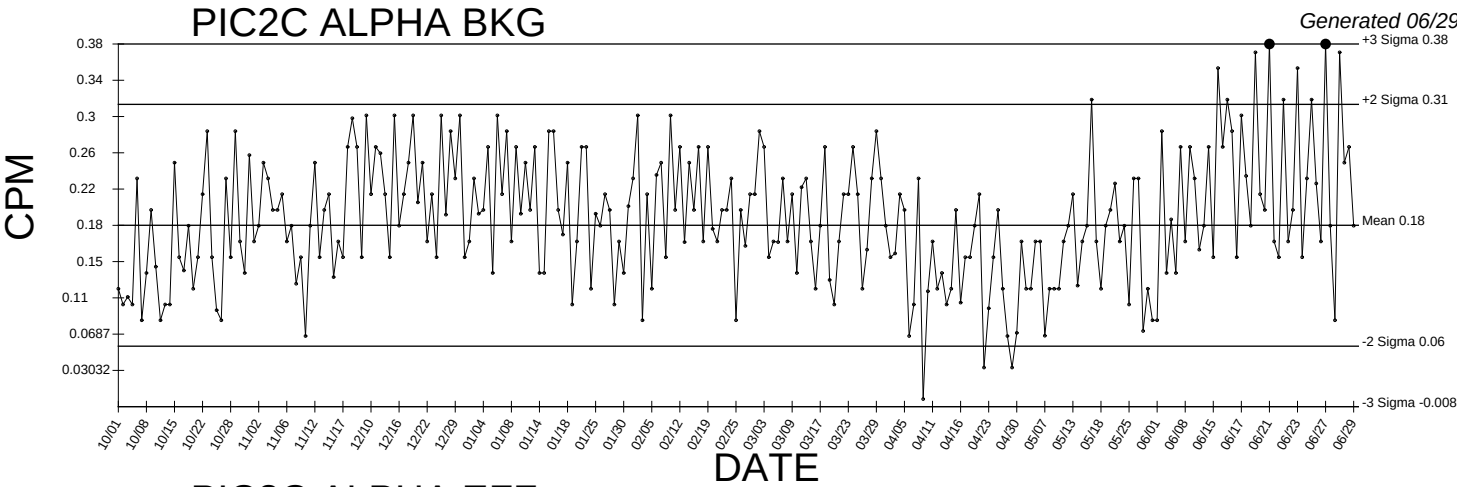
● Denotes Outlier



● Denotes Outlier



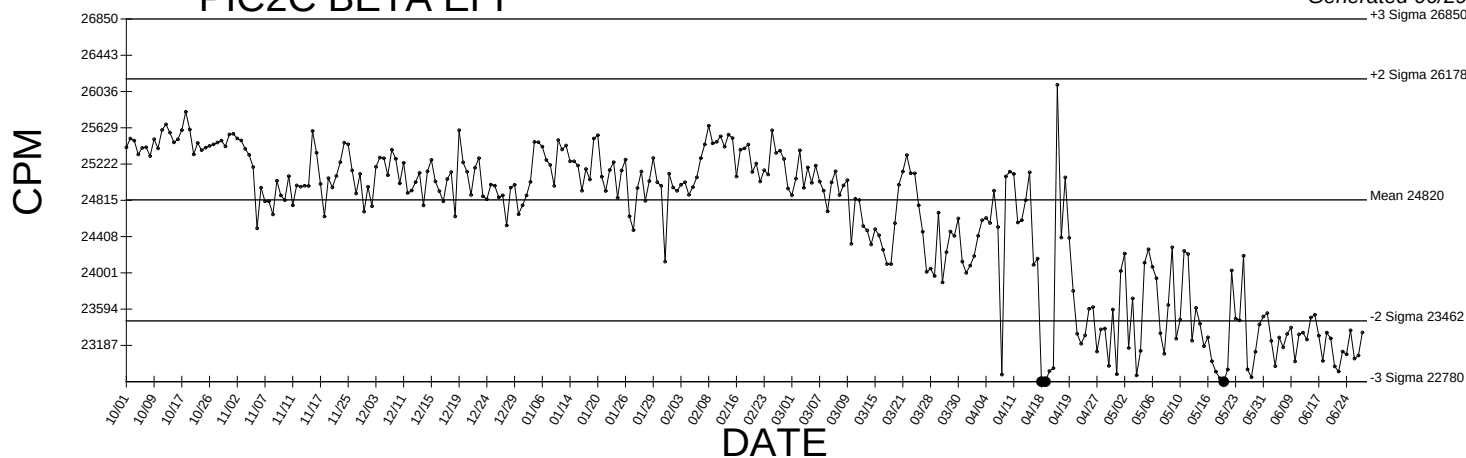
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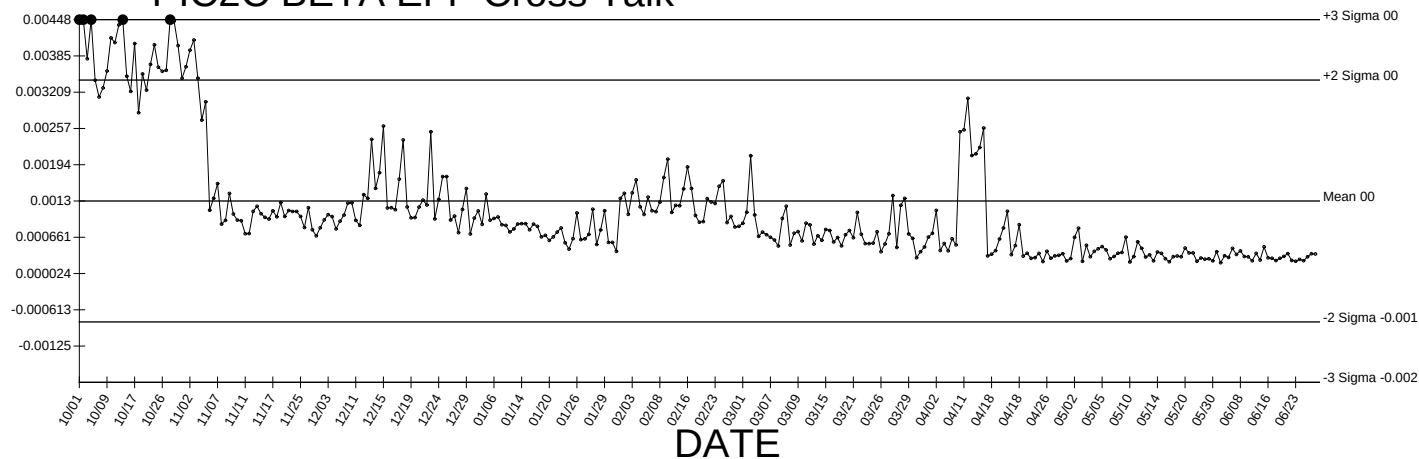
● Denotes Outlier

PIC2C BETA EFF

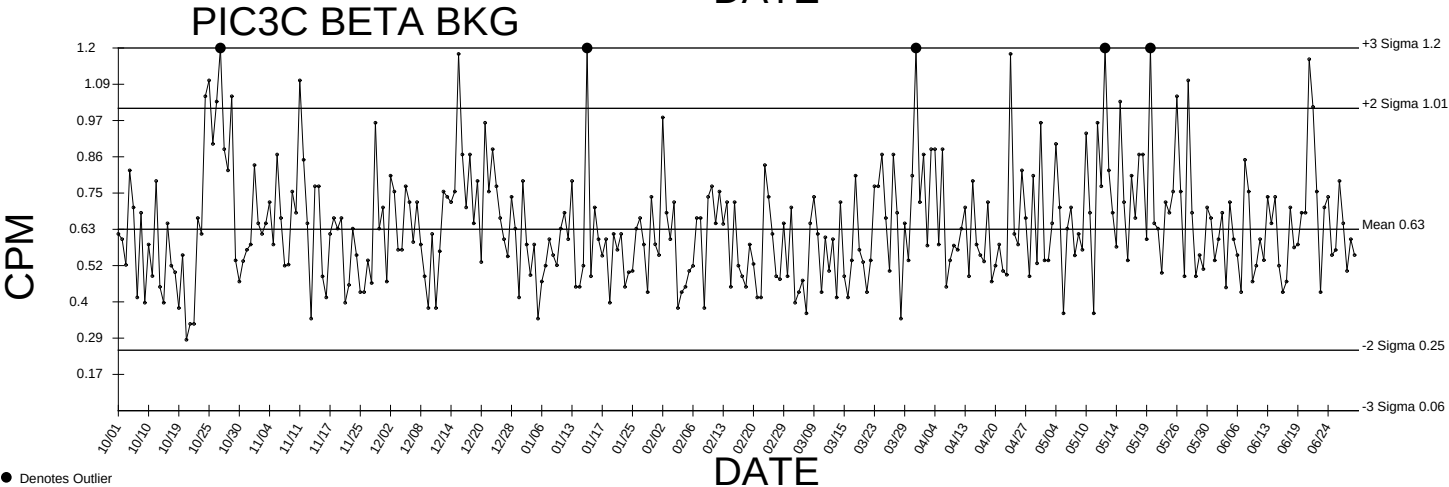
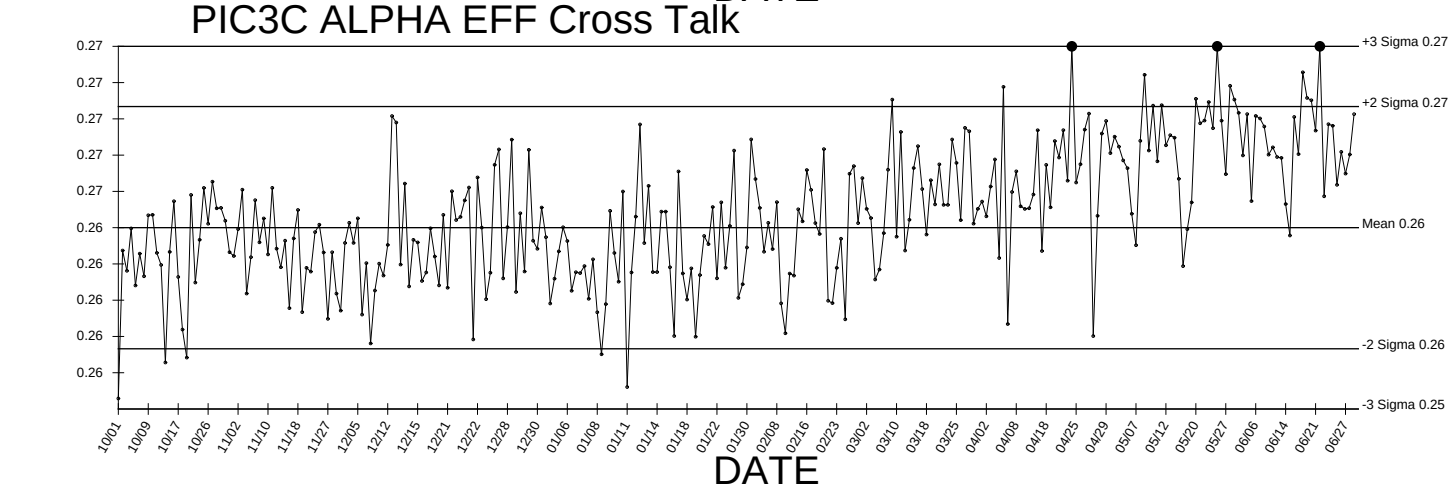
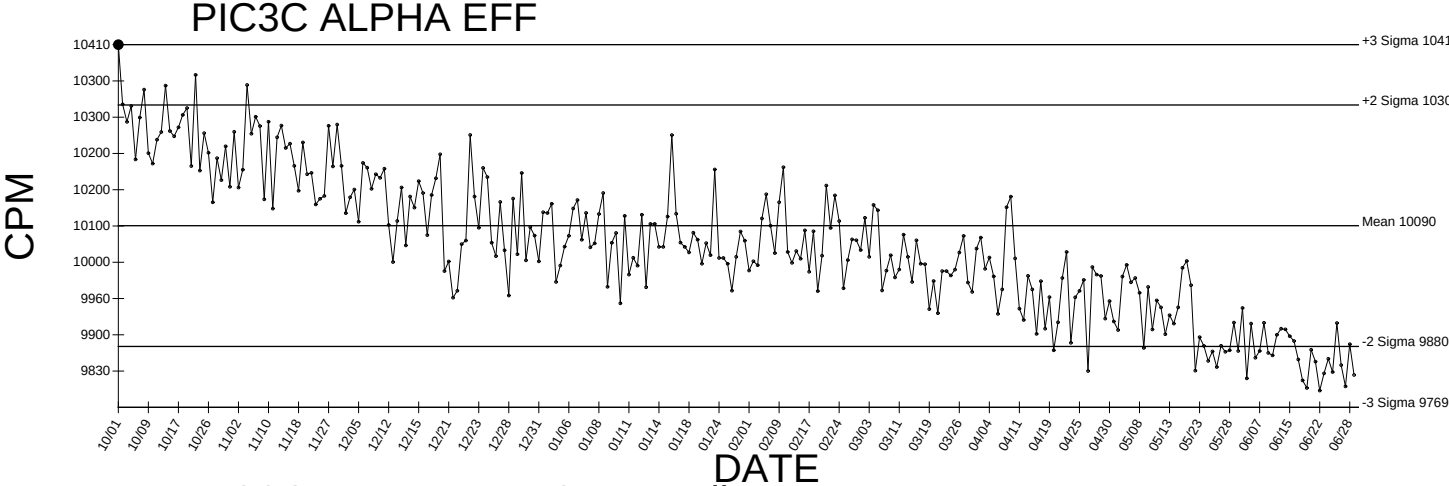
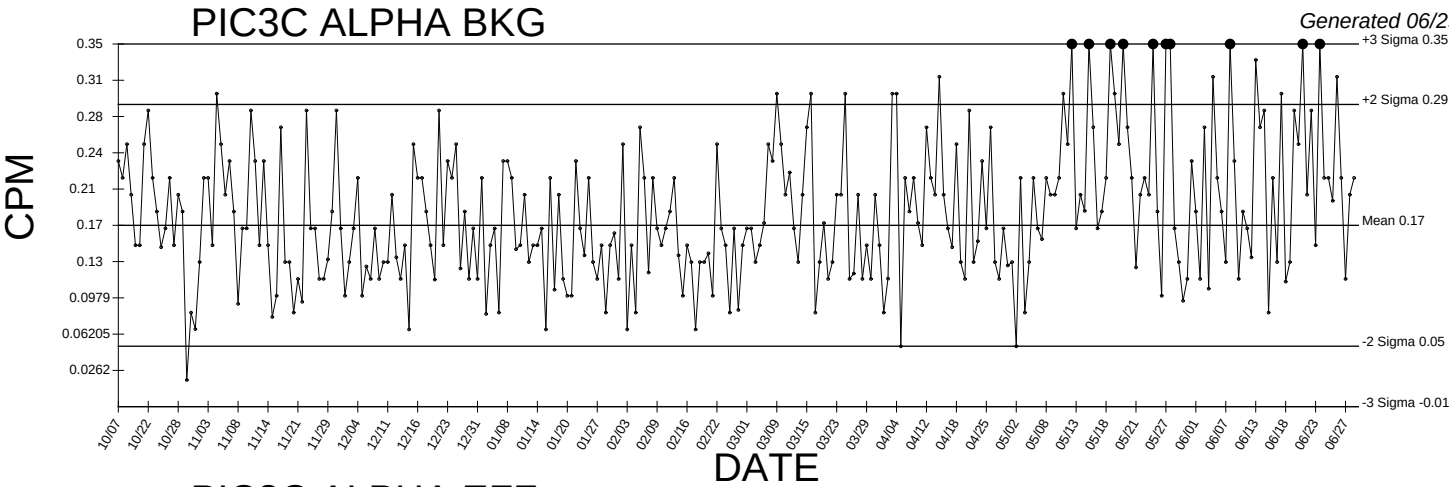
Generated 06/29/2016



PIC2C BETA EFF Cross Talk



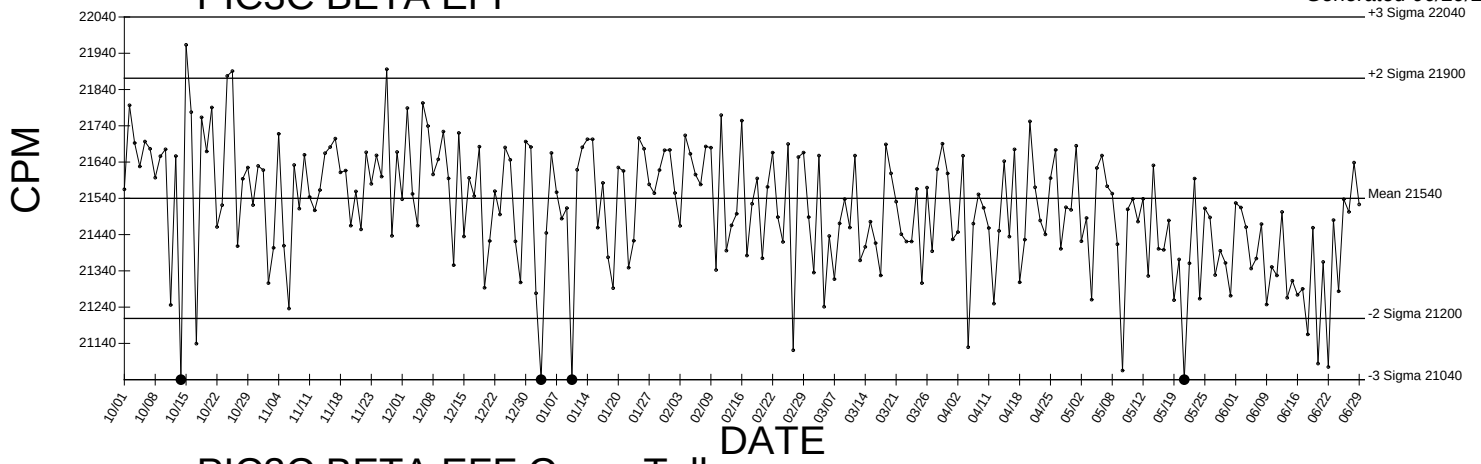
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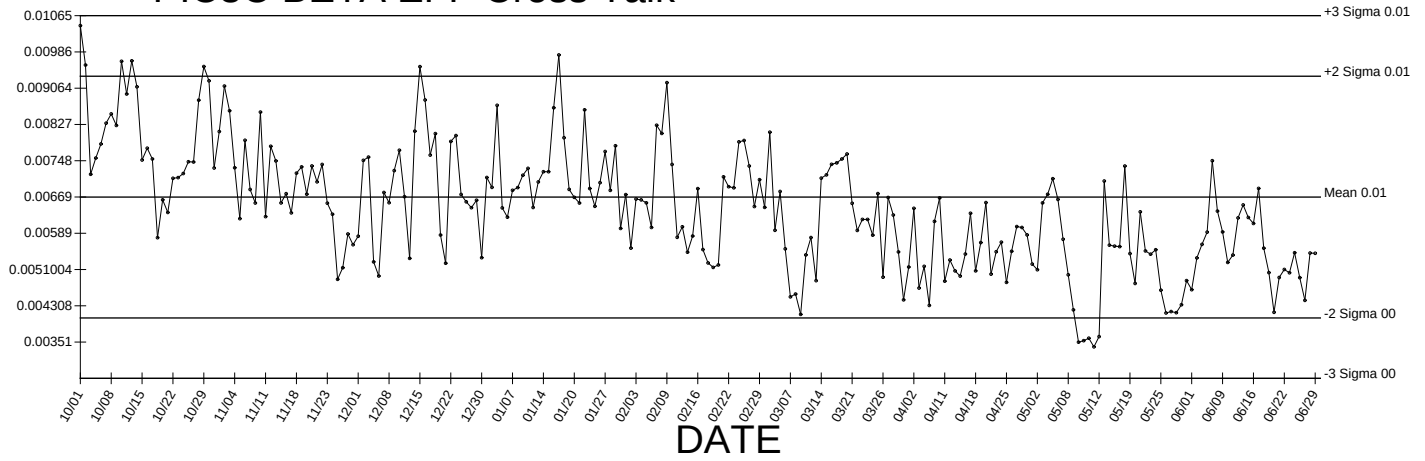
● Denotes Outlier

PIC3C BETA EFF

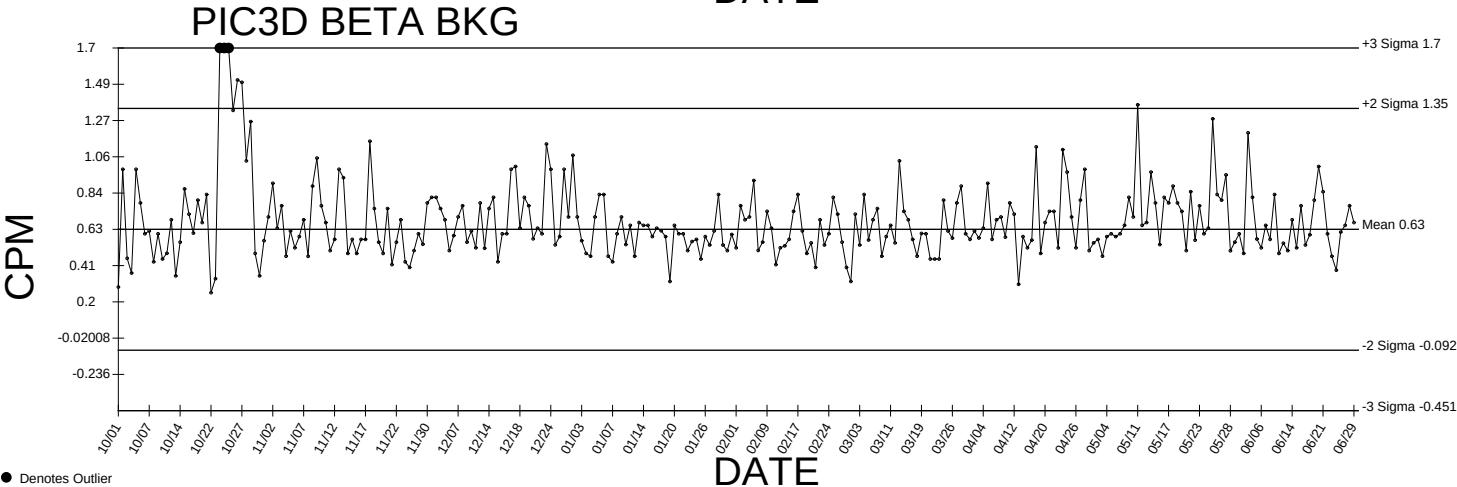
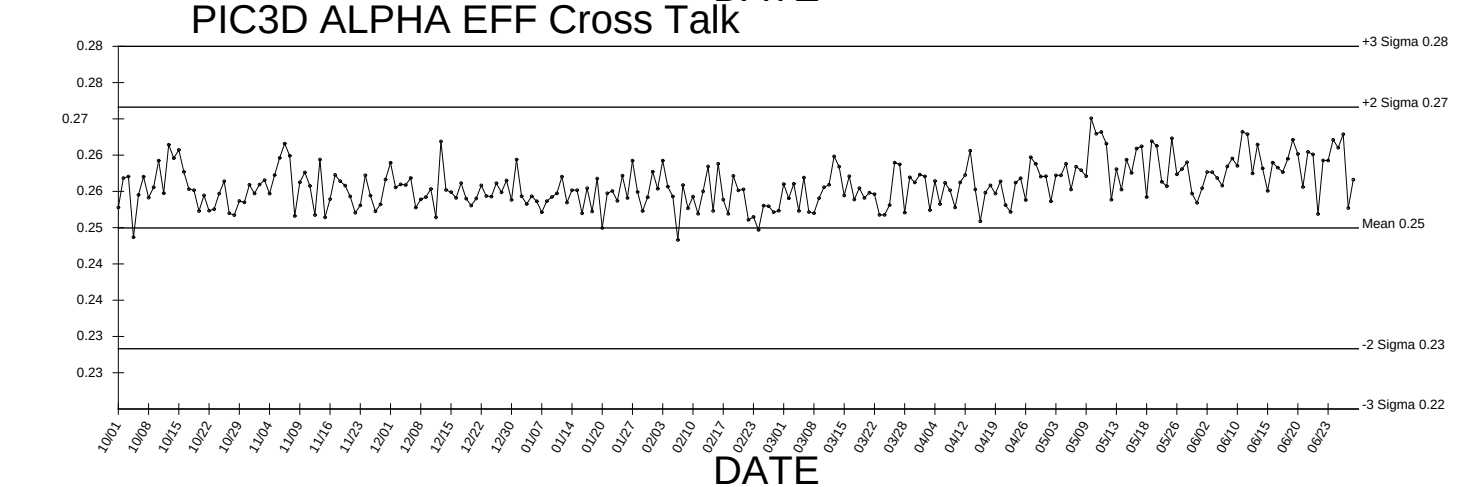
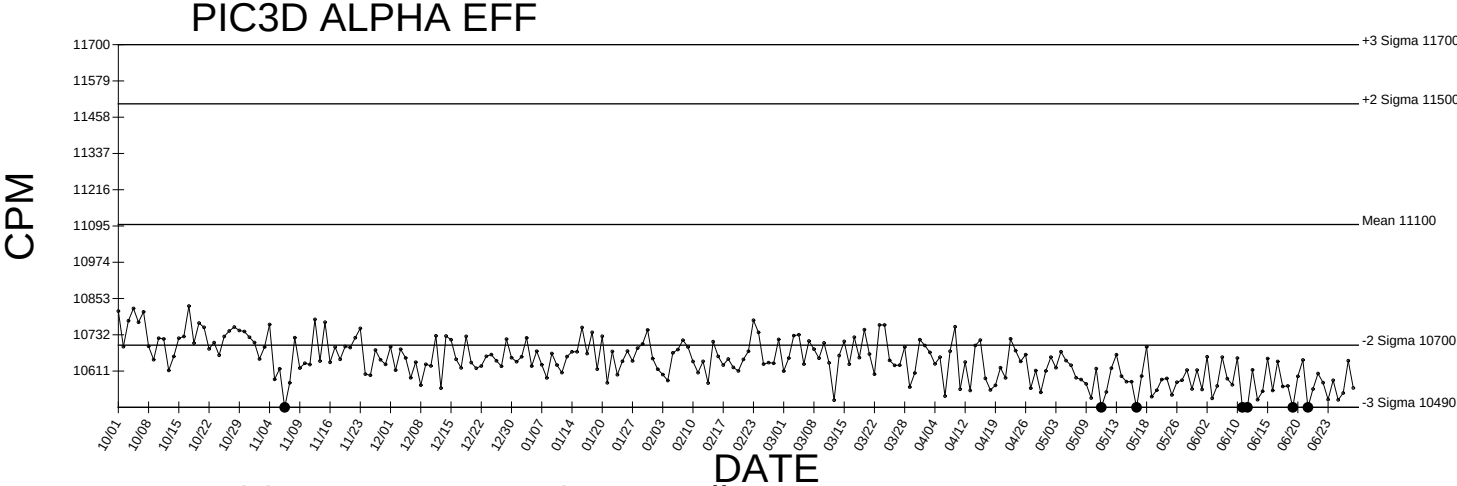
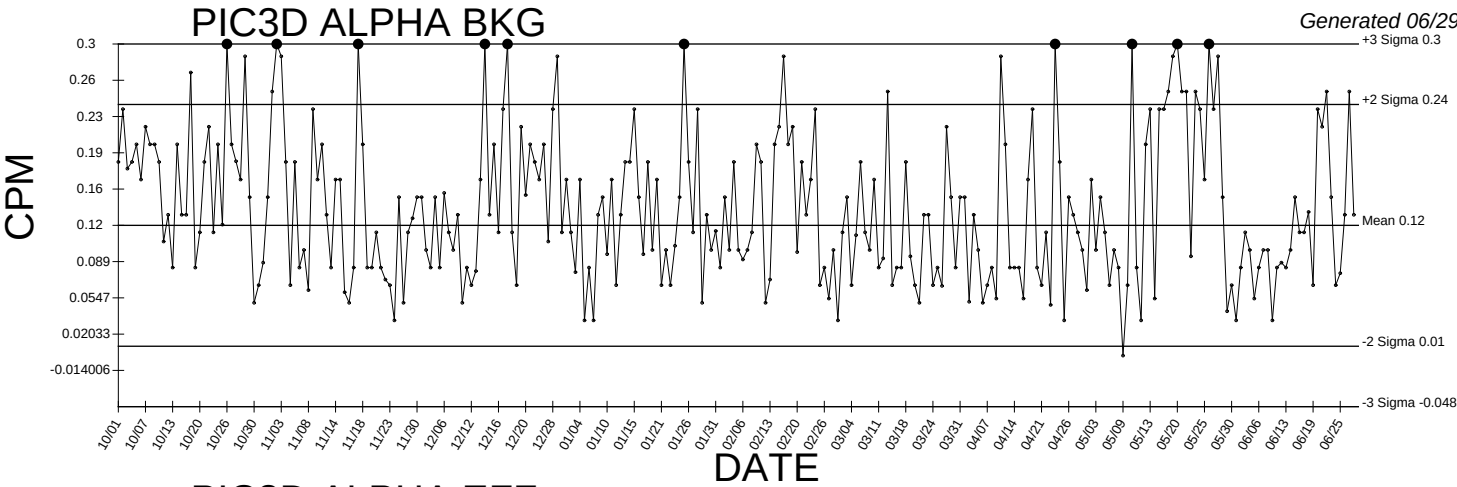
Generated 06/29/2016



PIC3C BETA EFF Cross Talk



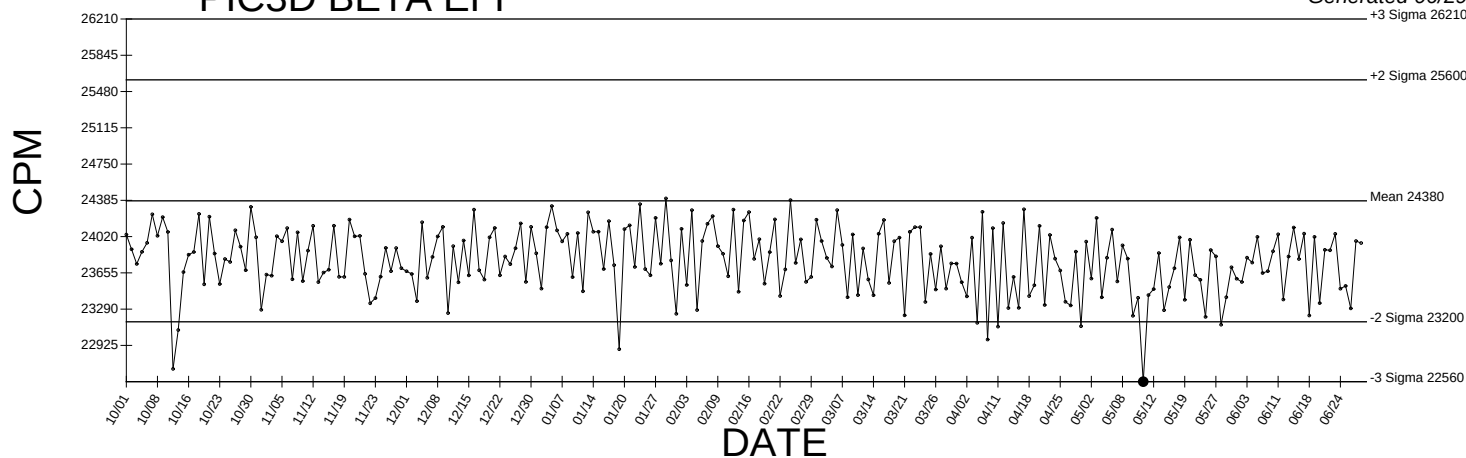
● Denotes Outlier



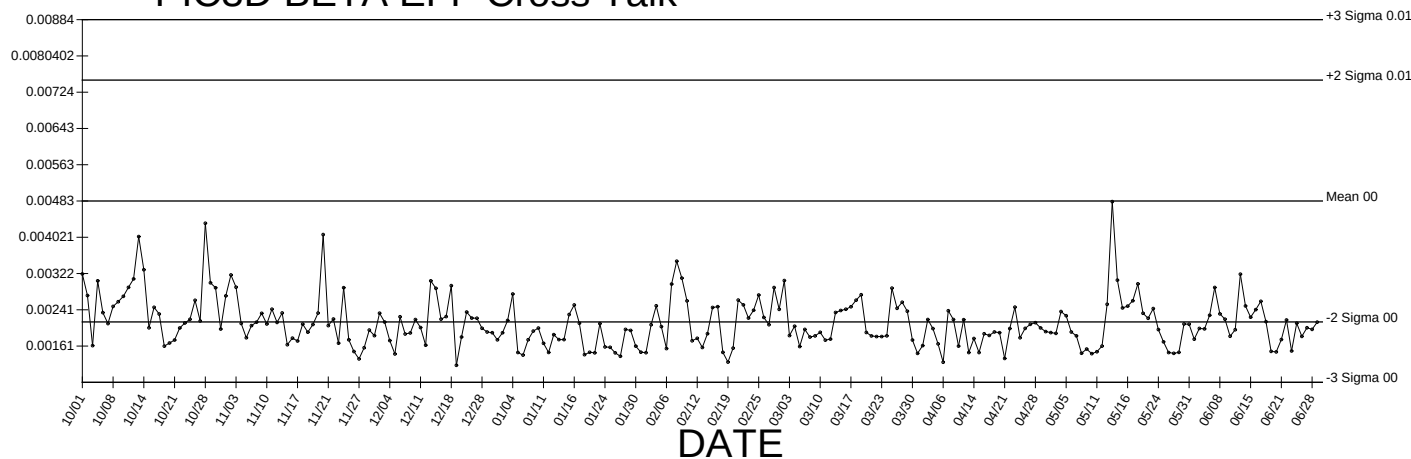
● Denotes Outlier

PIC3D BETA EFF

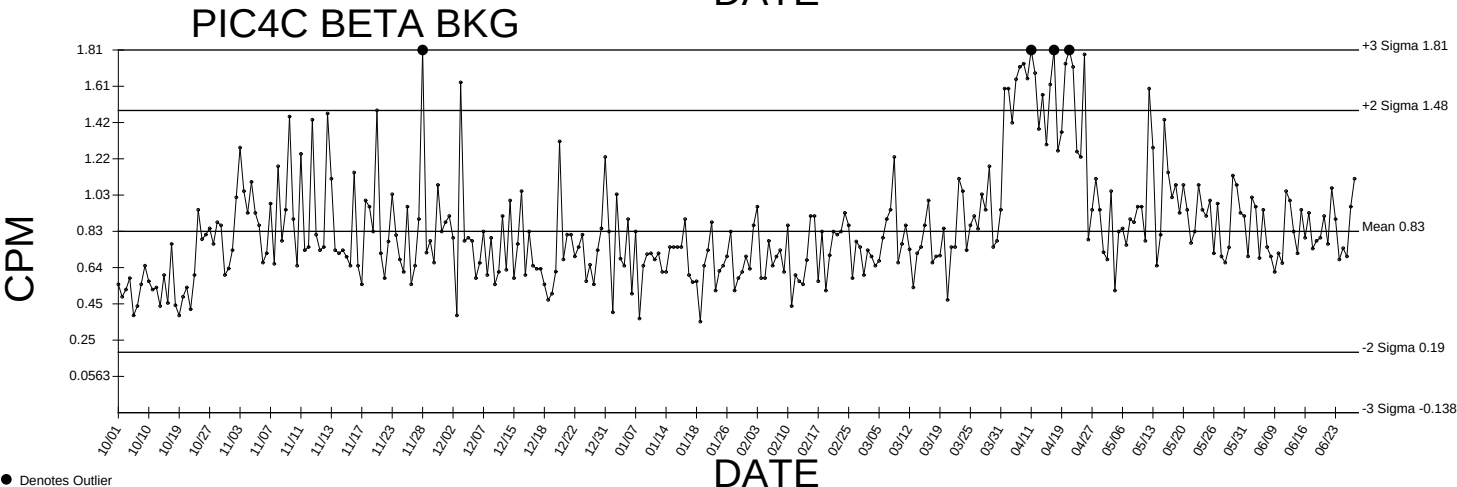
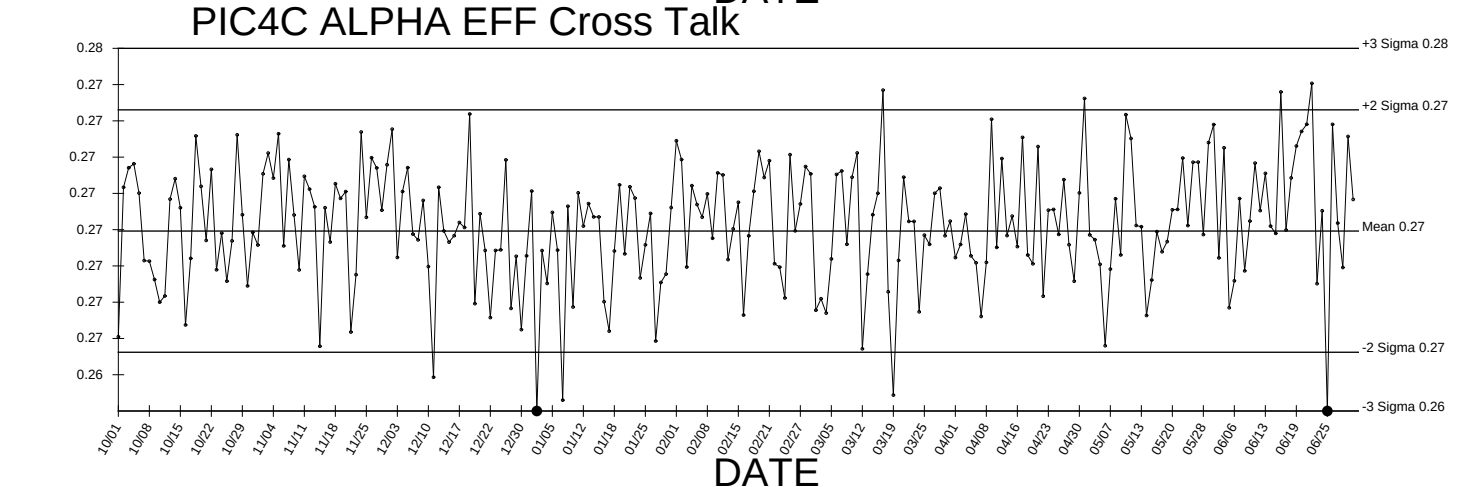
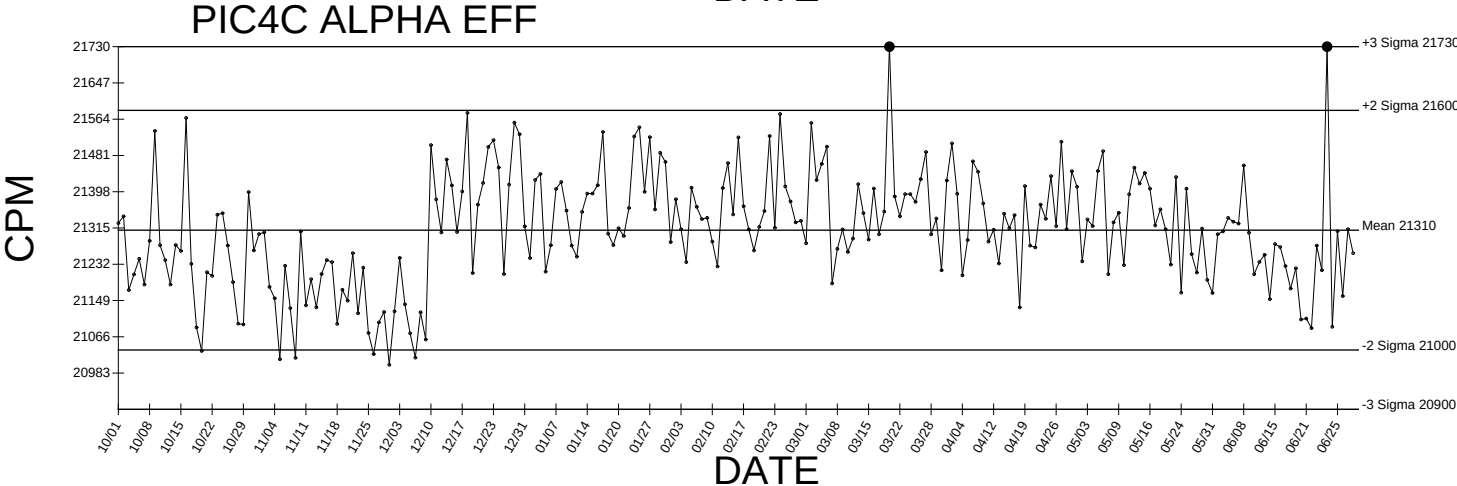
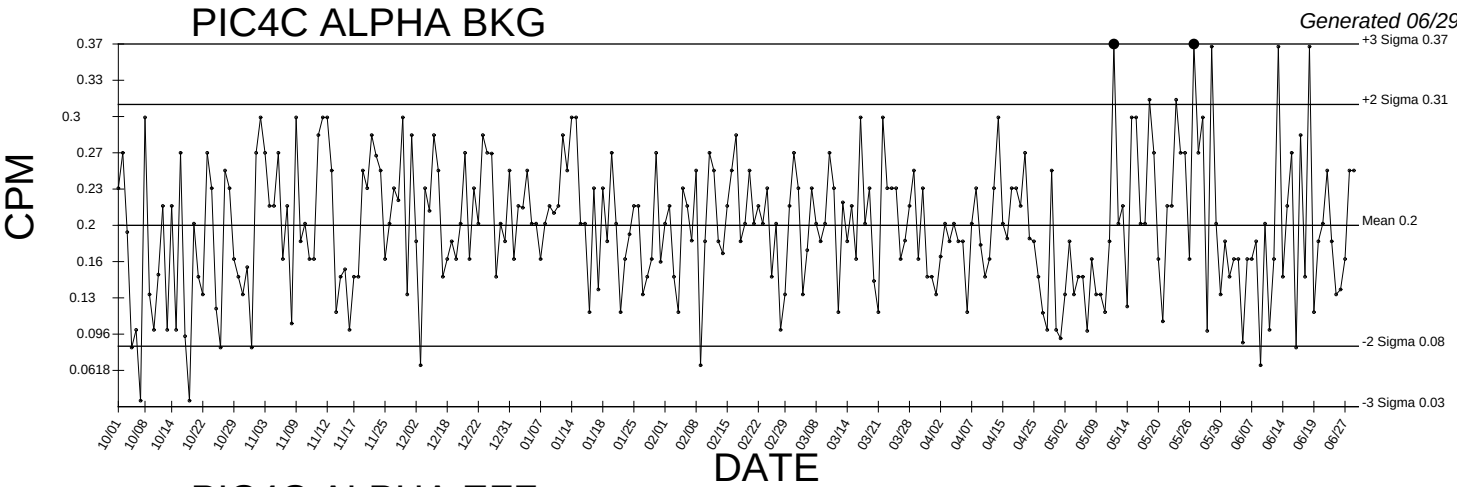
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+3 Sigma 26210



PIC3D BETA EFF Cross Talk



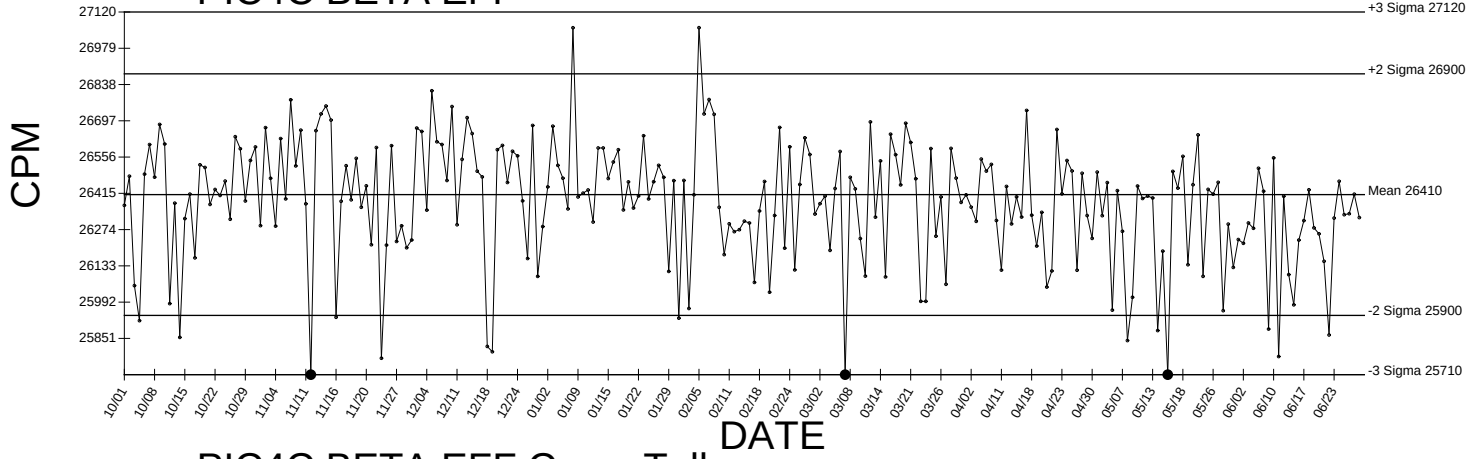
● Denotes Outlier



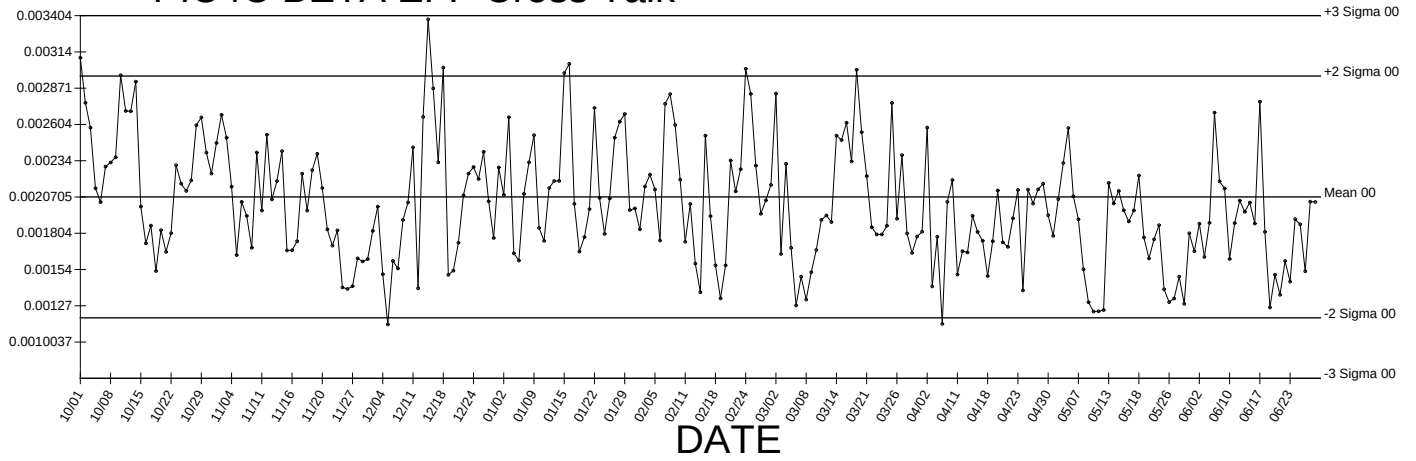
● Denotes Outlier

PIC4C BETA EFF

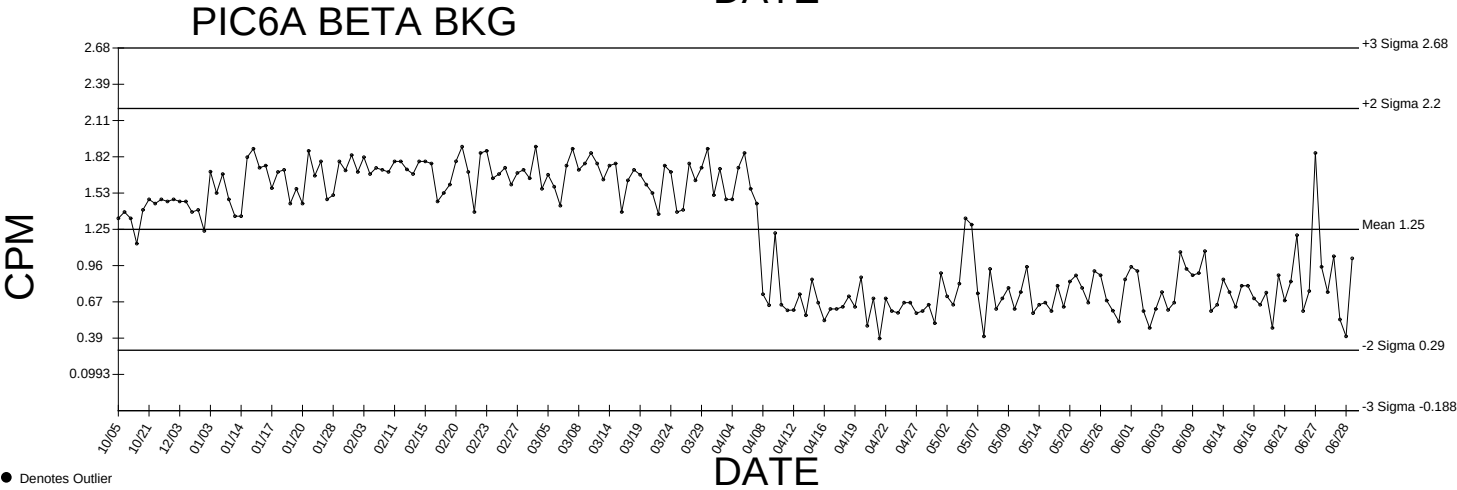
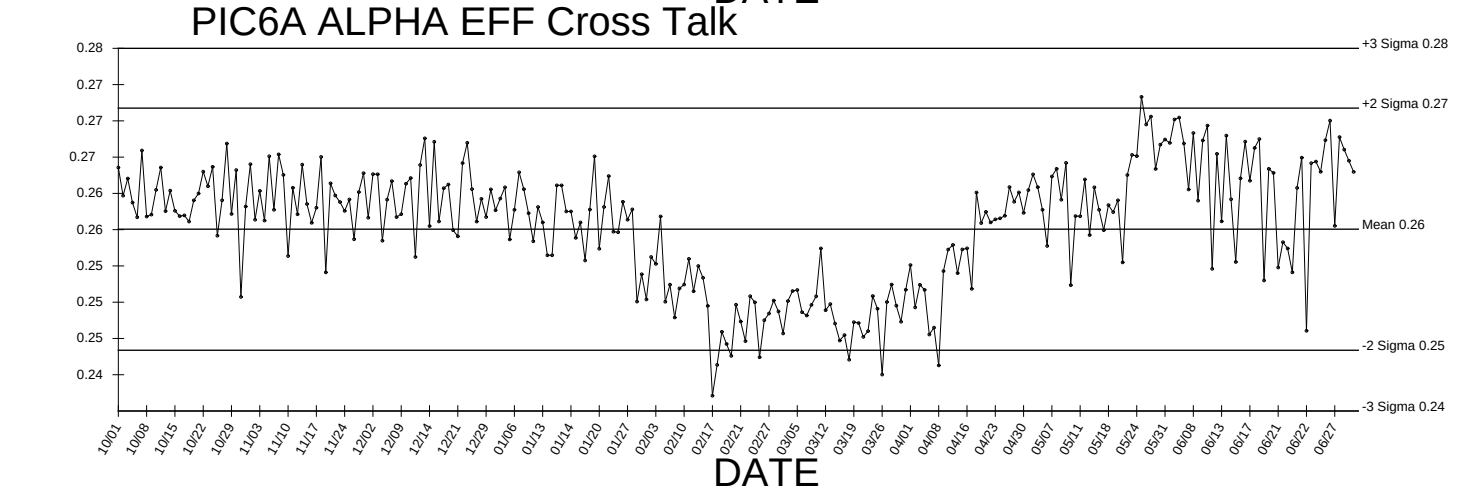
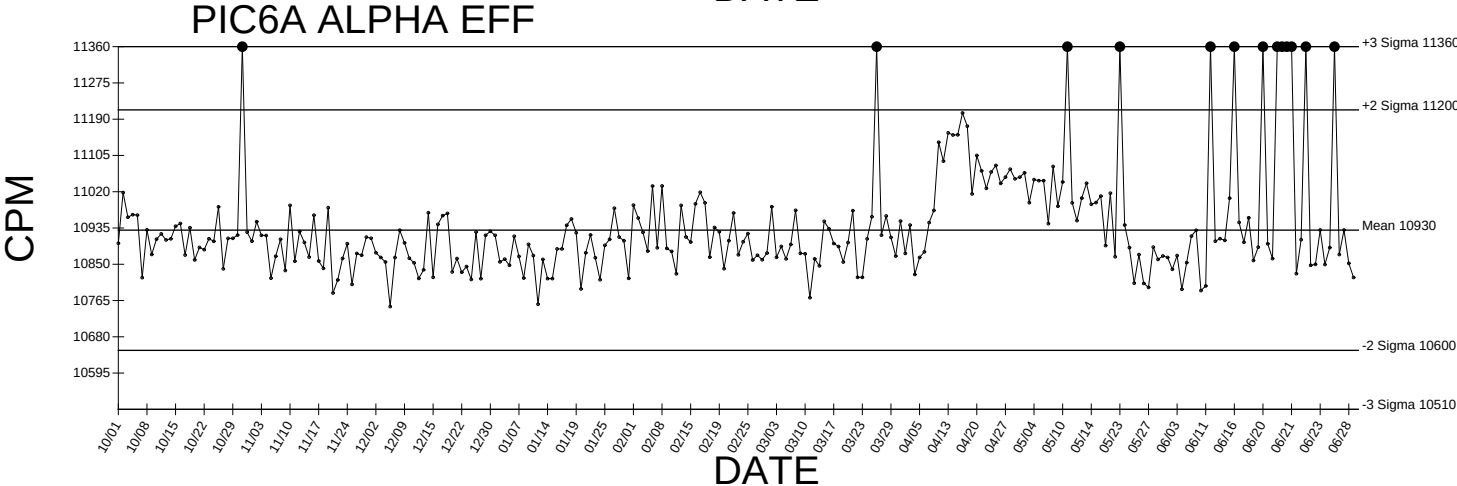
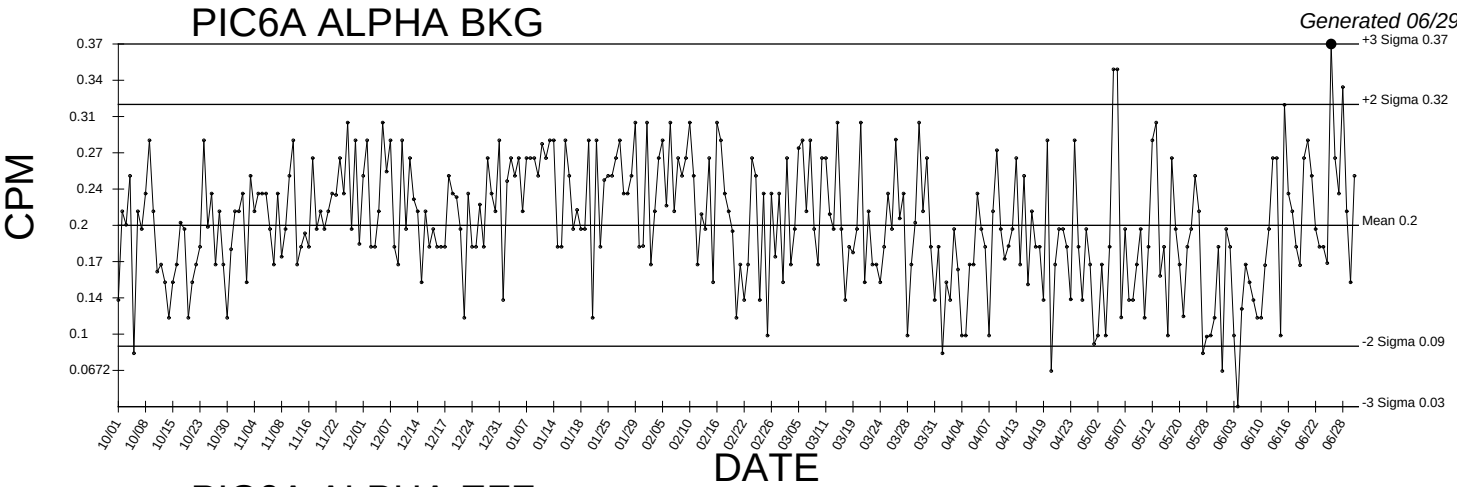
Generated 06/29/2016
+3 Sigma 27120



PIC4C BETA EFF Cross Talk



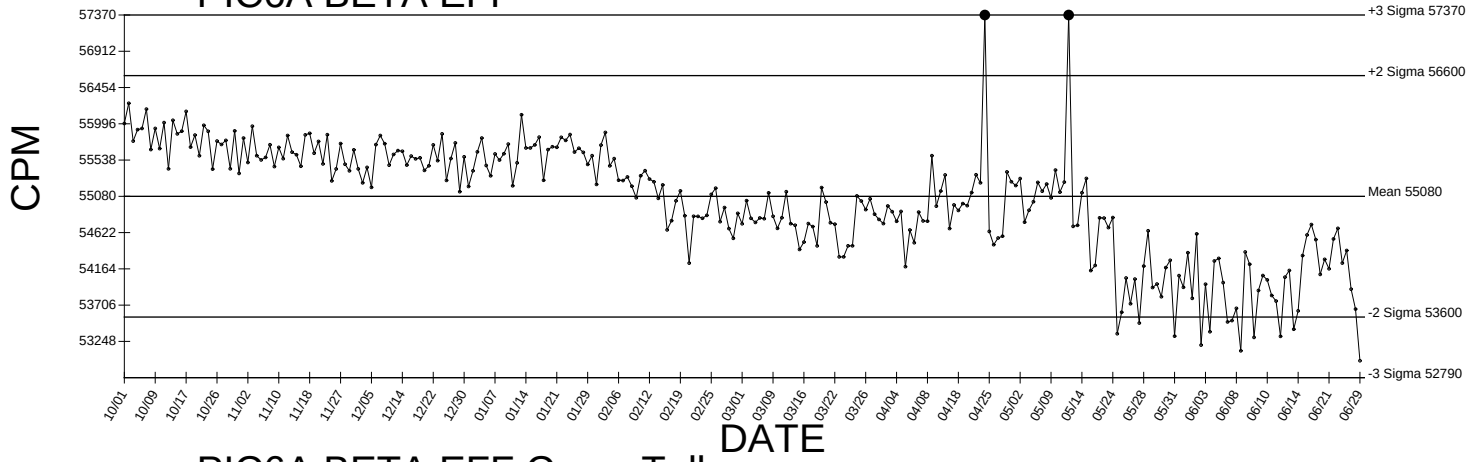
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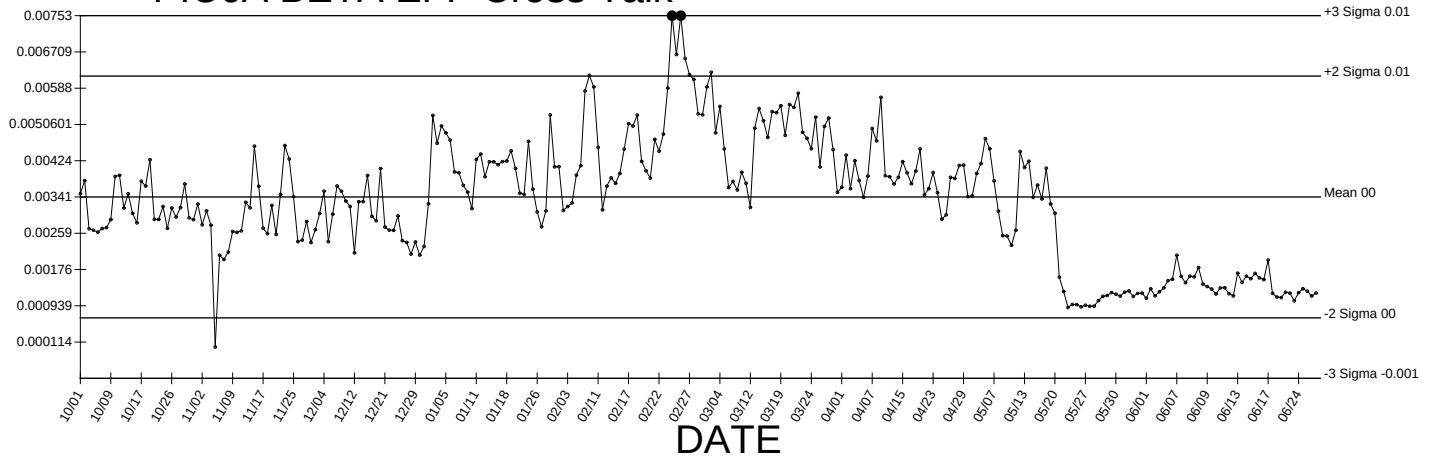
● Denotes Outlier

PIC6A BETA EFF

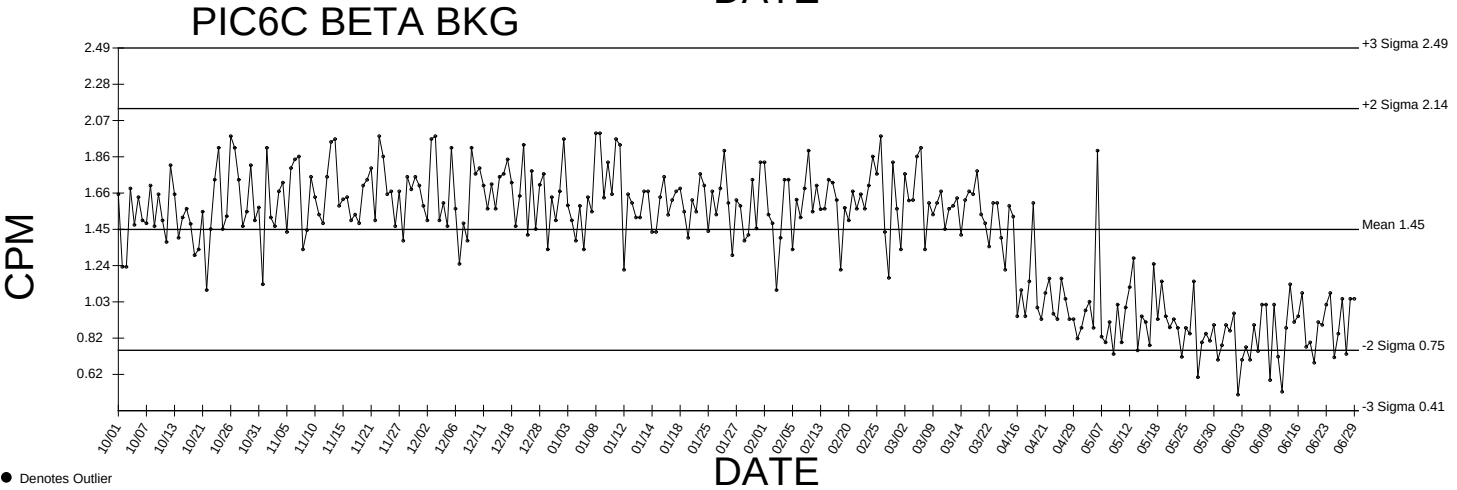
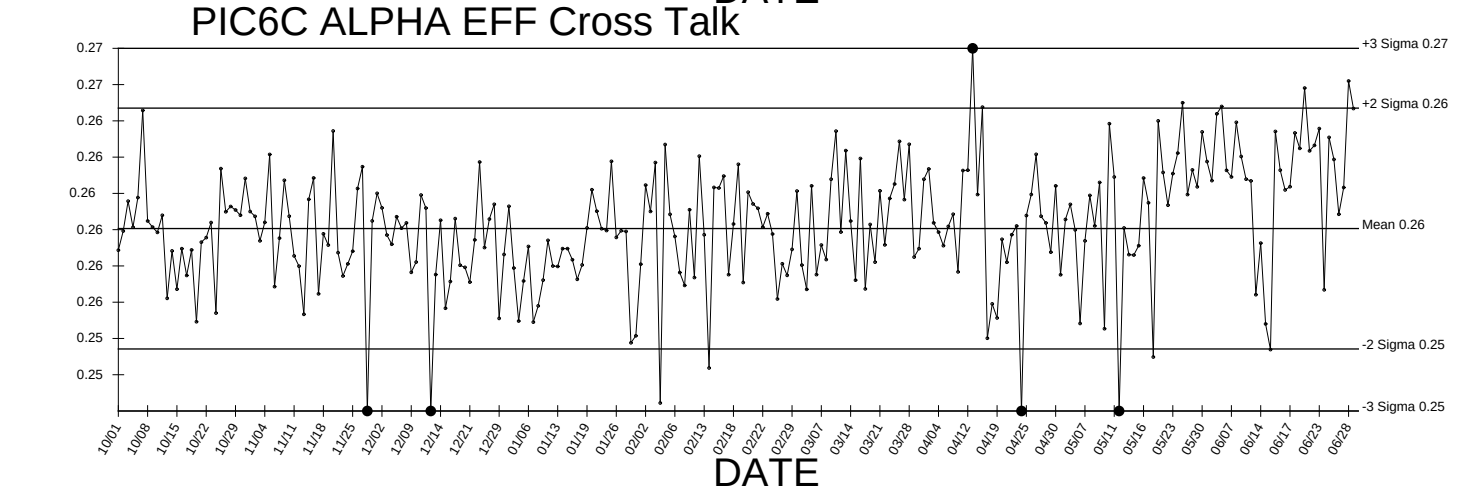
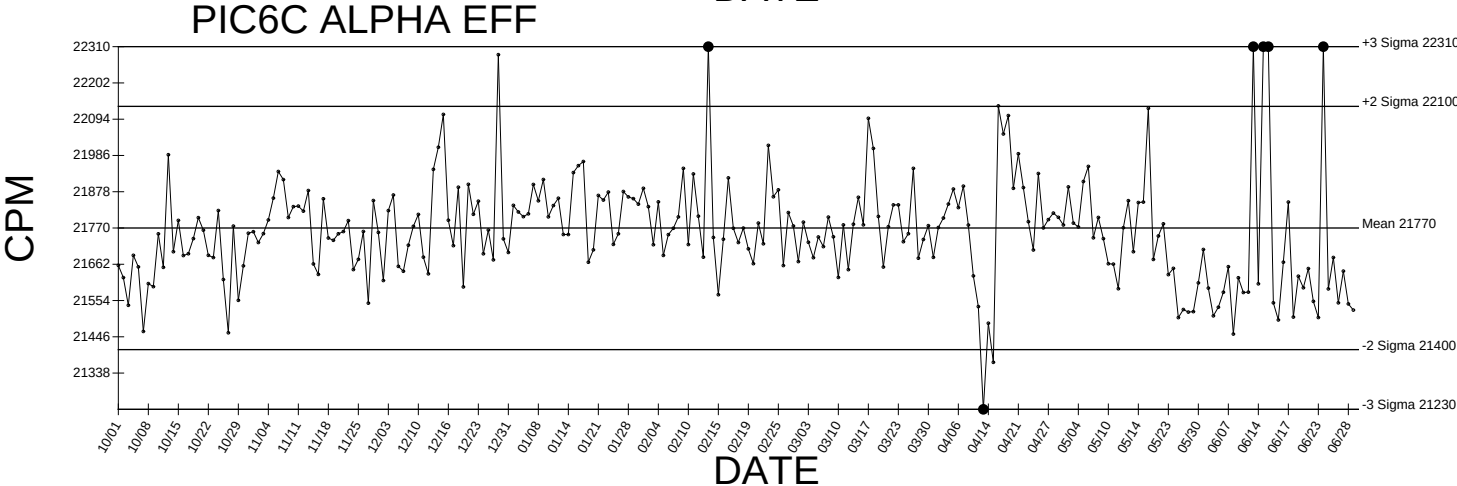
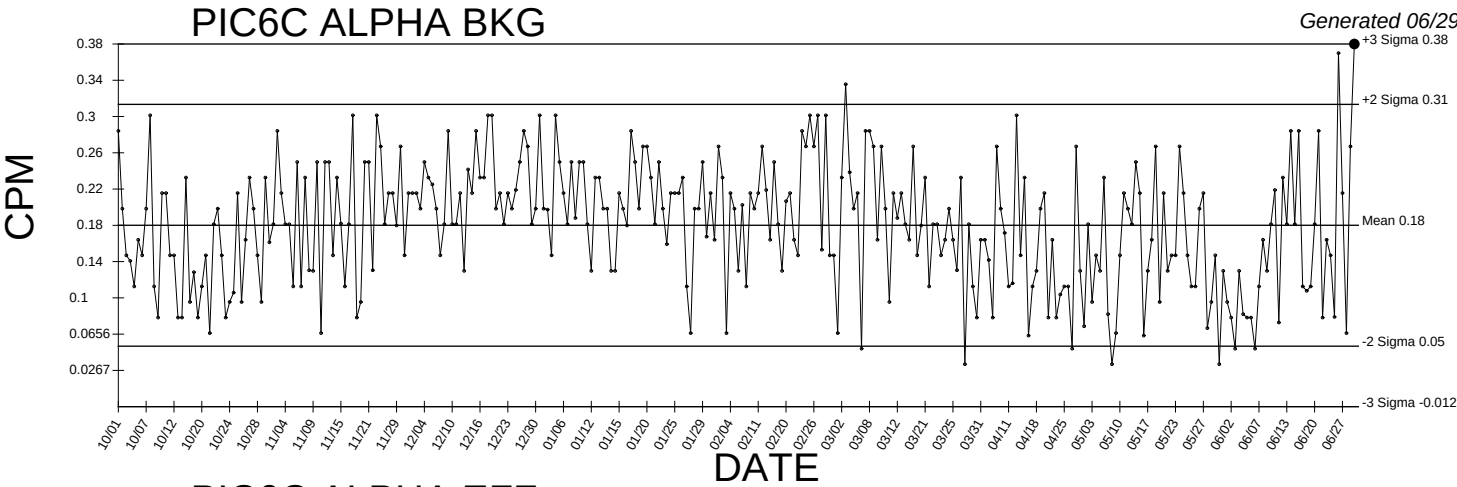
Generated 06/29/2016



PIC6A BETA EFF Cross Talk



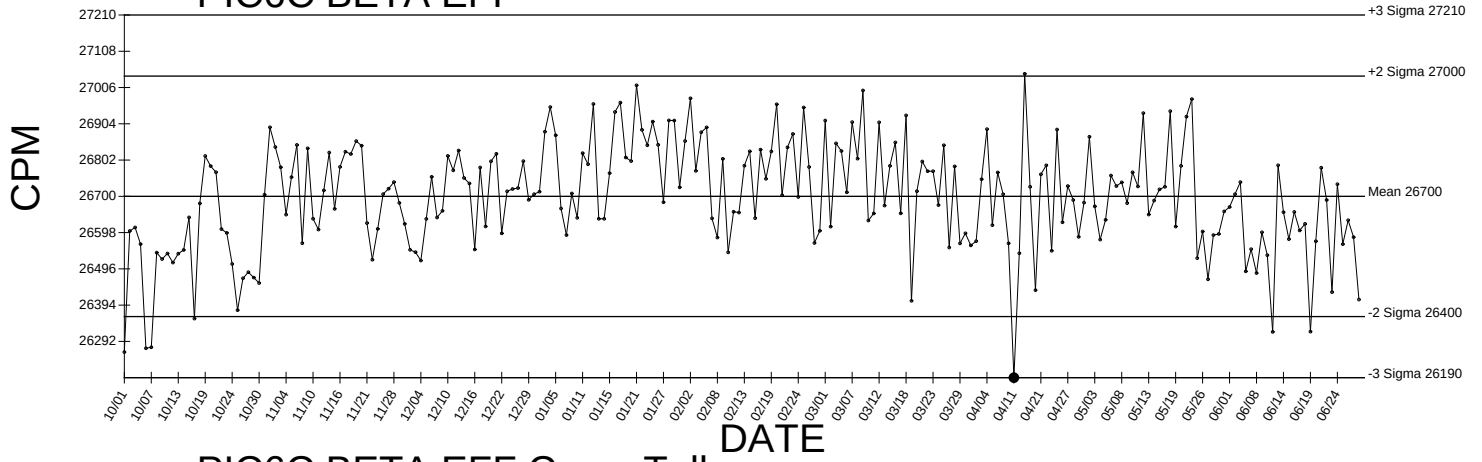
● Denotes Outlier



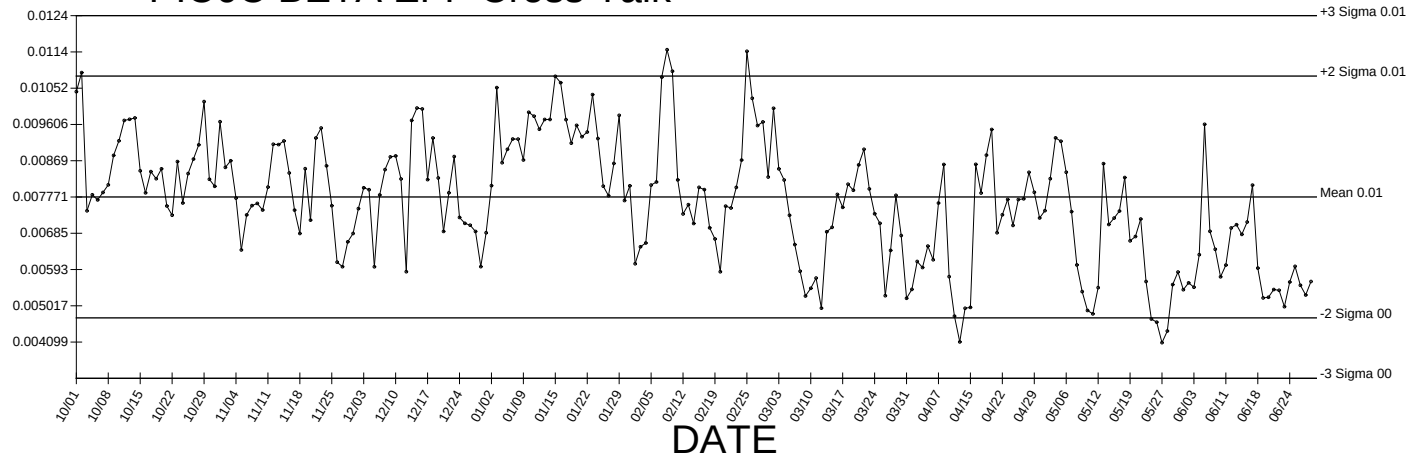
● Denotes Outlier

PIC6C BETA EFF

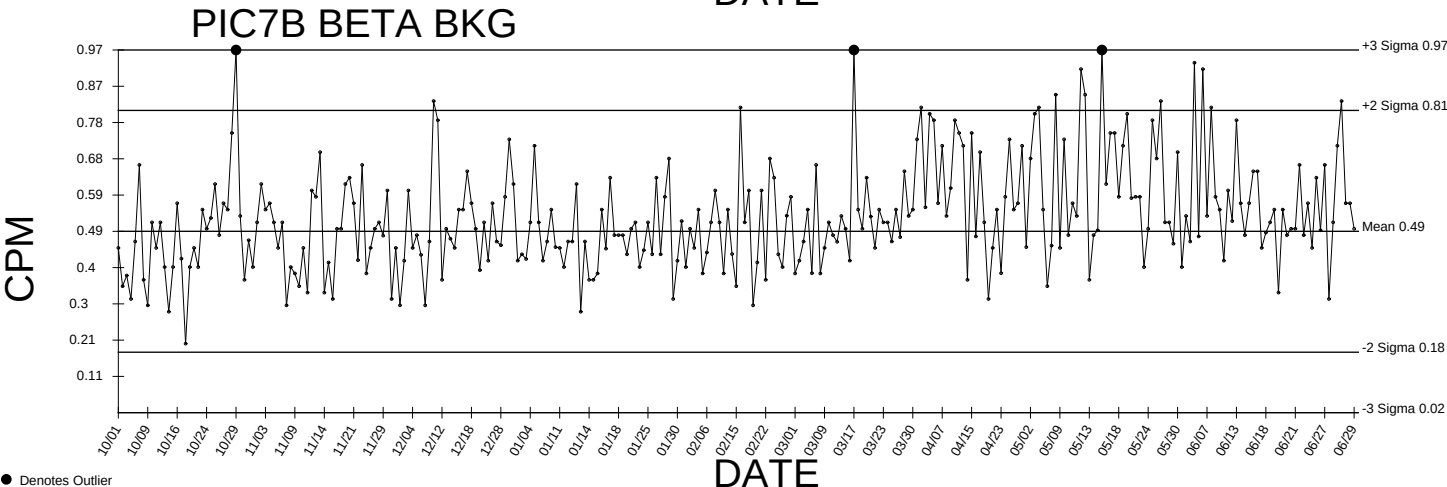
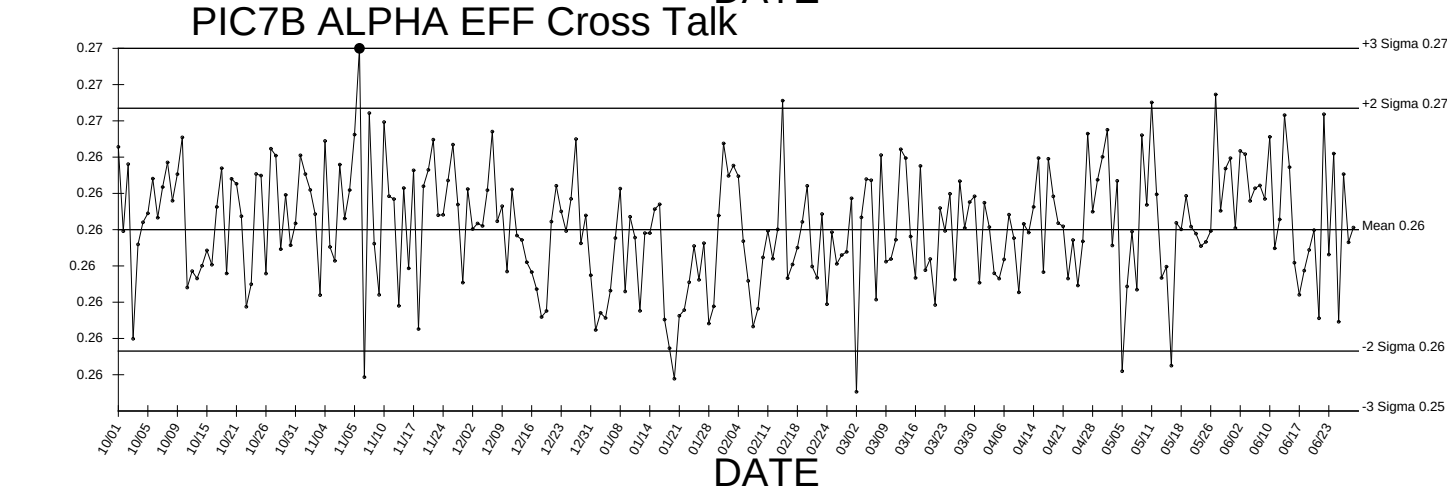
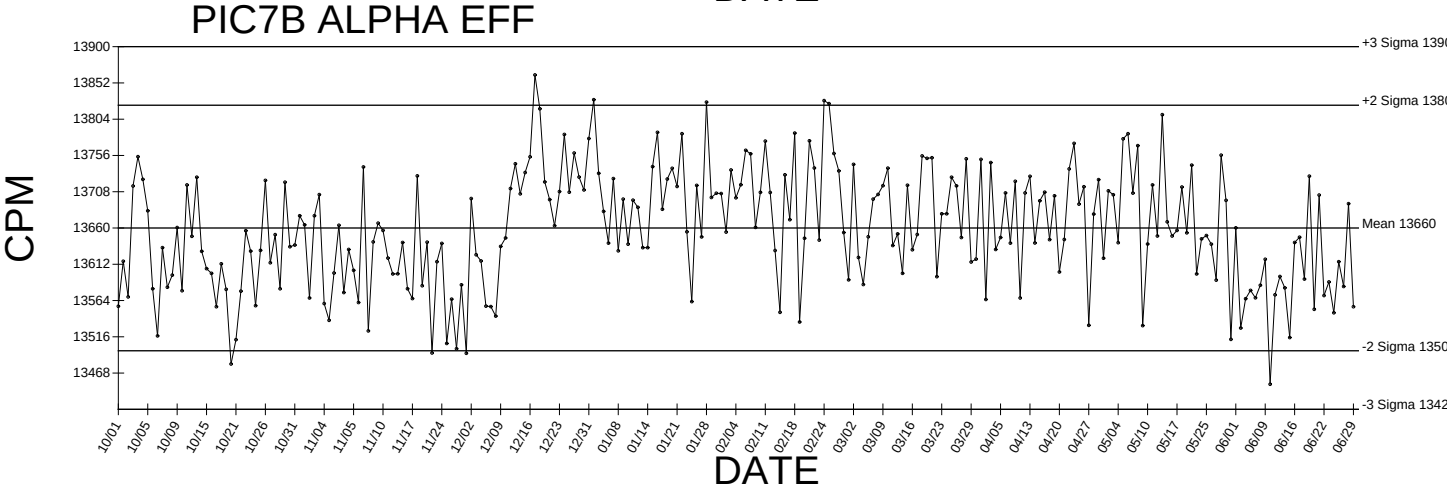
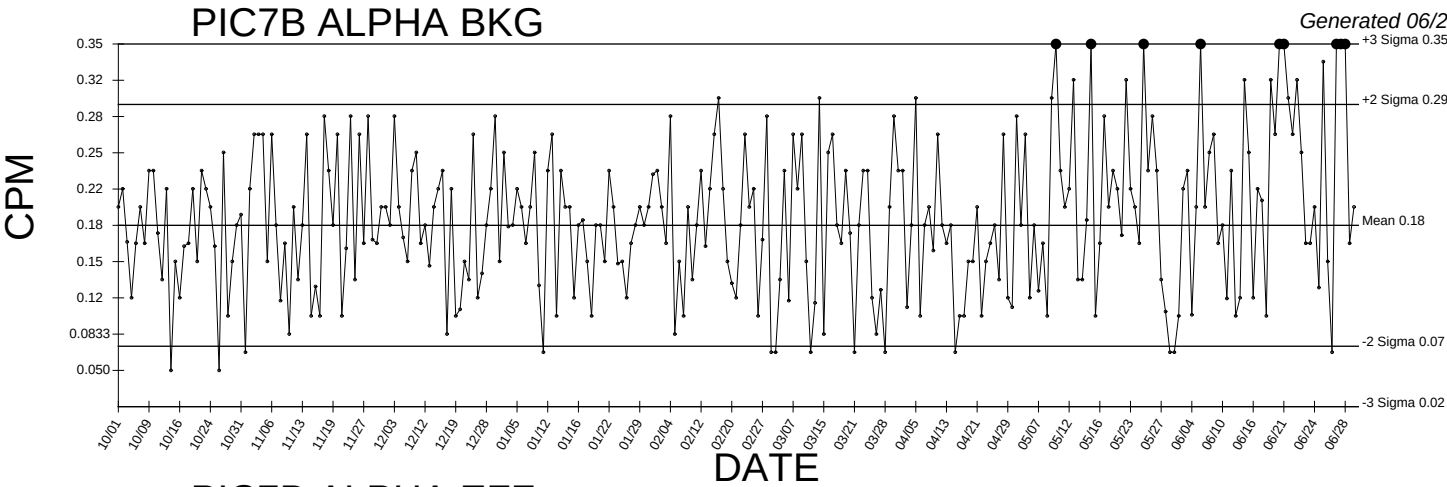
Generated 06/29/2016



PIC6C BETA EFF Cross Talk



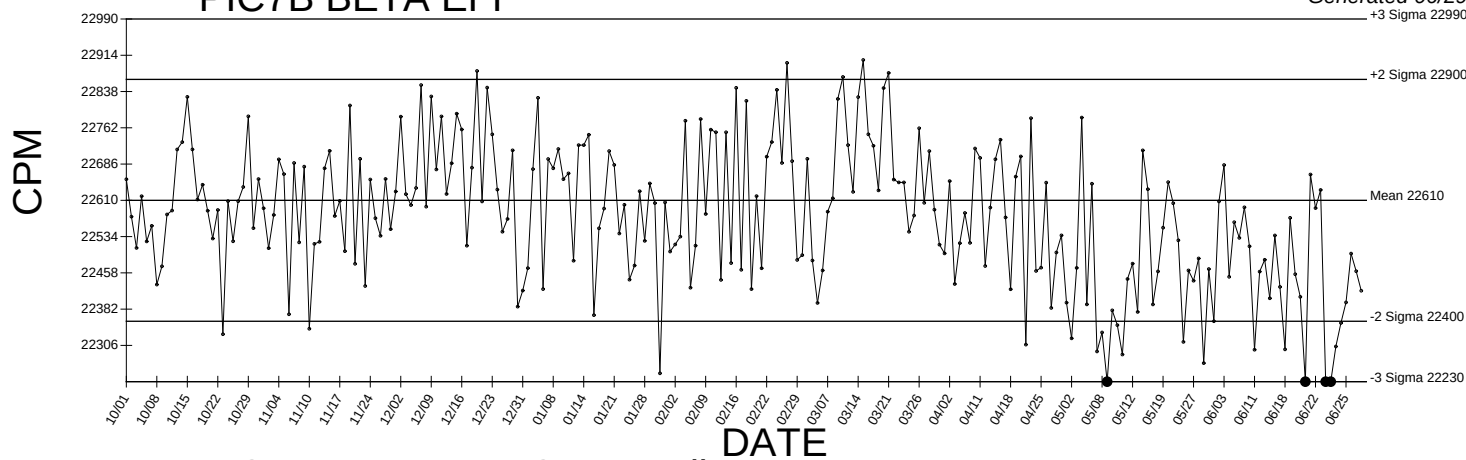
● Denotes Outlier



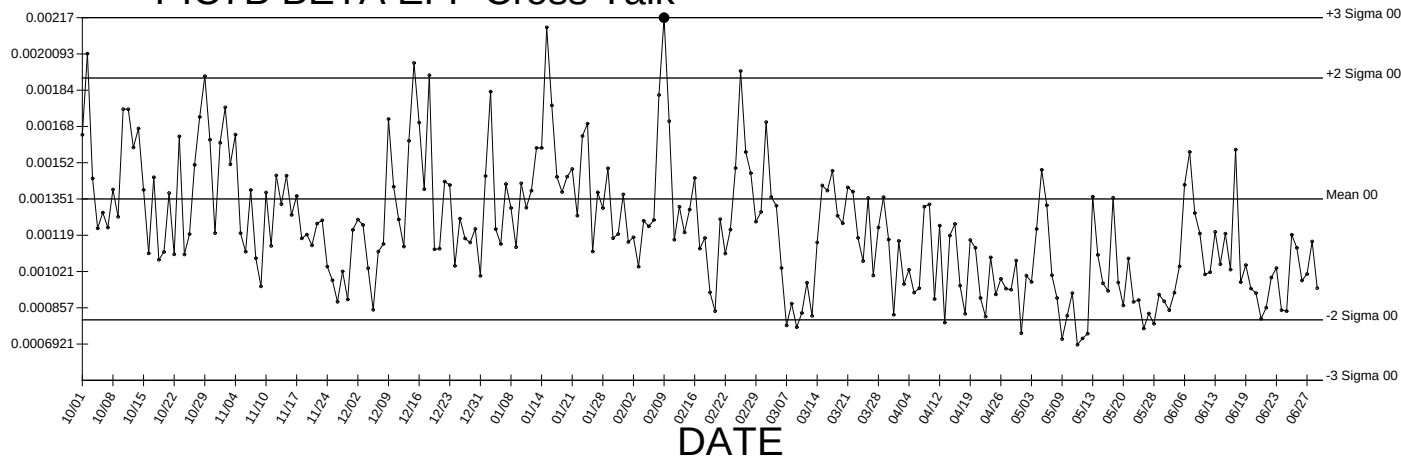
● Denotes Outlier

PIC7B BETA EFF

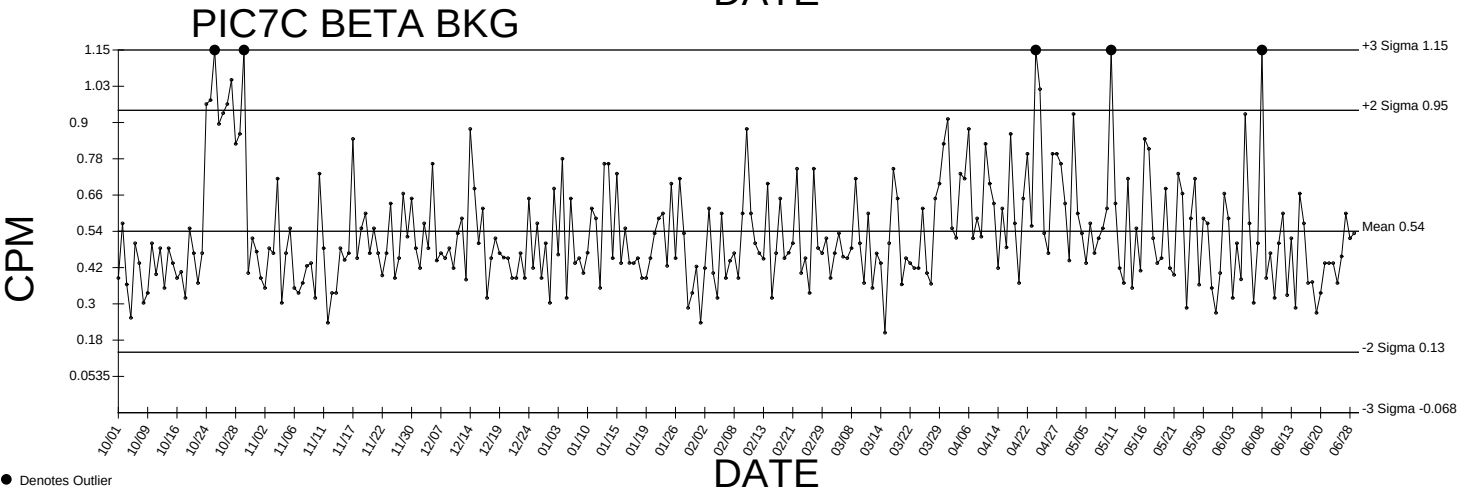
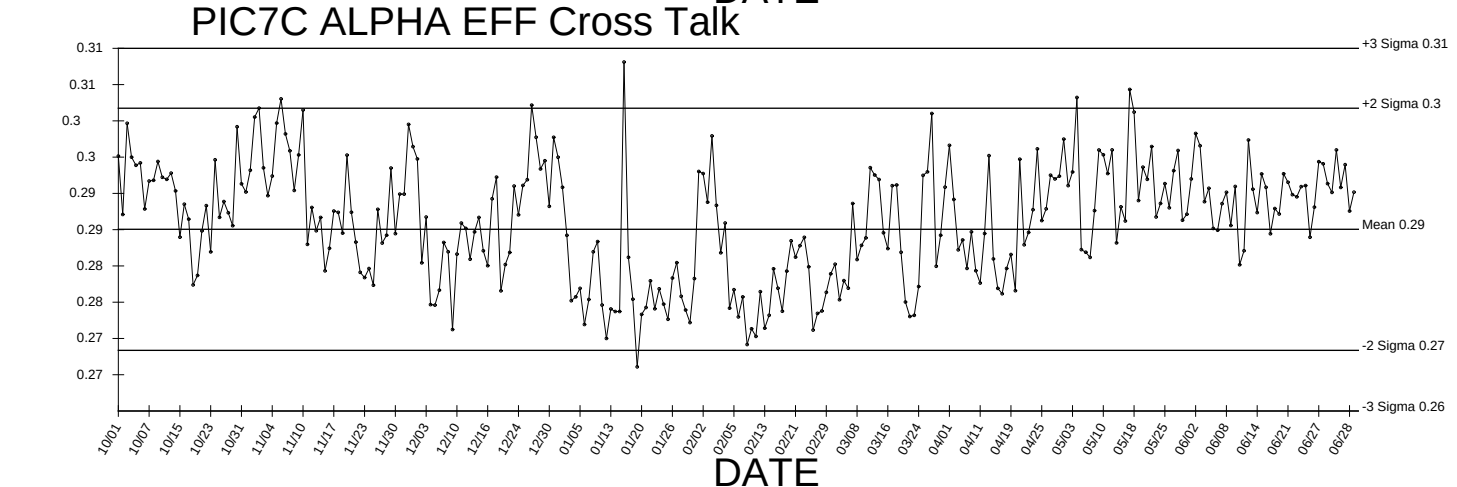
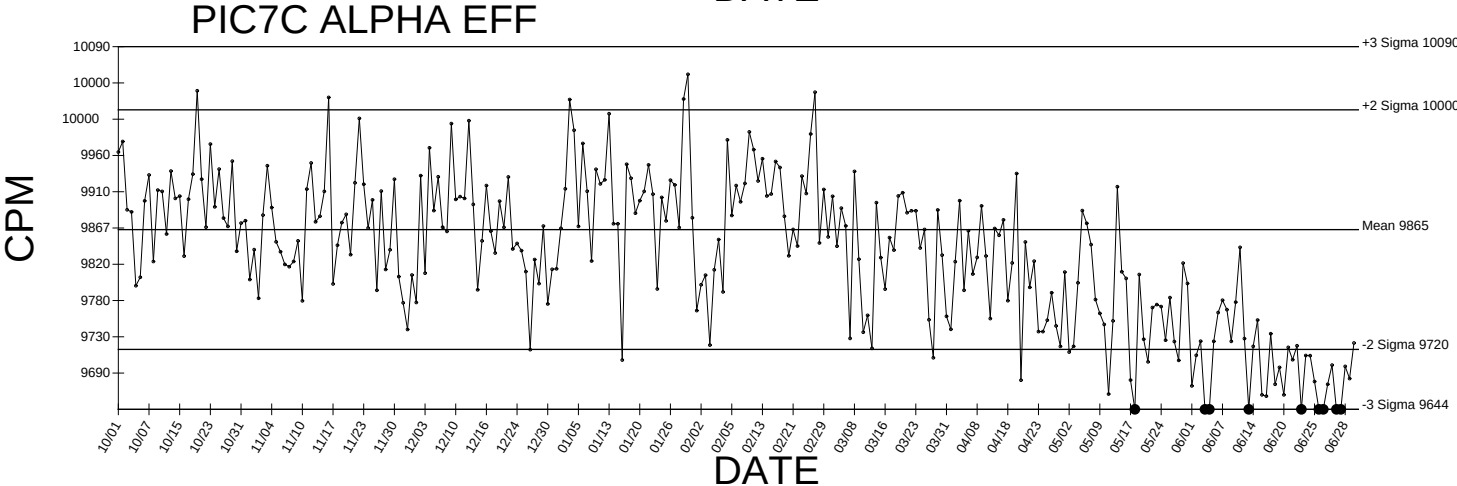
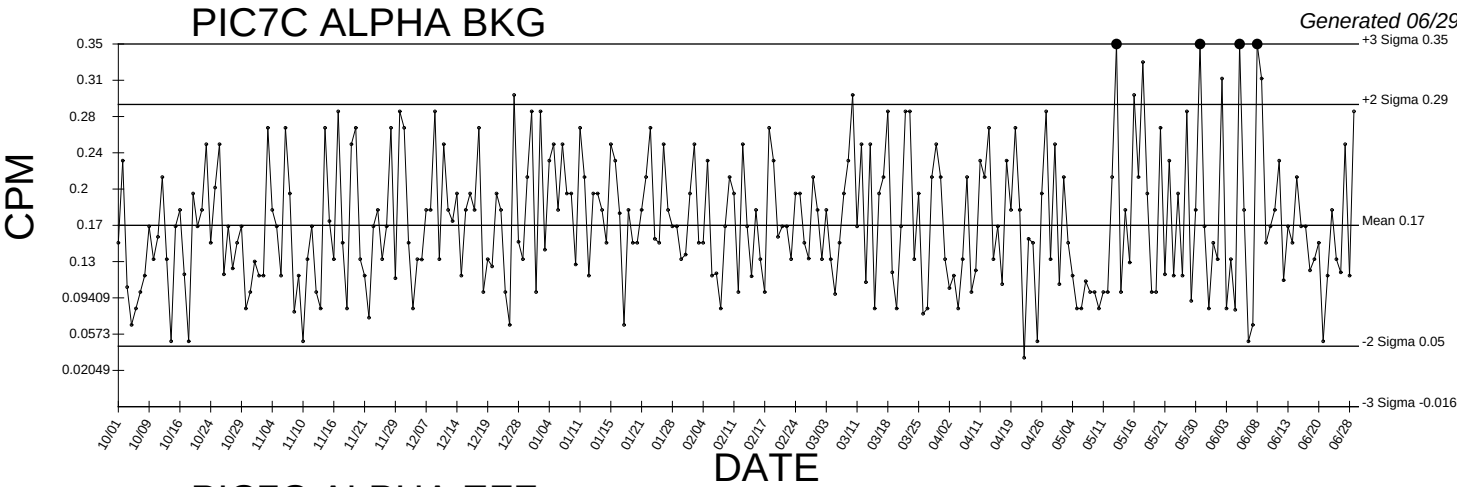
Generated 06/29/2016



PIC7B BETA EFF Cross Talk



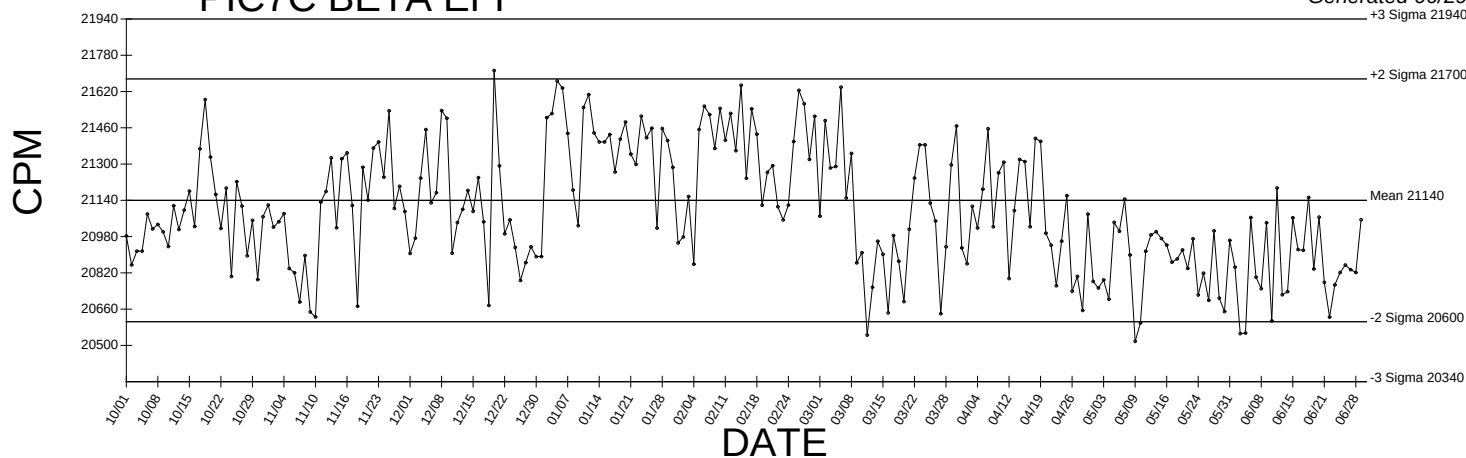
● Denotes Outlier



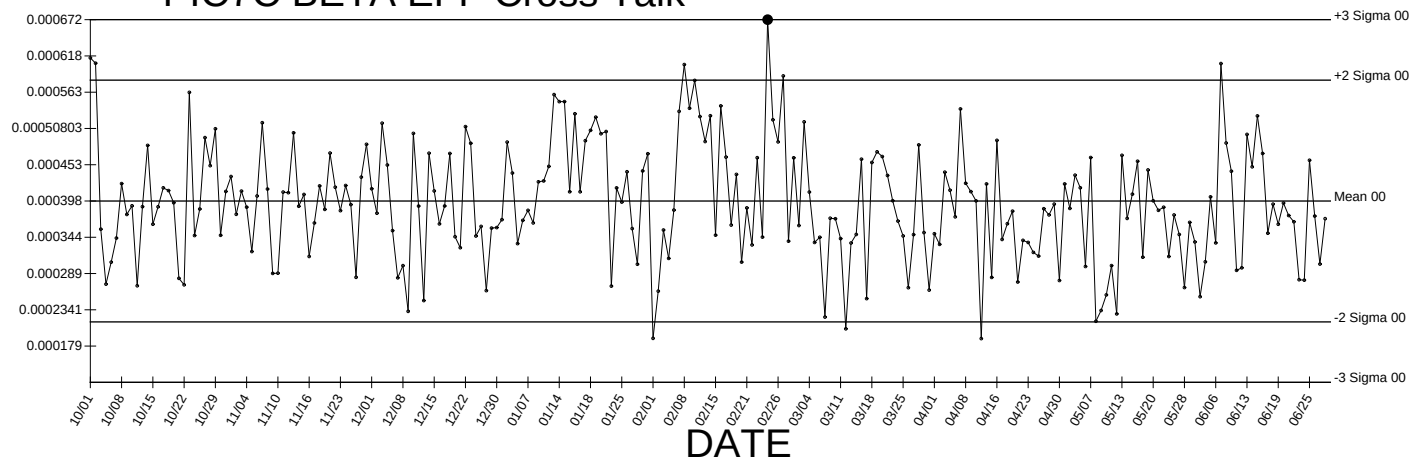
● Denotes Outlier

PIC7C BETA EFF

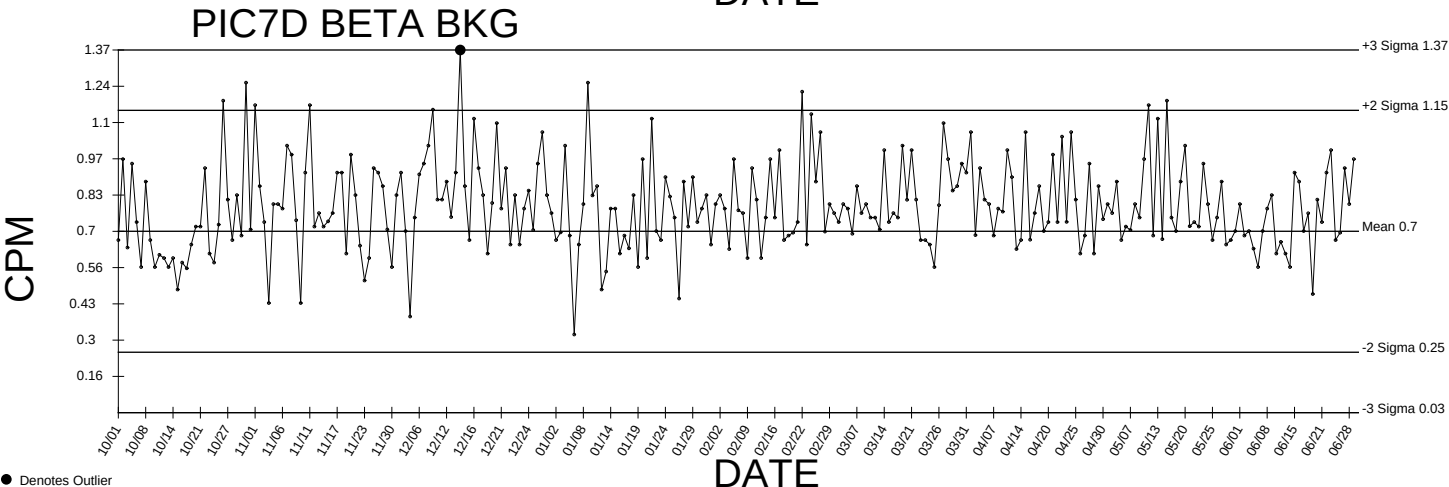
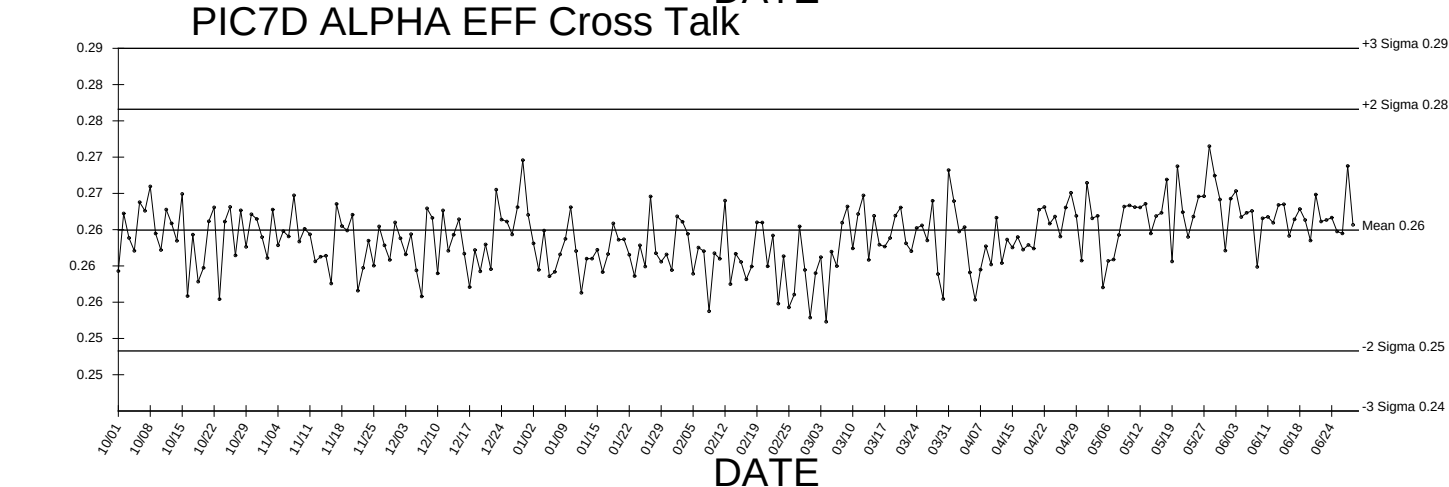
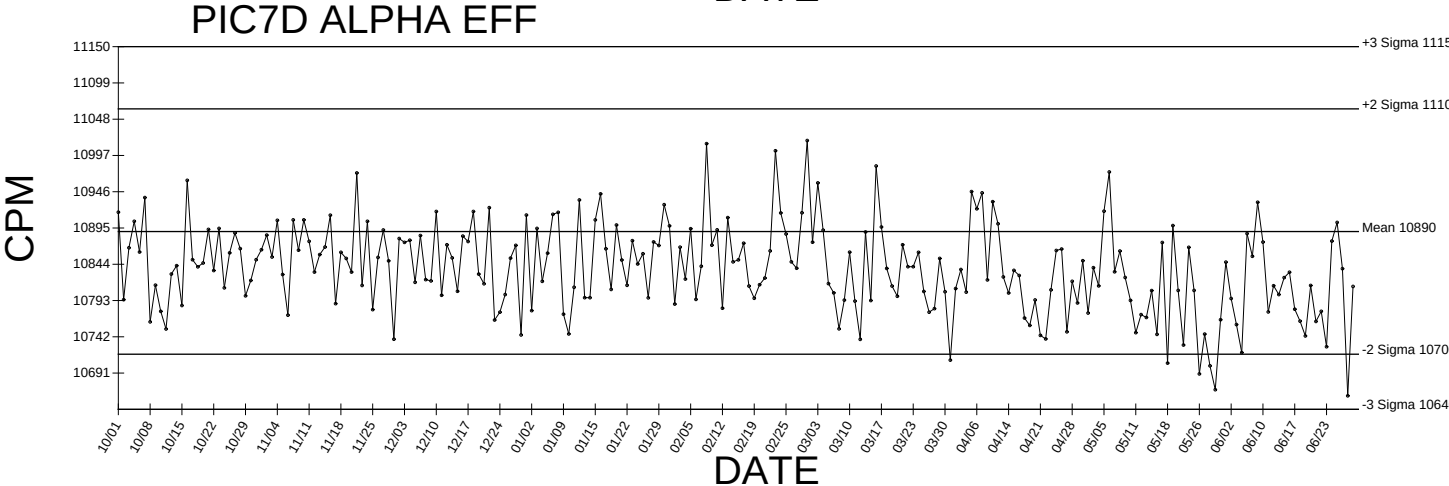
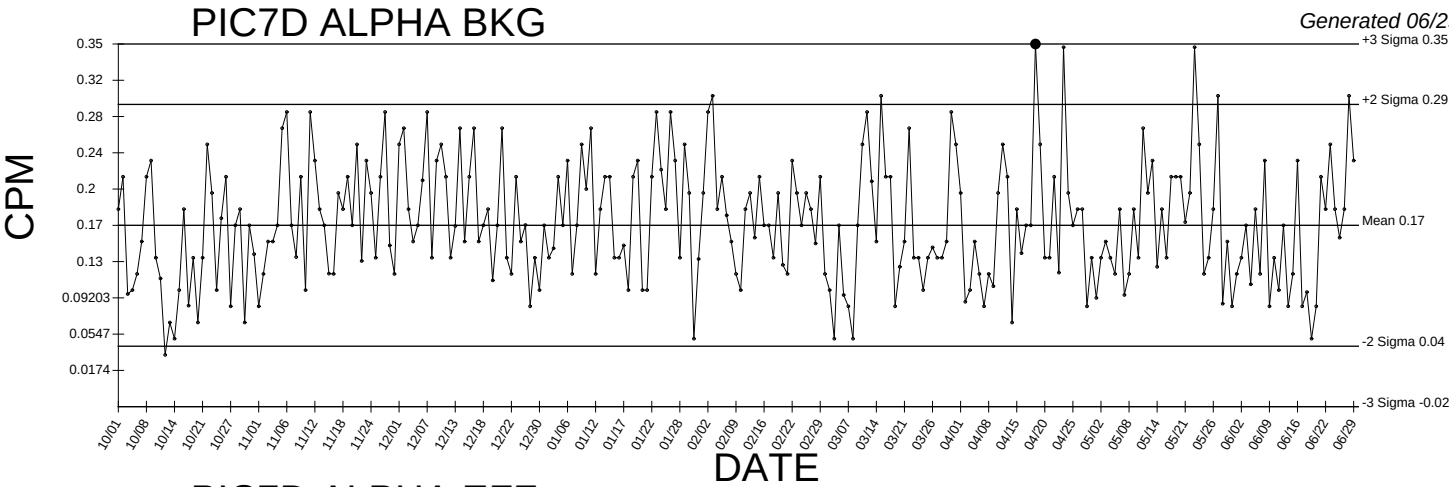
Generated 06/29/2016
+3 Sigma 21940



PIC7C BETA EFF Cross Talk



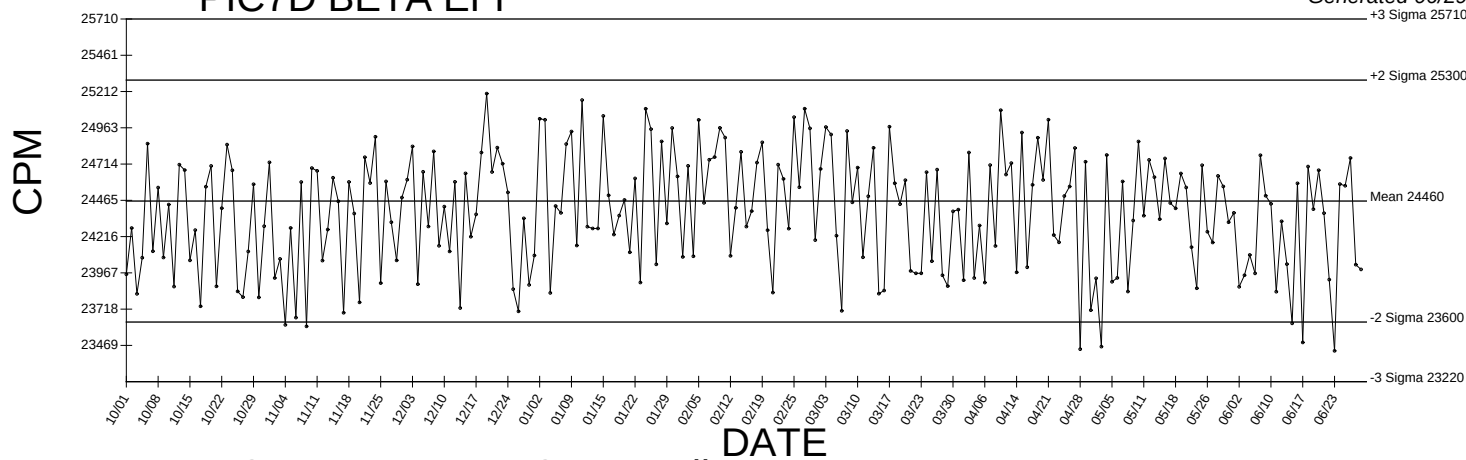
● Denotes Outlier



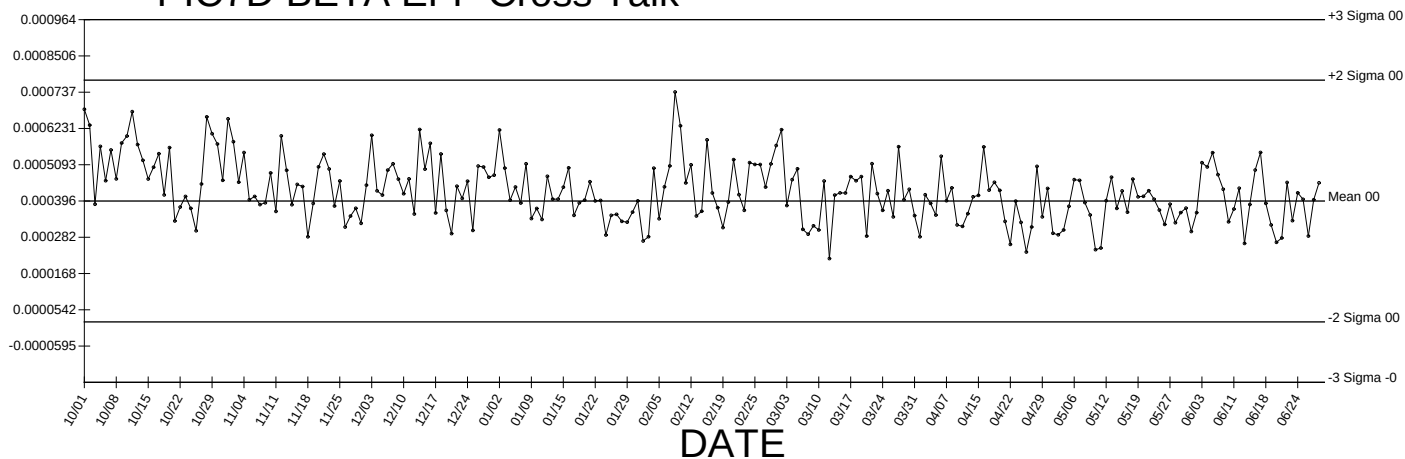
● Denotes Outlier

PIC7D BETA EFF

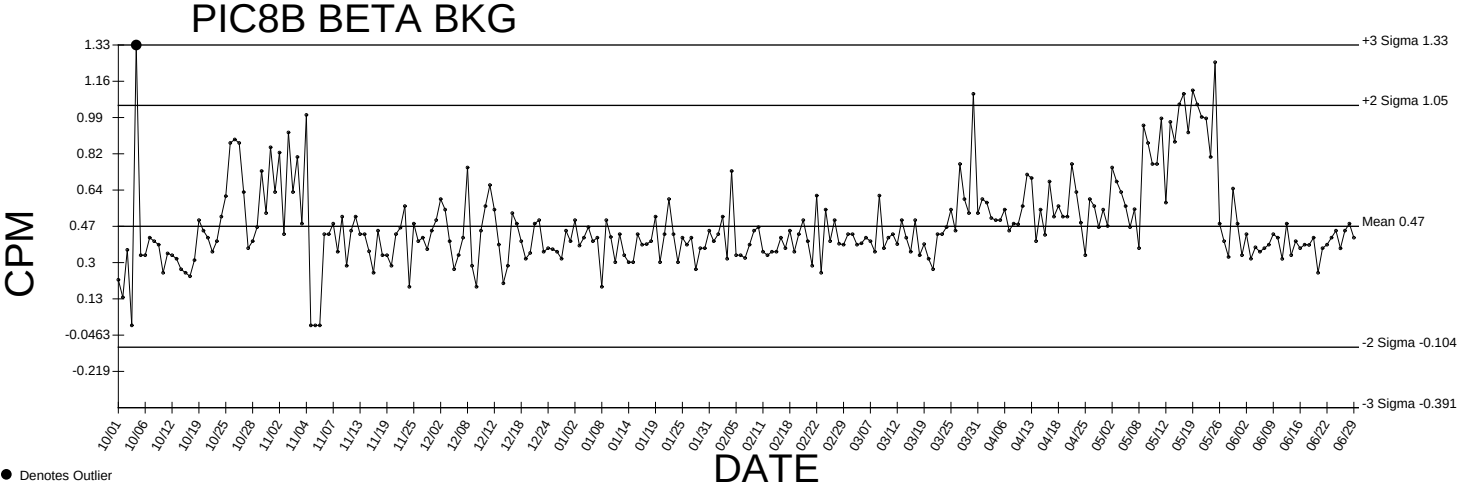
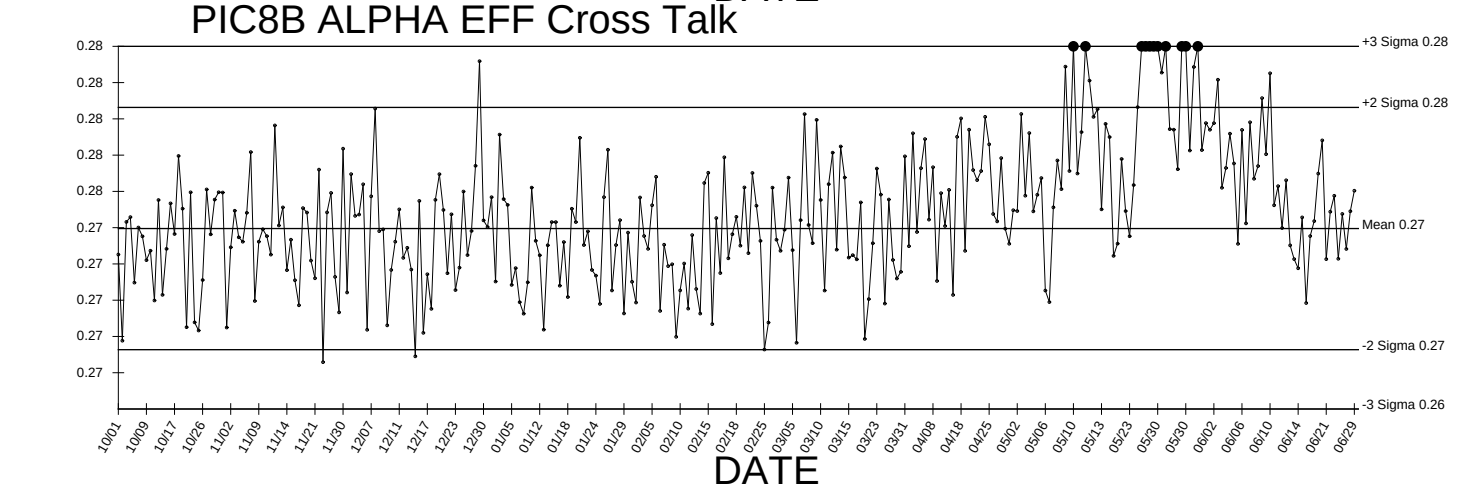
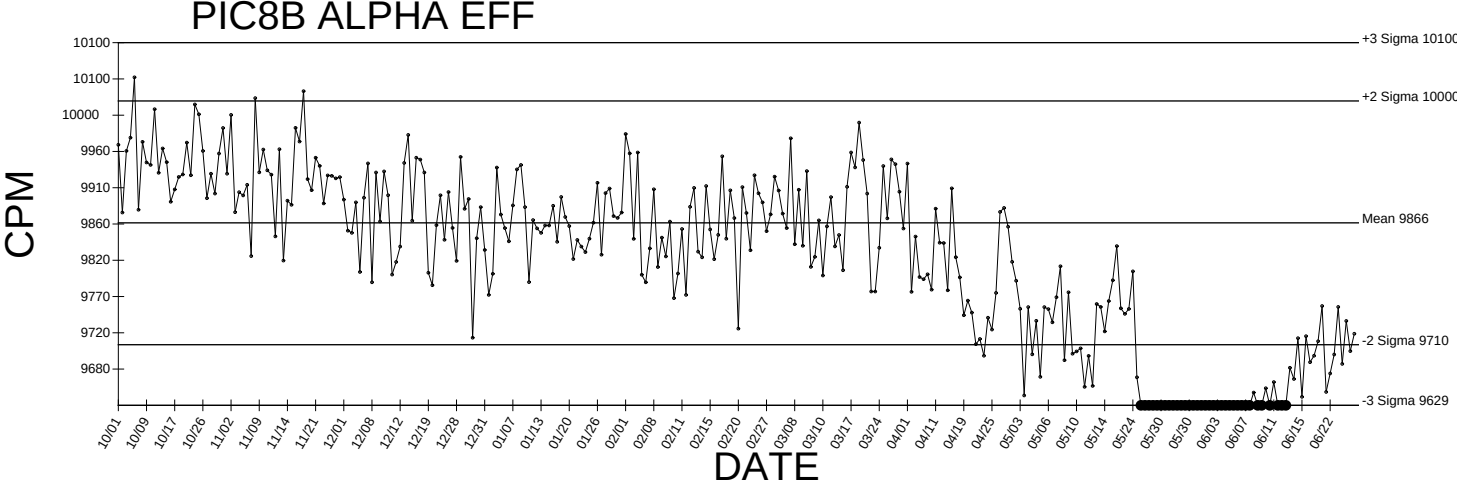
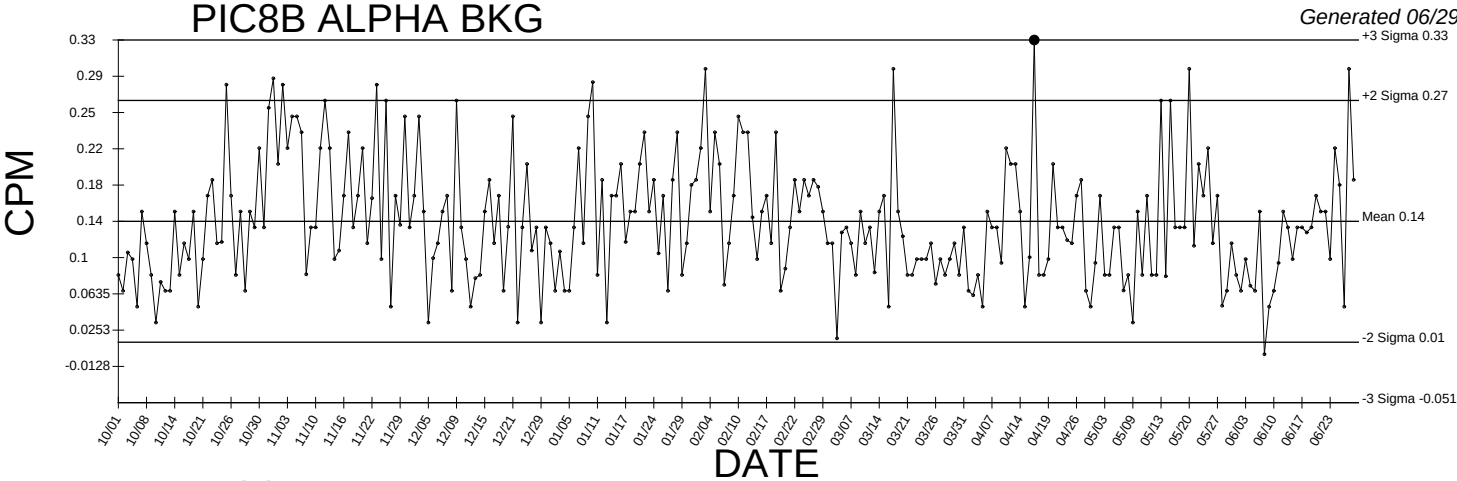
Generated 06/29/2016
+3 Sigma 25710



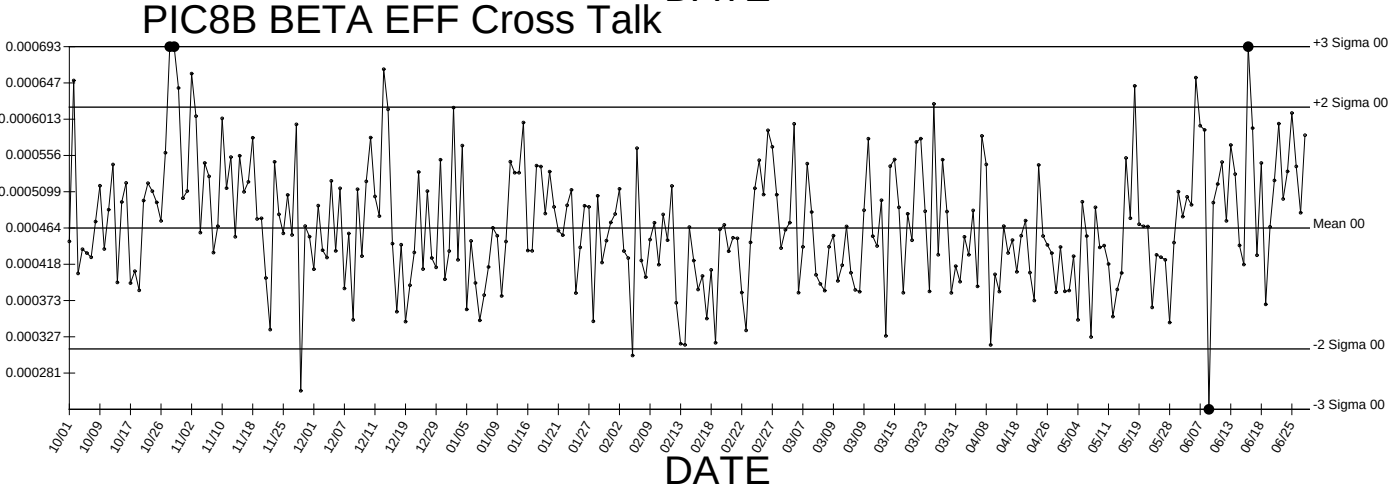
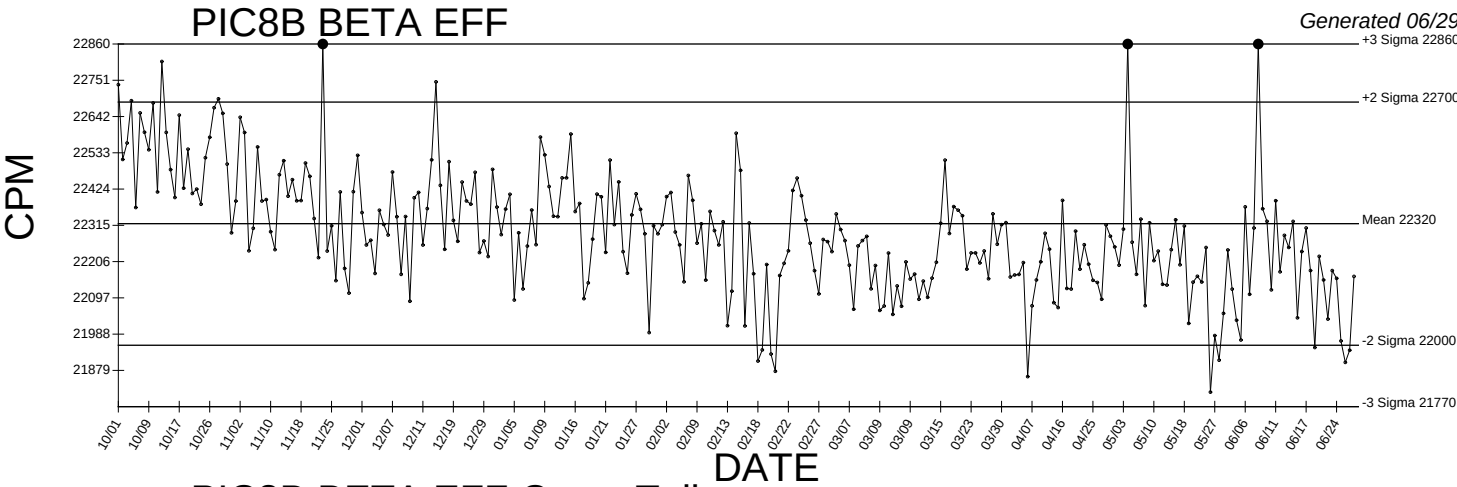
PIC7D BETA EFF Cross Talk



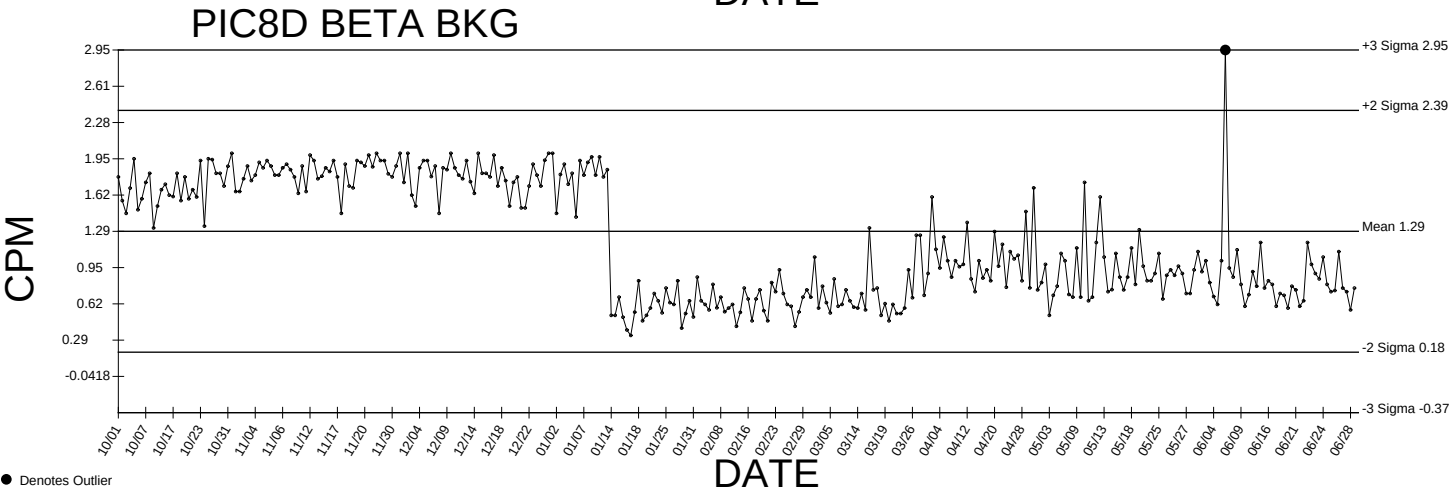
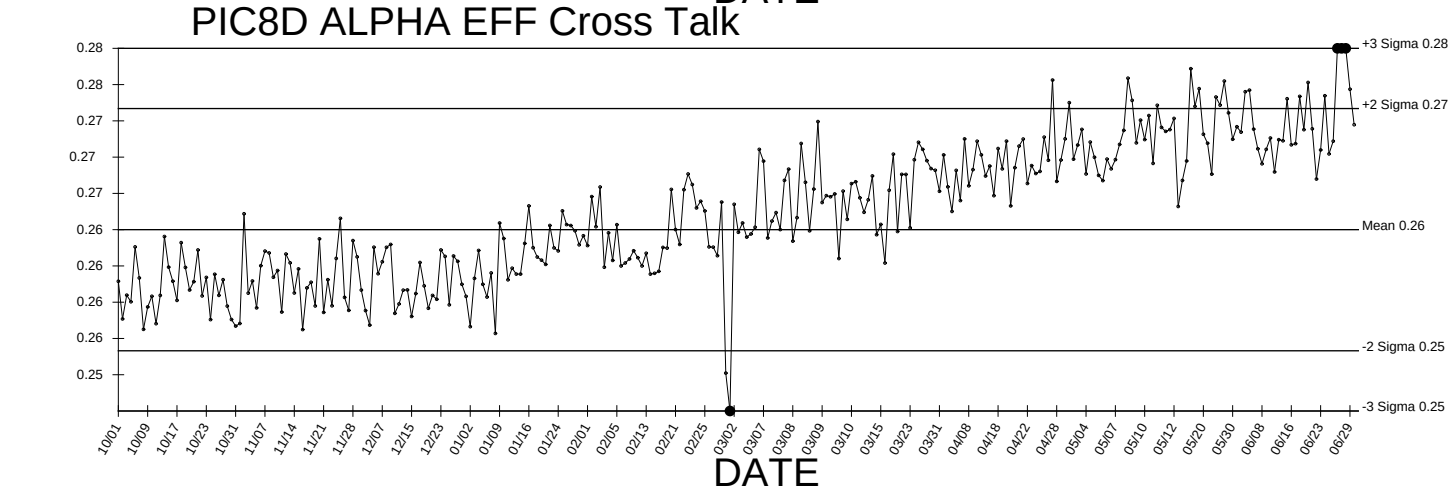
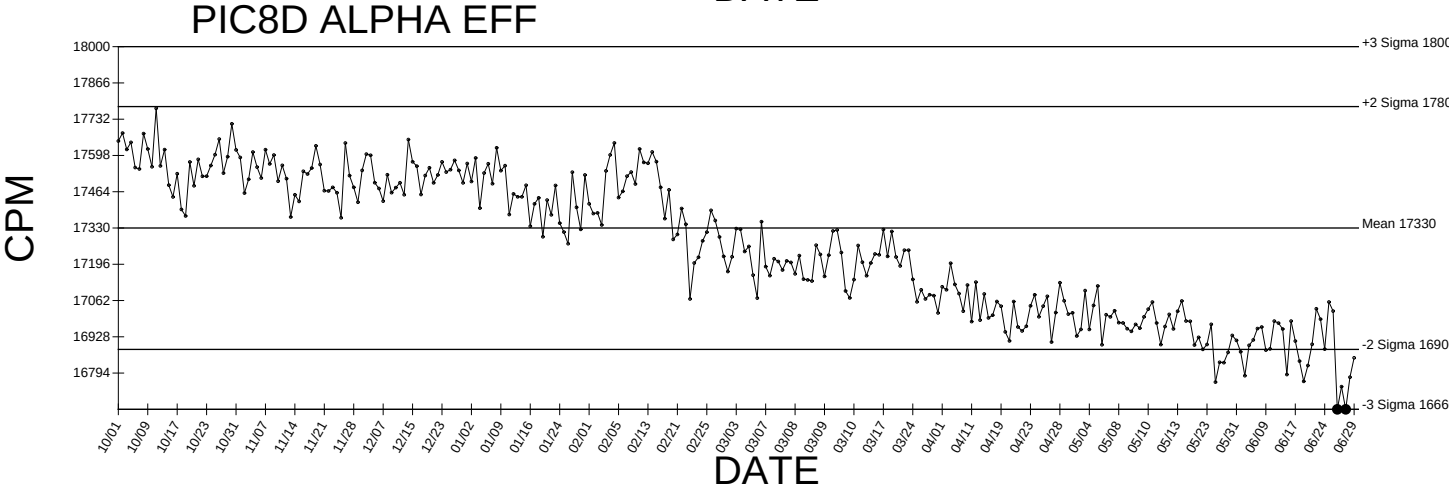
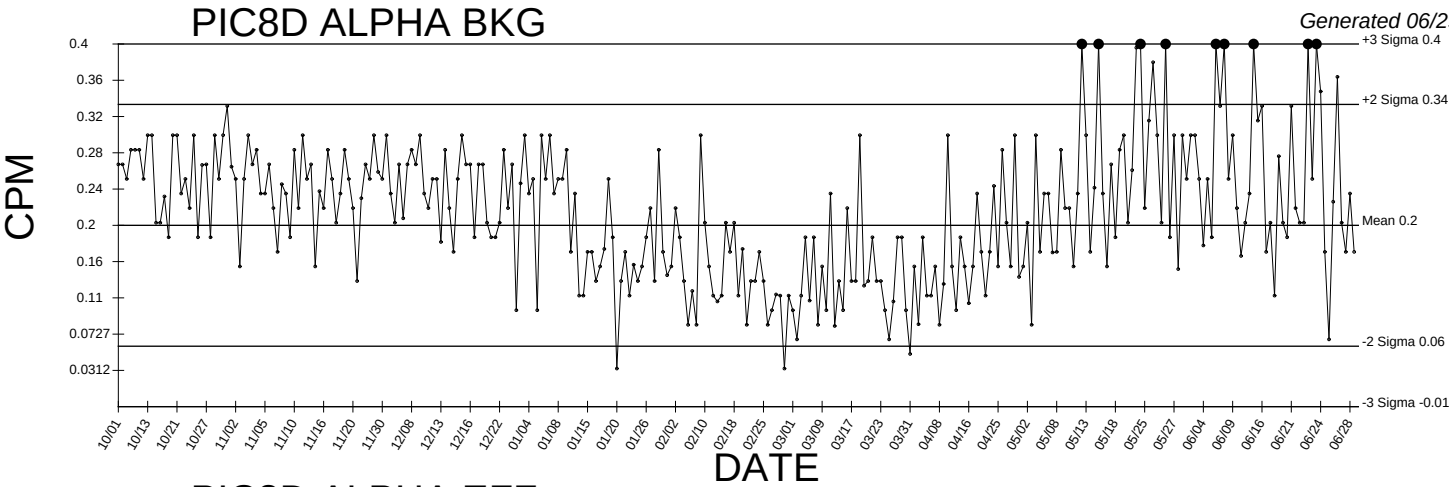
● Denotes Outlier



● Denotes Outlier



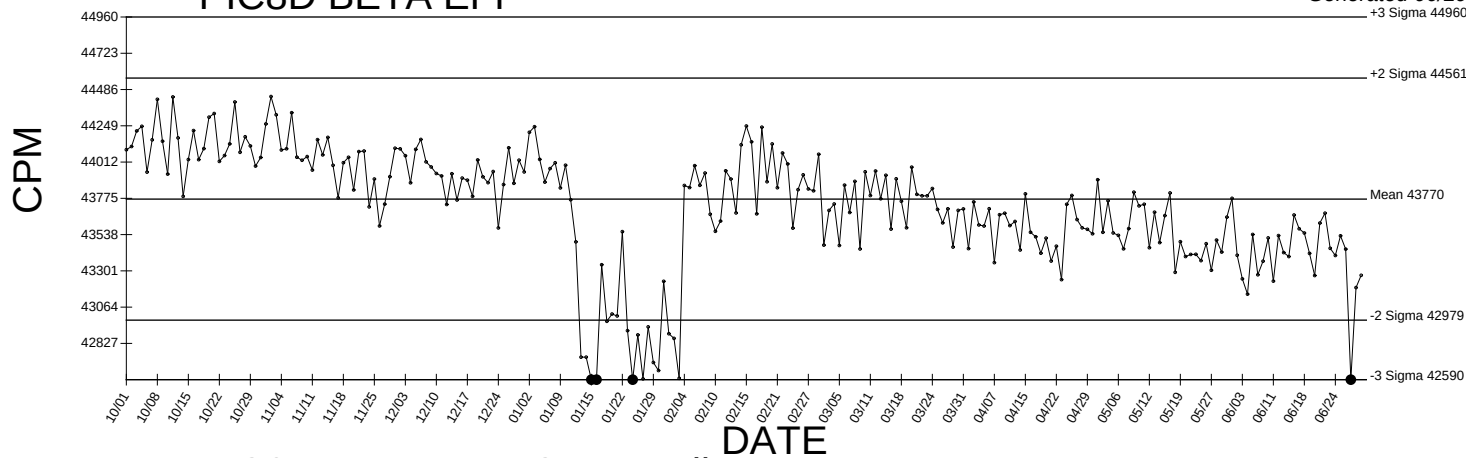
● Denotes Outlier



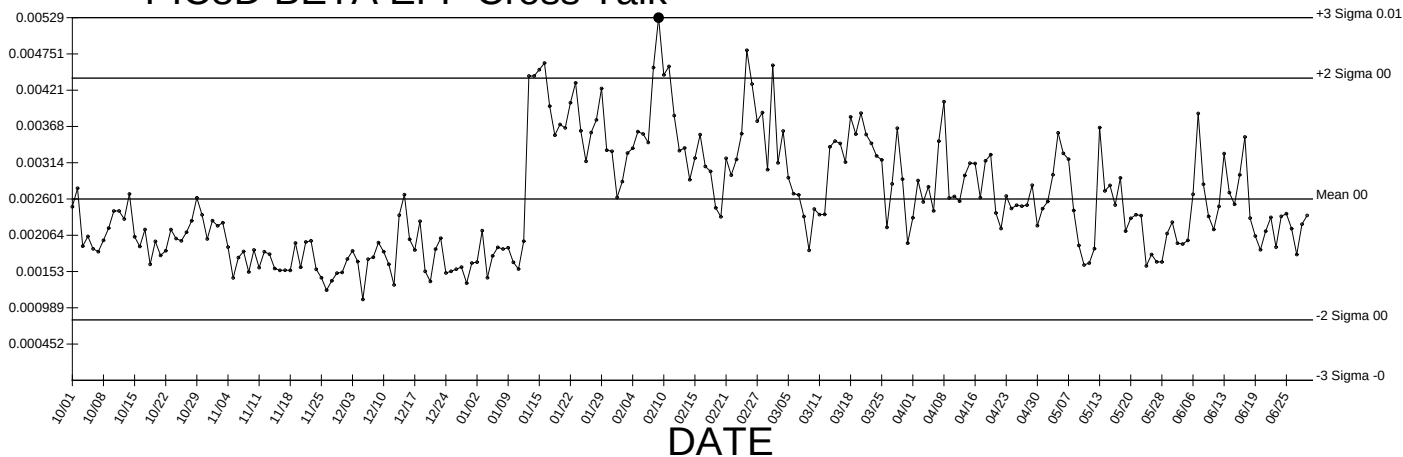
● Denotes Outlier

PIC8D BETA EFF

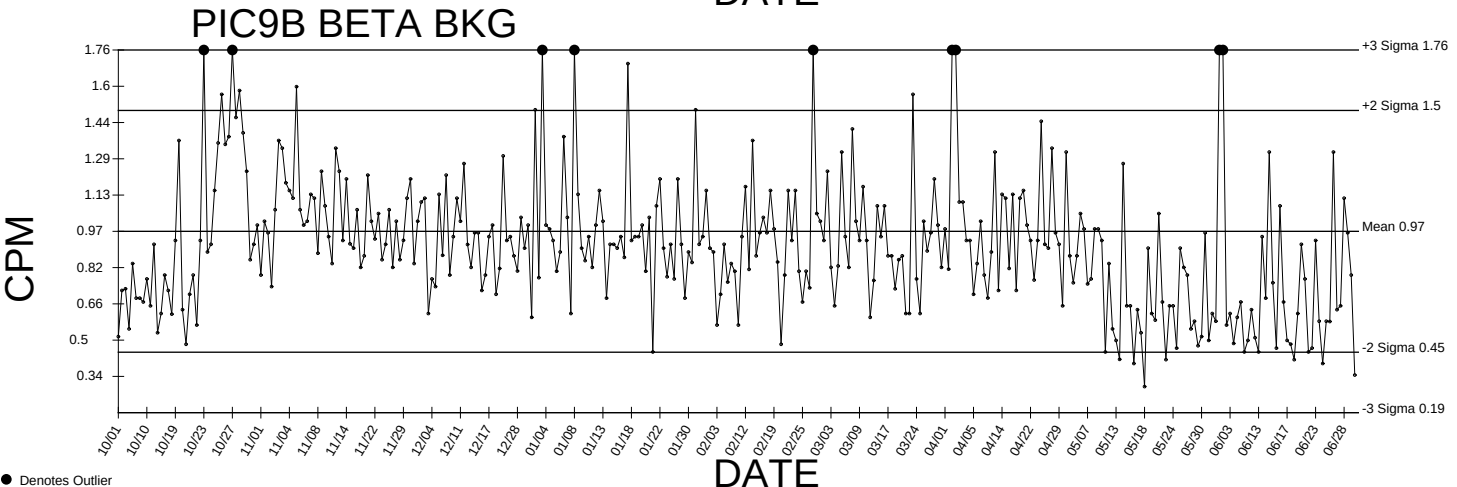
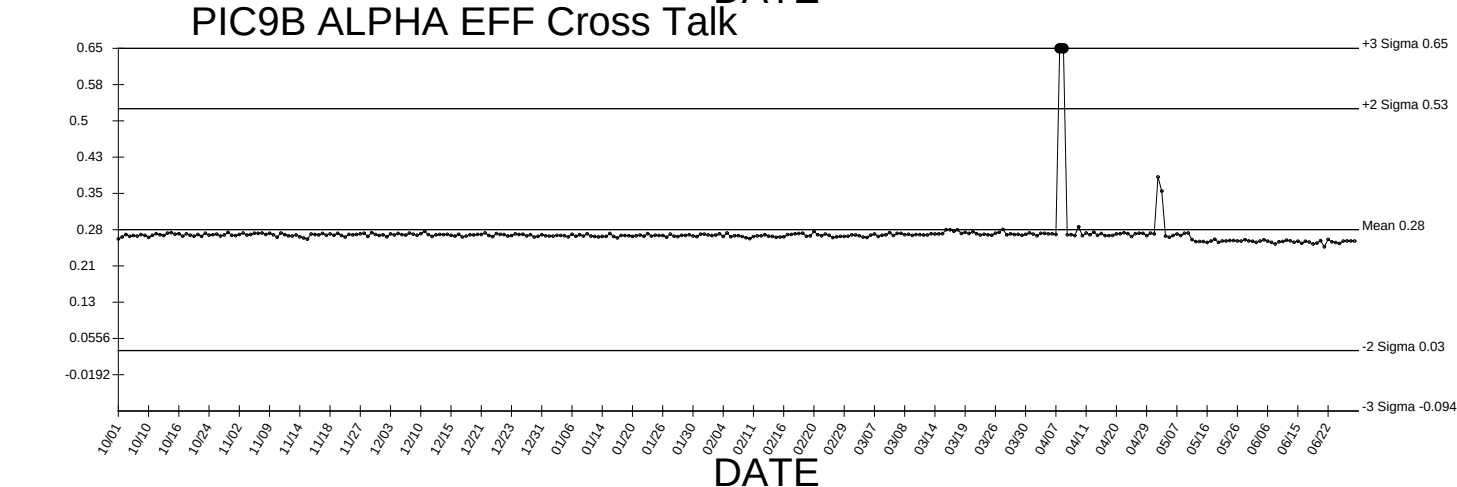
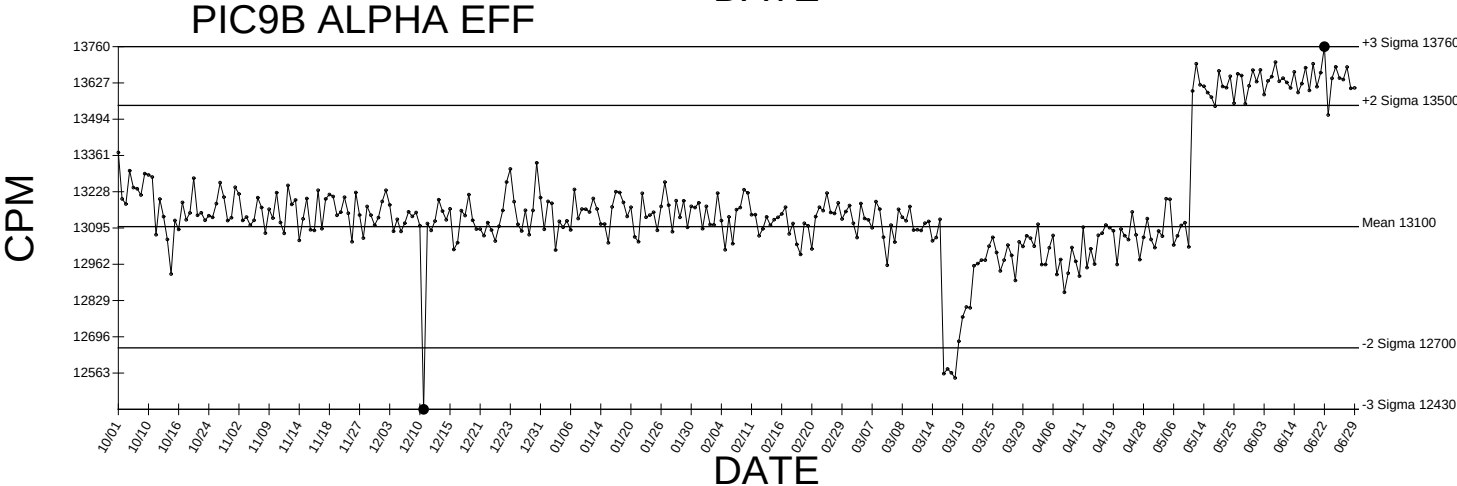
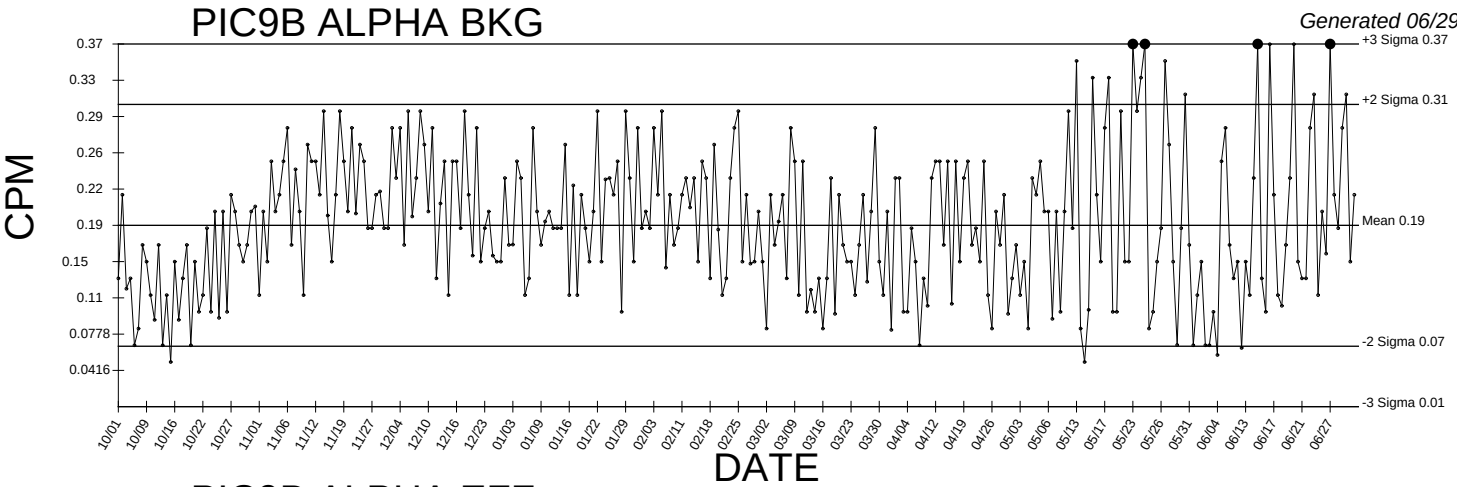
Generated 06/29/2016
+3 Sigma 44960



PIC8D BETA EFF Cross Talk



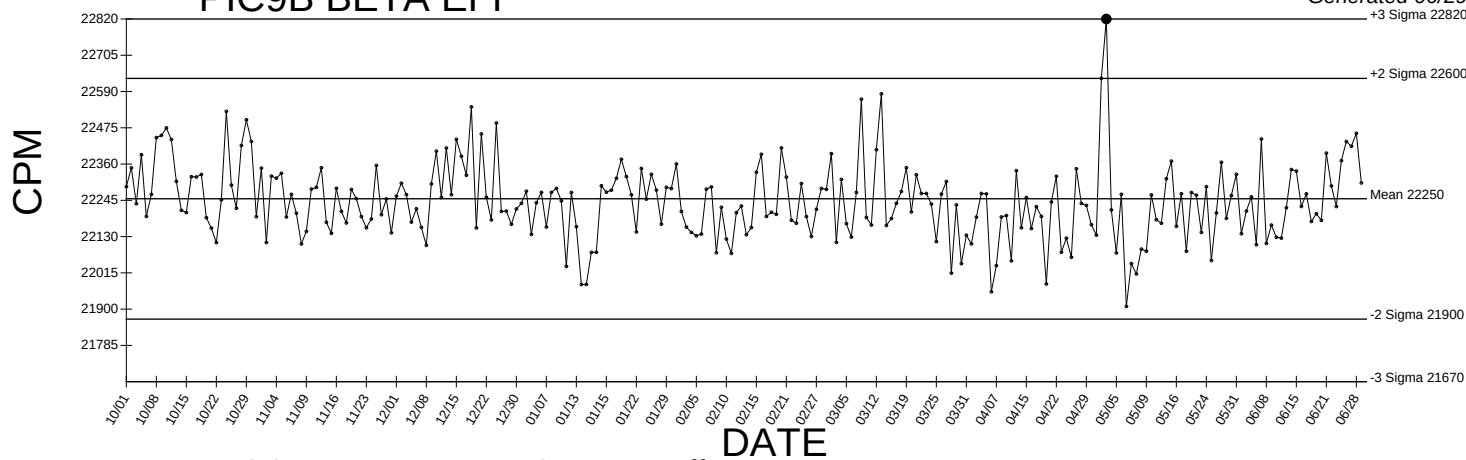
● Denotes Outlier



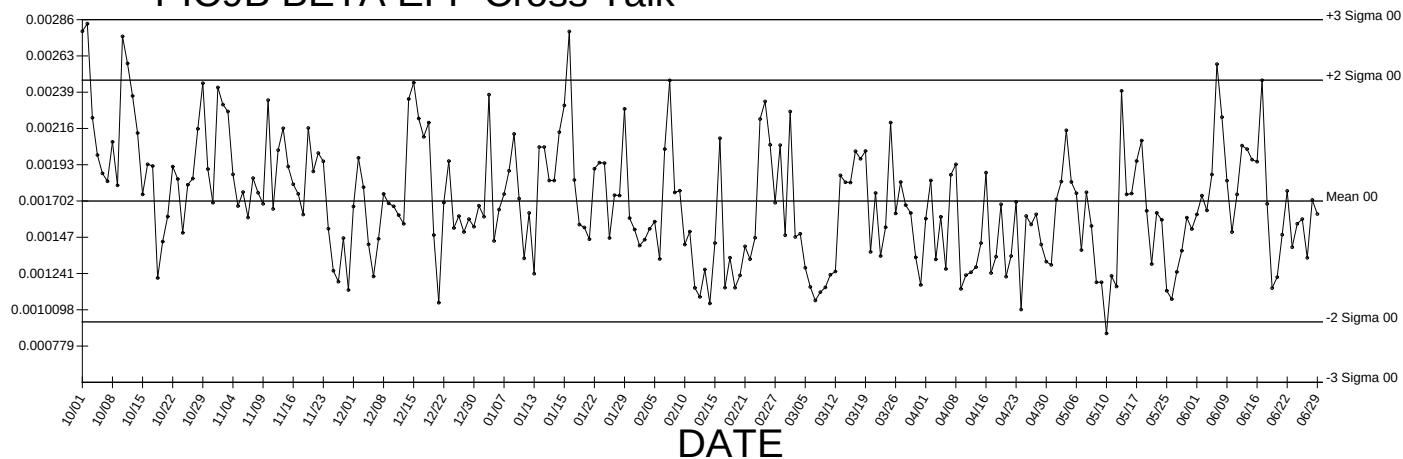
● Denotes Outlier

PIC9B BETA EFF

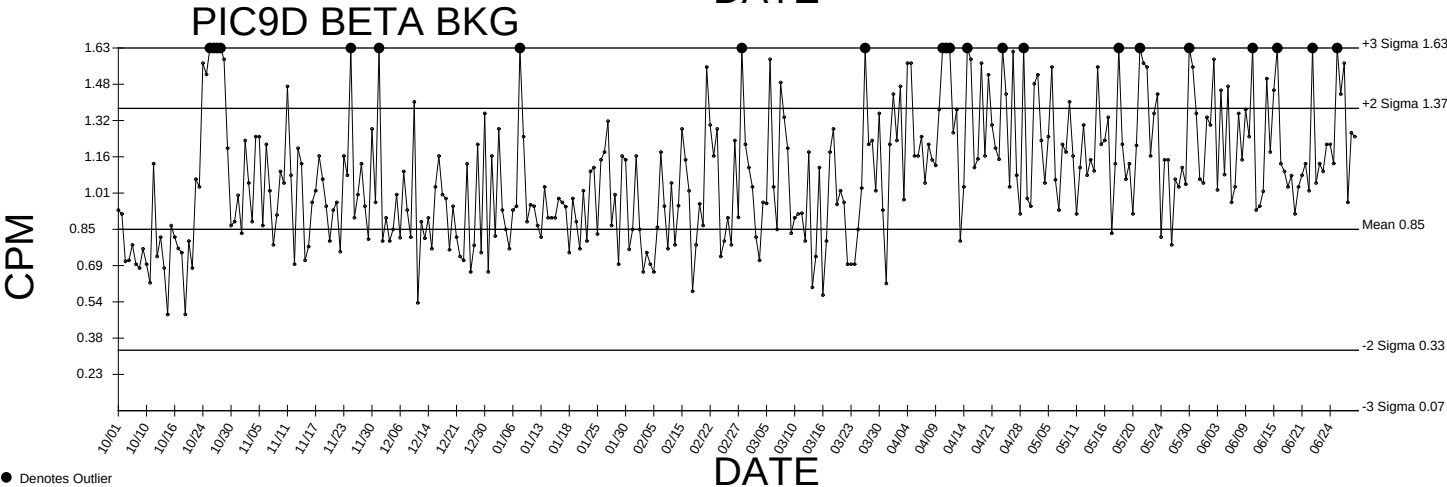
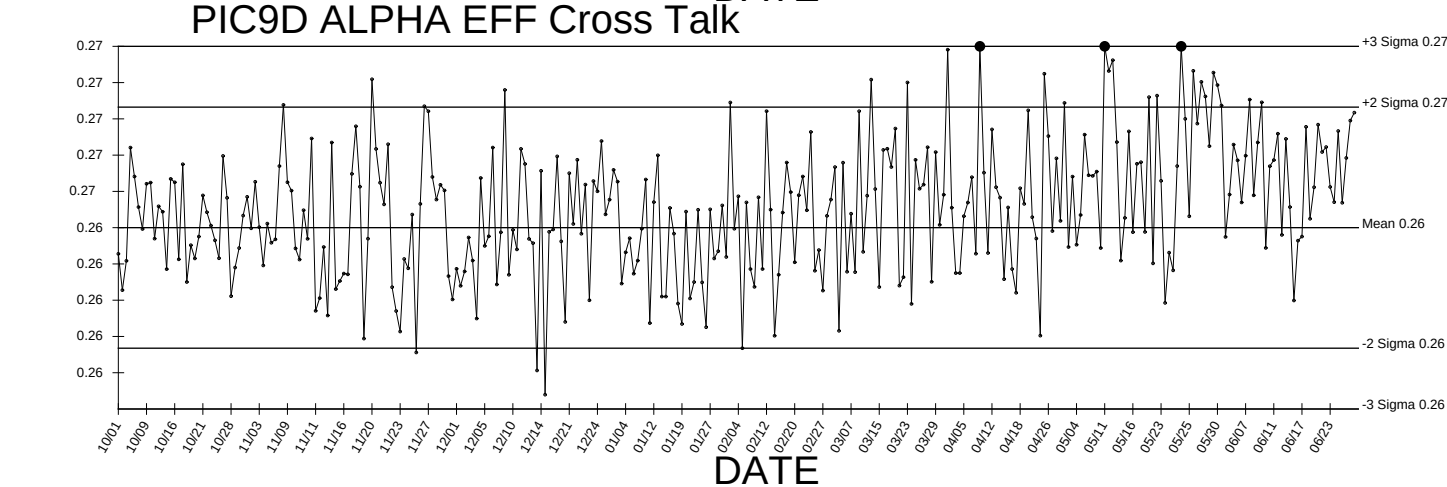
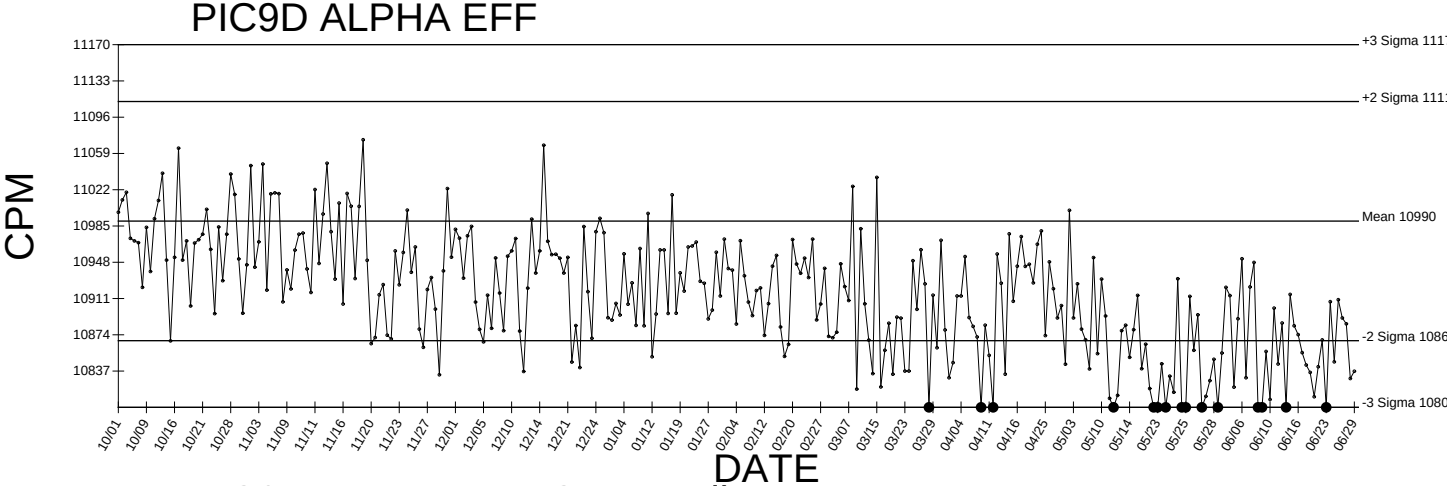
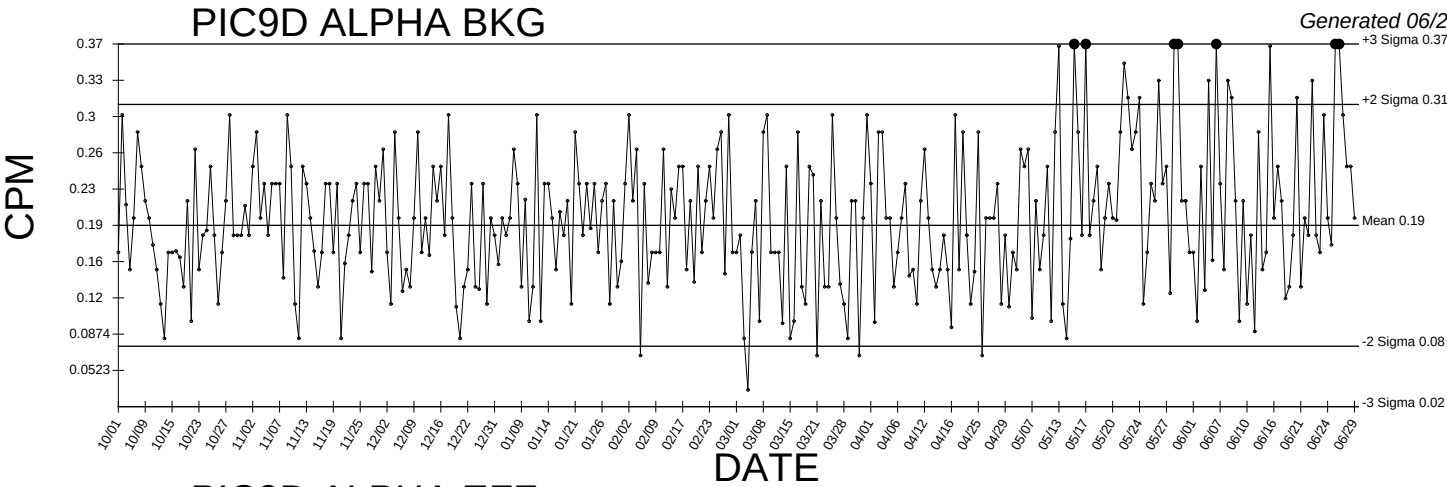
Generated 06/29/2016



PIC9B BETA EFF Cross Talk



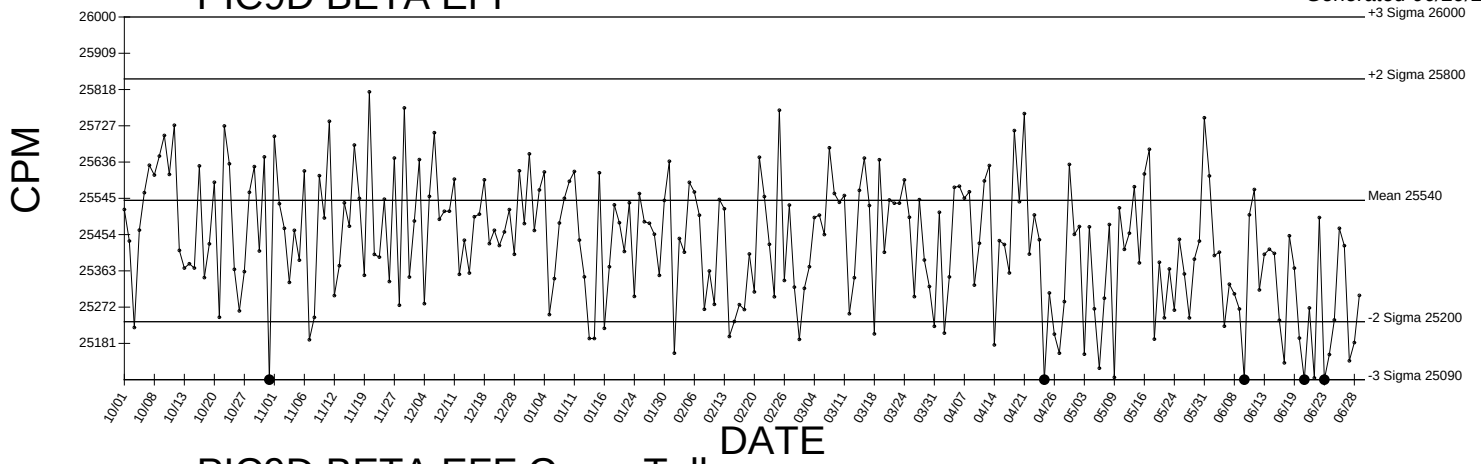
● Denotes Outlier



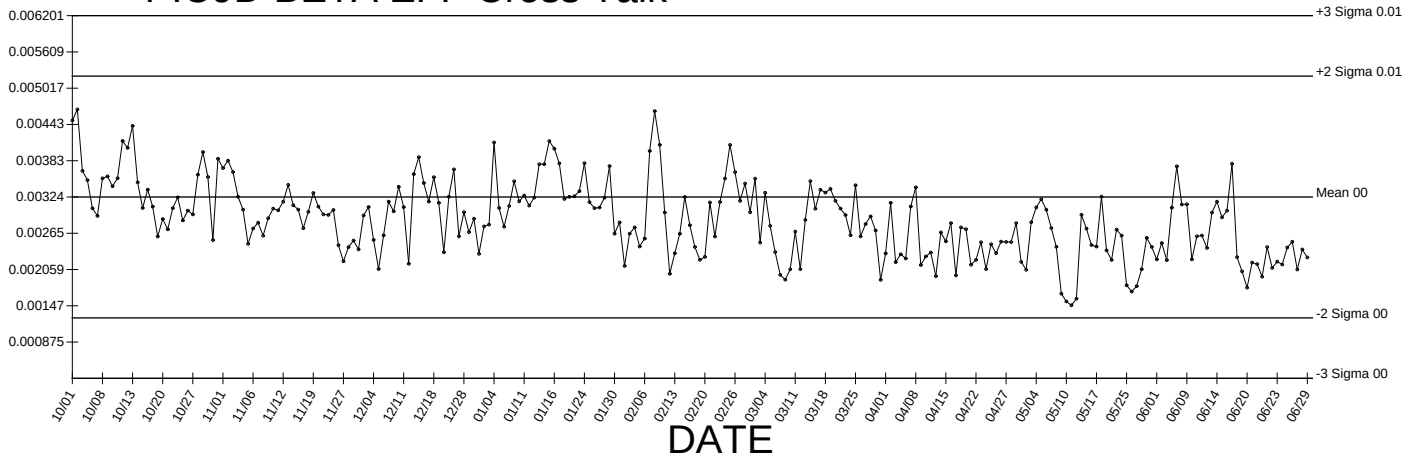
● Denotes Outlier

PIC9D BETA EFF

Generated 06/29/2016



PIC9D BETA EFF Cross Talk



● Denotes Outlier

Quality Control Charts

Data used for Gas Flow Liquids 30-JUN-2016

Strontium-90 BLANK: Limits LCL = -10 UCL = 11.1

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1570870	1203557832	01-JUN-2016 17:03	DONE	-0.16	-0.18	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1569292	1203553848	02-JUN-2016 16:36	DONE	0.43	-0.01	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1570929	1203557994	02-JUN-2016 17:15	DONE	21.3	5.9	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1569288	1203553841	02-JUN-2016 18:26	DONE	-0.719	-0.34	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571721	1203560137	03-JUN-2016 14:35	DONE	0.24	-0.06	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1569297	1203553855	03-JUN-2016 15:42	DONE	0.08	-0.11	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1570881	1203557871	07-JUN-2016 07:47	DONE	-0.037	-0.14	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572497	1203562021	07-JUN-2016 11:17	DONE	0.49	0.01	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572328	1203561595	07-JUN-2016 11:22	DONE	-1.5	-0.57	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1570960	1203558096	07-JUN-2016 13:18	DONE	-0.446	-0.26	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1567176	1203548452	07-JUN-2016 14:00	DONE	00	-0.13	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572622	1203562319	08-JUN-2016 13:21	DONE	0.01	-0.13	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1570950	1203558076	08-JUN-2016 14:58	DONE	2.27	0.51	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572897	1203563136	09-JUN-2016 14:20	DONE	3	0.72	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572625	1203562329	10-JUN-2016 13:27	DONE	-2.4	-0.81	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571080	1203558488	10-JUN-2016 13:34	DONE	0.18	-0.08	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571067	1203558451	11-JUN-2016 14:11	DONE	-0.027	-0.14	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571070	1203558460	11-JUN-2016 15:15	DONE	-0.287	-0.21	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571118	1203558593	11-JUN-2016 16:11	DONE	0.01	-0.13	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571041	1203558363	13-JUN-2016 09:51	DONE	0.45	-0.01	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571114	1203558577	14-JUN-2016 11:09	DONE	-0.259	-0.21	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572647	1203562458	14-JUN-2016 12:24	DONE	0.84	0.1	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571124	1203558615	14-JUN-2016 12:37	DONE	-0.103	-0.16	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1571122	1203558604	15-JUN-2016 10:20	DONE	0.29	-0.05	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572903	1203563160	15-JUN-2016 10:28	DONE	-0.367	-0.24	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1573325	1203564324	16-JUN-2016 15:19	DONE	0.34	-0.04	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572726	1203562651	16-JUN-2016 16:45	DONE	-0.244	-0.2	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572720	1203562624	16-JUN-2016 17:19	DONE	-0.738	-0.34	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572722	1203562632	20-JUN-2016 14:11	DONE	0.17	-0.08	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1572744	1203562716	20-JUN-2016 14:37	DONE	0.12	-0.1	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1574012	1203566009	20-JUN-2016 15:30	DONE	-0.37	-0.24	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1574031	1203566076	21-JUN-2016 13:07	DONE	-0.747	-0.34	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1574029	1203566072	21-JUN-2016 13:34	DONE	-1.4	-0.54	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1574034	1203566080	22-JUN-2016 15:39	DONE	-0.187	-0.19	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1574028	1203566068	22-JUN-2016 15:52	DONE	-0.252	-0.2	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1574054	1203566155	22-JUN-2016 16:30	DONE	-1.3	-0.51	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1574027	1203566064	22-JUN-2016 17:06	DONE	-0.105	-0.16	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1575811	1203570700	23-JUN-2016 11:51	DONE	-0.262	-0.21	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53
1575817	1203570734	24-JUN-2016 12:27	DONE	0.17	-0.09	pCi/L	0.47	-10	-6.6	7.53	11.1	3.53

Strontium-90 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1569259	1203553758	30-MAY-2016 12:00	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1568294	1203551289	30-MAY-2016 12:29	DONE	39.8	3.5	percent	3.95	0	-16	24.3	20.0	10.2
1568299	1203551305	31-MAY-2016 14:53	DONE	3.4	-0.05	percent	3.95	0	-16	24.3	20.0	10.2
1568299	1203551306	31-MAY-2016 17:13	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1570397	1203556591	01-JUN-2016 17:18	DONE	42.6	3.8	percent	3.95	0	-16	24.3	20.0	10.2
1569292	1203553849	02-JUN-2016 13:15	DONE	15.8	1.2	percent	3.95	0	-16	24.3	20.0	10.2
1570929	1203557995	02-JUN-2016 17:20	DONE	7.48	0.35	percent	3.95	0	-16	24.3	20.0	10.2
1569288	1203553842	02-JUN-2016 18:31	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571721	1203560138	03-JUN-2016 14:35	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1569297	1203553856	03-JUN-2016 15:47	DONE	26.2	2.2	percent	3.95	0	-16	24.3	20.0	10.2
1572497	1203562022	07-JUN-2016 11:17	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1570881	1203557872	07-JUN-2016 11:23	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1570960	1203558097	07-JUN-2016 13:18	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1567176	1203548453	07-JUN-2016 14:05	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1572622	1203562320	08-JUN-2016 13:22	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1570950	1203558077	08-JUN-2016 14:58	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1572897	1203563137	09-JUN-2016 17:08	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571080	1203558489	10-JUN-2016 13:34	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571067	1203558453	11-JUN-2016 14:13	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571070	1203558462	11-JUN-2016 15:15	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571118	1203558594	11-JUN-2016 16:11	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571041	1203558364	13-JUN-2016 09:56	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1572625	1203562330	13-JUN-2016 16:50	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571114	1203558578	14-JUN-2016 11:09	DONE	3.33	-0.06	percent	3.95	0	-16	24.3	20.0	10.2
1572647	1203562459	14-JUN-2016 12:24	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571124	1203558616	14-JUN-2016 12:37	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1571122	1203558605	15-JUN-2016 10:20	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1572720	1203562625	16-JUN-2016 17:17	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1572903	1203563161	20-JUN-2016 10:31	DONE	1.96	-0.2	percent	3.95	0	-16	24.3	20.0	10.2
1572722	1203562633	20-JUN-2016 14:08	DONE	2.8	-0.11	percent	3.95	0	-16	24.3	20.0	10.2
1572744	1203562717	20-JUN-2016 14:37	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1574031	1203566077	21-JUN-2016 13:07	DONE	10.9	0.68	percent	3.95	0	-16	24.3	20.0	10.2
1574012	1203566010	21-JUN-2016 15:01	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1574029	1203566073	21-JUN-2016 16:34	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1574054	1203566156	22-JUN-2016 14:32	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1574034	1203566081	22-JUN-2016 15:39	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1574028	1203566069	22-JUN-2016 15:49	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1574027	1203566065	22-JUN-2016 17:05	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2
1575817	1203570735	24-JUN-2016 16:21	DONE	0	-0.39	percent	3.95	0	-16	24.3	20.0	10.2

Strontium-90 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571721	1203560140	03-JUN-2016 14:35	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
1569297	1203553860	03-JUN-2016 15:42	DONE	99.7	-0.04	percent	100	75.0	83.3	117	125	8.33
1570881	1203557874	03-JUN-2016 18:15	DONE	95.5	-0.54	percent	100	75.0	83.3	117	125	8.33
1572497	1203562024	07-JUN-2016 11:17	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1572328	1203561597	07-JUN-2016 11:20	DONE	99.5	-0.06	percent	100	75.0	83.3	117	125	8.33
1572328	1203561596	07-JUN-2016 11:22	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1570960	1203558098	07-JUN-2016 13:18	DONE	97.4	-0.31	percent	100	75.0	83.3	117	125	8.33
1567176	1203548455	07-JUN-2016 14:00	DONE	95.4	-0.56	percent	100	75.0	83.3	117	125	8.33
1572622	1203562321	08-JUN-2016 13:22	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
1570950	1203558078	08-JUN-2016 16:21	DONE	106	0.69	percent	100	75.0	83.3	117	125	8.33
1572897	1203563138	09-JUN-2016 14:20	DONE	119	2.3	percent	100	75.0	83.3	117	125	8.33
1572625	1203562331	10-JUN-2016 13:27	DONE	114	1.6	percent	100	75.0	83.3	117	125	8.33
1571080	1203558490	10-JUN-2016 13:34	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1571067	1203558452	11-JUN-2016 14:13	DONE	107	0.85	percent	100	75.0	83.3	117	125	8.33
1571070	1203558461	11-JUN-2016 15:15	DONE	94.6	-0.65	percent	100	75.0	83.3	117	125	8.33
1571118	1203558596	11-JUN-2016 15:24	DONE	99.8	-0.02	percent	100	75.0	83.3	117	125	8.33
1571041	1203558366	13-JUN-2016 09:56	DONE	112	1.5	percent	100	75.0	83.3	117	125	8.33
1571114	1203558580	14-JUN-2016 11:10	DONE	106	0.69	percent	100	75.0	83.3	117	125	8.33
1572647	1203562460	14-JUN-2016 12:26	DONE	105	0.6	percent	100	75.0	83.3	117	125	8.33
1571124	1203558618	14-JUN-2016 12:37	DONE	102	0.25	percent	100	75.0	83.3	117	125	8.33
1571122	1203558607	15-JUN-2016 10:20	DONE	94.4	-0.67	percent	100	75.0	83.3	117	125	8.33
1572903	1203563162	15-JUN-2016 10:29	DONE	103	0.34	percent	100	75.0	83.3	117	125	8.33
1573325	1203564325	16-JUN-2016 15:19	DONE	97.2	-0.34	percent	100	75.0	83.3	117	125	8.33
1573325	1203564326	16-JUN-2016 15:19	DONE	91.7	-01	percent	100	75.0	83.3	117	125	8.33
1572726	1203562652	16-JUN-2016 16:41	DONE	99.6	-0.04	percent	100	75.0	83.3	117	125	8.33
1572726	1203562653	16-JUN-2016 16:45	DONE	95.9	-0.49	percent	100	75.0	83.3	117	125	8.33
1572720	1203562626	16-JUN-2016 17:19	DONE	102	0.27	percent	100	75.0	83.3	117	125	8.33
1572722	1203562634	20-JUN-2016 14:11	DONE	99.7	-0.04	percent	100	75.0	83.3	117	125	8.33
1572744	1203562719	20-JUN-2016 14:37	DONE	82.3	-2	percent	100	75.0	83.3	117	125	8.33
1574012	1203566013	20-JUN-2016 15:25	DONE	97.8	-0.27	percent	100	75.0	83.3	117	125	8.33
1574031	1203566079	21-JUN-2016 13:07	DONE	101	0.1	percent	100	75.0	83.3	117	125	8.33
1574029	1203566075	21-JUN-2016 13:39	DONE	105	0.58	percent	100	75.0	83.3	117	125	8.33
1574034	1203566083	22-JUN-2016 15:40	DONE	122	2.6	percent	100	75.0	83.3	117	125	8.33
1574028	1203566071	22-JUN-2016 15:49	DONE	117	2.1	percent	100	75.0	83.3	117	125	8.33
1574027	1203566067	22-JUN-2016 17:05	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
1575811	1203570701	23-JUN-2016 11:51	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
1575811	1203570702	23-JUN-2016 11:51	DONE	104	0.49	percent	100	75.0	83.3	117	125	8.33
1574054	1203566157	24-JUN-2016 10:55	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
1575817	1203570738	24-JUN-2016 12:27	DONE	114	1.6	percent	100	75.0	83.3	117	125	8.33

Strontium-90 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1551516	1203506368	21-MAR-2016 17:03	DONE	10.9	-0.12	percent	13.2	0	-26	51.9	20.0	19.4
1553049	1203510425	04-APR-2016 17:30	DONE	3.47	-0.5	percent	13.2	0	-26	51.9	20.0	19.4
1554930	1203515329	05-APR-2016 14:46	DONE	1.24	-0.62	percent	13.2	0	-26	51.9	20.0	19.4
1562324	1203535102	07-MAY-2016 15:22	DONE	17.1	0.2	percent	13.2	0	-26	51.9	20.0	19.4
1566482	1203546445	12-MAY-2016 09:23	DONE	14.1	0.05	percent	13.2	0	-26	51.9	20.0	19.4
1569098	1203553349	23-MAY-2016 17:44	DONE	12.8	-0.02	percent	13.2	0	-26	51.9	20.0	19.4
1568282	1203551248	28-MAY-2016 14:11	DONE	1.11	-0.62	percent	13.2	0	-26	51.9	20.0	19.4
1570870	1203557834	01-JUN-2016 17:03	DONE	72.2	3	percent	13.2	0	-26	51.9	20.0	19.4
1572328	1203561597	07-JUN-2016 11:20	DONE	12.4	-0.04	percent	13.2	0	-26	51.9	20.0	19.4
1573325	1203564326	16-JUN-2016 15:19	DONE	5.77	-0.38	percent	13.2	0	-26	51.9	20.0	19.4
1572726	1203562653	16-JUN-2016 16:45	DONE	3.82	-0.48	percent	13.2	0	-26	51.9	20.0	19.4
1575811	1203570702	23-JUN-2016 11:51	DONE	3.41	-0.51	percent	13.2	0	-26	51.9	20.0	19.4

Strontium-90 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1563858	1203539336	11-MAY-2016 10:41	DONE	1.01	-0.12	dec	1.12	0	-0.62	2.86	3.00	0.87
1565806	1203544681	16-MAY-2016 12:50	DONE	1.26	0.16	dec	1.12	0	-0.62	2.86	3.00	0.87
1565853	1203544837	17-MAY-2016 15:18	DONE	0.57	-0.63	dec	1.12	0	-0.62	2.86	3.00	0.87
1565856	1203544841	17-MAY-2016 18:21	DONE	2.55	1.6	dec	1.12	0	-0.62	2.86	3.00	0.87
1567171	1203548441	19-MAY-2016 15:33	DONE	1.21	0.1	dec	1.12	0	-0.62	2.86	3.00	0.87
1567171	1203548442	19-MAY-2016 15:33	DONE	0.38	-0.85	dec	1.12	0	-0.62	2.86	3.00	0.87
1567552	1203549437	23-MAY-2016 14:08	DONE	1.31	0.22	dec	1.12	0	-0.62	2.86	3.00	0.87
1567552	1203553406	23-MAY-2016 14:08	DONE	0.57	-0.64	dec	1.12	0	-0.62	2.86	3.00	0.87
1567152	1203548377	24-MAY-2016 06:58	DONE	2	1	dec	1.12	0	-0.62	2.86	3.00	0.87
1568235	1203551092	26-MAY-2016 13:32	DONE	1.95	0.95	dec	1.12	0	-0.62	2.86	3.00	0.87
1568294	1203551289	30-MAY-2016 12:29	DONE	2.2	1.2	dec	1.12	0	-0.62	2.86	3.00	0.87
1568299	1203551305	31-MAY-2016 14:53	DONE	0.29	-0.96	dec	1.12	0	-0.62	2.86	3.00	0.87
1568299	1203551306	31-MAY-2016 17:13	DONE	1.88	0.87	dec	1.12	0	-0.62	2.86	3.00	0.87
1570397	1203556591	01-JUN-2016 17:18	DONE	2.68	1.8	dec	1.12	0	-0.62	2.86	3.00	0.87
1569292	1203553849	02-JUN-2016 13:15	DONE	1.32	0.23	dec	1.12	0	-0.62	2.86	3.00	0.87
1570929	1203557995	02-JUN-2016 17:20	DONE	0.66	-0.53	dec	1.12	0	-0.62	2.86	3.00	0.87
1569288	1203553842	02-JUN-2016 18:31	DONE	0.02	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1571721	1203560138	03-JUN-2016 14:35	DONE	0.1	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1569297	1203553856	03-JUN-2016 15:47	DONE	1.39	0.31	dec	1.12	0	-0.62	2.86	3.00	0.87
1572497	1203562022	07-JUN-2016 11:17	DONE	1.59	0.54	dec	1.12	0	-0.62	2.86	3.00	0.87
1570881	1203557872	07-JUN-2016 11:23	DONE	0.61	-0.59	dec	1.12	0	-0.62	2.86	3.00	0.87
1570960	1203558097	07-JUN-2016 13:18	DONE	1.89	0.88	dec	1.12	0	-0.62	2.86	3.00	0.87
1567176	1203548453	07-JUN-2016 14:05	DONE	0.12	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1571067	1203558453	11-JUN-2016 14:13	DONE	2.08	1.1	dec	1.12	0	-0.62	2.86	3.00	0.87
1571070	1203558462	11-JUN-2016 15:15	DONE	1.18	0.07	dec	1.12	0	-0.62	2.86	3.00	0.87
1571118	1203558594	11-JUN-2016 16:11	DONE	0.34	-0.9	dec	1.12	0	-0.62	2.86	3.00	0.87

1571041	1203558364	13-JUN-2016 09:56	DONE	3.35	2.6	dec	1.12	0	-0.62	2.86	3.00	0.87
1571114	1203558578	14-JUN-2016 11:09	DONE	0.14	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1572647	1203562459	14-JUN-2016 12:24	DONE	0.98	-0.16	dec	1.12	0	-0.62	2.86	3.00	0.87
1571124	1203558616	14-JUN-2016 12:37	DONE	0.21	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1571122	1203558605	15-JUN-2016 10:20	DONE	0.14	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1572720	1203562625	16-JUN-2016 17:17	DONE	1.04	-0.09	dec	1.12	0	-0.62	2.86	3.00	0.87
1572722	1203562633	20-JUN-2016 14:08	DONE	0.24	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1572744	1203562717	20-JUN-2016 14:37	DONE	0.16	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1574031	1203566077	21-JUN-2016 13:07	DONE	0.77	-0.4	dec	1.12	0	-0.62	2.86	3.00	0.87
1574029	1203566073	21-JUN-2016 16:34	DONE	0.83	-0.33	dec	1.12	0	-0.62	2.86	3.00	0.87
1574054	1203566156	22-JUN-2016 14:32	DONE	2.35	1.4	dec	1.12	0	-0.62	2.86	3.00	0.87
1574028	1203566069	22-JUN-2016 15:49	DONE	0.22	-1	dec	1.12	0	-0.62	2.86	3.00	0.87
1574027	1203566065	22-JUN-2016 17:05	DONE	2.12	1.1	dec	1.12	0	-0.62	2.86	3.00	0.87

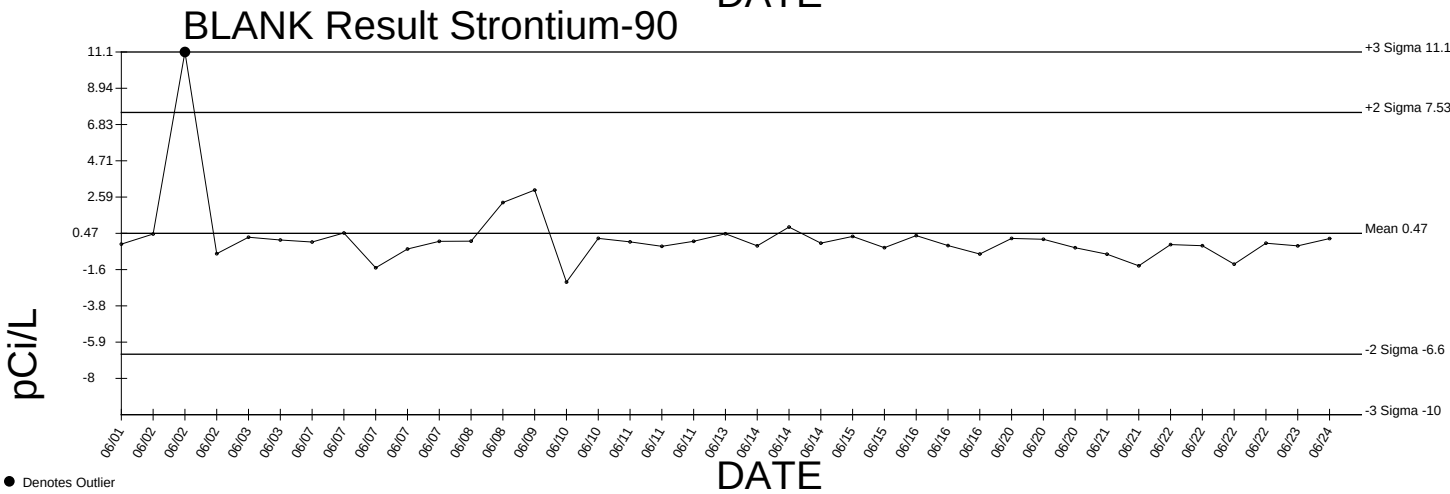
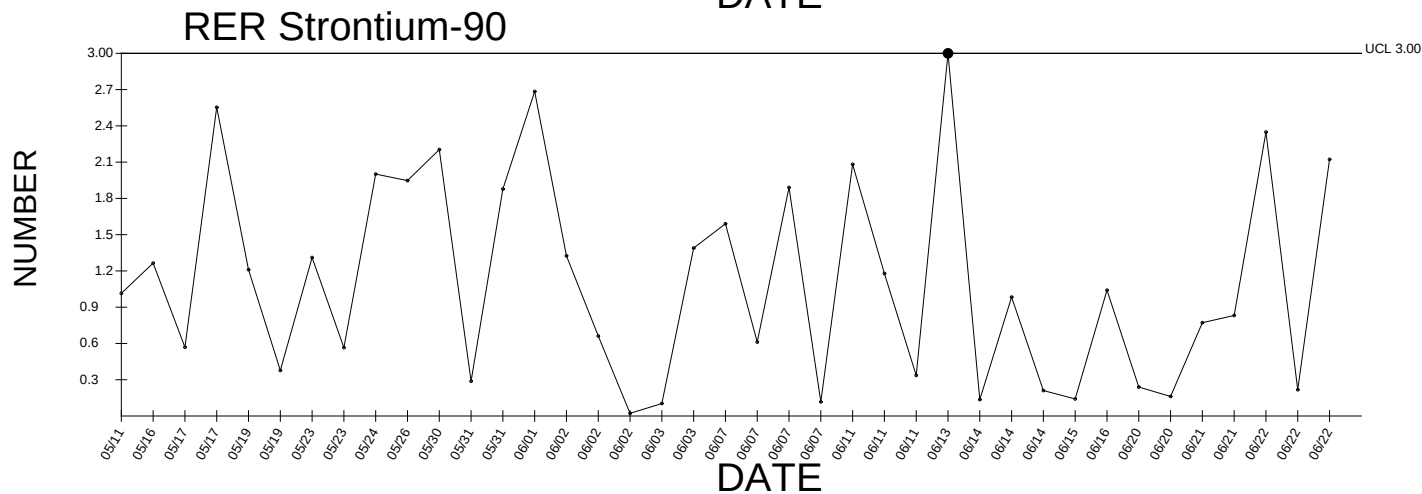
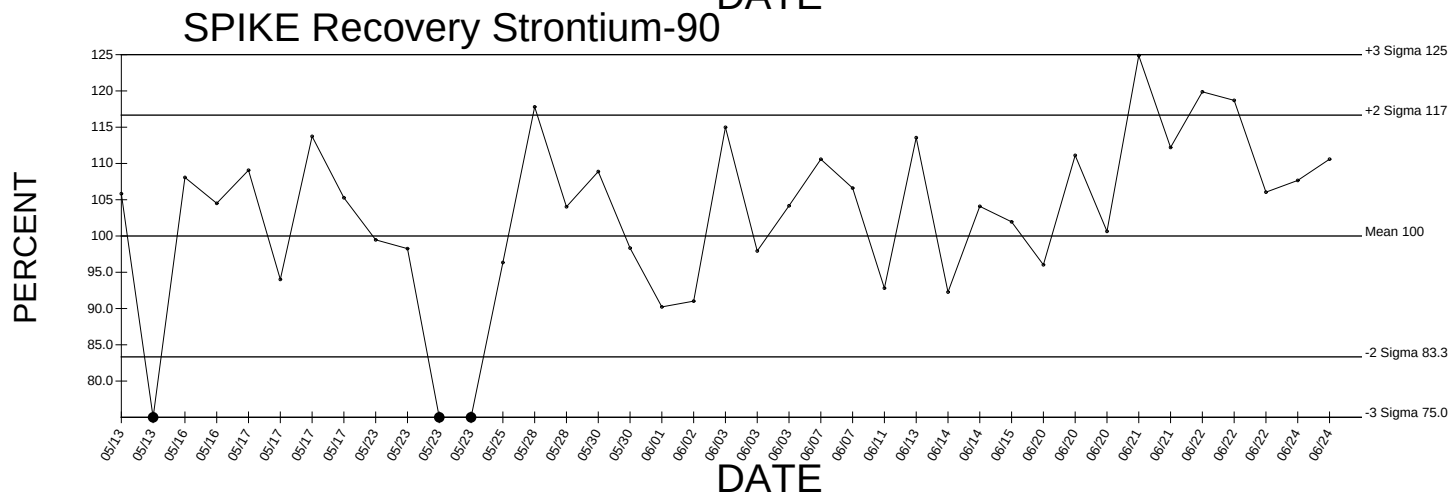
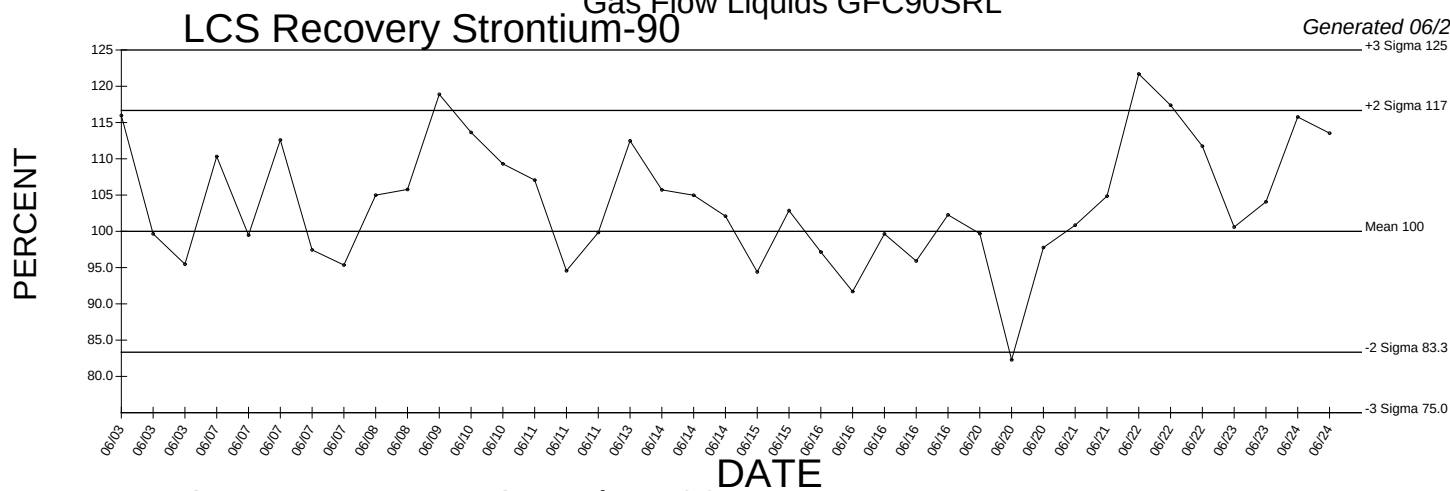
Strontium-90 SPIKE: Limits LCL = 75.0 UCL = 125

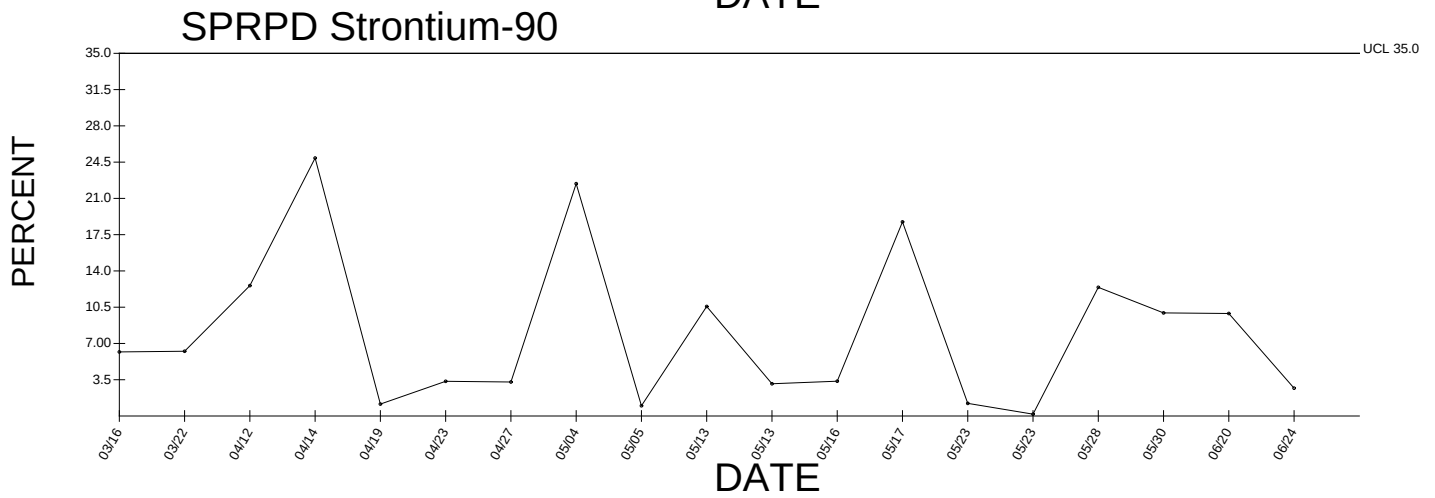
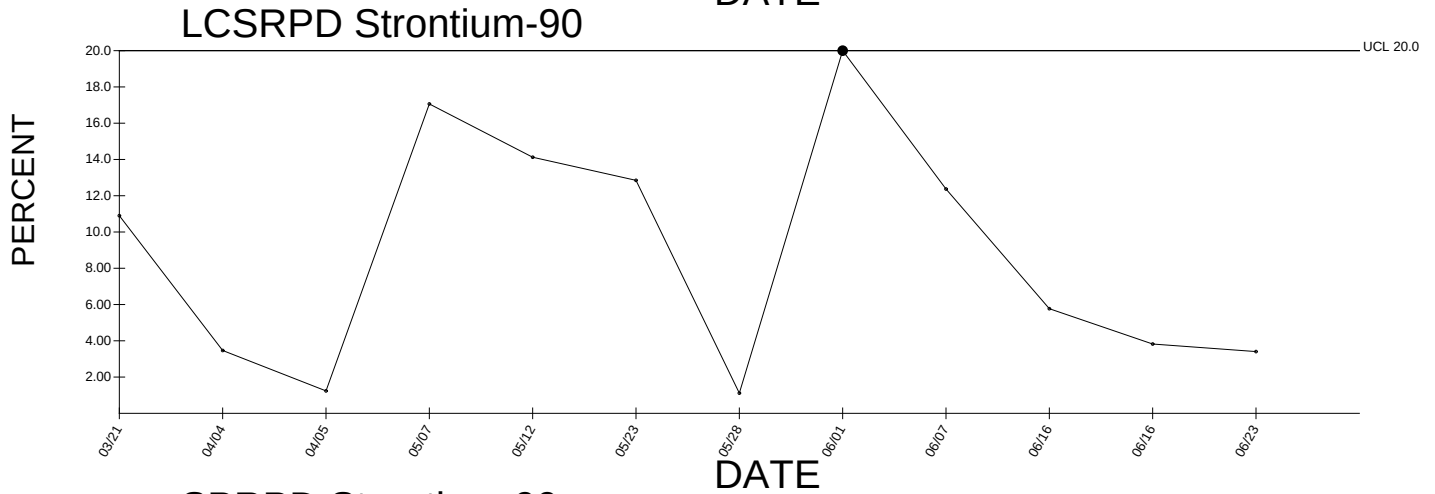
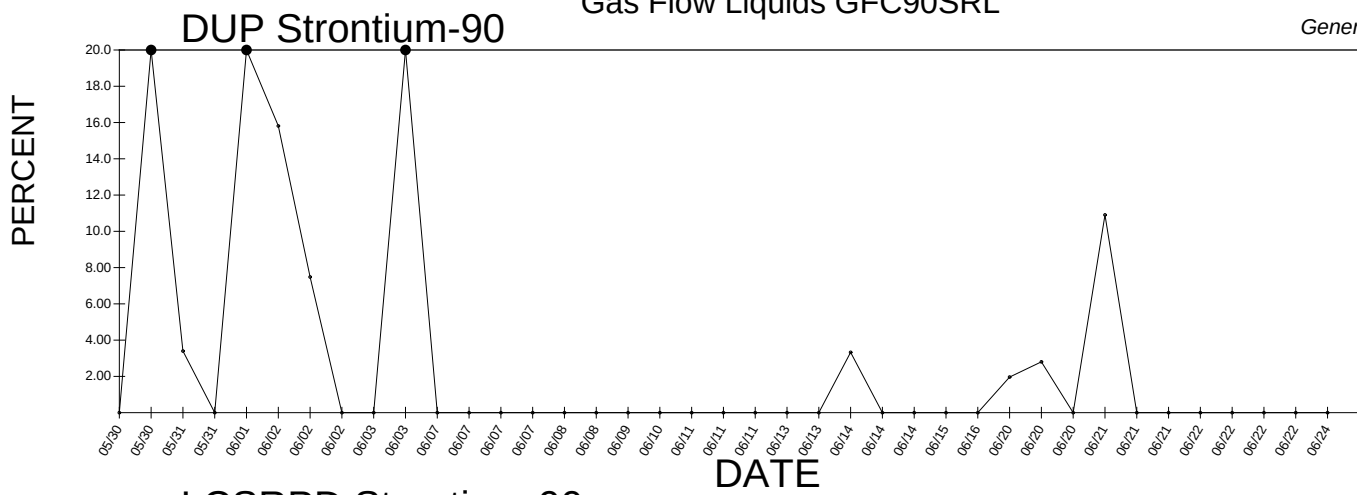
Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1563865	1203539368	13-MAY-2016 14:37	DONE	106	0.7	percent	100	75.0	83.3	117	125	8.33
1563865	1203539369	13-MAY-2016 14:37	DONE	54.9	-5	percent	100	75.0	83.3	117	125	8.33
1565818	1203544724	16-MAY-2016 15:43	DONE	108	0.97	percent	100	75.0	83.3	117	125	8.33
1565818	1203544723	16-MAY-2016 15:44	DONE	105	0.54	percent	100	75.0	83.3	117	125	8.33
1565853	1203544838	17-MAY-2016 15:18	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1567142	1203548335	17-MAY-2016 17:44	DONE	94	-0.72	percent	100	75.0	83.3	117	125	8.33
1567142	1203548336	17-MAY-2016 17:44	DONE	114	1.6	percent	100	75.0	83.3	117	125	8.33
1565856	1203544842	17-MAY-2016 18:26	DONE	105	0.63	percent	100	75.0	83.3	117	125	8.33
1567554	1203549445	23-MAY-2016 11:15	DONE	99.5	-0.06	percent	100	75.0	83.3	117	125	8.33
1567554	1203549444	23-MAY-2016 11:16	DONE	98.3	-0.21	percent	100	75.0	83.3	117	125	8.33
1566619	1203546846	23-MAY-2016 17:47	DONE	-760	-100	percent	100	75.0	83.3	117	125	8.33
1566619	1203546847	23-MAY-2016 17:47	DONE	-660	-90	percent	100	75.0	83.3	117	125	8.33
1569714	1203554858	25-MAY-2016 14:24	DONE	96.3	-0.44	percent	100	75.0	83.3	117	125	8.33
1568619	1203552186	28-MAY-2016 15:00	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
1568619	1203552187	28-MAY-2016 15:00	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
1568294	1203551290	30-MAY-2016 12:28	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1568294	1203551291	30-MAY-2016 12:28	DONE	98.3	-0.2	percent	100	75.0	83.3	117	125	8.33
1570397	1203556592	01-JUN-2016 15:36	DONE	90.2	-1	percent	100	75.0	83.3	117	125	8.33
1569288	1203553843	02-JUN-2016 18:24	DONE	91	-1	percent	100	75.0	83.3	117	125	8.33
1571721	1203560139	03-JUN-2016 14:35	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
1569297	1203553858	03-JUN-2016 15:42	DONE	97.9	-0.25	percent	100	75.0	83.3	117	125	8.33
1570881	1203557873	03-JUN-2016 18:15	DONE	104	0.5	percent	100	75.0	83.3	117	125	8.33
1572497	1203562023	07-JUN-2016 11:17	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1567176	1203548454	07-JUN-2016 14:00	DONE	107	0.79	percent	100	75.0	83.3	117	125	8.33
1571118	1203558595	11-JUN-2016 15:20	DONE	92.8	-0.86	percent	100	75.0	83.3	117	125	8.33
1571041	1203558365	13-JUN-2016 09:56	DONE	114	1.6	percent	100	75.0	83.3	117	125	8.33
1571114	1203558579	14-JUN-2016 11:10	DONE	92.3	-0.93	percent	100	75.0	83.3	117	125	8.33

1571124	1203558617	14-JUN-2016 12:37	DONE	104	0.49	percent	100	75.0	83.3	117	125	8.33
1571122	1203558606	15-JUN-2016 10:15	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
1572744	1203562718	20-JUN-2016 14:37	DONE	96	-0.48	percent	100	75.0	83.3	117	125	8.33
1574012	1203566011	20-JUN-2016 15:18	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1574012	1203566012	20-JUN-2016 15:27	DONE	101	0.08	percent	100	75.0	83.3	117	125	8.33
1574031	1203566078	21-JUN-2016 13:07	DONE	125	3	percent	100	75.0	83.3	117	125	8.33
1574029	1203566074	21-JUN-2016 16:34	DONE	112	1.5	percent	100	75.0	83.3	117	125	8.33
1574034	1203566082	22-JUN-2016 15:40	DONE	120	2.4	percent	100	75.0	83.3	117	125	8.33
1574028	1203566070	22-JUN-2016 15:49	DONE	119	2.2	percent	100	75.0	83.3	117	125	8.33
1574027	1203566066	22-JUN-2016 17:05	DONE	106	0.73	percent	100	75.0	83.3	117	125	8.33
1575817	1203570736	24-JUN-2016 12:27	DONE	108	0.92	percent	100	75.0	83.3	117	125	8.33
1575817	1203570737	24-JUN-2016 12:27	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33

Strontium-90 SPRPD: Limits LCL = 0 UCL = 35.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1550414	1203503620	16-MAR-2016 10:20	DONE	6.18	-0.25	percent	8.06	0	-6.8	22.9	35.0	7.42
1552839	1203509815	22-MAR-2016 13:37	DONE	6.25	-0.24	percent	8.06	0	-6.8	22.9	35.0	7.42
1556883	1203520417	12-APR-2016 09:14	DONE	12.6	0.61	percent	8.06	0	-6.8	22.9	35.0	7.42
1556950	1203520658	14-APR-2016 15:27	DONE	24.9	2.3	percent	8.06	0	-6.8	22.9	35.0	7.42
1558655	1203525089	19-APR-2016 07:53	DONE	1.15	-0.93	percent	8.06	0	-6.8	22.9	35.0	7.42
1560433	1203530021	23-APR-2016 14:44	DONE	3.35	-0.64	percent	8.06	0	-6.8	22.9	35.0	7.42
1561508	1203532962	27-APR-2016 17:18	DONE	3.28	-0.64	percent	8.06	0	-6.8	22.9	35.0	7.42
1562276	1203534935	04-MAY-2016 14:46	DONE	22.4	1.9	percent	8.06	0	-6.8	22.9	35.0	7.42
1563854	1203539319	05-MAY-2016 06:47	DONE	0.99	-0.95	percent	8.06	0	-6.8	22.9	35.0	7.42
1563865	1203539368	13-MAY-2016 14:37	DONE	10.6	0.34	percent	8.06	0	-6.8	22.9	35.0	7.42
1563865	1203539369	13-MAY-2016 14:37	DONE	3.11	-0.67	percent	8.06	0	-6.8	22.9	35.0	7.42
1565818	1203544724	16-MAY-2016 15:43	DONE	3.36	-0.63	percent	8.06	0	-6.8	22.9	35.0	7.42
1567142	1203548336	17-MAY-2016 17:44	DONE	18.7	1.4	percent	8.06	0	-6.8	22.9	35.0	7.42
1567554	1203549445	23-MAY-2016 11:15	DONE	1.22	-0.92	percent	8.06	0	-6.8	22.9	35.0	7.42
1566619	1203546847	23-MAY-2016 17:47	DONE	0.18	-1	percent	8.06	0	-6.8	22.9	35.0	7.42
1568619	1203552187	28-MAY-2016 15:00	DONE	12.4	0.59	percent	8.06	0	-6.8	22.9	35.0	7.42
1568294	1203551291	30-MAY-2016 12:28	DONE	9.95	0.25	percent	8.06	0	-6.8	22.9	35.0	7.42
1574012	1203566012	20-JUN-2016 15:27	DONE	9.89	0.25	percent	8.06	0	-6.8	22.9	35.0	7.42
1575817	1203570737	24-JUN-2016 12:27	DONE	2.68	-0.73	percent	8.06	0	-6.8	22.9	35.0	7.42





● Denotes Outlier

Data used for Gas Flow Solids 30-JUN-2016

Strontium-90 BLANK: Limits LCL = -20 UCL = 18.5

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1561011	1203531592	21-APR-2016 19:03	DONE	0.29	0.15	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1561012	1203531596	21-APR-2016 19:14	DONE	-0.065	0.1	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1561018	1203531620	22-APR-2016 14:05	DONE	0.16	0.13	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1555383	1203516505	25-APR-2016 18:53	DONE	0.01	0.11	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1560440	1203530041	27-APR-2016 07:13	DONE	-1.2	-0.07	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1562483	1203535554	27-APR-2016 07:42	DONE	-0.119	0.09	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1562714	1203536194	27-APR-2016 17:06	DONE	-0.921	-0.04	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1561490	1203532893	29-APR-2016 14:15	DONE	-0.503	0.03	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1561499	1203532929	29-APR-2016 17:17	DONE	-0.35	0.05	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1561682	1203533340	02-MAY-2016 15:10	DONE	0.2	0.14	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1561671	1203533308	02-MAY-2016 16:11	DONE	-0.055	0.1	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1562290	1203534981	06-MAY-2016 07:22	DONE	0.33	0.16	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1562336	1203535140	09-MAY-2016 15:05	DONE	-0.217	0.07	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1565737	1203544460	10-MAY-2016 16:48	DONE	0.04	0.12	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1562377	1203535283	11-MAY-2016 13:32	DONE	-0.215	0.07	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1566672	1203547017	12-MAY-2016 16:34	DONE	0.62	0.21	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1565397	1203543501	13-MAY-2016 13:10	DONE	1.78	0.39	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1567491	1203549283	19-MAY-2016 13:56	DONE	0.5	0.19	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1563969	1203539657	23-MAY-2016 16:09	DONE	0.09	0.12	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1568232	1203551077	24-MAY-2016 17:29	DONE	-0.056	0.1	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1569603	1203554575	25-MAY-2016 11:14	DONE	0.25	0.15	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1569605	1203554578	25-MAY-2016 12:52	DONE	-2	-0.21	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1568289	1203551271	28-MAY-2016 16:00	DONE	-0.001	0.11	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1570185	1203556047	01-JUN-2016 14:45	DONE	1.2	0.3	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1570509	1203556920	01-JUN-2016 14:49	DONE	11.9	2	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1570978	1203558138	06-JUN-2016 17:18	DONE	0.45	0.18	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1568342	1203551425	06-JUN-2016 17:29	DONE	0.14	0.13	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1568348	1203551441	08-JUN-2016 13:13	DONE	-0.025	0.1	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1570976	1203558132	09-JUN-2016 11:35	DONE	0.23	0.14	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1573314	1203564286	16-JUN-2016 15:25	DONE	-0.194	0.08	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1574019	1203566028	20-JUN-2016 13:32	DONE	-0.943	-0.04	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1574103	1203566313	24-JUN-2016 10:52	DONE	-0.038	0.1	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1574082	1203566250	24-JUN-2016 11:08	DONE	-0.354	0.05	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1574105	1203566316	24-JUN-2016 13:30	DONE	0.52	0.19	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1577155	1203574226	24-JUN-2016 16:14	DONE	-38	-6	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1575872	1203570890	27-JUN-2016 17:22	DONE	0.13	0.13	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1575827	1203570747	29-JUN-2016 08:05	DONE	-0.375	0.05	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1575826	1203570739	29-JUN-2016 09:57	DONE	-0.234	0.07	pCi/g	-0.693	-20	-13	12.1	18.5	6.4
1575804	1203570669	29-JUN-2016 13:10	DONE	-0.294	0.06	pCi/g	-0.693	-20	-13	12.1	18.5	6.4

Strontium-90 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1561012	1203531597	21-APR-2016 19:13	DONE	14.5	2.3	percent	1.83	0	-9	12.7	20.0	5.43
1561018	1203531621	22-APR-2016 14:05	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1560440	1203530042	27-APR-2016 07:13	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1562483	1203535555	27-APR-2016 07:44	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1562714	1203536195	27-APR-2016 17:06	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1555383	1203516507	28-APR-2016 15:25	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1555383	1203516508	28-APR-2016 15:25	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1561490	1203532894	29-APR-2016 14:15	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1561499	1203532930	29-APR-2016 17:17	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1561682	1203533341	02-MAY-2016 15:10	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1561671	1203533309	03-MAY-2016 12:16	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1562290	1203534982	06-MAY-2016 07:22	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1562336	1203535141	09-MAY-2016 15:05	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1565737	1203544461	10-MAY-2016 16:48	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1563969	1203539658	11-MAY-2016 16:10	DONE	11.9	1.9	percent	1.83	0	-9	12.7	20.0	5.43
1562377	1203535284	12-MAY-2016 08:48	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1566672	1203547018	12-MAY-2016 16:34	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1565397	1203543502	17-MAY-2016 11:52	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1567491	1203549284	19-MAY-2016 13:57	DONE	8.26	1.2	percent	1.83	0	-9	12.7	20.0	5.43
1569605	1203554579	25-MAY-2016 10:30	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1569603	1203554576	25-MAY-2016 11:14	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1568232	1203551078	25-MAY-2016 12:38	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1568289	1203551272	31-MAY-2016 12:55	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1570185	1203556048	01-JUN-2016 14:48	DONE	27.7	4.8	percent	1.83	0	-9	12.7	20.0	5.43
1570509	1203556922	01-JUN-2016 14:49	DONE	1.33	-0.09	percent	1.83	0	-9	12.7	20.0	5.43
1568342	1203551426	06-JUN-2016 17:29	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1570978	1203558139	07-JUN-2016 16:13	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1568348	1203551442	08-JUN-2016 16:27	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1570976	1203558133	09-JUN-2016 09:13	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1573314	1203564287	16-JUN-2016 15:28	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1574019	1203566029	20-JUN-2016 13:32	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1574103	1203566314	24-JUN-2016 10:52	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1574082	1203566251	24-JUN-2016 11:13	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1574105	1203566317	24-JUN-2016 13:30	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1577155	1203574227	24-JUN-2016 16:14	DONE	7.7	1.1	percent	1.83	0	-9	12.7	20.0	5.43
1575872	1203570891	27-JUN-2016 17:22	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1575827	1203570748	29-JUN-2016 08:05	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1575826	1203570740	29-JUN-2016 09:57	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43
1575804	1203570670	29-JUN-2016 13:10	DONE	0	-0.34	percent	1.83	0	-9	12.7	20.0	5.43

Strontium-90 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1561011	1203531595	21-APR-2016 17:43	DONE	82	-2	percent	100	75.0	83.3	117	125	8.33
1561012	1203531599	21-APR-2016 17:44	DONE	100	00	percent	100	75.0	83.3	117	125	8.33
1561018	1203531623	25-APR-2016 16:10	DONE	122	2.6	percent	100	75.0	83.3	117	125	8.33
1555383	1203516506	25-APR-2016 18:52	DONE	101	0.11	percent	100	75.0	83.3	117	125	8.33
1560440	1203530043	27-APR-2016 07:13	DONE	97.8	-0.26	percent	100	75.0	83.3	117	125	8.33
1562483	1203535556	27-APR-2016 07:44	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1562714	1203536196	27-APR-2016 17:06	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33
1561490	1203532895	29-APR-2016 14:16	DONE	92.9	-0.85	percent	100	75.0	83.3	117	125	8.33
1561499	1203532931	29-APR-2016 17:17	DONE	92.4	-0.91	percent	100	75.0	83.3	117	125	8.33
1561682	1203533342	02-MAY-2016 15:07	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
1561671	1203533310	02-MAY-2016 16:11	DONE	121	2.6	percent	100	75.0	83.3	117	125	8.33
1562290	1203534983	06-MAY-2016 07:23	DONE	105	0.54	percent	100	75.0	83.3	117	125	8.33
1562336	1203535142	09-MAY-2016 15:05	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1565737	1203544462	10-MAY-2016 16:48	DONE	119	2.2	percent	100	75.0	83.3	117	125	8.33
1562377	1203535285	11-MAY-2016 13:32	DONE	107	0.81	percent	100	75.0	83.3	117	125	8.33
1563969	1203539659	11-MAY-2016 16:10	DONE	101	0.15	percent	100	75.0	83.3	117	125	8.33
1565397	1203543504	12-MAY-2016 13:30	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
1566672	1203547019	12-MAY-2016 16:34	DONE	105	0.55	percent	100	75.0	83.3	117	125	8.33
1567491	1203549286	19-MAY-2016 13:56	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
1568232	1203551080	24-MAY-2016 17:29	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
1569605	1203554580	25-MAY-2016 11:08	DONE	101	0.1	percent	100	75.0	83.3	117	125	8.33
1569603	1203554577	25-MAY-2016 11:14	DONE	106	0.68	percent	100	75.0	83.3	117	125	8.33
1568289	1203551274	28-MAY-2016 16:00	DONE	98.7	-0.15	percent	100	75.0	83.3	117	125	8.33
1570185	1203556050	01-JUN-2016 14:48	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
1570509	1203556921	01-JUN-2016 14:49	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1570978	1203558140	06-JUN-2016 17:18	DONE	103	0.42	percent	100	75.0	83.3	117	125	8.33
1568342	1203551427	06-JUN-2016 17:29	DONE	86.9	-2	percent	100	75.0	83.3	117	125	8.33
1568348	1203551443	08-JUN-2016 13:13	DONE	124	2.9	percent	100	75.0	83.3	117	125	8.33
1570976	1203558134	09-JUN-2016 09:16	DONE	102	0.26	percent	100	75.0	83.3	117	125	8.33
1573314	1203564288	16-JUN-2016 15:28	DONE	96.7	-0.39	percent	100	75.0	83.3	117	125	8.33
1574019	1203566030	20-JUN-2016 13:32	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
1574103	1203566315	24-JUN-2016 10:52	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1574082	1203566252	24-JUN-2016 11:08	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
1574105	1203566318	24-JUN-2016 12:27	DONE	99.2	-0.1	percent	100	75.0	83.3	117	125	8.33
1577155	1203574228	24-JUN-2016 16:16	DONE	98.1	-0.23	percent	100	75.0	83.3	117	125	8.33
1575872	1203570894	27-JUN-2016 17:26	DONE	97.3	-0.32	percent	100	75.0	83.3	117	125	8.33
1575827	1203570751	29-JUN-2016 08:07	DONE	104	0.51	percent	100	75.0	83.3	117	125	8.33
1575826	1203570743	29-JUN-2016 09:58	DONE	91.3	-1	percent	100	75.0	83.3	117	125	8.33
1575804	1203570672	29-JUN-2016 13:10	DONE	103	0.39	percent	100	75.0	83.3	117	125	8.33

Strontium-90 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1552563	1203509079	21-MAR-2016 13:58	DONE	11.4		percent	11.4	0	11.4	11.4	20.0	0

Strontium-90 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1525915	1203440068	08-DEC-2015 17:18	DONE	2.58	3.2	dec	0.83	0	-0.268	1.94	3.00	0.55
1529152	1203447958	15-DEC-2015 12:49	DONE	0.15	-1	dec	0.83	0	-0.268	1.94	3.00	0.55
1529189	1203448080	16-DEC-2015 17:57	DONE	0.96	0.23	dec	0.83	0	-0.268	1.94	3.00	0.55
1531205	1203453117	22-DEC-2015 07:00	DONE	1.13	0.54	dec	0.83	0	-0.268	1.94	3.00	0.55
1531222	1203453171	23-DEC-2015 13:38	DONE	0.3	-0.96	dec	0.83	0	-0.268	1.94	3.00	0.55
1533767	1203459991	29-DEC-2015 15:40	DONE	1.32	0.89	dec	0.83	0	-0.268	1.94	3.00	0.55
1532745	1203457345	29-DEC-2015 17:07	DONE	0.3	-0.97	dec	0.83	0	-0.268	1.94	3.00	0.55
1534786	1203462642	07-JAN-2016 14:05	DONE	0.39	-0.81	dec	0.83	0	-0.268	1.94	3.00	0.55
1537995	1203470305	28-JAN-2016 15:57	DONE	0.79	-0.09	dec	0.83	0	-0.268	1.94	3.00	0.55
1540383	1203476505	02-FEB-2016 16:28	DONE	0.79	-0.09	dec	0.83	0	-0.268	1.94	3.00	0.55
1541822	1203480573	03-FEB-2016 12:43	DONE	0.54	-0.54	dec	0.83	0	-0.268	1.94	3.00	0.55
1539834	1203475119	04-FEB-2016 13:57	DONE	0.44	-0.71	dec	0.83	0	-0.268	1.94	3.00	0.55
1540713	1203477471	06-FEB-2016 11:46	DONE	1.09	0.47	dec	0.83	0	-0.268	1.94	3.00	0.55
1543275	1203484964	19-FEB-2016 13:07	DONE	0.49	-0.63	dec	0.83	0	-0.268	1.94	3.00	0.55
1550587	1203504000	10-MAR-2016 12:53	DONE	1.25	0.75	dec	0.83	0	-0.268	1.94	3.00	0.55
1551156	1203505347	10-MAR-2016 18:16	DONE	0.65	-0.33	dec	0.83	0	-0.268	1.94	3.00	0.55
1551915	1203507474	17-MAR-2016 15:37	DONE	1.16	0.6	dec	0.83	0	-0.268	1.94	3.00	0.55
1556714	1203520027	05-APR-2016 15:14	DONE	1.99	2.1	dec	0.83	0	-0.268	1.94	3.00	0.55
1555431	1203516631	06-APR-2016 15:54	DONE	1.16	0.6	dec	0.83	0	-0.268	1.94	3.00	0.55
1555978	1203518002	06-APR-2016 18:04	DONE	0.44	-0.71	dec	0.83	0	-0.268	1.94	3.00	0.55
1557885	1203523066	13-APR-2016 15:11	DONE	0.83	00	dec	0.83	0	-0.268	1.94	3.00	0.55
1558700	1203525265	21-APR-2016 12:00	DONE	0.47	-0.66	dec	0.83	0	-0.268	1.94	3.00	0.55
1561011	1203531593	21-APR-2016 19:03	DONE	0.02	-1	dec	0.83	0	-0.268	1.94	3.00	0.55
1561011	1203531594	21-APR-2016 19:03	DONE	0.91	0.15	dec	0.83	0	-0.268	1.94	3.00	0.55
1561012	1203531598	21-APR-2016 19:13	DONE	0.4	-0.79	dec	0.83	0	-0.268	1.94	3.00	0.55
1561012	1203531597	21-APR-2016 19:13	DONE	1.06	0.41	dec	0.83	0	-0.268	1.94	3.00	0.55
1561018	1203531621	22-APR-2016 14:05	DONE	0.45	-0.69	dec	0.83	0	-0.268	1.94	3.00	0.55
1555383	1203516507	28-APR-2016 15:25	DONE	0.33	-0.92	dec	0.83	0	-0.268	1.94	3.00	0.55
1555383	1203516508	28-APR-2016 15:25	DONE	1.14	0.55	dec	0.83	0	-0.268	1.94	3.00	0.55
1563969	1203539658	11-MAY-2016 16:10	DONE	0.86	0.04	dec	0.83	0	-0.268	1.94	3.00	0.55
1565397	1203543502	17-MAY-2016 11:52	DONE	0.92	0.16	dec	0.83	0	-0.268	1.94	3.00	0.55
1569605	1203554579	25-MAY-2016 10:30	DONE	1.06	0.4	dec	0.83	0	-0.268	1.94	3.00	0.55
1568232	1203551078	25-MAY-2016 12:38	DONE	0.61	-0.4	dec	0.83	0	-0.268	1.94	3.00	0.55
1568289	1203551272	31-MAY-2016 12:55	DONE	1.63	1.4	dec	0.83	0	-0.268	1.94	3.00	0.55
1570185	1203556048	01-JUN-2016 14:48	DONE	1.68	1.5	dec	0.83	0	-0.268	1.94	3.00	0.55
1570509	1203556922	01-JUN-2016 14:49	DONE	0.1	-1	dec	0.83	0	-0.268	1.94	3.00	0.55
1573314	1203564287	16-JUN-2016 15:28	DONE	0.58	-0.46	dec	0.83	0	-0.268	1.94	3.00	0.55

1574082	1203566251	24-JUN-2016 11:13	DONE	1.47	1.1	dec	0.83	0	-0.268	1.94	3.00	0.55
1575804	1203570670	29-JUN-2016 13:10	DONE	0.08	-1	dec	0.83	0	-0.268	1.94	3.00	0.55

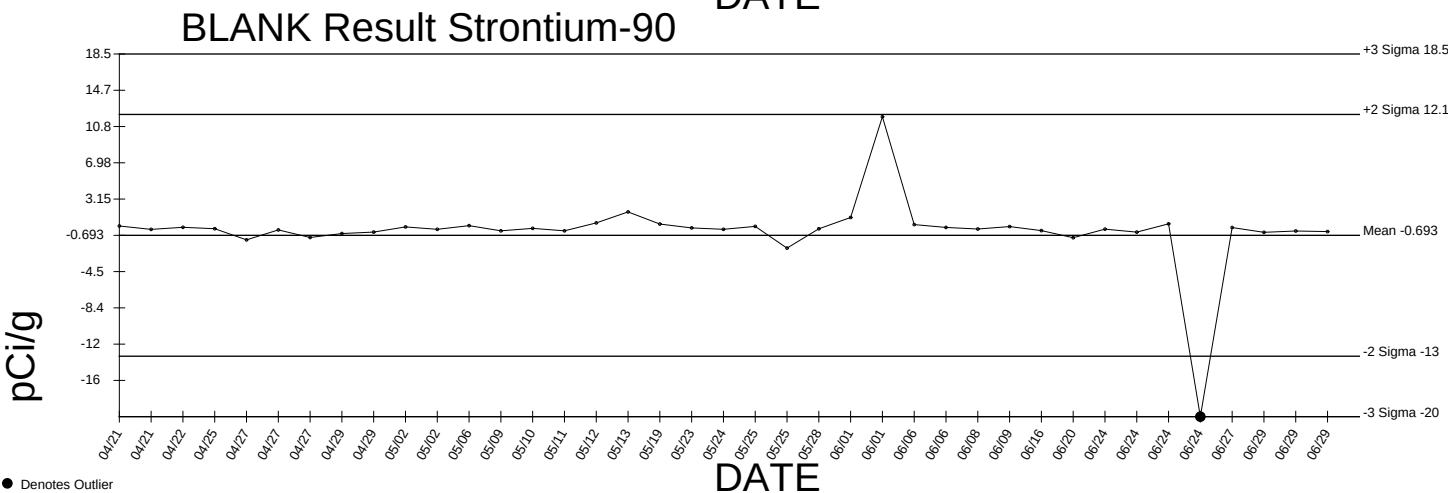
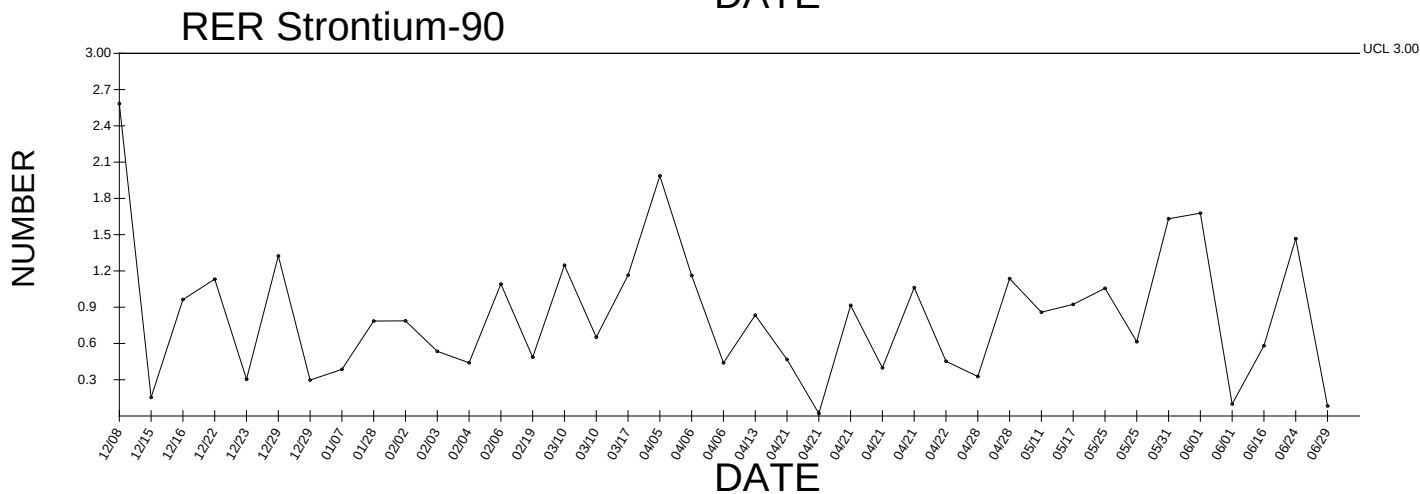
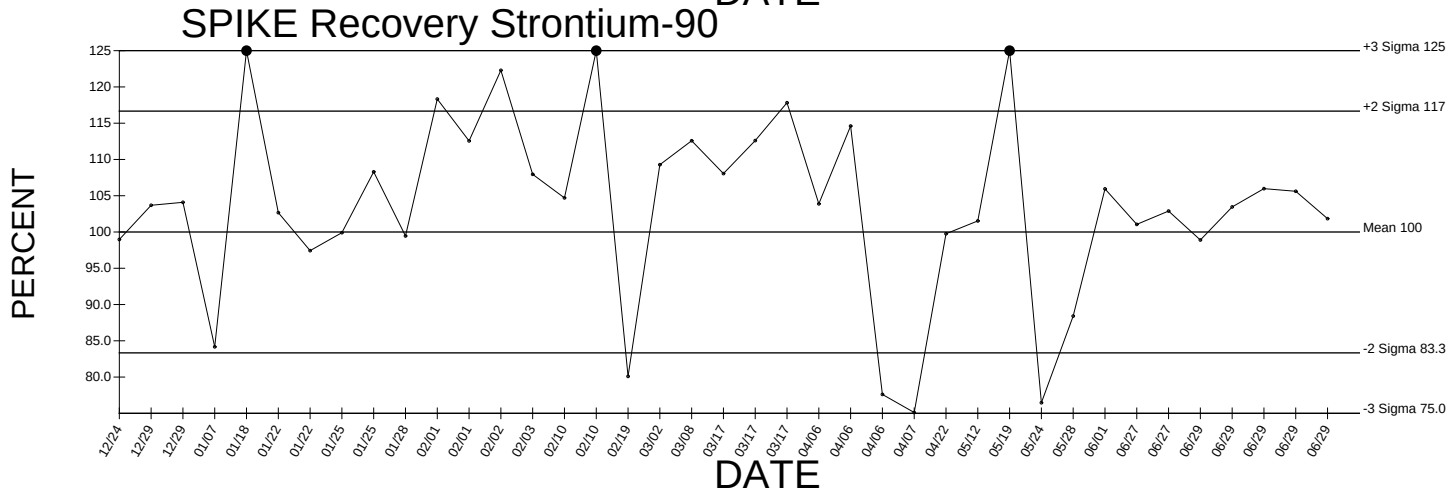
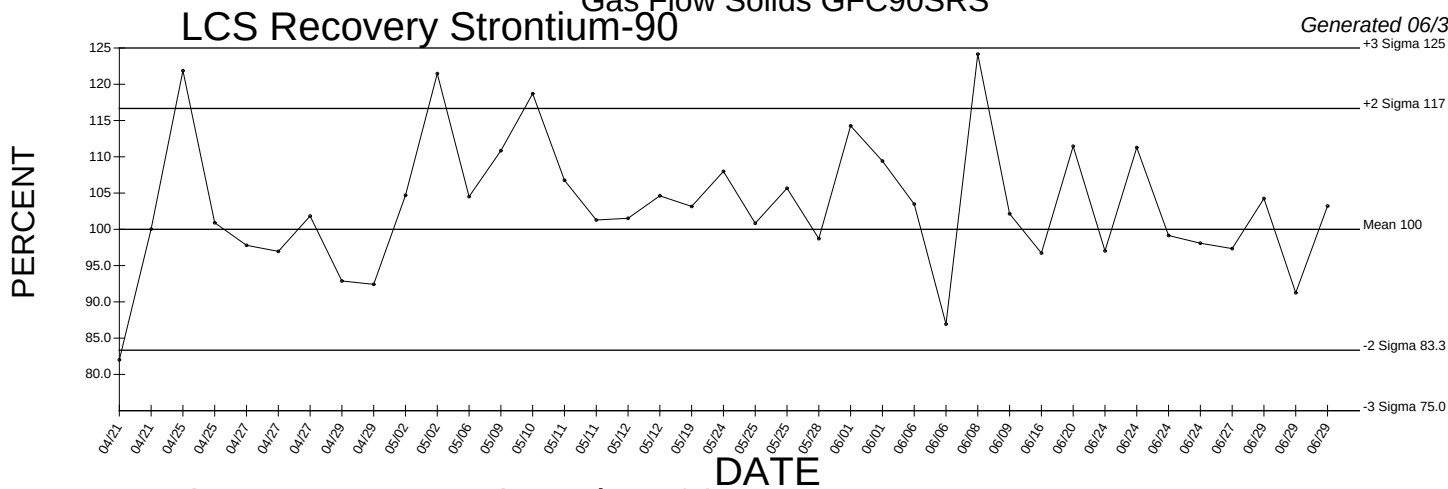
Strontium-90 SPIKE: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1532250	1203456032	24-DEC-2015 08:24	DONE	99	-0.12	percent	100	75.0	83.3	117	125	8.33
1533767	1203459992	29-DEC-2015 15:40	DONE	104	0.44	percent	100	75.0	83.3	117	125	8.33
1532745	1203457346	29-DEC-2015 17:07	DONE	104	0.49	percent	100	75.0	83.3	117	125	8.33
1534786	1203462643	07-JAN-2016 14:05	DONE	84.2	-2	percent	100	75.0	83.3	117	125	8.33
1536047	1203465564	18-JAN-2016 14:11	DONE	272	21	percent	100	75.0	83.3	117	125	8.33
1537959	1203470152	22-JAN-2016 16:28	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
1537959	1203470153	22-JAN-2016 16:28	DONE	97.4	-0.31	percent	100	75.0	83.3	117	125	8.33
1537958	1203470147	25-JAN-2016 15:21	DONE	99.9	-0.01	percent	100	75.0	83.3	117	125	8.33
1537958	1203470148	25-JAN-2016 15:21	DONE	108	01	percent	100	75.0	83.3	117	125	8.33
1537995	1203470306	28-JAN-2016 15:57	DONE	99.5	-0.07	percent	100	75.0	83.3	117	125	8.33
1540713	1203477472	01-FEB-2016 16:29	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
1540713	1203477473	01-FEB-2016 16:29	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1540383	1203476506	02-FEB-2016 16:28	DONE	122	2.7	percent	100	75.0	83.3	117	125	8.33
1541822	1203480574	03-FEB-2016 12:43	DONE	108	0.95	percent	100	75.0	83.3	117	125	8.33
1542894	1203483864	10-FEB-2016 16:32	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
1543092	1203484398	10-FEB-2016 17:43	DONE	128	3.3	percent	100	75.0	83.3	117	125	8.33
1543275	1203484965	19-FEB-2016 13:07	DONE	80.1	-2	percent	100	75.0	83.3	117	125	8.33
1544629	1203488555	02-MAR-2016 14:05	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1550587	1203504001	08-MAR-2016 19:13	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1551393	1203505995	17-MAR-2016 13:23	DONE	108	0.97	percent	100	75.0	83.3	117	125	8.33
1551393	1203505996	17-MAR-2016 13:23	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1551915	1203507475	17-MAR-2016 15:28	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
1555431	1203516632	06-APR-2016 15:54	DONE	104	0.47	percent	100	75.0	83.3	117	125	8.33
1556163	1203518586	06-APR-2016 16:23	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
1556163	1203518587	06-APR-2016 16:23	DONE	77.6	-3	percent	100	75.0	83.3	117	125	8.33
1555978	1203518003	07-APR-2016 10:15	DONE	75.1	-3	percent	100	75.0	83.3	117	125	8.33
1561018	1203531622	22-APR-2016 14:05	DONE	99.8	-0.03	percent	100	75.0	83.3	117	125	8.33
1565397	1203543503	12-MAY-2016 13:30	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
1567491	1203549285	19-MAY-2016 13:57	DONE	2020	230	percent	100	75.0	83.3	117	125	8.33
1568232	1203551079	24-MAY-2016 17:29	DONE	76.5	-3	percent	100	75.0	83.3	117	125	8.33
1568289	1203551273	28-MAY-2016 16:00	DONE	88.4	-1	percent	100	75.0	83.3	117	125	8.33
1570185	1203556049	01-JUN-2016 14:48	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
1575872	1203570892	27-JUN-2016 17:26	DONE	101	0.13	percent	100	75.0	83.3	117	125	8.33
1575872	1203570893	27-JUN-2016 17:26	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
1575827	1203570749	29-JUN-2016 08:05	DONE	98.9	-0.13	percent	100	75.0	83.3	117	125	8.33
1575827	1203570750	29-JUN-2016 08:05	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
1575826	1203570741	29-JUN-2016 09:58	DONE	106	0.72	percent	100	75.0	83.3	117	125	8.33
1575826	1203570742	29-JUN-2016 09:58	DONE	106	0.67	percent	100	75.0	83.3	117	125	8.33

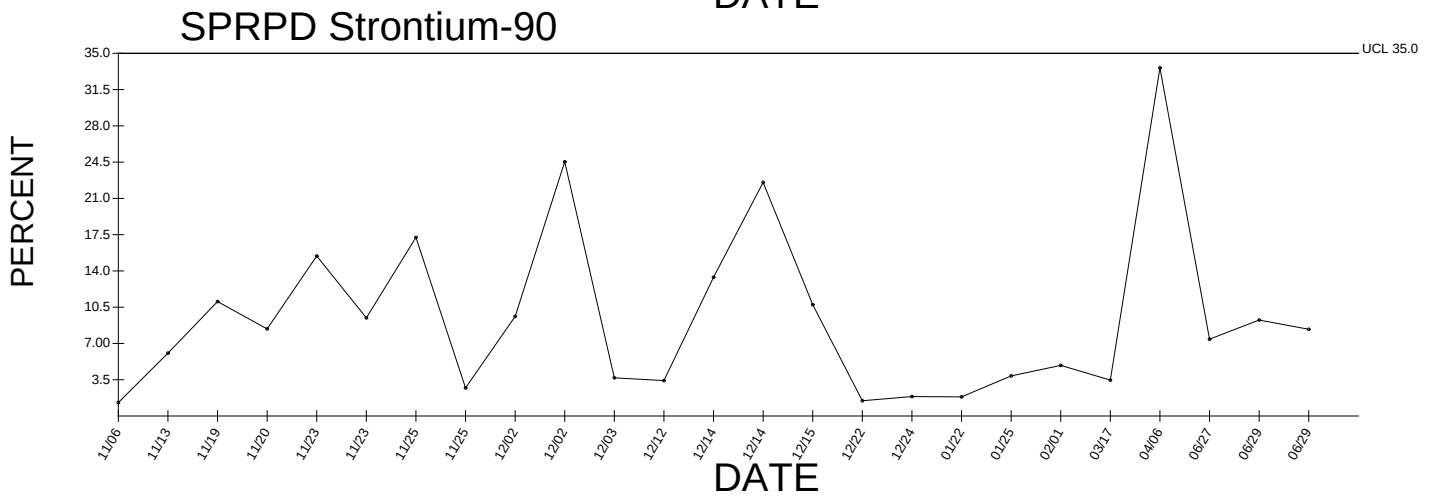
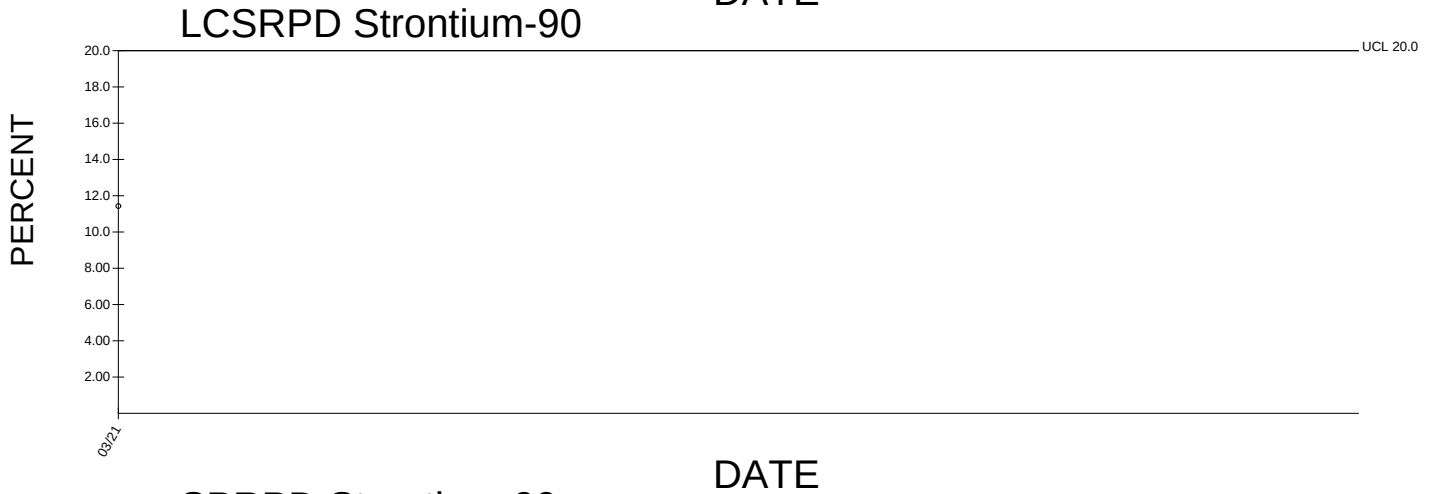
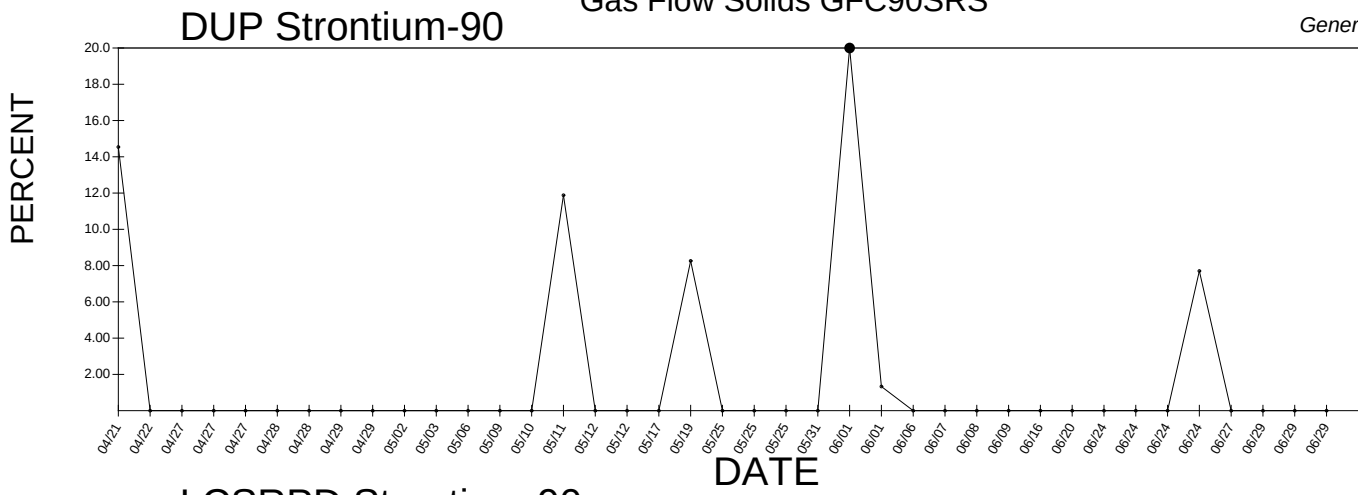
1575804	1203570671	29-JUN-2016 13:10	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33

Strontium-90 SPRPD: Limits LCL = 0 UCL = 35.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519651	1203423811	06-NOV-2015 17:00	DONE	1.3	-1	percent	9.43	0	-6.7	25.6	35.0	8.07
1522004	1203430142	13-NOV-2015 17:45	DONE	6.06	-0.42	percent	9.43	0	-6.7	25.6	35.0	8.07
1523532	1203433957	19-NOV-2015 07:55	DONE	11	0.2	percent	9.43	0	-6.7	25.6	35.0	8.07
1524556	1203436607	20-NOV-2015 17:12	DONE	8.41	-0.13	percent	9.43	0	-6.7	25.6	35.0	8.07
1523587	1203434138	23-NOV-2015 14:48	DONE	15.4	0.75	percent	9.43	0	-6.7	25.6	35.0	8.07
1523588	1203434143	23-NOV-2015 16:36	DONE	9.47	0.01	percent	9.43	0	-6.7	25.6	35.0	8.07
1524825	1203437293	25-NOV-2015 13:31	DONE	17.2	0.97	percent	9.43	0	-6.7	25.6	35.0	8.07
1525644	1203439314	25-NOV-2015 17:51	DONE	2.71	-0.83	percent	9.43	0	-6.7	25.6	35.0	8.07
1525637	1203439298	02-DEC-2015 07:01	DONE	9.6	0.02	percent	9.43	0	-6.7	25.6	35.0	8.07
1525787	1203439713	02-DEC-2015 17:44	DONE	24.5	1.9	percent	9.43	0	-6.7	25.6	35.0	8.07
1526924	1203442555	03-DEC-2015 14:16	DONE	3.68	-0.71	percent	9.43	0	-6.7	25.6	35.0	8.07
1529734	1203449357	12-DEC-2015 15:58	DONE	3.42	-0.74	percent	9.43	0	-6.7	25.6	35.0	8.07
1529146	1203447940	14-DEC-2015 13:00	DONE	13.4	0.49	percent	9.43	0	-6.7	25.6	35.0	8.07
1529143	1203447925	14-DEC-2015 14:22	DONE	22.5	1.6	percent	9.43	0	-6.7	25.6	35.0	8.07
1530410	1203450997	15-DEC-2015 16:40	DONE	10.7	0.16	percent	9.43	0	-6.7	25.6	35.0	8.07
1531317	1203453478	22-DEC-2015 17:45	DONE	1.47	-0.99	percent	9.43	0	-6.7	25.6	35.0	8.07
1532250	1203456032	24-DEC-2015 08:24	DONE	1.88	-0.93	percent	9.43	0	-6.7	25.6	35.0	8.07
1537959	1203470153	22-JAN-2016 16:28	DONE	1.85	-0.94	percent	9.43	0	-6.7	25.6	35.0	8.07
1537958	1203470148	25-JAN-2016 15:21	DONE	3.87	-0.69	percent	9.43	0	-6.7	25.6	35.0	8.07
1540713	1203477473	01-FEB-2016 16:29	DONE	4.88	-0.56	percent	9.43	0	-6.7	25.6	35.0	8.07
1551393	1203505996	17-MAR-2016 13:23	DONE	3.46	-0.74	percent	9.43	0	-6.7	25.6	35.0	8.07
1556163	1203518587	06-APR-2016 16:23	DONE	33.6	3	percent	9.43	0	-6.7	25.6	35.0	8.07
1575872	1203570893	27-JUN-2016 17:26	DONE	7.41	-0.25	percent	9.43	0	-6.7	25.6	35.0	8.07
1575827	1203570750	29-JUN-2016 08:05	DONE	9.26	-0.02	percent	9.43	0	-6.7	25.6	35.0	8.07
1575826	1203570742	29-JUN-2016 09:58	DONE	8.37	-0.13	percent	9.43	0	-6.7	25.6	35.0	8.07



● Denotes Outlier



● Denotes Outlier

RAD Standards Traceability

Standardization of Strontium Carrier 2414995

v1.2.1

Analyst	KSD1

Standard Information	
Isotope	Strontium
Serial Number	2414995
Amount of Std. (mL)	1.0
Standard Prepared	6/3/2016

Parent Information	
Parent Serial #	2130147.5
Parent Exp. Date	6/3/2018

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0104	0.0242	0.0388	0.0146	14.60	14.45
2	1.0136	0.0244	0.0392	0.0148	14.80	14.60
3	1.0191	0.0242	0.0390	0.0148	14.80	14.52
4	1.0214	0.0244	0.0391	0.0147	14.70	14.39

Mean Value (mg/mL) = 14.73
 Stdev (mg/mL) = ± 0.10
 1.0% of Mean Value = 0.147250
Pass
 Expiration Date 6/3/2017
 Mean Value (mg/1.0mL) = 14.73

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

2/4/2016
 14.6
 14.73



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.

Atlanta, Georgia 30318

Tel 404-352-8677

Fax 404-352-2837

www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC

P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%

10.41484 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 10/3/08

RECEIVED



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1243
Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL
Reference Date:	10/01/2008
Ampoule Mass (g):	10.41484 g
Uncertainty:	+/- .85 %
LogBook No:	RC-S-048-124

A Solution Material Info			
Isotope:	Strontium-90		
Prepared By:	Daniel Roy		
Prep Date:	12/19/2008		
Verification Date:	12/18/2015		
Expiration Date:	12/18/2016		
Primary Code:	1243-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	10.2164 g		
Density(g/mL):	0.9991	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (10.41484 \text{ g} * 100 \text{ mL}) = 226951.7634 \text{ dpm/mL}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9991 \text{ g/mL}) / (10.41484 \text{ g} * 100 \text{ mL}) = 227146.2010 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	03/26/2014	03/25/2015
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	03/26/2014	03/25/2015
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	03/19/2014	06/20/2014
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012
01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013

08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	01/15/2014	01/15/2015
12/04/2013	Gregory Ramsay	2.5347	1000	1243-L	575.747476 dpm/ml	12/04/2013	12/04/2014
08/11/2014	Gregory Ramsay	2.7006	1000	1243-M	613.431 dpm/mL	08/12/2014	08/12/2015
05/06/2015	Gregory Ramsay	2.5102	1000	1243-N	570.1824 dpm/mL	05/06/2015	05/06/2016
12/18/2015	Gregory Ramsay	2.5762	1000	1243-O	585.174 dpm/mL	12/18/2015	12/18/2016

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-O

v1.0.2

Instrument	BLUE
Analyst	BXF1
Verification Prep Date	12/18/2015

Standard Information	
Isotope	Sr-90
Serial Number	1243-O
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	585,174
Amount of Std. (mL)	1.0
Standard Prep Date	12/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	12/30/2015	88.50	1073.20	39.80
2	12/30/2015	90.20	1062.80	39.80
3	12/30/2015	89.60	1064.60	39.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	1033.40	2.017144	512.31	512.31
2	1023.00	2.017144	507.15	507.15
3	1024.80	2.017144	508.04	508.04

dpm/mL
509.17
2,755,468,033

Mean Value =
Stddev =

Certificate Value* = 491.8
Two sigma = 5.511
10 % of Mean = 50.917
Rule A (Pass/Fail) Pass
% Recovery 103.52%
Rule B (Pass/Fail) Pass
Expiration Date 12/18/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1243-O by transferring 1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 12/18/2015 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

Handwritten signature and date 12-30-15

Amanda Fehn

Runlogs

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1575817

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
1203570734	MB	KSD1	PIC13B	JUN-24-16 12:27:19	DONE	Tuffryn Filter	01-APR-16 00:00
1203570736	MS	KSD1	PIC11D	JUN-24-16 12:27:27	DONE	Tuffryn Filter	01-APR-16 00:00
1203570737	MSD	KSD1	PIC14B	JUN-24-16 12:27:29	DONE	Tuffryn Filter	01-APR-16 00:00
1203570738	LCS	KSD1	PIC14C	JUN-24-16 12:27:33	DONE	Tuffryn Filter	01-APR-16 00:00
398656026	SAMPLE	KSD1	PIC11C	JUN-24-16 12:27:38	DONE	Tuffryn Filter	01-APR-16 00:00
1203570735	DUP	KSD1	PIC14B	JUN-24-16 16:21:32	DONE	Tuffryn Filter	01-APR-16 00:00
398675001	SAMPLE	KSD1	PIC1D	JUN-29-16 10:23:06	DONE	Tuffryn Filter	01-APR-16 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1575826

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398656002	SAMPLE	KSD1	PIC10A	JUN-29-16 08:17:36	DONE	Tuffryn Filter	01-APR-16 00:00
398656003	SAMPLE	KSD1	PIC10B	JUN-29-16 08:17:41	DONE	Tuffryn Filter	01-APR-16 00:00
398656005	SAMPLE	KSD1	PIC10C	JUN-29-16 08:17:46	DONE	Tuffryn Filter	01-APR-16 00:00
398656007	SAMPLE	KSD1	PIC9D	JUN-29-16 08:17:52	DONE	Tuffryn Filter	01-APR-16 00:00
398656001	SAMPLE	KSD1	PIC11B	JUN-29-16 08:19:11	DONE	Tuffryn Filter	01-APR-16 00:00
398656004	SAMPLE	KSD1	PIC11A	JUN-29-16 08:19:19	DONE	Tuffryn Filter	01-APR-16 00:00
398656006	SAMPLE	KSD1	PIC11C	JUN-29-16 08:19:26	DONE	Tuffryn Filter	01-APR-16 00:00
398656008	SAMPLE	KSD1	PIC12D	JUN-29-16 08:19:32	DONE	Tuffryn Filter	01-APR-16 00:00
398656009	SAMPLE	KSD1	PIC13D	JUN-29-16 08:33:41	DONE	Tuffryn Filter	01-APR-16 00:00
398656010	SAMPLE	KSD1	PIC14A	JUN-29-16 08:33:46	DONE	Tuffryn Filter	01-APR-16 00:00
398656011	SAMPLE	KSD1	PIC1B	JUN-29-16 09:52:55	DONE	Tuffryn Filter	01-APR-16 00:00
398656012	SAMPLE	KSD1	PIC2B	JUN-29-16 09:52:59	DONE	Tuffryn Filter	01-APR-16 00:00
398656013	SAMPLE	KSD1	PIC2C	JUN-29-16 09:53:03	DONE	Tuffryn Filter	01-APR-16 00:00
398656016	SAMPLE	KSD1	PIC6A	JUN-29-16 09:57:08	DONE	Tuffryn Filter	01-APR-16 00:00
398656018	SAMPLE	KSD1	PIC7B	JUN-29-16 09:57:22	DONE	Tuffryn Filter	01-APR-16 00:00
398656019	SAMPLE	KSD1	PIC7C	JUN-29-16 09:57:28	DONE	Tuffryn Filter	01-APR-16 00:00
1203570739	MB	KSD1	PIC8B	JUN-29-16 09:57:43	DONE	Tuffryn Filter	01-APR-16 00:00
1203570740	DUP	KSD1	PIC8D	JUN-29-16 09:57:50	DONE	Tuffryn Filter	01-APR-16 00:00
1203570741	MS	KSD1	PIC9D	JUN-29-16 09:58:14	DONE	Tuffryn Filter	01-APR-16 00:00
1203570742	MSD	KSD1	PIC10A	JUN-29-16 09:58:21	DONE	Tuffryn Filter	01-APR-16 00:00
1203570743	LCS	KSD1	PIC10B	JUN-29-16 09:58:25	DONE	Tuffryn Filter	01-APR-16 00:00
398656014	SAMPLE	KSD1	PIC9B	JUN-29-16 12:26:37	DONE	Tuffryn Filter	01-APR-16 00:00
398656017	SAMPLE	KSD1	PIC9D	JUN-29-16 12:26:44	DONE	Tuffryn Filter	01-APR-16 00:00
398656015	SAMPLE	KSD1	PIC12D	JUN-29-16 14:02:24	DONE	Tuffryn Filter	01-APR-16 00:00
398656020	SAMPLE	KSD1	PIC14C	JUN-29-16 14:02:28	DONE	Tuffryn Filter	01-APR-16 00:00

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1575827

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398656021	SAMPLE	KSD1	PIC2C	JUN-29-16 08:02:11	DONE	Tuffryn Filter	01-APR-16 00:00
398656022	SAMPLE	KSD1	PIC3C	JUN-29-16 08:02:14	DONE	Tuffryn Filter	01-APR-16 00:00
398656023	SAMPLE	KSD1	PIC3D	JUN-29-16 08:02:19	DONE	Tuffryn Filter	01-APR-16 00:00
398656024	SAMPLE	KSD1	PIC4C	JUN-29-16 08:02:23	DONE	Tuffryn Filter	01-APR-16 00:00
398656025	SAMPLE	KSD1	PIC6A	JUN-29-16 08:05:23	DONE	Tuffryn Filter	01-APR-16 00:00
1203570747	MB	KSD1	PIC6C	JUN-29-16 08:05:33	DONE	Tuffryn Filter	01-APR-16 00:00
1203570748	DUP	KSD1	PIC7C	JUN-29-16 08:05:37	DONE	Tuffryn Filter	01-APR-16 00:00
1203570749	MS	KSD1	PIC7D	JUN-29-16 08:05:45	DONE	Tuffryn Filter	01-APR-16 00:00
1203570750	MSD	KSD1	PIC8B	JUN-29-16 08:05:51	DONE	Tuffryn Filter	01-APR-16 00:00
1203570751	LCS	KSD1	PIC8D	JUN-29-16 08:07:44	DONE	Tuffryn Filter	01-APR-16 00:00

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Case Narrative

**Case Narrative
for
Brookhaven National Laboratory (310464)
SDG: 37802
Work Order: 398732**

June 28, 2016

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary

Sample Receipt The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 06, 2016 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. There are no additional comments concerning sample receipt.

Sample Identification The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
398732001	37802-001
398732002	37802-002
398732003	37802-003

Case Narrative

Sample analyses were conducted using methodology as outlined in GEL Laboratories, LLC (GEL) Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

Data Package

The enclosed data package contains the following sections: General Narrative, Chain of Custody and Supporting Documentation, and data from the following fractions: Radiochemistry.



Kaitlyn Stone for
Edith Kent
Project Manager

Chain of Custody

398732

SAMPLING CHAIN OF CUSTODY

Requires EDD ☒

Analysis Requested By		Sampling Contractor		Analytical Laboratory	
Name:	W. Dorsch	Name:	P.W. Grosser Consulting	Name:	GEL
Lifer No:	21133	Contact:	Andy Lockwood	Address:	
Ext:		Phone:	631-589-6353	City:	St.
Acc. No:	20802/20804	Dept:	ES	Contact:	Zip:
Email Reports To:		Email/Fax:	andy@grosser.com	Phone:	
1 W. Dorsch		Sampler:	A. Lockwood	Email/Fax:	
2 A. Lockwood		Project Manager:	A. Lockwood	Field Engineer:	

Big 811 Pss Sampling
Hard Copy to John Burke

Type	UID	Site ID/Bldg/Life #	Sample Information		Date	Time	Hours	Additional Sample Information				Analysis Requested					
			Depth/RWP	Cont. Vol./Units				Name/Description	Cont. Vol./Units	Con. Type	Preservative	Alpha/Beta	Tritium	Gamma	Strontium	524.2	624
	001	EG 0811-PE-Hotspot	0-0.5	520 ml	6/20/16	0840	S	Big 811 Hotspot Post Excavation	520 ml	P	2H		X	X	X		
	002	EG 0811-PE-Hotspot	2400-2.5		6/20/16	0850	L						X	X	X		
	003	EG 0811-PE-F04			6/20/16	0900	L						X	X	X		

1 Relinquished By/Date/Time		2 Relinquished By/Date/Time		3 Relinquished By/Date/Time	
Print	Andy Lockwood	Print	TR/HOB	Print	R. Metch
Signature	<i>Andy Lockwood</i>	Signature	<i>TR/HOB</i>	Signature	<i>Robert Metch</i>
1 Received By/Date/Time		2 Received By/Date/Time		3 Received By/Date/Time	
Print	TR/HOB	Print	R. Metch	Print	Robert Metch
Signature	<i>TR/HOB</i>	Signature	<i>Robert Metch</i>	Signature	<i>Robert Metch</i>

Contractor Lab Sample Disposal:
☐ Return To Client
☐ Archive For _____ Months
☒ Full
 Data Package: ☒ Full
 Turn-Around Time Required:
☐ Rush (1 Day)
☐ 7 Days
☐ 14 Days
☒ 30 Days
☐ Other ()



SAMPLE RECEIPT & REVIEW FORM

Client: BRKL			SDG/AR/COC/Work Order:		
Received By: Zhu			Date Received: 6/6/16		
Suspected Hazard Information		Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.	
COC/Samples marked as radioactive?			☒	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0cpm	
Classified Radioactive II or III by RSO?			☒	If yes, Were swipes taken of sample containers < action levels?	
COC/Samples marked containing PCBs?			☒		
Package, COC, and/or Samples marked as beryllium or asbestos containing?			☒	If yes, samples are to be segregated as Safety Controlled Samples, and opened by the GEL Safety Group.	
Shipped as a DOT Hazardous?			☒	Hazard Class Shipped: UN#:	
Samples identified as Foreign Soil?			☒		

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2 Samples requiring cold preservation within (0 ≤ 6 deg. C)?*		☒		Preservation Method: Ice bags Blue ice Dry ice ☒ None Other (describe) 21°C
2a Daily check performed and passed on IR temperature gun?	☒			Temperature Device Serial #: Secondary Temperature Device Serial # (If Applicable): E5032015030
3 Chain of custody documents included with shipment?	☒			
4 Sample containers intact and sealed?	☒			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5 Samples requiring chemical preservation at proper pH?		☒		Sample ID's, containers affected and observed pH:
6 Do Low Level Perchlorate samples have headspace as required?		☒		If Preservation added, Lot#: Sample ID's and containers affected:
7 VOA vials contain acid preservation?		☒		(If unknown, select No)
8 VOA vials free of headspace (defined as < 6mm bubble)?		☒		Sample ID's and containers affected:
9 Are Encore containers present?			☒	(If yes, immediately deliver to Volatiles laboratory)
10 Samples received within holding time?	☒			ID's and tests affected:
11 Sample ID's on COC match ID's on bottles?	☒			Sample ID's and containers affected:
12 Date & time on COC match date & time on bottles?	☒			Sample ID's affected:
13 Number of containers received match number indicated on COC?		☒		Sample ID's affected: Rec'd missing samples on Friday 6/3 See note from JRR from 6/3 for list.
14 Are sample containers identifiable as GEL provided?		☒		
15 COC form is properly signed in relinquished/received sections?	☒			
16 Carrier and tracking number.				Circle Applicable: FedEx Air FedEx Ground UPS Field Services Courier Other 6503 4047 8209

Comments (Use Continuation Form if needed):

Work Order Containers

Sample ID: 398732001
Client Sample ID: 37802-001
Description: B811-PE-Hotspot 1 Soil

Label: 398732001.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:21:54	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:09:35	Christine Carter	Transferred custody to batch 1572470
06-JUN-16 14:09:35	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398732001.01.01	Type: Gamma Can	
08-JUN-16 13:07:17	Maggie Stamps	Transferred custody to batch 1572490
08-JUN-16 13:07:17	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398732001.01.02	Type: Dried Other	
24-JUN-16 12:07:50	Kelli Dorrell	Transferred custody to batch 1575874

Sample ID: 398732002
Client Sample ID: 37802-002
Description: B811-PE-Hotspot 2 (MS/MSD) Soil

Label: 398732002.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:21:54	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
Label: 398732002.02	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:21:54	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:09:35	Christine Carter	Transferred custody to batch 1572470
06-JUN-16 14:09:35	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398732002.02.01	Type: Gamma Can	
08-JUN-16 13:07:17	Maggie Stamps	Transferred custody to batch 1572490
08-JUN-16 13:07:17	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398732002.02.02	Type: Dried Other	
24-JUN-16 12:07:50	Kelli Dorrell	Transferred custody to batch 1575874

Work Order Containers

Sample ID: 398732003
Client Sample ID: 37802-003
Description: B811-PE-FD4 Soil

Label: 398732003.01	Type: Plastic 500 ml	Preservative: 4C (no chemical preservation)
06-JUN-16 11:21:54	Zachary Worsham	Changed sample location from Barcode Generated to Main Cooler
06-JUN-16 14:09:35	Christine Carter	Transferred custody to batch 1572470
06-JUN-16 14:09:35	Christine Carter	Changed sample location from Main Cooler to Radiochemistry Soil Preparation
06-JUN-16 15:27:34	Christine Carter	Changed sample location from Radiochemistry Soil Preparation to Return Shelf Chemistry Samples
07-JUN-16 07:13:30	William Munford	Changed sample location from Return Shelf Chemistry Samples to Main Cooler
Label: 398732003.01.01	Type: Gamma Can	
08-JUN-16 13:07:17	Maggie Stamps	Transferred custody to batch 1572490
08-JUN-16 13:07:17	Maggie Stamps	Changed sample location from Radiochemistry Soil Preparation to Radiochemistry Count Room
Label: 398732003.01.02	Type: Dried Other	
24-JUN-16 12:07:50	Kelli Dorrell	Transferred custody to batch 1575874

Data Review Qualifier Definitions

Project Specific Qualifier Definitions for GEL Client Code: BRKL

Qualifier	Qualifier Definition	Department	Fraction
U	Analyte was analyzed for, but not detected above the MDL, MDA, MDC or LOD.		
J	Value is estimated		
P	Organics--The concentrations between the primary and confirmation columns/detectors is >40% different. For HPLC, the difference is >70%.	Organics	
C	Analyte has been confirmed by GC/MS analysis	Organics	Pesticide
B	The target analyte was detected in the associated blank.	Organics	
E	Concentration of the target analyte exceeds the instrument calibration range	Organics	
A	The TIC is a suspected aldol-condensation product	Organics	Semi-Volatile
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
N	Metals--The Matrix spike sample recovery is not within specified control limits	Inorganics	
*	A quality control analyte recovery is outside of specified acceptance criteria		
N	Organics--Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor	Organics	Semi-Volatile
H	Analytical holding time was exceeded		
**	Analyte is a surrogate compound	Organics	
<	Result is less than value reported		
>	Result is greater than value reported		
UI	Gamma Spectroscopy--Uncertain identification	Radiological	
BD	Results are either below the MDC or tracer recovery is low	Radiological	
h	Preparation or preservation holding time was exceeded		
R	Sample results are rejected		
Z	Paint Filter Test--Particulates passed through the filter, however no free liquids were observed.	General Chemistry	General Chem
d	5-day BOD--The 2:1 depletion requirement was not met for this sample	General Chemistry	
B	Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL	Inorganics	Metals
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL. Qualifier Not Applicable for Radiochemistry.		
D	Results are reported from a diluted aliquot of the sample	Organics	
N/A	RPD or %Recovery limits do not apply.		
ND	Analyte concentration is not detected above the detection limit		
E	%difference of sample and SD is >10%. Sample concentration must meet flagging criteria	Inorganics	Metals
M	M if above MDC and less than LLD	Radiological	
NJ	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier		
FA	Failed analysis.	Radiological	Bioassay
M	REMP Result > MDC/CL and < RDL	Radiological	
E	General Chemistry--Concentration of the target analyte exceeds the instrument calibration range	General Chemistry	General Chem
JNX	Non Calibrated Compound	Organics	Volatile

Project Specific Qualifier Definitions for GEL Client Code: **BRKL**

Qualifier	Qualifier Definition	Department	Fraction
UJ	Compound cannot be extracted	Organics	Semi-Volatile
UJ	Gamma Spectroscopy--Uncertain identification	Radiological	Rad
Q	One or more quality control criteria have not been met. Refer to the applicable narrative or DER.		
K	Analyte present. Reported value may be biased high. Actual value is expected to be lower.	Radiological	
UL	Not considered detected. The associated number is the reported concentration, which may be inaccurate due to a low bias.	Radiological	
L	Analyte present. Reported value may be biased low. Actual value is expected to be higher.	Radiological	
FB	Mercury was found present at quantifiable concentrations in field blanks received with these samples. Data associated with the blank are deemed invalid for reporting to regulatory agencies	Inorganics	Metals
N1	See case narrative		
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.	Inorganics	
Y	QC Samples were not spiked with this compound	Organics	
R	Per section 9.3.4.1 of Method 1664 Revision B, due to matrix spike recovery issues, this result may not be reported or used for regulatory compliance purposes.	General Chemistry	General Chem
Y	Other specific qualifiers were required to properly define the results. Consult case narrative.	Radiological	Rad
**	Analyte is a Tracer compound	Radiological	
B	The target analyte was detected in the associated blank.	General Chemistry	
N	Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor	Organics	Volatile
e	5-day BOD--Test replicates show more than 30% difference between high and low values. The data is qualified per the method and can be used for reporting purposes	General Chemistry	General Chem

Data Review Qualifier Definitions

Qualifier Explanation

*	A quality control analyte recovery is outside of specified acceptance criteria
**	Analyte is a surrogate compound
<	Result is less than value reported
>	Result is greater than value reported
^	RPD of sample and duplicate evaluated using +/-RL. Concentrations are <5X the RL
A	The TIC is a suspected aldol-condensation product
B	Target analyte was detected in the associated blank
B	Metals-Either presence of analyte detected in the associated blank, or MDL/IDL < sample value < PQL
BD	Results are either below the MDC or tracer recovery is low
C	Analyte has been confirmed by GC/MS analysis
D	Results are reported from a diluted aliquot of the sample
d	5-day BOD-The 2:1 depletion requirement was not met for this sample
E	Organics-Concentration of the target analyte exceeds the instrument calibration range
E	Metals-%difference of sample and SD is >10%. Sample concentration must meet flagging criteria
H	Analytical holding time was exceeded
h	Preparation or preservation holding time was exceeded
J	Value is estimated
N	Metals-The Matrix spike sample recovery is not within specified control limits
N	Organics-Presumptive evidence based on mass spectral library search to make a tentative identification of the analyte (TIC). Quantitation is based on nearest internal standard response factor
N/A	Spike recovery limits do not apply. Sample concentration exceeds spike concentration by 4X or more
ND	Analyte concentration is not detected above the reporting limit
UI	Gamma Spectroscopy-Uncertain identification
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	QC Samples were not spiked with this compound
Z	Paint Filter Test-Particulates passed through the filter, however no free liquids were observed.

- P Organics-The concentrations between the primary and confirmation columns/detectors is >40% difference.
For HPLC, the difference is >70%.
- U Analyte was analyzed for, but not detected above the MDL, MDA, or LOD.

Laboratory Certifications

List of current GEL Certifications as of 28 June 2016

State	Certification
Alaska	UST-0110
Arkansas	88-0651
CLIA	42D0904046
California	2940
Colorado	SC00012
Connecticut	PH-0169
Delaware	SC00012
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330-15-00283, P330-15-00253
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C-SC-01
Kansas NELAP	E-10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA160006
Maryland	270
Massachusetts	M-SC012
Michigan	9976
Mississippi	SC00012
Nebraska	NE-OS-26-13
Nevada	SC000122016-1
New Hampshire NELAP	205415
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
North Dakota	R-158
Oklahoma	9904
Pennsylvania NELAP	68-00485
S.Carolina Radchem	10120002
South Carolina Chemistry	10120001
Tennessee	TN 02934
Texas NELAP	T104704235-16-11
Utah NELAP	SC000122016-20
Vermont	VT87156
Virginia NELAP	460202
Washington	C780
West Virginia	997404

Radiological Analysis

Case Narrative

**Radiochemistry
Technical Case Narrative
Brookhaven National Laboratory (BRKL)
SDG #: 37802
Work Order #: 398732**

Method/Analysis Information

Product: Gammaspec, Gamma, Solid (Long List) Remediation

Analytical Method: DOE HASL 300, 4.5.2.3/Ga-01-R

Prep Method: Dry Soil Prep

Analytical Batch Number: 1572490

Prep Batch Number: 1572470

Sample ID	Client ID
398732001	37802-001
398732002	37802-002
398732003	37802-003
1203561999	Method Blank (MB)
1203562001	Laboratory Control Sample (LCS)
1203562000	398732002(37802-002) Sample Duplicate (DUP)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-013 REV# 25.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples met the required acceptance limits.

Designated QC

The following sample was used for QC: 398732002 (37802-002).

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Recounts

None of the samples in this sample set were recounted.

Miscellaneous Information:**Data Exception (DER) Documentation**

A data exception report (DER) 1534527 was generated for samples 1203562000 (37802-002DUP), 398732002 (37802-002) and 398732003 (37802-003) in this SDG/batch. DER 1534527 was generated due to RDL less than MDA. The following RDLs in sample 398732002 were not achieved: Be-7 The following RDLs in DUP 1203562000 were not achieved: Be-7 and Co-57. Samples RDL could not be met in the maximum count time. Reporting results

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Co-57 RDL meets with rounding in sample 398732002 (37802-002). Be-7 RDL meets with rounding in sample 398732003 (37802-003).

Qualifier Information

Qualifier	Reason	Analyte	Sample	Client Sample
UI	Data rejected due to high peak-width.	Cobalt-60	398732001	37802-001
UI	Data rejected due to interference.	Europium-155	398732003	37802-003
		Manganese-54	398732002	37802-002
UI	Data rejected due to low abundance.	Americium-241	398732003	37802-003
		Cesium-134	398732001	37802-001
			398732002	37802-002
			398732003	37802-003
			1203562000	37802-002(398732002DUP)

Method/Analysis Information

Product: GFPC, Sr90, solid

Analytical Method: EPA 905.0 Modified/DOE RP501 Rev. 1 Modified

Prep Method: Dry Soil Prep

Analytical Batch Number: 1575874

Prep Batch Number: 1572470

Sample ID	Client ID
398732001	37802-001
398732002	37802-002
398732003	37802-003
1203570898	Method Blank (MB)
1203570902	Laboratory Control Sample (LCS)
1203570899	398732002(37802-002) Sample Duplicate (DUP)
1203570900	398732002(37802-002) Matrix Spike (MS)
1203570901	398732002(37802-002) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" basis.

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-RAD-A-004 REV# 17.

Calibration Information:

Calibration Information

All initial and continuing calibration requirements have been met.

Standards Information

Standard solutions for these analysis are NIST traceable or verified with a NIST traceable standard and used before the expiration dates.

Sample Geometry

All counting sources were prepared in the same geometry as the calibration standards.

Quality Control (QC) Information:

Blank Information

The blank volume is representative of the sample volume in this batch.

QC Information

All of the QC samples meet the required acceptance limits with the following exceptions: The sample and the

duplicate, 1203570899 (37802-002DUP) and 398732002 (37802-002), did not meet the relative percent difference requirement; however, they do meet the relative error ratio requirement with a value of 1.42.

Designated QC

The following sample was used for QC: 398732002 (37802-002).

Technical Information:**Holding Time**

All sample procedures for this sample set were performed within the required holding time.

Sample Re-prep/Re-analysis

None of the samples in this sample set required reprep or reanalysis.

Chemical Recoveries

All chemical recoveries meet the required acceptance limits for this sample set.

Recounts

Samples 1203570899 (37802-002DUP) and 398732002 (37802-002) were verified by recounting at least five days from the separation date. The recounts are reported.

Miscellaneous Information:**Data Exception (DER) Documentation**

Data exception reports are generated to document any procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Sample-Specific MDA/MDC

The MDA/MDC reported on the certificate of analysis is a sample-specific MDA/MDC.

Additional Comments

Additional comments were not required for this sample set.

Qualifier Information

Manual qualifiers were not required.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

GEL LABORATORIES LLC

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Qualifier Definition Report for

BRKL007 Brookhaven National Laboratory (310464)

Client SDG: 37802 GEL Work Order: 398732

The Qualifiers in this report are defined as follows:

DL Failed required detection limit.

J Estimated value; the result was greater than the MDA but less than the required detection limit.

U Undetected; sample result < MDA

UI Uncertain identification for gamma spectroscopy.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: 

Name: Theresa Austin

Date: 05 JUL 2016

Title: Group Leader

DATA EXCEPTION REPORT			
Mo.Day Yr. 30-JUN-16	Division: Radiochemistry	Quality Criteria: Specifications	Type: Process
Instrument Type: GAMMA SPECTROMETER	Test / Method: DOE HASL 300, 4.5.2.3/Ga-01-R	Matrix Type: Solid	Client Code: BRKL
Batch ID: 1572490	Sample Numbers: See Below		
Potentially affected work order(s)(SDG): 398732(37802) Application Issues: RDL less than MDA			
Specification and Requirements		DER Disposition:	
Exception Description:			
The following RDLs in sample 398732002 were not achieved: Be-7 The following RDLs in DUP 1203562000 were not achieved: Be-7 and Co-57.		Samples RDL could not be met in the maximum count time. Reporting results	

Originator's Name:

Bryan Williams 30-JUN-16

Data Validator/Group Leader:

Spencer Collins 30-JUN-16

Moisture LogBook

Batch: 1572470
Analyst: CXC1
Date/Time: 06-JUN-2016
Procedure Code ____PREPD
Procedure Description Dry Soil Prep GL-RAD-A-021
Lab Sop: GL-RAD-A-021

Sample St Sample Id Rpd(%)

Sample Id	Sample Type	Original Hsn	Instrument	Run Time	Container Wt	Initial Wt	Final Wt (g)	Net Initial Wt (g)	Net Final Wt (g)	Moisture (%)
398677040	SAMPLE		SP-39020004	14:26	13.198	428.168	404.443	414.97	391.245	5.717
398732001	SAMPLE		SP-39020004	14:26	13.194	397.144	375.247	383.95	362.053	5.703
398732002	SAMPLE		SP-39020004	14:26	13.191	421.885	408.055	408.694	394.864	3.383
398732003	SAMPLE		SP-39020004	14:26	13.157	432.455	413.483	419.298	400.326	4.524

Comments:

A) Result = (Net Initial - Net Final) /Net Initial * 100

Note: Aliquot is used for the determination of the effective MDL and PQL in LIMS

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37802-001	Project:	BRKL00700
Sample ID:	398732001	Client ID:	BRKL007
Matrix:	S	COC:	37802
Collect Date:	20-MAY-16 08:40	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-PE-Hotspot 1
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0216	+/-0.0136	0.0245	4.00	pCi/g		MXR1	06/28/16	1602	1572490	1
Beryllium-7	U	0.198	+/-0.221	0.277	0.300	pCi/g						
Cesium-134	J-UI	0.0272	+/-0.0131	0.0202	0.040	pCi/g						
Cesium-137		3.55	+/-0.056	0.0169	2.30	pCi/g						
Cobalt-57	U	-0.000771	+/-0.00614	0.0112	0.020	pCi/g						
Cobalt-60	J-UI	0.0334	+/-0.0174	0.0159	0.300	pCi/g						
Europium-152	U	-0.0322	+/-0.0291	0.0495	4.80	pCi/g						
Europium-154	U	-0.00593	+/-0.0289	0.0437	17.0	pCi/g						
Europium-155	U	0.0305	+/-0.0359	0.0399	0.300	pCi/g						
Manganese-54	U	0.0143	+/-0.00913	0.0173	0.050	pCi/g						
Sodium-22	U	-0.00459	+/-0.0105	0.0156	0.050	pCi/g						
Zinc-65	U	0.00204	+/-0.026	0.0388	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.0353	+/-0.486	0.923	2.00	pCi/g	KSD1	06/29/16	1117	1575874	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1426	1572470

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			89.6	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37802-002	Project:	BRKL00700
Sample ID:	398732002	Client ID:	BRKL007
Matrix:	S	COC:	37802
Collect Date:	20-MAY-16 08:50	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-PE-Hotspot 2 (MS/MSD)
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time	Batch	Method
Rad Gamma Spec Analysis												
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"												
Americium-241	U	0.0292	+/-0.0519	0.0905	4.00	pCi/g		MXR1	06/28/16	1603	1572490	1
Beryllium-7	U-DL	0.249	+/-0.306	0.539	0.300	pCi/g						
Cesium-134	J-UI	0.0342	+/-0.0139	0.0203	0.040	pCi/g						
Cesium-137		20.0	+/-0.129	0.023	2.30	pCi/g						
Cobalt-57	U-DL	-0.0023	+/-0.0116	0.0202	0.020	pCi/g						
Cobalt-60	U	0.00295	+/-0.00834	0.0154	0.300	pCi/g						
Europium-152	U	0.00442	+/-0.0528	0.0922	4.80	pCi/g						
Europium-154	U	-0.0158	+/-0.0307	0.0442	17.0	pCi/g						
Europium-155	U	0.0488	+/-0.0587	0.0737	0.300	pCi/g						
Manganese-54	J-UI	0.0162	+/-0.0132	0.0119	0.050	pCi/g						
Sodium-22	U	-0.00602	+/-0.011	0.0158	0.050	pCi/g						
Zinc-65	U	-0.000622	+/-0.0222	0.0334	0.500	pCi/g						

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	15.9	+/-1.49	0.807	2.00	pCi/g	KSD1	07/02/16	1205	1575874	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1426	1572470

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			86.9	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: July 5, 2016

Company : Brookhaven National Laboratory
Address : Building 462

Upton, New York 11973--5000

Contact: Mr. John Burke
Project: Hazardous & Radiochemical Analytical Services - Full

Client Sample ID:	37802-003	Project:	BRKL00700
Sample ID:	398732003	Client ID:	BRKL007
Matrix:	S	COC:	37802
Collect Date:	20-MAY-16 00:00	Samp Recv.:	
Receive Date:	06-JUN-16 08:15	Client Desc.:	B811-PE-FD4
Collector:	Client	Vol. Recv.:	

Parameter	Qualifier	Result	Uncertainty	MDC	RL	Units	DF	Analyst	Date	Time Batch	Method
Rad Gamma Spec Analysis											
Gammaspec, Gamma, Solid (Long List) Remediation "Dry Weight Corrected"											
Americium-241	J-UI	0.0419	+/-0.0181	0.0319	4.00	pCi/g		MXR1	06/28/16	1603 1572490	1
Beryllium-7	U-DL	0.0184	+/-0.232	0.333	0.300	pCi/g					
Cesium-134	J-UI	0.0302	+/-0.0202	0.0275	0.040	pCi/g					
Cesium-137	J	2.21	+/-0.0547	0.0219	2.30	pCi/g					
Cobalt-57	U	0.00735	+/-0.00782	0.0146	0.020	pCi/g					
Cobalt-60	U	0.019	+/-0.0125	0.0242	0.300	pCi/g					
Europium-152	U	-0.0257	+/-0.0369	0.0597	4.80	pCi/g					
Europium-154	U	-0.027	+/-0.0437	0.0622	17.0	pCi/g					
Europium-155	J-UI	0.072	+/-0.0438	0.0496	0.300	pCi/g					
Manganese-54	U	0.00429	+/-0.0126	0.0231	0.050	pCi/g					
Sodium-22	U	-0.00942	+/-0.0156	0.0223	0.050	pCi/g					
Zinc-65	U	-0.00308	+/-0.0327	0.0494	0.500	pCi/g					

Rad Gas Flow Proportional Counting

GFPC, Sr90, solid "Dry Weight Corrected"

Strontium-90	U	0.568	+/-0.669	1.13	2.00	pCi/g	KSD1	06/29/16	1121 1575874	2

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
Dry Soil Prep	Dry Soil Prep GL-RAD-A-021	CXC1	06/06/16	1426	1572470

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	DOE HASL 300, 4.5.2.3/Ga-01-R	
2	EPA 905.0 Modified/DOE RP501 Rev. 1 Modified	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Strontium Carrier	GFPC, Sr90, solid "Dry Weight Corrected"			85.5	(25%-125%)

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

Quality Control Summary

GEL LABORATORIES LLC

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QC Summary

Report Date: July 5, 2016

Page 1 of 3

Brookhaven National Laboratory
Building 462
Upton, New York

Contact: Mr. John Burke

Workorder: 398732

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572490										
QC1203562000	398732002	DUP									
Americium-241	U	0.0292	U	0.0731	pCi/g	N/A		N/A MXR1		06/29/16	15:33
	Uncertainty	+/-0.0519		+/-0.143							
Beryllium-7	U-DL	0.249	U-DL	0.441	pCi/g	N/A		N/A			
	Uncertainty	+/-0.306		+/-0.383							
Cesium-134	J-UI	0.0342	J-UI	0.0392	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0139		+/-0.0178							
Cesium-137		20.0		20.5	pCi/g	2.37		(0%-20%)			
	Uncertainty	+/-0.129		+/-0.140							
Cobalt-57	U-DL	-0.0023	U-DL	0.0124	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0116		+/-0.0139							
Cobalt-60	U	0.00295	U	-0.00373	pCi/g	N/A		N/A			
	Uncertainty	+/-0.00834		+/-0.0103							
Europium-152	U	0.00442	U	0.021	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0528		+/-0.0713							
Europium-154	U	-0.0158	U	-0.00721	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0307		+/-0.0302							
Europium-155	U	0.0488	U	0.0221	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0587		+/-0.0536							
Manganese-54	J-UI	0.0162	U	0.0135	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0132		+/-0.0128							
Sodium-22	U	-0.00602	U	-0.00272	pCi/g	N/A		N/A			
	Uncertainty	+/-0.011		+/-0.0108							
Zinc-65	U	-0.000622	U	-0.00708	pCi/g	N/A		N/A			
	Uncertainty	+/-0.0222		+/-0.0287							
QC1203562001	LCS										
Americium-241	489			542	pCi/g		111	(75%-125%)		06/29/16	14:54
	Uncertainty			+/-11.0							
Beryllium-7			U-DL	4.76	pCi/g						
	Uncertainty			+/-8.08							
Cesium-134			U-DL	-0.267	pCi/g						
	Uncertainty			+/-0.785							
Cesium-137	180			179	pCi/g		99.4	(75%-125%)			
	Uncertainty			+/-3.19							
Cobalt-57				1.37	pCi/g						
	Uncertainty			+/-0.604							
Cobalt-60	167			162	pCi/g		96.7	(75%-125%)			
	Uncertainty			+/-3.50							
Europium-152			U	-0.494	pCi/g						
	Uncertainty			+/-1.85							
Europium-154			U	0.676	pCi/g						

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QC Summary

Workorder: 398732

Page 2 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gamma Spec											
Batch	1572490										
		Uncertainty		+/-1.16							
Europium-155			U-DL	0.308	pCi/g				MXR1	06/29/16	14:54
		Uncertainty		+/-1.52							
Manganese-54			U-DL	0.192	pCi/g						
		Uncertainty		+/-0.783							
Sodium-22			U-DL	0.232	pCi/g						
		Uncertainty		+/-0.410							
Zinc-65				4.44	pCi/g						
		Uncertainty		+/-2.70							
QC1203561999	MB										
Americium-241			U	-0.00348	pCi/g					06/29/16	15:32
		Uncertainty		+/-0.023							
Beryllium-7			U	0.00648	pCi/g						
		Uncertainty		+/-0.0782							
Cesium-134			U	0.00107	pCi/g						
		Uncertainty		+/-0.00858							
Cesium-137			U	0.00155	pCi/g						
		Uncertainty		+/-0.0091							
Cobalt-57			U	-0.00294	pCi/g						
		Uncertainty		+/-0.00456							
Cobalt-60			U	0.00537	pCi/g						
		Uncertainty		+/-0.00936							
Europium-152			U	-0.0105	pCi/g						
		Uncertainty		+/-0.0219							
Europium-154			U	-0.00738	pCi/g						
		Uncertainty		+/-0.0242							
Europium-155			U	0.0153	pCi/g						
		Uncertainty		+/-0.0171							
Manganese-54			U	0.00506	pCi/g						
		Uncertainty		+/-0.00821							
Sodium-22			U	-0.00262	pCi/g						
		Uncertainty		+/-0.00856							
Zinc-65			U	0.00855	pCi/g						
		Uncertainty		+/-0.021							
Rad Gas Flow											
Batch	1575874										
QC1203570899	398732002	DUP									
Strontium-90		15.9		19.7	pCi/g	20.9*		(0%-20%)	KSD1	07/02/16	12:05
		Uncertainty	+/-1.49	+/-1.75							
QC1203570902	LCS										
Strontium-90		59.7		61.6	pCi/g		103	(75%-125%)		06/29/16	11:26
		Uncertainty		+/-2.90							
QC1203570898	MB										
Strontium-90			U	-0.817	pCi/g					06/29/16	11:21

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QC Summary

Workorder: 398732

Page 3 of 3

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Rad Gas Flow											
Batch	1575874										
				Uncertainty							
					+/-0.499						
QC1203570900	398732002	MS									
Strontium-90			59.8	15.9	78.5	pCi/g	105	(75%-125%)	KSD1	06/29/16	11:22
				Uncertainty	+/-1.49	+/-3.39					
QC1203570901	398732002	MSD									
Strontium-90			64.4	15.9	85.3	pCi/g	8.24	108	(0%-35%)		06/29/16 11:26
				Uncertainty	+/-1.49	+/-3.71					

Notes:

Counting Uncertainty is calculated at the 95% confidence level (1.96-sigma).

The Qualifiers in this report are defined as follows:

- DL Failed required detection limit.
- H Holding time exceeded
- J Estimated value; the result was greater than the MDA but less than the required detection limit.
- JN Presumptive evidence of the analyte at an estimated quantity.
- R The data are unusable (radionuclide may or may not be present).
- U Undetected; sample result < MDA
- UI Uncertain identification for gamma spectroscopy.

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more or %RPD not applicable.

^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.

* Indicates that a Quality Control parameter was not within specifications.

For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Gamma Spectroscopy Raw Data

30-Jun-2016

Batch# 1572490 Product: Y solid Date: 6/30/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			N/A
Samples have been blank corrected (if required). Blank correction reported included (if required).			N/A
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/MDC, error is 40% or less. If below the MDA/MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/LLD has been met.		✓	Der# ^{6/30/16} 1534527 1534527
If duplicate activities are: Less than 5x MDA/MDC, then RPD is 100% or less, If greater 5x MDA/MDC, then RPD 20% or less, If below the MDA/MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).			N/A
Method blank is less than the RDL/LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			N/A
Smears Taken for Radioactive batches.			N/A
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			N/A
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly statused.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			N/A
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.	✓		Der# 1534527
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.	✓		
Aliquot Correction completed if required.			N/A
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)			N/A

Primary Review Performed By:

[Signature] 6/30/16

Secondary Review Performed By:

[Signature] 6/29/16

Gamma Spec Queue Sheet 1.4-6/28/16

06/08/2016

Batch #: 1572490 Analyst: MXR1 First Client Due Date: 06/29/2016 Internal Due Date: 06/29/2016
 Gamma LCS Isotope: Mixed Gamma LCS Code: 1556 Expiration Date: 4/1/37 Vol: 1.0
 Initials: M.S. Prep Date: 6/7/16 Library: SOLID Balance ID: N/A

Sample ID	Client Description / Container ID	Type	Hazard Code	Client	Matrix	Collect Date	Geometry	Detector	Sealing Date/Time (if Applicable)
398732001-1	37802-001	SAMPLE		BRKL007	SOIL	20-MAY-16 08:40:00 MS	CAN	5	4/7/16
398732002-1	37802-002	SAMPLE		BRKL007	SOIL	20-MAY-16 08:50:00 MS		11	
398732003-1	37802-003	SAMPLE		BRKL007	SOIL	20-MAY-16 00:00:00 MS		41	
1203561999-1	MB	MB		QC ACCOUNT	SOIL	6/7/16 MS		30	
1203562000-1	DUP 37802-002(398732002)	DUP		QC ACCOUNT	SOIL	20-MAY-16 08:50:00 MS		43	
1203562001-1	LCS	LCS		QC ACCOUNT	SOIL	6/7/16 MS		28	

Wet/Dry Aliquot (1/g)

GEL Laboratories LLC, Radiochemistry Division

Data Reviewed By: B. Williams 4/28/16 Page 1 of 1

VAX/VMS Nuclide Identification Report Generated 30-JUN-2016 06:26:05.04

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732001.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;461
Background date    : 26-JUN-2016 12:03:45
Sample date       : 20-MAY-2016 08:40:00 Acquisition date : 28-JUN-2016 16:02:44
Sample ID        : G398732001 Sample quantity : 1.54127E+02 GRAM
Detector name    : GAM05 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:07.32 0.0%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572490 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	25.79	68	1231	0.85	53.09	51	5	1.57E-03	78.3	
2	0	32.34	1559	1872	1.01	66.18	62	8	3.61E-02	5.4	
3	0	36.82	515	1773	0.92	75.13	71	8	1.19E-02	14.9	
4	0	39.99	116	1302	1.41	81.48	80	6	2.70E-03	49.8	
5	0	46.77*	464	1948	0.88	95.05	91	9	1.08E-02	20.4	
6	0	53.72*	30	1680	0.92	108.94	106	7	7.03E-04	248.6	
7	0	63.50*	355	2294	0.90	128.50	125	8	8.22E-03	26.0	
8	2	73.43*	215	2116	1.09	148.38	145	15	4.97E-03	40.4	4.74E+00
9	2	75.13*	2214	1763	1.04	151.78	145	15	5.12E-02	3.9	
10	2	77.39*	3360	1389	0.91	156.29	145	15	7.78E-02	2.6	
11	4	84.40*	521	1467	1.36	170.32	167	29	1.21E-02	14.0	1.66E+00
12	4	87.47	1211	1648	1.19	176.46	167	29	2.80E-02	6.2	
13	4	90.18	790	1595	1.16	181.88	167	29	1.83E-02	9.3	
14	4	93.09*	961	1743	1.38	187.69	167	29	2.22E-02	10.2	
15	0	99.05*	166	1685	1.43	199.62	196	8	3.84E-03	47.2	
16	0	105.72	110	1543	1.66	212.95	209	7	2.54E-03	60.1	
17	0	115.56	162	1133	1.13	232.64	230	6	3.76E-03	33.9	
18	0	129.04	135	1470	0.91	259.59	257	7	3.14E-03	47.6	
19	0	144.34*	10	1424	1.27	290.21	287	7	2.26E-04	711.3	
20	0	154.21*	109	1475	0.95	309.94	306	8	2.52E-03	65.9	
21	0	186.09*	661	1888	1.24	373.72	369	10	1.53E-02	14.3	
22	0	209.27	269	1677	1.08	420.07	416	9	6.22E-03	28.1	
23	7	238.77*	4139	984	1.04	479.07	474	17	9.58E-02	2.2	1.59E+00
24	7	241.58	828	1532	1.63	484.69	474	17	1.92E-02	10.6	
25	0	270.18	356	1338	1.49	541.90	537	11	8.24E-03	20.6	
26	0	277.12	343	1513	1.50	555.79	550	13	7.94E-03	24.0	
27	0	295.30*	969	1333	0.98	592.15	587	11	2.24E-02	8.4	
28	0	300.17	244	1054	0.82	601.88	598	9	5.66E-03	24.8	
29	0	327.94	148	890	1.04	657.44	654	8	3.42E-03	36.0	
30	0	338.33*	704	887	1.11	678.21	674	8	1.63E-02	9.3	
31	0	351.88*	1984	1413	1.20	705.31	698	14	4.59E-02	4.7	
32	0	409.45	128	678	1.01	820.46	818	7	2.97E-03	34.8	
33	0	437.38	77	901	1.47	876.33	872	9	1.78E-03	71.0	
34	0	463.44	300	1388	1.31	928.44	921	14	6.94E-03	27.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	477.48	92	818	1.65	956.52	953	9	2.13E-03	57.0	
36	0	491.71	49	543	1.26	984.97	982	8	1.14E-03	83.2	
37	0	510.75*	293	1224	1.99	1023.06	1016	17	6.78E-03	33.6	
38	0	582.96*	1206	471	1.47	1167.47	1161	13	2.79E-02	5.1	
39	0	600.18	28	443	2.18	1201.91	1195	10	6.44E-04	143.3	
40	0	609.14*	1252	587	1.30	1219.83	1214	13	2.90E-02	5.2	
41	0	655.86	36	314	2.65	1313.26	1309	9	8.30E-04	90.6	
42	0	661.37	17871	597	1.44	1324.29	1317	15	4.14E-01	0.8	
43	0	726.89	268	285	1.60	1455.32	1450	12	6.20E-03	14.1	
44	0	737.10	46	284	3.86	1475.74	1468	14	1.07E-03	78.5	
45	0	743.29	13	313	3.20	1488.11	1482	14	3.08E-04	283.0	
46	1	767.73	163	224	1.82	1536.99	1530	21	3.78E-03	19.4	6.77E-01
47	1	772.21	86	210	1.82	1545.95	1530	21	2.00E-03	34.9	
48	0	785.66	89	167	1.39	1572.85	1569	9	2.06E-03	28.2	
49	0	794.58	117	201	1.63	1590.67	1586	10	2.70E-03	24.5	
50	0	816.76	13	129	0.90	1635.04	1630	9	3.00E-04	161.9	
51	0	838.56	102	636	5.87	1678.63	1656	31	2.36E-03	73.7	
52	0	860.31	161	152	1.81	1722.12	1717	10	3.74E-03	16.4	
53	0	903.93	42	167	2.72	1809.37	1804	10	9.74E-04	59.5	
54	0	910.82*	901	234	1.64	1823.14	1816	14	2.09E-02	5.2	
55	0	923.40	32	116	0.79	1848.30	1845	8	7.49E-04	60.5	
56	0	926.72	24	79	1.37	1854.93	1852	6	5.49E-04	62.9	
57	0	934.18	54	218	1.63	1869.85	1862	12	1.24E-03	56.7	
58	0	943.32	28	87	1.67	1888.12	1885	7	6.45E-04	59.1	
59	1	964.11	183	135	1.74	1929.69	1920	34	4.24E-03	13.7	1.61E+00
60	1	968.40	549	115	1.73	1938.28	1920	34	1.27E-02	5.7	
61	0	978.38	29	140	0.50	1958.23	1955	12	6.72E-04	83.2	
62	0	1000.73	97	130	2.72	2002.94	1997	11	2.24E-03	25.1	
63	0	1046.27	57	127	4.35	2093.98	2088	11	1.33E-03	40.5	
64	0	1063.40	17	160	1.19	2128.24	2122	10	3.86E-04	145.7	
65	0	1078.85	39	140	3.34	2159.14	2154	11	8.99E-04	61.6	
66	0	1119.72	269	217	1.75	2240.87	2235	15	6.23E-03	13.2	
67	0	1128.59	17	129	1.27	2258.61	2254	10	3.98E-04	126.1	
68	0	1154.29*	5	162	1.74	2309.98	2307	10	1.20E-04	546.8	
69	0	1172.63	83	112	1.11	2346.66	2343	9	1.93E-03	25.2	
70	0	1237.62	93	130	2.28	2476.62	2472	10	2.14E-03	25.4	
71	0	1280.98	47	112	1.70	2563.32	2556	12	1.09E-03	47.5	
72	0	1332.45	116	138	3.25	2666.23	2657	20	2.69E-03	26.6	
73	0	1378.51	74	142	2.28	2758.33	2747	19	1.72E-03	40.7	
74	0	1386.10	9	60	0.75	2773.49	2767	9	1.99E-04	164.5	
75	0	1407.65	38	65	1.64	2816.59	2813	10	8.80E-04	42.9	
76	0	1460.02*	1968	109	1.96	2921.29	2912	18	4.55E-02	2.7	
77	0	1508.78	38	87	1.03	3018.78	3010	14	8.70E-04	55.2	
78	2	1587.63	84	40	2.57	3176.44	3170	24	1.94E-03	19.0	1.10E+00
79	2	1592.00	69	37	2.57	3185.17	3170	24	1.60E-03	25.7	
80	0	1622.34	56	71	3.32	3245.83	3236	21	1.30E-03	40.4	
81	0	1630.32	49	38	1.53	3261.78	3256	12	1.14E-03	29.1	
82	0	1663.00	58	60	6.63	3327.11	3316	24	1.34E-03	37.7	
83	0	1728.92	73	33	2.84	3458.92	3453	12	1.70E-03	19.6	
84	0	1758.04	17	39	3.77	3517.14	3508	14	4.05E-04	79.0	
85	0	1763.78*	218	63	2.33	3528.60	3521	18	5.05E-03	12.7	
86	0	1846.75	34	53	1.37	3694.48	3688	14	7.92E-04	48.1	
87	0	1865.70	17	41	0.62	3732.36	3722	15	4.04E-04	83.6	
88	0	1989.80	25	32	3.60	3980.46	3973	13	5.72E-04	51.6	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 30-JUN-2016 06:26:07

```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732001.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 20-MAY-2016 08:40:00 Acquisition date : 28-JUN-2016 16:02:44
Sample ID        : G398732001 Sample quantity  : 154.13 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA5 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:07.32 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	RA-223	144.24
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
BE-7	477.60	10.44*	3.317E+00	1.180E-01	1.975E-01	113.90	OK
K-40	1460.82	10.66*	1.289E+00	5.622E+00	5.622E+00	5.40	OK
CO-60	1173.23	99.85	1.567E+00	2.145E-02	2.176E-02	50.49	OK
	1332.49	99.98*	1.400E+00	3.289E-02	3.336E-02	53.24	OK
AS-73	53.44	10.30*	9.167E+00	1.748E-02	2.459E-02	497.25	OK
CD-109	88.03	3.70*	9.355E+00	1.355E+00	1.438E+00	17.76	OK
SN-126	64.28	9.60	9.501E+00	2.085E-01	2.085E-01	51.95	OK
	86.94	8.90	9.355E+00	5.634E-01	5.634E-01	17.76	OK
	87.57	37.00*	9.355E+00	1.355E-01	1.355E-01	17.76	OK
BA-137M	661.66	89.90*	2.543E+00	3.351E+00	3.359E+00	1.61	OK
CS-137	661.66	85.10*	2.543E+00	3.540E+00	3.549E+00	1.61	OK
EU-155	86.55	30.70	9.355E+00	1.633E-01	1.659E-01	17.76	OK
	105.31	21.10*	8.884E+00	2.997E-02	3.045E-02	120.25	OK
TL-208	277.37	6.60	5.065E+00	4.805E-01	4.805E-01	47.97	OK
	583.19	85.00*	2.821E+00	2.185E-01	2.185E-01	10.14	OK
	860.56	12.50	2.043E+00	2.634E-01	2.634E-01	32.79	OK
PB-210	46.54	4.25*	8.662E+00	6.932E-01	6.956E-01	40.81	OK
BI-211	72.87	1.23	9.554E+00	9.660E-01	9.660E-01	80.84	OK
	351.06	12.92*	4.224E+00	2.672E-01	2.672E-01	105.54	OK
BI-212	727.33	6.67*	2.352E+00	7.243E-01	7.243E-01	28.12	OK
	785.37	1.10	2.205E+00	1.544E+00	1.544E+00	56.45	OK
	1620.50	1.47	1.171E+00	----- Line	Not Found	-----	Absent
PB-212	74.82	10.28	9.543E+00	9.052E-01	9.052E-01	11.57	OK
	77.11	17.10	9.522E+00	1.086E+00	1.086E+00	5.21	OK
	238.63	43.60*	5.643E+00	7.993E-01	7.993E-01	4.35	OK
	300.09	3.30	4.771E+00	7.211E-01	7.211E-01	49.67	OK
BI-214	609.32	45.49*	2.721E+00	4.372E-01	4.373E-01	10.37	OK
	1120.29	14.92	1.631E+00	4.476E-01	4.476E-01	26.36	OK
	1764.49	15.30	1.081E+00	5.063E-01	5.064E-01	25.50	OK
PB-214	74.82	5.80	9.545E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	9.522E+00	1.915E+00	1.915E+00	5.21	OK
	87.09	3.41	9.363E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	5.589E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	4.830E+00	5.067E-01	5.067E-01	16.80	OK
	351.93	35.60*	4.224E+00	----- Line	Not Found	-----	<<INT Reject
RN-222	609.32	45.49*	2.721E+00	4.372E-01	4.373E-01	10.37	OK
	1120.29	14.92	1.631E+00	4.476E-01	4.476E-01	26.36	OK
	1764.49	15.30	1.081E+00	5.063E-01	5.064E-01	25.50	OK
RA-224	240.99	4.10*	5.596E+00	8.165E-01	8.165E-01	48.10	OK
RA-226	609.32	45.49*	2.721E+00	4.372E-01	4.373E-01	10.37	OK
	1120.29	14.92	1.631E+00	4.476E-01	4.476E-01	26.36	OK
	1764.49	15.30	1.081E+00	5.063E-01	5.064E-01	25.50	OK
AC-228	105.21	1.10	8.884E+00	5.749E-01	5.749E-01	120.25	OK
	338.32	11.27	4.355E+00	6.592E-01	6.592E-01	18.66	OK
	794.95	4.25	2.184E+00	5.279E-01	5.279E-01	49.06	OK
	835.71	1.61	2.093E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.947E+00	7.428E-01	7.428E-01	10.41	OK
	968.97	15.80	1.848E+00	7.729E-01	7.729E-01	11.31	OK
RA-228	105.21	1.10	8.884E+00	5.749E-01	5.749E-01	120.25	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
	338.32	11.27	4.355E+00	6.592E-01	6.592E-01	18.66	OK
	794.95	4.25	2.184E+00	5.279E-01	5.279E-01	49.06	OK
	835.71	1.61	2.093E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.947E+00	7.428E-01	7.428E-01	10.41	OK
	968.97	15.80	1.848E+00	7.729E-01	7.729E-01	11.31	OK
TH-228	74.82	10.28	9.543E+00	9.052E-01	9.052E-01	11.57	OK
	77.11	17.10	9.522E+00	1.086E+00	1.086E+00	5.21	OK
	238.63	43.60*	5.643E+00	7.993E-01	7.993E-01	4.35	OK
	300.09	3.30	4.771E+00	7.211E-01	7.211E-01	49.67	OK
TH-229	85.43	14.70	9.417E+00	1.966E-01	1.966E-01	27.98	OK
	88.47	24.00	9.355E+00	2.089E-01	2.089E-01	17.76	OK
	193.51	4.41*	6.509E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	6.150E+00	----- Line	Not Found	-----	Absent
TH-230	609.32	45.49*	2.721E+00	4.372E-01	4.372E-01	10.37	OK
	1120.29	14.92	1.631E+00	4.476E-01	4.476E-01	26.36	OK
	1764.49	15.30	1.081E+00	5.063E-01	5.063E-01	25.50	OK
PA-231	283.69	1.70	4.978E+00	----- Line	Not Found	-----	Absent
	301.36	5.35*	4.771E+00	4.448E-01	4.448E-01	49.67	OK
TH-232	105.21	1.10	8.884E+00	5.749E-01	5.749E-01	120.25	OK
	338.32	11.27	4.355E+00	6.592E-01	6.592E-01	18.66	OK
	835.71	1.61	2.093E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.947E+00	7.428E-01	7.428E-01	10.41	OK
	968.97	15.80	1.848E+00	7.729E-01	7.729E-01	11.31	OK
PA-234M	766.42	0.32	2.247E+00	9.574E+00	9.574E+00	38.73	OK
	1001.03	0.84*	1.797E+00	2.629E+00	2.629E+00	50.17	OK
TH-234	63.29	3.70*	9.501E+00	5.411E-01	5.411E-01	51.95	OK
	92.59	4.23	9.226E+00	1.276E+00	1.276E+00	20.49	OK
U-234	609.32	45.49*	2.721E+00	4.372E-01	4.372E-01	10.37	OK
	1120.29	14.92	1.631E+00	4.476E-01	4.476E-01	26.36	OK
	1764.49	15.30	1.081E+00	5.063E-01	5.063E-01	25.50	OK
U-235	89.96	3.47	9.295E+00	1.272E+00	1.272E+00	18.55	OK
	93.35	5.60	9.226E+00	9.636E-01	9.636E-01	20.49	OK
	143.76	10.96*	7.743E+00	5.723E-03	5.723E-03	1422.69	OK
	163.33	5.08	7.228E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.675E+00	8.422E-02	8.422E-02	28.64	OK
	205.31	5.01	6.261E+00	----- Line	Not Found	-----	Absent
U-238	63.29	3.70*	9.501E+00	5.411E-01	5.411E-01	51.95	OK
	92.59	4.23	9.226E+00	1.276E+00	1.276E+00	20.49	OK
AM-243	43.53	5.90	8.322E+00	----- Line	Not Found	-----	Absent
	74.66	67.20*	9.543E+00	1.385E-01	1.385E-01	11.57	OK
ANH-511	511.00	100.00*	3.141E+00	4.105E-02	4.105E-02	67.16	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732001.CNF;1
Acquisition date : 28-JUN-2016 16:02:44 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:07.32 Half life ratio : *****
Sample date : 20-MAY-2016 08:40:00 Analyst initials: MXR1
Sample ID : G398732001 Sample Quantity : 1.5413E+02 GRAM
Batch Number : 1572490 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
BE-7	1.975E-01	2.205E-01	2.774E-01
K-40	5.622E+00	2.975E-01	1.473E-01
CO-60	3.336E-02	1.741E-02	1.593E-02
AS-73	2.459E-02	1.198E-01	1.092E-01
CD-109	1.438E+00	2.503E-01	2.424E-01
SN-126	1.355E-01	2.359E-02	2.281E-02
BA-137M	3.359E+00	5.301E-02	1.603E-02
CS-137	3.549E+00	5.600E-02	1.694E-02
EU-155	3.045E-02	3.588E-02	3.986E-02
TL-208	2.185E-01	2.171E-02	1.619E-02
PB-210	6.956E-01	2.782E-01	1.929E-01
BI-211	2.672E-01	2.763E-01	1.052E-01
BI-212	7.243E-01	1.996E-01	2.080E-01
PB-212	7.993E-01	3.409E-02	2.634E-02
BI-214	4.373E-01	4.444E-02	3.340E-02
PB-214	6.036E-01	5.568E-02	7.018E-02
RN-222	4.373E-01	4.444E-02	3.340E-02
RA-224	8.165E-01	3.849E-01	2.824E-01
RA-226	4.373E-01	4.444E-02	3.340E-02
AC-228	7.428E-01	7.575E-02	5.370E-02
RA-228	7.428E-01	7.575E-02	5.370E-02
TH-228	7.993E-01	3.409E-02	2.634E-02
TH-229	8.173E-02	1.463E-01	2.609E-01
TH-230	4.372E-01	4.444E-02	3.340E-02
PA-231	4.448E-01	2.165E-01	2.271E-01
TH-232	7.428E-01	7.575E-02	5.370E-02
PA-234M	2.629E+00	1.292E+00	1.698E+00
TH-234	5.411E-01	2.755E-01	2.395E-01
U-234	4.372E-01	4.444E-02	3.340E-02
U-235	5.723E-03	7.979E-02	8.548E-02
U-238	5.411E-01	2.755E-01	2.395E-01
AM-243	1.385E-01	1.571E-02	1.295E-02
ANH-511	4.105E-02	2.702E-02	1.560E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
NA-22	-4.593E-03	1.052E-02	1.560E-02	NOT IDENT.
NA-24	0.000E+00	1.143E+17	0.000E+00	SHORT HLIF
AL-26	3.815E-04	7.704E-03	1.420E-02	FAIL ABUN
SC-46	-4.229E-03	1.076E-02	1.867E-02	FAIL ABUN
V-48	-1.731E-02	5.192E-02	7.644E-02	FAIL ABUN
CR-51	-7.437E-02	1.925E-01	3.471E-01	NOT IDENT.
MN-54	1.434E-02	9.131E-03	1.727E-02	NOT IDENT.
CO-56	-1.924E-03	1.244E-02	2.061E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-7.705E-04	6.136E-03	1.123E-02	NOT IDENT.
CO-58	-1.764E-02	1.397E-02	1.975E-02	NOT IDENT.
FE-59	-1.501E-02	2.821E-02	4.979E-02	NOT IDENT.
ZN-65	2.041E-03	2.600E-02	3.880E-02	NOT IDENT.
GE-68	2.148E-01	3.417E-01	5.584E-01	NOT IDENT.
AS-74	8.600E-02	6.826E-02	1.150E-01	NOT IDENT.
SE-75	3.345E-03	1.434E-02	2.480E-02	NOT IDENT.
BR-77	0.000E+00	6.585E+03	0.000E+00	SHORT HLIF
SR-82	-3.216E-02	1.691E-01	2.591E-01	NOT IDENT.
RB-83	-4.509E-04	2.606E-02	4.539E-02	NOT IDENT.
KR-85	0.000E+00	2.446E+00	4.146E+00	NOT IDENT.
SR-85	0.000E+00	1.676E-02	2.839E-02	NOT IDENT.
RB-86	4.057E-01	4.981E-01	8.242E-01	NOT IDENT.
Y-88	9.312E-04	1.006E-02	1.861E-02	NOT IDENT.
Y-91	2.960E+00	5.948E+00	1.091E+01	NOT IDENT.
NB-94	7.901E-03	7.918E-03	1.479E-02	NOT IDENT.
NB-95	0.000E+00	1.449E-02	2.523E-02	NOT IDENT.
NB-95M	-3.233E-02	4.503E-02	7.281E-02	NOT IDENT.
ZR-95	3.635E-02	2.130E-02	4.091E-02	NOT IDENT.
NB-97	0.000E+00	1.269E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	1.690E+16	0.000E+00	SHORT HLIF
MO-99	0.000E+00	2.144E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
RH-101	-2.149E-03	8.186E-03	1.329E-02	NOT IDENT.
RH-102	-3.290E-04	1.377E-02	2.502E-02	FAIL ABUN
RU-103	-9.782E-03	2.163E-02	3.240E-02	FAIL ABUN
RH-106	-1.037E-02	8.372E-02	1.516E-01	NOT IDENT.
RU-106	-1.037E-02	8.372E-02	1.516E-01	NOT IDENT.
AG-108M	-2.629E-03	1.171E-02	1.797E-02	NOT IDENT.
AG-110M	2.220E-03	1.196E-02	2.137E-02	NOT IDENT.
SN-113	-5.076E-03	1.632E-02	2.892E-02	NOT IDENT.
CD-115	0.000E+00	6.693E+03	0.000E+00	SHORT HLIF
SN-117M	8.303E-03	5.142E-02	8.276E-02	NOT IDENT.
TE-123M	-1.758E-03	8.423E-03	1.433E-02	NOT IDENT.
SB-124	-2.299E-03	2.311E-02	4.250E-02	NOT IDENT.
SB-125	-2.908E-03	3.254E-02	5.741E-02	FAIL ABUN
TE-125M	-3.271E+00	3.064E+00	4.938E+00	NOT IDENT.
I-126	1.853E-01	2.240E-01	3.675E-01	NOT IDENT.
SB-126	-1.780E-02	1.553E-01	2.407E-01	NOT IDENT.
SB-127	0.000E+00	2.394E+01	0.000E+00	SHORT HLIF
I-131	1.308E-01	2.913E-01	5.291E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	3.884E+01	0.000E+00	SHORT HLIF
BA-133	6.073E-03	1.376E-02	2.211E-02	FAIL ABUN
I-133	0.000E+00	5.222E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.309E-02	2.021E-02	FAIL ABUN
CS-135	5.308E-02	4.568E-02	7.691E-02	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-1.181E-03	1.048E-01	1.567E-01	FAIL ABUN
CE-139	-5.105E-03	8.239E-03	1.455E-02	NOT IDENT.
BA-140	8.583E-02	2.830E-01	4.978E-01	NOT IDENT.
LA-140	3.259E-02	8.112E-02	1.295E-01	FAIL ABUN
CE-141	3.019E-03	4.209E-02	4.680E-02	FAIL ABUN
CE-143	0.000E+00	8.601E+06	0.000E+00	SHORT HLIF
CE-144	-4.576E-02	5.236E-02	8.909E-02	NOT IDENT.
PM-144	-1.011E-02	8.505E-03	1.462E-02	FAIL ABUN
PR-144	-7.691E-01	6.446E-01	1.108E+00	NOT IDENT.
PM-146	2.034E-03	1.557E-02	2.744E-02	FAIL ABUN
ND-147	1.425E-01	7.645E-01	1.339E+00	FAIL ABUN
PM-147	-1.179E+02	1.714E+02	3.103E+02	NOT IDENT.
PM-149	0.000E+00	5.146E+04	0.000E+00	SHORT HLIF
EU-150	1.010E-03	8.893E-03	1.421E-02	FAIL ABUN
EU-152	-3.215E-02	2.914E-02	4.946E-02	FAIL ABUN
GD-153	1.266E-02	2.308E-02	3.131E-02	NOT IDENT.
EU-154	-5.933E-03	2.885E-02	4.370E-02	NOT IDENT.
TB-160	-3.065E-02	3.785E-02	6.431E-02	FAIL ABUN

HO-166M	-1.029E-02	1.434E-02	2.508E-02	FAIL ABUN
TM-171	3.983E-01	1.941E+00	1.793E+00	FAIL ABUN
HF-172	3.782E-03	4.956E-02	8.125E-02	FAIL ABUN
LU-172	2.080E-02	1.442E-02	2.787E-02	FAIL ABUN
LU-176	-1.262E-03	7.204E-03	1.311E-02	FAIL ABUN
HF-181	1.764E-02	2.461E-02	3.867E-02	NOT IDENT.
TA-182	6.456E-02	4.464E-02	8.558E-02	FAIL ABUN
RE-183	-1.242E-02	1.992E-02	3.638E-02	NOT IDENT.
RE-184	5.068E-02	5.914E-02	8.583E-02	FAIL ABUN
W-188	-2.908E+00	2.808E+00	4.393E+00	FAIL ABUN
IR-192	-9.202E-04	1.207E-02	2.195E-02	FAIL ABUN
HG-203	2.384E-02	1.688E-02	2.848E-02	FAIL ABUN
BI-207	5.342E-03	1.525E-02	2.090E-02	FAIL ABUN
PB-211	-5.042E-02	2.461E-01	4.026E-01	NOT IDENT.
RN-219	2.547E-02	1.302E-01	2.328E-01	FAIL ABUN
RA-223	1.630E-01	2.070E-01	3.388E-01	FAIL ABUN
AC-227	1.990E-03	6.704E-02	1.243E-01	FAIL ABUN
TH-227	1.990E-03	6.704E-02	1.243E-01	FAIL ABUN
TH-231	1.630E-01	2.070E-01	3.388E-01	FAIL ABUN
PA-233	1.054E-02	1.779E-02	3.289E-02	FAIL ABUN
PA-234	-8.123E-02	8.006E-02	1.120E-01	FAIL ABUN
NP-237	1.054E-02	1.779E-02	3.289E-02	FAIL ABUN
NP-238	0.000E+00	1.557E+04	0.000E+00	SHORT HLIF
NP-239	0.000E+00	8.033E-02	1.069E-01	FAIL ABUN
PU-239	1.319E+02	1.232E+02	1.502E+02	FAIL ABUN
AM-241	2.155E-02	1.364E-02	2.449E-02	NOT IDENT.
CM-243	-1.111E-02	3.016E-02	3.921E-02	FAIL ABUN
BK-247	5.746E-03	2.351E-02	3.865E-02	FAIL ABUN
CM-247	4.398E-04	1.186E-02	2.113E-02	FAIL ABUN
CF-249	5.666E-03	1.273E-02	2.297E-02	NOT IDENT.
CF-251	2.148E-02	3.361E-02	6.057E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
BE-7	477.60	101	10.44*	3.317E+00	1.180E-01	1.975E-01	113.90
K-40	1460.82	1903	10.66*	1.289E+00	5.622E+00	5.622E+00	5.40
CO-60	1173.23	83	99.85	1.567E+00	2.145E-02	2.176E-02	50.49
	1332.49	113	99.98*	1.400E+00	3.289E-02	3.336E-02	53.24
AS-73	53.44	41	10.30*	9.167E+00	1.748E-02	2.459E-02	497.25
CD-109	88.03	1554	3.70*	9.355E+00	1.822E+00	1.934E+00	12.49
SN-126	64.28	469	9.60	9.501E+00	2.085E-01	2.085E-01	51.95
	86.94	1554	8.90	9.355E+00	7.576E-01	7.576E-01	12.49
	87.57	1554	37.00*	9.355E+00	1.822E-01	1.822E-01	12.49
BA-137M	661.66	18873	89.90*	2.543E+00	3.351E+00	3.359E+00	1.61
CS-137	661.66	18873	85.10*	2.543E+00	3.540E+00	3.549E+00	1.61
CE-141	145.44	12	48.29*	7.743E+00	1.299E-03	3.019E-03	1422.69
EU-155	86.55	1554	30.70	9.355E+00	2.196E-01	2.231E-01	12.49
	105.31	138	21.10*	8.884E+00	2.997E-02	3.045E-02	120.25
TL-208	277.37	396	6.60	5.065E+00	4.805E-01	4.805E-01	47.97
	583.19	1291	85.00*	2.821E+00	2.185E-01	2.185E-01	10.14
	860.56	166	12.50	2.043E+00	2.634E-01	2.634E-01	32.79
PB-210	46.54	629	4.25*	8.662E+00	6.932E-01	6.956E-01	40.81
BI-211	72.87	280	1.23	9.554E+00	9.660E-01	9.660E-01	80.84
	351.06	2236	12.92*	4.224E+00	1.663E+00	1.663E+00	9.41
BI-212	727.33	280	6.67*	2.352E+00	7.243E-01	7.243E-01	28.12
	785.37	92	1.10	2.205E+00	1.544E+00	1.544E+00	56.45
	1620.50	-----	1.47	1.171E+00	-----	Line Not Found	-----
PB-212	74.82	2879	10.28	9.543E+00	1.191E+00	1.191E+00	7.82
	77.11	4358	17.10	9.522E+00	1.086E+00	1.086E+00	5.21
	238.63	4845	43.60*	5.643E+00	7.993E-01	7.993E-01	4.35
	300.09	280	3.30	4.771E+00	7.211E-01	7.211E-01	49.67
BI-214	609.32	1333	45.49*	2.721E+00	4.372E-01	4.373E-01	10.37
	1120.29	268	14.92	1.631E+00	4.476E-01	4.476E-01	26.36
	1764.49	206	15.30	1.081E+00	5.063E-01	5.064E-01	25.50
PB-214	74.82	2879	5.80	9.543E+00	2.111E+00	2.111E+00	7.82
	77.11	4358	9.70	9.522E+00	1.915E+00	1.915E+00	5.21
	87.09	1554	3.41	9.355E+00	1.977E+00	1.977E+00	12.49
	242.00	968	7.25	5.596E+00	9.684E-01	9.684E-01	21.18
	295.22	1111	18.42	4.830E+00	5.067E-01	5.067E-01	16.80
	351.93	2236	35.60*	4.224E+00	6.036E-01	6.036E-01	9.41
RN-222	609.32	1333	45.49*	2.721E+00	4.372E-01	4.373E-01	10.37
	1120.29	268	14.92	1.631E+00	4.476E-01	4.476E-01	26.36
	1764.49	206	15.30	1.081E+00	5.063E-01	5.064E-01	25.50
RA-223	81.07	-----	15.00	9.473E+00	-----	Line Not Found	-----
	83.79	670	24.70	9.417E+00	1.170E-01	1.170E-01	27.98
	94.56	1227	8.67	9.226E+00	6.224E-01	6.224E-01	20.49
	144.24	12	3.27	7.743E+00	1.918E-02	1.918E-02	1422.69
	154.21	133	5.70	7.470E+00	1.264E-01	1.264E-01	131.72
	269.46	412	13.90	5.161E+00	2.329E-01	2.329E-01	41.15
	323.87	-----	3.99*	4.503E+00	-----	Line Not Found	-----
	338.28	797	2.84	4.355E+00	2.616E+00	2.616E+00	18.66

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
RA-224	240.99	968	4.10*	5.596E+00	1.712E+00	1.712E+00	21.18
RA-226	609.32	1333	45.49*	2.721E+00	4.372E-01	4.373E-01	10.37
	1120.29	268	14.92	1.631E+00	4.476E-01	4.476E-01	26.36
	1764.49	206	15.30	1.081E+00	5.063E-01	5.064E-01	25.50
AC-228	105.21	138	1.10	8.884E+00	5.749E-01	5.749E-01	120.25
	338.32	797	11.27	4.355E+00	6.592E-01	6.592E-01	18.66
	794.95	121	4.25	2.184E+00	5.279E-01	5.279E-01	49.06
	835.71	-----	1.61	2.093E+00	-----	Line Not Found	-----
	911.20	919	25.80*	1.947E+00	7.428E-01	7.428E-01	10.41
	968.97	556	15.80	1.848E+00	7.729E-01	7.729E-01	11.31
RA-228	105.21	138	1.10	8.884E+00	5.749E-01	5.749E-01	120.25
	338.32	797	11.27	4.355E+00	6.592E-01	6.592E-01	18.66
	794.95	121	4.25	2.184E+00	5.279E-01	5.279E-01	49.06
	835.71	-----	1.61	2.093E+00	-----	Line Not Found	-----
	911.20	919	25.80*	1.947E+00	7.428E-01	7.428E-01	10.41
	968.97	556	15.80	1.848E+00	7.729E-01	7.729E-01	11.31
TH-228	74.82	2879	10.28	9.543E+00	1.191E+00	1.191E+00	7.82
	77.11	4358	17.10	9.522E+00	1.086E+00	1.086E+00	5.21
	238.63	4845	43.60*	5.643E+00	7.993E-01	7.993E-01	4.35
	300.09	280	3.30	4.771E+00	7.211E-01	7.211E-01	49.67
TH-229	85.43	670	14.70	9.417E+00	1.966E-01	1.966E-01	27.98
	88.47	1554	24.00	9.355E+00	2.809E-01	2.809E-01	12.49
	193.51	-----	4.41*	6.509E+00	-----	Line Not Found	-----
	210.85	-----	2.80	6.150E+00	-----	Line Not Found	-----
TH-230	609.32	1333	45.49*	2.721E+00	4.372E-01	4.372E-01	10.37
	1120.29	268	14.92	1.631E+00	4.476E-01	4.476E-01	26.36
	1764.49	206	15.30	1.081E+00	5.063E-01	5.063E-01	25.50
PA-231	283.69	-----	1.70	4.978E+00	-----	Line Not Found	-----
	301.36	280	5.35*	4.771E+00	4.448E-01	4.448E-01	49.67
TH-232	105.21	138	1.10	8.884E+00	5.749E-01	5.749E-01	120.25
	338.32	797	11.27	4.355E+00	6.592E-01	6.592E-01	18.66
	835.71	-----	1.61	2.093E+00	-----	Line Not Found	-----
	911.20	919	25.80*	1.947E+00	7.428E-01	7.428E-01	10.41
	968.97	556	15.80	1.848E+00	7.729E-01	7.729E-01	11.31
PA-234M	766.42	170	0.32	2.247E+00	9.574E+00	9.574E+00	38.73
	1001.03	98	0.84*	1.797E+00	2.629E+00	2.629E+00	50.17
TH-234	63.29	469	3.70*	9.501E+00	5.411E-01	5.411E-01	51.95
	92.59	1227	4.23	9.226E+00	1.276E+00	1.276E+00	20.49
U-234	609.32	1333	45.49*	2.721E+00	4.372E-01	4.372E-01	10.37
	1120.29	268	14.92	1.631E+00	4.476E-01	4.476E-01	26.36
	1764.49	206	15.30	1.081E+00	5.063E-01	5.063E-01	25.50
U-235	89.96	1011	3.47	9.295E+00	1.272E+00	1.272E+00	18.55
	93.35	1227	5.60	9.226E+00	9.636E-01	9.636E-01	20.49
	143.76	12	10.96*	7.743E+00	5.723E-03	5.723E-03	1422.69
	163.33	-----	5.08	7.228E+00	-----	Line Not Found	-----
	185.72	792	57.20	6.675E+00	8.422E-02	8.422E-02	28.64
	205.31	-----	5.01	6.261E+00	-----	Line Not Found	-----
U-238	63.29	469	3.70*	9.501E+00	5.411E-01	5.411E-01	51.95
	92.59	1227	4.23	9.226E+00	1.276E+00	1.276E+00	20.49

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AM-243	43.53	-----	5.90	8.322E+00	-----	Line Not Found	-----
	74.66	2879	67.20*	9.543E+00	1.822E-01	1.822E-01	7.82
ANH-511	511.00	318	100.00*	3.141E+00	4.105E-02	4.105E-02	67.16

Flag: "*" = Keyline

Total number of lines in spectrum 88
Number of unidentified lines 26
Number of lines tentatively identified by NID 62 70.45%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
BE-7	53.22D	1.67	1.180E-01	1.975E-01	2.250E-01	113.90	
K-40	1.25E+09Y	1.00	5.622E+00	5.622E+00	0.304E+00	5.40	
CO-60	5.27Y	1.01	3.289E-02	3.336E-02	1.776E-02	53.24	
AS-73	80.30D	1.41	1.748E-02	2.459E-02	12.23E-02	497.25	
CD-109	461.40D	1.06	1.822E+00	1.934E+00	0.241E+00	12.49	
SN-126	2.30E+05Y	1.00	1.822E-01	1.822E-01	0.228E-01	12.49	
BA-137M	30.08Y	1.00	3.351E+00	3.359E+00	0.054E+00	1.61	
CS-137	30.08Y	1.00	3.540E+00	3.549E+00	0.057E+00	1.61	
CE-141	32.51D	2.32	1.299E-03	3.019E-03	42.95E-03	1422.69	
EU-155	4.75Y	1.02	2.997E-02	3.045E-02	3.661E-02	120.25	
TL-208	1.41E+10Y	1.00	2.185E-01	2.185E-01	0.222E-01	10.14	
PB-210	22.20Y	1.00	6.932E-01	6.956E-01	2.839E-01	40.81	
BI-211	7.04E+08Y	1.00	1.663E+00	1.663E+00	0.157E+00	9.41	
BI-212	1.41E+10Y	1.00	7.243E-01	7.243E-01	2.037E-01	28.12	
PB-212	1.41E+10Y	1.00	7.993E-01	7.993E-01	0.348E-01	4.35	
BI-214	1600.00Y	1.00	4.372E-01	4.373E-01	0.453E-01	10.37	
PB-214	1600.00Y	1.00	6.036E-01	6.036E-01	0.568E-01	9.41	
RN-222	1600.00Y	1.00	4.372E-01	4.373E-01	0.453E-01	10.37	
RA-223	7.04E+08Y	1.00	1.170E-01	1.170E-01	0.327E-01	27.98	K
RA-224	1.41E+10Y	1.00	1.712E+00	1.712E+00	0.363E+00	21.18	
RA-226	1600.00Y	1.00	4.372E-01	4.373E-01	0.453E-01	10.37	
AC-228	1.41E+10Y	1.00	7.428E-01	7.428E-01	0.773E-01	10.41	
RA-228	1.41E+10Y	1.00	7.428E-01	7.428E-01	0.773E-01	10.41	
TH-228	1.41E+10Y	1.00	7.993E-01	7.993E-01	0.348E-01	4.35	
TH-229	7340.00Y	1.00	2.809E-01	2.809E-01	0.351E-01	12.49	K
TH-230	7.54E+04Y	1.00	4.372E-01	4.372E-01	0.453E-01	10.37	
PA-231	7.04E+08Y	1.00	4.448E-01	4.448E-01	2.209E-01	49.67	
TH-232	1.41E+10Y	1.00	7.428E-01	7.428E-01	0.773E-01	10.41	
PA-234M	4.47E+09Y	1.00	2.629E+00	2.629E+00	1.319E+00	50.17	
TH-234	4.47E+09Y	1.00	5.411E-01	5.411E-01	2.811E-01	51.95	
U-234	2.45E+05Y	1.00	4.372E-01	4.372E-01	0.453E-01	10.37	
U-235	7.04E+08Y	1.00	5.723E-03	5.723E-03	81.42E-03	1422.69	
U-238	4.47E+09Y	1.00	5.411E-01	5.411E-01	2.811E-01	51.95	
AM-243	7370.00Y	1.00	1.822E-01	1.822E-01	0.142E-01	7.82	
ANH-511	1.00E+09Y	1.00	4.105E-02	4.105E-02	2.757E-02	67.16	

Total Activity : 3.113E+01 3.135E+01

Grand Total Activity : 3.113E+01 3.135E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	25.79	97	1748	0.85	53.09	51	5	1.57E-03	****	4.79E+00	
0	32.34	2175	2611	1.01	66.18	62	8	3.61E-02	10.9	6.46E+00	
0	36.82	711	2447	0.92	75.13	71	8	1.19E-02	29.7	7.35E+00	
0	39.99	160	1785	1.41	81.48	80	6	2.70E-03	99.5	7.86E+00	
0	99.05	210	2139	1.43	199.62	196	8	3.84E-03	94.5	9.07E+00	T
0	115.56	203	1418	1.13	232.64	230	6	3.76E-03	67.8	8.59E+00	T
0	129.04	168	1822	0.91	259.59	257	7	3.14E-03	95.3	8.19E+00	T
0	209.27	318	1988	1.08	420.07	416	9	6.22E-03	56.2	6.18E+00	
0	327.94	168	1010	1.04	657.44	654	8	3.42E-03	72.0	4.46E+00	T
0	409.45	142	752	1.01	820.46	818	7	2.97E-03	69.5	3.75E+00	T
0	437.38	85	993	1.47	876.33	872	9	1.78E-03	****	3.56E+00	
0	463.44	329	1521	1.31	928.44	921	14	6.94E-03	54.0	3.40E+00	T
0	491.71	54	591	1.26	984.97	982	8	1.14E-03	****	3.24E+00	T
0	600.18	30	473	2.18	1201.91	1195	10	6.44E-04	****	2.75E+00	T
0	655.86	38	332	2.65	1313.26	1309	9	8.30E-04	****	2.56E+00	
0	737.10	48	296	3.86	1475.74	1468	14	1.07E-03	****	2.32E+00	T
0	743.29	14	326	3.20	1488.11	1482	14	3.08E-04	****	2.31E+00	
1	772.21	90	218	1.82	1545.95	1530	21	2.00E-03	69.7	2.24E+00	T
0	816.76	13	133	0.90	1635.04	1630	9	3.00E-04	****	2.13E+00	T
0	838.56	105	655	5.87	1678.63	1656	31	2.36E-03	****	2.09E+00	
0	903.93	43	170	2.72	1809.37	1804	10	9.74E-04	****	1.96E+00	T
0	923.40	33	118	0.79	1848.30	1845	8	7.49E-04	****	1.92E+00	T
0	926.72	24	81	1.37	1854.93	1852	6	5.49E-04	****	1.92E+00	T
0	934.18	55	222	1.63	1869.85	1862	12	1.24E-03	****	1.91E+00	
0	943.32	28	89	1.67	1888.12	1885	7	6.45E-04	****	1.89E+00	T
1	964.11	185	137	1.74	1929.69	1920	34	4.24E-03	27.5	1.86E+00	T
0	978.38	29	142	0.50	1958.23	1955	12	6.72E-04	****	1.83E+00	
0	1046.27	58	127	4.35	2093.98	2088	11	1.33E-03	81.0	1.73E+00	T
0	1063.40	17	161	1.19	2128.24	2122	10	3.86E-04	****	1.71E+00	T
0	1078.85	39	140	3.34	2159.14	2154	11	8.99E-04	****	1.68E+00	
0	1128.59	17	128	1.27	2258.61	2254	10	3.98E-04	****	1.62E+00	T
0	1154.29	5	161	1.74	2309.98	2307	10	1.20E-04	****	1.59E+00	
0	1237.62	91	129	2.28	2476.62	2472	10	2.14E-03	50.8	1.49E+00	T
0	1280.98	46	110	1.70	2563.32	2556	12	1.09E-03	94.9	1.45E+00	
0	1378.51	72	138	2.28	2758.33	2747	19	1.72E-03	81.4	1.36E+00	
0	1386.10	8	59	0.75	2773.49	2767	9	1.99E-04	****	1.35E+00	
0	1407.65	37	63	1.64	2816.59	2813	10	8.80E-04	85.8	1.33E+00	T
0	1508.78	36	84	1.03	3018.78	3010	14	8.70E-04	****	1.25E+00	
2	1587.63	80	38	2.57	3176.44	3170	24	1.94E-03	38.0	1.19E+00	
2	1592.00	66	35	2.57	3185.17	3170	24	1.60E-03	51.4	1.19E+00	
0	1622.34	54	68	3.32	3245.83	3236	21	1.30E-03	80.9	1.17E+00	T
0	1630.32	47	36	1.53	3261.78	3256	12	1.14E-03	58.3	1.16E+00	
0	1663.00	55	57	6.63	3327.11	3316	24	1.34E-03	75.4	1.14E+00	
0	1728.92	69	31	2.84	3458.92	3453	12	1.70E-03	39.1	1.10E+00	
0	1758.04	17	36	3.77	3517.14	3508	14	4.05E-04	****	1.08E+00	
0	1846.75	32	50	1.37	3694.48	3688	14	7.92E-04	96.2	1.03E+00	
0	1865.70	16	38	0.62	3732.36	3722	15	4.04E-04	****	1.02E+00	
0	1989.80	23	30	3.60	3980.46	3973	13	5.72E-04	****	9.61E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732001.CNF;1
Acquisition date : 28-JUN-2016 16:02:44 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:07.32 Half life ratio : *****
Sample date : 20-MAY-2016 08:40:00 Nuclide Library : SOLID
Sample ID : G398732001 Analyst initials: MXR1
Batch Number : 1572490 Sample Quantity : 1.5413E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	1.360E-01
K-40	6.967E-02
CO-60	7.567E-03
AS-73	5.373E-02
CD-109	1.195E-01
SN-126	1.124E-02
BA-137M	7.772E-03
CS-137	8.211E-03
EU-155	1.962E-02
TL-208	7.860E-03
PB-210	9.483E-02
BI-211	5.159E-02
BI-212	1.005E-01
PB-212	1.294E-02
BI-214	1.625E-02
PB-214	3.473E-02
RN-222	1.625E-02
RA-224	1.387E-01
RA-226	1.625E-02
AC-228	2.575E-02
RA-228	2.575E-02
TH-228	1.294E-02
TH-229	1.285E-01
TH-230	1.625E-02
PA-231	1.113E-01
TH-232	2.575E-02
PA-234M	8.122E-01
TH-234	1.181E-01
U-234	1.625E-02
U-235	4.207E-02
U-238	1.181E-01
AM-243	6.384E-03
ANH-511	7.623E-03

---- Non-Identified Nuclides ----

Lc

Nuclide	(pCi/GRAM)	
NA-22	7.412E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.582E-03	FAIL ABUN
SC-46	8.950E-03	FAIL ABUN
V-48	3.653E-02	FAIL ABUN
CR-51	1.702E-01	NOT IDENT.
MN-54	8.346E-03	NOT IDENT.
CO-56	9.923E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	5.526E-03	NOT IDENT.
CO-58	9.492E-03	NOT IDENT.
FE-59	2.380E-02	NOT IDENT.
ZN-65	1.866E-02	NOT IDENT.
GE-68	2.680E-01	NOT IDENT.
AS-74	5.591E-02	NOT IDENT.
SE-75	1.217E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.247E-01	NOT IDENT.
RB-83	2.215E-02	NOT IDENT.
KR-85	2.032E+00	NOT IDENT.
SR-85	1.391E-02	NOT IDENT.
RB-86	3.957E-01	NOT IDENT.
Y-88	8.618E-03	NOT IDENT.
Y-91	5.235E+00	NOT IDENT.
NB-94	7.165E-03	NOT IDENT.
NB-95	1.224E-02	NOT IDENT.
NB-95M	3.579E-02	NOT IDENT.
ZR-95	1.977E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	6.540E-03	NOT IDENT.
RH-102	1.212E-02	FAIL ABUN
RU-103	1.582E-02	FAIL ABUN
RH-106	7.357E-02	NOT IDENT.
RU-106	7.357E-02	NOT IDENT.
AG-108M	8.811E-03	NOT IDENT.
AG-110M	1.026E-02	NOT IDENT.
SN-113	1.418E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	4.071E-02	NOT IDENT.
TE-123M	7.051E-03	NOT IDENT.
SB-124	1.963E-02	NOT IDENT.
SB-125	2.818E-02	FAIL ABUN
TE-125M	2.430E+00	NOT IDENT.
I-126	1.782E-01	NOT IDENT.
SB-126	1.163E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	2.595E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.084E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.799E-03	FAIL ABUN
CS-135	3.778E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	7.512E-02	FAIL ABUN
CE-139	7.156E-03	NOT IDENT.
BA-140	2.424E-01	NOT IDENT.
LA-140	6.060E-02	FAIL ABUN
CE-141	2.304E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	4.384E-02	NOT IDENT.
PM-144	7.065E-03	FAIL ABUN
PR-144	5.353E-01	NOT IDENT.
PM-146	1.347E-02	FAIL ABUN
ND-147	6.527E-01	FAIL ABUN
PM-147	1.527E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	6.973E-03	FAIL ABUN
EU-152	2.424E-02	FAIL ABUN
GD-153	1.541E-02	NOT IDENT.
EU-154	2.076E-02	NOT IDENT.
TB-160	3.081E-02	FAIL ABUN
HO-166M	1.211E-02	FAIL ABUN

TM-171	8.823E-01	FAIL ABUN
HF-172	3.999E-02	FAIL ABUN
LU-172	1.339E-02	FAIL ABUN
LU-176	6.427E-03	FAIL ABUN
HF-181	1.893E-02	NOT IDENT.
TA-182	4.108E-02	FAIL ABUN
RE-183	1.792E-02	NOT IDENT.
RE-184	4.131E-02	FAIL ABUN
W-188	2.154E+00	FAIL ABUN
IR-192	1.076E-02	FAIL ABUN
HG-203	1.400E-02	FAIL ABUN
BI-207	1.002E-02	FAIL ABUN
PB-211	1.974E-01	NOT IDENT.
RN-219	1.142E-01	FAIL ABUN
RA-223	1.663E-01	FAIL ABUN
AC-227	6.107E-02	FAIL ABUN
TH-227	6.107E-02	FAIL ABUN
TH-231	1.663E-01	FAIL ABUN
PA-233	1.613E-02	FAIL ABUN
PA-234	5.356E-02	FAIL ABUN
NP-237	1.613E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	5.262E-02	FAIL ABUN
PU-239	7.402E+01	FAIL ABUN
AM-241	1.207E-02	NOT IDENT.
CM-243	1.930E-02	FAIL ABUN
BK-247	1.897E-02	FAIL ABUN
CM-247	1.036E-02	FAIL ABUN
CF-249	1.127E-02	NOT IDENT.
CF-251	2.981E-02	NOT IDENT.

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DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732001.CNF;1
Acquisition date : 28-JUN-2016 16:02:44 Sensitivity : 3.000
Detector ID : GAM05 Energy tolerance : 1.500
Elapsed live time : 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time : 0 12:00:07.32 Half life ratio : *****
Sample date : 20-MAY-2016 08:40:00 Nuclide Library : SOLID
Sample ID : G398732001 Analyst initials : MXR1
Batch Number : 1572490 Sample Quantity : 1.5413E+02 GRAM
Quantity Err(%) : 1.2976E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 17-SEP-2015 12:25:23 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
BE-7	1.975E-01	2.212E-01	2.212E-01
K-40	5.622E+00	5.813E-01	5.813E-01
CO-60	3.336E-02	1.762E-02	1.762E-02
AS-73	2.459E-02	1.199E-01	1.199E-01
CD-109	1.438E+00	2.996E-01	2.996E-01
SN-126	1.355E-01	2.731E-02	2.731E-02
BA-137M	3.359E+00	2.725E-01	2.725E-01
CS-137	3.549E+00	2.877E-01	2.877E-01
EU-155	3.045E-02	3.603E-02	3.603E-02
TL-208	2.185E-01	2.857E-02	2.857E-02
PB-210	6.956E-01	2.843E-01	2.843E-01
BI-211	2.672E-01	3.431E-01	3.431E-01
BI-212	7.243E-01	2.124E-01	2.124E-01
PB-212	7.993E-01	1.134E-01	1.134E-01
BI-214	4.373E-01	5.754E-02	5.754E-02
PB-214	6.036E-01	8.057E-02	8.057E-02
RN-222	4.373E-01	5.754E-02	5.754E-02
RA-224	8.165E-01	4.283E-01	4.283E-01
RA-226	4.373E-01	5.754E-02	5.754E-02
AC-228	7.428E-01	1.378E-01	1.378E-01
RA-228	7.428E-01	1.378E-01	1.378E-01
TH-228	7.993E-01	1.134E-01	1.134E-01
TH-229	8.173E-02	1.468E-01	1.468E-01
TH-230	4.372E-01	5.754E-02	5.754E-02
PA-231	4.448E-01	2.403E-01	2.403E-01
TH-232	7.428E-01	1.378E-01	1.378E-01
PA-234M	2.629E+00	1.369E+00	1.369E+00
TH-234	5.411E-01	3.010E-01	3.010E-01
U-234	4.372E-01	5.754E-02	5.754E-02
U-235	5.723E-03	7.980E-02	7.980E-02
U-238	5.411E-01	3.010E-01	3.010E-01
AM-243	1.385E-01	2.034E-02	2.034E-02
ANH-511	4.105E-02	2.725E-02	2.725E-02

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
NA-22	-4.593E-03	1.053E-02	1.073E-02	NOT IDENT.
NA-24	-3.255E+16	1.144E+17	0.000E+00	SHORT HLIF
AL-26	3.815E-04	7.704E-03	7.706E-03	FAIL ABUN
SC-46	-4.229E-03	1.078E-02	1.095E-02	FAIL ABUN
V-48	-1.731E-02	5.200E-02	5.258E-02	FAIL ABUN
CR-51	-7.437E-02	1.926E-01	1.955E-01	NOT IDENT.
MN-54	1.434E-02	9.315E-03	1.134E-02	NOT IDENT.
CO-56	-1.924E-03	1.244E-02	1.247E-02	FAIL ABUN
MN-56	-1.000E+41	6.075E+41	0.000E+00	SHORT HLIF
CO-57	-7.705E-04	6.136E-03	6.146E-03	NOT IDENT.
CO-58	-1.764E-02	1.413E-02	1.622E-02	NOT IDENT.
FE-59	-1.501E-02	2.838E-02	2.917E-02	NOT IDENT.
ZN-65	2.041E-03	2.600E-02	2.602E-02	NOT IDENT.
GE-68	2.148E-01	3.441E-01	3.574E-01	NOT IDENT.
AS-74	8.600E-02	6.888E-02	7.904E-02	NOT IDENT.
SE-75	3.345E-03	1.434E-02	1.442E-02	NOT IDENT.
BR-77	1.544E+05	1.776E+05	1.907E+05	SHORT HLIF
SR-82	-3.216E-02	1.691E-01	1.697E-01	NOT IDENT.
RB-83	-4.509E-04	2.606E-02	2.606E-02	NOT IDENT.
KR-85	7.398E+00	2.529E+00	4.186E+00	NOT IDENT.
SR-85	5.052E-02	1.732E-02	2.861E-02	NOT IDENT.
RB-86	4.057E-01	5.039E-01	5.361E-01	NOT IDENT.
Y-88	9.312E-04	1.007E-02	1.007E-02	NOT IDENT.
Y-91	2.960E+00	5.954E+00	6.102E+00	NOT IDENT.
NB-94	7.901E-03	7.950E-03	8.712E-03	NOT IDENT.
NB-95	3.270E-02	1.492E-02	2.097E-02	NOT IDENT.
NB-95M	-3.233E-02	4.528E-02	4.757E-02	NOT IDENT.
ZR-95	3.635E-02	2.164E-02	2.714E-02	NOT IDENT.
NB-97	1.000E+41	1.499E+40	0.000E+00	SHORT HLIF
ZR-97	3.495E+16	1.717E+16	0.000E+00	SHORT HLIF
MO-99	1.668E+03	2.152E+03	2.279E+03	SHORT HLIF
TC-99M	-1.000E+41	5.747E+41	0.000E+00	SHORT HLIF
RH-101	-2.149E-03	8.198E-03	8.255E-03	NOT IDENT.
RH-102	-3.290E-04	1.377E-02	1.377E-02	FAIL ABUN
RU-103	-9.782E-03	2.165E-02	2.209E-02	FAIL ABUN
RH-106	-1.037E-02	8.373E-02	8.386E-02	NOT IDENT.
RU-106	-1.037E-02	8.373E-02	8.386E-02	NOT IDENT.
AG-108M	-2.629E-03	1.171E-02	1.177E-02	NOT IDENT.
AG-110M	2.220E-03	1.196E-02	1.200E-02	NOT IDENT.
SN-113	-5.076E-03	1.633E-02	1.649E-02	NOT IDENT.
CD-115	7.660E+02	6.694E+03	6.702E+03	SHORT HLIF
SN-117M	8.303E-03	5.143E-02	5.157E-02	NOT IDENT.
TE-123M	-1.758E-03	8.427E-03	8.464E-03	NOT IDENT.
SB-124	-2.299E-03	2.311E-02	2.314E-02	NOT IDENT.
SB-125	-2.908E-03	3.255E-02	3.257E-02	FAIL ABUN
TE-125M	-3.271E+00	3.082E+00	3.417E+00	NOT IDENT.
I-126	1.853E-01	2.246E-01	2.397E-01	NOT IDENT.
SB-126	-1.780E-02	1.554E-01	1.556E-01	NOT IDENT.
SB-127	4.202E+00	2.395E+01	2.403E+01	SHORT HLIF
I-131	1.308E-01	2.915E-01	2.974E-01	NOT IDENT.
I-132	1.000E+41	3.789E+41	0.000E+00	SHORT HLIF
TE-132	-2.155E+00	3.885E+01	3.886E+01	SHORT HLIF
BA-133	6.073E-03	1.378E-02	1.404E-02	FAIL ABUN
I-133	3.719E+09	5.222E+11	5.222E+11	SHORT HLIF
CS-134	2.722E-02	1.347E-02	1.822E-02	FAIL ABUN
CS-135	5.308E-02	4.617E-02	5.200E-02	NOT IDENT.
I-135	-6.638E+40	8.326E+41	0.000E+00	SHORT HLIF
CS-136	-1.181E-03	1.048E-01	1.048E-01	FAIL ABUN
CE-139	-5.105E-03	8.338E-03	8.649E-03	NOT IDENT.
BA-140	8.583E-02	2.831E-01	2.858E-01	NOT IDENT.
LA-140	3.259E-02	8.116E-02	8.248E-02	FAIL ABUN
CE-141	3.019E-03	4.209E-02	4.212E-02	FAIL ABUN
CE-143	3.580E+07	9.457E+06	1.870E+07	SHORT HLIF
CE-144	-4.576E-02	5.267E-02	5.657E-02	NOT IDENT.
PM-144	-1.011E-02	8.552E-03	9.691E-03	FAIL ABUN
PR-144	-7.691E-01	6.482E-01	7.351E-01	NOT IDENT.
PM-146	2.034E-03	1.557E-02	1.560E-02	FAIL ABUN
ND-147	1.425E-01	7.646E-01	7.673E-01	FAIL ABUN
PM-147	-1.179E+02	1.718E+02	1.799E+02	NOT IDENT.
PM-149	-1.023E+04	5.149E+04	5.170E+04	SHORT HLIF
EU-150	1.010E-03	8.894E-03	8.906E-03	FAIL ABUN
EU-152	-3.215E-02	2.934E-02	3.272E-02	FAIL ABUN
GD-153	1.266E-02	2.311E-02	2.380E-02	NOT IDENT.
EU-154	-5.933E-03	2.885E-02	2.898E-02	NOT IDENT.
TB-160	-3.065E-02	3.813E-02	4.055E-02	FAIL ABUN

HO-166M	-1.029E-02	1.437E-02	1.510E-02	FAIL	ABUN
TM-171	3.983E-01	1.941E+00	1.949E+00	FAIL	ABUN
HF-172	3.782E-03	4.956E-02	4.959E-02	FAIL	ABUN
LU-172	2.080E-02	1.509E-02	1.777E-02	FAIL	ABUN
LU-176	-1.262E-03	7.205E-03	7.228E-03	FAIL	ABUN
HF-181	1.764E-02	2.465E-02	2.590E-02	NOT	IDENT.
TA-182	6.456E-02	4.503E-02	5.362E-02	FAIL	ABUN
RE-183	-1.242E-02	1.997E-02	2.074E-02	NOT	IDENT.
RE-184	5.068E-02	5.973E-02	6.395E-02	FAIL	ABUN
W-188	-2.908E+00	2.841E+00	3.129E+00	FAIL	ABUN
IR-192	-9.202E-04	1.207E-02	1.208E-02	FAIL	ABUN
HG-203	2.384E-02	1.708E-02	2.018E-02	FAIL	ABUN
BI-207	5.342E-03	1.529E-02	1.547E-02	FAIL	ABUN
PB-211	-5.042E-02	2.461E-01	2.472E-01	NOT	IDENT.
RN-219	2.547E-02	1.302E-01	1.307E-01	FAIL	ABUN
RA-223	1.630E-01	2.078E-01	2.204E-01	FAIL	ABUN
AC-227	1.990E-03	6.705E-02	6.705E-02	FAIL	ABUN
TH-227	1.990E-03	6.705E-02	6.705E-02	FAIL	ABUN
TH-231	1.630E-01	2.078E-01	2.204E-01	FAIL	ABUN
PA-233	1.054E-02	1.783E-02	1.845E-02	FAIL	ABUN
PA-234	-8.123E-02	1.233E-01	1.286E-01	FAIL	ABUN
NP-237	1.054E-02	1.783E-02	1.845E-02	FAIL	ABUN
NP-238	-5.233E+03	1.559E+04	1.577E+04	SHORT	HLIF
NP-239	1.210E-01	8.172E-02	9.824E-02	FAIL	ABUN
PU-239	1.319E+02	1.241E+02	1.377E+02	FAIL	ABUN
AM-241	2.155E-02	1.374E-02	1.683E-02	NOT	IDENT.
CM-243	-1.111E-02	3.019E-02	3.060E-02	FAIL	ABUN
BK-247	5.746E-03	2.355E-02	2.369E-02	FAIL	ABUN
CM-247	4.398E-04	1.186E-02	1.186E-02	FAIL	ABUN
CF-249	5.666E-03	1.274E-02	1.300E-02	NOT	IDENT.
CF-251	2.148E-02	3.384E-02	3.520E-02	NOT	IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
74.66	1026.2125	105.31	1441.2679	131.20	1331.3121
879.38	1079.4355	86.79	1442.0443	133.02	1317.0706
46.54	1115.8651	86.94	1442.5369	133.52	1324.5787
228.16	0.0000	87.09	1443.0255	136.00	1283.1885
52.39	1185.1023	87.57	1444.5859	136.47	1317.9517
1093.63	1172.6709	88.03	1446.0754	739.50	0.0000
52.39	1149.1429	306.78	1447.0764	140.51	0.0000
125.81	1144.8740	88.47	1447.4941	143.76	1251.6761
53.44	1208.3522	143.76	1452.2780	144.24	1227.7571
54.07	1210.7358	90.64	1454.4453	145.44	1178.6888
293.27	0.0000	531.02	1455.9427	152.43	1172.5315
482.18	1522.1642	92.59	1460.6241	1048.07	1196.0481
57.98	1481.6869	93.35	1463.0121	154.21	1187.7677
59.27	1332.2578	94.56	1466.7950	158.56	1215.2461
59.32	1377.9960	311.90	1467.0787	159.00	1193.9009
59.54	1378.8827	946.00	1467.1418	162.33	1134.9564
60.96	1500.9299	94.87	1467.7644	537.26	1118.4556
61.17	1501.8364	97.43	1194.2556	163.33	1156.8521
62.93	1618.0549	98.43	1183.8533	165.86	1170.6659
63.29	1619.6910	98.44	1183.8784	427.87	1168.2279
290.67	1621.0055	103.37	1186.5411	176.60	1191.4966
87.57	1690.5970	116.74	1186.5411	177.52	1178.8434
66.73	1700.6543	100.11	1252.5886	181.07	0.0000
67.24	1649.7699	102.03	1231.5212	181.52	1208.6908
67.68	1718.3203	103.18	1297.9591	184.41	1145.8151
1221.41	1718.6451	103.37	1298.4524	185.72	1276.4103
97.43	1786.3440	911.20	1265.4751	193.51	1292.5913
279.20	1829.3666	105.31	1265.7213	197.03	1342.9504
1063.66	1752.3080	106.12	1272.0985	198.01	1256.3667
72.87	1581.5485	106.47	1272.9730	201.83	1336.3737
351.06	1581.5485	109.28	1350.1354	203.43	1245.6772
74.66	1588.7156	111.00	1300.2715	205.31	1287.9679
238.63	1589.3501	111.76	0.0000	210.85	1226.7980
351.93	1589.3501	114.06	1365.3405	215.65	1114.5397
238.63	1589.3501	116.30	0.0000	222.11	1073.4673
74.97	1589.9399	116.74	1204.4948	227.09	1063.3569
77.11	1598.3850	119.76	1193.2129	227.38	1042.8916
78.74	1524.8131	264.66	1297.7948	228.16	0.0000
256.23	1409.7554	121.22	1298.0266	228.18	1051.9282
133.52	1429.5319	344.28	1273.3781	235.69	1160.8226
364.49	1429.7699	122.06	1263.0247	235.96	1147.1599
711.68	1384.2784	122.92	1237.9496	238.63	1017.5647
356.01	1462.8265	1274.44	1262.2823	238.98	0.0000
323.87	1463.0697	123.68	1248.6173	240.99	1020.1556
81.75	1468.1791	125.81	1248.2477	242.00	1021.2609
83.79	1495.9814	127.23	1276.9994	244.70	965.7047
265.00	1432.8982	127.91	1272.4463	685.70	0.0000
193.51	1437.6033	129.30	1285.0670	388.16	958.9692

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
507.63	0.0000	345.93	774.8267	569.50	440.1119
256.23	972.2062	351.06	813.7097	569.70	440.1597
527.90	0.0000	351.93	814.2830	583.19	372.6594
264.66	879.2018	355.39	0.0000	584.27	359.8665
264.80	871.8776	356.01	760.7869	595.83	327.0929
265.00	872.0398	364.49	801.7284	600.60	434.6783
268.22	883.5320	366.42	0.0000	602.52	0.0000
269.46	896.7041	372.51	805.7305	604.72	486.0576
270.03	897.2023	375.05	780.4951	607.14	489.7266
401.81	904.3120	377.52	808.8194	609.32	425.6186
273.65	906.4548	383.85	847.6765	610.33	395.4929
276.40	923.4871	388.16	833.3585	614.28	356.3640
583.19	924.3518	666.33	808.5704	618.01	361.0450
277.60	924.5526	391.69	841.5723	884.68	367.0312
402.40	924.9077	400.66	809.6558	621.93	353.4433
279.20	895.9614	401.81	831.6108	630.19	0.0000
279.54	896.2603	402.40	825.8814	631.29	327.2328
279.70	881.7477	404.85	839.1797	633.25	313.5927
280.46	875.0656	410.95	802.6110	634.78	342.7000
301.36	853.9923	413.71	813.9917	635.95	335.4521
284.31	911.0576	720.70	794.6506	636.99	330.0341
285.41	903.8578	423.72	914.5566	1690.97	326.8041
285.90	0.0000	427.09	879.5651	657.76	320.2358
287.50	838.3173	427.87	912.0162	657.90	0.0000
290.67	922.0126	433.94	863.6058	661.66	331.8511
293.27	0.0000	439.40	816.8868	664.57	0.0000
295.22	823.3582	453.88	911.2967	666.33	288.4618
316.51	823.9127	463.37	890.5294	666.50	288.4841
298.58	916.8245	468.07	949.3887	667.71	0.0000
299.98	868.7373	473.00	0.0000	677.62	231.0695
300.09	868.8226	631.29	941.6931	685.70	0.0000
300.13	868.8510	696.49	869.4155	695.00	294.3183
311.90	868.8510	477.60	821.8934	696.49	323.3011
301.36	814.5328	482.18	656.8406	696.51	323.3011
302.85	848.5482	487.02	617.6514	697.00	315.6986
304.50	780.8640	492.35	0.0000	697.30	322.4648
304.85	779.6191	497.08	585.2302	697.49	311.9318
306.78	823.2045	505.52	622.9387	702.65	270.3459
308.46	876.1392	507.63	0.0000	706.68	298.7988
311.90	795.8347	511.00	597.3483	711.68	293.6836
316.51	811.3621	514.00	535.4062	720.70	281.3057
319.41	869.4005	514.00	535.4062	721.93	0.0000
320.08	856.6082	520.40	526.2846	722.78	244.3551
321.04	853.5220	520.69	0.0000	722.91	247.6040
323.87	836.9167	667.71	0.0000	723.31	247.6476
325.23	905.0489	527.90	0.0000	756.73	229.9353
1596.21	884.8085	528.26	472.6483	727.33	263.6626
333.37	878.5049	529.59	476.3159	733.00	219.4629
333.97	870.2388	529.87	0.0000	735.93	224.6318
334.37	864.3769	531.02	467.9047	737.46	224.7834
338.28	857.3527	537.26	432.0116	739.50	0.0000
338.32	857.3798	1260.41	0.0000	747.24	204.4830
340.48	796.1125	552.55	407.9077	748.06	217.6511
340.55	819.3521	795.86	368.8599	752.31	256.7498
344.28	865.0599	569.33	424.0905	753.82	225.4163

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
756.73	198.1047	968.97	185.5674	1505.03	94.6909
756.80	198.1096	983.53	168.5811	1584.12	72.8125
763.94	225.7467	984.45	0.0000	1596.21	60.2384
765.81	224.2760	996.26	158.5189	1620.50	40.3829
1001.03	229.2855	1001.03	162.3889	1621.92	40.3960
766.84	217.7764	1002.74	144.4303	1678.03	0.0000
772.60	0.0000	1004.73	149.9478	1690.97	51.2767
776.52	223.6487	1021.30	0.0000	1750.46	0.0000
777.92	0.0000	1025.87	0.0000	1764.49	44.7534
778.90	237.3774	1028.54	0.0000	1770.23	58.0841
783.70	0.0000	1037.84	193.6519	1771.35	56.4370
785.37	236.4561	1038.76	0.0000	1791.20	0.0000
903.28	225.1154	1046.59	192.3804	1808.65	52.5753
794.95	219.3743	1048.07	181.4758	1810.72	0.0000
795.86	207.0955	1049.04	149.3122	1836.06	50.9482
801.95	264.5484	1050.41	160.3853		
810.06	266.3892	1063.66	189.5089		
810.29	266.4150	1077.00	157.0216		
810.45	266.4343	1077.34	161.8012		
810.76	265.5063	1085.87	157.1170		
815.77	190.9518	1093.63	146.0312		
818.51	170.2608	1099.45	176.1262		
832.01	206.4444	1112.07	155.9313		
834.85	206.6774	1112.84	129.9469		
835.71	206.7468	1115.54	183.0394		
836.80	0.0000	1120.29	192.4752		
846.75	0.0000	1120.55	192.4919		
846.77	228.8849	1121.30	166.0743		
856.80	195.1257	1808.65	177.3919		
860.56	182.0430	1131.51	0.0000		
871.09	199.3092	1147.95	0.0000		
873.19	180.8661	1332.49	170.6385		
875.33	0.0000	1177.95	163.6509		
879.38	205.1253	1189.05	163.7845		
880.51	188.6295	1204.77	167.4297		
883.24	182.6000	1221.41	139.2363		
884.68	183.7369	1231.02	161.4391		
889.28	191.3402	1235.36	168.0914		
894.76	194.8617	1238.28	183.6398		
1836.06	205.1892	1260.41	0.0000		
900.72	201.9144	1271.87	127.1268		
903.28	192.6497	1274.44	127.8895		
911.20	179.7363	1274.54	136.3089		
912.08	187.0367	1291.59	127.2311		
984.45	0.0000	1298.22	0.0000		
926.50	173.9751	1312.11	122.9909		
929.11	184.6942	1332.49	119.6826		
937.49	169.3789	1362.66	0.0000		
983.53	179.3356	1365.19	96.5820		
946.00	203.5242	1368.63	0.0000		
949.00	157.9333	1384.29	88.3998		
954.55	0.0000	1408.01	90.5391		
962.31	185.1315	1457.56	0.0000		
964.08	185.2500	1460.82	101.0306		
966.17	185.3854	1489.16	94.4732		

VAX/VMS Nuclide Identification Report Generated 30-JUN-2016 06:26:42.72

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732002.CNF:1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF:503
Background date    : 27-JUN-2016 09:26:53
Sample date       : 20-MAY-2016 08:50:00 Acquisition date : 28-JUN-2016 16:03:05
Sample ID        : G398732002 Sample quantity : 1.57293E+02 GRAM
Detector name     : GAM11 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:16.19 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572490 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.68*	68	2912	0.87	93.24	91	6	1.58E-03	132.9	
2	0	62.97*	74	4403	0.97	125.84	123	8	1.72E-03	165.2	
3	2	74.92*	910	3033	0.88	149.75	146	13	2.11E-02	10.1	6.09E-01
4	2	77.13*	1703	2814	0.87	154.18	146	13	3.94E-02	5.7	
5	0	83.93*	143	3315	1.29	167.80	166	6	3.31E-03	68.8	
6	0	87.25	670	3846	1.11	174.43	171	7	1.55E-02	15.8	
7	5	90.00	352	1651	0.83	179.95	178	13	8.16E-03	15.9	2.05E+00
8	5	92.84*	782	4183	1.33	185.62	178	13	1.81E-02	16.2	
9	0	105.27	143	3019	1.20	210.50	209	6	3.30E-03	61.4	
10	0	129.12	224	3074	0.85	258.23	256	6	5.17E-03	39.8	
11	0	140.72*	155	2883	1.84	281.45	279	6	3.58E-03	58.4	
12	2	185.85*	624	4055	1.33	371.78	366	28	1.44E-02	19.9	1.48E+00
13	2	187.69	334	4183	1.29	375.46	366	28	7.73E-03	35.1	
14	0	209.10	347	3015	1.11	418.30	416	6	8.03E-03	25.6	
15	4	238.65*	3161	2665	0.97	477.44	473	14	7.32E-02	3.3	2.93E+00
16	4	241.45	499	3544	1.34	483.04	473	14	1.16E-02	21.4	
17	0	270.01	441	3293	1.65	540.19	536	9	1.02E-02	24.0	
18	0	276.95	90	1836	0.49	554.09	552	5	2.07E-03	72.4	
19	0	295.17*	971	3067	1.12	590.55	586	9	2.25E-02	11.1	
20	0	300.75	98	2957	0.67	601.71	597	8	2.27E-03	96.4	
21	0	327.75	133	1981	0.70	655.76	653	6	3.08E-03	53.5	
22	0	338.41*	731	2898	1.11	677.08	673	9	1.69E-02	14.2	
23	0	351.94*	1425	3071	1.02	704.16	700	9	3.30E-02	7.7	
24	0	394.64	84	2654	0.53	789.60	787	8	1.94E-03	107.1	
25	0	410.88	55	2841	0.78	822.10	816	8	1.27E-03	169.2	
26	0	463.02	285	3251	1.39	926.44	923	8	6.60E-03	35.1	
27	0	510.99*	326	2729	2.12	1022.41	1015	14	7.55E-03	38.3	
28	0	583.17*	1039	1097	1.32	1166.84	1161	11	2.41E-02	7.2	
29	0	609.36*	942	1094	1.27	1219.24	1213	11	2.18E-02	8.2	
30	0	661.63*	98912	1167	1.38	1323.83	1316	16	2.29E+00	0.3	
31	0	679.14	23	182	1.36	1358.87	1356	8	5.39E-04	102.4	
32	0	693.35	57	234	1.70	1387.30	1383	9	1.31E-03	50.7	
33	0	720.60	84	166	3.72	1441.82	1437	10	1.94E-03	30.9	
34	0	727.03	262	297	1.60	1454.68	1450	14	6.07E-03	15.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	768.51*	91	223	1.77	1537.68	1517	31	2.10E-03	41.9	2.60E+00
36	1	772.01	69	123	1.77	1544.68	1517	31	1.59E-03	31.4	
37	0	776.30	18	165	0.61	1553.26	1547	9	4.17E-04	132.9	
38	0	784.78	76	220	0.66	1570.22	1565	12	1.76E-03	40.7	
39	0	789.21	11	192	0.95	1579.08	1577	10	2.51E-04	241.6	
40	0	794.72	145	203	1.83	1590.11	1586	11	3.35E-03	20.7	
41	0	829.85	60	177	1.42	1660.40	1654	12	1.38E-03	46.7	
42	0	835.52	73	213	2.03	1671.73	1666	12	1.70E-03	41.5	
43	0	860.29	163	148	1.46	1721.28	1715	12	3.76E-03	17.0	
44	0	911.16*	645	257	1.62	1823.05	1816	16	1.49E-02	7.3	
45	0	923.11	11	127	1.38	1846.96	1842	9	2.52E-04	190.5	
46	0	934.21	89	166	2.19	1869.17	1862	13	2.05E-03	32.0	
47	1	964.67	192	161	1.89	1930.10	1922	23	4.46E-03	14.4	1.81E+00
48	1	968.94*	351	149	1.66	1938.65	1922	23	8.13E-03	9.5	
49	0	983.23	14	146	4.23	1967.23	1963	12	3.26E-04	174.0	
50	0	1120.52*	231	258	1.81	2241.87	2232	20	5.34E-03	19.6	
51	0	1156.17	83	200	1.91	2313.18	2305	19	1.92E-03	43.2	
52	0	1217.77	13	88	1.23	2436.40	2431	8	3.08E-04	127.8	
53	4	1219.73	39	34	1.23	2440.31	2438	20	8.91E-04	28.1	1.58E+00
54	4	1223.22	47	117	2.49	2447.30	2438	20	1.08E-03	54.5	
55	0	1230.20	15	107	0.54	2461.26	2458	9	3.41E-04	128.9	
56	0	1238.32	60	148	2.07	2477.50	2472	10	1.39E-03	40.1	
57	0	1378.84	15	121	0.75	2758.54	2754	13	3.44E-04	165.0	
58	0	1391.37	20	58	3.33	2783.61	2778	11	4.63E-04	77.0	
59	0	1408.70	49	90	1.47	2818.27	2811	15	1.13E-03	44.5	
60	0	1460.75*	1683	101	1.99	2922.36	2912	20	3.90E-02	3.0	
61	0	1570.87	36	59	3.81	3142.59	3132	17	8.27E-04	52.2	
62	2	1588.17	72	64	2.39	3177.20	3169	27	1.66E-03	25.5	2.57E+00
63	2	1593.01	34	59	2.48	3186.86	3169	27	7.79E-04	56.2	
64	0	1622.13	49	68	1.12	3245.10	3238	17	1.13E-03	41.1	
65	0	1631.12*	32	51	2.45	3263.07	3255	16	7.48E-04	61.2	
66	0	1729.81	73	55	1.67	3460.43	3451	17	1.69E-03	26.1	
67	0	1764.87*	179	63	2.27	3530.53	3522	19	4.14E-03	15.5	
68	4	1852.05	11	8	1.44	3704.86	3703	13	2.51E-04	42.1	1.24E+00
69	4	1855.39	22	9	2.20	3711.53	3703	13	5.15E-04	32.5	

Flag: "*" = Peak area was modified by background subtraction


```

Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732002.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 20-MAY-2016 08:50:00 Acquisition date : 28-JUN-2016 16:03:05
Sample ID        : G398732002 Sample quantity : 157.29 GRAM
Sample type      : SOLID Sample geometry :
Detector name    : GAMMA11 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:00:16.19 0.0%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	1.256E+00	4.844E+00	4.844E+00	6.06	OK
MN-54	834.85	99.98*	2.034E+00	1.484E-02	1.620E-02	82.95	OK
SR-82	776.52	15.08*	2.163E+00	2.292E-02	6.760E-02	265.73	OK
CD-109	88.03	3.70*	6.499E+00	9.450E-01	1.003E+00	49.66	OK
SN-126	64.28	9.60	3.862E+00	1.068E-01	1.068E-01	330.37	OK
	86.94	8.90	6.499E+00	3.929E-01	3.929E-01	49.66	OK
	87.57	37.00*	6.499E+00	9.450E-02	9.450E-02	49.66	OK
BA-137M	661.66	89.90*	2.462E+00	1.889E+01	1.893E+01	0.66	OK
CS-137	661.66	85.10*	2.462E+00	1.995E+01	2.000E+01	0.66	OK
EU-155	86.55	30.70	6.499E+00	1.139E-01	1.157E-01	49.66	OK
	105.31	21.10*	7.173E+00	4.800E-02	4.876E-02	122.76	OK
TL-208	277.37	6.60	4.706E+00	1.336E-01	1.336E-01	144.79	OK
	583.19	85.00*	2.717E+00	1.928E-01	1.928E-01	14.33	OK
	860.56	12.50	1.985E+00	2.689E-01	2.689E-01	33.92	OK
PB-210	46.54	4.25*	1.306E+00	6.746E-01	6.769E-01	265.77	OK
BI-212	727.33	6.67*	2.282E+00	7.202E-01	7.202E-01	30.52	OK
	785.37	1.10	2.143E+00	1.333E+00	1.333E+00	81.41	OK
	1620.50	1.47	1.155E+00	-----	Line Not Found	-----	Absent
PB-212	74.82	10.28	5.446E+00	5.489E-01	5.489E-01	33.80	OK
	77.11	17.10	5.678E+00	9.183E-01	9.183E-01	11.48	OK
	238.63	43.60*	5.226E+00	6.527E-01	6.527E-01	6.68	OK
	300.09	3.30	4.436E+00	3.081E-01	3.081E-01	192.89	OK
BI-214	609.32	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42	OK
	1120.29	14.92	1.579E+00	3.894E-01	3.894E-01	39.18	OK
	1764.49	15.30	1.084E+00	4.065E-01	4.065E-01	30.99	OK
PB-214	74.82	5.80	5.435E+00	-----	Line Not Found	-----	<<INT Reject
	77.11	9.70	5.678E+00	1.619E+00	1.619E+00	11.48	OK
	87.09	3.41	6.489E+00	-----	Line Not Found	-----	<<INT Reject
	242.00	7.25	5.176E+00	-----	Line Not Found	-----	<<INT Reject
	295.22	18.42	4.496E+00	5.397E-01	5.397E-01	22.13	OK
	351.93	35.60*	3.959E+00	4.572E-01	4.572E-01	15.49	OK
RN-222	609.32	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42	OK
	1120.29	14.92	1.579E+00	3.894E-01	3.894E-01	39.18	OK
	1764.49	15.30	1.084E+00	4.065E-01	4.065E-01	30.99	OK
RA-224	240.99	4.10*	5.184E+00	1.492E-01	1.492E-01	347.25	OK
RA-226	609.32	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42	OK
	1120.29	14.92	1.579E+00	3.894E-01	3.894E-01	39.18	OK
	1764.49	15.30	1.084E+00	4.065E-01	4.065E-01	30.99	OK
AC-228	105.21	1.10	7.173E+00	9.207E-01	9.207E-01	122.76	OK
	338.32	11.27	4.073E+00	7.233E-01	7.233E-01	28.43	OK
	794.95	4.25	2.121E+00	6.640E-01	6.640E-01	41.49	OK
	835.71	1.61	2.034E+00	9.216E-01	9.216E-01	82.95	OK
	911.20	25.80*	1.890E+00	5.387E-01	5.387E-01	14.67	OK
	968.97	15.80	1.793E+00	5.017E-01	5.017E-01	18.96	OK
RA-228	105.21	1.10	7.173E+00	9.207E-01	9.207E-01	122.76	OK
	338.32	11.27	4.073E+00	7.233E-01	7.233E-01	28.43	OK
	794.95	4.25	2.121E+00	6.640E-01	6.640E-01	41.49	OK
	835.71	1.61	2.034E+00	9.216E-01	9.216E-01	82.95	OK
	911.20	25.80*	1.890E+00	5.387E-01	5.387E-01	14.67	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	968.97	15.80	1.793E+00	5.017E-01	5.017E-01	18.96	OK
	74.82	10.28	5.446E+00	5.489E-01	5.489E-01	33.80	OK
	77.11	17.10	5.678E+00	9.183E-01	9.183E-01	11.48	OK
	238.63	43.60*	5.226E+00	6.527E-01	6.527E-01	6.68	OK
TH-229	300.09	3.30	4.436E+00	3.081E-01	3.081E-01	192.89	OK
	85.43	14.70	6.272E+00	8.066E-02	8.066E-02	137.61	OK
	88.47	24.00	6.499E+00	1.457E-01	1.457E-01	49.66	OK
	193.51	4.41*	5.998E+00	----- Line	Not Found	-----	Absent
TH-230	210.85	2.80	5.680E+00	----- Line	Not Found	-----	Absent
	609.32	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42	OK
	1120.29	14.92	1.579E+00	3.894E-01	3.894E-01	39.18	OK
	1764.49	15.30	1.084E+00	4.065E-01	4.065E-01	30.99	OK
PA-231	283.69	1.70	4.626E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	4.436E+00	1.900E-01	1.900E-01	192.89	OK
	105.21	1.10	7.173E+00	9.207E-01	9.207E-01	122.76	OK
	338.32	11.27	4.073E+00	7.233E-01	7.233E-01	28.43	OK
	835.71	1.61	2.034E+00	9.216E-01	9.216E-01	82.95	OK
TH-234	911.20	25.80*	1.890E+00	5.387E-01	5.387E-01	14.67	OK
	968.97	15.80	1.793E+00	5.017E-01	5.017E-01	18.96	OK
	63.29	3.70*	3.862E+00	2.772E-01	2.772E-01	330.37	OK
	92.59	4.23	6.801E+00	1.399E+00	1.399E+00	32.40	OK
U-234	609.32	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42	OK
	1120.29	14.92	1.579E+00	3.894E-01	3.894E-01	39.18	OK
	1764.49	15.30	1.084E+00	4.065E-01	4.065E-01	30.99	OK
	89.96	3.47	6.660E+00	7.872E-01	7.872E-01	31.79	OK
U-235	93.35	5.60	6.801E+00	1.057E+00	1.057E+00	32.40	OK
	143.76	10.96*	6.969E+00	----- Line	Not Found	-----	Absent
	163.33	5.08	6.597E+00	----- Line	Not Found	-----	Absent
	185.72	57.20	6.146E+00	8.551E-02	8.551E-02	39.80	OK
U-238	205.31	5.01	5.779E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	3.862E+00	2.772E-01	2.772E-01	330.37	OK
	92.59	4.23	6.801E+00	1.399E+00	1.399E+00	32.40	OK
	43.53	5.90	9.036E-01	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	5.446E+00	8.397E-02	8.398E-02	33.80	OK
	511.00	100.00*	3.005E+00	4.720E-02	4.720E-02	76.62	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732002.CNF;1
Acquisition date : 28-JUN-2016 16:03:05 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:16.19 Half life ratio : *****
Sample date : 20-MAY-2016 08:50:00 Analyst initials: MXR1
Sample ID : G398732002 Sample Quantity : 1.5729E+02 GRAM
Batch Number : 1572490 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	4.844E+00	2.877E-01	1.269E-01
MN-54	1.620E-02	1.317E-02	1.191E-02
SR-82	6.760E-02	1.760E-01	2.431E-01
CD-109	1.003E+00	4.881E-01	5.004E-01
SN-126	9.450E-02	4.599E-02	4.734E-02
BA-137M	1.893E+01	1.217E-01	2.175E-02
CS-137	2.000E+01	1.286E-01	2.298E-02
EU-155	4.876E-02	5.866E-02	7.367E-02
TL-208	1.928E-01	2.707E-02	2.583E-02
PB-210	6.769E-01	1.763E+00	1.887E+00
BI-212	7.202E-01	2.154E-01	1.911E-01
PB-212	6.527E-01	4.276E-02	4.792E-02
BI-214	3.361E-01	5.408E-02	4.738E-02
PB-214	4.572E-01	6.941E-02	7.052E-02
RN-222	3.361E-01	5.408E-02	4.738E-02
RA-224	1.492E-01	5.077E-01	5.135E-01
RA-226	3.361E-01	5.408E-02	4.738E-02
AC-228	5.387E-01	7.744E-02	4.909E-02
RA-228	5.387E-01	7.744E-02	4.909E-02
TH-228	6.527E-01	4.276E-02	4.792E-02
TH-229	3.330E-01	2.643E-01	4.606E-01
TH-230	3.361E-01	5.407E-02	4.738E-02
PA-231	1.900E-01	3.592E-01	4.280E-01
TH-232	5.387E-01	7.744E-02	4.909E-02
TH-234	2.772E-01	8.975E-01	7.749E-01
U-234	3.361E-01	5.407E-02	4.738E-02
U-235	-8.184E-03	9.543E-02	1.460E-01
U-238	2.772E-01	8.975E-01	7.749E-01
AM-243	8.398E-02	2.782E-02	3.159E-02
ANH-511	4.720E-02	3.545E-02	2.643E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)

BE-7	2.487E-01	3.056E-01	5.392E-01	NOT IDENT.
NA-22	-6.019E-03	1.096E-02	1.576E-02	NOT IDENT.
NA-24	0.000E+00	8.850E+16	0.000E+00	SHORT HLIF
AL-26	5.026E-03	7.586E-03	1.437E-02	NOT IDENT.
SC-46	-7.012E-03	1.045E-02	1.803E-02	FAIL ABUN
V-48	1.790E-02	6.104E-02	7.491E-02	FAIL ABUN
CR-51	7.546E-02	3.540E-01	6.442E-01	NOT IDENT.
CO-56	2.676E-03	1.085E-02	1.969E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	-2.298E-03	1.158E-02	2.015E-02	NOT IDENT.
CO-58	-9.598E-03	1.056E-02	1.820E-02	NOT IDENT.
FE-59	1.408E-02	2.733E-02	4.937E-02	NOT IDENT.
CO-60	2.954E-03	8.337E-03	1.543E-02	NOT IDENT.
ZN-65	-6.217E-04	2.222E-02	3.341E-02	NOT IDENT.
GE-68	8.391E-02	2.820E-01	5.042E-01	NOT IDENT.
AS-73	-1.023E-01	3.388E-01	6.159E-01	NOT IDENT.
AS-74	4.864E-02	9.998E-02	1.742E-01	NOT IDENT.
SE-75	-7.074E-03	2.663E-02	4.547E-02	NOT IDENT.
BR-77	0.000E+00	8.243E+03	0.000E+00	SHORT HLIF
RB-83	3.092E-03	4.488E-02	7.809E-02	NOT IDENT.
KR-85	0.000E+00	3.998E+00	6.365E+00	NOT IDENT.
SR-85	0.000E+00	2.739E-02	4.359E-02	NOT IDENT.
RB-86	1.582E-01	4.106E-01	7.381E-01	NOT IDENT.
Y-88	-2.303E-03	1.020E-02	1.778E-02	NOT IDENT.
Y-91	1.704E+00	5.495E+00	1.013E+01	NOT IDENT.
NB-94	-3.682E-04	7.418E-03	1.347E-02	NOT IDENT.
NB-95	1.166E-02	1.418E-02	2.325E-02	NOT IDENT.
NB-95M	4.666E-03	8.393E-02	1.292E-01	NOT IDENT.
ZR-95	2.774E-02	2.388E-02	4.019E-02	NOT IDENT.
NB-97	0.000E+00	1.116E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.730E+16	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.274E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.144E+41	0.000E+00	SHORT HLIF
RH-101	2.228E-03	1.465E-02	2.394E-02	NOT IDENT.
RH-102	1.604E-03	2.199E-02	3.989E-02	NOT IDENT.
RU-103	-1.251E-02	3.559E-02	6.168E-02	FAIL ABUN
RH-106	-3.329E-02	1.258E-01	2.269E-01	NOT IDENT.
RU-106	-3.329E-02	1.258E-01	2.269E-01	NOT IDENT.
AG-108M	-1.577E-03	1.985E-02	3.494E-02	NOT IDENT.
AG-110M	9.445E-03	1.159E-02	2.157E-02	NOT IDENT.
SN-113	-1.208E-02	3.479E-02	5.401E-02	NOT IDENT.
CD-115	0.000E+00	1.153E+04	0.000E+00	SHORT HLIF
SN-117M	6.144E-02	8.004E-02	1.448E-01	NOT IDENT.
TE-123M	1.415E-02	1.382E-02	2.508E-02	NOT IDENT.
SB-124	2.194E-02	2.362E-02	4.607E-02	NOT IDENT.
SB-125	-1.667E-02	6.072E-02	1.068E-01	FAIL ABUN
TE-125M	-2.158E+00	5.516E+00	9.049E+00	NOT IDENT.
I-126	-4.087E-01	2.478E-01	3.601E-01	NOT IDENT.
SB-126	0.000E+00	1.579E-01	2.293E-01	FAIL ABUN
SB-127	0.000E+00	2.537E+01	0.000E+00	SHORT HLIF
I-131	3.169E-01	5.374E-01	9.710E-01	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	7.092E+01	0.000E+00	SHORT HLIF
BA-133	-4.818E-03	2.619E-02	4.122E-02	FAIL ABUN
I-133	0.000E+00	8.833E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.392E-02	2.029E-02	FAIL ABUN
CS-135	1.160E-01	8.360E-02	1.390E-01	NOT IDENT.
I-135	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CS-136	-2.216E-02	7.963E-02	1.382E-01	NOT IDENT.
CE-139	2.763E-03	1.463E-02	2.618E-02	NOT IDENT.
BA-140	1.821E-01	4.818E-01	8.423E-01	NOT IDENT.
LA-140	8.376E-02	7.672E-02	1.338E-01	FAIL ABUN
CE-141	2.238E-02	4.254E-02	7.728E-02	NOT IDENT.
CE-143	0.000E+00	1.486E+07	0.000E+00	SHORT HLIF
CE-144	-4.116E-02	9.018E-02	1.551E-01	NOT IDENT.
PM-144	-1.350E-03	9.460E-03	1.485E-02	NOT IDENT.
PR-144	-1.034E-01	7.170E-01	1.125E+00	NOT IDENT.
PM-146	-8.133E-03	3.097E-02	5.413E-02	NOT IDENT.
ND-147	5.715E-01	1.309E+00	2.291E+00	FAIL ABUN
PM-147	1.120E+02	3.075E+02	5.652E+02	NOT IDENT.
PM-149	0.000E+00	9.451E+04	0.000E+00	SHORT HLIF
EU-150	4.299E-03	1.591E-02	2.543E-02	FAIL ABUN
EU-152	4.420E-03	5.280E-02	9.215E-02	FAIL ABUN
GD-153	-6.506E-03	3.671E-02	6.102E-02	NOT IDENT.
EU-154	-1.575E-02	3.066E-02	4.418E-02	NOT IDENT.
TB-160	-4.116E-03	3.786E-02	6.731E-02	FAIL ABUN
HO-166M	-4.056E-03	1.341E-02	2.409E-02	FAIL ABUN
TM-171	-1.817E+00	5.873E+00	1.068E+01	NOT IDENT.

HF-172	4.077E-02	8.805E-02	1.447E-01	FAIL ABUN
LU-172	-9.682E-03	1.353E-02	2.272E-02	FAIL ABUN
LU-176	-7.991E-03	1.341E-02	2.425E-02	FAIL ABUN
HF-181	-4.366E-02	4.148E-02	7.131E-02	NOT IDENT.
TA-182	6.378E-02	7.375E-02	8.290E-02	FAIL ABUN
RE-183	-6.943E-02	7.816E-02	1.489E-01	NOT IDENT.
RE-184	-9.707E-03	4.635E-02	7.699E-02	NOT IDENT.
W-188	4.620E-01	5.142E+00	8.307E+00	FAIL ABUN
IR-192	-9.133E-03	2.252E-02	4.070E-02	FAIL ABUN
HG-203	-7.691E-04	3.137E-02	4.852E-02	NOT IDENT.
BI-207	3.415E-03	1.140E-02	2.036E-02	FAIL ABUN
BI-211	0.000E+00	1.912E-01	2.454E-01	FAIL ABUN
PB-211	5.099E-02	4.910E-01	7.658E-01	NOT IDENT.
RN-219	-1.574E-01	2.438E-01	4.294E-01	FAIL ABUN
RA-223	8.433E-02	3.736E-01	5.985E-01	FAIL ABUN
AC-227	-3.895E-02	1.194E-01	2.200E-01	FAIL ABUN
TH-227	-3.895E-02	1.194E-01	2.200E-01	FAIL ABUN
TH-231	8.433E-02	3.736E-01	5.985E-01	FAIL ABUN
PA-233	-8.696E-03	3.293E-02	5.969E-02	FAIL ABUN
PA-234	1.450E-02	6.351E-02	1.144E-01	NOT IDENT.
PA-234M	-6.386E-01	1.386E+00	1.842E+00	NOT IDENT.
NP-237	-8.696E-03	3.293E-02	5.969E-02	FAIL ABUN
NP-238	0.000E+00	1.796E+04	0.000E+00	SHORT HLIF
NP-239	1.365E-01	1.059E-01	1.975E-01	FAIL ABUN
PU-239	2.462E+02	1.922E+02	2.569E+02	FAIL ABUN
AM-241	2.921E-02	5.185E-02	9.054E-02	NOT IDENT.
CM-243	1.519E-02	4.394E-02	7.333E-02	FAIL ABUN
BK-247	-1.363E-02	4.382E-02	7.096E-02	FAIL ABUN
CM-247	-9.348E-03	2.236E-02	3.949E-02	FAIL ABUN
CF-249	2.504E-03	2.335E-02	4.168E-02	NOT IDENT.
CF-251	4.558E-03	5.722E-02	1.017E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1631	10.66*	1.256E+00	4.844E+00	4.844E+00	6.06
MN-54	834.85	76	99.98*	2.034E+00	1.484E-02	1.620E-02	82.95
SR-82	776.52	19	15.08*	2.163E+00	2.292E-02	6.760E-02	265.73
CD-109	88.03	872	3.70*	6.499E+00	1.442E+00	1.531E+00	31.63
SN-126	64.28	100	9.60	3.862E+00	1.068E-01	1.068E-01	330.37
	86.94	872	8.90	6.499E+00	5.996E-01	5.996E-01	31.63
	87.57	872	37.00*	6.499E+00	1.442E-01	1.442E-01	31.63
BA-137M	661.66	105083	89.90*	2.462E+00	1.889E+01	1.893E+01	0.66
CS-137	661.66	105083	85.10*	2.462E+00	1.995E+01	2.000E+01	0.66
EU-155	86.55	872	30.70	6.499E+00	1.738E-01	1.766E-01	31.63
	105.31	183	21.10*	7.173E+00	4.800E-02	4.876E-02	122.76
TL-208	277.37	104	6.60	4.706E+00	1.336E-01	1.336E-01	144.79
	583.19	1119	85.00*	2.717E+00	1.928E-01	1.928E-01	14.33
	860.56	168	12.50	1.985E+00	2.689E-01	2.689E-01	33.92
PB-210	46.54	94	4.25*	1.306E+00	6.746E-01	6.769E-01	265.77
BI-211	72.87	-----	1.23	5.213E+00	-----	Line Not Found	-----
	351.06	1620	12.92*	3.959E+00	1.260E+00	1.260E+00	15.49
BI-212	727.33	276	6.67*	2.282E+00	7.202E-01	7.202E-01	30.52
	785.37	79	1.10	2.143E+00	1.333E+00	1.333E+00	81.41
	1620.50	-----	1.47	1.155E+00	-----	Line Not Found	-----
PB-212	74.82	1201	10.28	5.446E+00	8.534E-01	8.534E-01	20.26
	77.11	2242	17.10	5.678E+00	9.183E-01	9.183E-01	11.48
	238.63	3739	43.60*	5.226E+00	6.527E-01	6.527E-01	6.68
	300.09	113	3.30	4.436E+00	3.081E-01	3.081E-01	192.89
BI-214	609.32	1009	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42
	1120.29	231	14.92	1.579E+00	3.894E-01	3.894E-01	39.18
	1764.49	169	15.30	1.084E+00	4.065E-01	4.065E-01	30.99
PB-214	74.82	1201	5.80	5.446E+00	1.513E+00	1.513E+00	20.26
	77.11	2242	9.70	5.678E+00	1.619E+00	1.619E+00	11.48
	87.09	872	3.41	6.499E+00	1.565E+00	1.565E+00	31.63
	242.00	590	7.25	5.184E+00	6.240E-01	6.241E-01	42.87
	295.22	1124	18.42	4.496E+00	5.397E-01	5.397E-01	22.13
	351.93	1620	35.60*	3.959E+00	4.572E-01	4.572E-01	15.49
RN-222	609.32	1009	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42
	1120.29	231	14.92	1.579E+00	3.894E-01	3.894E-01	39.18
	1764.49	169	15.30	1.084E+00	4.065E-01	4.065E-01	30.99
RA-224	240.99	590	4.10*	5.184E+00	1.103E+00	1.103E+00	42.87
RA-226	609.32	1009	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42
	1120.29	231	14.92	1.579E+00	3.894E-01	3.894E-01	39.18
	1764.49	169	15.30	1.084E+00	4.065E-01	4.065E-01	30.99
AC-228	105.21	183	1.10	7.173E+00	9.207E-01	9.207E-01	122.76
	338.32	835	11.27	4.073E+00	7.233E-01	7.233E-01	28.43
	794.95	151	4.25	2.121E+00	6.640E-01	6.640E-01	41.49
	835.71	76	1.61	2.034E+00	9.216E-01	9.216E-01	82.95
	911.20	660	25.80*	1.890E+00	5.387E-01	5.387E-01	14.67
	968.97	357	15.80	1.793E+00	5.017E-01	5.017E-01	18.96
RA-228	105.21	183	1.10	7.173E+00	9.207E-01	9.207E-01	122.76

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	835	11.27	4.073E+00	7.233E-01	7.233E-01	28.43
	794.95	151	4.25	2.121E+00	6.640E-01	6.640E-01	41.49
	835.71	76	1.61	2.034E+00	9.216E-01	9.216E-01	82.95
	911.20	660	25.80*	1.890E+00	5.387E-01	5.387E-01	14.67
	968.97	357	15.80	1.793E+00	5.017E-01	5.017E-01	18.96
TH-228	74.82	1201	10.28	5.446E+00	8.534E-01	8.534E-01	20.26
	77.11	2242	17.10	5.678E+00	9.183E-01	9.183E-01	11.48
	238.63	3739	43.60*	5.226E+00	6.527E-01	6.527E-01	6.68
	300.09	113	3.30	4.436E+00	3.081E-01	3.081E-01	192.89
TH-229	85.43	187	14.70	6.272E+00	8.066E-02	8.066E-02	137.61
	88.47	872	24.00	6.499E+00	2.224E-01	2.224E-01	31.63
	193.51	-----	4.41*	5.998E+00	-----	Line Not Found	-----
	210.85	-----	2.80	5.680E+00	-----	Line Not Found	-----
TH-230	609.32	1009	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42
	1120.29	231	14.92	1.579E+00	3.894E-01	3.894E-01	39.18
	1764.49	169	15.30	1.084E+00	4.065E-01	4.065E-01	30.99
PA-231	283.69	-----	1.70	4.626E+00	-----	Line Not Found	-----
	301.36	113	5.35*	4.436E+00	1.900E-01	1.900E-01	192.89
TH-232	105.21	183	1.10	7.173E+00	9.207E-01	9.207E-01	122.76
	338.32	835	11.27	4.073E+00	7.233E-01	7.233E-01	28.43
	835.71	76	1.61	2.034E+00	9.216E-01	9.216E-01	82.95
	911.20	660	25.80*	1.890E+00	5.387E-01	5.387E-01	14.67
	968.97	357	15.80	1.793E+00	5.017E-01	5.017E-01	18.96
TH-234	63.29	100	3.70*	3.862E+00	2.772E-01	2.772E-01	330.37
	92.59	1012	4.23	6.801E+00	1.399E+00	1.399E+00	32.40
U-234	609.32	1009	45.49*	2.626E+00	3.361E-01	3.361E-01	16.42
	1120.29	231	14.92	1.579E+00	3.894E-01	3.894E-01	39.18
	1764.49	169	15.30	1.084E+00	4.065E-01	4.065E-01	30.99
U-235	89.96	457	3.47	6.660E+00	7.872E-01	7.872E-01	31.79
	93.35	1012	5.60	6.801E+00	1.057E+00	1.057E+00	32.40
	143.76	-----	10.96*	6.969E+00	-----	Line Not Found	-----
	163.33	-----	5.08	6.597E+00	-----	Line Not Found	-----
	185.72	756	57.20	6.146E+00	8.551E-02	8.551E-02	39.80
	205.31	-----	5.01	5.779E+00	-----	Line Not Found	-----
U-238	63.29	100	3.70*	3.862E+00	2.772E-01	2.772E-01	330.37
	92.59	1012	4.23	6.801E+00	1.399E+00	1.399E+00	32.40
AM-243	43.53	-----	5.90	9.036E-01	-----	Line Not Found	-----
	74.66	1201	67.20*	5.446E+00	1.306E-01	1.306E-01	20.26
ANH-511	511.00	357	100.00*	3.005E+00	4.720E-02	4.720E-02	76.62

Flag: "*" = Keyline

Total number of lines in spectrum 69
Number of unidentified lines 22
Number of lines tentatively identified by NID 47 68.12%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	4.844E+00	4.844E+00	0.294E+00	6.06	
MN-54	312.05D	1.09	1.484E-02	1.620E-02	1.344E-02	82.95	
SR-82	25.35D	2.95	2.292E-02	6.760E-02	17.96E-02	265.73	
CD-109	461.40D	1.06	1.442E+00	1.531E+00	0.484E+00	31.63	
SN-126	2.30E+05Y	1.00	1.442E-01	1.442E-01	0.456E-01	31.63	
BA-137M	30.08Y	1.00	1.889E+01	1.893E+01	0.012E+01	0.66	
CS-137	30.08Y	1.00	1.995E+01	2.000E+01	0.013E+01	0.66	
EU-155	4.75Y	1.02	4.800E-02	4.876E-02	5.986E-02	122.76	
TL-208	1.41E+10Y	1.00	1.928E-01	1.928E-01	0.276E-01	14.33	
PB-210	22.20Y	1.00	6.746E-01	6.769E-01	17.99E-01	265.77	
BI-211	7.04E+08Y	1.00	1.260E+00	1.260E+00	0.195E+00	15.49	
BI-212	1.41E+10Y	1.00	7.202E-01	7.202E-01	2.198E-01	30.52	
PB-212	1.41E+10Y	1.00	6.527E-01	6.527E-01	0.436E-01	6.68	
BI-214	1600.00Y	1.00	3.361E-01	3.361E-01	0.552E-01	16.42	
PB-214	1600.00Y	1.00	4.572E-01	4.572E-01	0.708E-01	15.49	
RN-222	1600.00Y	1.00	3.361E-01	3.361E-01	0.552E-01	16.42	
RA-224	1.41E+10Y	1.00	1.103E+00	1.103E+00	0.473E+00	42.87	
RA-226	1600.00Y	1.00	3.361E-01	3.361E-01	0.552E-01	16.42	
AC-228	1.41E+10Y	1.00	5.387E-01	5.387E-01	0.790E-01	14.67	
RA-228	1.41E+10Y	1.00	5.387E-01	5.387E-01	0.790E-01	14.67	
TH-228	1.41E+10Y	1.00	6.527E-01	6.527E-01	0.436E-01	6.68	
TH-229	7340.00Y	1.00	2.224E-01	2.224E-01	0.703E-01	31.63	K
TH-230	7.54E+04Y	1.00	3.361E-01	3.361E-01	0.552E-01	16.42	
PA-231	7.04E+08Y	1.00	1.900E-01	1.900E-01	3.666E-01	192.89	
TH-232	1.41E+10Y	1.00	5.387E-01	5.387E-01	0.790E-01	14.67	
TH-234	4.47E+09Y	1.00	2.772E-01	2.772E-01	9.158E-01	330.37	
U-234	2.45E+05Y	1.00	3.361E-01	3.361E-01	0.552E-01	16.42	
U-235	7.04E+08Y	1.00	8.551E-02	8.551E-02	3.404E-02	39.80	K
U-238	4.47E+09Y	1.00	2.772E-01	2.772E-01	9.158E-01	330.37	
AM-243	7370.00Y	1.00	1.306E-01	1.306E-01	0.264E-01	20.26	
ANH-511	1.00E+09Y	1.00	4.720E-02	4.720E-02	3.617E-02	76.62	
Total Activity :			5.559E+01	5.583E+01			

Grand Total Activity : 5.559E+01 5.583E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	129.12	281	3859	0.85	258.23	256	6	5.17E-03	79.7	7.18E+00	T
0	140.72	192	3589	1.84	281.45	279	6	3.58E-03	****	7.02E+00	T
2	187.69	404	5066	1.29	375.46	366	28	7.73E-03	70.1	6.11E+00	
0	209.10	416	3613	1.11	418.30	416	6	8.03E-03	51.3	5.71E+00	
0	270.01	515	3847	1.65	540.19	536	9	1.02E-02	48.0	4.79E+00	T
0	327.75	152	2269	0.70	655.76	653	6	3.08E-03	****	4.17E+00	T
0	394.64	94	2982	0.53	789.60	787	8	1.94E-03	****	3.64E+00	
0	410.88	61	3178	0.78	822.10	816	8	1.27E-03	****	3.53E+00	T
0	463.02	315	3591	1.39	926.44	923	8	6.60E-03	70.2	3.24E+00	T
0	679.14	25	192	1.36	1358.87	1356	8	5.39E-04	****	2.41E+00	
0	693.35	60	248	1.70	1387.30	1383	9	1.31E-03	****	2.37E+00	
0	720.60	88	175	3.72	1441.82	1437	10	1.94E-03	61.8	2.30E+00	T
1	768.51	95	233	1.77	1537.68	1517	31	2.10E-03	83.9	2.18E+00	
1	772.01	72	128	1.77	1544.68	1517	31	1.59E-03	62.8	2.17E+00	T
0	789.21	11	200	0.95	1579.08	1577	10	2.51E-04	****	2.13E+00	
0	829.85	62	184	1.42	1660.40	1654	12	1.38E-03	93.4	2.05E+00	
0	923.11	11	130	1.38	1846.96	1842	9	2.52E-04	****	1.87E+00	T
0	934.21	91	170	2.19	1869.17	1862	13	2.05E-03	63.9	1.85E+00	
1	964.67	196	164	1.89	1930.10	1922	23	4.46E-03	28.7	1.80E+00	T
0	983.23	14	148	4.23	1967.23	1963	12	3.26E-04	****	1.77E+00	T
0	1156.17	82	200	1.91	2313.18	2305	19	1.92E-03	86.3	1.54E+00	
0	1217.77	13	87	1.23	2436.40	2431	8	3.08E-04	****	1.47E+00	
4	1219.73	38	34	1.23	2440.31	2438	20	8.91E-04	56.3	1.47E+00	
4	1223.22	46	116	2.49	2447.30	2438	20	1.08E-03	****	1.46E+00	
0	1230.20	15	106	0.54	2461.26	2458	9	3.41E-04	****	1.46E+00	T
0	1238.32	59	146	2.07	2477.50	2472	10	1.39E-03	80.3	1.45E+00	T
0	1378.84	14	118	0.75	2758.54	2754	13	3.44E-04	****	1.32E+00	
0	1391.37	19	57	3.33	2783.61	2778	11	4.63E-04	****	1.31E+00	
0	1408.70	48	88	1.47	2818.27	2811	15	1.13E-03	89.1	1.29E+00	T
0	1570.87	34	57	3.81	3142.59	3132	17	8.27E-04	****	1.18E+00	
2	1588.17	69	61	2.39	3177.20	3169	27	1.66E-03	51.1	1.17E+00	
2	1593.01	32	57	2.48	3186.86	3169	27	7.79E-04	****	1.17E+00	
0	1622.13	47	65	1.12	3245.10	3238	17	1.13E-03	82.2	1.15E+00	T
0	1631.12	31	49	2.45	3263.07	3255	16	7.48E-04	****	1.15E+00	
0	1729.81	69	52	1.67	3460.43	3451	17	1.69E-03	52.3	1.10E+00	
4	1852.05	10	8	1.44	3704.86	3703	13	2.51E-04	84.2	1.05E+00	
4	1855.39	21	8	2.20	3711.53	3703	13	5.15E-04	65.0	1.05E+00	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732002.CNF;1  *
* Acquisition date   : 28-JUN-2016 16:03:05 Sensitivity      : 3.000          *
* Detector ID        : GAM11 Energy tolerance: 1.500        *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000    *
* Elapsed real time  : 0 12:00:16.19 Half life ratio  : *****          *
* Sample date        : 20-MAY-2016 08:50:00 Nuclide Library : SOLID          *
* Sample ID          : G398732002 Analyst initials: MXR1          *
* Batch Number       : 1572490 Sample Quantity : 1.5729E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 16-JUL-2015 08:37:24 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	5.943E-02
MN-54	5.664E-03
SR-82	1.166E-01
CD-109	2.478E-01
SN-126	2.344E-02
BA-137M	1.063E-02
CS-137	1.123E-02
EU-155	3.646E-02
TL-208	1.268E-02
PB-210	9.329E-01
BI-212	9.196E-02
PB-212	2.372E-02
BI-214	2.324E-02
PB-214	3.488E-02
RN-222	2.324E-02
RA-224	2.542E-01
RA-226	2.324E-02
AC-228	2.343E-02
RA-228	2.343E-02
TH-228	2.372E-02
TH-229	2.282E-01
TH-230	2.324E-02
PA-231	2.117E-01
TH-232	2.343E-02
TH-234	3.836E-01
U-234	2.324E-02
U-235	7.228E-02
U-238	3.836E-01
AM-243	1.564E-02
ANH-511	1.304E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
BE-7	2.669E-01 NOT IDENT.

NA-22	7.487E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	6.680E-03	NOT IDENT.
SC-46	8.625E-03	FAIL ABUN
V-48	3.574E-02	FAIL ABUN
CR-51	3.186E-01	NOT IDENT.
CO-56	9.457E-03	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	9.975E-03	NOT IDENT.
CO-58	8.714E-03	NOT IDENT.
FE-59	2.358E-02	NOT IDENT.
CO-60	7.310E-03	NOT IDENT.
ZN-65	1.595E-02	NOT IDENT.
GE-68	2.407E-01	NOT IDENT.
AS-73	3.047E-01	NOT IDENT.
AS-74	8.547E-02	NOT IDENT.
SE-75	2.250E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
RB-83	3.849E-02	NOT IDENT.
KR-85	3.141E+00	NOT IDENT.
SR-85	2.151E-02	NOT IDENT.
RB-86	3.524E-01	NOT IDENT.
Y-88	8.226E-03	NOT IDENT.
Y-91	4.841E+00	NOT IDENT.
NB-94	6.502E-03	NOT IDENT.
NB-95	1.124E-02	NOT IDENT.
NB-95M	6.396E-02	NOT IDENT.
ZR-95	1.940E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.185E-02	NOT IDENT.
RH-102	1.956E-02	NOT IDENT.
RU-103	3.045E-02	FAIL ABUN
RH-106	1.112E-01	NOT IDENT.
RU-106	1.112E-01	NOT IDENT.
AG-108M	1.730E-02	NOT IDENT.
AG-110M	1.035E-02	NOT IDENT.
SN-113	2.672E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	7.172E-02	NOT IDENT.
TE-123M	1.242E-02	NOT IDENT.
SB-124	2.144E-02	NOT IDENT.
SB-125	5.285E-02	FAIL ABUN
TE-125M	4.479E+00	NOT IDENT.
I-126	1.744E-01	NOT IDENT.
SB-126	1.106E-01	FAIL ABUN
SB-127	0.000E+00	SHORT HLIF
I-131	4.803E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.039E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	9.833E-03	FAIL ABUN
CS-135	6.882E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	6.584E-02	NOT IDENT.
CE-139	1.296E-02	NOT IDENT.
BA-140	4.146E-01	NOT IDENT.
LA-140	6.277E-02	FAIL ABUN
CE-141	3.826E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	7.678E-02	NOT IDENT.
PM-144	7.172E-03	NOT IDENT.
PR-144	5.436E-01	NOT IDENT.
PM-146	2.681E-02	NOT IDENT.
ND-147	1.128E+00	FAIL ABUN
PM-147	2.799E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.258E-02	FAIL ABUN
EU-152	4.557E-02	FAIL ABUN
GD-153	3.020E-02	NOT IDENT.
EU-154	2.099E-02	NOT IDENT.
TB-160	3.230E-02	FAIL ABUN
HO-166M	1.161E-02	FAIL ABUN
TM-171	5.282E+00	NOT IDENT.
HF-172	7.167E-02	FAIL ABUN

LU-172	1.080E-02	FAIL ABUN
LU-176	1.199E-02	FAIL ABUN
HF-181	3.525E-02	NOT IDENT.
TA-182	3.972E-02	FAIL ABUN
RE-183	7.366E-02	NOT IDENT.
RE-184	3.687E-02	NOT IDENT.
W-188	4.110E+00	FAIL ABUN
IR-192	2.013E-02	FAIL ABUN
HG-203	2.401E-02	NOT IDENT.
BI-207	9.738E-03	FAIL ABUN
BI-211	1.217E-01	FAIL ABUN
PB-211	3.789E-01	NOT IDENT.
RN-219	2.125E-01	FAIL ABUN
RA-223	2.961E-01	FAIL ABUN
AC-227	1.089E-01	FAIL ABUN
TH-227	1.089E-01	FAIL ABUN
TH-231	2.961E-01	FAIL ABUN
PA-233	2.952E-02	FAIL ABUN
PA-234	5.473E-02	NOT IDENT.
PA-234M	8.841E-01	NOT IDENT.
NP-237	2.952E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	9.778E-02	FAIL ABUN
PU-239	1.273E+02	FAIL ABUN
AM-241	4.480E-02	NOT IDENT.
CM-243	3.629E-02	FAIL ABUN
BK-247	3.511E-02	FAIL ABUN
CM-247	1.954E-02	FAIL ABUN
CF-249	2.062E-02	NOT IDENT.
CF-251	5.035E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732002.CNF;1
Acquisition date : 28-JUN-2016 16:03:05 Sensitivity : 3.000
Detector ID : GAM11 Energy tolerance : 1.500
Elapsed live time : 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time : 0 12:00:16.19 Half life ratio : *****
Sample date : 20-MAY-2016 08:50:00 Nuclide Library : SOLID
Sample ID : G398732002 Analyst initials : MXR1
Batch Number : 1572490 Sample Quantity : 1.5729E+02 GRAM
Quantity Err(%) : 1.2715E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 16-JUL-2015 08:37:24 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	4.844E+00	5.079E-01	5.079E-01
MN-54	1.620E-02	1.332E-02	1.332E-02
SR-82	6.760E-02	1.762E-01	1.762E-01
CD-109	1.003E+00	5.041E-01	5.041E-01
SN-126	9.450E-02	4.724E-02	4.724E-02
BA-137M	1.893E+01	1.511E+00	1.511E+00
CS-137	2.000E+01	1.595E+00	1.595E+00
EU-155	4.876E-02	5.881E-02	5.881E-02
TL-208	1.928E-01	3.133E-02	3.133E-02
PB-210	6.769E-01	1.764E+00	1.764E+00
BI-212	7.202E-01	2.266E-01	2.266E-01
PB-212	6.527E-01	6.966E-02	6.966E-02
BI-214	3.361E-01	6.059E-02	6.059E-02
PB-214	4.572E-01	7.893E-02	7.893E-02
RN-222	3.361E-01	6.059E-02	6.059E-02
RA-224	1.492E-01	5.202E-01	5.202E-01
RA-226	3.361E-01	6.059E-02	6.059E-02
AC-228	5.387E-01	1.101E-01	1.101E-01
RA-228	5.387E-01	1.101E-01	1.101E-01
TH-228	6.527E-01	6.966E-02	6.966E-02
TH-229	3.330E-01	2.655E-01	2.655E-01
TH-230	3.361E-01	6.059E-02	6.059E-02
PA-231	1.900E-01	3.618E-01	3.618E-01
TH-232	5.387E-01	1.101E-01	1.101E-01
TH-234	2.772E-01	8.997E-01	8.997E-01
U-234	3.361E-01	6.059E-02	6.059E-02
U-235	-8.184E-03	9.543E-02	9.543E-02
U-238	2.772E-01	8.997E-01	8.997E-01
AM-243	8.398E-02	2.938E-02	2.938E-02
ANH-511	4.720E-02	3.565E-02	3.565E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)

BE-7	2.487E-01	3.063E-01	3.262E-01	NOT IDENT.
NA-22	-6.019E-03	1.097E-02	1.130E-02	NOT IDENT.
NA-24	-9.185E+16	8.896E+16	0.000E+00	SHORT HLIF
AL-26	5.026E-03	7.595E-03	7.926E-03	NOT IDENT.
SC-46	-7.012E-03	1.049E-02	1.096E-02	FAIL ABUN
V-48	1.790E-02	6.111E-02	6.164E-02	FAIL ABUN
CR-51	7.546E-02	3.541E-01	3.557E-01	NOT IDENT.
CO-56	2.676E-03	1.085E-02	1.092E-02	FAIL ABUN
MN-56	1.000E+41	3.941E+41	0.000E+00	SHORT HLIF
CO-57	-2.298E-03	1.158E-02	1.163E-02	NOT IDENT.
CO-58	-9.598E-03	1.062E-02	1.147E-02	NOT IDENT.
FE-59	1.408E-02	2.748E-02	2.820E-02	NOT IDENT.
CO-60	2.954E-03	8.341E-03	8.446E-03	NOT IDENT.
ZN-65	-6.217E-04	2.222E-02	2.222E-02	NOT IDENT.
GE-68	8.391E-02	2.824E-01	2.849E-01	NOT IDENT.
AS-73	-1.023E-01	3.395E-01	3.426E-01	NOT IDENT.
AS-74	4.864E-02	1.001E-01	1.025E-01	NOT IDENT.
SE-75	-7.074E-03	2.664E-02	2.683E-02	NOT IDENT.
BR-77	1.258E+05	1.442E+05	1.550E+05	SHORT HLIF
RB-83	3.092E-03	4.488E-02	4.490E-02	NOT IDENT.
KR-85	7.814E+00	4.048E+00	5.366E+00	NOT IDENT.
SR-85	5.331E-02	2.773E-02	3.669E-02	NOT IDENT.
RB-86	1.582E-01	4.116E-01	4.178E-01	NOT IDENT.
Y-88	-2.303E-03	1.020E-02	1.026E-02	NOT IDENT.
Y-91	1.704E+00	5.498E+00	5.551E+00	NOT IDENT.
NB-94	-3.682E-04	7.418E-03	7.420E-03	NOT IDENT.
NB-95	1.166E-02	1.423E-02	1.517E-02	NOT IDENT.
NB-95M	4.666E-03	8.393E-02	8.396E-02	NOT IDENT.
ZR-95	2.774E-02	2.405E-02	2.710E-02	NOT IDENT.
NB-97	1.000E+41	1.371E+40	0.000E+00	SHORT HLIF
ZR-97	2.111E+16	2.736E+16	0.000E+00	SHORT HLIF
MO-99	-6.800E+02	1.276E+03	1.312E+03	SHORT HLIF
TC-99M	1.000E+41	1.150E+41	0.000E+00	SHORT HLIF
RH-101	2.228E-03	1.466E-02	1.469E-02	NOT IDENT.
RH-102	1.604E-03	2.199E-02	2.200E-02	NOT IDENT.
RU-103	-1.251E-02	3.561E-02	3.605E-02	FAIL ABUN
RH-106	-3.329E-02	1.258E-01	1.267E-01	NOT IDENT.
RU-106	-3.329E-02	1.258E-01	1.267E-01	NOT IDENT.
AG-108M	-1.577E-03	1.985E-02	1.986E-02	NOT IDENT.
AG-110M	9.445E-03	1.166E-02	1.242E-02	NOT IDENT.
SN-113	-1.208E-02	3.480E-02	3.522E-02	NOT IDENT.
CD-115	-7.908E+03	1.155E+04	1.209E+04	SHORT HLIF
SN-117M	6.144E-02	8.016E-02	8.481E-02	NOT IDENT.
TE-123M	1.415E-02	1.385E-02	1.525E-02	NOT IDENT.
SB-124	2.194E-02	2.368E-02	2.566E-02	NOT IDENT.
SB-125	-1.667E-02	6.073E-02	6.119E-02	FAIL ABUN
TE-125M	-2.158E+00	5.519E+00	5.604E+00	NOT IDENT.
I-126	-4.087E-01	2.507E-01	3.111E-01	NOT IDENT.
SB-126	2.608E-01	1.615E-01	1.997E-01	FAIL ABUN
SB-127	-1.129E+01	2.547E+01	2.598E+01	SHORT HLIF
I-131	3.169E-01	5.380E-01	5.566E-01	NOT IDENT.
I-132	1.000E+41	1.655E+42	0.000E+00	SHORT HLIF
TE-132	5.425E+01	7.121E+01	7.529E+01	SHORT HLIF
BA-133	-4.818E-03	2.619E-02	2.628E-02	FAIL ABUN
I-133	4.547E+11	8.911E+11	9.143E+11	SHORT HLIF
CS-134	3.424E-02	1.443E-02	2.113E-02	FAIL ABUN
CS-135	1.160E-01	8.436E-02	9.926E-02	NOT IDENT.
I-135	2.513E+40	7.355E+41	0.000E+00	SHORT HLIF
CS-136	-2.216E-02	7.975E-02	8.037E-02	NOT IDENT.
CE-139	2.763E-03	1.464E-02	1.470E-02	NOT IDENT.
BA-140	1.821E-01	4.820E-01	4.890E-01	NOT IDENT.
LA-140	8.376E-02	7.700E-02	8.576E-02	FAIL ABUN
CE-141	2.238E-02	4.257E-02	4.375E-02	NOT IDENT.
CE-143	2.801E+07	1.506E+07	1.965E+07	SHORT HLIF
CE-144	-4.116E-02	9.024E-02	9.213E-02	NOT IDENT.
PM-144	-1.350E-03	9.460E-03	9.480E-03	NOT IDENT.
PR-144	-1.034E-01	7.171E-01	7.186E-01	NOT IDENT.
PM-146	-8.133E-03	3.098E-02	3.120E-02	NOT IDENT.
ND-147	5.715E-01	1.309E+00	1.335E+00	FAIL ABUN
PM-147	1.120E+02	3.076E+02	3.117E+02	NOT IDENT.
PM-149	-7.384E+04	9.520E+04	1.009E+05	SHORT HLIF
EU-150	4.299E-03	1.591E-02	1.603E-02	FAIL ABUN
EU-152	4.420E-03	5.280E-02	5.284E-02	FAIL ABUN
GD-153	-6.506E-03	3.672E-02	3.683E-02	NOT IDENT.
EU-154	-1.575E-02	3.069E-02	3.150E-02	NOT IDENT.
TB-160	-4.116E-03	3.787E-02	3.791E-02	FAIL ABUN
HO-166M	-4.056E-03	1.341E-02	1.354E-02	FAIL ABUN
TM-171	-1.817E+00	5.876E+00	5.932E+00	NOT IDENT.

HF-172	4.077E-02	8.833E-02	9.022E-02	FAIL ABUN
LU-172	-9.682E-03	1.368E-02	1.436E-02	FAIL ABUN
LU-176	-7.991E-03	1.343E-02	1.391E-02	FAIL ABUN
HF-181	-4.366E-02	4.163E-02	4.605E-02	NOT IDENT.
TA-182	6.378E-02	7.398E-02	7.937E-02	FAIL ABUN
RE-183	-6.943E-02	7.853E-02	8.453E-02	NOT IDENT.
RE-184	-9.707E-03	4.637E-02	4.658E-02	NOT IDENT.
W-188	4.620E-01	5.143E+00	5.147E+00	FAIL ABUN
IR-192	-9.133E-03	2.254E-02	2.291E-02	FAIL ABUN
HG-203	-7.691E-04	3.137E-02	3.138E-02	NOT IDENT.
BI-207	3.415E-03	1.142E-02	1.152E-02	FAIL ABUN
BI-211	1.260E+00	2.184E-01	6.085E-01	FAIL ABUN
PB-211	5.099E-02	4.910E-01	4.916E-01	NOT IDENT.
RN-219	-1.574E-01	2.449E-01	2.549E-01	FAIL ABUN
RA-223	8.433E-02	3.737E-01	3.757E-01	FAIL ABUN
AC-227	-3.895E-02	1.196E-01	1.209E-01	FAIL ABUN
TH-227	-3.895E-02	1.196E-01	1.209E-01	FAIL ABUN
TH-231	8.433E-02	3.737E-01	3.757E-01	FAIL ABUN
PA-233	-8.696E-03	3.294E-02	3.317E-02	FAIL ABUN
PA-234	1.450E-02	6.567E-02	6.600E-02	NOT IDENT.
PA-234M	-6.386E-01	1.391E+00	1.420E+00	NOT IDENT.
NP-237	-8.696E-03	3.294E-02	3.317E-02	FAIL ABUN
NP-238	5.266E+03	1.798E+04	1.814E+04	SHORT HLIF
NP-239	1.365E-01	1.068E-01	1.232E-01	FAIL ABUN
PU-239	2.462E+02	1.931E+02	2.227E+02	FAIL ABUN
AM-241	2.921E-02	5.191E-02	5.355E-02	NOT IDENT.
CM-243	1.519E-02	4.397E-02	4.450E-02	FAIL ABUN
BK-247	-1.363E-02	4.392E-02	4.435E-02	FAIL ABUN
CM-247	-9.348E-03	2.242E-02	2.281E-02	FAIL ABUN
CF-249	2.504E-03	2.335E-02	2.338E-02	NOT IDENT.
CF-251	4.558E-03	5.723E-02	5.726E-02	NOT IDENT.

 * GEL Laboratories LLC *
 * 2040 Savage Road *
 * Charleston, SC 29407 *
 * GAMMA SPECTROSCOPY BACKGROUND REPORT *

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2412.2305	87.09	3138.7700	136.47	3008.6453
45.60	2494.4116	87.57	3150.3638	140.51	0.0000
46.54	2469.1465	88.03	3153.3438	143.76	2976.1975
49.72	0.0000	88.34	3155.3530	144.24	3052.9614
51.35	2510.6750	88.47	3156.2046	145.44	2996.9790
51.87	2566.2644	89.96	3165.7917	152.43	3038.5662
52.39	2575.3442	1093.63	2881.8264	153.25	2944.3176
52.97	2606.4995	91.11	2884.5510	323.87	2934.5725
53.44	2613.4893	92.59	2893.0959	156.02	3171.9041
54.07	2577.3979	93.35	2897.4612	158.56	2979.7410
57.36	0.0000	94.56	2848.5398	159.00	2957.1560
57.53	2754.0525	94.65	2849.0408	162.33	3143.9260
57.98	2780.2339	94.67	2849.1470	162.66	3102.7327
59.27	2722.5635	94.87	2943.3542	163.33	3108.7161
59.32	2722.9292	97.43	2978.1338	165.86	3120.2336
59.54	2672.9731	98.43	2823.7524	176.31	2988.1980
60.96	2736.1396	98.44	2823.8120	176.60	3000.1309
61.17	2790.7566	99.53	2817.1282	177.52	3074.1265
62.93	2984.0640	100.11	2922.4595	181.07	0.0000
63.29	2986.8250	102.03	3025.8958	181.52	3153.8286
63.58	2989.0442	103.18	2985.7891	184.41	3448.5220
64.28	3056.8401	103.37	2841.2805	143.76	3454.0352
66.73	2980.0840	105.21	2836.2664	193.51	3486.4414
67.24	3079.5630	105.31	2935.1272	197.03	3746.4038
125.81	3072.1104	106.12	2886.7859	198.01	3660.5947
67.75	3072.6313	106.47	2952.5278	201.83	3700.1924
69.67	3073.4631	109.28	2992.4189	203.43	3527.8838
70.83	3117.3486	111.00	2962.1460	205.31	3528.1282
72.81	3141.5154	111.76	0.0000	210.85	3333.3833
72.87	3141.9539	114.06	3063.9800	215.65	3288.0496
74.66	3170.1169	116.30	0.0000	222.11	3275.6257
74.82	3171.2800	116.74	2976.6929	227.09	3141.3384
74.97	3172.3728	119.76	3263.4292	227.38	3142.3120
77.11	3187.8289	121.12	3102.6492	228.16	0.0000
78.74	3109.4326	121.22	3103.1536	228.18	3080.5339
79.69	3117.3462	121.78	3112.0349	116.74	3080.5339
80.12	3067.5015	122.06	3113.4568	235.69	3068.0396
80.19	3067.9731	122.92	3095.7646	235.96	3115.8477
80.57	3081.6418	123.07	3096.5176	238.63	3031.3118
81.00	3014.9360	265.00	3121.7190	238.98	0.0000
81.07	3015.3989	125.81	3081.5469	240.99	3038.5544
81.75	3113.7202	127.23	3206.7974	242.00	3061.4585
83.79	3161.9270	127.91	3195.1204	244.70	3015.6829
84.00	3149.3301	129.30	3180.3186	252.40	0.0000
85.43	2967.7441	131.20	3042.3440	252.80	2766.2114
86.55	2974.6890	133.02	3151.9233	254.15	0.0000
86.79	3136.8169	133.52	3133.5500	256.23	2801.1252
86.94	3137.8020	136.00	3003.4224	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	2778.8752	355.39	0.0000	584.27	921.3771
264.80	2779.2546	356.01	2606.2209	595.83	863.8292
265.00	2779.0608	364.49	2540.3174	427.87	881.5461
268.22	2709.8977	366.42	0.0000	602.52	0.0000
269.46	2651.2417	372.51	2582.5557	604.72	844.7872
270.03	2652.6379	375.05	2648.9658	607.14	923.0165
271.23	2629.6577	377.52	2638.9700	609.32	841.3031
273.65	2556.8833	356.01	2623.2693	610.33	821.9306
276.40	2605.7681	388.16	2661.8552	614.28	830.4451
277.37	2613.4834	388.63	2654.8557	618.01	795.2444
277.60	2582.3440	391.69	2726.4573	620.36	794.3405
278.00	2627.1113	264.66	2775.9543	621.93	787.7064
279.20	2658.9417	401.81	2801.7676	630.19	0.0000
279.54	2677.1509	402.40	2779.9407	631.29	816.6941
279.70	2677.5564	404.85	2778.3813	633.25	733.8065
280.46	2656.1360	410.95	2953.5684	634.78	767.0971
283.69	2584.6702	413.71	2764.4172	635.95	815.7844
284.31	2602.4858	414.70	2817.4907	636.99	828.9309
285.41	2719.8225	423.72	2929.0583	645.85	786.6606
285.90	0.0000	427.09	2945.6477	657.76	892.2295
287.50	2687.4512	427.87	3000.9238	657.90	0.0000
290.67	2681.7266	433.94	3037.1482	661.66	603.5723
293.27	0.0000	439.40	3082.5457	664.57	0.0000
351.93	2610.0215	453.88	3466.5442	666.33	410.9406
295.96	2409.3557	463.37	3411.0693	666.50	410.9623
879.38	2595.4414	468.07	3335.9553	667.71	0.0000
299.98	2613.2996	473.00	0.0000	677.62	253.7075
300.09	2655.3955	475.06	3090.5178	685.70	0.0000
300.13	2655.4832	476.78	2975.4941	695.00	271.2732
301.36	2644.4529	477.60	2860.8213	696.49	276.1376
302.85	2554.5728	482.18	2490.8599	696.51	276.1376
256.23	2592.2007	487.02	2184.4312	697.00	283.9973
304.85	2630.0330	492.35	0.0000	697.30	280.9131
306.78	2615.3875	497.08	1974.9943	697.49	280.9351
308.46	2545.6199	505.52	1842.9244	702.65	257.1760
311.90	2574.3716	507.63	0.0000	706.68	246.3414
316.51	2595.3765	511.00	1658.9617	711.68	246.8787
319.41	2594.9492	514.00	1520.0685	720.70	213.5193
320.08	2581.3713	514.00	1520.0685	721.93	0.0000
321.04	2526.1028	520.40	1502.5862	722.78	194.0944
323.87	2566.1506	520.69	0.0000	722.91	194.1094
325.23	2635.2722	522.65	0.0000	723.31	194.1394
328.76	2677.4702	527.90	0.0000	724.19	194.2145
333.37	2608.3809	528.26	1425.1078	727.33	215.8195
333.97	2550.3926	529.59	1405.6760	733.00	240.9079
334.37	2633.2161	529.87	0.0000	735.93	221.1044
338.28	2555.1978	531.02	1322.6418	333.97	217.2234
338.32	2555.2798	537.26	1221.0476	739.50	0.0000
311.90	2445.9058	546.56	0.0000	747.24	184.6316
340.48	2445.9058	552.55	1036.8591	748.06	196.1814
340.55	2446.0229	563.25	937.3463	752.31	228.1627
344.28	2475.8035	569.33	951.3281	753.82	205.0455
345.93	2614.6768	946.00	951.4072	756.73	200.0885
351.06	2558.0806	569.70	951.5127	756.80	200.0936
351.93	2558.9756	583.19	933.7340	884.68	240.8203

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	241.0034	1274.44	196.1354	1620.50	68.9981
766.42	241.0645	1001.03	155.4723	1621.92	58.3991
766.84	241.1072	1002.74	137.6939	1678.03	0.0000
772.60	0.0000	1004.73	205.0975	1690.97	41.9092
776.52	183.9604	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	53.1901
778.90	145.3711	1028.54	0.0000	1063.66	36.5165
783.70	0.0000	1037.84	138.2012	1771.35	38.3511
785.37	199.1943	1038.76	0.0000	1791.20	0.0000
792.07	107.1694	631.29	130.0539	1808.65	45.0796
794.95	190.2012	1048.07	145.0445	1810.72	0.0000
795.86	188.6416	1049.04	153.6258	1836.06	56.1154
810.06	198.2026	1050.41	112.0701		
810.29	198.2224	1063.66	151.1206		
344.28	198.2322	1077.00	134.5276		
810.76	201.2013	1077.34	137.7688		
815.77	170.1279	1085.87	137.0521		
1048.07	172.2742	1093.63	149.2731		
832.01	123.6938	1099.45	133.2880		
834.85	123.8281	1112.07	139.5938		
835.71	231.2199	1112.84	137.8180		
836.80	0.0000	1115.54	148.8185		
846.75	0.0000	1120.29	151.5697		
846.77	188.0771	1120.55	151.5833		
856.80	143.1689	1221.41	151.6172		
860.56	171.7128	1129.67	151.7239		
871.09	170.7056	1131.51	0.0000		
873.19	181.8926	1147.95	0.0000		
875.33	0.0000	1173.23	135.6652		
879.38	191.3730	1177.95	153.4095		
880.51	199.5130	1189.05	143.6979		
883.24	167.4347	1204.77	144.3412		
884.68	160.4557	1221.41	123.4922		
889.28	184.9837	1231.02	187.6139		
894.76	204.5941	1235.36	197.2253		
898.04	158.1899	1238.28	176.3672		
900.72	177.6276	1260.41	0.0000		
903.28	177.7899	1271.87	132.7995		
911.20	145.6917	1274.44	114.8555		
912.08	145.7371	1274.54	115.8047		
923.98	0.0000	1291.59	110.6144		
926.50	170.7194	1298.22	0.0000		
929.11	125.5924	1312.11	93.9565		
937.49	145.6683	1332.49	99.2741		
944.13	178.2922	1362.66	0.0000		
946.00	153.6599	1365.19	83.5854		
949.00	155.8810	1368.63	0.0000		
667.71	0.0000	1384.29	74.2218		
962.31	141.7249	1408.01	82.5166		
964.08	148.3835	1457.56	0.0000		
966.17	148.4882	1460.82	72.6376		
911.20	148.6278	1489.16	57.0997		
968.97	148.6278	1505.03	74.4035		
983.53	155.6206	1584.12	68.4459		
984.45	0.0000	1596.21	49.2715		

VAX/VMS Nuclide Identification Report Generated 30-JUN-2016 06:27:27.43

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*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration   : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732003.CNF;1
Background file  : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;102
Background date   : 26-JUN-2016 12:06:12
Sample date      : 20-MAY-2016 00:00:00 Acquisition date : 28-JUN-2016 16:03:27
Sample ID       : G398732003 Sample quantity  : 1.48707E+02 GRAM
Detector name    : GAM41 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:01:08.99 0.2%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity      : 3.00000
Batch ID         : 1572490 Detector SN#     :
Matrix Spike ID  : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	36.73	175	1114	1.27	73.76	73	6	4.05E-03	31.4	
2	0	40.08	58	1051	0.72	80.46	78	6	1.34E-03	89.7	
3	0	46.71*	155	1408	0.97	93.71	90	8	3.59E-03	53.6	
4	0	63.39*	280	1854	0.90	127.07	123	8	6.49E-03	34.2	
5	0	67.06	94	1673	0.56	134.40	132	7	2.17E-03	72.9	
6	3	73.49*	210	2398	1.63	147.25	142	19	4.85E-03	49.8	3.42E+00
7	3	74.99*	1740	1409	1.01	150.25	142	19	4.03E-02	4.5	
8	3	77.24*	2587	1330	0.96	154.75	142	19	5.99E-02	3.2	
9	3	84.33*	306	1425	1.12	168.94	165	30	7.09E-03	23.9	4.39E+00
10	3	87.32	887	1350	1.11	174.92	165	30	2.05E-02	7.5	
11	3	90.05	578	918	0.92	180.37	165	30	1.34E-02	8.9	
12	3	92.80*	868	1198	1.17	185.87	165	30	2.01E-02	10.6	
13	0	99.11*	125	1370	1.81	198.49	195	9	2.89E-03	59.8	
14	0	105.51	202	1251	1.27	211.28	208	8	4.68E-03	31.0	
15	0	108.94	101	898	1.15	218.13	216	6	2.35E-03	47.9	
16	0	129.33	209	1209	1.20	258.90	256	8	4.83E-03	29.7	
17	0	144.04*	82	1124	0.82	288.31	285	8	1.90E-03	80.6	
18	0	150.37	119	1019	1.71	300.98	298	8	2.76E-03	47.2	
19	0	154.06	130	1080	1.02	308.36	305	8	3.02E-03	44.5	
20	0	163.76*	30	751	1.40	327.74	325	6	6.92E-04	173.7	
21	0	185.94*	570	1667	1.22	372.09	366	13	1.32E-02	17.1	
22	0	198.74*	13	1025	1.23	397.68	395	8	3.08E-04	490.8	
23	0	209.51	290	1168	0.86	419.22	414	10	6.71E-03	22.8	
24	0	215.15	78	852	0.99	430.51	428	8	1.80E-03	65.9	
25	3	238.74*	3144	633	1.06	477.68	473	18	7.28E-02	2.4	7.89E-01
26	3	241.73	754	1041	1.93	483.64	473	18	1.75E-02	11.4	
27	0	270.79	341	783	1.06	541.75	537	11	7.88E-03	16.9	
28	0	277.51	386	954	4.17	555.20	548	15	8.94E-03	18.1	
29	0	288.06	59	537	1.25	576.29	574	8	1.37E-03	69.3	
30	0	295.33*	800	749	1.16	590.83	586	10	1.85E-02	7.9	
31	0	300.01	196	666	1.12	600.19	596	9	4.53E-03	24.8	
32	0	328.20	168	806	1.42	656.55	651	11	3.89E-03	33.6	
33	0	338.38	632	729	1.13	676.90	671	11	1.46E-02	9.2	
34	0	352.02*	1286	666	1.15	704.17	699	10	2.98E-02	5.2	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	463.05*	123	570	1.40	926.21	922	9	2.84E-03	39.2	
36	0	472.23	32	478	0.63	944.56	942	8	7.50E-04	117.9	
37	0	510.91*	197	614	1.85	1021.93	1015	13	4.56E-03	37.2	
38	0	543.10	15	297	0.86	1086.29	1083	9	3.45E-04	210.8	
39	0	546.57	40	117	1.30	1093.24	1091	5	9.32E-04	43.7	
40	0	583.32*	819	367	1.48	1166.74	1161	13	1.90E-02	7.2	
41	0	601.84	38	334	1.51	1203.77	1196	11	8.83E-04	95.1	
42	0	609.38*	866	282	1.39	1218.84	1214	10	2.00E-02	5.5	
43	0	661.67	7778	401	1.47	1323.43	1316	15	1.80E-01	1.3	
44	0	705.33	38	204	1.75	1410.75	1408	9	8.76E-04	69.6	
45	0	727.15	209	198	1.61	1454.39	1448	12	4.85E-03	15.1	
46	0	768.77	60	233	1.42	1537.64	1533	11	1.40E-03	50.9	
47	0	794.82	89	207	1.92	1589.72	1583	12	2.06E-03	34.1	
48	0	859.99	84	218	1.89	1720.09	1715	15	1.93E-03	40.0	
49	0	897.81	11	146	1.00	1795.73	1793	11	2.56E-04	214.8	
50	0	911.17*	571	188	1.83	1822.46	1814	16	1.32E-02	7.3	
51	0	928.51	15	114	1.32	1857.13	1850	10	3.36E-04	145.8	
52	3	964.33	114	148	2.09	1928.78	1921	24	2.63E-03	24.0	1.36E+00
53	3	968.93	363	114	1.89	1937.99	1921	24	8.41E-03	7.8	
54	0	1000.69*	47	110	1.73	2001.52	1994	13	1.09E-03	66.6	
55	0	1089.55	24	130	0.99	2179.27	2172	13	5.50E-04	101.1	
56	0	1095.49	30	123	0.64	2191.15	2185	12	7.01E-04	75.5	
57	0	1120.10	236	166	1.71	2240.38	2231	17	5.46E-03	14.1	
58	0	1155.02	63	185	8.30	2310.25	2299	20	1.46E-03	54.2	
59	0	1173.63	95	148	2.53	2347.48	2339	16	2.21E-03	30.3	
60	0	1237.82	108	117	1.69	2475.89	2469	13	2.50E-03	22.8	
61	0	1271.27	43	140	7.20	2542.80	2528	22	1.00E-03	71.8	
62	0	1379.05	42	103	1.72	2758.44	2749	17	9.81E-04	57.7	
63	0	1409.74	40	90	3.44	2819.84	2808	21	9.28E-04	62.4	
64	0	1438.37	21	19	1.77	2877.12	2873	8	4.81E-04	44.1	
65	0	1460.63*	1308	108	1.93	2921.65	2915	18	3.03E-02	3.5	
66	0	1509.88	43	29	1.64	3020.20	3015	9	9.92E-04	27.9	
67	0	1568.37	69	62	12.59	3137.23	3117	36	1.60E-03	38.2	
68	0	1588.70	32	65	0.69	3177.91	3173	11	7.48E-04	50.9	
69	0	1620.87	31	38	0.86	3242.29	3235	14	7.11E-04	46.5	
70	0	1632.01	20	35	2.20	3264.59	3259	11	4.58E-04	62.6	
71	0	1656.48	12	42	3.51	3313.53	3300	18	2.71E-04	136.8	
72	0	1661.66	20	21	1.02	3323.92	3319	10	4.71E-04	46.8	
73	0	1675.51	19	24	0.72	3351.63	3346	12	4.40E-04	56.4	
74	0	1764.62	125	48	2.20	3529.95	3521	15	2.88E-03	15.1	
75	0	1915.92	22	31	3.55	3832.71	3821	21	5.12E-04	66.8	

Flag: "*" = Peak area was modified by background subtraction

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732003.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 20-MAY-2016 00:00:00 Acquisition date : 28-JUN-2016 16:03:27
Sample ID        : G398732003 Sample quantity : 148.71 GRAM
Sample type      : SOLID Sample geometry :
Detector name    : GAMMA41 Detector geometry: CAN
Elapsed live time: 0 12:00:00.00 Elapsed real time: 0 12:01:08.99 0.2%
Energy tolerance : 1.50 keV Half life ratio : 10.00
Errors propagated: No Systematic Error : 0.00 %
Efficiency type  : Empirical Efficiencies at : Peak Energy
Abundance limit  : 75.00

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Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	87.09	EU-155	86.55
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	242.00	RA-224	240.99
U-235	143.76	CE-141	145.44
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
K-40	1460.82	10.66*	8.932E-01	5.569E+00	5.569E+00	6.97	OK
CD-109	88.03	3.70*	7.449E+00	1.184E+00	1.258E+00	22.52	OK
TE-125M	109.28	0.27*	6.935E+00	2.804E+00	4.540E+00	95.86	OK
SN-126	64.28	9.60	7.794E+00	2.028E-01	2.028E-01	68.42	OK
	86.94	8.90	7.449E+00	4.924E-01	4.924E-01	22.52	OK
	87.57	37.00*	7.449E+00	1.184E-01	1.184E-01	22.52	OK
BA-137M	661.66	89.90*	1.827E+00	2.082E+00	2.087E+00	2.53	OK
CS-137	661.66	85.10*	1.827E+00	2.199E+00	2.205E+00	2.53	OK
EU-155	86.55	30.70	7.449E+00	1.427E-01	1.450E-01	22.52	OK
	105.31	21.10*	7.020E+00	7.087E-02	7.201E-02	62.06	OK
TL-208	277.37	6.60	3.906E+00	7.150E-01	7.150E-01	36.28	OK
	583.19	85.00*	2.051E+00	2.091E-01	2.091E-01	14.33	OK
	860.56	12.50	1.435E+00	1.995E-01	1.995E-01	80.03	OK
PB-210	46.54	4.25*	7.559E+00	2.673E-01	2.682E-01	107.18	OK
BI-212	727.33	6.67*	1.675E+00	8.166E-01	8.166E-01	30.21	OK
	785.37	1.10	1.560E+00	----- Line	Not Found	-----	Absent
	1620.50	1.47	8.176E-01	1.024E+00	1.024E+00	93.00	OK
PB-212	74.82	10.28	7.681E+00	8.628E-01	8.628E-01	13.61	OK
	77.11	17.10	7.645E+00	1.053E+00	1.053E+00	6.45	OK
	238.63	43.60*	4.384E+00	7.953E-01	7.953E-01	4.86	OK
	300.09	3.30	3.669E+00	7.651E-01	7.651E-01	49.69	OK
BI-214	609.32	45.49*	1.971E+00	4.278E-01	4.279E-01	10.94	OK
	1120.29	14.92	1.128E+00	5.846E-01	5.846E-01	28.18	OK
	1764.49	15.30	7.620E-01	4.246E-01	4.247E-01	30.28	OK
PB-214	74.82	5.80	7.683E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	7.645E+00	1.857E+00	1.857E+00	6.45	OK
	87.09	3.41	7.454E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.340E+00	----- Line	Not Found	-----	<<INT Reject
	295.22	18.42	3.716E+00	5.546E-01	5.546E-01	15.84	OK
	351.93	35.60*	3.213E+00	5.249E-01	5.250E-01	10.32	OK
RN-222	609.32	45.49*	1.971E+00	4.278E-01	4.279E-01	10.94	OK
	1120.29	14.92	1.128E+00	5.846E-01	5.846E-01	28.18	OK
	1764.49	15.30	7.620E-01	4.246E-01	4.247E-01	30.28	OK
RA-224	240.99	4.10*	4.344E+00	1.065E+00	1.065E+00	46.22	OK
RA-226	609.32	45.49*	1.971E+00	4.278E-01	4.279E-01	10.94	OK
	1120.29	14.92	1.128E+00	5.846E-01	5.846E-01	28.18	OK
	1764.49	15.30	7.620E-01	4.246E-01	4.247E-01	30.28	OK
AC-228	105.21	1.10	7.020E+00	1.359E+00	1.359E+00	62.06	OK
	338.32	11.27	3.322E+00	7.911E-01	7.911E-01	18.35	OK
	794.95	4.25	1.543E+00	5.853E-01	5.853E-01	68.12	OK
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.361E+00	6.925E-01	6.925E-01	14.68	OK
	968.97	15.80	1.286E+00	7.561E-01	7.561E-01	15.57	OK
RA-228	105.21	1.10	7.020E+00	1.359E+00	1.359E+00	62.06	OK
	338.32	11.27	3.322E+00	7.911E-01	7.911E-01	18.35	OK
	794.95	4.25	1.543E+00	5.853E-01	5.853E-01	68.12	OK
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
	911.20	25.80*	1.361E+00	6.925E-01	6.925E-01	14.68	OK
	968.97	15.80	1.286E+00	7.561E-01	7.561E-01	15.57	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	7.681E+00	8.628E-01	8.628E-01	13.61	OK
	77.11	17.10	7.645E+00	1.053E+00	1.053E+00	6.45	OK
	238.63	43.60*	4.384E+00	7.953E-01	7.953E-01	4.86	OK
	300.09	3.30	3.669E+00	7.651E-01	7.651E-01	49.69	OK
TH-229	85.43	14.70	7.512E+00	1.467E-01	1.467E-01	47.78	OK
	88.47	24.00	7.449E+00	1.826E-01	1.826E-01	22.52	OK
	193.51	4.41*	5.088E+00	----- Line	Not Found	-----	Absent
	210.85	2.80	4.819E+00	1.051E+00	1.051E+00	45.67	OK
TH-230	609.32	45.49*	1.971E+00	4.278E-01	4.278E-01	10.94	OK
	1120.29	14.92	1.128E+00	5.846E-01	5.846E-01	28.18	OK
	1764.49	15.30	7.620E-01	4.246E-01	4.246E-01	30.28	OK
	283.69	1.70	3.838E+00	----- Line	Not Found	-----	Absent
TH-232	301.36	5.35*	3.669E+00	4.720E-01	4.720E-01	49.69	OK
	105.21	1.10	7.020E+00	1.359E+00	1.359E+00	62.06	OK
	338.32	11.27	3.322E+00	7.911E-01	7.911E-01	18.35	OK
	835.71	1.61	1.473E+00	----- Line	Not Found	-----	Absent
TH-234	911.20	25.80*	1.361E+00	6.925E-01	6.925E-01	14.68	OK
	968.97	15.80	1.286E+00	7.561E-01	7.561E-01	15.57	OK
	63.29	3.70*	7.794E+00	5.261E-01	5.261E-01	68.42	OK
	92.59	4.23	7.326E+00	1.469E+00	1.469E+00	21.28	OK
U-234	609.32	45.49*	1.971E+00	4.278E-01	4.278E-01	10.94	OK
	1120.29	14.92	1.128E+00	5.846E-01	5.846E-01	28.18	OK
	1764.49	15.30	7.620E-01	4.246E-01	4.246E-01	30.28	OK
	89.96	3.47	7.389E+00	1.186E+00	1.186E+00	17.72	OK
U-235	93.35	5.60	7.326E+00	1.109E+00	1.109E+00	21.28	OK
	143.76	10.96*	6.087E+00	6.231E-02	6.231E-02	161.19	OK
	163.33	5.08	5.658E+00	5.200E-02	5.200E-02	347.37	OK
	185.72	57.20	5.224E+00	9.429E-02	9.429E-02	34.13	OK
U-238	205.31	5.01	4.887E+00	----- Line	Not Found	-----	Absent
	63.29	3.70*	7.794E+00	5.261E-01	5.261E-01	68.42	OK
	92.59	4.23	7.326E+00	1.469E+00	1.469E+00	21.28	OK
	43.53	5.90	7.421E+00	----- Line	Not Found	-----	Absent
AM-243	74.66	67.20*	7.681E+00	1.320E-01	1.320E-01	13.61	OK
	511.00	100.00*	2.315E+00	3.834E-02	3.834E-02	74.38	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732003.CNF;1
Acquisition date : 28-JUN-2016 16:03:27 Sensitivity : 3.000
Detector ID : GAM41 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:01:08.99 Half life ratio : *****
Sample date : 20-MAY-2016 00:00:00 Analyst initials: MXR1
Sample ID : G398732003 Sample Quantity : 1.4871E+02 GRAM
Batch Number : 1572490 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	5.569E+00	3.806E-01	1.881E-01
CD-109	1.258E+00	2.776E-01	3.323E-01
TE-125M	4.540E+00	4.266E+00	6.886E+00
SN-126	1.184E-01	2.614E-02	3.125E-02
BA-137M	2.087E+00	5.175E-02	2.073E-02
CS-137	2.205E+00	5.467E-02	2.190E-02
EU-155	7.201E-02	4.379E-02	4.958E-02
TL-208	2.091E-01	2.937E-02	2.134E-02
PB-210	2.682E-01	2.817E-01	2.454E-01
BI-212	8.166E-01	2.418E-01	2.636E-01
PB-212	7.953E-01	3.789E-02	3.267E-02
BI-214	4.279E-01	4.588E-02	4.211E-02
PB-214	5.250E-01	5.309E-02	4.645E-02
RN-222	4.279E-01	4.588E-02	4.211E-02
RA-224	1.065E+00	4.823E-01	3.501E-01
RA-226	4.279E-01	4.588E-02	4.211E-02
AC-228	6.925E-01	9.966E-02	7.981E-02
RA-228	6.925E-01	9.966E-02	7.981E-02
TH-228	7.953E-01	3.789E-02	3.267E-02
TH-229	-6.500E-02	1.837E-01	3.135E-01
TH-230	4.278E-01	4.588E-02	4.211E-02
PA-231	4.720E-01	2.298E-01	2.754E-01
TH-232	6.925E-01	9.966E-02	7.981E-02
TH-234	5.261E-01	3.528E-01	3.088E-01
U-234	4.278E-01	4.588E-02	4.211E-02
U-235	6.231E-02	9.843E-02	1.083E-01
U-238	5.261E-01	3.528E-01	3.088E-01
AM-243	1.320E-01	1.761E-02	1.747E-02
ANH-511	3.834E-02	2.794E-02	1.929E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	1.840E-02	2.316E-01	3.333E-01	NOT IDENT.

NA-22	-9.419E-03	1.563E-02	2.229E-02	NOT IDENT.
NA-24	0.000E+00	1.982E+17	0.000E+00	SHORT HLIF
AL-26	-4.179E-03	9.957E-03	1.753E-02	NOT IDENT.
SC-46	-5.349E-03	1.421E-02	2.525E-02	FAIL ABUN
V-48	8.761E-03	6.087E-02	1.105E-01	NOT IDENT.
CR-51	1.538E-01	2.396E-01	4.452E-01	NOT IDENT.
MN-54	4.294E-03	1.260E-02	2.312E-02	NOT IDENT.
CO-56	2.900E-03	1.504E-02	2.754E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	7.347E-03	7.824E-03	1.458E-02	NOT IDENT.
CO-58	-1.721E-02	1.476E-02	2.534E-02	NOT IDENT.
FE-59	-4.679E-02	5.941E-02	6.589E-02	NOT IDENT.
CO-60	1.900E-02	1.248E-02	2.420E-02	FAIL ABUN
ZN-65	-3.083E-03	3.267E-02	4.943E-02	NOT IDENT.
GE-68	1.824E-01	4.004E-01	7.337E-01	NOT IDENT.
AS-73	-8.670E-03	8.731E-02	1.460E-01	NOT IDENT.
AS-74	7.119E-02	9.200E-02	1.469E-01	NOT IDENT.
SE-75	-8.597E-03	1.908E-02	3.038E-02	NOT IDENT.
BR-77	0.000E+00	8.133E+03	0.000E+00	SHORT HLIF
SR-82	-1.203E-01	2.142E-01	3.623E-01	NOT IDENT.
RB-83	-3.139E-02	3.115E-02	5.349E-02	NOT IDENT.
KR-85	0.000E+00	3.052E+00	5.508E+00	NOT IDENT.
SR-85	0.000E+00	2.098E-02	3.786E-02	NOT IDENT.
RB-86	2.198E-01	5.912E-01	1.079E+00	NOT IDENT.
Y-88	-3.702E-02	2.077E-02	2.522E-02	FAIL ABUN
Y-91	2.861E+00	8.065E+00	1.455E+01	NOT IDENT.
NB-94	1.037E-03	1.258E-02	1.906E-02	NOT IDENT.
NB-95	1.268E-03	2.415E-02	3.367E-02	NOT IDENT.
NB-95M	7.867E-02	6.196E-02	9.892E-02	NOT IDENT.
ZR-95	2.335E-03	3.243E-02	5.659E-02	NOT IDENT.
NB-97	0.000E+00	1.882E+40	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	2.942E+16	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.983E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.619E+41	0.000E+00	SHORT HLIF
RH-101	7.075E-03	1.093E-02	1.781E-02	FAIL ABUN
RH-102	-5.351E-03	1.861E-02	3.239E-02	NOT IDENT.
RU-103	1.148E-02	2.983E-02	4.157E-02	FAIL ABUN
RH-106	1.145E-01	1.155E-01	2.113E-01	NOT IDENT.
RU-106	1.145E-01	1.155E-01	2.113E-01	NOT IDENT.
AG-108M	-6.740E-03	1.175E-02	2.075E-02	NOT IDENT.
AG-110M	6.264E-03	1.571E-02	2.906E-02	FAIL ABUN
SN-113	-1.393E-02	1.947E-02	3.452E-02	NOT IDENT.
CD-115	0.000E+00	9.166E+03	0.000E+00	SHORT HLIF
SN-117M	3.725E-02	7.294E-02	1.092E-01	NOT IDENT.
TE-123M	1.122E-02	1.355E-02	1.863E-02	NOT IDENT.
SB-124	-1.250E-02	3.196E-02	5.678E-02	NOT IDENT.
SB-125	-6.655E-03	3.713E-02	6.634E-02	FAIL ABUN
I-126	4.479E-01	2.878E-01	4.814E-01	NOT IDENT.
SB-126	6.297E-02	2.288E-01	3.499E-01	NOT IDENT.
SB-127	0.000E+00	3.513E+01	0.000E+00	SHORT HLIF
I-131	1.137E-01	3.521E-01	6.450E-01	NOT IDENT.
I-132	0.000E+00	1.645E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	5.265E+01	0.000E+00	SHORT HLIF
BA-133	1.007E-02	1.648E-02	2.669E-02	FAIL ABUN
I-133	0.000E+00	8.599E+11	0.000E+00	SHORT HLIF
CS-134	0.000E+00	2.016E-02	2.748E-02	FAIL ABUN
CS-135	9.758E-02	6.078E-02	9.791E-02	NOT IDENT.
I-135	0.000E+00	1.449E+41	0.000E+00	SHORT HLIF
CS-136	4.275E-02	1.163E-01	2.125E-01	FAIL ABUN
CE-139	3.803E-03	1.210E-02	1.924E-02	NOT IDENT.
BA-140	-1.651E-01	3.911E-01	6.179E-01	FAIL ABUN
LA-140	-4.179E-02	1.130E-01	1.760E-01	FAIL ABUN
CE-141	3.312E-02	5.233E-02	6.106E-02	FAIL ABUN
CE-143	0.000E+00	1.684E+07	0.000E+00	SHORT HLIF
CE-144	3.642E-03	7.149E-02	1.144E-01	NOT IDENT.
PM-144	3.547E-03	1.193E-02	2.114E-02	NOT IDENT.
PR-144	2.689E-01	9.046E-01	1.603E+00	NOT IDENT.
PM-146	1.312E-02	1.806E-02	3.286E-02	NOT IDENT.
ND-147	-1.709E-01	9.533E-01	1.684E+00	FAIL ABUN
PM-147	3.448E+01	2.179E+02	4.003E+02	NOT IDENT.
PM-149	0.000E+00	8.276E+04	0.000E+00	SHORT HLIF
EU-150	6.068E-03	1.551E-02	1.705E-02	FAIL ABUN
EU-152	-2.574E-02	3.685E-02	5.974E-02	FAIL ABUN
GD-153	3.504E-02	3.370E-02	4.173E-02	NOT IDENT.
EU-154	-2.703E-02	4.370E-02	6.220E-02	NOT IDENT.
TB-160	-2.789E-02	5.028E-02	8.854E-02	FAIL ABUN
HO-166M	4.824E-03	2.448E-02	3.726E-02	NOT IDENT.
TM-171	6.427E-01	1.409E+00	2.381E+00	FAIL ABUN

HF-172	-3.830E-02	6.584E-02	1.039E-01	FAIL ABUN
LU-172	2.028E-02	3.585E-02	3.762E-02	FAIL ABUN
LU-176	-5.573E-03	8.954E-03	1.576E-02	FAIL ABUN
HF-181	-6.060E-03	2.613E-02	4.628E-02	NOT IDENT.
TA-182	-5.909E-02	6.408E-02	1.070E-01	FAIL ABUN
RE-183	1.878E-02	2.661E-02	4.756E-02	FAIL ABUN
RE-184	2.745E-02	1.120E-01	1.136E-01	NOT IDENT.
W-188	1.061E+00	4.844E+00	5.333E+00	FAIL ABUN
IR-192	4.780E-03	1.500E-02	2.770E-02	FAIL ABUN
HG-203	0.000E+00	2.106E-02	3.411E-02	FAIL ABUN
BI-207	1.273E-04	1.585E-02	2.834E-02	FAIL ABUN
BI-211	0.000E+00	1.463E-01	2.206E-01	FAIL ABUN
PB-211	-1.237E-01	2.742E-01	4.883E-01	NOT IDENT.
RN-219	-3.205E-03	1.533E-01	2.764E-01	FAIL ABUN
RA-223	-3.389E-02	2.540E-01	4.027E-01	FAIL ABUN
AC-227	-4.674E-02	8.515E-02	1.473E-01	FAIL ABUN
TH-227	-4.674E-02	8.515E-02	1.473E-01	FAIL ABUN
TH-231	-3.389E-02	2.540E-01	4.027E-01	FAIL ABUN
PA-233	-1.853E-02	2.143E-02	3.848E-02	FAIL ABUN
PA-234	-2.318E-02	9.118E-02	1.622E-01	FAIL ABUN
PA-234M	1.891E+00	2.469E+00	2.778E+00	FAIL ABUN
NP-237	-1.853E-02	2.143E-02	3.848E-02	FAIL ABUN
NP-238	0.000E+00	1.995E+04	0.000E+00	SHORT HLIF
NP-239	-3.052E-02	7.636E-02	1.390E-01	FAIL ABUN
PU-239	0.000E+00	1.528E+02	1.969E+02	FAIL ABUN
AM-241	0.000E+00	1.813E-02	3.185E-02	NOT IDENT.
CM-243	8.237E-03	4.371E-02	5.049E-02	FAIL ABUN
BK-247	4.799E-04	3.131E-02	4.786E-02	FAIL ABUN
CM-247	-1.039E-03	1.418E-02	2.552E-02	FAIL ABUN
CF-249	1.636E-02	1.506E-02	2.796E-02	NOT IDENT.
CF-251	-2.533E-03	4.033E-02	7.223E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	1260	10.66*	8.932E-01	5.569E+00	5.569E+00	6.97
CD-109	88.03	1111	3.70*	7.449E+00	1.695E+00	1.800E+00	14.99
TE-125M	109.28	125	0.27*	6.935E+00	2.804E+00	4.540E+00	95.86
SN-126	64.28	361	9.60	7.794E+00	2.028E-01	2.028E-01	68.42
	86.94	1111	8.90	7.449E+00	7.049E-01	7.049E-01	14.99
	87.57	1111	37.00*	7.449E+00	1.695E-01	1.695E-01	14.99
BA-137M	661.66	8128	89.90*	1.827E+00	2.082E+00	2.087E+00	2.53
CS-137	661.66	8128	85.10*	1.827E+00	2.199E+00	2.205E+00	2.53
CE-141	145.44	99	48.29*	6.087E+00	1.414E-02	3.312E-02	161.19
EU-155	86.55	1111	30.70	7.449E+00	2.043E-01	2.076E-01	14.99
	105.31	250	21.10*	7.020E+00	7.087E-02	7.201E-02	62.06
TL-208	277.37	438	6.60	3.906E+00	7.150E-01	7.150E-01	36.28
	583.19	867	85.00*	2.051E+00	2.091E-01	2.091E-01	14.33
	860.56	85	12.50	1.435E+00	1.995E-01	1.995E-01	80.03
PB-210	46.54	204	4.25*	7.559E+00	2.673E-01	2.682E-01	107.18
BI-211	72.87	266	1.23	7.703E+00	1.183E+00	1.183E+00	99.64
	351.06	1427	12.92*	3.213E+00	1.446E+00	1.446E+00	10.32
BI-212	727.33	217	6.67*	1.675E+00	8.166E-01	8.166E-01	30.21
	785.37	-----	1.10	1.560E+00	-----	Line Not Found	-----
	1620.50	29	1.47	8.176E-01	1.024E+00	1.024E+00	93.00
PB-212	74.82	2206	10.28	7.681E+00	1.176E+00	1.176E+00	9.06
	77.11	3273	17.10	7.645E+00	1.053E+00	1.053E+00	6.45
	238.63	3614	43.60*	4.384E+00	7.953E-01	7.953E-01	4.86
	300.09	220	3.30	3.669E+00	7.651E-01	7.651E-01	49.69
BI-214	609.32	912	45.49*	1.971E+00	4.278E-01	4.279E-01	10.94
	1120.29	234	14.92	1.128E+00	5.846E-01	5.846E-01	28.18
	1764.49	118	15.30	7.620E-01	4.246E-01	4.247E-01	30.28
PB-214	74.82	2206	5.80	7.681E+00	2.084E+00	2.084E+00	9.06
	77.11	3273	9.70	7.645E+00	1.857E+00	1.857E+00	6.45
	87.09	1111	3.41	7.449E+00	1.840E+00	1.840E+00	14.99
	242.00	866	7.25	4.344E+00	1.157E+00	1.157E+00	22.83
	295.22	902	18.42	3.716E+00	5.546E-01	5.546E-01	15.84
	351.93	1427	35.60*	3.213E+00	5.249E-01	5.250E-01	10.32
RN-222	609.32	912	45.49*	1.971E+00	4.278E-01	4.279E-01	10.94
	1120.29	234	14.92	1.128E+00	5.846E-01	5.846E-01	28.18
	1764.49	118	15.30	7.620E-01	4.246E-01	4.247E-01	30.28
RA-224	240.99	866	4.10*	4.344E+00	2.045E+00	2.045E+00	22.83
RA-226	609.32	912	45.49*	1.971E+00	4.278E-01	4.279E-01	10.94
	1120.29	234	14.92	1.128E+00	5.846E-01	5.846E-01	28.18
	1764.49	118	15.30	7.620E-01	4.246E-01	4.247E-01	30.28
AC-228	105.21	250	1.10	7.020E+00	1.359E+00	1.359E+00	62.06
	338.32	704	11.27	3.322E+00	7.911E-01	7.911E-01	18.35
	794.95	91	4.25	1.543E+00	5.853E-01	5.853E-01	68.12
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	578	25.80*	1.361E+00	6.925E-01	6.925E-01	14.68
	968.97	365	15.80	1.286E+00	7.561E-01	7.561E-01	15.57
RA-228	105.21	250	1.10	7.020E+00	1.359E+00	1.359E+00	62.06

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	704	11.27	3.322E+00	7.911E-01	7.911E-01	18.35
	794.95	91	4.25	1.543E+00	5.853E-01	5.853E-01	68.12
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	578	25.80*	1.361E+00	6.925E-01	6.925E-01	14.68
	968.97	365	15.80	1.286E+00	7.561E-01	7.561E-01	15.57
TH-228	74.82	2206	10.28	7.681E+00	1.176E+00	1.176E+00	9.06
	77.11	3273	17.10	7.645E+00	1.053E+00	1.053E+00	6.45
	238.63	3614	43.60*	4.384E+00	7.953E-01	7.953E-01	4.86
	300.09	220	3.30	3.669E+00	7.651E-01	7.651E-01	49.69
TH-229	85.43	385	14.70	7.512E+00	1.467E-01	1.467E-01	47.78
	88.47	1111	24.00	7.449E+00	2.614E-01	2.614E-01	14.99
	193.51	-----	4.41*	5.088E+00	-----	Line Not Found	-----
	210.85	337	2.80	4.819E+00	1.051E+00	1.051E+00	45.67
TH-230	609.32	912	45.49*	1.971E+00	4.278E-01	4.278E-01	10.94
	1120.29	234	14.92	1.128E+00	5.846E-01	5.846E-01	28.18
	1764.49	118	15.30	7.620E-01	4.246E-01	4.246E-01	30.28
PA-231	283.69	-----	1.70	3.838E+00	-----	Line Not Found	-----
	301.36	220	5.35*	3.669E+00	4.720E-01	4.720E-01	49.69
TH-232	105.21	250	1.10	7.020E+00	1.359E+00	1.359E+00	62.06
	338.32	704	11.27	3.322E+00	7.911E-01	7.911E-01	18.35
	835.71	-----	1.61	1.473E+00	-----	Line Not Found	-----
	911.20	578	25.80*	1.361E+00	6.925E-01	6.925E-01	14.68
	968.97	365	15.80	1.286E+00	7.561E-01	7.561E-01	15.57
TH-234	63.29	361	3.70*	7.794E+00	5.261E-01	5.261E-01	68.42
	92.59	1082	4.23	7.326E+00	1.469E+00	1.469E+00	21.28
U-234	609.32	912	45.49*	1.971E+00	4.278E-01	4.278E-01	10.94
	1120.29	234	14.92	1.128E+00	5.846E-01	5.846E-01	28.18
	1764.49	118	15.30	7.620E-01	4.246E-01	4.246E-01	30.28
U-235	89.96	723	3.47	7.389E+00	1.186E+00	1.186E+00	17.72
	93.35	1082	5.60	7.326E+00	1.109E+00	1.109E+00	21.28
	143.76	99	10.96*	6.087E+00	6.231E-02	6.231E-02	161.19
	163.33	36	5.08	5.658E+00	5.200E-02	5.200E-02	347.37
	185.72	670	57.20	5.224E+00	9.429E-02	9.429E-02	34.13
	205.31	-----	5.01	4.887E+00	-----	Line Not Found	-----
U-238	63.29	361	3.70*	7.794E+00	5.261E-01	5.261E-01	68.42
	92.59	1082	4.23	7.326E+00	1.469E+00	1.469E+00	21.28
AM-243	43.53	-----	5.90	7.421E+00	-----	Line Not Found	-----
	74.66	2206	67.20*	7.681E+00	1.798E-01	1.798E-01	9.06
ANH-511	511.00	211	100.00*	2.315E+00	3.834E-02	3.834E-02	74.38

Flag: "*" = Keyline

Total number of lines in spectrum 75
Number of unidentified lines 19
Number of lines tentatively identified by NID 56 74.67%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	5.569E+00	5.569E+00	0.388E+00	6.97	
CD-109	461.40D	1.06	1.695E+00	1.800E+00	0.270E+00	14.99	
TE-125M	57.40D	1.62	2.804E+00	4.540E+00	4.353E+00	95.86	
SN-126	2.30E+05Y	1.00	1.695E-01	1.695E-01	0.254E-01	14.99	
BA-137M	30.08Y	1.00	2.082E+00	2.087E+00	0.053E+00	2.53	
CS-137	30.08Y	1.00	2.199E+00	2.205E+00	0.056E+00	2.53	
CE-141	32.51D	2.34	1.414E-02	3.312E-02	5.339E-02	161.19	
EU-155	4.75Y	1.02	7.087E-02	7.201E-02	4.469E-02	62.06	
TL-208	1.41E+10Y	1.00	2.091E-01	2.091E-01	0.300E-01	14.33	
PB-210	22.20Y	1.00	2.673E-01	2.682E-01	2.874E-01	107.18	
BI-211	7.04E+08Y	1.00	1.446E+00	1.446E+00	0.149E+00	10.32	
BI-212	1.41E+10Y	1.00	8.166E-01	8.166E-01	2.467E-01	30.21	
PB-212	1.41E+10Y	1.00	7.953E-01	7.953E-01	0.387E-01	4.86	
BI-214	1600.00Y	1.00	4.278E-01	4.279E-01	0.468E-01	10.94	
PB-214	1600.00Y	1.00	5.249E-01	5.250E-01	0.542E-01	10.32	
RN-222	1600.00Y	1.00	4.278E-01	4.279E-01	0.468E-01	10.94	
RA-224	1.41E+10Y	1.00	2.045E+00	2.045E+00	0.467E+00	22.83	
RA-226	1600.00Y	1.00	4.278E-01	4.279E-01	0.468E-01	10.94	
AC-228	1.41E+10Y	1.00	6.925E-01	6.925E-01	1.017E-01	14.68	
RA-228	1.41E+10Y	1.00	6.925E-01	6.925E-01	1.017E-01	14.68	
TH-228	1.41E+10Y	1.00	7.953E-01	7.953E-01	0.387E-01	4.86	
TH-229	7340.00Y	1.00	2.614E-01	2.614E-01	0.392E-01	14.99	K
TH-230	7.54E+04Y	1.00	4.278E-01	4.278E-01	0.468E-01	10.94	
PA-231	7.04E+08Y	1.00	4.720E-01	4.720E-01	2.345E-01	49.69	
TH-232	1.41E+10Y	1.00	6.925E-01	6.925E-01	1.017E-01	14.68	
TH-234	4.47E+09Y	1.00	5.261E-01	5.261E-01	3.600E-01	68.42	
U-234	2.45E+05Y	1.00	4.278E-01	4.278E-01	0.468E-01	10.94	
U-235	7.04E+08Y	1.00	6.231E-02	6.231E-02	10.04E-02	161.19	
U-238	4.47E+09Y	1.00	5.261E-01	5.261E-01	3.600E-01	68.42	
AM-243	7370.00Y	1.00	1.798E-01	1.798E-01	0.163E-01	9.06	
ANH-511	1.00E+09Y	1.00	3.834E-02	3.834E-02	2.851E-02	74.38	
Total Activity :			2.779E+01	2.966E+01			

Grand Total Activity : 2.779E+01 2.966E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	36.73	235	1494	1.27	73.76	73	6	4.05E-03	62.8	6.97E+00	
0	40.08	77	1401	0.72	80.46	78	6	1.34E-03	****	7.22E+00	
0	67.06	120	2141	0.56	134.40	132	7	2.17E-03	****	7.77E+00	T
0	99.11	155	1699	1.81	198.49	195	9	2.89E-03	****	7.18E+00	T
0	129.33	253	1466	1.20	258.90	256	8	4.83E-03	59.4	6.43E+00	T
0	150.37	143	1220	1.71	300.98	298	8	2.76E-03	94.4	5.94E+00	
0	154.06	156	1290	1.02	308.36	305	8	3.02E-03	89.1	5.86E+00	T
0	198.74	16	1198	1.23	397.68	395	8	3.08E-04	****	5.00E+00	T
0	215.15	90	989	0.99	430.51	428	8	1.80E-03	****	4.73E+00	T
0	270.79	387	891	1.06	541.75	537	11	7.88E-03	33.9	3.98E+00	T
0	288.06	67	607	1.25	576.29	574	8	1.37E-03	****	3.79E+00	T
0	328.20	188	900	1.42	656.55	651	11	3.89E-03	67.2	3.41E+00	T
0	463.05	133	617	1.40	926.21	922	9	2.84E-03	78.4	2.53E+00	T
0	472.23	35	516	0.63	944.56	942	8	7.50E-04	****	2.48E+00	T
0	543.10	16	316	0.86	1086.29	1083	9	3.45E-04	****	2.19E+00	
0	546.57	43	124	1.30	1093.24	1091	5	9.32E-04	87.5	2.18E+00	T
0	601.84	40	352	1.51	1203.77	1196	11	8.83E-04	****	1.99E+00	T
0	705.33	39	212	1.75	1410.75	1408	9	8.76E-04	****	1.72E+00	T
0	768.77	62	240	1.42	1537.64	1533	11	1.40E-03	****	1.59E+00	
0	897.81	11	148	1.00	1795.73	1793	11	2.56E-04	****	1.38E+00	T
0	928.51	15	116	1.32	1857.13	1850	10	3.36E-04	****	1.34E+00	T
3	964.33	115	149	2.09	1928.78	1921	24	2.63E-03	48.0	1.29E+00	T
0	1000.69	47	111	1.73	2001.52	1994	13	1.09E-03	****	1.25E+00	T
0	1089.55	24	129	0.99	2179.27	2172	13	5.50E-04	****	1.16E+00	
0	1095.49	30	122	0.64	2191.15	2185	12	7.01E-04	****	1.15E+00	
0	1155.02	62	183	8.30	2310.25	2299	20	1.46E-03	****	1.10E+00	
0	1173.63	94	146	2.53	2347.48	2339	16	2.21E-03	60.5	1.08E+00	T
0	1237.82	106	115	1.69	2475.89	2469	13	2.50E-03	45.6	1.03E+00	T
0	1271.27	42	137	7.20	2542.80	2528	22	1.00E-03	****	1.01E+00	T
0	1379.05	41	100	1.72	2758.44	2749	17	9.81E-04	****	9.39E-01	
0	1409.74	39	87	3.44	2819.84	2808	21	9.28E-04	****	9.21E-01	
0	1438.37	20	19	1.77	2877.12	2873	8	4.81E-04	88.1	9.05E-01	
0	1509.88	41	28	1.64	3020.20	3015	9	9.92E-04	55.8	8.68E-01	
0	1568.37	66	59	12.59	3137.23	3117	36	1.60E-03	76.3	8.41E-01	
0	1588.70	31	62	0.69	3177.91	3173	11	7.48E-04	****	8.32E-01	
0	1632.01	19	34	2.20	3264.59	3259	11	4.58E-04	****	8.13E-01	
0	1656.48	11	40	3.51	3313.53	3300	18	2.71E-04	****	8.03E-01	
0	1661.66	19	20	1.02	3323.92	3319	10	4.71E-04	93.7	8.01E-01	
0	1675.51	18	23	0.72	3351.63	3346	12	4.40E-04	****	7.95E-01	
0	1915.92	21	29	3.55	3832.71	3821	21	5.12E-04	****	7.13E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
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*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732003.CNF;1  *
* Acquisition date   : 28-JUN-2016 16:03:27 Sensitivity      : 3.000          *
* Detector ID        : GAM41 Energy tolerance: 1.500         *
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000      *
* Elapsed real time  : 0 12:01:08.99 Half life ratio  : *****          *
* Sample date        : 20-MAY-2016 00:00:00 Nuclide Library : SOLID         *
* Sample ID          : G398732003 Analyst initials: MXR1          *
* Batch Number       : 1572490 Sample Quantity : 1.4871E+02 GRAM      *
* Wet wt corr        : 1.00000 Wet Weight : 0.00000          *
*                                     Dry Weight : 0.00000          *
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 26-JAN-2016 06:01:47 Eff. Geometry   : CAN          *
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3          *
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	8.807E-02
CD-109	1.639E-01
TE-125M	3.392E+00
SN-126	1.541E-02
BA-137M	1.001E-02
CS-137	1.058E-02
EU-155	2.439E-02
TL-208	1.034E-02
PB-210	1.208E-01
BI-212	1.267E-01
PB-212	1.603E-02
BI-214	2.042E-02
PB-214	2.272E-02
RN-222	2.042E-02
RA-224	1.718E-01
RA-226	2.042E-02
AC-228	3.827E-02
RA-228	3.827E-02
TH-228	1.603E-02
TH-229	1.541E-01
TH-230	2.041E-02
PA-231	1.347E-01
TH-232	3.827E-02
TH-234	1.524E-01
U-234	2.041E-02
U-235	5.325E-02
U-238	1.524E-01
AM-243	8.620E-03
ANH-511	9.395E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	1.629E-01	NOT IDENT.
NA-22	1.056E-02	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
AL-26	8.004E-03	NOT IDENT.
SC-46	1.205E-02	FAIL ABUN
V-48	5.269E-02	NOT IDENT.
CR-51	2.180E-01	NOT IDENT.
MN-54	1.114E-02	NOT IDENT.
CO-56	1.321E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	7.177E-03	NOT IDENT.
CO-58	1.211E-02	NOT IDENT.
FE-59	3.130E-02	NOT IDENT.
CO-60	1.150E-02	FAIL ABUN
ZN-65	2.360E-02	NOT IDENT.
GE-68	3.500E-01	NOT IDENT.
AS-73	7.195E-02	NOT IDENT.
AS-74	7.113E-02	NOT IDENT.
SE-75	1.488E-02	NOT IDENT.
BR-77	0.000E+00	SHORT HLIF
SR-82	1.739E-01	NOT IDENT.
RB-83	2.597E-02	NOT IDENT.
KR-85	2.696E+00	NOT IDENT.
SR-85	1.853E-02	NOT IDENT.
RB-86	5.145E-01	NOT IDENT.
Y-88	1.161E-02	FAIL ABUN
Y-91	6.941E+00	NOT IDENT.
NB-94	9.199E-03	NOT IDENT.
NB-95	1.628E-02	NOT IDENT.
NB-95M	4.865E-02	NOT IDENT.
ZR-95	2.729E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	8.770E-03	FAIL ABUN
RH-102	1.565E-02	NOT IDENT.
RU-103	2.025E-02	FAIL ABUN
RH-106	1.024E-01	NOT IDENT.
RU-106	1.024E-01	NOT IDENT.
AG-108M	1.014E-02	NOT IDENT.
AG-110M	1.390E-02	FAIL ABUN
SN-113	1.687E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	5.369E-02	NOT IDENT.
TE-123M	9.162E-03	NOT IDENT.
SB-124	2.599E-02	NOT IDENT.
SB-125	3.244E-02	FAIL ABUN
I-126	2.325E-01	NOT IDENT.
SB-126	1.690E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	3.153E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	1.305E-02	FAIL ABUN
I-133	0.000E+00	SHORT HLIF
CS-134	1.329E-02	FAIL ABUN
CS-135	4.805E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	1.014E-01	FAIL ABUN
CE-139	9.463E-03	NOT IDENT.
BA-140	2.996E-01	FAIL ABUN
LA-140	8.171E-02	FAIL ABUN
CE-141	3.006E-02	FAIL ABUN
CE-143	0.000E+00	SHORT HLIF
CE-144	5.629E-02	NOT IDENT.
PM-144	1.021E-02	NOT IDENT.
PR-144	7.742E-01	NOT IDENT.
PM-146	1.608E-02	NOT IDENT.
ND-147	8.177E-01	FAIL ABUN
PM-147	1.969E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	8.344E-03	FAIL ABUN
EU-152	2.920E-02	FAIL ABUN
GD-153	2.055E-02	NOT IDENT.
EU-154	2.947E-02	NOT IDENT.
TB-160	4.228E-02	FAIL ABUN
HO-166M	1.801E-02	NOT IDENT.
TM-171	1.173E+00	FAIL ABUN
HF-172	5.114E-02	FAIL ABUN

LU-172	1.799E-02	FAIL ABUN
LU-176	7.708E-03	FAIL ABUN
HF-181	2.258E-02	NOT IDENT.
TA-182	5.093E-02	FAIL ABUN
RE-183	2.345E-02	FAIL ABUN
RE-184	5.438E-02	NOT IDENT.
W-188	2.610E+00	FAIL ABUN
IR-192	1.356E-02	FAIL ABUN
HG-203	1.672E-02	FAIL ABUN
BI-207	1.352E-02	FAIL ABUN
BI-211	1.089E-01	FAIL ABUN
PB-211	2.388E-01	NOT IDENT.
RN-219	1.351E-01	FAIL ABUN
RA-223	1.971E-01	FAIL ABUN
AC-227	7.219E-02	FAIL ABUN
TH-227	7.219E-02	FAIL ABUN
TH-231	1.971E-01	FAIL ABUN
PA-233	1.881E-02	FAIL ABUN
PA-234	7.745E-02	FAIL ABUN
PA-234M	1.335E+00	FAIL ABUN
NP-237	1.881E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	6.842E-02	FAIL ABUN
PU-239	9.702E+01	FAIL ABUN
AM-241	1.571E-02	NOT IDENT.
CM-243	2.484E-02	FAIL ABUN
BK-247	2.345E-02	FAIL ABUN
CM-247	1.248E-02	FAIL ABUN
CF-249	1.369E-02	NOT IDENT.
CF-251	3.549E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G398732003.CNF;1
Acquisition date : 28-JUN-2016 16:03:27 Sensitivity : 3.000
Detector ID : GAM41 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:01:08.99 Half life ratio : *****
Sample date : 20-MAY-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G398732003 Analyst initials: MXR1
Batch Number : 1572490 Sample Quantity : 1.4871E+02 GRAM
Quantity Err(%) : 1.3449E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 26-JAN-2016 06:01:47 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	5.569E+00	6.084E-01	6.084E-01
CD-109	1.258E+00	3.173E-01	3.173E-01
TE-125M	4.540E+00	4.293E+00	4.293E+00
SN-126	1.184E-01	2.921E-02	2.921E-02
BA-137M	2.087E+00	1.781E-01	1.781E-01
CS-137	2.205E+00	1.880E-01	1.880E-01
EU-155	7.201E-02	4.452E-02	4.452E-02
TL-208	2.091E-01	3.438E-02	3.438E-02
PB-210	2.682E-01	2.837E-01	2.837E-01
BI-212	8.166E-01	2.535E-01	2.535E-01
PB-212	7.953E-01	8.439E-02	8.439E-02
BI-214	4.279E-01	5.844E-02	5.844E-02
PB-214	5.250E-01	6.947E-02	6.947E-02
RN-222	4.279E-01	5.844E-02	5.844E-02
RA-224	1.065E+00	5.083E-01	5.083E-01
RA-226	4.279E-01	5.844E-02	5.844E-02
AC-228	6.925E-01	1.292E-01	1.292E-01
RA-228	6.925E-01	1.292E-01	1.292E-01
TH-228	7.953E-01	8.439E-02	8.439E-02
TH-229	-6.500E-02	1.838E-01	1.838E-01
TH-230	4.278E-01	5.844E-02	5.844E-02
PA-231	4.720E-01	2.535E-01	2.535E-01
TH-232	6.925E-01	1.292E-01	1.292E-01
TH-234	5.261E-01	3.760E-01	3.760E-01
U-234	4.278E-01	5.844E-02	5.844E-02
U-235	6.231E-02	9.867E-02	9.867E-02
U-238	5.261E-01	3.760E-01	3.760E-01
AM-243	1.320E-01	2.406E-02	2.406E-02
ANH-511	3.834E-02	2.814E-02	2.814E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	1.840E-02	2.316E-01	2.317E-01 NOT IDENT.

NA-22	-9.419E-03	1.565E-02	1.622E-02	NOT IDENT.
NA-24	-2.342E+16	1.982E+17	0.000E+00	SHORT HLIF
AL-26	-4.179E-03	9.962E-03	1.014E-02	NOT IDENT.
SC-46	-5.349E-03	1.422E-02	1.443E-02	FAIL ABUN
V-48	8.761E-03	6.088E-02	6.101E-02	NOT IDENT.
CR-51	1.538E-01	2.400E-01	2.498E-01	NOT IDENT.
MN-54	4.294E-03	1.261E-02	1.276E-02	NOT IDENT.
CO-56	2.900E-03	1.505E-02	1.510E-02	FAIL ABUN
MN-56	1.000E+41	5.018E+41	0.000E+00	SHORT HLIF
CO-57	7.347E-03	7.873E-03	8.541E-03	NOT IDENT.
CO-58	-1.721E-02	1.486E-02	1.676E-02	NOT IDENT.
FE-59	-4.679E-02	6.003E-02	6.363E-02	NOT IDENT.
CO-60	1.900E-02	1.257E-02	1.521E-02	FAIL ABUN
ZN-65	-3.083E-03	3.267E-02	3.270E-02	NOT IDENT.
GE-68	1.824E-01	4.015E-01	4.099E-01	NOT IDENT.
AS-73	-8.670E-03	8.733E-02	8.742E-02	NOT IDENT.
AS-74	7.119E-02	9.232E-02	9.774E-02	NOT IDENT.
SE-75	-8.597E-03	1.909E-02	1.948E-02	NOT IDENT.
BR-77	1.707E+05	1.974E+05	2.119E+05	SHORT HLIF
SR-82	-1.203E-01	2.146E-01	2.213E-01	NOT IDENT.
RB-83	-3.139E-02	3.153E-02	3.456E-02	NOT IDENT.
KR-85	1.329E+01	3.258E+00	6.821E+00	NOT IDENT.
SR-85	9.114E-02	2.239E-02	4.679E-02	NOT IDENT.
RB-86	2.198E-01	5.924E-01	6.006E-01	NOT IDENT.
Y-88	-3.702E-02	2.095E-02	2.679E-02	FAIL ABUN
Y-91	2.861E+00	8.069E+00	8.171E+00	NOT IDENT.
NB-94	1.037E-03	1.258E-02	1.259E-02	NOT IDENT.
NB-95	1.268E-03	2.415E-02	2.416E-02	NOT IDENT.
NB-95M	7.867E-02	6.258E-02	7.193E-02	NOT IDENT.
ZR-95	2.335E-03	3.243E-02	3.245E-02	NOT IDENT.
NB-97	1.000E+41	2.052E+40	0.000E+00	SHORT HLIF
ZR-97	8.201E+16	3.024E+16	0.000E+00	SHORT HLIF
MO-99	8.594E+02	1.984E+03	2.022E+03	SHORT HLIF
TC-99M	1.000E+41	1.625E+41	0.000E+00	SHORT HLIF
RH-101	7.075E-03	1.103E-02	1.148E-02	FAIL ABUN
RH-102	-5.351E-03	1.862E-02	1.878E-02	NOT IDENT.
RU-103	1.148E-02	2.984E-02	3.029E-02	FAIL ABUN
RH-106	1.145E-01	1.160E-01	1.270E-01	NOT IDENT.
RU-106	1.145E-01	1.160E-01	1.270E-01	NOT IDENT.
AG-108M	-6.740E-03	1.176E-02	1.215E-02	NOT IDENT.
AG-110M	6.264E-03	1.573E-02	1.598E-02	FAIL ABUN
SN-113	-1.393E-02	1.950E-02	2.049E-02	NOT IDENT.
CD-115	3.994E+03	9.175E+03	9.350E+03	SHORT HLIF
SN-117M	3.725E-02	7.303E-02	7.494E-02	NOT IDENT.
TE-123M	1.122E-02	1.359E-02	1.450E-02	NOT IDENT.
SB-124	-1.250E-02	3.197E-02	3.247E-02	NOT IDENT.
SB-125	-6.655E-03	3.714E-02	3.726E-02	FAIL ABUN
I-126	4.479E-01	2.908E-01	3.540E-01	NOT IDENT.
SB-126	6.297E-02	2.290E-01	2.307E-01	NOT IDENT.
SB-127	1.158E+01	3.521E+01	3.559E+01	SHORT HLIF
I-131	1.137E-01	3.523E-01	3.560E-01	NOT IDENT.
I-132	1.000E+41	2.955E+41	0.000E+00	SHORT HLIF
TE-132	-1.623E+01	5.269E+01	5.319E+01	SHORT HLIF
BA-133	1.007E-02	1.651E-02	1.712E-02	FAIL ABUN
I-133	-4.929E+11	8.694E+11	8.974E+11	SHORT HLIF
CS-134	3.019E-02	2.037E-02	2.450E-02	FAIL ABUN
CS-135	9.758E-02	6.159E-02	7.568E-02	NOT IDENT.
I-135	-1.000E+41	1.709E+41	0.000E+00	SHORT HLIF
CS-136	4.275E-02	1.165E-01	1.181E-01	FAIL ABUN
CE-139	3.803E-03	1.213E-02	1.225E-02	NOT IDENT.
BA-140	-1.651E-01	3.913E-01	3.983E-01	FAIL ABUN
LA-140	-4.179E-02	1.131E-01	1.146E-01	FAIL ABUN
CE-141	3.312E-02	5.244E-02	5.453E-02	FAIL ABUN
CE-143	9.459E+07	1.889E+07	4.664E+07	SHORT HLIF
CE-144	3.642E-03	7.149E-02	7.151E-02	NOT IDENT.
PM-144	3.547E-03	1.194E-02	1.204E-02	NOT IDENT.
PR-144	2.689E-01	9.049E-01	9.130E-01	NOT IDENT.
PM-146	1.312E-02	1.811E-02	1.905E-02	NOT IDENT.
ND-147	-1.709E-01	9.534E-01	9.565E-01	FAIL ABUN
PM-147	3.448E+01	2.179E+02	2.185E+02	NOT IDENT.
PM-149	-1.217E+03	8.276E+04	8.277E+04	SHORT HLIF
EU-150	6.068E-03	1.552E-02	1.576E-02	FAIL ABUN
EU-152	-2.574E-02	3.692E-02	3.870E-02	FAIL ABUN
GD-153	3.504E-02	3.386E-02	3.736E-02	NOT IDENT.
EU-154	-2.703E-02	4.376E-02	4.542E-02	NOT IDENT.
TB-160	-2.789E-02	5.038E-02	5.192E-02	FAIL ABUN
HO-166M	4.824E-03	2.448E-02	2.458E-02	NOT IDENT.
TM-171	6.427E-01	1.412E+00	1.441E+00	FAIL ABUN

HF-172	-3.830E-02	6.627E-02	6.848E-02	FAIL	ABUN
LU-172	2.028E-02	3.607E-02	3.721E-02	FAIL	ABUN
LU-176	-5.573E-03	8.967E-03	9.312E-03	FAIL	ABUN
HF-181	-6.060E-03	2.614E-02	2.628E-02	NOT	IDENT.
TA-182	-5.909E-02	6.427E-02	6.957E-02	FAIL	ABUN
RE-183	1.878E-02	2.676E-02	2.807E-02	FAIL	ABUN
RE-184	2.745E-02	1.121E-01	1.128E-01	NOT	IDENT.
W-188	1.061E+00	4.846E+00	4.870E+00	FAIL	ABUN
IR-192	4.780E-03	1.501E-02	1.516E-02	FAIL	ABUN
HG-203	3.650E-02	2.130E-02	2.691E-02	FAIL	ABUN
BI-207	1.273E-04	1.585E-02	1.585E-02	FAIL	ABUN
BI-211	1.446E+00	1.928E-01	6.800E-01	FAIL	ABUN
PB-211	-1.237E-01	2.744E-01	2.801E-01	NOT	IDENT.
RN-219	-3.205E-03	1.533E-01	1.534E-01	FAIL	ABUN
RA-223	-3.389E-02	2.541E-01	2.545E-01	FAIL	ABUN
AC-227	-4.674E-02	8.545E-02	8.801E-02	FAIL	ABUN
TH-227	-4.674E-02	8.545E-02	8.801E-02	FAIL	ABUN
TH-231	-3.389E-02	2.541E-01	2.545E-01	FAIL	ABUN
PA-233	-1.853E-02	2.150E-02	2.306E-02	FAIL	ABUN
PA-234	-2.318E-02	9.500E-02	9.557E-02	FAIL	ABUN
PA-234M	1.891E+00	2.484E+00	2.626E+00	FAIL	ABUN
NP-237	-1.853E-02	2.150E-02	2.306E-02	FAIL	ABUN
NP-238	-6.987E+03	1.997E+04	2.022E+04	SHORT	HLIF
NP-239	-3.052E-02	7.647E-02	7.770E-02	FAIL	ABUN
PU-239	2.622E+02	1.557E+02	1.955E+02	FAIL	ABUN
AM-241	4.185E-02	1.901E-02	2.678E-02	NOT	IDENT.
CM-243	8.237E-03	4.372E-02	4.388E-02	FAIL	ABUN
BK-247	4.799E-04	3.131E-02	3.131E-02	FAIL	ABUN
CM-247	-1.039E-03	1.419E-02	1.419E-02	FAIL	ABUN
CF-249	1.636E-02	1.516E-02	1.686E-02	NOT	IDENT.
CF-251	-2.533E-03	4.034E-02	4.035E-02	NOT	IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	1216.7920	87.09	1624.3041	136.47	1212.8711
45.60	1311.8099	87.57	1625.3597	140.51	0.0000
46.54	1311.2797	88.03	1626.3693	143.76	1166.6642
49.72	0.0000	88.34	1627.0488	144.24	1131.1154
51.35	1373.3507	88.47	1627.3325	145.44	1052.1417
51.87	1317.3440	89.96	1630.5721	152.43	1083.5320
52.39	1357.1494	1093.63	1632.0435	153.25	1084.3744
52.97	1402.2236	91.11	1633.0594	323.87	1133.9624
53.44	1402.5403	92.59	1636.2330	156.02	1147.2524
54.07	1432.6932	93.35	1637.8496	158.56	1075.5645
57.36	0.0000	94.56	1640.4161	159.00	1041.4219
57.53	1578.7438	94.65	1640.6075	162.33	1131.1246
57.98	1495.9629	94.67	1640.6537	162.66	1155.1371
59.27	1531.2288	94.87	1641.0759	163.33	1129.2976
59.32	1488.1405	97.43	1176.5726	165.86	1088.9050
59.54	1435.3792	98.43	1178.0577	176.31	1008.1158
60.96	1615.0884	98.44	1178.0719	176.60	1025.9329
61.17	1615.6581	99.53	1131.5763	177.52	1022.6151
62.93	1716.0665	100.11	1121.3154	181.07	0.0000
63.29	1717.0891	102.03	1137.3837	181.52	1072.3978
63.58	1719.3566	103.18	1138.9834	184.41	1101.6416
64.28	1728.5941	103.37	1139.2507	143.76	1118.2638
66.73	1735.4434	105.21	1151.4042	193.51	1153.3362
67.24	1780.6385	105.31	1151.5413	197.03	1151.8235
125.81	1813.5275	106.12	1250.8057	198.01	1206.5765
67.75	1813.7245	106.47	1251.3313	201.83	1095.4807
69.67	1835.0760	109.28	1398.4415	203.43	963.3501
70.83	1838.3633	111.00	1320.7495	205.31	1029.0948
72.81	1770.8445	111.76	0.0000	210.85	845.6954
72.87	1771.0060	114.06	1201.6404	215.65	915.2223
74.66	1775.7708	116.30	0.0000	222.11	930.0908
74.82	1776.1965	116.74	1264.4042	227.09	951.7977
74.97	1776.5930	119.76	1239.3647	227.38	941.2432
77.11	1782.2020	121.12	1195.2240	228.16	0.0000
78.74	1719.0684	121.22	1181.6486	228.18	978.3928
79.69	1621.0291	121.78	1142.2169	116.74	978.3928
80.12	1547.6221	122.06	1142.5682	235.69	1000.8177
80.19	1547.7744	122.92	1176.9928	235.96	1035.6451
80.57	1623.0648	123.07	1177.1851	238.63	887.0924
81.00	1624.0562	265.00	1225.0865	238.98	0.0000
81.07	1624.2224	125.81	1264.1222	240.99	888.5715
81.75	1625.7792	127.23	1237.6638	242.00	889.2081
83.79	1731.3965	127.91	1216.4802	244.70	803.3229
84.00	1617.4357	129.30	1206.8126	252.40	0.0000
85.43	1620.6290	131.20	1158.9672	252.80	789.6444
86.55	1623.1165	133.02	1165.9332	254.15	0.0000
86.79	1623.6377	133.52	1177.6442	256.23	813.4424
86.94	1623.9742	136.00	1230.1860	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	793.3889	355.39	0.0000	584.27	310.0342
264.80	793.4656	356.01	582.8781	595.83	269.8706
265.00	768.5354	364.49	607.0808	427.87	326.5033
268.22	754.2363	366.42	0.0000	602.52	0.0000
269.46	769.0256	372.51	620.0087	604.72	328.0507
270.03	779.9473	375.05	610.4663	607.14	326.6057
271.23	752.1653	377.52	618.7957	609.32	330.6908
273.65	550.8025	356.01	668.1404	610.33	314.8130
276.40	688.8336	388.16	611.7579	614.28	271.7241
277.37	689.2587	388.63	627.0786	618.01	318.1461
277.60	689.3627	391.69	666.0612	620.36	277.5707
278.00	689.5422	264.66	630.8870	621.93	280.8700
279.20	663.3243	401.81	634.1152	630.19	0.0000
279.54	661.6770	402.40	645.7566	631.29	278.6705
279.70	661.7495	404.85	671.4075	633.25	255.7136
280.46	642.4365	410.95	608.1973	634.78	248.4856
283.69	603.5202	413.71	659.9292	635.95	275.9763
284.31	617.1760	414.70	617.9535	636.99	281.3474
285.41	687.4125	423.72	632.2365	645.85	274.8345
285.90	0.0000	427.09	628.4180	657.76	283.0664
287.50	654.2643	427.87	644.1225	657.90	0.0000
290.67	646.5762	433.94	625.6075	661.66	266.7978
293.27	0.0000	439.40	607.7576	664.57	0.0000
351.93	707.8317	453.88	634.3471	666.33	189.8623
295.96	662.1998	463.37	651.8232	666.50	189.8754
879.38	663.2675	468.07	571.4260	667.71	0.0000
299.98	675.8751	473.00	0.0000	677.62	218.0350
300.09	675.9208	475.06	581.4316	685.70	0.0000
300.13	675.9345	476.78	568.6899	695.00	233.2962
301.36	662.8825	477.60	563.9465	696.49	253.8498
302.85	651.4102	482.18	534.3483	696.51	253.8556
256.23	676.2109	487.02	464.9379	697.00	260.3509
304.85	676.3568	492.35	0.0000	697.30	260.3745
306.78	690.2401	497.08	408.0864	697.49	273.3042
308.46	638.1750	505.52	423.9069	702.65	246.1106
311.90	694.0674	507.63	0.0000	706.68	260.1106
316.51	678.6185	511.00	462.6910	711.68	264.8644
319.41	698.0453	514.00	386.8963	720.70	251.1966
320.08	687.3474	514.00	386.8963	721.93	0.0000
321.04	691.6198	520.40	420.1662	722.78	251.3662
323.87	714.5017	520.69	0.0000	722.91	251.3776
325.23	744.0938	522.65	0.0000	723.31	258.6406
328.76	701.2007	527.90	0.0000	724.19	240.6241
333.37	649.3195	528.26	379.0741	727.33	199.2139
333.97	644.9280	529.59	403.5492	733.00	175.9940
334.37	648.1450	529.87	0.0000	735.93	208.1228
338.28	676.9692	531.02	373.4323	333.97	212.5862
338.32	676.9871	537.26	358.0001	739.50	0.0000
311.90	605.6751	546.56	0.0000	747.24	214.3463
340.48	605.6751	552.55	311.9113	748.06	223.1549
340.55	605.6991	563.25	300.3536	752.31	223.4537
344.28	667.1865	569.33	306.2066	753.82	214.7961
345.93	689.4344	946.00	306.2212	756.73	238.0272
351.06	646.4213	569.70	307.2780	756.80	238.0325
351.93	649.5183	583.19	320.2400	884.68	251.0273

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	262.4344	1274.44	132.4942	1620.50	47.8306
766.42	268.7739	1001.03	154.4831	1621.92	53.5840
766.84	271.9476	1002.74	139.4314	1678.03	0.0000
772.60	0.0000	1004.73	139.5038	1690.97	46.4816
776.52	215.2189	507.63	0.0000	1750.46	0.0000
739.50	0.0000	1025.87	0.0000	1764.49	42.8909
778.90	206.1719	1028.54	0.0000	1063.66	48.0840
783.70	0.0000	1037.84	134.4561	1771.35	48.0925
785.37	172.4591	1038.76	0.0000	1791.20	0.0000
792.07	221.7920	631.29	126.8229	1808.65	44.4366
794.95	214.0592	1048.07	130.8345	1810.72	0.0000
795.86	210.9482	1049.04	140.7808	1836.06	50.5838
810.06	183.0482	1050.41	143.8023		
810.29	183.0603	1063.66	143.2734		
344.28	184.9268	1077.00	128.7690		
810.76	194.2366	1077.34	128.7795		
815.77	141.4764	1085.87	147.4766		
1048.07	175.1255	1093.63	126.2769		
832.01	216.0408	1099.45	134.1931		
834.85	212.4754	1112.07	131.1445		
835.71	219.0846	1112.84	139.8007		
836.80	0.0000	1115.54	151.9743		
846.75	0.0000	1120.29	129.0938		
846.77	173.7687	1120.55	129.0990		
856.80	177.6336	1221.41	155.6417		
860.56	154.6542	1129.67	146.6495		
871.09	163.6341	1131.51	0.0000		
873.19	170.3540	1147.95	0.0000		
875.33	0.0000	1173.23	136.8026		
879.38	168.7581	1177.95	150.6740		
880.51	173.5544	1189.05	165.9814		
883.24	149.9573	1204.77	132.6323		
884.68	147.1699	1221.41	160.9829		
889.28	158.7676	1231.02	157.7801		
894.76	135.4800	1235.36	143.7332		
898.04	151.9408	1238.28	170.4576		
900.72	186.3871	1260.41	0.0000		
903.28	154.6139	1271.87	123.4068		
911.20	181.7354	1274.44	130.6321		
912.08	172.2107	1274.54	130.6321		
923.98	0.0000	1291.59	101.6219		
926.50	159.4413	1298.22	0.0000		
929.11	184.5469	1312.11	99.9556		
937.49	168.5877	1332.49	80.3016		
944.13	156.3409	1362.66	0.0000		
946.00	159.3167	1365.19	74.4548		
949.00	144.9493	1368.63	0.0000		
667.71	0.0000	1384.29	76.8750		
962.31	142.9654	1408.01	72.9473		
964.08	143.5858	1457.56	0.0000		
966.17	143.6671	1460.82	72.4612		
911.20	143.7725	1489.16	67.2464		
968.97	143.7725	1505.03	50.8196		
983.53	136.5165	1584.12	78.1736		
984.45	0.0000	1596.21	65.1931		

VAX/VMS Nuclide Identification Report Generated 30-JUN-2016 06:28:18.31

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561999.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM36.CNF;38
Background date    : 26-JUN-2016 12:06:01
Sample date       : 7-JUN-2016 00:00:00. Acquisition date : 29-JUN-2016 15:32:35
Sample ID        : G1203561999. Sample quantity : 1.57293E+02 GRAM
Detector name    : GAM36. Detector geometry: CAN
Elapsed live time: 0 12:00:00.00. Elapsed real time: 0 12:00:01.75 0.0%
Energy tolerance : 1.50000 keV. Analyst Initials : MXR1
Abundance limit  : 75.00000. Sensitivity : 3.00000
Batch ID        : 1572490. Detector SN# :
Matrix Spike ID  : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.79*	39	373	1.09	93.54	90	8	9.10E-04	111.4	
2	0	143.86*	13	345	1.56	287.70	284	8	3.08E-04	325.8	
3	0	209.34	78	281	1.66	418.67	415	9	1.82E-03	39.9	
4	0	238.54*	37	363	0.98	477.06	471	12	8.49E-04	127.6	
5	5	349.11	19	108	1.13	698.21	696	15	4.44E-04	80.0	2.20E+00
6	5	352.10*	29	229	1.97	704.18	696	15	6.66E-04	138.6	
7	0	422.23	29	92	2.32	844.42	841	8	6.62E-04	61.5	
8	0	511.28*	63	250	2.67	1022.51	1015	22	1.46E-03	93.3	
9	0	542.94	14	89	3.39	1085.81	1080	9	3.22E-04	125.5	
10	0	576.23	20	45	1.00	1152.40	1149	8	4.70E-04	61.0	
11	0	609.10*	1	82	0.92	1218.12	1213	10	2.99E-05	*****	
12	0	760.26	19	38	0.97	1520.37	1517	8	4.31E-04	61.9	
13	0	804.81	21	70	0.62	1609.45	1603	11	4.94E-04	79.5	
14	0	851.97	25	155	4.86	1703.74	1683	26	5.84E-04	136.8	
15	0	969.95	33	49	1.44	1939.64	1933	14	7.64E-04	48.2	
16	0	1121.25	51	41	7.35	2242.10	2233	20	1.19E-03	33.3	
17	0	1145.76	13	29	1.41	2291.12	2287	9	3.02E-04	79.7	
18	0	1250.33	26	39	3.89	2500.15	2493	19	5.96E-04	60.8	
19	0	1281.45	11	17	4.30	2562.36	2555	11	2.65E-04	74.7	
20	0	1336.25	15	12	0.94	2671.91	2668	7	3.55E-04	45.4	
21	0	1433.95	20	14	0.60	2867.19	2863	9	4.66E-04	39.9	
22	0	1460.32*	2	32	3.60	2919.91	2913	14	5.32E-05	696.6	
23	0	1477.15	19	9	1.33	2953.56	2947	12	4.39E-04	39.1	
24	0	1584.85	16	0	3.90	3168.81	3164	10	3.70E-04	25.0	
25	0	1764.13	32	10	3.00	3527.13	3521	13	7.42E-04	26.8	
26	0	1773.85	16	0	4.94	3546.56	3540	13	3.70E-04	25.0	
27	0	1886.34	5	11	0.77	3771.37	3764	10	1.10E-04	134.8	
28	0	1915.31	10	12	1.99	3829.25	3823	11	2.37E-04	70.7	
29	0	1940.76	18	15	3.83	3880.11	3871	16	4.08E-04	55.8	
30	0	1983.42	4	7	1.01	3965.36	3959	8	8.84E-05	136.1	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 30-JUN-2016 06:28:21

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561999.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 29-JUN-2016 15:32:35
Sample ID	: G1203561999	Sample quantity	: 157.29 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA36	Detector geometry	: CAN
Elapsed live time	: 0 12:00:00.00	Elapsed real time	: 0 12:00:01.75 0.0%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Linear	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	2	10.66*	6.549E-01	1.268E-02	1.268E-02	1393.23
PB-210	46.54	54	4.25*	8.772E-01	5.766E-01	5.778E-01	222.85
BI-211	72.87	-----	1.23	3.327E+00	-----	Line Not Found	-----
	351.06	33	12.92*	2.413E+00	4.175E-02	4.175E-02	277.28
BI-214	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
RN-222	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
RA-226	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
TH-230	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
U-234	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
ANH-511	511.00	69	100.00*	1.689E+00	1.620E-02	1.620E-02	186.64

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561999.CNF;1
Acquisition date : 29-JUN-2016 15:32:35 Sensitivity : 3.000
Detector ID : GAM36 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:01.75 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Analyst initials: MXR1
Sample ID : G1203561999 Sample Quantity : 1.5729E+02 GRAM
Batch Number : 1572490 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:39:12 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
K-40	1.268E-02	1.731E-01	1.658E-01
PB-210	5.778E-01	1.262E+00	8.900E-01
BI-211	4.175E-02	1.134E-01	8.149E-02
BI-214	8.423E-04	3.748E-02	2.695E-02
RN-222	8.423E-04	3.748E-02	2.695E-02
RA-226	8.423E-04	3.748E-02	2.695E-02
TH-230	8.423E-04	3.748E-02	2.695E-02
U-234	8.423E-04	3.748E-02	2.695E-02
ANH-511	1.620E-02	2.963E-02	1.109E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	6.482E-03	7.815E-02	1.452E-01	NOT IDENT.
NA-22	-2.617E-03	8.562E-03	1.352E-02	NOT IDENT.
NA-24	0.000E+00	9.976E+08	0.000E+00	SHORT HLIF
AL-26	-2.630E-05	8.931E-03	1.689E-02	NOT IDENT.
SC-46	5.652E-03	9.396E-03	1.841E-02	FAIL ABUN
V-48	1.773E-03	2.091E-02	3.917E-02	NOT IDENT.
CR-51	5.247E-02	9.300E-02	1.810E-01	NOT IDENT.
MN-54	5.061E-03	8.210E-03	1.609E-02	NOT IDENT.
CO-56	8.366E-03	1.054E-02	2.068E-02	NOT IDENT.
MN-56	0.000E+00	1.257E+41	0.000E+00	SHORT HLIF
CO-57	-2.937E-03	4.560E-03	8.449E-03	NOT IDENT.
CO-58	8.933E-05	1.051E-02	1.858E-02	NOT IDENT.
FE-59	-7.044E-03	2.261E-02	4.009E-02	NOT IDENT.
CO-60	5.370E-03	9.363E-03	1.687E-02	NOT IDENT.
ZN-65	8.549E-03	2.103E-02	3.522E-02	NOT IDENT.
GE-68	-9.670E-03	4.080E-01	5.727E-01	NOT IDENT.
AS-73	5.225E-02	1.376E-01	2.560E-01	NOT IDENT.
AS-74	1.003E-02	3.116E-02	5.753E-02	NOT IDENT.
SE-75	3.511E-03	9.925E-03	1.806E-02	NOT IDENT.
BR-77	1.694E+01	4.237E+01	3.805E+01	FAIL ABUN
SR-82	-1.014E-02	8.459E-02	1.585E-01	NOT IDENT.

RB-83	-1.153E-02	1.993E-02	3.015E-02	NOT IDENT.
KR-85	0.000E+00	1.867E+00	4.046E+00	NOT IDENT.
SR-85	0.000E+00	1.073E-02	2.325E-02	NOT IDENT.
RB-86	-8.705E-02	3.415E-01	4.711E-01	NOT IDENT.
Y-88	2.851E-04	1.099E-02	2.076E-02	NOT IDENT.
Y-91	-5.300E-02	4.522E+00	8.233E+00	NOT IDENT.
NB-94	-3.749E-03	7.613E-03	1.387E-02	NOT IDENT.
NB-95	4.351E-03	1.097E-02	1.943E-02	NOT IDENT.
NB-95M	-6.609E-03	2.813E-02	4.449E-02	NOT IDENT.
ZR-95	-9.857E-03	1.990E-02	3.079E-02	NOT IDENT.
NB-97	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	9.940E+08	0.000E+00	SHORT HLIF
MO-99	7.563E+00	1.933E+01	3.753E+01	NOT IDENT.
TC-99M	0.000E+00	1.278E+25	0.000E+00	SHORT HLIF
RH-101	-2.018E-03	5.318E-03	9.929E-03	NOT IDENT.
RH-102	1.994E-03	1.332E-02	2.429E-02	NOT IDENT.
RU-103	1.113E-03	1.008E-02	1.872E-02	FAIL ABUN
RH-106	-8.925E-03	7.617E-02	1.363E-01	NOT IDENT.
RU-106	-8.925E-03	7.617E-02	1.363E-01	NOT IDENT.
AG-108M	4.842E-04	6.596E-03	1.231E-02	NOT IDENT.
CD-109	-3.603E-02	1.190E-01	2.290E-01	NOT IDENT.
AG-110M	2.828E-03	1.094E-02	2.093E-02	NOT IDENT.
SN-113	7.937E-03	1.019E-02	1.986E-02	NOT IDENT.
CD-115	0.000E+00	2.741E+01	0.000E+00	SHORT HLIF
SN-117M	2.866E-03	1.362E-02	2.562E-02	NOT IDENT.
TE-123M	8.513E-04	5.012E-03	9.411E-03	NOT IDENT.
SB-124	-1.220E-02	2.227E-02	3.893E-02	NOT IDENT.
SB-125	4.901E-04	2.009E-02	3.625E-02	NOT IDENT.
TE-125M	1.233E+00	1.826E+00	3.582E+00	NOT IDENT.
I-126	-3.404E-02	8.060E-02	1.396E-01	NOT IDENT.
SB-126	-6.626E-02	7.591E-02	8.441E-02	NOT IDENT.
SN-126	-8.395E-03	1.185E-02	2.246E-02	NOT IDENT.
SB-127	-2.127E-01	1.232E+00	2.179E+00	NOT IDENT.
I-131	4.149E-02	4.998E-02	9.779E-02	NOT IDENT.
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-2.738E-01	7.561E-01	1.345E+00	NOT IDENT.
BA-133	-1.962E-03	9.795E-03	1.603E-02	NOT IDENT.
I-133	0.000E+00	6.049E+05	0.000E+00	SHORT HLIF
CS-134	1.065E-03	8.576E-03	1.632E-02	NOT IDENT.
CS-135	-2.360E-02	3.257E-02	5.595E-02	NOT IDENT.
I-135	0.000E+00	3.869E+23	0.000E+00	SHORT HLIF
CS-136	-6.831E-03	3.729E-02	6.719E-02	NOT IDENT.
BA-137M	1.463E-03	8.618E-03	1.566E-02	NOT IDENT.
CS-137	1.546E-03	9.104E-03	1.654E-02	NOT IDENT.
CE-139	-1.498E-03	5.278E-03	9.688E-03	NOT IDENT.
BA-140	6.803E-02	1.049E-01	1.787E-01	FAIL ABUN
LA-140	-2.175E-02	3.309E-02	5.704E-02	NOT IDENT.
CE-141	-1.331E-02	2.010E-02	2.437E-02	NOT IDENT.
CE-143	0.000E+00	1.307E+03	0.000E+00	SHORT HLIF
CE-144	-5.230E-03	3.515E-02	6.593E-02	NOT IDENT.
PM-144	4.837E-03	8.648E-03	1.680E-02	NOT IDENT.
PR-144	3.635E-01	6.499E-01	1.262E+00	NOT IDENT.
PM-146	6.310E-03	9.576E-03	1.842E-02	NOT IDENT.
ND-147	3.403E-02	1.937E-01	3.613E-01	NOT IDENT.
PM-147	3.863E+01	1.302E+02	2.502E+02	NOT IDENT.
PM-149	0.000E+00	2.295E+02	0.000E+00	SHORT HLIF
EU-150	-1.253E-03	6.045E-03	1.128E-02	NOT IDENT.
EU-152	-1.047E-02	2.189E-02	3.887E-02	NOT IDENT.
GD-153	3.307E-03	1.412E-02	2.751E-02	NOT IDENT.
EU-154	-7.384E-03	2.416E-02	3.816E-02	NOT IDENT.
EU-155	1.531E-02	1.714E-02	3.408E-02	NOT IDENT.
TB-160	-1.706E-02	4.557E-02	5.765E-02	FAIL ABUN
HO-166M	-1.213E-02	1.376E-02	2.431E-02	NOT IDENT.
TM-171	2.249E-01	2.681E+00	4.926E+00	NOT IDENT.
HF-172	1.200E-02	3.260E-02	6.267E-02	NOT IDENT.
LU-172	-2.628E-03	1.309E-02	2.364E-02	FAIL ABUN
LU-176	2.358E-04	5.274E-03	1.007E-02	NOT IDENT.
HF-181	2.323E-03	1.133E-02	2.116E-02	NOT IDENT.
TA-182	-3.840E-02	3.676E-02	5.864E-02	FAIL ABUN
RE-183	2.141E-03	3.189E-02	5.817E-02	NOT IDENT.
RE-184	-1.952E-02	3.208E-02	5.647E-02	NOT IDENT.
W-188	-2.510E-01	1.705E+00	3.000E+00	NOT IDENT.
IR-192	-8.034E-04	7.526E-03	1.423E-02	NOT IDENT.
HG-203	9.777E-03	8.999E-03	1.694E-02	NOT IDENT.
BI-207	-5.736E-03	1.159E-02	2.025E-02	NOT IDENT.
TL-208	-5.729E-03	1.499E-02	1.776E-02	NOT IDENT.
PB-211	1.478E-02	1.470E-01	2.767E-01	NOT IDENT.
BI-212	-9.237E-02	1.691E-01	2.256E-01	NOT IDENT.

PB-212	1.131E-02	2.827E-02	2.522E-02	FAIL ABUN
PB-214	1.515E-02	4.117E-02	3.636E-02	FAIL ABUN
RN-219	9.282E-03	8.523E-02	1.604E-01	NOT IDENT.
RA-223	-4.972E-02	1.383E-01	2.572E-01	FAIL ABUN
RA-224	-5.393E-02	1.358E-01	2.119E-01	NOT IDENT.
AC-227	-6.378E-04	5.075E-02	9.107E-02	NOT IDENT.
TH-227	-6.378E-04	5.075E-02	9.107E-02	NOT IDENT.
AC-228	-1.752E-02	6.006E-02	7.382E-02	FAIL ABUN
RA-228	-1.752E-02	6.006E-02	7.382E-02	FAIL ABUN
TH-228	1.131E-02	2.827E-02	2.522E-02	FAIL ABUN
TH-229	2.741E-02	9.575E-02	1.778E-01	NOT IDENT.
PA-231	1.002E-01	9.540E-02	1.899E-01	NOT IDENT.
TH-231	-4.972E-02	1.383E-01	2.572E-01	FAIL ABUN
TH-232	-1.752E-02	6.006E-02	7.382E-02	FAIL ABUN
PA-233	3.433E-03	1.312E-02	2.526E-02	NOT IDENT.
PA-234	1.272E-02	6.389E-02	1.212E-01	NOT IDENT.
PA-234M	1.836E+00	1.051E+00	2.208E+00	NOT IDENT.
TH-234	-1.032E-01	2.798E-01	4.353E-01	NOT IDENT.
U-235	1.210E-02	7.724E-02	7.126E-02	FAIL ABUN
NP-237	3.433E-03	1.312E-02	2.526E-02	NOT IDENT.
NP-238	0.000E+00	5.719E+01	0.000E+00	SHORT HLIF
U-238	-1.032E-01	2.798E-01	4.353E-01	NOT IDENT.
NP-239	-6.129E-03	4.419E-02	8.388E-02	NOT IDENT.
PU-239	2.369E+01	5.587E+01	1.076E+02	NOT IDENT.
AM-241	-3.481E-03	2.296E-02	4.130E-02	NOT IDENT.
AM-243	-1.059E-02	1.154E-02	1.600E-02	NOT IDENT.
CM-243	-6.992E-03	1.739E-02	3.298E-02	NOT IDENT.
BK-247	-3.861E-03	1.701E-02	3.006E-02	NOT IDENT.
CM-247	6.999E-04	7.723E-03	1.453E-02	NOT IDENT.
CF-249	-7.936E-04	8.141E-03	1.520E-02	NOT IDENT.
CF-251	2.182E-03	2.438E-02	4.510E-02	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
K-40	1460.82	2	10.66*	6.549E-01	1.268E-02	1.268E-02	1393.23
PB-210	46.54	54	4.25*	8.772E-01	5.766E-01	5.778E-01	222.85
BI-211	72.87	-----	1.23	3.327E+00	-----	Line Not Found	-----
	351.06	33	12.92*	2.413E+00	4.175E-02	4.175E-02	277.28
BI-214	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
RN-222	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
RA-226	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
TH-230	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
U-234	609.32	1	45.49*	1.438E+00	8.423E-04	8.423E-04	4540.86
	1120.29	51	14.92	8.366E-01	1.636E-01	1.636E-01	66.59
	1764.49	30	15.30	5.420E-01	1.455E-01	1.455E-01	53.59
ANH-511	511.00	69	100.00*	1.689E+00	1.620E-02	1.620E-02	186.64

Flag: "*" = Keyline

Total number of lines in spectrum 30
Number of unidentified lines 18
Number of lines tentatively identified by NID 12 40.00%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.25E+09Y	1.00	1.268E-02	1.268E-02	17.67E-02	1393.23	
PB-210	22.20Y	1.00	5.766E-01	5.778E-01	12.88E-01	222.85	
BI-211	7.04E+08Y	1.00	4.175E-02	4.175E-02	11.58E-02	277.28	
BI-214	1600.00Y	1.00	8.423E-04	8.423E-04	382.5E-04	4540.86	
RN-222	1600.00Y	1.00	8.423E-04	8.423E-04	382.5E-04	4540.86	
RA-226	1600.00Y	1.00	8.423E-04	8.423E-04	382.5E-04	4540.86	
TH-230	7.54E+04Y	1.00	8.423E-04	8.423E-04	382.5E-04	4540.86	
U-234	2.45E+05Y	1.00	8.423E-04	8.423E-04	382.5E-04	4540.86	
ANH-511	1.00E+09Y	1.00	1.620E-02	1.620E-02	3.024E-02	186.64	
Total Activity :			6.515E-01	6.526E-01			

Grand Total Activity : 6.515E-01 6.526E-01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	143.86	17	429	1.56	287.70	284	8	3.08E-04	****	4.95E+00	T
0	209.34	94	336	1.66	418.67	415	9	1.82E-03	79.9	3.92E+00	
0	238.54	43	430	0.98	477.06	471	12	8.49E-04	****	3.50E+00	T
5	349.11	22	122	1.13	698.21	696	15	4.44E-04	****	2.43E+00	
0	422.23	32	103	2.32	844.42	841	8	6.62E-04	****	2.02E+00	T
0	542.94	15	97	3.39	1085.81	1080	9	3.22E-04	****	1.60E+00	
0	576.23	22	48	1.00	1152.40	1149	8	4.70E-04	****	1.51E+00	
0	760.26	19	40	0.97	1520.37	1517	8	4.31E-04	****	1.18E+00	
0	804.81	22	72	0.62	1609.45	1603	11	4.94E-04	****	1.12E+00	
0	851.97	26	160	4.86	1703.74	1683	26	5.84E-04	****	1.07E+00	
0	969.95	34	50	1.44	1939.64	1933	14	7.64E-04	96.5	9.52E-01	T
0	1145.76	13	29	1.41	2291.12	2287	9	3.02E-04	****	8.20E-01	
0	1250.33	25	39	3.89	2500.15	2493	19	5.96E-04	****	7.58E-01	
0	1281.45	11	16	4.30	2562.36	2555	11	2.65E-04	****	7.41E-01	
0	1336.25	15	11	0.94	2671.91	2668	7	3.55E-04	90.8	7.12E-01	
0	1433.95	20	13	0.60	2867.19	2863	9	4.66E-04	79.8	6.66E-01	
0	1477.15	18	9	1.33	2953.56	2947	12	4.39E-04	78.3	6.48E-01	
0	1584.85	15	0	3.90	3168.81	3164	10	3.70E-04	50.0	6.05E-01	T
0	1773.85	15	0	4.94	3546.56	3540	13	3.70E-04	50.0	5.39E-01	
0	1886.34	4	11	0.77	3771.37	3764	10	1.10E-04	****	5.05E-01	
0	1915.31	10	11	1.99	3829.25	3823	11	2.37E-04	****	4.96E-01	
0	1940.76	16	14	3.83	3880.11	3871	16	4.08E-04	****	4.89E-01	
0	1983.42	4	7	1.01	3965.36	3959	8	8.84E-05	****	4.78E-01	

Flags: "T" = Tentatively associated

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561999.CNF;1
Acquisition date : 29-JUN-2016 15:32:35 Sensitivity : 3.000
Detector ID : GAM36 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:01.75 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561999 Analyst initials: MXR1
Batch Number : 1572490 Sample Quantity : 1.5729E+02 GRAM
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:39:12 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7

Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
K-40	7.514E-02
PB-210	4.288E-01
BI-211	3.896E-02
BI-214	1.263E-02
RN-222	1.263E-02
RA-226	1.263E-02
TH-230	1.263E-02
U-234	1.263E-02
ANH-511	5.218E-03

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	6.863E-02	NOT IDENT.
NA-22	6.018E-03	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	7.426E-03	NOT IDENT.
SC-46	8.561E-03	FAIL ABUN
V-48	1.802E-02	NOT IDENT.
CR-51	8.674E-02	NOT IDENT.
MN-54	7.512E-03	NOT IDENT.
CO-56	9.715E-03	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-57	4.085E-03	NOT IDENT.
CO-58	8.669E-03	NOT IDENT.
FE-59	1.843E-02	NOT IDENT.
CO-60	7.668E-03	NOT IDENT.
ZN-65	1.624E-02	NOT IDENT.
GE-68	2.657E-01	NOT IDENT.
AS-73	1.234E-01	NOT IDENT.
AS-74	2.721E-02	NOT IDENT.
SE-75	8.690E-03	NOT IDENT.
BR-77	1.847E+01	FAIL ABUN
SR-82	7.335E-02	NOT IDENT.
RB-83	1.418E-02	NOT IDENT.

KR-85	1.947E+00	NOT IDENT.
SR-85	1.119E-02	NOT IDENT.
RB-86	2.185E-01	NOT IDENT.
Y-88	9.167E-03	NOT IDENT.
Y-91	3.767E+00	NOT IDENT.
NB-94	6.501E-03	NOT IDENT.
NB-95	9.111E-03	NOT IDENT.
NB-95M	2.142E-02	NOT IDENT.
ZR-95	1.430E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	1.756E+01	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	4.797E-03	NOT IDENT.
RH-102	1.143E-02	NOT IDENT.
RU-103	8.833E-03	FAIL ABUN
RH-106	6.405E-02	NOT IDENT.
RU-106	6.405E-02	NOT IDENT.
AG-108M	5.842E-03	NOT IDENT.
CD-109	1.108E-01	NOT IDENT.
AG-110M	9.689E-03	NOT IDENT.
SN-113	9.475E-03	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	1.237E-02	NOT IDENT.
TE-123M	4.543E-03	NOT IDENT.
SB-124	1.686E-02	NOT IDENT.
SB-125	1.717E-02	NOT IDENT.
TE-125M	1.735E+00	NOT IDENT.
I-126	6.551E-02	NOT IDENT.
SB-126	3.921E-02	NOT IDENT.
SN-126	1.087E-02	NOT IDENT.
SB-127	1.018E+00	NOT IDENT.
I-131	4.678E-02	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	6.472E-01	NOT IDENT.
BA-133	7.634E-03	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	7.581E-03	NOT IDENT.
CS-135	2.686E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.103E-02	NOT IDENT.
BA-137M	7.368E-03	NOT IDENT.
CS-137	7.784E-03	NOT IDENT.
CE-139	4.672E-03	NOT IDENT.
BA-140	8.447E-02	FAIL ABUN
LA-140	2.525E-02	NOT IDENT.
CE-141	1.180E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	3.189E-02	NOT IDENT.
PM-144	7.946E-03	NOT IDENT.
PR-144	5.971E-01	NOT IDENT.
PM-146	8.756E-03	NOT IDENT.
ND-147	1.696E-01	NOT IDENT.
PM-147	1.211E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	5.411E-03	NOT IDENT.
EU-152	1.858E-02	NOT IDENT.
GD-153	1.331E-02	NOT IDENT.
EU-154	1.699E-02	NOT IDENT.
EU-155	1.648E-02	NOT IDENT.
TB-160	2.664E-02	FAIL ABUN
HO-166M	1.134E-02	NOT IDENT.
TM-171	2.372E+00	NOT IDENT.
HF-172	3.032E-02	NOT IDENT.
LU-172	1.079E-02	FAIL ABUN
LU-176	4.816E-03	NOT IDENT.
HF-181	1.002E-02	NOT IDENT.
TA-182	2.633E-02	FAIL ABUN
RE-183	2.800E-02	NOT IDENT.
RE-184	2.601E-02	NOT IDENT.
W-188	1.440E+00	NOT IDENT.
IR-192	6.800E-03	NOT IDENT.
HG-203	8.148E-03	NOT IDENT.
BI-207	9.292E-03	NOT IDENT.
TL-208	8.444E-03	NOT IDENT.
PB-211	1.313E-01	NOT IDENT.
BI-212	1.061E-01	NOT IDENT.
PB-212	1.224E-02	FAIL ABUN

PB-214	1.753E-02	FAIL ABUN
RN-219	7.622E-02	NOT IDENT.
RA-223	1.232E-01	FAIL ABUN
RA-224	1.020E-01	NOT IDENT.
AC-227	4.373E-02	NOT IDENT.
TH-227	4.373E-02	NOT IDENT.
AC-228	3.481E-02	FAIL ABUN
RA-228	3.481E-02	FAIL ABUN
TH-228	1.224E-02	FAIL ABUN
TH-229	8.581E-02	NOT IDENT.
PA-231	9.125E-02	NOT IDENT.
TH-231	1.232E-01	FAIL ABUN
TH-232	3.481E-02	FAIL ABUN
PA-233	1.209E-02	NOT IDENT.
PA-234	5.591E-02	NOT IDENT.
PA-234M	1.034E+00	NOT IDENT.
TH-234	2.113E-01	NOT IDENT.
U-235	3.458E-02	FAIL ABUN
NP-237	1.209E-02	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	2.113E-01	NOT IDENT.
NP-239	4.052E-02	NOT IDENT.
PU-239	5.199E+01	NOT IDENT.
AM-241	1.988E-02	NOT IDENT.
AM-243	7.752E-03	NOT IDENT.
CM-243	1.593E-02	NOT IDENT.
BK-247	1.444E-02	NOT IDENT.
CM-247	6.898E-03	NOT IDENT.
CF-249	7.212E-03	NOT IDENT.
CF-251	2.181E-02	NOT IDENT.

GEL Laboratories LLC
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Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203561999.CNF;1
Acquisition date : 29-JUN-2016 15:32:35 Sensitivity : 3.000
Detector ID : GAM36 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:01.75 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203561999 Analyst initials: MXR1
Batch Number : 1572490 Sample Quantity : 1.5729E+02 GRAM
Quantity Err(%) : 1.2715E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 1-JUN-2016 09:39:12 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
K-40	1.268E-02	1.731E-01	1.731E-01
PB-210	5.778E-01	1.263E+00	1.263E+00
BI-211	4.175E-02	1.135E-01	1.135E-01
BI-214	8.423E-04	3.748E-02	3.748E-02
RN-222	8.423E-04	3.748E-02	3.748E-02
RA-226	8.423E-04	3.748E-02	3.748E-02
TH-230	8.423E-04	3.748E-02	3.748E-02
U-234	8.423E-04	3.748E-02	3.748E-02
ANH-511	1.620E-02	2.964E-02	2.964E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	6.482E-03	7.815E-02	7.820E-02	NOT IDENT.
NA-22	-2.617E-03	8.562E-03	8.643E-03	NOT IDENT.
NA-24	2.008E+08	9.976E+08	1.002E+09	SHORT HLIF
AL-26	-2.630E-05	8.931E-03	8.931E-03	NOT IDENT.
SC-46	5.652E-03	9.399E-03	9.738E-03	FAIL ABUN
V-48	1.773E-03	2.091E-02	2.092E-02	NOT IDENT.
CR-51	5.247E-02	9.302E-02	9.598E-02	NOT IDENT.
MN-54	5.061E-03	8.213E-03	8.524E-03	NOT IDENT.
CO-56	8.366E-03	1.054E-02	1.120E-02	NOT IDENT.
MN-56	1.000E+41	1.257E+41	0.000E+00	SHORT HLIF
CO-57	-2.937E-03	4.562E-03	4.750E-03	NOT IDENT.
CO-58	8.933E-05	1.051E-02	1.051E-02	NOT IDENT.
FE-59	-7.044E-03	2.262E-02	2.284E-02	NOT IDENT.
CO-60	5.370E-03	9.365E-03	9.673E-03	NOT IDENT.
ZN-65	8.549E-03	2.103E-02	2.138E-02	NOT IDENT.
GE-68	-9.670E-03	4.080E-01	4.080E-01	NOT IDENT.
AS-73	5.225E-02	1.380E-01	1.400E-01	NOT IDENT.
AS-74	1.003E-02	3.117E-02	3.149E-02	NOT IDENT.
SE-75	3.511E-03	9.926E-03	1.005E-02	NOT IDENT.
BR-77	1.694E+01	4.383E+01	4.449E+01	FAIL ABUN
SR-82	-1.014E-02	8.459E-02	8.471E-02	NOT IDENT.

RB-83	-1.153E-02	1.999E-02	2.066E-02	NOT IDENT.
KR-85	7.232E+00	1.890E+00	3.769E+00	NOT IDENT.
SR-85	4.149E-02	1.086E-02	2.163E-02	NOT IDENT.
RB-86	-8.705E-02	3.415E-01	3.438E-01	NOT IDENT.
Y-88	2.851E-04	1.099E-02	1.099E-02	NOT IDENT.
Y-91	-5.300E-02	4.522E+00	4.522E+00	NOT IDENT.
NB-94	-3.749E-03	7.614E-03	7.800E-03	NOT IDENT.
NB-95	4.351E-03	1.097E-02	1.114E-02	NOT IDENT.
NB-95M	-6.609E-03	2.814E-02	2.829E-02	NOT IDENT.
ZR-95	-9.857E-03	1.990E-02	2.039E-02	NOT IDENT.
NB-97	-1.000E+41	6.564E+42	0.000E+00	SHORT HLIF
ZR-97	1.229E+09	9.952E+08	1.139E+09	SHORT HLIF
MO-99	7.563E+00	1.933E+01	1.963E+01	NOT IDENT.
TC-99M	4.957E+24	1.279E+25	0.000E+00	SHORT HLIF
RH-101	-2.018E-03	5.330E-03	5.407E-03	NOT IDENT.
RH-102	1.994E-03	1.332E-02	1.335E-02	NOT IDENT.
RU-103	1.113E-03	1.008E-02	1.009E-02	FAIL ABUN
RH-106	-8.925E-03	7.617E-02	7.628E-02	NOT IDENT.
RU-106	-8.925E-03	7.617E-02	7.628E-02	NOT IDENT.
AG-108M	4.842E-04	6.596E-03	6.599E-03	NOT IDENT.
CD-109	-3.603E-02	1.191E-01	1.202E-01	NOT IDENT.
AG-110M	2.828E-03	1.094E-02	1.101E-02	NOT IDENT.
SN-113	7.937E-03	1.020E-02	1.081E-02	NOT IDENT.
CD-115	-2.915E+01	2.746E+01	3.045E+01	SHORT HLIF
SN-117M	2.866E-03	1.362E-02	1.368E-02	NOT IDENT.
TE-123M	8.513E-04	5.012E-03	5.027E-03	NOT IDENT.
SB-124	-1.220E-02	2.228E-02	2.295E-02	NOT IDENT.
SB-125	4.901E-04	2.009E-02	2.009E-02	NOT IDENT.
TE-125M	1.233E+00	1.828E+00	1.910E+00	NOT IDENT.
I-126	-3.404E-02	8.063E-02	8.208E-02	NOT IDENT.
SB-126	-6.626E-02	7.619E-02	8.184E-02	NOT IDENT.
SN-126	-8.395E-03	1.186E-02	1.245E-02	NOT IDENT.
SB-127	-2.127E-01	1.232E+00	1.236E+00	NOT IDENT.
I-131	4.149E-02	5.002E-02	5.340E-02	NOT IDENT.
I-132	-1.000E+41	2.809E+41	0.000E+00	SHORT HLIF
TE-132	-2.738E-01	7.565E-01	7.665E-01	NOT IDENT.
BA-133	-1.962E-03	9.795E-03	9.835E-03	NOT IDENT.
I-133	-1.343E+05	6.053E+05	6.083E+05	SHORT HLIF
CS-134	1.065E-03	8.576E-03	8.590E-03	NOT IDENT.
CS-135	-2.360E-02	3.260E-02	3.430E-02	NOT IDENT.
I-135	1.998E+23	4.007E+23	0.000E+00	SHORT HLIF
CS-136	-6.831E-03	3.729E-02	3.742E-02	NOT IDENT.
BA-137M	1.463E-03	8.619E-03	8.644E-03	NOT IDENT.
CS-137	1.546E-03	9.105E-03	9.131E-03	NOT IDENT.
CE-139	-1.498E-03	5.287E-03	5.330E-03	NOT IDENT.
BA-140	6.803E-02	1.049E-01	1.093E-01	FAIL ABUN
LA-140	-2.175E-02	3.310E-02	3.453E-02	NOT IDENT.
CE-141	-1.331E-02	2.011E-02	2.098E-02	NOT IDENT.
CE-143	-4.162E+02	1.307E+03	1.321E+03	SHORT HLIF
CE-144	-5.230E-03	3.515E-02	3.523E-02	NOT IDENT.
PM-144	4.837E-03	8.651E-03	8.922E-03	NOT IDENT.
PR-144	3.635E-01	6.501E-01	6.704E-01	NOT IDENT.
PM-146	6.310E-03	9.587E-03	1.000E-02	NOT IDENT.
ND-147	3.403E-02	1.937E-01	1.943E-01	NOT IDENT.
PM-147	3.863E+01	1.302E+02	1.314E+02	NOT IDENT.
PM-149	1.743E+02	2.307E+02	2.437E+02	SHORT HLIF
EU-150	-1.253E-03	6.045E-03	6.071E-03	NOT IDENT.
EU-152	-1.047E-02	2.190E-02	2.240E-02	NOT IDENT.
GD-153	3.307E-03	1.412E-02	1.419E-02	NOT IDENT.
EU-154	-7.384E-03	2.416E-02	2.439E-02	NOT IDENT.
EU-155	1.531E-02	1.718E-02	1.851E-02	NOT IDENT.
TB-160	-1.706E-02	4.558E-02	4.623E-02	FAIL ABUN
HO-166M	-1.213E-02	1.377E-02	1.482E-02	NOT IDENT.
TM-171	2.249E-01	2.681E+00	2.683E+00	NOT IDENT.
HF-172	1.200E-02	3.266E-02	3.310E-02	NOT IDENT.
LU-172	-2.628E-03	1.310E-02	1.315E-02	FAIL ABUN
LU-176	2.358E-04	5.274E-03	5.275E-03	NOT IDENT.
HF-181	2.323E-03	1.133E-02	1.137E-02	NOT IDENT.
TA-182	-3.840E-02	3.679E-02	4.066E-02	FAIL ABUN
RE-183	2.141E-03	3.190E-02	3.191E-02	NOT IDENT.
RE-184	-1.952E-02	3.211E-02	3.329E-02	NOT IDENT.
W-188	-2.510E-01	1.705E+00	1.709E+00	NOT IDENT.
IR-192	-8.034E-04	7.526E-03	7.535E-03	NOT IDENT.
HG-203	9.777E-03	9.010E-03	1.003E-02	NOT IDENT.
BI-207	-5.736E-03	1.160E-02	1.188E-02	NOT IDENT.
TL-208	-5.729E-03	1.499E-02	1.521E-02	NOT IDENT.
PB-211	1.478E-02	1.470E-01	1.472E-01	NOT IDENT.
BI-212	-9.237E-02	1.691E-01	1.742E-01	NOT IDENT.

PB-212	1.131E-02	2.828E-02	2.873E-02	FAIL ABUN
PB-214	1.515E-02	4.117E-02	4.174E-02	FAIL ABUN
RN-219	9.282E-03	8.524E-02	8.534E-02	NOT IDENT.
RA-223	-4.972E-02	1.384E-01	1.402E-01	FAIL ABUN
RA-224	-5.393E-02	1.358E-01	1.379E-01	NOT IDENT.
AC-227	-6.378E-04	5.075E-02	5.075E-02	NOT IDENT.
TH-227	-6.378E-04	5.075E-02	5.075E-02	NOT IDENT.
AC-228	-1.752E-02	6.007E-02	6.059E-02	FAIL ABUN
RA-228	-1.752E-02	6.007E-02	6.059E-02	FAIL ABUN
TH-228	1.131E-02	2.828E-02	2.873E-02	FAIL ABUN
TH-229	2.741E-02	9.576E-02	9.656E-02	NOT IDENT.
PA-231	1.002E-01	9.776E-02	1.077E-01	NOT IDENT.
TH-231	-4.972E-02	1.384E-01	1.402E-01	FAIL ABUN
TH-232	-1.752E-02	6.007E-02	6.059E-02	FAIL ABUN
PA-233	3.433E-03	1.313E-02	1.322E-02	NOT IDENT.
PA-234	1.272E-02	6.552E-02	6.577E-02	NOT IDENT.
PA-234M	1.836E+00	1.054E+00	1.340E+00	NOT IDENT.
TH-234	-1.032E-01	2.807E-01	2.845E-01	NOT IDENT.
U-235	1.210E-02	7.724E-02	7.743E-02	FAIL ABUN
NP-237	3.433E-03	1.313E-02	1.322E-02	NOT IDENT.
NP-238	9.704E+00	5.719E+01	5.736E+01	SHORT HLIF
U-238	-1.032E-01	2.807E-01	2.845E-01	NOT IDENT.
NP-239	-6.129E-03	4.419E-02	4.427E-02	NOT IDENT.
PU-239	2.369E+01	5.588E+01	5.690E+01	NOT IDENT.
AM-241	-3.481E-03	2.296E-02	2.302E-02	NOT IDENT.
AM-243	-1.059E-02	1.156E-02	1.251E-02	NOT IDENT.
CM-243	-6.992E-03	1.741E-02	1.769E-02	NOT IDENT.
BK-247	-3.861E-03	1.703E-02	1.711E-02	NOT IDENT.
CM-247	6.999E-04	7.724E-03	7.730E-03	NOT IDENT.
CF-249	-7.936E-04	8.141E-03	8.149E-03	NOT IDENT.
CF-251	2.182E-03	2.438E-02	2.440E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	76.5981	87.09	326.1626	136.47	288.2783
45.60	259.8015	87.57	330.0406	140.51	268.7255
46.54	231.0187	88.03	304.7581	143.76	285.7592
49.72	191.5637	88.34	289.0539	144.24	285.9731
51.35	232.2863	88.47	291.7897	145.44	263.4471
51.87	238.6969	89.96	584.5957	152.43	266.7534
52.39	222.1829	1093.63	532.1530	153.25	277.0076
52.97	211.6984	91.11	393.0717	153.87	271.4365
53.44	221.6993	92.59	314.0273	156.02	262.1920
54.07	206.3503	93.35	297.5571	158.56	244.1539
57.36	0.0000	94.56	493.6098	159.00	247.3116
57.53	203.6030	94.65	568.9672	162.33	240.4490
57.98	213.6967	94.67	568.9930	162.66	240.5608
59.27	216.9653	94.87	569.2288	163.33	239.7843
59.32	216.9969	97.43	278.4690	165.86	254.7968
59.54	225.7706	98.43	263.6879	176.31	294.3747
60.96	283.6695	98.44	263.6938	176.60	294.4886
61.17	363.1640	99.53	260.6572	177.52	282.5223
62.93	224.2066	100.11	265.4940	181.07	281.7895
63.29	226.9234	102.03	264.6971	181.52	294.3498
63.58	238.3358	103.18	280.7981	184.41	286.1327
64.28	230.8756	103.37	280.9046	143.76	266.8874
66.73	239.1192	105.21	248.0514	193.51	243.3234
67.24	241.1242	105.31	248.0996	197.03	285.4730
125.81	252.3399	106.12	263.1607	198.01	291.0909
67.75	252.3865	106.47	295.4533	201.83	253.2495
69.67	240.9747	109.28	283.2061	203.43	250.5555
70.83	251.0222	111.00	284.1259	205.31	209.0911
72.81	328.1414	111.76	296.5788	210.85	242.6009
72.87	328.1923	114.06	286.6743	215.65	244.5011
74.66	305.6820	116.30	265.4194	222.11	254.9921
74.82	305.8036	116.74	273.1129	227.09	240.0521
74.97	305.9162	119.76	289.6414	227.38	243.4027
77.11	318.7140	121.12	283.7399	228.16	234.8741
78.74	296.6140	121.22	285.6745	228.18	234.8785
79.69	323.2845	121.78	314.2691	116.74	234.8785
80.12	288.0413	122.06	313.4790	235.69	234.6133
80.19	288.0886	122.92	301.6569	235.96	221.4611
80.57	290.9508	123.07	301.7364	238.63	209.9424
81.00	305.1541	265.00	289.7466	238.98	210.0207
81.07	300.8564	125.81	274.6564	240.99	237.6107
81.75	311.7824	127.23	286.7521	242.00	247.8453
83.79	283.5000	127.91	298.5311	244.70	222.4182
84.00	287.1368	129.30	260.0330	252.40	180.4830
85.43	313.5371	131.20	282.9214	252.80	183.9211
86.55	325.7712	133.02	301.0887	254.15	0.0000
86.79	329.4680	133.52	294.5978	256.23	193.5691
86.94	329.5784	136.00	288.0600	260.90	0.0000

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.66	197.4811	355.39	0.0000	584.27	77.9479
264.80	197.5094	356.01	141.6891	595.83	92.3907
265.00	206.6310	364.49	133.7146	427.87	113.0814
268.22	219.8147	366.42	146.9340	602.52	0.0000
269.46	172.1883	372.51	125.1956	604.72	86.3428
270.03	175.7064	375.05	135.7339	607.14	105.4692
271.23	191.9019	377.52	111.6024	609.32	74.4291
273.65	194.6429	356.01	107.4212	610.33	72.7371
276.40	208.9342	388.16	119.1075	614.28	76.3533
277.37	201.0834	388.63	129.5496	618.01	83.6712
277.60	202.2754	391.69	120.3628	620.36	68.5390
278.00	203.5039	264.66	124.0094	621.93	83.8381
279.20	170.3572	401.81	118.3824	630.19	0.0000
279.54	176.1685	402.40	115.5681	631.29	80.9488
279.70	176.1934	404.85	113.8559	633.25	85.4077
280.46	170.5589	410.95	119.1525	634.78	84.3785
283.69	199.9785	413.71	109.7574	635.95	78.9434
284.31	208.1909	414.70	107.9053	636.99	66.9179
285.41	189.8786	423.72	116.3379	645.85	74.9229
285.90	0.0000	427.09	99.5047	657.76	84.2244
287.50	206.4897	427.87	107.7785	657.90	0.0000
290.67	194.2999	433.94	114.2203	661.66	81.0512
293.27	0.0000	439.40	128.3575	664.57	0.0000
351.93	185.7620	453.88	102.8781	666.33	87.9082
295.96	179.7504	463.37	117.4436	666.50	87.9155
879.38	217.0936	468.07	107.8121	667.71	0.0000
299.98	176.0040	473.00	93.1277	677.62	68.2434
300.09	172.5019	475.06	106.2831	685.70	71.8711
300.13	172.5079	476.78	89.3341	695.00	80.2999
301.36	159.4825	477.60	96.4102	696.49	87.5794
302.85	179.9879	482.18	99.7070	696.51	87.5794
256.23	166.9986	487.02	97.9843	697.00	93.9199
304.85	175.0053	492.35	0.0000	697.30	100.2577
306.78	161.1384	497.08	90.4558	697.49	100.2658
308.46	163.1506	505.52	96.4324	702.65	86.0149
311.90	159.1952	507.63	0.0000	706.68	64.4044
316.51	158.9414	511.00	84.0376	711.68	85.4606
319.41	147.7009	514.00	84.1871	720.70	79.4172
320.08	154.0536	514.00	84.1871	721.93	0.0000
321.04	174.7996	520.40	102.2273	722.78	73.0957
323.87	187.7990	520.69	102.2455	722.91	73.0996
325.23	162.8271	522.65	0.0000	723.31	74.9411
328.76	183.1603	527.90	0.0000	724.19	71.3121
333.37	171.1861	528.26	90.0639	727.33	68.6664
333.97	191.2059	529.59	80.8088	733.00	79.8527
334.37	197.6157	529.87	0.0000	735.93	60.6568
338.28	171.8782	531.02	74.6543	333.97	66.2150
338.32	171.8840	537.26	79.9148	739.50	61.6724
311.90	166.7206	546.56	0.0000	747.24	62.8037
340.48	166.7206	552.55	81.8657	748.06	67.4448
340.55	166.7317	563.25	82.3489	752.31	56.4622
344.28	173.3731	569.33	66.7337	753.82	54.5441
345.93	168.3756	946.00	65.6801	756.73	69.5526
351.06	157.1214	569.70	60.3903	756.80	69.5544
351.93	157.2310	583.19	75.7690	884.68	60.4662

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
765.81	66.4987	1274.44	56.9105	1620.50	21.1188
766.42	58.2016	1001.03	36.6451	1621.92	24.1436
766.84	54.8489	1002.74	48.8883	1678.03	0.0000
772.60	0.0000	1004.73	58.0952	1690.97	20.4297
776.52	54.2419	507.63	0.0000	1750.46	0.0000
739.50	50.5314	1025.87	0.0000	1764.49	12.4517
778.90	46.8079	1028.54	0.0000	1063.66	6.2334
783.70	63.7865	1037.84	31.9476	1771.35	6.2349
785.37	51.6270	1038.76	0.0000	1791.20	0.0000
792.07	56.4785	631.29	41.3418	1808.65	17.8024
794.95	55.6020	1048.07	52.7357	1810.72	0.0000
795.86	54.6809	1049.04	56.8906	1836.06	18.9551
810.06	71.1200	1050.41	44.4970		
810.29	66.3855	1063.66	50.9260		
344.28	66.3889	1077.00	45.9250		
810.76	65.2118	1077.34	39.6681		
815.77	61.7802	1085.87	36.6355		
1048.07	70.4120	1093.63	39.8722		
832.01	63.1399	1099.45	49.4074		
834.85	53.6334	1112.07	43.5341		
835.71	49.8189	1112.84	45.7433		
836.80	0.0000	1115.54	38.7381		
846.75	0.0000	1120.29	37.0320		
846.77	61.5844	1120.55	37.0354		
856.80	57.9609	1221.41	37.0439		
860.56	64.8163	1129.67	38.9082		
871.09	48.5669	1131.51	0.0000		
873.19	59.2993	1147.95	0.0000		
875.33	0.0000	1173.23	38.7070		
879.38	48.7207	1177.95	37.6848		
880.51	50.6911	1189.05	29.1674		
883.24	56.5981	1204.77	39.0691		
884.68	46.8656	1221.41	43.6191		
889.28	46.9465	1231.02	29.5247		
894.76	69.5855	1235.36	42.6981		
898.04	47.1012	1238.28	33.9683		
900.72	63.8463	1260.41	0.0000		
903.28	58.0075	1271.87	20.1119		
911.20	52.2612	1274.44	26.8827		
912.08	65.1009	1274.54	26.8839		
923.98	0.0000	1291.59	31.5111		
926.50	56.5213	1298.22	0.0000		
929.11	50.6190	1312.11	24.2322		
937.49	55.7512	1332.49	24.0977		
944.13	48.8983	1362.66	0.0000		
946.00	43.9377	1365.19	24.5771		
949.00	49.9829	1368.63	0.0000		
667.71	0.0000	1384.29	36.0981		
962.31	48.9630	1408.01	27.7173		
964.08	50.2502	1457.56	0.0000		
966.17	70.4016	1460.82	31.5456		
911.20	51.3424	1489.16	25.3568		
968.97	51.3424	1505.03	25.4541		
983.53	42.4973	1584.12	19.9471		
984.45	0.0000	1596.21	29.0035		

VAX/VMS Nuclide Identification Report Generated 30-JUN-2016 06:29:01.70

```
*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562000.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;136
Background date    : 26-JUN-2016 12:06:18
Sample date       : 20-MAY-2016 08:50:00 Acquisition date : 29-JUN-2016 15:33:07
Sample ID        : G1203562000 Sample quantity : 1.57293E+02 GRAM
Detector name     : GAM43 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:15.82 0.0%
Energy tolerance  : 1.50000 keV Analyst Initials : MXR1
Abundance limit   : 75.00000 Sensitivity : 3.00000
Batch ID          : 1572490 Detector SN# :
Matrix Spike ID   : LCS ID : 1556
*****
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	62.89*	125	3478	1.38	125.56	123	7	2.90E-03	81.2	
2	0	66.08*	120	3039	1.35	131.95	130	6	2.78E-03	76.5	
3	2	74.75*	741	3655	1.11	149.29	146	13	1.72E-02	14.6	1.49E+00
4	2	77.08	1228	3631	1.17	153.95	146	13	2.84E-02	8.7	
5	0	84.36*	40	2564	0.92	168.52	166	5	9.32E-04	203.6	
6	0	87.32*	412	3109	0.98	174.45	172	6	9.53E-03	22.5	
7	0	89.92	265	3143	0.78	179.63	177	6	6.12E-03	34.1	
8	0	92.79*	273	4148	1.10	185.39	182	8	6.32E-03	44.1	
9	0	129.02	138	3498	0.98	257.87	255	7	3.19E-03	71.6	
10	0	143.11*	101	3288	1.75	286.05	284	7	2.35E-03	105.7	
11	2	185.85*	863	4834	1.62	371.56	365	38	2.00E-02	16.3	4.54E+00
12	2	193.67	235	4538	1.49	387.19	365	38	5.45E-03	52.2	
13	2	197.85*	143	5150	1.65	395.57	365	38	3.31E-03	95.5	
14	0	209.12	261	3923	1.34	418.12	415	8	6.03E-03	42.1	
15	3	238.60*	2981	2643	1.08	477.10	469	18	6.90E-02	3.4	8.77E-01
16	3	241.50*	361	3527	1.39	482.89	469	18	8.37E-03	30.3	
17	0	269.79	227	2570	1.09	539.49	537	7	5.26E-03	37.6	
18	0	295.23*	824	3007	1.23	590.37	586	9	1.91E-02	13.0	
19	0	300.03*	105	2381	0.90	599.99	597	7	2.43E-03	81.9	
20	0	327.84	203	2684	0.98	655.62	652	8	4.70E-03	44.8	
21	0	338.32*	458	3081	1.25	676.59	673	9	1.06E-02	22.8	
22	0	351.76*	1166	2969	1.20	703.48	699	9	2.70E-02	9.1	
23	0	401.98	46	2729	0.97	803.94	803	8	1.08E-03	195.3	
24	0	462.64	113	3619	1.55	925.28	922	9	2.62E-03	96.2	
25	0	510.67*	315	3151	2.06	1021.37	1013	17	7.29E-03	45.1	
26	0	583.00*	879	1095	1.55	1166.05	1161	11	2.04E-02	8.4	
27	0	609.20*	990	1099	1.44	1218.47	1213	12	2.29E-02	8.0	
28	0	620.07	28	656	0.62	1240.21	1239	8	6.43E-04	160.6	
29	0	661.39	87443	1180	1.55	1322.87	1314	17	2.02E+00	0.3	
30	0	712.20	35	135	1.46	1424.51	1422	7	8.09E-04	57.6	
31	0	726.37	206	275	1.49	1452.85	1447	15	4.77E-03	18.8	
32	0	730.98	19	68	1.70	1462.06	1461	4	4.46E-04	65.7	
33	0	768.47	50	280	1.67	1537.07	1528	13	1.15E-03	71.1	
34	0	785.38	117	176	0.69	1570.90	1564	16	2.71E-03	27.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	794.18	184	154	2.17	1588.49	1581	15	4.26E-03	16.4	
36	1	802.43*	24	160	2.00	1605.00	1599	21	5.55E-04	123.6	1.46E+00
37	1	805.37	41	172	2.21	1610.87	1599	21	9.55E-04	68.3	
38	0	835.44	52	165	1.77	1671.03	1666	10	1.20E-03	48.2	
39	0	839.93	54	162	1.32	1680.00	1676	11	1.24E-03	48.2	
40	0	860.40	124	136	1.97	1720.95	1714	11	2.88E-03	20.2	
41	0	876.65	23	126	3.66	1753.44	1746	11	5.25E-04	98.2	
42	0	910.93*	571	222	1.80	1822.03	1812	18	1.32E-02	8.0	
43	1	964.20	171	136	2.15	1928.59	1921	28	3.97E-03	15.8	1.54E+00
44	1	968.62	410	122	2.22	1937.43	1921	28	9.50E-03	7.5	
45	0	1023.38	21	139	4.96	2046.95	2035	16	4.97E-04	126.4	
46	4	1032.61	25	46	2.09	2065.41	2062	15	5.74E-04	47.5	1.16E+00
47	4	1036.11	40	50	1.84	2072.42	2062	15	9.31E-04	36.4	
48	0	1054.04	22	157	0.67	2108.28	2097	15	5.18E-04	124.0	
49	0	1087.99	33	82	1.15	2176.18	2170	11	7.55E-04	57.3	
50	0	1091.68	41	76	2.76	2183.56	2180	9	9.51E-04	41.0	
51	0	1120.06	229	151	1.71	2240.33	2233	16	5.29E-03	13.7	
52	0	1155.03	37	96	1.68	2310.27	2305	9	8.66E-04	50.0	
53	0	1178.88	102	230	12.00	2357.98	2343	28	2.36E-03	43.4	
54	4	1237.47	123	147	3.38	2475.16	2466	57	2.86E-03	24.7	1.52E+00
55	4	1258.19	47	100	3.40	2516.60	2466	57	1.08E-03	48.7	
56	0	1377.95	77	62	1.68	2756.15	2751	14	1.78E-03	25.1	
57	0	1460.25*	1479	84	2.35	2920.74	2911	20	3.42E-02	3.2	
58	0	1509.53	18	48	1.62	3019.30	3014	9	4.18E-04	73.8	
59	0	1544.82	13	43	3.42	3089.89	3082	12	3.08E-04	101.3	
60	0	1589.35	70	110	2.97	3178.94	3171	25	1.63E-03	41.3	
61	0	1619.47*	30	38	4.36	3239.19	3231	16	6.92E-04	53.8	
62	6	1628.88	29	22	2.54	3258.00	3246	36	6.64E-04	46.2	2.68E+00
63	6	1631.41	27	27	2.52	3263.07	3246	36	6.28E-04	48.4	
64	6	1637.23	33	33	4.51	3274.71	3246	36	7.59E-04	39.0	
65	0	1707.90	21	25	0.58	3416.04	3409	14	4.96E-04	53.6	
66	6	1727.85	21	43	3.57	3455.94	3452	19	4.94E-04	49.4	7.54E+00
67	6	1729.88	52	81	2.60	3460.00	3452	19	1.20E-03	40.2	
68	0	1740.66	15	37	4.19	3481.57	3471	16	3.48E-04	96.8	
69	0	1764.08*	215	35	2.81	3528.39	3519	20	4.97E-03	10.6	
70	0	1809.05	29	28	1.28	3618.34	3610	17	6.80E-04	46.1	
71	0	2015.25	28	31	2.98	4030.69	4022	16	6.42E-04	49.3	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 30-JUN-2016 06:29:03

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562000.CNF;1
Analyses by       : PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4,INTERF V2.4
Sample title      : MXR1
Sample date       : 20-MAY-2016 08:50:00 Acquisition date : 29-JUN-2016 15:33:07
Sample ID        : G1203562000 Sample quantity  : 157.29 GRAM
Sample type       : SOLID Sample geometry   :
Detector name     : GAMMA43 Detector geometry: CAN
Elapsed live time : 0 12:00:00.00 Elapsed real time: 0 12:00:15.82 0.0%
Energy tolerance  : 1.50 keV Half life ratio  : 10.00
Errors propagated: No Systematic Error   : 0.00 %
Efficiency type   : Empirical Efficiencies at : Peak Energy
Abundance limit   : 75.00
    
```

Interference Report

Interfering		Interfered	
Nuclide	Line	Nuclide	Line
PB-214	242.00	RA-224	240.99
PB-214	87.09	SN-126	86.94
PB-214	87.09	SN-126	87.57
PB-214	87.09	CD-109	88.03
PB-214	87.09	TH-229	88.47
PB-214	74.82	AM-243	74.66
PB-214	74.82	TH-228	74.82
PB-214	74.82	PB-212	74.82
PB-214	351.93	BI-211	351.06

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
AL-26	1129.67	2.50	1.293E+00	----- Line	Not Found	-----	Absent
	1808.65	99.76*	8.735E-01	1.266E-02	1.266E-02	92.15	OK
K-40	1460.82	10.66*	1.017E+00	5.259E+00	5.259E+00	6.43	OK
MN-54	834.85	99.98*	1.730E+00	1.238E-02	1.354E-02	96.50	OK
CD-109	88.03	3.70*	4.675E+00	7.461E-01	7.929E-01	76.03	OK
SN-126	64.28	9.60	1.805E+00	3.858E-01	3.858E-01	162.45	OK
	86.94	8.90	4.675E+00	3.102E-01	3.102E-01	76.03	OK
	87.57	37.00*	4.675E+00	7.461E-02	7.461E-02	76.03	OK
BA-137M	661.66	89.90*	2.126E+00	1.934E+01	1.939E+01	0.70	OK
CS-137	661.66	85.10*	2.126E+00	2.043E+01	2.048E+01	0.70	OK
TL-208	277.37	6.60	4.073E+00	----- Line	Not Found	-----	Absent
	583.19	85.00*	2.356E+00	1.881E-01	1.881E-01	16.71	OK
	860.56	12.50	1.683E+00	2.425E-01	2.425E-01	40.40	OK
BI-212	727.33	6.67*	1.962E+00	6.580E-01	6.580E-01	37.54	OK
	785.37	1.10	1.830E+00	2.410E+00	2.410E+00	54.81	OK
	1620.50	1.47	9.367E-01	8.265E-01	8.265E-01	107.69	OK
PB-212	74.82	10.28	3.336E+00	8.369E-01	8.369E-01	40.59	OK
	77.11	17.10	3.617E+00	1.039E+00	1.039E+00	17.45	OK
	238.63	43.60*	4.535E+00	7.092E-01	7.092E-01	6.76	OK
	300.09	3.30	3.848E+00	3.794E-01	3.794E-01	163.75	OK
BI-214	609.32	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95	OK
	1120.29	14.92	1.304E+00	4.677E-01	4.677E-01	27.49	OK
	1764.49	15.30	8.857E-01	5.964E-01	5.964E-01	21.21	OK
PB-214	74.82	5.80	3.345E+00	----- Line	Not Found	-----	<<INT Reject
	77.11	9.70	3.617E+00	1.831E+00	1.832E+00	17.45	OK
	87.09	3.41	4.655E+00	----- Line	Not Found	-----	<<INT Reject
	242.00	7.25	4.497E+00	5.208E-01	5.208E-01	60.53	OK
	295.22	18.42	3.894E+00	5.289E-01	5.289E-01	26.08	OK
	351.93	35.60*	3.431E+00	4.317E-01	4.317E-01	18.20	OK
RN-219	271.23	10.80	4.155E+00	2.353E-01	2.353E-01	75.29	OK
	401.81	6.60*	3.116E+00	1.007E-01	1.007E-01	390.56	OK
RN-222	609.32	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95	OK
	1120.29	14.92	1.304E+00	4.677E-01	4.677E-01	27.49	OK
	1764.49	15.30	8.857E-01	5.964E-01	5.964E-01	21.21	OK
RA-226	609.32	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95	OK
	1120.29	14.92	1.304E+00	4.677E-01	4.677E-01	27.49	OK
	1764.49	15.30	8.857E-01	5.964E-01	5.964E-01	21.21	OK
AC-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.529E+00	5.230E-01	5.230E-01	45.64	OK
	794.95	4.25	1.812E+00	9.901E-01	9.901E-01	32.84	OK
	835.71	1.61	1.730E+00	7.687E-01	7.687E-01	96.50	OK
	911.20	25.80*	1.594E+00	5.661E-01	5.661E-01	16.02	OK
	968.97	15.80	1.503E+00	6.994E-01	6.994E-01	15.05	OK
RA-228	105.21	1.10	5.759E+00	----- Line	Not Found	-----	Absent
	338.32	11.27	3.529E+00	5.230E-01	5.230E-01	45.64	OK
	794.95	4.25	1.812E+00	9.901E-01	9.901E-01	32.84	OK
	835.71	1.61	1.730E+00	7.687E-01	7.687E-01	96.50	OK
	911.20	25.80*	1.594E+00	5.661E-01	5.661E-01	16.02	OK
	968.97	15.80	1.503E+00	6.994E-01	6.994E-01	15.05	OK

Nuclide Type:

Nuclide	Energy	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error	Status
TH-228	74.82	10.28	3.336E+00	8.369E-01	8.369E-01	40.59	OK
	77.11	17.10	3.617E+00	1.039E+00	1.039E+00	17.45	OK
	238.63	43.60*	4.535E+00	7.092E-01	7.092E-01	6.76	OK
	300.09	3.30	3.848E+00	3.794E-01	3.794E-01	163.75	OK
TH-229	85.43	14.70	4.402E+00	3.232E-02	3.232E-02	407.22	OK
	88.47	24.00	4.675E+00	1.150E-01	1.150E-01	76.03	OK
	193.51	4.41*	5.219E+00	4.912E-01	4.912E-01	104.40	OK
	210.85	2.80	4.939E+00	-----	Line Not Found	-----	Absent
TH-230	609.32	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95	OK
	1120.29	14.92	1.304E+00	4.677E-01	4.677E-01	27.49	OK
	1764.49	15.30	8.857E-01	5.964E-01	5.964E-01	21.21	OK
	283.69	1.70	4.007E+00	-----	Line Not Found	-----	Absent
TH-232	301.36	5.35*	3.848E+00	2.340E-01	2.340E-01	163.75	OK
	105.21	1.10	5.759E+00	-----	Line Not Found	-----	Absent
	338.32	11.27	3.529E+00	5.230E-01	5.230E-01	45.64	OK
	835.71	1.61	1.730E+00	7.687E-01	7.687E-01	96.50	OK
TH-234	911.20	25.80*	1.594E+00	5.661E-01	5.661E-01	16.02	OK
	968.97	15.80	1.503E+00	6.994E-01	6.994E-01	15.05	OK
	63.29	3.70*	1.805E+00	1.001E+00	1.001E+00	162.45	OK
	92.59	4.23	5.106E+00	6.505E-01	6.505E-01	88.24	OK
U-234	609.32	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95	OK
	1120.29	14.92	1.304E+00	4.677E-01	4.677E-01	27.49	OK
	1764.49	15.30	8.857E-01	5.964E-01	5.964E-01	21.21	OK
	89.96	3.47	4.891E+00	8.045E-01	8.045E-01	68.19	OK
U-235	93.35	5.60	5.106E+00	4.914E-01	4.914E-01	88.24	OK
	143.76	10.96*	6.021E+00	7.602E-02	7.602E-02	211.40	OK
	163.33	5.08	5.735E+00	-----	Line Not Found	-----	Absent
	185.72	57.20	5.351E+00	1.359E-01	1.359E-01	32.58	OK
U-238	205.31	5.01	5.027E+00	-----	Line Not Found	-----	Absent
	63.29	3.70*	1.805E+00	1.001E+00	1.001E+00	162.45	OK
	92.59	4.23	5.106E+00	6.505E-01	6.505E-01	88.24	OK
	43.53	5.90	1.429E-01	-----	Line Not Found	-----	Absent
AM-243	74.66	67.20*	3.336E+00	1.280E-01	1.280E-01	40.59	OK
	278.00	3.40	4.066E+00	-----	Line Not Found	-----	Absent
CM-247	287.50	2.00	3.969E+00	-----	Line Not Found	-----	Absent
	402.40	72.00*	3.116E+00	9.234E-03	9.234E-03	390.56	OK
ANH-511	511.00	100.00*	2.611E+00	5.240E-02	5.240E-02	90.21	OK

Flag: "*" = Keyline

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562000.CNF;1
Acquisition date : 29-JUN-2016 15:33:07 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:15.82 Half life ratio : *****
Sample date : 20-MAY-2016 08:50:00 Analyst initials: MXR1
Sample ID : G1203562000 Sample Quantity : 1.5729E+02 GRAM
Batch Number : 1572490 Wet Weight : 0.00000
Wet wt corr : 1.00000 Dry Weight : 0.00000
Nuclide Library : SOLID.NLB;6

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
AL-26	1.266E-02	1.143E-02	1.513E-02
K-40	5.259E+00	3.314E-01	1.707E-01
MN-54	1.354E-02	1.281E-02	1.817E-02
CD-109	7.929E-01	5.908E-01	7.498E-01
SN-126	7.461E-02	5.559E-02	7.013E-02
BA-137M	1.939E+01	1.329E-01	2.673E-02
CS-137	2.048E+01	1.404E-01	2.823E-02
TL-208	1.881E-01	3.081E-02	3.243E-02
BI-212	6.580E-01	2.421E-01	2.285E-01
PB-212	7.092E-01	4.701E-02	6.136E-02
BI-214	4.081E-01	6.380E-02	5.950E-02
PB-214	4.317E-01	7.698E-02	8.842E-02
RN-219	1.007E-01	3.856E-01	5.374E-01
RN-222	4.081E-01	6.380E-02	5.950E-02
RA-226	4.081E-01	6.380E-02	5.950E-02
AC-228	5.661E-01	8.889E-02	6.304E-02
RA-228	5.661E-01	8.889E-02	6.304E-02
TH-228	7.092E-01	4.701E-02	6.136E-02
TH-229	4.912E-01	5.025E-01	5.532E-01
TH-230	4.081E-01	6.380E-02	5.950E-02
PA-231	2.340E-01	3.756E-01	5.254E-01
TH-232	5.661E-01	8.889E-02	6.304E-02
TH-234	1.001E+00	1.594E+00	1.715E+00
U-234	4.081E-01	6.380E-02	5.950E-02
U-235	7.602E-02	1.575E-01	1.835E-01
U-238	1.001E+00	1.594E+00	1.715E+00
AM-243	1.280E-01	5.093E-02	5.393E-02
CM-247	9.234E-03	3.534E-02	4.946E-02
ANH-511	5.240E-02	4.632E-02	3.354E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.413E-01	3.826E-01	6.797E-01	NOT IDENT.

NA-22	-2.720E-03	1.078E-02	1.901E-02	NOT IDENT.
NA-24	0.000E+00	3.437E+17	0.000E+00	SHORT HLIF
SC-46	-3.986E-03	1.281E-02	2.239E-02	FAIL ABUN
V-48	-1.899E-02	5.354E-02	9.250E-02	NOT IDENT.
CR-51	-3.099E-01	4.466E-01	8.067E-01	NOT IDENT.
CO-56	-4.304E-04	1.494E-02	2.280E-02	FAIL ABUN
MN-56	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
CO-57	1.237E-02	1.392E-02	2.621E-02	NOT IDENT.
CO-58	-1.008E-02	1.526E-02	2.234E-02	NOT IDENT.
FE-59	-3.903E-02	3.824E-02	5.893E-02	NOT IDENT.
CO-60	-3.733E-03	1.026E-02	1.790E-02	NOT IDENT.
ZN-65	-7.078E-03	2.870E-02	4.341E-02	NOT IDENT.
GE-68	3.601E-01	3.360E-01	6.430E-01	NOT IDENT.
AS-73	-1.334E-01	1.158E+00	2.128E+00	NOT IDENT.
AS-74	-4.687E-02	1.328E-01	2.274E-01	NOT IDENT.
SE-75	3.297E-02	3.560E-02	5.838E-02	FAIL ABUN
BR-77	0.000E+00	1.206E+04	0.000E+00	SHORT HLIF
SR-82	-1.577E-01	1.854E-01	3.033E-01	NOT IDENT.
RB-83	-1.321E-02	5.682E-02	9.869E-02	NOT IDENT.
KR-85	0.000E+00	5.200E+00	8.284E+00	NOT IDENT.
SR-85	0.000E+00	3.599E-02	5.733E-02	NOT IDENT.
RB-86	5.565E-01	5.100E-01	9.767E-01	NOT IDENT.
Y-88	-1.129E-02	1.072E-02	1.751E-02	NOT IDENT.
Y-91	2.136E+00	6.890E+00	1.255E+01	NOT IDENT.
NB-94	7.334E-03	9.374E-03	1.741E-02	NOT IDENT.
NB-95	0.000E+00	1.588E-02	2.822E-02	NOT IDENT.
NB-95M	1.439E-01	1.078E-01	1.702E-01	NOT IDENT.
ZR-95	3.001E-02	2.341E-02	4.467E-02	NOT IDENT.
NB-97	0.000E+00	1.883E+39	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	9.177E+16	0.000E+00	SHORT HLIF
MO-99	0.000E+00	1.893E+03	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	1.526E+41	0.000E+00	SHORT HLIF
RH-101	-3.612E-03	1.857E-02	3.033E-02	FAIL ABUN
RH-102	4.774E-03	2.702E-02	4.880E-02	NOT IDENT.
RU-103	-3.003E-02	4.522E-02	7.832E-02	FAIL ABUN
RH-106	-1.333E-02	1.620E-01	2.912E-01	NOT IDENT.
RU-106	-1.333E-02	1.620E-01	2.912E-01	NOT IDENT.
AG-108M	-1.412E-02	2.483E-02	4.362E-02	NOT IDENT.
AG-110M	3.686E-03	1.349E-02	2.436E-02	FAIL ABUN
SN-113	-2.383E-02	3.821E-02	6.779E-02	NOT IDENT.
CD-115	0.000E+00	1.931E+04	0.000E+00	SHORT HLIF
SN-117M	-4.129E-02	1.045E-01	1.902E-01	NOT IDENT.
TE-123M	-2.244E-03	1.727E-02	3.153E-02	NOT IDENT.
SB-124	-3.490E-02	4.055E-02	5.377E-02	NOT IDENT.
SB-125	-3.927E-02	7.550E-02	1.329E-01	FAIL ABUN
TE-125M	-1.345E+00	6.678E+00	1.254E+01	NOT IDENT.
I-126	3.192E-01	2.920E-01	4.808E-01	NOT IDENT.
SB-126	-5.360E-02	1.791E-01	2.731E-01	NOT IDENT.
SB-127	0.000E+00	3.282E+01	0.000E+00	SHORT HLIF
I-131	1.680E-01	7.265E-01	1.311E+00	NOT IDENT.
I-132	0.000E+00	1.367E+41	0.000E+00	SHORT HLIF
TE-132	0.000E+00	1.093E+02	0.000E+00	SHORT HLIF
BA-133	4.275E-03	3.320E-02	5.215E-02	NOT IDENT.
I-133	0.000E+00	2.412E+12	0.000E+00	SHORT HLIF
CS-134	0.000E+00	1.778E-02	2.248E-02	FAIL ABUN
CS-135	3.297E-02	1.135E-01	1.741E-01	NOT IDENT.
I-135	0.000E+00	1.880E+41	0.000E+00	SHORT HLIF
CS-136	4.569E-02	1.158E-01	1.861E-01	NOT IDENT.
CE-139	-8.340E-03	1.799E-02	3.262E-02	NOT IDENT.
BA-140	-6.517E-01	6.455E-01	1.102E+00	NOT IDENT.
LA-140	4.675E-02	1.045E-01	1.714E-01	FAIL ABUN
CE-141	1.628E-03	6.148E-02	9.959E-02	NOT IDENT.
CE-143	0.000E+00	3.113E+07	0.000E+00	SHORT HLIF
CE-144	5.834E-02	1.224E-01	2.012E-01	NOT IDENT.
PM-144	-8.562E-03	1.004E-02	1.755E-02	NOT IDENT.
PR-144	-6.487E-01	7.617E-01	1.331E+00	NOT IDENT.
PM-146	5.501E-03	3.787E-02	6.676E-02	NOT IDENT.
ND-147	-5.078E-01	1.736E+00	3.008E+00	FAIL ABUN
PM-147	-3.140E+01	3.896E+02	7.267E+02	NOT IDENT.
PM-149	0.000E+00	1.697E+05	0.000E+00	SHORT HLIF
EU-150	4.161E-03	2.317E-02	3.215E-02	FAIL ABUN
EU-152	2.101E-02	7.132E-02	1.180E-01	FAIL ABUN
GD-153	-2.105E-02	5.125E-02	8.536E-02	NOT IDENT.
EU-154	-7.208E-03	3.018E-02	5.325E-02	NOT IDENT.
EU-155	2.209E-02	5.360E-02	1.015E-01	FAIL ABUN
TB-160	-1.038E-02	5.001E-02	7.507E-02	FAIL ABUN
HO-166M	1.357E-02	1.533E-02	3.057E-02	FAIL ABUN
TM-171	3.407E-01	2.122E+01	3.912E+01	FAIL ABUN

HF-172	-5.141E-02	1.125E-01	1.833E-01	FAIL ABUN
LU-172	1.374E-02	1.994E-02	3.242E-02	FAIL ABUN
LU-176	-7.589E-03	1.674E-02	3.045E-02	FAIL ABUN
HF-181	-1.090E-01	5.280E-02	9.000E-02	NOT IDENT.
TA-182	5.348E-03	5.563E-02	9.981E-02	FAIL ABUN
RE-183	-1.683E-01	2.289E-01	4.152E-01	FAIL ABUN
RE-184	5.290E-03	6.169E-02	9.435E-02	NOT IDENT.
W-188	7.980E-01	6.879E+00	1.043E+01	FAIL ABUN
IR-192	-1.328E-02	2.836E-02	5.141E-02	FAIL ABUN
HG-203	-1.459E-02	3.568E-02	6.185E-02	NOT IDENT.
BI-207	5.534E-03	1.352E-02	2.502E-02	FAIL ABUN
PB-210	2.168E+00	5.586E+00	1.042E+01	NOT IDENT.
BI-211	0.000E+00	2.121E-01	2.908E-01	FAIL ABUN
PB-211	-3.277E-01	6.300E-01	9.645E-01	NOT IDENT.
RA-223	8.195E-02	4.699E-01	7.463E-01	FAIL ABUN
RA-224	0.000E+00	5.463E-01	7.663E-01	FAIL ABUN
AC-227	-4.051E-03	1.594E-01	2.799E-01	FAIL ABUN
TH-227	-4.051E-03	1.594E-01	2.799E-01	FAIL ABUN
TH-231	8.195E-02	4.699E-01	7.463E-01	FAIL ABUN
PA-233	1.074E-02	4.333E-02	7.642E-02	FAIL ABUN
PA-234	4.069E-03	7.570E-02	1.343E-01	NOT IDENT.
PA-234M	9.063E-02	1.628E+00	2.136E+00	NOT IDENT.
NP-237	1.074E-02	4.333E-02	7.642E-02	FAIL ABUN
NP-238	0.000E+00	2.090E+04	0.000E+00	SHORT HLIF
NP-239	-1.519E-01	1.368E-01	2.531E-01	NOT IDENT.
PU-239	1.786E+02	2.505E+02	3.242E+02	FAIL ABUN
AM-241	7.308E-02	1.426E-01	2.342E-01	NOT IDENT.
CM-243	-2.815E-02	5.381E-02	1.011E-01	NOT IDENT.
BK-247	3.189E-02	5.563E-02	9.070E-02	FAIL ABUN
CF-249	2.183E-02	2.907E-02	5.247E-02	NOT IDENT.
CF-251	-2.027E-02	7.010E-02	1.266E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
AL-26	1129.67	-----	2.50	1.293E+00	-----	Line Not Found	-----
	1808.65	28	99.76*	8.735E-01	1.266E-02	1.266E-02	92.15
K-40	1460.82	1434	10.66*	1.017E+00	5.259E+00	5.259E+00	6.43
MN-54	834.85	54	99.98*	1.730E+00	1.238E-02	1.354E-02	96.50
CD-109	88.03	536	3.70*	4.675E+00	1.232E+00	1.310E+00	45.05
SN-126	64.28	168	9.60	1.805E+00	3.858E-01	3.858E-01	162.45
	86.94	536	8.90	4.675E+00	5.123E-01	5.123E-01	45.05
	87.57	536	37.00*	4.675E+00	1.232E-01	1.232E-01	45.05
BA-137M	661.66	92902	89.90*	2.126E+00	1.934E+01	1.939E+01	0.70
CS-137	661.66	92902	85.10*	2.126E+00	2.043E+01	2.048E+01	0.70
TL-208	277.37	-----	6.60	4.073E+00	-----	Line Not Found	-----
	583.19	947	85.00*	2.356E+00	1.881E-01	1.881E-01	16.71
	860.56	128	12.50	1.683E+00	2.425E-01	2.425E-01	40.40
BI-211	72.87	-----	1.23	3.101E+00	-----	Line Not Found	-----
	351.06	1326	12.92*	3.431E+00	1.189E+00	1.189E+00	18.20
BI-212	727.33	216	6.67*	1.962E+00	6.580E-01	6.580E-01	37.54
	785.37	122	1.10	1.830E+00	2.410E+00	2.410E+00	54.81
	1620.50	29	1.47	9.367E-01	8.265E-01	8.265E-01	107.69
PB-212	74.82	978	10.28	3.336E+00	1.135E+00	1.135E+00	29.28
	77.11	1615	17.10	3.617E+00	1.039E+00	1.039E+00	17.45
	238.63	3526	43.60*	4.535E+00	7.092E-01	7.092E-01	6.76
	300.09	121	3.30	3.848E+00	3.794E-01	3.794E-01	163.75
BI-214	609.32	1062	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95
	1120.29	229	14.92	1.304E+00	4.677E-01	4.677E-01	27.49
	1764.49	203	15.30	8.857E-01	5.964E-01	5.964E-01	21.21
PB-214	74.82	978	5.80	3.336E+00	2.011E+00	2.011E+00	29.28
	77.11	1615	9.70	3.617E+00	1.831E+00	1.832E+00	17.45
	87.09	536	3.41	4.675E+00	1.337E+00	1.337E+00	45.05
	242.00	427	7.25	4.497E+00	5.208E-01	5.208E-01	60.53
	295.22	954	18.42	3.894E+00	5.289E-01	5.289E-01	26.08
	351.93	1326	35.60*	3.431E+00	4.317E-01	4.317E-01	18.20
RN-219	271.23	265	10.80	4.155E+00	2.353E-01	2.353E-01	75.29
	401.81	52	6.60*	3.116E+00	1.007E-01	1.007E-01	390.56
RN-222	609.32	1062	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95
	1120.29	229	14.92	1.304E+00	4.677E-01	4.677E-01	27.49
	1764.49	203	15.30	8.857E-01	5.964E-01	5.964E-01	21.21
RA-224	240.99	427	4.10*	4.497E+00	9.209E-01	9.209E-01	60.53
RA-226	609.32	1062	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95
	1120.29	229	14.92	1.304E+00	4.677E-01	4.677E-01	27.49
	1764.49	203	15.30	8.857E-01	5.964E-01	5.964E-01	21.21
AC-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	523	11.27	3.529E+00	5.230E-01	5.230E-01	45.64
	794.95	192	4.25	1.812E+00	9.901E-01	9.901E-01	32.84
	835.71	54	1.61	1.730E+00	7.687E-01	7.687E-01	96.50
	911.20	585	25.80*	1.594E+00	5.661E-01	5.661E-01	16.02
	968.97	418	15.80	1.503E+00	6.994E-01	6.994E-01	15.05
RA-228	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
	338.32	523	11.27	3.529E+00	5.230E-01	5.230E-01	45.64
	794.95	192	4.25	1.812E+00	9.901E-01	9.901E-01	32.84
	835.71	54	1.61	1.730E+00	7.687E-01	7.687E-01	96.50
	911.20	585	25.80*	1.594E+00	5.661E-01	5.661E-01	16.02
	968.97	418	15.80	1.503E+00	6.994E-01	6.994E-01	15.05
TH-228	74.82	978	10.28	3.336E+00	1.135E+00	1.135E+00	29.28
	77.11	1615	17.10	3.617E+00	1.039E+00	1.039E+00	17.45
	238.63	3526	43.60*	4.535E+00	7.092E-01	7.092E-01	6.76
	300.09	121	3.30	3.848E+00	3.794E-01	3.794E-01	163.75
TH-229	85.43	53	14.70	4.402E+00	3.232E-02	3.232E-02	407.22
	88.47	536	24.00	4.675E+00	1.900E-01	1.900E-01	45.05
	193.51	284	4.41*	5.219E+00	4.912E-01	4.912E-01	104.40
	210.85	-----	2.80	4.939E+00	-----	Line Not Found	-----
TH-230	609.32	1062	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95
	1120.29	229	14.92	1.304E+00	4.677E-01	4.677E-01	27.49
	1764.49	203	15.30	8.857E-01	5.964E-01	5.964E-01	21.21
PA-231	283.69	-----	1.70	4.007E+00	-----	Line Not Found	-----
	301.36	121	5.35*	3.848E+00	2.340E-01	2.340E-01	163.75
TH-232	105.21	-----	1.10	5.759E+00	-----	Line Not Found	-----
	338.32	523	11.27	3.529E+00	5.230E-01	5.230E-01	45.64
	835.71	54	1.61	1.730E+00	7.687E-01	7.687E-01	96.50
	911.20	585	25.80*	1.594E+00	5.661E-01	5.661E-01	16.02
	968.97	418	15.80	1.503E+00	6.994E-01	6.994E-01	15.05
TH-234	63.29	168	3.70*	1.805E+00	1.001E+00	1.001E+00	162.45
	92.59	353	4.23	5.106E+00	6.505E-01	6.505E-01	88.24
U-234	609.32	1062	45.49*	2.275E+00	4.081E-01	4.081E-01	15.95
	1120.29	229	14.92	1.304E+00	4.677E-01	4.677E-01	27.49
	1764.49	203	15.30	8.857E-01	5.964E-01	5.964E-01	21.21
U-235	89.96	343	3.47	4.891E+00	8.045E-01	8.045E-01	68.19
	93.35	353	5.60	5.106E+00	4.914E-01	4.914E-01	88.24
	143.76	126	10.96*	6.021E+00	7.602E-02	7.602E-02	211.40
	163.33	-----	5.08	5.735E+00	-----	Line Not Found	-----
	185.72	1046	57.20	5.351E+00	1.359E-01	1.359E-01	32.58
	205.31	-----	5.01	5.027E+00	-----	Line Not Found	-----
U-238	63.29	168	3.70*	1.805E+00	1.001E+00	1.001E+00	162.45
	92.59	353	4.23	5.106E+00	6.505E-01	6.505E-01	88.24
AM-243	43.53	-----	5.90	1.429E-01	-----	Line Not Found	-----
	74.66	978	67.20*	3.336E+00	1.736E-01	1.736E-01	29.28
CM-247	278.00	-----	3.40	4.066E+00	-----	Line Not Found	-----
	287.50	-----	2.00	3.969E+00	-----	Line Not Found	-----
	402.40	52	72.00*	3.116E+00	9.234E-03	9.234E-03	390.56
ANH-511	511.00	344	100.00*	2.611E+00	5.240E-02	5.240E-02	90.21

Flag: "*" = Keyline

Total number of lines in spectrum 71
Number of unidentified lines 25
Number of lines tentatively identified by NID 46 64.79%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AL-26	7.17E+05Y	1.00	1.266E-02	1.266E-02	1.167E-02	92.15	
K-40	1.25E+09Y	1.00	5.259E+00	5.259E+00	0.338E+00	6.43	
MN-54	312.05D	1.09	1.238E-02	1.354E-02	1.307E-02	96.50	
CD-109	461.40D	1.06	1.232E+00	1.310E+00	0.590E+00	45.05	
SN-126	2.30E+05Y	1.00	1.232E-01	1.232E-01	0.555E-01	45.05	
BA-137M	30.08Y	1.00	1.934E+01	1.939E+01	0.014E+01	0.70	
CS-137	30.08Y	1.00	2.043E+01	2.048E+01	0.014E+01	0.70	
TL-208	1.41E+10Y	1.00	1.881E-01	1.881E-01	0.314E-01	16.71	
BI-211	7.04E+08Y	1.00	1.189E+00	1.189E+00	0.216E+00	18.20	
BI-212	1.41E+10Y	1.00	6.580E-01	6.580E-01	2.470E-01	37.54	
PB-212	1.41E+10Y	1.00	7.092E-01	7.092E-01	0.480E-01	6.76	
BI-214	1600.00Y	1.00	4.081E-01	4.081E-01	0.651E-01	15.95	
PB-214	1600.00Y	1.00	4.317E-01	4.317E-01	0.785E-01	18.20	
RN-219	7.04E+08Y	1.00	1.007E-01	1.007E-01	3.934E-01	390.56	
RN-222	1600.00Y	1.00	4.081E-01	4.081E-01	0.651E-01	15.95	
RA-224	1.41E+10Y	1.00	9.209E-01	9.209E-01	5.575E-01	60.53	
RA-226	1600.00Y	1.00	4.081E-01	4.081E-01	0.651E-01	15.95	
AC-228	1.41E+10Y	1.00	5.661E-01	5.661E-01	0.907E-01	16.02	
RA-228	1.41E+10Y	1.00	5.661E-01	5.661E-01	0.907E-01	16.02	
TH-228	1.41E+10Y	1.00	7.092E-01	7.092E-01	0.480E-01	6.76	
TH-229	7340.00Y	1.00	4.912E-01	4.912E-01	5.128E-01	104.40	
TH-230	7.54E+04Y	1.00	4.081E-01	4.081E-01	0.651E-01	15.95	
PA-231	7.04E+08Y	1.00	2.340E-01	2.340E-01	3.832E-01	163.75	
TH-232	1.41E+10Y	1.00	5.661E-01	5.661E-01	0.907E-01	16.02	
TH-234	4.47E+09Y	1.00	1.001E+00	1.001E+00	1.626E+00	162.45	
U-234	2.45E+05Y	1.00	4.081E-01	4.081E-01	0.651E-01	15.95	
U-235	7.04E+08Y	1.00	7.602E-02	7.602E-02	16.07E-02	211.40	
U-238	4.47E+09Y	1.00	1.001E+00	1.001E+00	1.626E+00	162.45	
AM-243	7370.00Y	1.00	1.736E-01	1.736E-01	0.508E-01	29.28	
CM-247	1.56E+07Y	1.00	9.234E-03	9.234E-03	36.06E-03	390.56	
ANH-511	1.00E+09Y	1.00	5.240E-02	5.240E-02	4.727E-02	90.21	
Total Activity :			5.809E+01	5.827E+01			

Grand Total Activity : 5.809E+01 5.827E+01

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.08	160	4054	1.35	131.95	130	6	2.78E-03	****	2.22E+00	T
0	129.02	173	4391	0.98	257.87	255	7	3.19E-03	****	6.11E+00	T
2	197.85	172	6204	1.65	395.57	365	38	3.31E-03	****	5.15E+00	T
0	209.12	312	4701	1.34	418.12	415	8	6.03E-03	84.2	4.97E+00	
0	327.84	233	3074	0.98	655.62	652	8	4.70E-03	89.5	3.61E+00	T
0	462.64	125	3997	1.55	925.28	922	9	2.62E-03	****	2.81E+00	T
0	620.07	30	702	0.62	1240.21	1239	8	6.43E-04	****	2.24E+00	T
0	712.20	37	142	1.46	1424.51	1422	7	8.09E-04	****	2.00E+00	T
0	730.98	20	71	1.70	1462.06	1461	4	4.46E-04	****	1.95E+00	
0	768.47	52	292	1.67	1537.07	1528	13	1.15E-03	****	1.87E+00	
1	802.43	25	166	2.00	1605.00	1599	21	5.55E-04	****	1.79E+00	T
1	805.37	43	178	2.21	1610.87	1599	21	9.55E-04	****	1.79E+00	
0	839.93	56	168	1.32	1680.00	1676	11	1.24E-03	96.4	1.72E+00	
0	876.65	23	130	3.66	1753.44	1746	11	5.25E-04	****	1.65E+00	T
1	964.20	174	139	2.15	1928.59	1921	28	3.97E-03	31.5	1.51E+00	T
0	1023.38	22	140	4.96	2046.95	2035	16	4.97E-04	****	1.42E+00	
4	1032.61	25	46	2.09	2065.41	2062	15	5.74E-04	94.9	1.41E+00	
4	1036.11	41	50	1.84	2072.42	2062	15	9.31E-04	72.8	1.41E+00	
0	1054.04	23	158	0.67	2108.28	2097	15	5.18E-04	****	1.38E+00	
0	1087.99	33	83	1.15	2176.18	2170	11	7.55E-04	****	1.34E+00	
0	1091.68	41	76	2.76	2183.56	2180	9	9.51E-04	82.1	1.34E+00	
0	1155.03	37	95	1.68	2310.27	2305	9	8.66E-04	****	1.27E+00	
0	1178.88	101	229	12.00	2357.98	2343	28	2.36E-03	86.7	1.24E+00	T
4	1237.47	122	145	3.38	2475.16	2466	57	2.86E-03	49.5	1.18E+00	T
4	1258.19	46	99	3.40	2516.60	2466	57	1.08E-03	97.5	1.16E+00	
0	1377.95	75	61	1.68	2756.15	2751	14	1.78E-03	50.1	1.07E+00	
0	1509.53	17	46	1.62	3019.30	3014	9	4.18E-04	****	9.89E-01	
0	1544.82	13	41	3.42	3089.89	3082	12	3.08E-04	****	9.71E-01	
0	1589.35	67	105	2.97	3178.94	3171	25	1.63E-03	82.6	9.50E-01	
6	1628.88	27	21	2.54	3258.00	3246	36	6.64E-04	92.4	9.33E-01	
6	1631.41	26	25	2.52	3263.07	3246	36	6.28E-04	96.9	9.32E-01	
6	1637.23	31	32	4.51	3274.71	3246	36	7.59E-04	77.9	9.29E-01	
0	1707.90	20	23	0.58	3416.04	3409	14	4.96E-04	****	9.03E-01	
6	1727.85	20	41	3.57	3455.94	3452	19	4.94E-04	98.9	8.97E-01	
6	1729.88	49	77	2.60	3460.00	3452	19	1.20E-03	80.4	8.96E-01	
0	1740.66	14	35	4.19	3481.57	3471	16	3.48E-04	****	8.93E-01	
0	2015.25	26	29	2.98	4030.69	4022	16	6.42E-04	98.6	8.38E-01	

Flags: "T" = Tentatively associated

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*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                    *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562000.CNF;1
* Acquisition date   : 29-JUN-2016 15:33:07 Sensitivity      : 3.000
* Detector ID        : GAM43 Energy tolerance: 1.500
* Elapsed live time  : 0 12:00:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 12:00:15.82 Half life ratio : *****
* Sample date        : 20-MAY-2016 08:50:00 Nuclide Library : SOLID
* Sample ID          : G1203562000 Analyst initials: MXR1
* Batch Number       : 1572490 Sample Quantity : 1.5729E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                                     Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 10-SEP-2015 10:32:19 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
AL-26	6.947E-03
K-40	8.038E-02
MN-54	8.739E-03
CD-109	3.716E-01
SN-126	3.475E-02
BA-137M	1.308E-02
CS-137	1.382E-02
TL-208	1.595E-02
BI-212	1.101E-01
PB-212	3.041E-02
BI-214	2.923E-02
PB-214	4.377E-02
RN-219	2.661E-01
RN-222	2.923E-02
RA-226	2.923E-02
AC-228	3.020E-02
RA-228	3.020E-02
TH-228	3.041E-02
TH-229	2.743E-01
TH-230	2.923E-02
PA-231	2.601E-01
TH-232	3.020E-02
TH-234	8.496E-01
U-234	2.923E-02
U-235	9.091E-02
U-238	8.496E-01
AM-243	2.672E-02
CM-247	2.449E-02
ANH-511	1.657E-02

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	3.367E-01	NOT IDENT.
NA-22	9.019E-03	NOT IDENT.

NA-24	0.000E+00	SHORT HLIF
SC-46	1.073E-02	FAIL ABUN
V-48	4.412E-02	NOT IDENT.
CR-51	3.993E-01	NOT IDENT.
CO-56	1.094E-02	FAIL ABUN
MN-56	0.000E+00	SHORT HLIF
CO-57	1.299E-02	NOT IDENT.
CO-58	1.071E-02	NOT IDENT.
FE-59	2.811E-02	NOT IDENT.
CO-60	8.454E-03	NOT IDENT.
ZN-65	2.079E-02	NOT IDENT.
GE-68	3.077E-01	NOT IDENT.
AS-73	1.054E+00	NOT IDENT.
AS-74	1.118E-01	NOT IDENT.
SE-75	2.892E-02	FAIL ABUN
BR-77	0.000E+00	SHORT HLIF
SR-82	1.457E-01	NOT IDENT.
RB-83	4.870E-02	NOT IDENT.
KR-85	4.094E+00	NOT IDENT.
SR-85	2.834E-02	NOT IDENT.
RB-86	4.675E-01	NOT IDENT.
Y-88	7.941E-03	NOT IDENT.
Y-91	5.997E+00	NOT IDENT.
NB-94	8.432E-03	NOT IDENT.
NB-95	1.366E-02	NOT IDENT.
NB-95M	8.435E-02	NOT IDENT.
ZR-95	2.151E-02	NOT IDENT.
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	0.000E+00	SHORT HLIF
TC-99M	0.000E+00	SHORT HLIF
RH-101	1.503E-02	FAIL ABUN
RH-102	2.395E-02	NOT IDENT.
RU-103	3.871E-02	FAIL ABUN
RH-106	1.430E-01	NOT IDENT.
RU-106	1.430E-01	NOT IDENT.
AG-108M	2.161E-02	NOT IDENT.
AG-110M	1.167E-02	FAIL ABUN
SN-113	3.357E-02	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	9.425E-02	NOT IDENT.
TE-123M	1.563E-02	NOT IDENT.
SB-124	2.490E-02	NOT IDENT.
SB-125	6.585E-02	FAIL ABUN
TE-125M	6.212E+00	NOT IDENT.
I-126	2.335E-01	NOT IDENT.
SB-126	1.315E-01	NOT IDENT.
SB-127	0.000E+00	SHORT HLIF
I-131	6.491E-01	NOT IDENT.
I-132	0.000E+00	SHORT HLIF
TE-132	0.000E+00	SHORT HLIF
BA-133	2.582E-02	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	1.088E-02	FAIL ABUN
CS-135	8.623E-02	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	8.894E-02	NOT IDENT.
CE-139	1.616E-02	NOT IDENT.
BA-140	5.432E-01	NOT IDENT.
LA-140	8.032E-02	FAIL ABUN
CE-141	4.935E-02	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	9.972E-02	NOT IDENT.
PM-144	8.484E-03	NOT IDENT.
PR-144	6.435E-01	NOT IDENT.
PM-146	3.309E-02	NOT IDENT.
ND-147	1.483E+00	FAIL ABUN
PM-147	3.601E+02	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	1.592E-02	FAIL ABUN
EU-152	5.840E-02	FAIL ABUN
GD-153	4.229E-02	NOT IDENT.
EU-154	2.527E-02	NOT IDENT.
EU-155	5.031E-02	FAIL ABUN
TB-160	3.592E-02	FAIL ABUN
HO-166M	1.478E-02	FAIL ABUN
TM-171	1.937E+01	FAIL ABUN
HF-172	9.082E-02	FAIL ABUN

LU-172	1.554E-02	FAIL ABUN
LU-176	1.507E-02	FAIL ABUN
HF-181	4.453E-02	NOT IDENT.
TA-182	4.777E-02	FAIL ABUN
RE-183	2.056E-01	FAIL ABUN
RE-184	4.521E-02	NOT IDENT.
W-188	5.165E+00	FAIL ABUN
IR-192	2.545E-02	FAIL ABUN
HG-203	3.063E-02	NOT IDENT.
BI-207	1.198E-02	FAIL ABUN
PB-210	5.160E+00	NOT IDENT.
BI-211	1.442E-01	FAIL ABUN
PB-211	4.777E-01	NOT IDENT.
RA-223	3.695E-01	FAIL ABUN
RA-224	3.803E-01	FAIL ABUN
AC-227	1.387E-01	FAIL ABUN
TH-227	1.387E-01	FAIL ABUN
TH-231	3.695E-01	FAIL ABUN
PA-233	3.784E-02	FAIL ABUN
PA-234	6.423E-02	NOT IDENT.
PA-234M	1.024E+00	NOT IDENT.
NP-237	3.784E-02	FAIL ABUN
NP-238	0.000E+00	SHORT HLIF
NP-239	1.254E-01	NOT IDENT.
PU-239	1.607E+02	FAIL ABUN
AM-241	1.160E-01	NOT IDENT.
CM-243	5.007E-02	NOT IDENT.
BK-247	4.492E-02	FAIL ABUN
CF-249	2.598E-02	NOT IDENT.
CF-251	6.274E-02	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562000.CNF;1
Acquisition date : 29-JUN-2016 15:33:07 Sensitivity : 3.000
Detector ID : GAM43 Energy tolerance: 1.500
Elapsed live time: 0 12:00:00.00 Abundance limit : 75.000
Elapsed real time: 0 12:00:15.82 Half life ratio : *****
Sample date : 20-MAY-2016 08:50:00 Nuclide Library : SOLID
Sample ID : G1203562000 Analyst initials: MXR1
Batch Number : 1572490 Sample Quantity : 1.5729E+02 GRAM
Quantity Err(%) : 1.2715E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 10-SEP-2015 10:32:19 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM43_CAN.CNF;6

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
AL-26	1.266E-02	1.148E-02	1.148E-02
K-40	5.259E+00	5.580E-01	5.580E-01
MN-54	1.354E-02	1.294E-02	1.294E-02
CD-109	7.930E-01	6.023E-01	6.023E-01
SN-126	7.462E-02	5.653E-02	5.653E-02
BA-137M	1.939E+01	1.749E+00	1.749E+00
CS-137	2.048E+01	1.847E+00	1.847E+00
TL-208	1.881E-01	3.510E-02	3.510E-02
BI-212	6.580E-01	2.524E-01	2.524E-01
PB-212	7.092E-01	7.995E-02	7.995E-02
BI-214	4.081E-01	7.358E-02	7.358E-02
PB-214	4.317E-01	8.610E-02	8.610E-02
RN-219	1.007E-01	3.858E-01	3.858E-01
RN-222	4.081E-01	7.358E-02	7.358E-02
RA-226	4.081E-01	7.358E-02	7.358E-02
AC-228	5.661E-01	1.263E-01	1.263E-01
RA-228	5.661E-01	1.263E-01	1.263E-01
TH-228	7.092E-01	7.995E-02	7.995E-02
TH-229	4.912E-01	5.040E-01	5.040E-01
TH-230	4.081E-01	7.357E-02	7.357E-02
PA-231	2.340E-01	3.794E-01	3.794E-01
TH-232	5.661E-01	1.263E-01	1.263E-01
TH-234	1.001E+00	1.612E+00	1.612E+00
U-234	4.081E-01	7.357E-02	7.357E-02
U-235	7.602E-02	1.576E-01	1.576E-01
U-238	1.001E+00	1.612E+00	1.612E+00
AM-243	1.280E-01	5.289E-02	5.289E-02
CM-247	9.234E-03	3.538E-02	3.538E-02
ANH-511	5.240E-02	4.655E-02	4.655E-02

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)
BE-7	4.413E-01	3.844E-01	4.329E-01 NOT IDENT.

NA-22	-2.720E-03	1.078E-02	1.085E-02	NOT IDENT.
NA-24	1.545E+17	3.440E+17	0.000E+00	SHORT HLIF
SC-46	-3.986E-03	1.283E-02	1.295E-02	FAIL ABUN
V-48	-1.899E-02	5.364E-02	5.432E-02	NOT IDENT.
CR-51	-3.099E-01	4.475E-01	4.688E-01	NOT IDENT.
CO-56	-4.304E-04	1.494E-02	1.494E-02	FAIL ABUN
MN-56	-1.000E+41	4.112E+42	0.000E+00	SHORT HLIF
CO-57	1.237E-02	1.396E-02	1.503E-02	NOT IDENT.
CO-58	-1.008E-02	1.531E-02	1.597E-02	NOT IDENT.
FE-59	-3.903E-02	3.910E-02	4.287E-02	NOT IDENT.
CO-60	-3.733E-03	1.026E-02	1.040E-02	NOT IDENT.
ZN-65	-7.078E-03	2.873E-02	2.891E-02	NOT IDENT.
GE-68	3.601E-01	3.432E-01	3.797E-01	NOT IDENT.
AS-73	-1.334E-01	1.158E+00	1.160E+00	NOT IDENT.
AS-74	-4.687E-02	1.329E-01	1.345E-01	NOT IDENT.
SE-75	3.297E-02	3.574E-02	3.871E-02	FAIL ABUN
BR-77	1.819E+05	2.137E+05	2.289E+05	SHORT HLIF
SR-82	-1.577E-01	1.863E-01	1.994E-01	NOT IDENT.
RB-83	-1.321E-02	5.685E-02	5.716E-02	NOT IDENT.
KR-85	1.360E+01	5.333E+00	8.125E+00	NOT IDENT.
SR-85	9.391E-02	3.691E-02	5.616E-02	NOT IDENT.
RB-86	5.565E-01	5.213E-01	5.785E-01	NOT IDENT.
Y-88	-1.129E-02	1.075E-02	1.190E-02	NOT IDENT.
Y-91	2.136E+00	6.893E+00	6.960E+00	NOT IDENT.
NB-94	7.334E-03	9.402E-03	9.966E-03	NOT IDENT.
NB-95	3.960E-02	1.652E-02	2.433E-02	NOT IDENT.
NB-95M	1.439E-01	1.089E-01	1.267E-01	NOT IDENT.
ZR-95	3.001E-02	2.366E-02	2.725E-02	NOT IDENT.
NB-97	1.000E+41	9.186E+39	0.000E+00	SHORT HLIF
ZR-97	1.323E+17	9.249E+16	0.000E+00	SHORT HLIF
MO-99	-2.550E+03	1.915E+03	2.234E+03	SHORT HLIF
TC-99M	-1.000E+41	1.530E+41	0.000E+00	SHORT HLIF
RH-101	-3.612E-03	1.858E-02	1.865E-02	FAIL ABUN
RH-102	4.774E-03	2.703E-02	2.711E-02	NOT IDENT.
RU-103	-3.003E-02	4.530E-02	4.728E-02	FAIL ABUN
RH-106	-1.333E-02	1.620E-01	1.621E-01	NOT IDENT.
RU-106	-1.333E-02	1.620E-01	1.621E-01	NOT IDENT.
AG-108M	-1.412E-02	2.485E-02	2.566E-02	NOT IDENT.
AG-110M	3.686E-03	1.350E-02	1.361E-02	FAIL ABUN
SN-113	-2.383E-02	3.826E-02	3.974E-02	NOT IDENT.
CD-115	-1.886E+04	1.940E+04	2.118E+04	SHORT HLIF
SN-117M	-4.129E-02	1.045E-01	1.062E-01	NOT IDENT.
TE-123M	-2.244E-03	1.727E-02	1.730E-02	NOT IDENT.
SB-124	-3.490E-02	4.064E-02	4.358E-02	NOT IDENT.
SB-125	-3.927E-02	7.557E-02	7.762E-02	FAIL ABUN
TE-125M	-1.345E+00	6.679E+00	6.707E+00	NOT IDENT.
I-126	3.192E-01	2.938E-01	3.271E-01	NOT IDENT.
SB-126	-5.360E-02	1.792E-01	1.808E-01	NOT IDENT.
SB-127	-1.046E+01	3.290E+01	3.323E+01	SHORT HLIF
I-131	1.680E-01	7.266E-01	7.306E-01	NOT IDENT.
I-132	-1.000E+41	2.842E+41	0.000E+00	SHORT HLIF
TE-132	-3.531E+01	1.093E+02	1.105E+02	SHORT HLIF
BA-133	4.275E-03	3.320E-02	3.326E-02	NOT IDENT.
I-133	-2.826E+12	2.525E+12	2.828E+12	SHORT HLIF
CS-134	3.920E-02	1.842E-02	2.552E-02	FAIL ABUN
CS-135	3.297E-02	1.136E-01	1.145E-01	NOT IDENT.
I-135	1.000E+41	2.093E+41	0.000E+00	SHORT HLIF
CS-136	4.569E-02	1.161E-01	1.180E-01	NOT IDENT.
CE-139	-8.340E-03	1.808E-02	1.846E-02	NOT IDENT.
BA-140	-6.517E-01	6.480E-01	7.115E-01	NOT IDENT.
LA-140	4.675E-02	1.046E-01	1.067E-01	FAIL ABUN
CE-141	1.628E-03	6.148E-02	6.148E-02	NOT IDENT.
CE-143	1.004E+08	3.270E+07	5.584E+07	SHORT HLIF
CE-144	5.834E-02	1.226E-01	1.253E-01	NOT IDENT.
PM-144	-8.562E-03	1.008E-02	1.079E-02	NOT IDENT.
PR-144	-6.487E-01	7.644E-01	8.184E-01	NOT IDENT.
PM-146	5.501E-03	3.787E-02	3.795E-02	NOT IDENT.
ND-147	-5.078E-01	1.737E+00	1.752E+00	FAIL ABUN
PM-147	-3.140E+01	3.896E+02	3.899E+02	NOT IDENT.
PM-149	-1.063E+04	1.697E+05	1.697E+05	SHORT HLIF
EU-150	4.161E-03	2.318E-02	2.325E-02	FAIL ABUN
EU-152	2.101E-02	7.135E-02	7.198E-02	FAIL ABUN
GD-153	-2.105E-02	5.128E-02	5.216E-02	NOT IDENT.
EU-154	-7.208E-03	3.019E-02	3.036E-02	NOT IDENT.
EU-155	2.209E-02	5.364E-02	5.456E-02	FAIL ABUN
TB-160	-1.038E-02	5.004E-02	5.025E-02	FAIL ABUN
HO-166M	1.357E-02	1.540E-02	1.657E-02	FAIL ABUN
TM-171	3.407E-01	2.122E+01	2.122E+01	FAIL ABUN

HF-172	-5.141E-02	1.129E-01	1.153E-01	FAIL ABUN
LU-172	-1.374E-02	2.016E-02	2.109E-02	FAIL ABUN
LU-176	-7.589E-03	1.676E-02	1.710E-02	FAIL ABUN
HF-181	-1.090E-01	5.363E-02	7.273E-02	NOT IDENT.
TA-182	5.348E-03	5.563E-02	5.569E-02	FAIL ABUN
RE-183	-1.683E-01	2.304E-01	2.426E-01	FAIL ABUN
RE-184	5.290E-03	6.170E-02	6.174E-02	NOT IDENT.
W-188	7.980E-01	6.880E+00	6.889E+00	FAIL ABUN
IR-192	-1.328E-02	2.838E-02	2.901E-02	FAIL ABUN
HG-203	-1.459E-02	3.571E-02	3.631E-02	NOT IDENT.
BI-207	5.534E-03	1.356E-02	1.379E-02	FAIL ABUN
PB-210	2.168E+00	5.591E+00	5.676E+00	NOT IDENT.
BI-211	1.189E+00	2.380E-01	5.866E-01	FAIL ABUN
PB-211	-3.277E-01	6.307E-01	6.478E-01	NOT IDENT.
RA-223	8.195E-02	4.700E-01	4.714E-01	FAIL ABUN
RA-224	9.209E-01	5.529E-01	6.914E-01	FAIL ABUN
AC-227	-4.051E-03	1.594E-01	1.594E-01	FAIL ABUN
TH-227	-4.051E-03	1.594E-01	1.594E-01	FAIL ABUN
TH-231	8.195E-02	4.700E-01	4.714E-01	FAIL ABUN
PA-233	1.074E-02	4.334E-02	4.361E-02	FAIL ABUN
PA-234	4.069E-03	7.585E-02	7.587E-02	NOT IDENT.
PA-234M	9.063E-02	1.628E+00	1.629E+00	NOT IDENT.
NP-237	1.074E-02	4.334E-02	4.361E-02	FAIL ABUN
NP-238	-4.614E+03	2.091E+04	2.102E+04	SHORT HLIF
NP-239	-1.519E-01	1.378E-01	1.539E-01	NOT IDENT.
PU-239	1.786E+02	2.510E+02	2.636E+02	FAIL ABUN
AM-241	7.308E-02	1.429E-01	1.466E-01	NOT IDENT.
CM-243	-2.815E-02	5.391E-02	5.538E-02	NOT IDENT.
BK-247	3.189E-02	5.606E-02	5.787E-02	FAIL ABUN
CF-249	2.183E-02	2.916E-02	3.078E-02	NOT IDENT.
CF-251	-2.027E-02	7.015E-02	7.074E-02	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	3216.8596	87.09	3520.4600	136.47	3709.4211
45.60	3151.7302	87.57	3593.0750	140.51	0.0000
46.54	3137.3267	88.03	3700.2644	143.76	3628.3250
49.72	0.0000	88.34	3626.5188	323.87	3633.5806
51.35	3119.7283	88.47	3627.4944	145.44	3659.8374
51.87	3111.8833	89.96	4235.8027	152.43	3623.8757
52.39	3164.1892	90.64	3469.8225	153.25	3615.5398
52.97	3185.4370	91.11	3473.1423	154.21	3608.7964
53.44	3170.7136	92.59	3483.5127	156.02	3651.8599
54.07	3110.6587	93.35	3357.7195	158.56	3719.1750
57.36	0.0000	94.56	3480.3828	159.00	3701.9580
57.53	3227.9717	94.65	3517.4543	57.98	3652.2854
57.98	3281.3289	94.67	3517.5923	162.66	3642.1738
59.27	3178.1714	94.87	3518.9705	143.76	3674.8369
59.32	3178.5991	97.43	3512.6492	165.86	3745.2473
59.54	3159.4700	98.43	3394.5459	176.31	3653.1565
60.96	3241.2932	98.44	3394.6045	176.60	3647.5276
61.17	3236.6104	99.53	3419.6484	177.52	3681.7188
125.81	3289.1199	100.11	3456.1882	181.07	0.0000
63.29	3301.9980	102.03	3573.6104	181.52	3633.7048
63.58	3245.6370	103.18	3584.8423	184.41	4047.4553
64.28	3251.4932	103.37	3586.1167	185.72	4053.9946
66.73	3435.3777	105.21	3535.7439	193.51	4092.3091
67.24	3437.5378	105.31	3536.3926	197.03	4109.3784
67.68	3441.3062	106.12	3531.7776	198.01	4114.0757
67.75	3506.3062	106.47	3566.2922	201.83	4278.6084
69.67	3488.0288	109.28	3684.3877	203.43	4150.2754
70.83	3523.3264	111.00	3673.0864	205.31	4276.7388
72.81	3524.3770	111.76	0.0000	193.51	4042.1238
72.87	3524.8755	114.06	3633.7971	879.38	4051.1572
74.66	3483.6838	116.30	0.0000	1221.41	3936.8413
74.82	3484.9817	116.74	3800.2224	227.09	3917.6741
74.97	3486.1848	265.00	3622.5259	227.38	3919.9333
77.11	3503.3269	121.12	3688.6614	228.16	0.0000
1093.63	3530.3506	121.22	3703.0713	228.18	3867.2009
79.69	3602.9421	121.78	3652.2297	235.69	3684.0408
80.12	3606.3733	122.06	3595.9192	235.96	3782.2695
80.19	3557.0481	122.92	3670.1665	238.63	3751.1465
80.57	3560.0327	123.07	3679.3772	238.98	0.0000
81.00	3331.7603	123.68	3670.1375	240.99	3760.1711
81.07	3407.2266	125.81	3721.4419	351.93	3477.8936
81.75	3569.2581	127.23	3778.9749	244.70	3525.1953
83.79	3463.3865	127.91	3695.3833	252.40	0.0000
84.00	3464.9436	129.30	3635.5681	252.80	3433.8691
85.43	3652.6345	946.00	3756.5854	254.15	0.0000
86.55	3661.2715	133.02	3779.2844	256.23	3362.6726
86.79	3621.7117	133.52	3669.7168	260.90	0.0000
86.94	3622.8652	136.00	3718.9836	264.66	3196.8945

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	3197.3396	356.01	3079.5569	595.83	1109.4445
265.00	3254.9453	364.49	3004.1348	600.60	1071.4526
268.22	3403.8589	366.42	0.0000	507.63	0.0000
269.46	3263.0706	372.51	3015.1614	604.72	1138.9264
270.03	3227.3257	375.05	3109.0928	607.14	1075.7393
271.23	3256.3169	377.52	3109.8137	609.32	997.9166
273.65	3470.5750	383.85	3149.0684	610.33	963.8508
276.40	3183.1890	388.16	3081.1313	614.28	918.3091
277.37	3127.1990	388.63	3063.7517	618.01	946.9099
103.37	3174.4458	391.69	3228.7310	620.36	928.4426
277.60	3174.4458	400.66	3315.3887	621.93	954.1448
278.00	3175.6245	401.81	3197.3218	630.19	0.0000
279.20	3277.9678	402.40	3217.5283	631.29	907.3353
264.66	3318.9727	404.85	3441.0105	633.25	898.8839
279.70	3279.4534	711.68	3337.7429	634.78	902.3260
280.46	3345.1130	413.71	3441.6323	635.95	922.4048
283.69	3075.9211	414.70	3381.6858	364.49	915.4105
284.31	3105.5535	423.72	3525.1724	645.85	942.6693
285.41	3134.2673	427.09	3585.7754	657.76	1003.7429
285.90	0.0000	427.87	3542.7583	657.90	0.0000
287.50	3127.8169	433.94	3653.7769	661.66	680.8851
290.67	3110.9612	439.40	3638.5264	664.57	0.0000
293.27	0.0000	453.88	3904.9060	666.33	311.0692
295.22	3119.7864	427.87	4182.5366	666.50	306.2285
295.96	2972.9009	316.51	4077.8149	667.71	0.0000
298.58	3174.0820	473.00	0.0000	677.62	270.7419
256.23	2993.8008	475.06	3705.6069	685.70	0.0000
238.63	2957.8645	476.78	3412.6462	695.00	274.7789
300.13	2957.9443	477.60	3304.3694	696.49	318.0721
301.36	2992.8206	482.18	3044.5303	696.51	318.0721
302.85	3017.7866	487.02	2539.7334	720.70	317.1814
304.50	3034.1670	492.35	0.0000	697.30	317.2285
304.85	3056.2769	497.08	2363.4944	697.49	311.5046
306.78	3068.8721	505.52	2215.9399	702.65	280.5106
308.46	3046.7456	507.63	0.0000	884.68	303.1439
311.90	3064.7007	511.00	2021.0231	711.68	274.8761
316.51	3058.9568	514.00	1889.0771	720.70	242.3370
319.41	3009.2224	514.00	1889.0771	293.27	0.0000
320.08	3031.1155	520.40	1822.1597	722.78	259.1694
321.04	3027.5479	520.69	0.0000	722.91	259.1857
323.87	3009.3843	522.65	0.0000	723.31	235.9651
325.23	3043.5059	527.90	0.0000	724.19	252.6777
328.76	3021.2769	528.26	1724.3936	727.33	228.0482
333.37	3092.8665	529.59	1670.6151	733.00	203.5730
333.97	3081.9124	529.87	0.0000	735.93	177.0968
334.37	3034.4897	531.02	1607.2941	737.46	224.6906
338.28	3062.5210	537.26	1574.5388	739.50	0.0000
338.32	3062.6011	546.56	0.0000	453.88	208.5798
340.48	3130.4661	552.55	1254.2080	748.06	216.4857
1048.07	3130.6702	563.25	1137.3704	752.31	200.1899
344.28	3017.0417	569.33	1138.8391	753.82	204.2422
345.93	3037.2222	569.50	1127.0441	756.73	174.9978
351.06	3122.1416	569.70	1146.6167	756.80	178.9341
351.93	3026.0098	583.19	1109.9786	763.94	202.8474
355.39	0.0000	333.97	1062.6453	765.81	179.3186

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.42	186.1314	996.26	169.7105	1620.50	0.0000
631.29	221.1426	1001.03	145.2338	1621.92	0.0000
667.71	0.0000	1002.74	147.4690	1678.03	0.0000
776.52	235.4972	1004.73	160.4921	1690.97	56.0547
777.92	0.0000	1021.30	0.0000	1750.46	0.0000
344.28	198.9881	1025.87	0.0000	1764.49	57.8981
685.70	0.0000	984.45	0.0000	1770.23	40.1726
785.37	196.0960	1037.84	130.6494	846.77	50.6635
792.07	131.6536	1038.76	0.0000	1791.20	0.0000
794.95	187.7208	1046.59	147.3926	1808.65	42.5748
795.86	143.8389	1048.07	139.2664	1810.72	0.0000
801.95	188.2448	1049.04	142.5910	1836.06	50.7712
810.06	203.1953	1050.41	163.9648		
810.29	213.5488	1063.66	154.3048		
810.45	213.5618	1077.00	129.4361		
810.76	210.1428	1077.34	129.4505		
815.77	184.2361	1085.87	137.6055		
818.51	194.5117	1093.63	149.5679		
832.01	182.3584	1099.45	181.1363		
834.85	212.1129	1112.07	190.5172		
835.71	212.1852	1112.84	193.9092		
911.20	212.1852	1115.54	180.6812		
836.80	0.0000	1120.29	147.4312		
846.75	0.0000	1120.55	147.4419		
846.77	188.6271	1121.30	142.4518		
856.80	187.5859	1129.67	145.4010		
860.56	168.5391	1260.41	0.0000		
871.09	165.6770	1147.95	0.0000		
1274.44	142.8744	1173.23	146.3428		
875.33	0.0000	1177.95	164.5557		
879.38	171.4855	1189.05	152.1376		
880.51	166.2507	1204.77	145.2178		
883.24	170.7455	1221.41	162.6521		
884.68	162.2257	1231.02	183.3521		
889.28	186.3025	1235.36	173.1812		
894.76	185.6353	1238.28	142.6189		
898.04	184.8155	1260.41	0.0000		
900.72	180.1465	1271.87	106.9478		
903.28	171.1975	1274.44	123.0257		
911.20	172.1301	1274.54	123.0300		
912.08	177.1034	1291.59	100.4813		
923.98	0.0000	1298.22	0.0000		
926.50	156.2815	1312.11	121.2346		
929.11	187.9187	1332.49	106.6479		
937.49	213.7422	1362.66	0.0000		
944.13	157.2455	1365.19	99.3512		
946.00	155.2335	1368.63	0.0000		
949.00	163.8518	1384.29	88.2532		
954.55	0.0000	1408.01	82.8237		
962.31	171.1258	1457.56	0.0000		
964.08	154.0743	1460.82	87.0440		
966.17	154.1834	1489.16	80.2411		
968.97	154.3309	1505.03	92.7277		
983.53	154.0195	1584.12	55.3939		
984.45	0.0000	1596.21	62.2769		

VAX/VMS Nuclide Identification Report Generated 30-JUN-2016 06:29:40.23

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*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562001.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;251
Background date    : 26-JUN-2016 12:05:29
Sample date       : 7-JUN-2016 00:00:00. Acquisition date : 29-JUN-2016 14:54:21
Sample ID        : G1203562001. Sample quantity : 1.15000E+02 GRAM
Detector name    : GAM28. Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:04.13 0.5%
Energy tolerance : 1.50000 keV Analyst Initials : MXR1
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID        : 1572490 Detector SN# :
Matrix Spike ID  : LCS ID : 1556
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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	36.93	444	1143	1.33	73.90	72	6	4.93E-01	12.8	
2	0	46.50*	6805	4120	1.12	93.05	87	12	7.56E+00	2.2	
3	0	59.60	17528	3573	1.15	119.27	114	12	1.95E+01	1.0	
4	0	71.29	73	822	1.39	142.66	141	6	8.14E-02	63.3	
5	0	88.15	3178	1709	1.17	176.41	171	12	3.53E+00	3.2	
6	0	122.46	267	1011	1.14	245.08	241	9	2.96E-01	22.5	
7	0	147.88	62	448	1.00	295.96	294	5	6.85E-02	53.2	
8	0	216.74	73	837	0.87	433.77	431	8	8.10E-02	69.7	
9	0	252.05	65	750	2.20	504.46	502	9	7.23E-02	76.7	
10	0	267.95	73	796	1.46	536.27	532	10	8.11E-02	73.4	
11	0	438.78	118	509	2.60	878.18	875	8	1.31E-01	34.5	
12	0	444.16	48	641	0.76	888.96	887	9	5.32E-02	96.7	
13	0	523.14	49	335	1.43	1047.03	1044	8	5.47E-02	65.9	
14	0	538.86	68	416	0.77	1078.51	1074	11	7.56E-02	57.7	
15	0	632.07	43	248	1.47	1265.05	1262	8	4.73E-02	66.1	
16	0	638.04	98	345	3.64	1277.00	1271	12	1.09E-01	39.5	
17	0	661.53*	14283	532	1.56	1324.03	1317	15	1.59E+01	0.9	
18	0	757.56	25	311	1.24	1516.22	1513	10	2.77E-02	133.8	
19	0	820.54	36	346	1.33	1642.27	1639	9	4.00E-02	94.3	
20	0	873.16	49	384	2.91	1747.59	1741	11	5.46E-02	78.5	
21	3	1098.77	58	135	1.42	2199.15	2197	16	6.46E-02	31.7	9.11E-01
22	3	1102.79	101	306	2.60	2207.20	2197	16	1.12E-01	36.3	
23	0	1115.37	132	363	1.81	2232.39	2226	13	1.47E-01	31.0	
24	0	1172.87	9605	294	1.89	2347.46	2337	20	1.07E+01	1.1	
25	10	1271.83	35	64	5.28	2545.54	2538	24	3.91E-02	51.6	4.65E+00
26	10	1276.76	25	56	2.99	2555.39	2538	24	2.77E-02	65.2	
27	0	1332.10	8756	92	1.94	2666.16	2657	20	9.73E+00	1.1	
28	0	1413.68	30	6	2.83	2829.44	2824	11	3.28E-02	24.0	
29	0	1573.78	7	21	0.55	3149.88	3142	12	7.40E-03	143.2	
30	0	1708.44	10	13	2.73	3419.40	3408	13	1.10E-02	81.8	
31	0	1728.22	18	15	2.99	3459.00	3451	15	2.00E-02	52.5	
32	0	1768.41	7	9	1.36	3539.43	3534	9	7.78E-03	86.0	
33	6	1902.21	16	1	3.29	3807.22	3803	17	1.78E-02	26.6	1.11E+00
34	6	1906.22	16	4	2.21	3815.26	3803	17	1.80E-02	26.9	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1946.83	20	3	1.00	3896.54	3889	14	2.17E-02	30.4	

Flag: "*" = Peak area was modified by background subtraction

VMS Nuclide Identification Report V3.1 Generated 30-JUN-2016 06:29:42

Configuration	: DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562001.CNF;1		
Analyses by	: PEAK V16.9,PEAKEFF V2.2,ENBACK V1.6,NID V3.4		
Sample title	: MXR1		
Sample date	: 7-JUN-2016 00:00:00	Acquisition date	: 29-JUN-2016 14:54:21
Sample ID	: G1203562001	Sample quantity	: 115.00 GRAM
Sample type	: SOLID	Sample geometry	:
Detector name	: GAMMA28	Detector geometry	: CAN
Elapsed live time	: 0 00:15:00.00	Elapsed real time	: 0 00:15:04.13 0.5%
Energy tolerance	: 1.50 keV	Half life ratio	: 10.00
Errors propagated	: No	Systematic Error	: 0.00 %
Efficiency type	: Empirical	Efficiencies at	: Peak Energy
Abundance limit	: 75.00		

Interference Report

No interference correction performed

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	279	85.60*	6.574E+00	1.296E+00	1.373E+00	44.91
	136.47	-----	10.68	6.543E+00	-----	Line Not Found	-----
CO-60	1173.23	9149	99.85	1.503E+00	1.591E+02	1.604E+02	2.22
	1332.49	8293	99.98*	1.349E+00	1.605E+02	1.619E+02	2.21
ZN-65	1115.54	126	50.60*	1.569E+00	4.160E+00	4.436E+00	62.05
CD-109	88.03	3374	3.70*	5.560E+00	4.283E+02	4.432E+02	6.32
SN-126	64.28	-----	9.60	3.159E+00	-----	Line Not Found	-----
	86.94	3374	8.90	5.560E+00	1.781E+02	1.781E+02	6.32
	87.57	3374	37.00*	5.560E+00	4.283E+01	4.283E+01	6.32
CS-135	268.22	74	16.00*	4.657E+00	2.597E+00	2.597E+00	146.86
BA-137M	661.66	13950	89.90*	2.390E+00	1.695E+02	1.698E+02	1.82
CS-137	661.66	13950	85.10*	2.390E+00	1.791E+02	1.793E+02	1.82
PM-147	121.22	279	0.00*	6.574E+00	3.892E+04	3.956E+04	44.91
PB-210	46.54	7409	4.25*	9.086E-01	5.010E+03	5.020E+03	4.49
AM-241	59.54	18900	35.90*	2.537E+00	5.420E+02	5.420E+02	2.07

Flag: "*" = Keyline

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*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                           *
*****
*                                     DETECTOR AND SAMPLE DATA                       *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562001.CNF;1      *
* Acquisition date   : 29-JUN-2016 14:54:21 Sensitivity      : 3.000                *
* Detector ID       : GAM28 Energy tolerance: 1.500          *
* Elapsed live time : 0 00:15:00.00 Abundance limit : 75.000    *
* Elapsed real time : 0 00:15:04.13 Half life ratio : *****          *
* Sample date       : 7-JUN-2016 00:00:00 Analyst initials: MXR1          *
* Sample ID         : G1203562001 Sample Quantity : 1.1500E+02 GRAM      *
* Batch Number      : 1572490 Wet Weight : 0.00000          *
* Wet wt corr       : 1.00000 Dry Weight : 0.00000           *
* Nuclide Library   : SOLID.NLB;6
*****
*                                     CALIBRATION INFORMATION                       *
*
* Eff. Cal. date    : 27-JUL-2015 07:57:17 Eff. Geometry   : CAN            *
* Eff. File         : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9          *
*****

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Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Cnt uncert (1.96-sigma)	MDA (pCi/GRAM)
CO-57	1.373E+00	6.042E-01	6.698E-01
CO-60	1.619E+02	3.498E+00	7.413E-01
ZN-65	4.436E+00	2.697E+00	2.945E+00
CD-109	4.432E+02	2.745E+01	1.977E+01
SN-126	4.283E+01	2.654E+00	1.921E+00
CS-135	2.597E+00	3.738E+00	4.545E+00
BA-137M	1.698E+02	3.021E+00	1.095E+00
CS-137	1.793E+02	3.191E+00	1.157E+00
PM-147	3.956E+04	1.741E+04	1.959E+04
PB-210	5.020E+03	2.208E+02	1.506E+02
AM-241	5.420E+02	1.099E+01	6.273E+00

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L. Cnt Uncert (1.96-sigma)	MDA (pCi/GRAM)	
BE-7	4.758E+00	8.079E+00	1.436E+01	NOT IDENT.
NA-22	2.318E-01	4.095E-01	7.672E-01	NOT IDENT.
NA-24	0.000E+00	2.686E+10	0.000E+00	SHORT HLIF
AL-26	-1.138E-01	2.692E-01	4.846E-01	NOT IDENT.
K-40	-1.163E+00	2.962E+00	5.192E+00	NOT IDENT.
SC-46	5.516E-01	9.907E-01	1.771E+00	NOT IDENT.
V-48	-1.627E+00	2.355E+00	4.027E+00	NOT IDENT.
CR-51	9.838E+00	8.163E+00	1.437E+01	NOT IDENT.
MN-54	1.923E-01	7.829E-01	1.337E+00	NOT IDENT.
CO-56	5.698E-01	9.433E-01	1.628E+00	NOT IDENT.
MN-56	0.000E+00	1.646E+41	0.000E+00	SHORT HLIF
CO-58	-6.683E-01	8.910E-01	1.472E+00	NOT IDENT.
FE-59	2.298E+00	1.426E+00	3.969E+00	FAIL ABUN
GE-68	1.597E+00	2.937E+01	5.111E+01	NOT IDENT.
AS-73	-3.387E+01	2.542E+01	4.276E+01	NOT IDENT.
AS-74	2.440E+00	2.223E+00	4.010E+00	NOT IDENT.
SE-75	-1.735E-02	9.004E-01	1.358E+00	FAIL ABUN
BR-77	3.931E+02	1.293E+03	2.256E+03	NOT IDENT.
SR-82	5.462E+00	8.267E+00	1.443E+01	NOT IDENT.

RB-83	6.399E-01	1.606E+00	2.488E+00	NOT IDENT.
KR-85	5.294E+01	1.258E+02	2.232E+02	NOT IDENT.
SR-85	3.027E-01	7.215E-01	1.280E+00	NOT IDENT.
RB-86	3.156E+00	2.416E+01	4.214E+01	NOT IDENT.
Y-88	1.260E-01	3.620E-01	7.177E-01	NOT IDENT.
Y-91	1.032E+02	2.881E+02	5.164E+02	NOT IDENT.
NB-94	-8.440E-02	5.858E-01	1.003E+00	NOT IDENT.
NB-95	5.950E-02	8.578E-01	1.429E+00	NOT IDENT.
NB-95M	-7.126E-01	2.063E+00	3.545E+00	NOT IDENT.
ZR-95	6.899E-01	1.809E+00	2.535E+00	FAIL ABUN
NB-97	0.000E+00	9.435E+39	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	4.939E+10	0.000E+00	SHORT HLIF
MO-99	-1.438E+03	1.555E+03	2.571E+03	NOT IDENT.
TC-99M	0.000E+00	4.940E+26	0.000E+00	SHORT HLIF
RH-101	2.059E-01	5.008E-01	8.016E-01	NOT IDENT.
RH-102	7.931E-01	1.028E+00	1.765E+00	FAIL ABUN
RU-103	2.062E-02	9.361E-01	1.642E+00	NOT IDENT.
RH-106	1.519E-01	5.994E+00	1.040E+01	NOT IDENT.
RU-106	1.519E-01	5.994E+00	1.040E+01	NOT IDENT.
AG-108M	1.417E-02	7.228E-01	1.111E+00	NOT IDENT.
AG-110M	1.446E-01	1.180E+00	2.085E+00	NOT IDENT.
SN-113	-9.483E-02	9.684E-01	1.622E+00	NOT IDENT.
CD-115	0.000E+00	2.534E+03	0.000E+00	SHORT HLIF
SN-117M	-9.297E-01	1.114E+00	1.935E+00	NOT IDENT.
TE-123M	-3.808E-02	4.107E-01	7.263E-01	NOT IDENT.
SB-124	-3.214E-01	7.188E-01	1.294E+00	NOT IDENT.
SB-125	6.823E-01	1.895E+00	3.376E+00	NOT IDENT.
TE-125M	-5.405E+01	1.495E+02	2.673E+02	NOT IDENT.
I-126	2.068E+00	6.504E+00	9.896E+00	NOT IDENT.
SB-126	-5.951E-01	3.841E+00	6.565E+00	NOT IDENT.
SB-127	2.777E+01	8.578E+01	1.501E+02	FAIL ABUN
I-131	-7.310E-01	4.402E+00	7.400E+00	FAIL ABUN
I-132	0.000E+00	1.960E+41	0.000E+00	SHORT HLIF
TE-132	-5.341E+01	6.133E+01	1.042E+02	NOT IDENT.
BA-133	-3.866E-01	7.912E-01	1.320E+00	NOT IDENT.
I-133	0.000E+00	4.513E+07	0.000E+00	SHORT HLIF
CS-134	-2.667E-01	7.845E-01	1.319E+00	NOT IDENT.
I-135	0.000E+00	9.628E+24	0.000E+00	SHORT HLIF
CS-136	-1.286E+00	3.590E+00	6.176E+00	NOT IDENT.
CE-139	2.777E-01	4.310E-01	7.740E-01	NOT IDENT.
BA-140	2.087E+00	8.445E+00	1.297E+01	NOT IDENT.
LA-140	4.598E-02	1.031E+00	1.978E+00	NOT IDENT.
CE-141	-1.335E-01	1.143E+00	1.786E+00	NOT IDENT.
CE-143	0.000E+00	9.091E+04	0.000E+00	SHORT HLIF
CE-144	-9.087E-01	2.926E+00	5.188E+00	NOT IDENT.
PM-144	2.170E-01	5.806E-01	1.016E+00	NOT IDENT.
PR-144	1.630E+01	4.362E+01	7.635E+01	NOT IDENT.
PM-146	-4.451E-02	9.787E-01	1.718E+00	FAIL ABUN
ND-147	-4.872E-01	1.698E+01	2.968E+01	NOT IDENT.
PM-149	0.000E+00	1.646E+04	0.000E+00	SHORT HLIF
EU-150	-2.449E-02	4.884E-01	8.288E-01	FAIL ABUN
EU-152	-4.938E-01	1.849E+00	3.110E+00	FAIL ABUN
GD-153	-8.827E-01	1.294E+00	2.142E+00	NOT IDENT.
EU-154	6.758E-01	1.158E+00	2.172E+00	FAIL ABUN
EU-155	3.083E-01	1.517E+00	2.749E+00	NOT IDENT.
TB-160	-2.783E-01	3.622E+00	5.717E+00	FAIL ABUN
HO-166M	2.280E-01	1.076E+00	1.867E+00	NOT IDENT.
TM-171	-2.043E+02	4.914E+02	8.388E+02	NOT IDENT.
HF-172	2.157E+00	3.034E+00	4.906E+00	FAIL ABUN
LU-172	4.781E-01	1.720E+00	2.600E+00	FAIL ABUN
LU-176	-1.676E-01	4.822E-01	8.157E-01	FAIL ABUN
HF-181	-3.203E-02	1.073E+00	1.880E+00	NOT IDENT.
TA-182	-1.588E+00	2.125E+00	3.567E+00	NOT IDENT.
RE-183	0.000E+00	1.023E+01	2.109E+01	FAIL ABUN
RE-184	-1.415E+00	3.451E+00	5.992E+00	NOT IDENT.
W-188	1.274E+02	1.353E+02	2.377E+02	NOT IDENT.
IR-192	-3.606E-01	6.945E-01	1.167E+00	NOT IDENT.
HG-203	-1.587E-01	7.447E-01	1.271E+00	FAIL ABUN
BI-207	-2.646E-01	1.138E+00	1.966E+00	NOT IDENT.
TL-208	-1.478E-01	6.338E-01	1.096E+00	NOT IDENT.
BI-211	-1.071E+00	3.790E+00	6.370E+00	NOT IDENT.
PB-211	-1.229E+01	1.407E+01	2.441E+01	NOT IDENT.
BI-212	4.005E+00	8.593E+00	1.505E+01	NOT IDENT.
PB-212	8.541E-03	9.248E-01	1.603E+00	NOT IDENT.
BI-214	-3.371E-01	1.230E+00	2.115E+00	NOT IDENT.
PB-214	6.041E-01	1.373E+00	2.356E+00	FAIL ABUN
RN-219	7.157E+00	7.924E+00	1.436E+01	NOT IDENT.
RN-222	-3.371E-01	1.230E+00	2.115E+00	NOT IDENT.

RA-223	-5.256E+00	1.145E+01	1.924E+01	NOT IDENT.
RA-224	8.277E+00	9.853E+00	1.740E+01	NOT IDENT.
RA-226	-3.371E-01	1.230E+00	2.115E+00	NOT IDENT.
AC-227	-1.129E+00	4.887E+00	7.325E+00	NOT IDENT.
TH-227	-1.129E+00	4.887E+00	7.325E+00	NOT IDENT.
AC-228	-1.554E+00	3.349E+00	5.804E+00	NOT IDENT.
RA-228	-1.554E+00	3.349E+00	5.804E+00	NOT IDENT.
TH-228	8.541E-03	9.248E-01	1.603E+00	NOT IDENT.
TH-229	-1.570E-01	8.258E+00	1.445E+01	FAIL ABUN
TH-230	-3.371E-01	1.230E+00	2.115E+00	NOT IDENT.
PA-231	-1.382E+00	8.134E+00	1.385E+01	NOT IDENT.
TH-231	-5.256E+00	1.145E+01	1.924E+01	NOT IDENT.
TH-232	-1.554E+00	3.349E+00	5.804E+00	NOT IDENT.
PA-233	-7.351E-02	1.180E+00	2.009E+00	NOT IDENT.
PA-234	3.858E+00	8.154E+00	1.441E+01	NOT IDENT.
PA-234M	-6.255E+01	1.021E+02	1.749E+02	NOT IDENT.
TH-234	-2.165E+01	2.321E+01	3.448E+01	NOT IDENT.
U-234	-3.371E-01	1.230E+00	2.115E+00	NOT IDENT.
U-235	9.772E-01	2.967E+00	4.952E+00	NOT IDENT.
NP-237	-7.351E-02	1.180E+00	2.009E+00	NOT IDENT.
NP-238	0.000E+00	5.666E+03	0.000E+00	SHORT HLIF
U-238	-2.165E+01	2.321E+01	3.448E+01	NOT IDENT.
NP-239	-3.163E+00	3.930E+00	6.701E+00	NOT IDENT.
PU-239	-3.600E+03	4.767E+03	8.381E+03	NOT IDENT.
AM-243	-1.745E-01	8.906E-01	1.341E+00	NOT IDENT.
CM-243	-2.932E-01	1.677E+00	2.804E+00	NOT IDENT.
BK-247	1.214E-01	1.556E+00	2.354E+00	FAIL ABUN
CM-247	5.981E-01	7.213E-01	1.305E+00	NOT IDENT.
CF-249	-4.978E-01	8.207E-01	1.356E+00	FAIL ABUN
CF-251	7.748E-01	1.883E+00	3.350E+00	NOT IDENT.
ANH-511	1.171E-01	5.549E-01	9.880E-01	NOT IDENT.

Nuclide Line Activity Report

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	2-Sigma %Error
CO-57	122.06	279	85.60*	6.574E+00	1.296E+00	1.373E+00	44.91
	136.47	-----	10.68	6.543E+00	-----	Line Not Found	-----
CO-60	1173.23	9149	99.85	1.503E+00	1.591E+02	1.604E+02	2.22
	1332.49	8293	99.98*	1.349E+00	1.605E+02	1.619E+02	2.21
ZN-65	1115.54	126	50.60*	1.569E+00	4.160E+00	4.436E+00	62.05
CD-109	88.03	3374	3.70*	5.560E+00	4.283E+02	4.432E+02	6.32
SN-126	64.28	-----	9.60	3.159E+00	-----	Line Not Found	-----
	86.94	3374	8.90	5.560E+00	1.781E+02	1.781E+02	6.32
	87.57	3374	37.00*	5.560E+00	4.283E+01	4.283E+01	6.32
CS-135	268.22	74	16.00*	4.657E+00	2.597E+00	2.597E+00	146.86
BA-137M	661.66	13950	89.90*	2.390E+00	1.695E+02	1.698E+02	1.82
CS-137	661.66	13950	85.10*	2.390E+00	1.791E+02	1.793E+02	1.82
PM-147	121.22	279	0.00*	6.574E+00	3.892E+04	3.956E+04	44.91
PB-210	46.54	7409	4.25*	9.086E-01	5.010E+03	5.020E+03	4.49
AM-241	59.54	18900	35.90*	2.537E+00	5.420E+02	5.420E+02	2.07

Flag: "*" = Keyline

Total number of lines in spectrum 35
Number of unidentified lines 15
Number of lines tentatively identified by NID 20 57.14%

Nuclide Type :

Nuclide	Hlife	Decay	Uncorrected pCi/GRAM	Decay Corr pCi/GRAM	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-57	271.74D	1.06	1.296E+00	1.373E+00	0.617E+00	44.91	
CO-60	5.27Y	1.01	1.605E+02	1.619E+02	0.036E+02	2.21	
ZN-65	244.06D	1.07	4.160E+00	4.436E+00	2.752E+00	62.05	
CD-109	461.40D	1.03	4.283E+02	4.432E+02	0.280E+02	6.32	
SN-126	2.30E+05Y	1.00	4.283E+01	4.283E+01	0.271E+01	6.32	
CS-135	2.30E+06Y	1.00	2.597E+00	2.597E+00	3.814E+00	146.86	
BA-137M	30.08Y	1.00	1.695E+02	1.698E+02	0.031E+02	1.82	
CS-137	30.08Y	1.00	1.791E+02	1.793E+02	0.033E+02	1.82	
PM-147	2.62Y	1.02	3.892E+04	3.956E+04	1.777E+04	44.91	
PB-210	22.20Y	1.00	5.010E+03	5.020E+03	0.225E+03	4.49	
AM-241	432.60Y	1.00	5.420E+02	5.420E+02	0.112E+02	2.07	
Total Activity :			4.546E+04	4.613E+04			

Grand Total Activity : 4.546E+04 4.613E+04

Flags: "K" = Keyline not found "M" = Manually accepted
"E" = Manually edited "A" = Nuclide specific abn. limit

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	36.93	488	1256	1.33	73.90	72	6	4.93E-01	25.6	2.06E-01	
0	71.29	78	880	1.39	142.66	141	6	8.14E-02	****	4.03E+00	T
0	147.88	64	466	1.00	295.96	294	5	6.85E-02	****	6.43E+00	
0	216.74	75	857	0.87	433.77	431	8	8.10E-02	****	5.36E+00	T
0	252.05	66	763	2.20	504.46	502	9	7.23E-02	****	4.86E+00	T
0	438.78	117	506	2.60	878.18	875	8	1.31E-01	69.1	3.26E+00	T
0	444.16	48	637	0.76	888.96	887	9	5.32E-02	****	3.23E+00	
0	523.14	49	330	1.43	1047.03	1044	8	5.47E-02	****	2.86E+00	T
0	538.86	67	410	0.77	1078.51	1074	11	7.56E-02	****	2.79E+00	
0	632.07	42	243	1.47	1265.05	1262	8	4.73E-02	****	2.48E+00	T
0	638.04	96	338	3.64	1277.00	1271	12	1.09E-01	79.0	2.46E+00	T
0	757.56	24	302	1.24	1516.22	1513	10	2.77E-02	****	2.15E+00	T
0	820.54	35	335	1.33	1642.27	1639	9	4.00E-02	****	2.02E+00	
0	873.16	47	370	2.91	1747.59	1741	11	5.46E-02	****	1.92E+00	T
3	1098.77	56	129	1.42	2199.15	2197	16	6.46E-02	63.3	1.59E+00	T
3	1102.79	96	292	2.60	2207.20	2197	16	1.12E-01	72.7	1.58E+00	
10	1271.83	33	61	5.28	2545.54	2538	24	3.91E-02	****	1.40E+00	T
10	1276.76	24	53	2.99	2555.39	2538	24	2.77E-02	****	1.40E+00	
0	1413.68	28	5	2.83	2829.44	2824	11	3.28E-02	48.0	1.28E+00	
0	1573.78	6	20	0.55	3149.88	3142	12	7.40E-03	****	1.17E+00	
0	1708.44	9	12	2.73	3419.40	3408	13	1.10E-02	****	1.09E+00	
0	1728.22	17	14	2.99	3459.00	3451	15	2.00E-02	****	1.08E+00	
0	1768.41	7	8	1.36	3539.43	3534	9	7.78E-03	****	1.06E+00	
6	1902.21	15	1	3.29	3807.22	3803	17	1.78E-02	53.1	1.01E+00	
6	1906.22	15	3	2.21	3815.26	3803	17	1.80E-02	53.9	1.00E+00	
0	1946.83	18	3	1.00	3896.54	3889	14	2.17E-02	60.8	9.88E-01	

Flags: "T" = Tentatively associated

```

*****
*                                     GEL Laboratories LLC                      *
*                                     2040 Savage Road                        *
*                                     Charleston, SC 29407                     *
*****
*
*                                     DETECTOR AND SAMPLE DATA                *
*
* Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562001.CNF;1
* Acquisition date   : 29-JUN-2016 14:54:21 Sensitivity      : 3.000
* Detector ID        : GAM28 Energy tolerance: 1.500
* Elapsed live time  : 0 00:15:00.00 Abundance limit : 75.000
* Elapsed real time  : 0 00:15:04.13 Half life ratio : *****
* Sample date        : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
* Sample ID          : G1203562001 Analyst initials: MXR1
* Batch Number       : 1572490 Sample Quantity : 1.1500E+02 GRAM
* Wet wt corr        : 1.00000 Wet Weight : 0.00000
*                                     Dry Weight : 0.00000
*****
*
*                                     CALIBRATION INFORMATION                  *
*
* Eff. Cal. date     : 27-JUL-2015 07:57:17 Eff. Geometry   : CAN
* Eff. File          : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9
*****

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Combined Critical Level Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)
CO-57	3.283E-01
CO-60	3.445E-01
ZN-65	1.426E+00
CD-109	9.709E+00
SN-126	9.435E-01
CS-135	2.226E+00
BA-137M	5.313E-01
CS-137	5.612E-01
PM-147	9.602E+03
PB-210	7.438E+01
AM-241	3.098E+00

---- Non-Identified Nuclides ----

Nuclide	Lc (pCi/GRAM)	
BE-7	7.032E+00	NOT IDENT.
NA-22	3.582E-01	NOT IDENT.
NA-24	0.000E+00	SHORT HLIF
AL-26	2.087E-01	NOT IDENT.
K-40	2.333E+00	NOT IDENT.
SC-46	8.634E-01	NOT IDENT.
V-48	1.960E+00	NOT IDENT.
CR-51	7.032E+00	NOT IDENT.
MN-54	6.504E-01	NOT IDENT.
CO-56	7.925E-01	NOT IDENT.
MN-56	0.000E+00	SHORT HLIF
CO-58	7.145E-01	NOT IDENT.
FE-59	1.930E+00	FAIL ABUN
GE-68	2.485E+01	NOT IDENT.
AS-73	2.115E+01	NOT IDENT.
AS-74	1.950E+00	NOT IDENT.
SE-75	6.644E-01	FAIL ABUN
BR-77	1.106E+03	NOT IDENT.
SR-82	7.015E+00	NOT IDENT.
RB-83	1.212E+00	NOT IDENT.

KR-85	1.088E+02	NOT IDENT.
SR-85	6.238E-01	NOT IDENT.
RB-86	2.049E+01	NOT IDENT.
Y-88	3.193E-01	NOT IDENT.
Y-91	2.462E+02	NOT IDENT.
NB-94	4.862E-01	NOT IDENT.
NB-95	6.936E-01	NOT IDENT.
NB-95M	1.737E+00	NOT IDENT.
ZR-95	1.230E+00	FAIL ABUN
NB-97	0.000E+00	SHORT HLIF
ZR-97	0.000E+00	SHORT HLIF
MO-99	1.246E+03	NOT IDENT.
TC-99M	0.000E+00	SHORT HLIF
RH-101	3.929E-01	NOT IDENT.
RH-102	8.569E-01	FAIL ABUN
RU-103	8.017E-01	NOT IDENT.
RH-106	5.053E+00	NOT IDENT.
RU-106	5.053E+00	NOT IDENT.
AG-108M	5.439E-01	NOT IDENT.
AG-110M	1.016E+00	NOT IDENT.
SN-113	7.938E-01	NOT IDENT.
CD-115	0.000E+00	SHORT HLIF
SN-117M	9.469E-01	NOT IDENT.
TE-123M	3.556E-01	NOT IDENT.
SB-124	5.606E-01	NOT IDENT.
SB-125	1.653E+00	NOT IDENT.
TE-125M	1.310E+02	NOT IDENT.
I-126	4.798E+00	NOT IDENT.
SB-126	3.180E+00	NOT IDENT.
SB-127	7.268E+01	FAIL ABUN
I-131	3.620E+00	FAIL ABUN
I-132	0.000E+00	SHORT HLIF
TE-132	5.108E+01	NOT IDENT.
BA-133	6.452E-01	NOT IDENT.
I-133	0.000E+00	SHORT HLIF
CS-134	6.396E-01	NOT IDENT.
I-135	0.000E+00	SHORT HLIF
CS-136	3.002E+00	NOT IDENT.
CE-139	3.791E-01	NOT IDENT.
BA-140	6.312E+00	NOT IDENT.
LA-140	8.807E-01	NOT IDENT.
CE-141	8.749E-01	NOT IDENT.
CE-143	0.000E+00	SHORT HLIF
CE-144	2.543E+00	NOT IDENT.
PM-144	4.922E-01	NOT IDENT.
PR-144	3.698E+01	NOT IDENT.
PM-146	8.419E-01	FAIL ABUN
ND-147	1.445E+01	NOT IDENT.
PM-149	0.000E+00	SHORT HLIF
EU-150	4.053E-01	FAIL ABUN
EU-152	1.521E+00	FAIL ABUN
GD-153	1.050E+00	NOT IDENT.
EU-154	1.014E+00	FAIL ABUN
EU-155	1.348E+00	NOT IDENT.
TB-160	2.784E+00	FAIL ABUN
HO-166M	9.051E-01	NOT IDENT.
TM-171	4.147E+02	NOT IDENT.
HF-172	2.405E+00	FAIL ABUN
LU-172	1.265E+00	FAIL ABUN
LU-176	3.990E-01	FAIL ABUN
HF-181	9.194E-01	NOT IDENT.
TA-182	1.681E+00	NOT IDENT.
RE-183	1.050E+01	FAIL ABUN
RE-184	2.920E+00	NOT IDENT.
W-188	1.164E+02	NOT IDENT.
IR-192	5.707E-01	NOT IDENT.
HG-203	6.224E-01	FAIL ABUN
BI-207	9.544E-01	NOT IDENT.
TL-208	5.325E-01	NOT IDENT.
BI-211	3.115E+00	NOT IDENT.
PB-211	1.194E+01	NOT IDENT.
BI-212	7.289E+00	NOT IDENT.
PB-212	7.857E-01	NOT IDENT.
BI-214	1.027E+00	NOT IDENT.
PB-214	1.153E+00	FAIL ABUN
RN-219	7.031E+00	NOT IDENT.
RN-222	1.027E+00	NOT IDENT.
RA-223	9.406E+00	NOT IDENT.

RA-224	8.531E+00	NOT IDENT.
RA-226	1.027E+00	NOT IDENT.
AC-227	3.586E+00	NOT IDENT.
TH-227	3.586E+00	NOT IDENT.
AC-228	2.830E+00	NOT IDENT.
RA-228	2.830E+00	NOT IDENT.
TH-228	7.857E-01	NOT IDENT.
TH-229	7.089E+00	FAIL ABUN
TH-230	1.027E+00	NOT IDENT.
PA-231	6.772E+00	NOT IDENT.
TH-231	9.406E+00	NOT IDENT.
TH-232	2.830E+00	NOT IDENT.
PA-233	9.831E-01	NOT IDENT.
PA-234	7.046E+00	NOT IDENT.
PA-234M	8.505E+01	NOT IDENT.
TH-234	1.693E+01	NOT IDENT.
U-234	1.027E+00	NOT IDENT.
U-235	2.427E+00	NOT IDENT.
NP-237	9.831E-01	NOT IDENT.
NP-238	0.000E+00	SHORT HLIF
U-238	1.693E+01	NOT IDENT.
NP-239	3.283E+00	NOT IDENT.
PU-239	4.106E+03	NOT IDENT.
AM-243	6.588E-01	NOT IDENT.
CM-243	1.375E+00	NOT IDENT.
BK-247	1.152E+00	FAIL ABUN
CM-247	6.388E-01	NOT IDENT.
CF-249	6.631E-01	FAIL ABUN
CF-251	1.641E+00	NOT IDENT.
ANH-511	4.820E-01	NOT IDENT.

GEL Laboratories LLC
2040 Savage Road
Charleston, SC 29407

DETECTOR AND SAMPLE DATA

Configuration : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]G1203562001.CNF;1
Acquisition date : 29-JUN-2016 14:54:21 Sensitivity : 3.000
Detector ID : GAM28 Energy tolerance: 1.500
Elapsed live time: 0 00:15:00.00 Abundance limit : 75.000
Elapsed real time: 0 00:15:04.13 Half life ratio : *****
Sample date : 7-JUN-2016 00:00:00 Nuclide Library : SOLID
Sample ID : G1203562001 Analyst initials: MXR1
Batch Number : 1572490 Sample Quantity : 1.1500E+02 GRAM
Quantity Err(%) : 1.7391E-03 %
Wet wt corr : 1.00000 Wet Weight : 0.00000
Dry Weight : 0.00000

CALIBRATION INFORMATION

Eff. Cal. date : 27-JUL-2015 07:57:17 Eff. Geometry : CAN
Eff. File : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF;9

Combined Activity-MDA Report

NOTE: Not all "Identified Nuclides" are valid.
Please refer to Certificate of Analysis.

---- Identified Nuclides ----

Nuclide	Activity (pCi/GRAM)	Act Error (1.96-sigma)	TPU (1.96-sigma)
CO-57	1.373E+00	6.120E-01	6.120E-01
CO-60	1.619E+02	1.439E+01	1.439E+01
ZN-65	4.436E+00	2.827E+00	2.827E+00
CD-109	4.432E+02	5.105E+01	5.105E+01
SN-126	4.283E+01	4.381E+00	4.381E+00
CS-135	2.597E+00	3.745E+00	3.745E+00
BA-137M	1.698E+02	1.403E+01	1.403E+01
CS-137	1.793E+02	1.481E+01	1.481E+01
PM-147	3.956E+04	1.764E+04	1.764E+04
PB-210	5.020E+03	4.921E+02	4.921E+02
AM-241	5.420E+02	4.373E+01	4.373E+01

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/GRAM)	K.L Act error (1.96-sigma)	TPU (1.96-sigma)	
BE-7	4.758E+00	8.088E+00	8.368E+00	NOT IDENT.
NA-22	2.318E-01	4.101E-01	4.232E-01	NOT IDENT.
NA-24	-1.998E+10	2.693E+10	2.839E+10	SHORT HLIF
AL-26	-1.138E-01	2.693E-01	2.742E-01	NOT IDENT.
K-40	-1.163E+00	2.964E+00	3.010E+00	NOT IDENT.
SC-46	5.516E-01	9.932E-01	1.024E+00	NOT IDENT.
V-48	-1.627E+00	2.368E+00	2.479E+00	NOT IDENT.
CR-51	9.838E+00	8.198E+00	9.321E+00	NOT IDENT.
MN-54	1.923E-01	7.832E-01	7.880E-01	NOT IDENT.
CO-56	5.698E-01	9.456E-01	9.799E-01	NOT IDENT.
MN-56	1.000E+41	1.650E+41	0.000E+00	SHORT HLIF
CO-58	-6.683E-01	8.940E-01	9.434E-01	NOT IDENT.
FE-59	2.298E+00	1.495E+00	1.819E+00	FAIL ABUN
GE-68	1.597E+00	2.937E+01	2.938E+01	NOT IDENT.
AS-73	-3.387E+01	2.636E+01	3.046E+01	NOT IDENT.
AS-74	2.440E+00	2.238E+00	2.493E+00	NOT IDENT.
SE-75	-1.735E-02	9.004E-01	9.005E-01	FAIL ABUN
BR-77	3.931E+02	1.318E+03	1.330E+03	NOT IDENT.
SR-82	5.462E+00	8.286E+00	8.644E+00	NOT IDENT.

RB-83	6.399E-01	1.609E+00	1.635E+00	NOT IDENT.
KR-85	5.294E+01	1.259E+02	1.281E+02	NOT IDENT.
SR-85	3.027E-01	7.219E-01	7.347E-01	NOT IDENT.
RB-86	3.156E+00	2.416E+01	2.421E+01	NOT IDENT.
Y-88	1.260E-01	3.621E-01	3.665E-01	NOT IDENT.
Y-91	1.032E+02	2.883E+02	2.920E+02	NOT IDENT.
NB-94	-8.440E-02	5.859E-01	5.871E-01	NOT IDENT.
NB-95	5.950E-02	8.578E-01	8.582E-01	NOT IDENT.
NB-95M	-7.126E-01	2.065E+00	2.089E+00	NOT IDENT.
ZR-95	6.899E-01	1.810E+00	1.837E+00	FAIL ABUN
NB-97	1.000E+41	1.242E+40	0.000E+00	SHORT HLIF
ZR-97	-4.184E+09	4.939E+10	4.943E+10	SHORT HLIF
MO-99	-1.438E+03	1.562E+03	1.691E+03	NOT IDENT.
TC-99M	-4.749E+26	4.968E+26	0.000E+00	SHORT HLIF
RH-101	2.059E-01	5.023E-01	5.108E-01	NOT IDENT.
RH-102	7.931E-01	1.032E+00	1.092E+00	FAIL ABUN
RU-103	2.062E-02	9.362E-01	9.362E-01	NOT IDENT.
RH-106	1.519E-01	5.994E+00	5.994E+00	NOT IDENT.
RU-106	1.519E-01	5.994E+00	5.994E+00	NOT IDENT.
AG-108M	1.417E-02	7.228E-01	7.229E-01	NOT IDENT.
AG-110M	1.446E-01	1.180E+00	1.182E+00	NOT IDENT.
SN-113	-9.483E-02	9.684E-01	9.693E-01	NOT IDENT.
CD-115	-2.155E+02	2.534E+03	2.536E+03	SHORT HLIF
SN-117M	-9.297E-01	1.116E+00	1.192E+00	NOT IDENT.
TE-123M	-3.808E-02	4.107E-01	4.111E-01	NOT IDENT.
SB-124	-3.214E-01	7.192E-01	7.337E-01	NOT IDENT.
SB-125	6.823E-01	1.896E+00	1.920E+00	NOT IDENT.
TE-125M	-5.405E+01	1.495E+02	1.515E+02	NOT IDENT.
I-126	2.068E+00	6.507E+00	6.573E+00	NOT IDENT.
SB-126	-5.951E-01	3.842E+00	3.851E+00	NOT IDENT.
SB-127	2.777E+01	8.586E+01	8.677E+01	FAIL ABUN
I-131	-7.310E-01	4.403E+00	4.415E+00	FAIL ABUN
I-132	-1.000E+41	3.054E+42	0.000E+00	SHORT HLIF
TE-132	-5.341E+01	6.158E+01	6.612E+01	NOT IDENT.
BA-133	-3.866E-01	7.918E-01	8.107E-01	NOT IDENT.
I-133	-5.503E+06	4.514E+07	4.521E+07	SHORT HLIF
CS-134	-2.667E-01	7.850E-01	7.941E-01	NOT IDENT.
I-135	-4.114E+24	9.865E+24	0.000E+00	SHORT HLIF
CS-136	-1.286E+00	3.597E+00	3.644E+00	NOT IDENT.
CE-139	2.777E-01	4.348E-01	4.525E-01	NOT IDENT.
BA-140	2.087E+00	8.447E+00	8.499E+00	NOT IDENT.
LA-140	4.598E-02	1.031E+00	1.031E+00	NOT IDENT.
CE-141	-1.335E-01	1.143E+00	1.145E+00	NOT IDENT.
CE-143	4.369E+04	9.097E+04	9.308E+04	SHORT HLIF
CE-144	-9.087E-01	2.927E+00	2.955E+00	NOT IDENT.
PM-144	2.170E-01	5.809E-01	5.890E-01	NOT IDENT.
PR-144	1.630E+01	4.364E+01	4.426E+01	NOT IDENT.
PM-146	-4.451E-02	9.787E-01	9.790E-01	FAIL ABUN
ND-147	-4.872E-01	1.698E+01	1.698E+01	NOT IDENT.
PM-149	-2.580E+04	1.689E+04	2.051E+04	SHORT HLIF
EU-150	-2.449E-02	4.884E-01	4.885E-01	FAIL ABUN
EU-152	-4.938E-01	1.849E+00	1.862E+00	FAIL ABUN
GD-153	-8.827E-01	1.296E+00	1.356E+00	NOT IDENT.
EU-154	6.758E-01	1.160E+00	1.199E+00	FAIL ABUN
EU-155	3.083E-01	1.517E+00	1.523E+00	NOT IDENT.
TB-160	-2.783E-01	3.622E+00	3.625E+00	FAIL ABUN
HO-166M	2.280E-01	1.077E+00	1.082E+00	NOT IDENT.
TM-171	-2.043E+02	4.917E+02	5.003E+02	NOT IDENT.
HF-172	2.157E+00	3.057E+00	3.208E+00	FAIL ABUN
LU-172	4.781E-01	1.723E+00	1.737E+00	FAIL ABUN
LU-176	-1.676E-01	4.824E-01	4.883E-01	FAIL ABUN
HF-181	-3.203E-02	1.073E+00	1.073E+00	NOT IDENT.
TA-182	-1.588E+00	2.130E+00	2.247E+00	NOT IDENT.
RE-183	3.501E+02	3.871E+01	1.625E+02	FAIL ABUN
RE-184	-1.415E+00	3.458E+00	3.516E+00	NOT IDENT.
W-188	1.274E+02	1.363E+02	1.479E+02	NOT IDENT.
IR-192	-3.606E-01	6.950E-01	7.138E-01	NOT IDENT.
HG-203	-1.587E-01	7.448E-01	7.482E-01	FAIL ABUN
BI-207	-2.646E-01	1.139E+00	1.145E+00	NOT IDENT.
TL-208	-1.478E-01	6.340E-01	6.374E-01	NOT IDENT.
BI-211	-1.071E+00	3.790E+00	3.821E+00	NOT IDENT.
PB-211	-1.229E+01	1.411E+01	1.516E+01	NOT IDENT.
BI-212	4.005E+00	8.602E+00	8.789E+00	NOT IDENT.
PB-212	8.541E-03	9.248E-01	9.248E-01	NOT IDENT.
BI-214	-3.371E-01	1.230E+00	1.239E+00	NOT IDENT.
PB-214	6.041E-01	1.374E+00	1.401E+00	FAIL ABUN
RN-219	7.157E+00	7.990E+00	8.617E+00	NOT IDENT.
RN-222	-3.371E-01	1.230E+00	1.239E+00	NOT IDENT.

RA-223	-5.256E+00	1.146E+01	1.170E+01	NOT IDENT.
RA-224	8.277E+00	9.875E+00	1.056E+01	NOT IDENT.
RA-226	-3.371E-01	1.230E+00	1.239E+00	NOT IDENT.
AC-227	-1.129E+00	4.890E+00	4.916E+00	NOT IDENT.
TH-227	-1.129E+00	4.890E+00	4.916E+00	NOT IDENT.
AC-228	-1.554E+00	3.355E+00	3.428E+00	NOT IDENT.
RA-228	-1.554E+00	3.355E+00	3.428E+00	NOT IDENT.
TH-228	8.541E-03	9.248E-01	9.248E-01	NOT IDENT.
TH-229	-1.570E-01	8.258E+00	8.258E+00	FAIL ABUN
TH-230	-3.371E-01	1.230E+00	1.239E+00	NOT IDENT.
PA-231	-1.382E+00	8.140E+00	8.164E+00	NOT IDENT.
TH-231	-5.256E+00	1.146E+01	1.170E+01	NOT IDENT.
TH-232	-1.554E+00	3.355E+00	3.428E+00	NOT IDENT.
PA-233	-7.351E-02	1.180E+00	1.180E+00	NOT IDENT.
PA-234	3.858E+00	9.287E+00	9.448E+00	NOT IDENT.
PA-234M	-6.255E+01	1.026E+02	1.064E+02	NOT IDENT.
TH-234	-2.165E+01	2.371E+01	2.564E+01	NOT IDENT.
U-234	-3.371E-01	1.230E+00	1.239E+00	NOT IDENT.
U-235	9.772E-01	2.968E+00	3.001E+00	NOT IDENT.
NP-237	-7.351E-02	1.180E+00	1.180E+00	NOT IDENT.
NP-238	-9.564E+02	5.668E+03	5.685E+03	SHORT HLIF
U-238	-2.165E+01	2.371E+01	2.564E+01	NOT IDENT.
NP-239	-3.163E+00	3.942E+00	4.192E+00	NOT IDENT.
PU-239	-3.600E+03	4.774E+03	5.042E+03	NOT IDENT.
AM-243	-1.745E-01	8.907E-01	8.942E-01	NOT IDENT.
CM-243	-2.932E-01	1.677E+00	1.682E+00	NOT IDENT.
BK-247	1.214E-01	1.556E+00	1.557E+00	FAIL ABUN
CM-247	5.981E-01	7.294E-01	7.776E-01	NOT IDENT.
CF-249	-4.978E-01	8.224E-01	8.525E-01	FAIL ABUN
CF-251	7.748E-01	1.885E+00	1.917E+00	NOT IDENT.
ANH-511	1.171E-01	5.550E-01	5.575E-01	NOT IDENT.

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
43.53	2085.0977	87.09	960.8939	136.47	764.5043
45.60	2116.6853	87.57	961.6382	140.51	840.6230
46.54	2121.4858	88.03	962.3525	143.76	748.4451
49.72	2320.8628	88.34	962.8302	144.24	751.3162
51.35	2383.6279	88.47	963.0281	145.44	750.8868
51.87	2397.5737	89.96	818.1235	152.43	705.0914
52.39	2400.3621	90.64	860.1258	153.25	710.7009
52.97	2507.8599	91.11	864.1928	154.21	692.8341
53.44	2623.5032	92.59	785.4164	156.02	711.0206
54.07	2645.0730	93.35	782.9026	158.56	752.3085
57.36	0.0000	94.56	788.3864	159.00	716.1544
57.53	2791.9270	94.65	788.4946	162.33	714.0424
57.98	2918.9285	94.67	788.5190	162.66	732.1549
59.27	2032.1566	94.87	788.7598	163.33	785.3480
59.32	2032.3672	97.43	831.0754	165.86	686.5601
59.54	2033.2909	98.43	806.8921	176.31	756.0096
60.96	2039.1923	98.44	806.9063	176.60	754.3202
61.17	947.9443	99.53	811.6901	177.52	728.2997
62.93	961.0862	100.11	800.7999	181.07	792.2094
63.29	1014.0251	102.03	847.2260	181.52	820.3551
63.58	1014.6067	103.18	857.9553	184.41	839.0450
64.28	1011.0961	103.37	858.1915	185.72	827.6201
66.73	955.6349	105.21	812.6018	193.51	845.5084
67.24	938.5759	105.31	812.7186	197.03	836.6616
67.68	923.8789	106.12	797.8746	198.01	824.7704
67.75	924.0031	106.47	810.5549	201.83	866.8065
69.67	1014.9607	109.28	804.9625	203.43	824.0450
70.83	1002.2344	111.00	781.2857	205.31	824.4908
72.81	972.6152	111.76	772.3849	210.85	856.2307
72.87	972.7223	114.06	777.4784	215.65	929.3761
74.66	999.2138	116.30	810.0631	222.11	862.4680
74.82	999.4972	116.74	818.5503	227.09	847.5148
74.97	971.3884	119.76	758.9469	227.38	864.7162
77.11	1063.3010	121.12	814.7112	228.16	863.2897
78.74	1048.3916	121.22	814.8188	228.18	863.3094
79.69	1029.9111	121.78	819.7119	235.69	801.3321
80.12	1053.1222	122.06	792.0538	235.96	801.5082
80.19	1053.2510	122.92	782.1735	238.63	782.0953
80.57	1037.0792	123.07	782.3265	238.98	782.3200
81.00	1061.4478	123.68	781.5053	240.99	744.1786
81.07	1085.1881	125.81	736.1032	242.00	766.0444
81.75	1106.7000	127.23	750.4152	244.70	762.6599
83.79	1131.9438	127.91	820.8746	252.40	690.6436
84.00	1086.5681	129.30	814.7664	252.80	716.5893
85.43	1087.4316	131.20	770.4746	254.15	0.0000
86.55	1108.1433	133.02	823.9824	256.23	727.1259
86.79	1108.5754	133.52	824.4876	260.90	0.0000
86.94	960.6615	136.00	780.4848	264.66	689.0367

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
264.80	689.1183	364.49	660.6220	600.60	382.5938
265.00	689.2203	366.42	661.3989	602.52	0.0000
268.22	726.2452	372.51	644.9991	604.72	360.3562
269.46	723.0024	375.05	653.7544	607.14	371.6887
270.03	705.1049	1093.63	676.9475	609.32	394.9655
271.23	684.2127	383.85	710.7348	610.33	401.1167
273.65	716.4339	388.16	692.3986	614.28	384.7838
276.40	728.6502	388.63	666.8532	618.01	393.3934
277.37	680.2853	391.69	682.6113	620.36	398.7870
277.60	680.4051	400.66	658.8726	621.93	389.0136
278.00	697.2556	401.81	629.5463	630.19	0.0000
279.20	728.0753	402.40	621.6392	631.29	387.4908
279.54	718.8904	404.85	709.2310	633.25	382.7646
279.70	729.3945	410.95	659.9988	634.78	282.2080
280.46	697.4807	413.71	689.1687	635.95	282.3447
283.69	643.7471	414.70	721.3362	636.99	302.6367
284.31	635.6743	423.72	703.0292	645.85	371.5517
285.41	703.1514	427.09	690.5964	657.76	366.1875
285.90	0.0000	427.87	664.3538	657.90	0.0000
287.50	674.8754	433.94	694.6979	661.66	349.4312
290.67	645.9583	439.40	722.1613	664.57	0.0000
293.27	0.0000	453.88	797.0078	666.33	316.3877
295.22	685.9956	463.37	764.5659	666.50	316.4104
295.96	648.4076	468.07	799.1098	667.71	0.0000
298.58	655.9464	473.00	768.3196	677.62	314.7050
299.98	661.8773	475.06	750.3613	685.70	285.8595
300.09	661.9251	476.78	736.9245	695.00	298.2288
300.13	661.9442	477.60	703.4218	696.49	294.2611
301.36	650.8756	482.18	645.7293	696.51	294.2681
302.85	617.6494	487.02	589.7217	697.00	299.4873
304.50	642.7562	492.35	0.0000	697.30	304.6797
304.85	657.7661	497.08	562.3004	697.49	291.2738
306.78	687.3289	505.52	541.7447	702.65	337.3813
308.46	644.5223	507.63	0.0000	706.68	326.4895
311.90	668.4263	511.00	488.7563	711.68	318.7898
316.51	699.3956	514.00	470.3339	720.70	318.8123
319.41	636.4817	514.00	470.3339	721.93	0.0000
320.08	612.1069	520.40	428.2918	722.78	304.4542
321.04	614.6443	520.69	428.3464	722.91	308.6393
323.87	651.2725	522.65	0.0000	723.31	314.9471
325.23	634.6533	527.90	0.0000	724.19	324.4316
328.76	613.4879	528.26	444.3091	727.33	291.3902
333.37	623.9975	529.59	436.9559	733.00	326.5260
333.97	638.3039	529.87	0.0000	735.93	309.0586
334.37	624.4025	531.02	441.3394	737.46	315.5209
338.28	654.1946	537.26	409.1120	739.50	374.5014
338.32	654.2039	546.56	0.0000	747.24	359.7680
340.48	607.3120	552.55	391.2041	748.06	383.0176
340.55	607.3376	563.25	371.5669	752.31	358.3115
344.28	674.1316	569.33	399.0409	753.82	305.7815
345.93	634.5022	569.50	408.8758	756.73	353.5902
351.06	651.8750	569.70	408.9064	756.80	353.5984
351.93	622.6824	583.19	391.5916	763.94	356.2617
355.39	0.0000	584.27	369.0785	765.81	356.4919
356.01	644.0197	595.83	348.0950	766.42	365.3917

ENERGY	MDA COUNTS	ENERGY	MDA COUNTS	ENERGY	MDA COUNTS
766.84	351.6801	1002.74	425.9883	1678.03	0.0000
772.60	0.0000	1004.73	395.7891	1690.97	19.0799
776.52	353.9344	1021.30	0.0000	1750.46	0.0000
777.92	367.9291	1025.87	0.0000	1764.49	16.9226
778.90	366.9921	1028.54	0.0000	1770.23	35.5746
783.70	350.5505	1037.84	416.7643	1771.35	32.1924
785.37	373.1396	1038.76	0.0000	1791.20	0.0000
792.07	343.0139	1046.59	397.5562	1808.65	17.5442
794.95	369.0220	1048.07	414.0955	1810.72	0.0000
795.86	348.8025	1049.04	419.9800	1836.06	17.6290
801.95	381.6918	1050.41	415.3215		
810.06	393.4857	1063.66	378.1448		
810.29	393.5215	1077.00	405.7199		
810.45	396.7651	1077.34	400.9004		
810.76	405.4131	1085.87	393.0682		
815.77	400.3492	1093.63	401.1161		
818.51	377.3523	1099.45	369.9314		
832.01	383.3761	1112.07	386.2800		
834.85	395.6632	1112.84	383.0006		
835.71	396.8544	1115.54	305.9443		
836.80	0.0000	1120.29	309.6914		
846.75	0.0000	1120.55	309.7171		
846.77	402.6460	1121.30	314.8320		
856.80	412.6900	1129.67	270.6584		
860.56	449.2603	1131.51	0.0000		
871.09	469.7863	1147.95	0.0000		
873.19	418.8829	1173.23	206.0145		
875.33	0.0000	1177.95	140.0681		
879.38	453.6090	1189.05	151.8763		
880.51	437.0194	1204.77	129.3937		
883.24	427.5554	1221.41	110.7878		
884.68	462.6255	1231.02	86.8188		
889.28	463.2920	1235.36	77.8146		
894.76	531.2997	1238.28	88.9919		
898.04	454.4242	1260.41	0.0000		
900.72	519.3707	1271.87	54.0287		
903.28	506.8577	1274.44	54.0610		
911.20	522.9055	1274.54	54.0632		
912.08	501.7514	1291.59	64.5201		
923.98	0.0000	1298.22	0.0000		
926.50	543.9505	1312.11	63.7987		
929.11	549.9623	1332.49	57.8936		
937.49	593.3257	1362.66	0.0000		
944.13	607.6030	1365.19	39.5756		
946.00	594.8396	1368.63	0.0000		
949.00	610.3480	1384.29	40.7885		
954.55	0.0000	1408.01	21.6270		
962.31	541.3359	1457.56	0.0000		
964.08	546.3187	1460.82	30.8349		
966.17	567.3490	1489.16	32.0874		
968.97	461.4087	1505.03	22.5355		
983.53	484.1667	1584.12	24.2997		
984.45	0.0000	1596.21	21.5473		
996.26	406.2221	1620.50	16.0015		
1001.03	441.9449	1621.92	12.2401		

Method Calibration Data

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414

(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma S

Geometry: Can

	YES	NO	Comments
1) Is all calibration standard information enclosed for: the primary standard certificate? the secondary standard(s) documentation? the nuclide library used? the VMS certificate file?	☒		1738 1701
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included: amp, HVPS, ADC settings?	☒		

Prepared By: R. Fitch

Date: 9/18/15

Reviewed By: M. Stamp

Date: 9/18/15

Effective Date: 9/17/15

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, % Type			Calibration Method*
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.880E+05	—	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.754E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffu
J. S. Laffu, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738 Open/Reference Date: 01-APR-15
Name: Mixed Gamma CAN Received: 01-APR-15
Type: Source Material Expires: 01-APR-16
Employee: Maggie Stamps Verified: 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γps/gram	This Source γps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.614E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.367E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.6	1.7	3.6	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.996E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

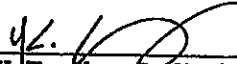
Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibbitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 2014414



Standard Logbook

Serial ID: 1701 Open/Reference Date: 01-APR-14
Name: Mixed Gamma CAN Received: 01-APR-14
Type: Source Material Expires: 01-APR-40
Employee: Maggie Stamps Verified: 28-MAY-14
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

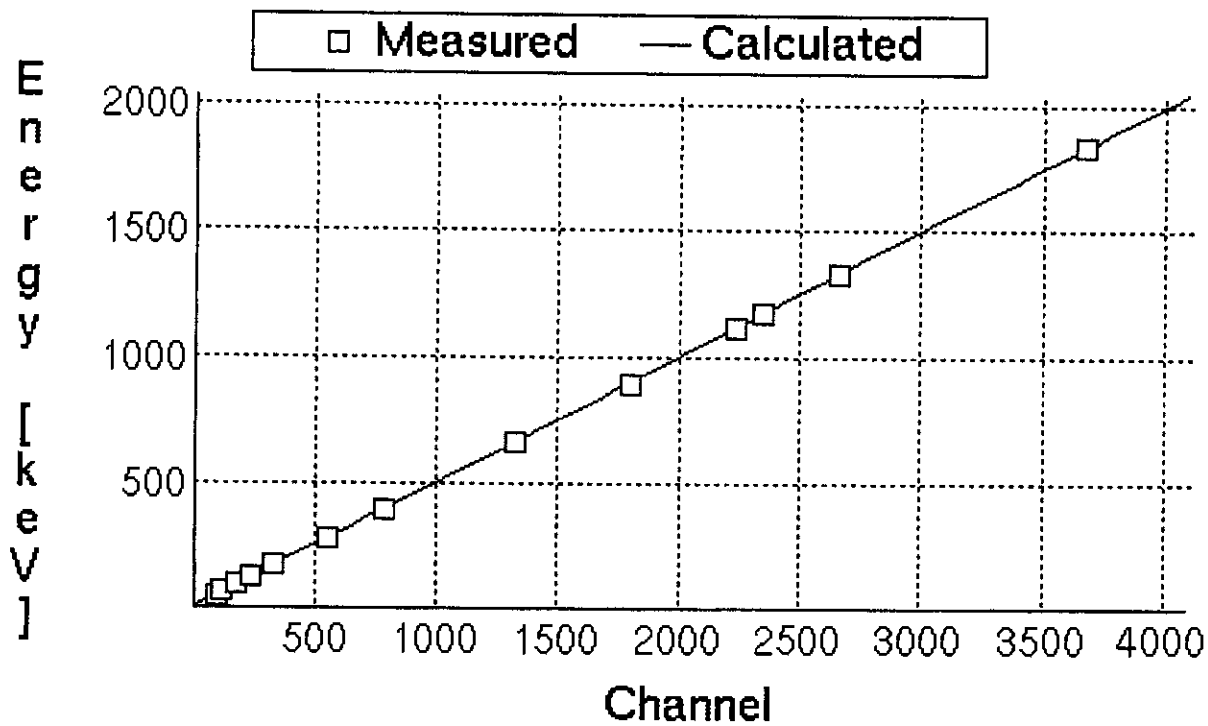
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



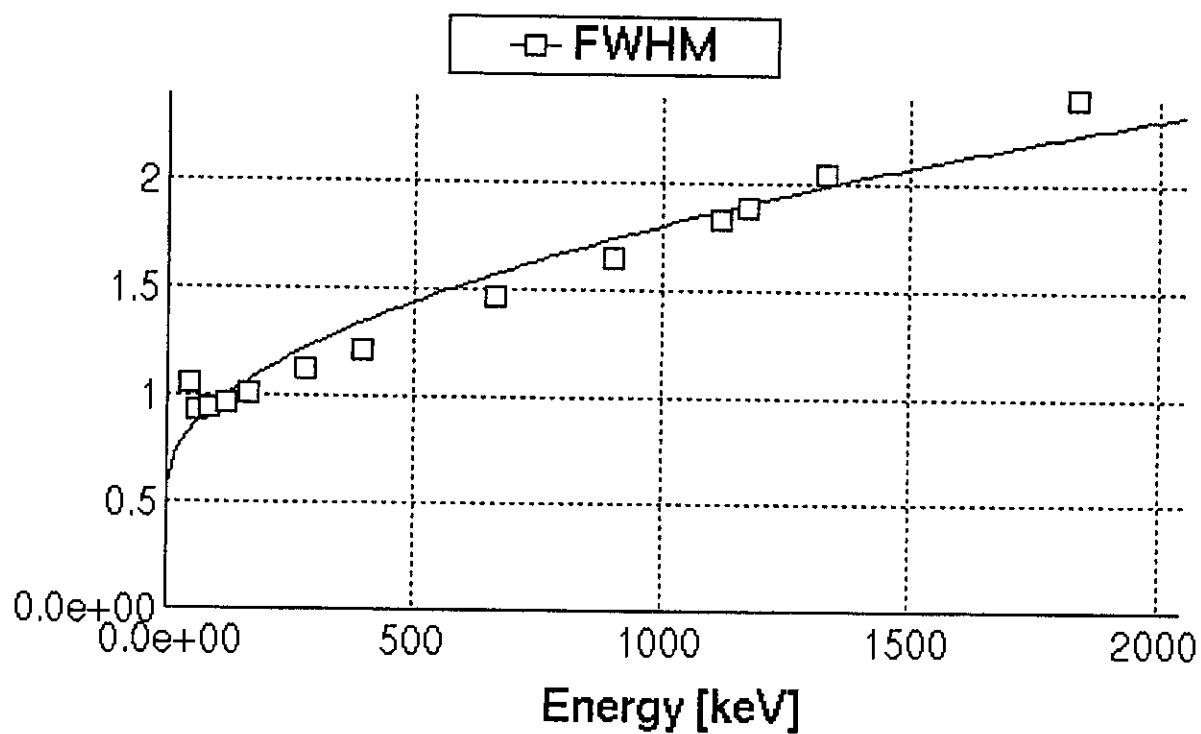
Datasource:

Energy = $6.296 \times 10^{-2} \text{ keV} + 5.000 \times 10^{-1} * \text{Ch} + -6.185 \times 10^{-8} * \text{Ch}^2$ [CHISQ = 2.433×10^{-2}]

FWHM = $7.011 \times 10^{-1} \text{ keV} + 3.286 \times 10^{-2} * E^{1/2}$ [CHISQ = 1.030×10^{-2}]

Lo Tail = $0.000 \times 10^{+0} \text{ keV} + 0.000 \times 10^{+0} * E$ [CHISQ = $0.000 \times 10^{+0}$]

Energy calibration ⁵ 8/17/15
RF
9/17/15



Datasource:

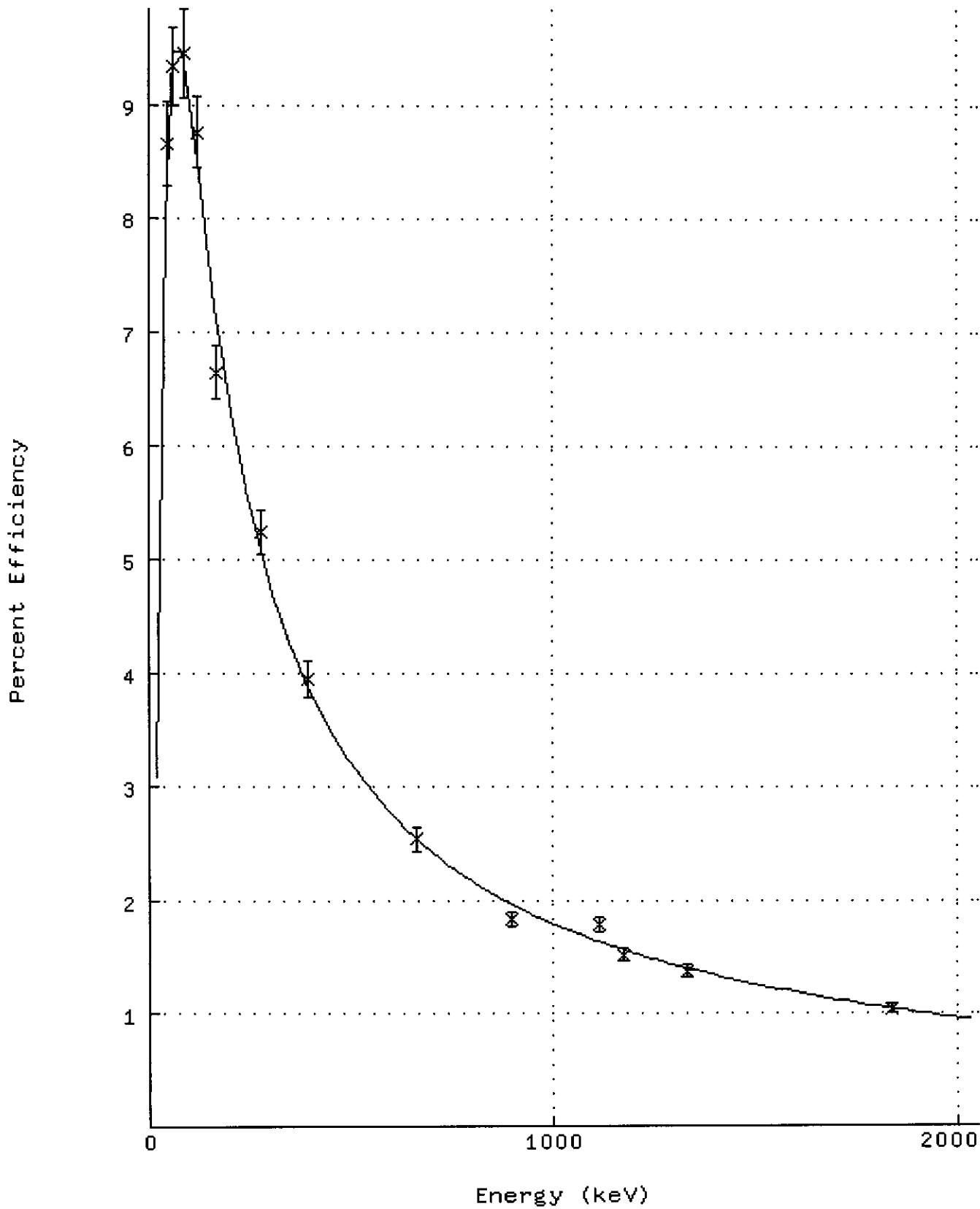
Energy = $-7.460e-01 \text{ keV} + 4.999e-01 * \text{Ch} + 3.783e-08 * \text{Ch}^2$ [CHISQ = $2.881e-02$]

FWHM = $5.660e-01 \text{ keV} + 3.913e-02 * E^{1/2}$ [CHISQ = $1.235e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

Energy^{Shape} calibration 85 9/17/15
9/17/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM05_CAN.CNF;19
Calib Date: 17-SEP-2015 12:25
Detector : GAMMA5
Geometry/Shelf: CAN/0
Fit type : 4 Deg. Empirical



$$\text{Energy} = -0.7460 + 0.4999 \cdot \text{Channel} + 3.7831\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	94.45	46.54	46.47	0.067
2	120.55	59.54	59.52	0.019
3	177.59	88.03	88.04	-0.007
4	245.68	122.06	122.08	-0.018
5	333.30	165.86	165.88	-0.025
6	560.00	279.20	279.23	-0.029
7	785.02	391.70	391.73	-0.031
8	1324.90	661.66	661.68	-0.020
9	1797.59	898.04	898.05	-0.007
10	2232.50	1115.60	1115.54	0.062
11	2347.85	1173.23	1173.22	0.006
12	2666.31	1332.49	1332.49	0.001
13	3673.15	1836.06	1836.08	-0.020

FWHM Calibration Report

$$\text{FWHM} = 0.5660 + 3.9131\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.06	0.83	0.222
2	59.54	0.93	0.87	0.065
3	88.03	0.94	0.93	0.011
4	122.06	0.97	1.00	-0.027
5	165.86	1.02	1.07	-0.055
6	279.20	1.13	1.22	-0.090
7	391.70	1.22	1.34	-0.118
8	661.66	1.46	1.57	-0.109
9	898.04	1.65	1.74	-0.085
10	1115.60	1.84	1.87	-0.036
11	1173.23	1.89	1.91	-0.014
12	1332.49	2.05	1.99	0.057
13	1836.06	2.42	2.24	0.180

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-3.967	0.8490	-4.5782E-02	2.8716E-02	-1.7147E-02	0.0000E+00

Average Deviation = 3.07 % Reduced Chi-Square = 2.19

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	8.65E-02	3.64E-03	8.64E-02	0.03	0.13
2	59.54	9.33E-02	3.38E-03	9.41E-02	-0.22	-0.80
3	88.03	9.44E-02	3.88E-03	9.34E-02	0.24	1.01
4	122.06	8.75E-02	3.10E-03	8.40E-02	1.15	4.08
5	165.86	6.64E-02	2.37E-03	7.16E-02	-2.19	-7.82
6	279.20	5.24E-02	1.99E-03	5.04E-02	1.00	3.79
7	391.70	3.94E-02	1.57E-03	3.88E-02	0.38	1.51
8	661.66	2.54E-02	1.03E-03	2.54E-02	-0.02	-0.09
9	898.04	1.84E-02	6.95E-04	1.97E-02	-1.91	-7.24
10	1115.60	1.79E-02	6.39E-04	1.64E-02	2.38	8.51
11	1173.23	1.52E-02	6.00E-04	1.57E-02	-0.77	-3.05
12	1332.49	1.38E-02	5.42E-04	1.40E-02	-0.44	-1.73
13	1836.06	1.04E-02	3.93E-04	1.04E-02	-0.04	-0.14

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM05_CAN_344241.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 344234 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 17-SEP-2015 11:31:49
 Decay time : 168 23:31:49.44 % dead time : 3.6%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:31:07.76

----- Detector Parameters -----

Energy cal. time : 17-SEP-2015 09:36:46 Energy cal. oper.: gamma spec user
 Detector name : GAMMA5 Counting geometry: CAN
 Effic. cal. time : 17-SEP-2015 12:25:23 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	6	20.82	349745	34747	1.31	43.15	39	17	1.94E+02	0.4	9.59E+03
2	6	21.91	1853287	33782	1.05	45.31	39	17	1.03E+03	0.1	
3	6	24.68	536878	71109	1.35	50.87	39	17	2.98E+02	0.2	
4	0	32.88	37699	42901	1.12	67.27	63	9	2.09E+01	1.1	
5	2	36.42	4504	18367	0.97	74.34	72	26	2.50E+00	4.5	1.87E+03
6	2	37.92	6272	27358	0.98	77.34	72	26	3.48E+00	4.5	
7	2	40.26	8836	27007	0.99	82.03	72	26	4.91E+00	3.3	
8	2	41.92	9152	26771	0.99	85.34	72	26	5.08E+00	3.3	
9	2	46.36	186489	25244	1.01	94.22	72	26	1.04E+02	0.3	
10	0	49.75	2058	27876	1.30	101.01	99	7	1.14E+00	13.7	
11	0	59.39	129847	36008	1.03	120.29	114	12	7.21E+01	0.4	
12	10	67.16	4978	26585	2.30	135.84	130	22	2.77E+00	6.8	2.81E+01
13	10	70.46	2332	16097	1.20	142.43	130	22	1.30E+00	9.4	
14	10	72.63	3588	25845	2.11	146.77	130	22	1.99E+00	8.8	
15	0	87.93	144725	20766	1.06	177.38	173	10	8.04E+01	0.3	
16	0	103.25	213	8037	1.16	208.01	206	6	1.18E-01	66.9	
17	0	109.07	429	9130	1.88	219.65	217	7	2.38E-01	37.3	
18	0	121.96	61693	13479	1.10	245.44	239	12	3.43E+01	0.6	
19	0	136.36	7392	10408	1.08	274.25	269	11	4.11E+00	2.9	
20	0	165.79	42725	9686	1.04	333.10	327	12	2.37E+01	0.7	
21	0	189.22	187	4212	1.40	379.98	378	6	1.04E-01	55.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	199.00	3066	7501	1.24	399.53	395	10	1.70E+00	5.6	
23	0	203.43	733	6449	1.16	408.41	405	9	4.07E-01	20.1	
24	0	255.01	1348	5810	1.21	511.56	507	10	7.49E-01	10.9	
25	0	279.14	13458	6275	1.16	559.83	554	12	7.48E+00	1.5	
26	0	311.42	217	2582	1.29	624.39	622	6	1.21E-01	37.8	
27	0	391.64	30029	5261	1.27	784.84	779	13	1.67E+01	0.8	
28	0	450.59	174	2604	1.63	902.74	900	7	9.67E-02	49.2	
29	0	471.80	117	3413	0.62	945.17	944	9	6.49E-02	90.5	
30	0	510.97	3552	5296	2.53	1023.49	1016	17	1.97E+00	5.0	
31	0	520.06	124	2437	1.60	1041.68	1040	8	6.87E-02	69.7	
32	0	602.05	125	1973	1.29	1205.65	1203	7	6.97E-02	59.4	
33	0	661.61	33659	4482	1.49	1324.77	1319	13	1.87E+01	0.7	
34	0	789.70	53	1965	1.47	1580.92	1580	8	2.97E-02	144.1	
35	0	798.90	163	2236	2.10	1599.33	1596	9	9.06E-02	52.9	
36	0	813.64	556	3025	1.53	1628.80	1623	12	3.09E-01	20.2	
37	0	897.99	30954	5499	1.67	1797.48	1790	16	1.72E+01	0.8	
38	0	957.92	126	2154	0.89	1917.32	1914	8	7.00E-02	64.4	
39	0	1115.51	30160	3031	1.84	2232.45	2224	18	1.68E+01	0.7	
40	0	1173.18	36375	2377	1.83	2347.76	2338	20	2.02E+01	0.6	
41	0	1242.35	76	417	1.39	2486.07	2482	9	4.20E-02	50.1	
42	0	1266.22	51	311	1.00	2533.79	2531	7	2.85E-02	58.9	
43	4	1325.03	675	769	2.91	2651.39	2644	49	3.75E-01	10.2	5.42E+00
44	4	1332.46	32791	679	2.06	2666.25	2644	49	1.82E+01	0.6	
45	0	1370.53	58	496	0.63	2742.37	2739	10	3.21E-02	73.2	
46	0	1802.77	40	236	8.13	3606.56	3600	21	2.24E-02	96.7	
47	0	1836.04	18364	621	2.35	3673.06	3661	24	1.02E+01	0.8	
48	0	1850.78	251	353	3.41	3702.52	3695	16	1.39E-01	17.9	
49	0	1892.95	11	107	1.08	3786.83	3779	11	6.01E-03	189.5	
50	0	2013.17	28	136	5.20	4027.18	4020	16	1.54E-02	95.8	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM05_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM05.CNF;405
Background date    : 14-SEP-2015 12:56:59
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 17-SEP-2015 12:31:33
Sample ID        : VER_GAM05_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM05              Detector geometry: CAN
Elapsed live time: 0 00:30:00.00      Elapsed real time: 0 00:30:39.16  2.1%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID        :                     Detector SN#       :
Matrix Spike ID :                     LCS ID            :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	5	20.70	184237	23737	1.20	42.91	40	16	1.02E+02	0.3	4.90E+03
2	5	21.94	1125905	25281	1.06	45.38	40	16	6.26E+02	0.1	
3	5	24.81*	284291	23893	1.23	51.12	40	16	1.58E+02	0.2	
4	3	31.99	5047	8565	0.84	65.48	64	7	2.80E+00	2.8	5.39E+01
5	3	33.10	4697	16760	1.05	67.71	64	7	2.61E+00	4.8	
6	2	36.42	4689	16582	0.97	74.34	71	27	2.60E+00	4.8	1.85E+03
7	2	39.92	10251	16921	0.98	81.34	71	27	5.70E+00	2.5	
8	2	43.75*	8020	14603	0.82	89.00	71	27	4.46E+00	3.0	
9	2	46.40*	180551	18673	1.01	94.30	71	27	1.00E+02	0.3	
10	0	49.71	2192	23331	1.20	100.92	99	7	1.22E+00	11.8	
11	0	59.44	131886	26931	1.06	120.39	114	12	7.33E+01	0.4	
12	9	66.02*	1144	10993	1.50	133.55	129	23	6.36E-01	17.4	1.51E+01
13	9	67.64*	2252	16266	2.09	136.78	129	23	1.25E+00	12.1	
14	0	87.98	85759	10771	1.07	177.48	173	10	4.76E+01	0.4	
15	0	122.03	24276	5446	1.07	245.58	240	11	1.35E+01	0.9	
16	0	136.49	3084	4306	1.07	274.51	270	11	1.71E+00	4.5	
17	0	165.82	7159	3691	1.05	333.16	328	11	3.98E+00	2.0	
18	0	199.08*	592	3127	1.13	399.69	396	9	3.29E-01	17.5	
19	0	254.93	170	2419	1.22	511.40	508	8	9.44E-02	50.7	
20	0	310.93	169	2291	2.49	623.41	618	9	9.36E-02	51.8	
21	0	365.34	94	1366	0.98	732.23	729	6	5.23E-02	63.1	
22	0	391.65	3421	2473	1.30	784.86	780	11	1.90E+00	3.3	
23	0	510.95*	942	2708	2.41	1023.47	1016	14	5.23E-01	12.2	
24	0	532.69	148	1581	1.96	1066.94	1063	10	8.21E-02	51.0	
25	0	558.66	80	1211	1.23	1118.88	1115	9	4.43E-02	79.7	
26	0	564.31	273	2211	6.48	1130.17	1123	17	1.52E-01	39.9	
27	0	634.00	98	1170	0.75	1269.54	1265	9	5.43E-02	64.1	
28	0	661.65	34645	2215	1.49	1324.85	1318	15	1.92E+01	0.6	
29	0	727.84*	163	931	2.71	1457.22	1454	8	9.04E-02	33.4	
30	0	898.01	2871	2331	1.82	1797.53	1791	12	1.60E+00	3.8	
31	0	911.07*	137	1055	1.19	1823.64	1821	6	7.63E-02	38.4	
32	0	979.10	145	817	1.08	1959.68	1957	6	8.04E-02	32.4	
33	0	1035.95	58	1189	0.74	2073.35	2070	10	3.20E-02	112.9	
34	0	1115.58	10637	1970	1.85	2232.58	2224	19	5.91E+00	1.4	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	1	1124.10	108	885	2.07	2249.62	2244	17	5.98E-02	51.1	2.13E+00
36	1	1127.85	106	633	1.69	2257.12	2244	17	5.90E-02	43.0	
37	0	1173.23	32071	1481	1.85	2347.86	2338	20	1.78E+01	0.6	
38	0	1268.64	90	176	2.88	2538.63	2532	14	5.01E-02	32.9	
39	3	1321.85	71	85	2.65	2645.02	2640	54	3.96E-02	33.2	1.67E+01
40	3	1324.83	90	103	1.99	2651.00	2640	54	5.01E-02	32.2	
41	3	1332.58	30148	197	2.17	2666.49	2640	54	1.67E+01	0.6	
42	0	1354.62	102	203	2.34	2710.56	2703	14	5.68E-02	31.7	
43	0	1477.37	18	143	4.53	2955.99	2945	15	9.87E-03	148.4	
44	0	1485.25	17	92	1.28	2971.74	2967	9	9.50E-03	104.0	
45	0	1501.47	71	156	3.96	3004.18	2995	19	3.97E-02	43.7	
46	0	1836.17	1822	130	2.43	3673.33	3662	20	1.01E+00	2.8	
47	0	1850.97	35	75	2.38	3702.92	3696	13	1.95E-02	53.6	
48	0	1999.09	20	47	0.83	3999.03	3994	11	1.10E-02	70.4	
49	0	2012.49	21	53	3.27	4025.82	4015	15	1.15E-02	81.2	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	24276	85.60*	8.398E+00	5.070E+03	1.980E+04	1.74
	136.47	3084	10.68	7.969E+00	5.442E+03	2.125E+04	9.02
CO-60	1173.23	32071	99.85	1.566E+00	3.079E+04	3.731E+04	1.26
	1332.49	30148	99.98*	1.400E+00	3.235E+04	3.920E+04	1.15
ZN-65	1115.54	10637	50.60*	1.637E+00	1.929E+04	8.789E+04	2.80
Y-88	898.04	2871	93.70	1.970E+00	2.335E+03	7.515E+04	7.69
	1836.06	1822	99.20*	1.039E+00	2.653E+03	8.539E+04	5.60
CD-109	88.03	85759	3.70*	9.345E+00	3.724E+05	8.307E+05	0.82
SN-113	391.70	3421	64.97*	3.884E+00	2.035E+03	5.075E+04	6.58
CS-137	661.66	34645	85.10*	2.542E+00	2.405E+04	2.487E+04	1.23
CE-139	165.86	7159	80.00*	7.164E+00	1.876E+03	2.761E+04	4.05
PB-210	46.54	180551	4.25*	8.626E+00	7.395E+05	7.740E+05	0.56
AM-241	59.54	131886	35.90*	9.406E+00	5.865E+04	5.878E+04	0.74

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM05.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 14-SEP-2015 09:22:33 Acquisition date : 14-SEP-2015 12:56:59
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.78

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5251E+00	-1.04	
[1.54669+/-0.02071]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 9 / 18 / 15

Sample ID : Bkg

Acquisition date : 14-SEP-2015 12:56:59

VMS Gamma Spectroscopy Report generated 15-SEP-2015 05:37:02

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM05__343820.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 343820 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 14-SEP-2015 09:22:33

---- Sample Decay/Count Information ----

Sample Date : 14-SEP-2015 09:22:33 Acquisition date : 14-SEP-2015 12:56:59
 Decay time : 0 03:34:26.26 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.78

---- Detector Parameters ----

Energy cal. time : 3-SEP-2014 07:46:12. Energy cal. oper.: gamma spec user
 Detector name : GAMMA5 Counting geometry:
 Effic. cal. time : 4-SEP-2014 04:50:23. Effic. cal. oper.:

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	25.71	119	979	1.40	52.79	50	7	1.98E-03	45.2	
2	6	44.53	39	355	1.04	90.43	88	12	6.45E-04	68.3	1.79E+00
3	6	46.64	880	402	0.89	94.65	88	12	1.47E-02	4.8	
4	2	51.84	38	66	0.88	105.06	104	9	6.26E-04	24.7	1.49E+00
5	2	53.54	159	558	1.30	108.45	104	9	2.65E-03	27.0	
6	0	63.45	557	743	0.84	128.29	124	9	9.29E-03	9.8	
7	0	66.56	56	503	0.79	134.51	133	6	9.27E-04	65.1	
8	0	74.27	63	635	0.70	149.92	149	6	1.06E-03	63.8	
9	0	77.33	180	523	0.96	156.04	154	6	3.00E-03	21.5	
10	0	84.46	116	666	0.63	170.31	167	7	1.94E-03	37.9	
11	3	92.73	789	560	1.06	186.84	183	12	1.31E-02	5.9	1.52E+00
12	3	94.82	63	657	1.26	191.02	183	12	1.06E-03	81.9	
13	0	112.38	52	590	1.61	226.14	224	7	8.60E-04	79.1	
14	0	139.60	131	589	1.98	280.60	278	8	2.19E-03	33.0	
15	0	143.96	99	686	1.48	289.32	286	9	1.65E-03	48.8	
16	0	185.81	360	596	1.21	373.03	369	8	6.01E-03	12.9	
17	0	198.73	79	455	0.88	398.87	396	7	1.31E-03	46.6	
18	0	205.42	70	431	1.41	412.25	410	7	1.17E-03	50.4	
19	0	238.65	283	451	1.28	478.71	475	8	4.72E-03	14.3	

20	0	338.13	68	381	1.82	677.68	672	10	1.14E-03	54.9	
21	0	351.76	101	283	1.42	704.95	702	8	1.68E-03	30.5	
22	0	412.13	11	301	0.79	825.69	820	9	1.78E-04	295.2	
23	0	511.09	1493	456	2.73	1023.61	1014	19	2.49E-02	4.3	
24	0	569.63	54	162	1.31	1140.69	1137	8	8.96E-04	43.2	
25	0	583.15	122	251	1.48	1167.72	1162	13	2.04E-03	28.1	
26	0	609.51	151	268	1.64	1220.43	1215	12	2.51E-03	23.3	
27	0	669.23	26	160	0.96	1339.87	1334	9	4.26E-04	92.3	
28	0	727.04	57	191	2.43	1455.48	1451	13	9.51E-04	51.4	
29	0	764.70	44	172	4.87	1530.79	1524	14	7.34E-04	64.9	
30	0	802.81	77	231	1.99	1607.00	1600	18	1.29E-03	47.3	
31	0	911.18	60	172	1.50	1823.73	1816	15	9.98E-04	49.5	
32	0	945.83	17	77	1.05	1893.01	1889	8	2.87E-04	91.9	
33	0	969.36	54	105	0.98	1940.06	1934	11	9.04E-04	39.3	
34	0	1001.28	57	54	2.57	2003.90	2000	8	9.53E-04	25.9	
35	0	1033.67	22	105	0.62	2068.67	2061	12	3.63E-04	96.4	
36	0	1043.22	9	81	1.40	2087.75	2086	8	1.43E-04	184.6	
37	0	1130.64	37	64	2.00	2262.57	2257	12	6.19E-04	45.8	
38	0	1228.24	44	74	5.30	2457.74	2451	14	7.32E-04	44.1	
39	0	1293.91	12	81	1.39	2589.04	2582	11	2.03E-04	147.0	
40	1	1460.74	120	54	2.45	2922.61	2915	37	1.99E-03	15.0	4.21E+00
41	1	1467.16	43	37	2.45	2935.45	2915	37	7.15E-04	36.5	
42	1	1472.96	34	16	2.45	2947.03	2915	37	5.66E-04	31.1	
43	0	1513.31	13	95	5.23	3027.72	3009	21	2.08E-04	196.5	
44	0	1668.17	25	40	1.52	3337.33	3331	14	4.22E-04	57.5	
45	0	1677.81	36	37	6.24	3356.60	3346	21	5.99E-04	45.4	
46	0	1764.77	47	40	0.99	3530.45	3525	13	7.77E-04	31.4	
47	0	1884.21	12	36	0.55	3769.24	3760	13	2.01E-04	106.1	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 5

Calibration Date: 9/17/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.878E+04	3.91
Cs-137	661.7	0.851	735.7	2.3365E+04	2.487E+04	6.44
Co-60	1173.2	0.9985	1383	3.7435E+04	3.731E+04	-0.33
Co-60	1332.5	0.9998	1385	3.7440E+04	3.920E+04	4.70

Prepared By: R. Fisher

Date: 9/18/15

Reviewed By: M. Stamp

Date: 9/18/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)558-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 5

Date Performed: 9/17/15

Performed By: RF

High Voltage Power Supply Model No. <u>310GD</u> High Voltage <u>5.00 Kv</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>5</u> Fine Gain <u>0.565</u> Time Constant <u>4 μsec</u> Input polarity <u>Negative</u> BSLR rate <u>12</u> BSLR mode <u>14</u> Threshold <u>19</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>2AC:2</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gammac II

Geometry: Coen

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the second standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:	☒		
amp, HVPS, ADC settings?			

Prepared By: R. Finch

Date: 7/20/15

Reviewed By: W. Stamp

Date: 7/24/15

Effective Date: 7/16/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MDX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.738E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffu
J. S. Laffu, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Ziegler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.896E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' B-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

Page 1 of 2

Corporate Office

24937 Avenue Tibblitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: Y. K. 10
K. Eardley, Radiochemist

QC Approved: 286
A. Chen, Spectroscopist

Date: 20 MAY 14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

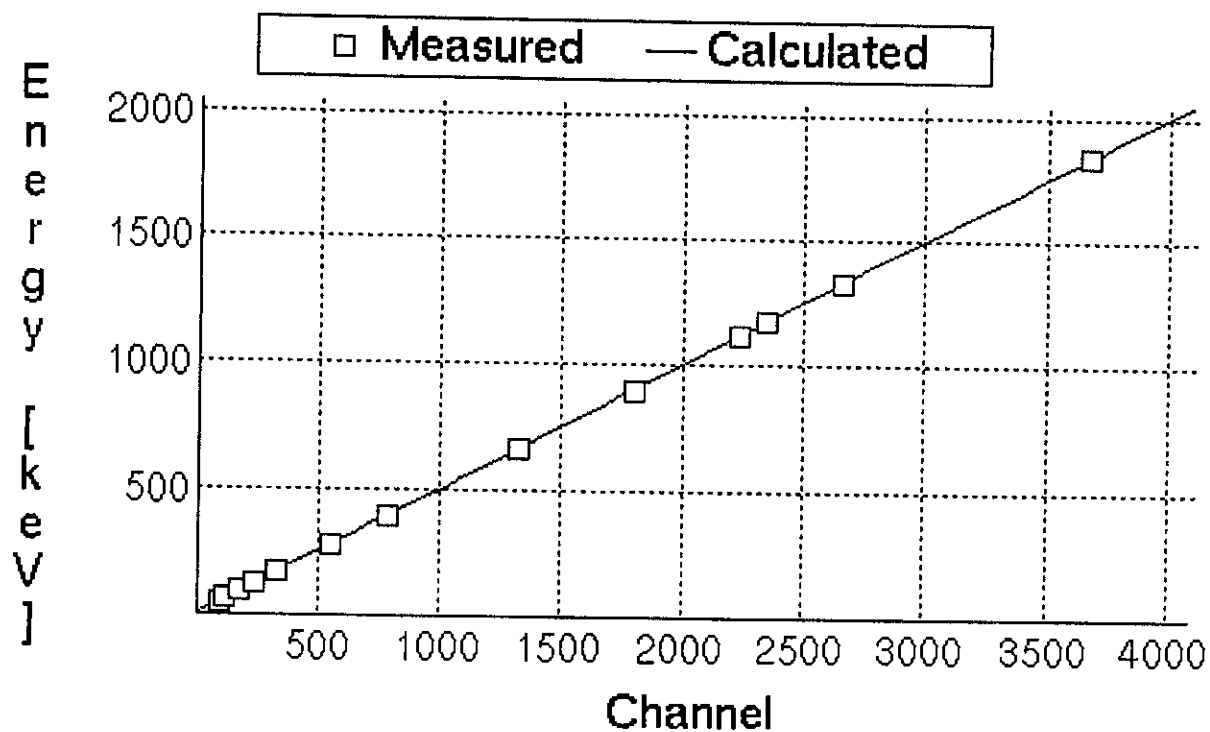
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218
Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



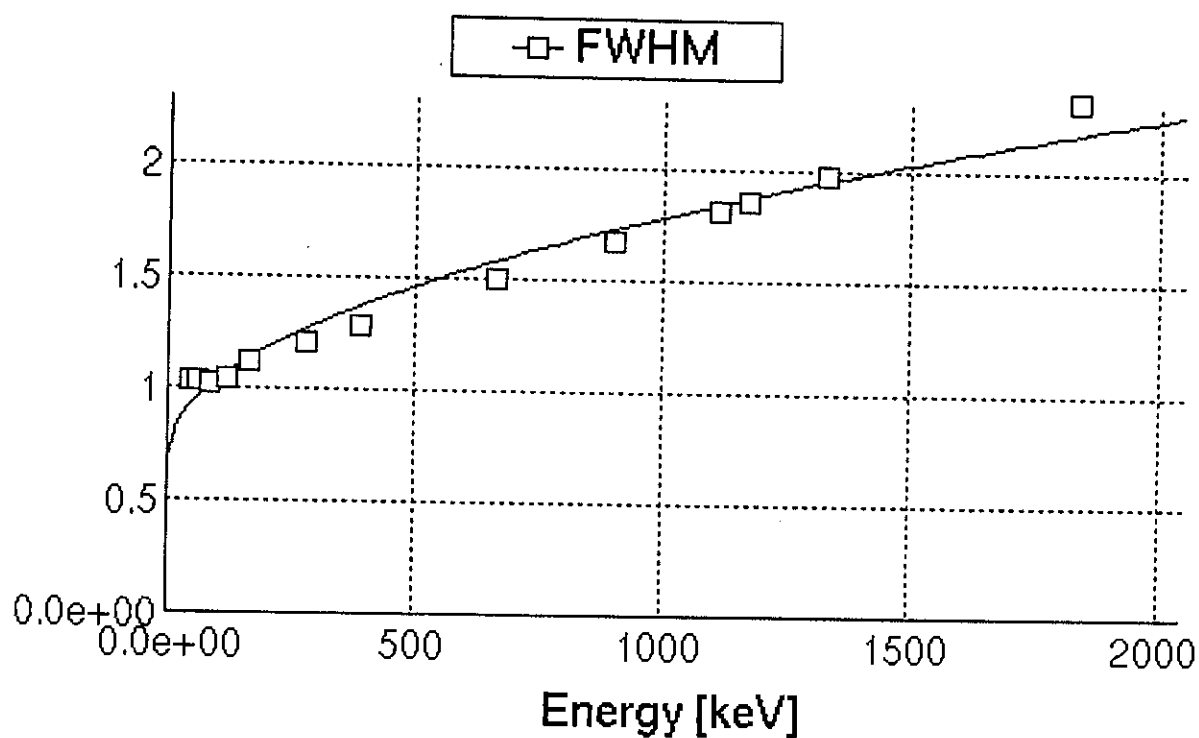
Datasource:

Energy = $1.690e-01$ keV + $4.998e-01$ *Ch + $6.449e-08$ *Ch² [CHISQ = $1.700e-02$]

FWHM = $6.848e-01$ keV + $3.488e-02$ *E^{1/2} [CHISQ = $5.595e-03$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

energy calibration Y 11 3/10/15



Datasource:

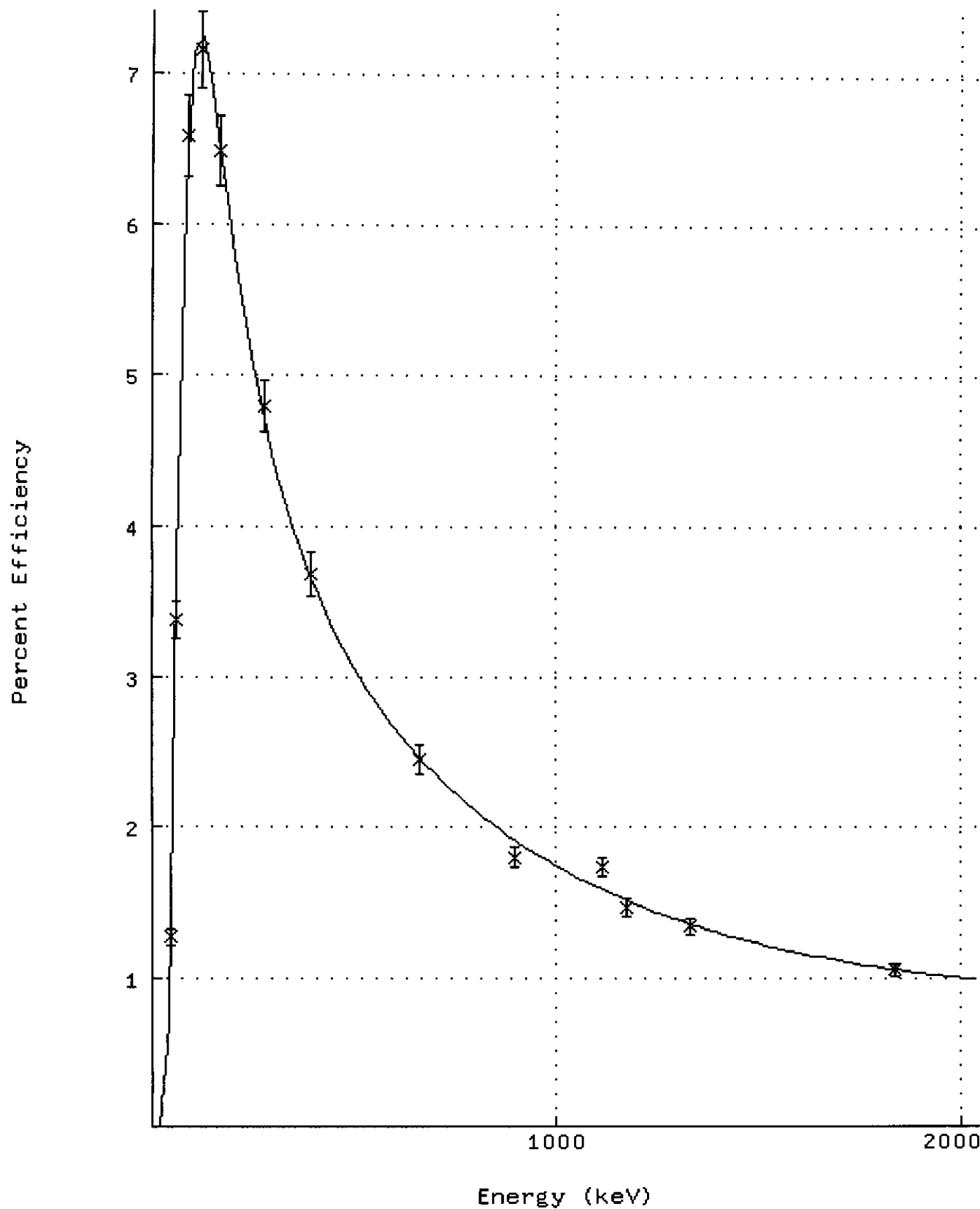
Energy = $1.690e-01 \text{ keV} + 4.998e-01 * \text{Ch} + 6.449e-08 * \text{Ch}^2$ [CHISQ = $1.700e-02$]

FWHM = $6.848e-01 \text{ keV} + 3.488e-02 * E^{1/2}$ [CHISQ = $5.595e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

shape calibration yll 3/10/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM11_CAN.CNF;13
Calib Date: 16-JUL-2015 08:37
Detector : GAMMA11 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = 0.1690 + 0.4998 \cdot \text{Channel} + 6.4495\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.73	46.54	46.52	0.022
2	118.79	59.54	59.54	0.000
3	175.81	88.03	88.04	-0.012
4	243.87	122.06	122.06	-0.003
5	331.52	165.86	165.88	-0.017
6	558.22	279.20	279.19	0.005
7	783.26	391.70	391.69	0.006
8	1323.25	661.66	661.66	0.000
9	1796.01	898.04	898.05	-0.010
10	2230.95	1115.60	1115.55	0.048
11	2346.32	1173.23	1173.25	-0.017
12	2664.77	1332.49	1332.52	-0.025
13	3671.40	1836.06	1836.06	0.005

FWHM Calibration Report

$$\text{FWHM} = 0.6848 + 3.4877\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.04	0.92	0.114
2	59.54	1.03	0.95	0.078
3	88.03	1.02	1.01	0.012
4	122.06	1.04	1.07	-0.030
5	165.86	1.13	1.13	-0.009
6	279.20	1.20	1.27	-0.066
7	391.70	1.29	1.38	-0.090
8	661.66	1.50	1.58	-0.079
9	898.04	1.68	1.73	-0.049
10	1115.60	1.82	1.85	-0.030
11	1173.23	1.87	1.88	-0.011
12	1332.49	1.98	1.96	0.024
13	1836.06	2.32	2.18	0.137

Sample ID : 100218

Acquisition date : 16-JUL-2015 07:07:32

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x=\ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-3.996	0.8606	-7.4543E-02	-8.2622E-02	0.1132	-3.7732E-02

Average Deviation = 2.21 % Reduced Chi-Square = 1.58

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	1.27E-02	5.47E-04	1.29E-02	-0.26	-1.14
2	59.54	3.37E-02	1.23E-03	3.32E-02	0.41	1.49
3	88.03	6.57E-02	2.70E-03	6.55E-02	0.09	0.36
4	122.06	7.14E-02	2.52E-03	7.24E-02	-0.38	-1.35
5	165.86	6.48E-02	2.29E-03	6.55E-02	-0.30	-1.05
6	279.20	4.79E-02	1.70E-03	4.68E-02	0.66	2.35
7	391.70	3.67E-02	1.44E-03	3.66E-02	0.09	0.34
8	661.66	2.45E-02	9.89E-04	2.46E-02	-0.14	-0.57
9	898.04	1.80E-02	6.69E-04	1.91E-02	-1.76	-6.55
10	1115.60	1.73E-02	6.13E-04	1.59E-02	2.43	8.57
11	1173.23	1.47E-02	5.77E-04	1.52E-02	-0.81	-3.20
12	1332.49	1.34E-02	5.26E-04	1.36E-02	-0.32	-1.24
13	1836.06	1.05E-02	3.91E-04	1.05E-02	-0.13	-0.47

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM11_CAN_336761.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 336743 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 16-JUL-2015 07:07:32
 Decay time : 105 19:07:32.28 % dead time : 3.0%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:50.12

----- Detector Parameters -----

Energy cal. time : 10-MAR-2015 09:04:48 Energy cal. oper.: gamma spec user
 Detector name : GAMMA11 Counting geometry: CAN
 Effic. cal. time : 16-JUL-2015 08:37:24 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	33.40	7831	24399	1.93	66.49	65	6	2.18E+00	3.3	
2	0	46.54	57598	54218	0.89	92.77	88	10	1.60E+01	0.9	
3	0	59.56	96577	55511	0.91	118.82	113	12	2.68E+01	0.6	
4	0	66.39	622	27395	1.18	132.49	131	6	1.73E-01	42.1	
5	5	70.88	2889	28224	1.08	141.47	138	12	8.03E-01	9.3	2.06E+00
6	5	72.91	4149	23294	0.84	145.53	138	12	1.15E+00	5.8	
7	7	83.03	6335	57198	1.95	165.78	160	25	1.76E+00	7.3	1.78E+02
8	7	85.59	11665	53548	1.96	170.91	160	25	3.24E+00	5.3	
9	7	88.07	219559	22482	1.03	175.87	160	25	6.10E+01	0.2	
10	0	122.13	119444	36325	0.96	244.00	238	12	3.32E+01	0.4	
11	0	136.55	14735	24613	1.04	272.85	268	10	4.09E+00	2.2	
12	0	158.04	297	11744	1.22	315.84	314	5	8.24E-02	55.1	
13	0	165.94	115149	31458	1.11	331.64	325	14	3.20E+01	0.4	
14	0	203.02	230	10524	1.20	405.83	404	6	6.40E-02	70.7	
15	0	255.22	3689	14892	1.24	510.25	506	10	1.02E+00	6.4	
16	0	268.57	235	8157	1.13	536.96	535	6	6.52E-02	61.1	
17	0	279.24	63886	18565	1.16	558.31	551	14	1.77E+01	0.6	
18	0	310.71	561	8585	1.30	621.25	618	8	1.56E-01	28.9	
19	0	391.75	82510	14401	1.24	783.38	776	14	2.29E+01	0.5	
20	0	511.04	8288	12209	2.65	1021.99	1014	16	2.30E+00	3.2	
21	0	661.73	65943	12980	1.43	1323.38	1315	16	1.83E+01	0.5	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	719.52	128	5734	0.89	1438.97	1437	9	3.54E-02	107.2	
23	0	807.05	69	4814	0.51	1614.03	1614	8	1.92E-02	174.2	
24	0	814.24	1145	6045	1.43	1628.40	1624	10	3.18E-01	13.0	
25	0	821.88	151	4969	2.18	1643.69	1641	8	4.19E-02	81.4	
26	0	857.11	195	5107	1.20	1714.14	1712	8	5.43E-02	63.7	
27	0	875.16	103	5462	3.53	1750.23	1749	8	2.87E-02	124.4	
28	0	898.12	91685	12798	1.63	1796.16	1787	17	2.55E+01	0.4	
29	0	928.43	150	4839	1.29	1856.76	1853	8	4.16E-02	80.9	
30	0	1115.64	70071	7587	1.75	2231.12	2222	19	1.95E+01	0.5	
31	0	1173.32	72565	4940	1.85	2346.46	2336	20	2.02E+01	0.4	
32	5	1325.30	1987	2927	3.15	2650.34	2641	34	5.52E-01	7.1	7.92E+00
33	5	1332.60	65401	1945	1.97	2664.94	2641	34	1.82E+01	0.4	
34	0	1447.94	119	1223	1.82	2895.53	2892	8	3.30E-02	51.9	
35	0	1541.82	99	1904	1.14	3083.23	3080	10	2.74E-02	83.3	
36	0	1753.17	91	429	2.18	3505.72	3501	10	2.53E-02	43.9	
37	0	1757.57	48	579	2.33	3514.51	3510	12	1.34E-02	100.6	
38	0	1836.12	56503	1277	2.22	3671.53	3660	24	1.57E+01	0.5	
39	0	1847.43	16	406	1.37	3694.13	3687	10	4.32E-03	245.5	
40	0	1866.46	39	501	0.77	3732.17	3722	15	1.09E-02	125.8	
41	0	1901.43	31	240	1.38	3802.06	3801	9	8.65E-03	90.7	
42	0	1915.18	63	330	2.49	3829.56	3824	12	1.75E-02	59.4	
43	0	2037.14	95	315	2.72	4073.31	4065	15	2.63E-02	42.1	

```
*****
*                                     *
*               GEL Laboratories LLC   *
*               2040 Savage Road      *
*               Charleston, SC 29407  *
*                                     *
*****
```

```
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM11_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM11.CNF;450
Background date    : 11-JUL-2015 12:14:04
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 16-JUL-2015 08:45:10
Sample ID        : VER_GAM11_CAN      Sample quantity  : 1.00000E+00 SAMPLE
Detector name     : GAM11             Detector geometry: CAN
Elapsed live time : 0 01:00:00.00     Elapsed real time: 0 01:00:51.95  1.4%
Energy tolerance  : 1.50000 keV       Analyst Initials  :
Abundance limit   : 75.00000          Sensitivity       : 3.00000
Batch ID          :                   Detector SN#       :
Matrix Spike ID   :                   LCS ID            :
```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	33.45	5291	15782	2.00	66.58	65	6	1.47E+00	3.9	
2	1	39.75	953	21174	0.99	79.18	76	22	2.65E-01	24.1	2.85E+02
3	1	42.65	1823	17242	0.91	85.00	76	22	5.06E-01	11.2	
4	1	46.56*	60732	19205	1.02	92.82	76	22	1.69E+01	0.5	
5	0	59.59	98635	28712	0.83	118.87	114	10	2.74E+01	0.5	
6	0	66.61*	504	13482	1.49	132.93	131	6	1.40E-01	36.6	
7	0	88.09	132159	22847	0.87	175.90	171	10	3.67E+01	0.3	
8	0	122.10	48738	13138	0.90	243.95	238	12	1.35E+01	0.7	
9	0	136.53	5728	8026	0.97	272.81	269	9	1.59E+00	3.1	
10	0	165.90	19291	9449	1.09	331.58	326	12	5.36E+00	1.2	
11	0	255.19	276	4684	1.15	510.20	507	7	7.67E-02	41.6	
12	0	278.87	274	4139	1.42	557.57	555	7	7.61E-02	39.4	
13	0	319.55	83	4200	1.00	638.94	636	8	2.30E-02	136.0	
14	0	391.69	9607	6028	1.19	783.26	777	12	2.67E+00	1.9	
15	0	431.24	175	3347	1.26	862.37	860	7	4.87E-02	55.2	
16	0	450.96	211	4114	1.27	901.81	899	8	5.87E-02	53.0	
17	0	504.29	122	3139	1.50	1008.48	1005	8	3.38E-02	80.4	
18	0	510.86*	2580	5777	2.33	1021.64	1014	15	7.17E-01	6.7	
19	0	661.59*	67362	5006	1.43	1323.10	1315	16	1.87E+01	0.5	
20	0	790.78	60	2207	1.23	1581.48	1578	7	1.67E-02	130.1	
21	0	868.48	57	2965	0.81	1736.88	1735	8	1.59E-02	165.0	
22	0	873.64	110	2184	1.36	1747.20	1744	6	3.06E-02	67.7	
23	0	897.92	9108	5637	1.62	1795.75	1789	14	2.53E+00	2.0	
24	0	903.45	214	3131	2.46	1806.81	1803	8	5.93E-02	45.9	
25	0	1115.39*	25216	4129	1.75	2230.64	2221	17	7.00E+00	0.9	
26	0	1173.07*	64087	3029	1.76	2345.97	2336	20	1.78E+01	0.4	
27	0	1219.21	68	593	1.31	2438.23	2434	9	1.88E-02	66.2	
28	2	1325.04	211	643	2.36	2649.82	2641	34	5.87E-02	26.1	6.73E+00
29	2	1332.32	58181	466	1.88	2664.38	2641	34	1.62E+01	0.4	
30	0	1395.92	26	231	0.50	2791.53	2789	8	7.28E-03	101.9	
31	0	1458.52	29	368	1.77	2916.69	2907	14	8.02E-03	143.2	
32	0	1514.82	91	298	4.12	3029.25	3025	12	2.52E-02	39.3	
33	0	1579.79	23	351	2.61	3159.12	3159	11	6.45E-03	156.8	
34	0	1589.51	41	418	2.53	3178.56	3174	13	1.15E-02	102.8	

Sample ID : VER_GAM11_CAN

Acquisition date : 16-JUL-2015 08:45:10

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1695.04	49	278	4.08	3389.52	3379	16	1.36E-02	77.8	
36	0	1745.47	46	142	1.31	3490.32	3485	12	1.29E-02	53.3	
37	0	1835.72	5398	306	2.21	3670.74	3662	20	1.50E+00	1.6	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	48738	85.60*	7.241E+00	5.903E+03	1.962E+04	1.31
	136.47	5728	10.68	7.086E+00	5.683E+03	1.889E+04	6.24
CO-60	1173.23	64087	99.85	1.517E+00	3.176E+04	3.763E+04	0.90
	1332.49	58181	99.98*	1.358E+00	3.217E+04	3.811E+04	0.84
ZN-65	1115.54	25216	50.60*	1.586E+00	2.359E+04	8.986E+04	1.71
Y-88	898.04	9108	93.70	1.914E+00	3.813E+03	8.139E+04	4.08
	1836.06	5398	99.20*	1.054E+00	3.875E+03	8.273E+04	3.15
CD-109	88.03	132159	3.70*	6.551E+00	4.093E+05	8.304E+05	0.70
SN-113	391.70	9607	64.97*	3.661E+00	3.033E+03	5.170E+04	3.82
CS-137	661.66	67362	85.10*	2.462E+00	2.414E+04	2.487E+04	0.90
CE-139	165.86	19291	80.00*	6.545E+00	2.766E+03	2.963E+04	2.48
PB-210	46.54	60732	4.25*	1.289E+00	8.321E+05	8.662E+05	1.10
AM-241	59.54	98635	35.90*	3.330E+00	6.194E+04	6.207E+04	0.91

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM11.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 11-JUL-2015 12:14:04 Acquisition date : 11-JUL-2015 12:14:04
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.21

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5515E+00	0.46	
[1.54507+/-0.01390]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RF Approval Date: 7 / 23 / 15

VMS Gamma Spectroscopy Report generated 12-JUL-2015 04:54:20

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM11__336196.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 336196 Sptrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 11-JUL-2015 12:14:04

---- Sample Decay/Count Information ----

Sample Date : 11-JUL-2015 12:14:04 Acquisition date : 11-JUL-2015 12:14:04
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:04.21

---- Detector Parameters ----

Energy cal. time : 10-MAR-2015 09:04:48 Energy cal. oper.: gamma spec user
 Detector name : GAMMA11 Counting geometry:
 Effic. cal. time : 31-JUL-2014 10:19:09 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	44.89	50	167	0.74	89.47	88	11	8.33E-04	32.8	1.26E+00
2	4	46.66	237	674	1.35	93.01	88	11	3.95E-03	20.3	
3	3	63.41	390	494	0.82	126.53	123	14	6.50E-03	9.7	3.55E+00
4	3	66.44	101	639	1.08	132.59	123	14	1.68E-03	43.0	
5	0	77.19	38	826	1.31	154.09	151	8	6.38E-04	132.4	
6	0	84.11	147	730	1.41	167.94	164	8	2.46E-03	32.8	
7	2	89.99	71	334	0.97	179.71	178	13	1.18E-03	38.6	6.23E-01
8	2	92.73	966	533	1.03	185.19	178	13	1.61E-02	5.0	
9	0	98.25	42	522	1.10	196.22	195	6	7.06E-04	86.5	
10	0	113.33	70	492	1.77	226.40	224	6	1.17E-03	51.3	
11	0	140.11	90	660	1.41	279.98	276	8	1.50E-03	50.5	
12	0	143.71	106	667	0.99	287.18	284	8	1.77E-03	43.1	
13	0	185.89	671	620	1.04	371.57	367	9	1.12E-02	7.8	
14	0	198.38	91	827	2.16	396.55	393	11	1.52E-03	62.5	
15	0	238.72	253	646	1.11	477.25	473	9	4.22E-03	19.1	
16	0	244.32	49	369	1.48	488.45	486	6	8.23E-04	63.2	
17	0	295.88	87	421	1.73	591.59	587	9	1.45E-03	43.9	
18	0	328.44	60	295	1.28	656.73	654	7	9.98E-04	49.4	
19	0	338.88	123	448	3.38	677.61	673	11	2.04E-03	34.7	

20	0	352.45	162	486	1.15	704.75	699	12	2.71E-03	28.2	
21	0	470.91	35	247	2.76	941.72	938	9	5.81E-04	82.9	
22	0	511.51	1322	460	2.47	1022.92	1015	17	2.20E-02	4.6	
23	0	569.82	89	257	1.18	1139.56	1134	12	1.49E-03	37.3	
24	0	583.53	145	278	0.90	1166.98	1159	14	2.42E-03	25.8	
25	0	598.88	131	539	5.49	1197.69	1186	21	2.19E-03	45.1	
26	0	609.57	123	231	1.38	1219.06	1215	9	2.05E-03	24.0	
27	0	630.09	34	188	1.77	1260.10	1254	10	5.62E-04	79.3	
28	0	662.41	226	275	1.11	1324.74	1318	14	3.77E-03	16.9	
29	0	804.61	65	201	3.75	1609.14	1601	14	1.09E-03	47.9	
30	0	911.77	151	145	1.78	1823.45	1816	17	2.51E-03	20.0	
31	0	938.10	19	151	3.50	1876.11	1864	15	3.21E-04	141.8	
32	0	969.87	32	153	1.48	1939.64	1932	13	5.35E-04	81.3	
33	0	1002.17	75	119	1.81	2004.22	1999	12	1.25E-03	31.4	
34	0	1023.70	26	70	1.78	2047.27	2043	9	4.32E-04	61.4	
35	0	1029.36	15	42	0.67	2058.60	2055	6	2.50E-04	73.0	
36	0	1065.07	37	96	0.61	2130.00	2124	11	6.24E-04	53.3	
37	3	1116.69	46	76	2.46	2233.23	2227	25	7.64E-04	41.8	2.34E+00
38	3	1120.55	71	74	2.47	2240.95	2227	25	1.19E-03	30.7	
39	0	1171.72	45	84	3.49	2343.26	2335	13	7.47E-04	44.8	
40	0	1461.64	80	60	1.43	2922.93	2915	14	1.34E-03	23.2	
41	0	1569.22	28	64	4.49	3138.00	3130	18	4.69E-04	68.9	
42	0	1681.35	64	46	10.75	3362.16	3350	26	1.07E-03	31.4	
43	0	1699.47	22	27	1.88	3398.38	3394	10	3.64E-04	49.6	
44	0	1765.55	52	42	2.86	3530.47	3523	13	8.61E-04	29.4	
45	0	1778.61	29	43	0.54	3556.58	3548	17	4.75E-04	55.7	
46	0	1816.14	16	31	2.89	3631.59	3622	14	2.62E-04	79.9	
47	0	1858.42	32	65	7.65	3716.11	3700	24	5.30E-04	69.8	
48	4	1869.86	28	25	3.21	3738.96	3731	26	4.68E-04	45.2	1.32E+00
49	4	1875.94	32	25	3.21	3751.12	3731	26	5.29E-04	35.1	
50	0	1965.72	44	28	7.88	3930.56	3918	22	7.25E-04	34.3	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration VerificationInstrument: GAMMA 11Calibration Date: 7/16/2015Geometry: CANManufacturer Standard Id: 96485GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.207E+04	9.73
Cs-137	661.7	0.851	735.7	2.3365E+04	2.487E+04	6.44
Co-60	1173.2	0.9985	1383	3.7435E+04	3.763E+04	0.52
Co-60	1332.5	0.9998	1385	3.7440E+04	3.811E+04	1.79

Prepared By: R. FuterDate: 7/28/15Reviewed By: M. StampDate: 7/24/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma v1

Date Performed: 7/16/15

Performed By: RF

High Voltage Power Supply Model No. <u>TC450</u> High Voltage <u>2.8KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.779</u> Time Constant <u>6.44K</u> Input polarity <u>Positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>ND579</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>3F7:1</u>	

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 28

Geometry: Cap

- 1) Is all calibration standard information enclosed for:
the primary standard certificate?
the secondary standard(s) documentation?
the nuclide library used?
the VMS certificate file?

YES	NO	Comments
☒		1738
☒		1701
☒		
☒		

- 2) Is the energy calibration graph included?

☒		

- 3) Is the detector efficiency curve printout included?

☒		

- 4) Is the efficiency calibration report included and reviewed?

☒		

- 5) Is the raw count data included for:
the calibration peak report?
the calibration verification PEAK report?
the calibration verification NID report?
the last instrument background?

☒		
☒		
☒		
☒		

- 6) Are the calibration verification calculations included?

☒		

- 7) Are the instrument settings included:
amp, HVPS, ADC settings?

☒		

Prepared By: R. Fisher

Date: 7/28/15

Reviewed By: M. Stamp

Date: 8/5/15

Effective Date: 7/27/15



Eckert & Ziegler

Analytics

1738

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Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1998, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Haff
J. S. Haff, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Ziegler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Reference Date: 01-Apr-2014

Product Code: MK-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.880E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.996E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

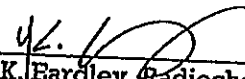
Page 1 of 2

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 
K. Eardley, Radiochemist

QC Approved: 
A. Chen, Spectroscopist

Date: 2014414



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zelger Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

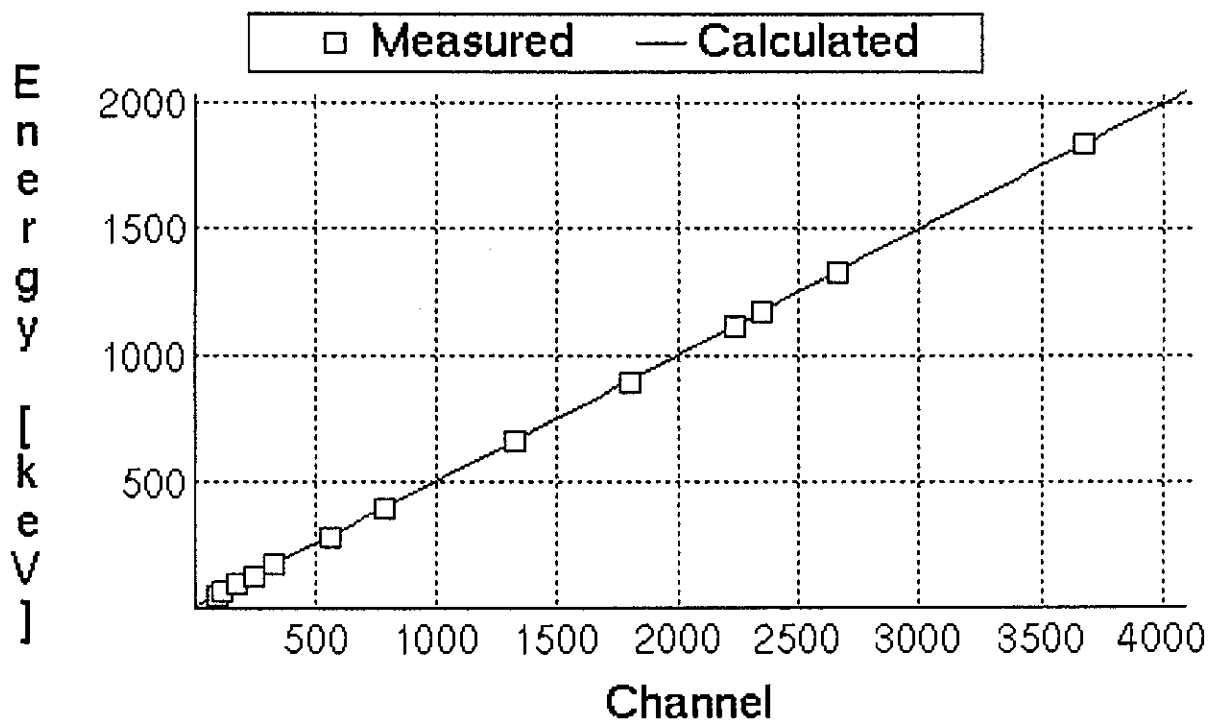
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
			*		59.54	35.90
					0.00	0.00

Title: CAN 100218
 Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



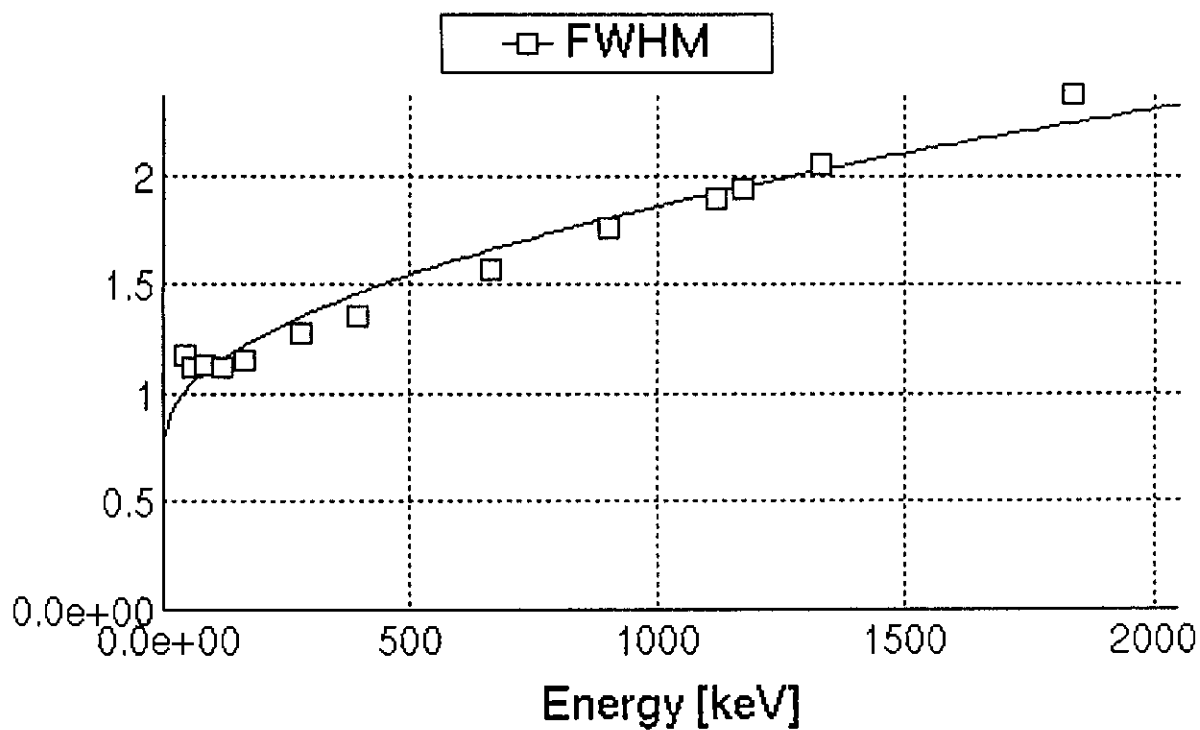
Datasource:

Energy = $-7.803\text{e-}02 \text{ keV} + 4.999\text{e-}01 * \text{Ch} + -6.354\text{e-}09 * \text{Ch}^2$ [CHISQ = $9.474\text{e-}04$]

FWHM = $7.778\text{e-}01 \text{ keV} + 3.419\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $7.637\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

energy calibration r28 8/14/15



Datasource:

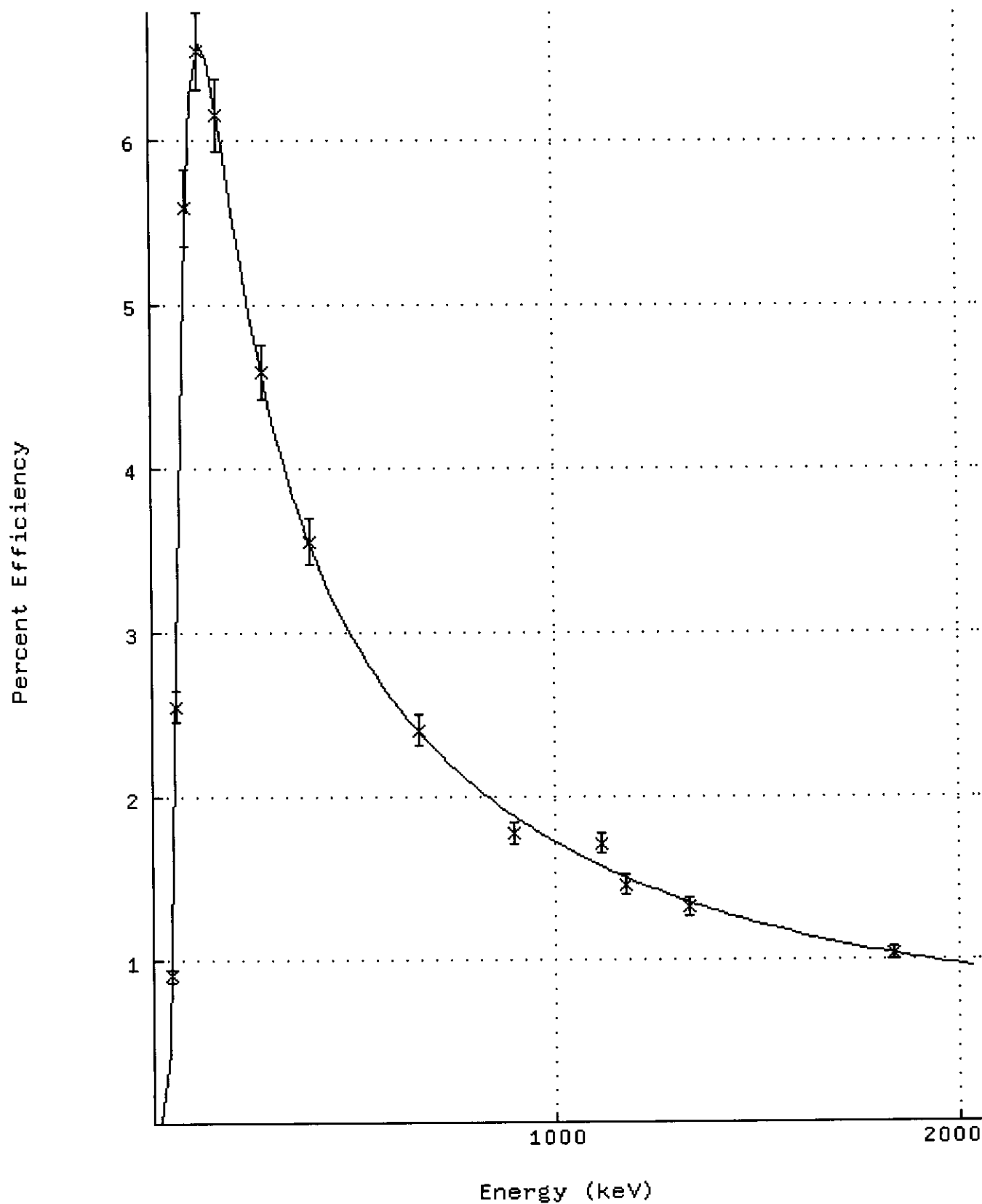
Energy = $-7.803\text{e-}02 \text{ keV} + 4.999\text{e-}01 * \text{Ch} + -6.354\text{e-}09 * \text{Ch}^2$ [CHISQ = $9.474\text{e-}04$]

FWHM = $7.778\text{e-}01 \text{ keV} + 3.419\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $7.637\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

shape calibration r28 5/14/15

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM28_CAN.CNF; 9
Calib Date: 27-JUL-2015 07:57
Detector : GAMMA28 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = -7.8032\text{E-}02 + 0.4999 \cdot \text{Channel} + -6.3544\text{E-}09 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.14	46.54	46.48	0.056
2	119.20	59.54	59.51	0.034
3	176.26	88.03	88.03	-0.002
4	244.38	122.06	122.08	-0.023
5	332.02	165.86	165.89	-0.034
6	558.74	279.20	279.23	-0.029
7	783.80	391.70	391.73	-0.029
8	1323.82	661.66	661.67	-0.013
9	1796.67	898.04	898.04	0.003
10	2231.79	1115.60	1115.54	0.064
11	2347.21	1173.23	1173.23	0.000
12	2665.84	1332.49	1332.50	-0.012
13	3673.29	1836.06	1836.07	-0.014

FWHM Calibration Report

$$\text{FWHM} = 0.7778 + 3.4188\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.17	1.01	0.163
2	59.54	1.11	1.04	0.072
3	88.03	1.13	1.10	0.029
4	122.06	1.12	1.16	-0.033
5	165.86	1.16	1.22	-0.062
6	279.20	1.27	1.35	-0.078
7	391.70	1.36	1.45	-0.097
8	661.66	1.56	1.66	-0.094
9	898.04	1.76	1.80	-0.041
10	1115.60	1.90	1.92	-0.022
11	1173.23	1.94	1.95	-0.006
12	1332.49	2.05	2.03	0.028
13	1836.06	2.38	2.24	0.139

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.014	0.8200	-7.4901E-02	-1.8143E-02	6.6255E-02	-3.0081E-02

Average Deviation = 1.86 % Reduced Chi-Square = 1.31

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	9.08E-03	3.95E-04	9.12E-03	-0.11	-0.48
2	59.54	2.54E-02	9.56E-04	2.53E-02	0.16	0.59
3	88.03	5.57E-02	2.30E-03	5.55E-02	0.10	0.42
4	122.06	6.53E-02	2.33E-03	6.57E-02	-0.18	-0.65
5	165.86	6.14E-02	2.19E-03	6.18E-02	-0.19	-0.68
6	279.20	4.58E-02	1.66E-03	4.52E-02	0.32	1.18
7	391.70	3.55E-02	1.41E-03	3.54E-02	0.08	0.31
8	661.66	2.40E-02	9.78E-04	2.39E-02	0.10	0.41
9	898.04	1.77E-02	6.67E-04	1.88E-02	-1.56	-5.89
10	1115.60	1.71E-02	6.10E-04	1.57E-02	2.30	8.20
11	1173.23	1.46E-02	5.76E-04	1.50E-02	-0.79	-3.13
12	1332.49	1.32E-02	5.22E-04	1.35E-02	-0.54	-2.13
13	1836.06	1.03E-02	3.89E-04	1.03E-02	-0.03	-0.10

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM28_CAN_338011.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 338005 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 27-JUL-2015 07:08:18
 Decay time : 116 19:08:18.26 % dead time : 1.9%
 Elapsed live time: 0 00:30:00.00 Elapsed real time: 0 00:30:34.18

---- Detector Parameters ----

Energy cal. time : 14-MAY-2015 11:45:57 Energy cal. oper.: gamma spec user
 Detector name : GAMMA28 Counting geometry: CAN
 Effic. cal. time : 27-JUL-2015 07:57:17 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	4	36.36	4359	704	1.36	72.89	69	32	2.42E+00	3.3	3.14E+02
2	4	37.87	4566	1906	1.45	75.92	69	32	2.54E+00	3.8	
3	4	40.01	2918	2606	1.09	80.20	69	32	1.62E+00	5.0	
4	4	42.31	2723	3756	1.10	84.80	69	32	1.51E+00	5.4	
5	4	46.39	19663	10331	1.48	92.95	69	32	1.09E+01	1.1	
6	0	59.38	35881	23084	1.20	118.95	112	14	1.99E+01	1.0	
7	10	67.64	2186	18548	2.74	135.46	129	23	1.21E+00	12.9	3.73E+00
8	10	70.64	1862	13016	1.37	141.47	129	23	1.03E+00	11.0	
9	10	72.67	2362	13500	1.38	145.54	129	23	1.31E+00	8.8	
10	9	83.60	2683	29058	2.57	167.39	160	22	1.49E+00	13.9	1.28E+01
11	9	85.57	2801	20655	1.76	171.34	160	22	1.56E+00	13.3	
12	9	87.97	93859	11832	1.21	176.14	160	22	5.21E+01	0.4	
13	0	101.76	480	13322	2.10	203.73	201	10	2.67E-01	45.1	
14	0	122.03	52628	17063	1.23	244.28	238	13	2.92E+01	0.7	
15	0	136.48	6521	9878	1.17	273.18	269	9	3.62E+00	3.0	
16	0	165.86	51185	12710	1.29	331.95	326	13	2.84E+01	0.6	
17	0	255.22	1628	6869	1.28	510.72	506	10	9.05E-01	9.8	
18	0	261.83	121	5124	0.60	523.94	521	8	6.72E-02	103.0	
19	0	279.20	25518	8012	1.36	558.69	553	13	1.42E+01	1.0	
20	0	391.71	37122	7375	1.42	783.75	776	16	2.06E+01	0.7	
21	0	465.17	142	2886	1.40	930.72	928	7	7.89E-02	63.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	511.11	4210	6599	2.41	1022.61	1015	19	2.34E+00	4.9	
23	0	540.87	150	2209	1.81	1082.14	1080	7	8.34E-02	52.6	
24	0	555.32	81	2187	1.51	1111.07	1108	7	4.47E-02	97.0	
25	0	638.98	81	2746	1.25	1278.42	1277	8	4.49E-02	112.6	
26	0	661.68	32148	5973	1.61	1323.83	1317	16	1.79E+01	0.8	
27	0	698.30	113	2393	1.44	1397.09	1395	7	6.28E-02	72.5	
28	0	733.81	138	2254	1.85	1468.14	1465	8	7.65E-02	59.7	
29	0	758.70	36	2251	0.75	1517.92	1517	8	1.98E-02	231.0	
30	0	814.06	647	3285	2.09	1628.67	1623	12	3.59E-01	18.2	
31	0	831.83	75	2241	2.46	1664.23	1662	8	4.19E-02	109.0	
32	0	898.08	42207	6902	1.75	1796.76	1787	20	2.34E+01	0.7	
33	0	936.01	84	2558	0.64	1872.64	1870	9	4.66E-02	109.3	
34	0	1038.60	81	1450	1.06	2077.87	2075	8	4.52E-02	81.7	
35	0	1115.61	33583	3579	1.85	2231.93	2222	20	1.87E+01	0.7	
36	0	1173.31	35826	2376	1.97	2347.37	2338	20	1.99E+01	0.6	
37	0	1223.42	35	584	1.42	2447.62	2446	8	1.92E-02	122.4	
38	0	1280.11	45	354	1.11	2561.02	2558	6	2.49E-02	68.5	
39	0	1324.71	605	1306	2.41	2650.25	2641	15	3.36E-01	13.7	
40	0	1332.59	32517	1947	2.06	2666.01	2656	21	1.81E+01	0.7	
41	0	1443.16	63	551	0.86	2887.21	2883	9	3.50E-02	68.4	
42	0	1605.15	33	1067	0.61	3211.30	3207	11	1.82E-02	193.9	
43	0	1776.14	30	296	5.43	3553.38	3543	15	1.67E-02	126.5	
44	0	1836.19	25990	766	2.37	3673.52	3662	24	1.44E+01	0.7	
45	0	1860.66	23	130	0.89	3722.48	3719	10	1.28E-02	95.1	
46	0	1916.68	32	175	6.64	3834.55	3825	17	1.80E-02	96.2	
47	0	1996.78	38	129	1.04	3994.80	3988	13	2.09E-02	64.7	

```

*****
*                               GEL Laboratories LLC                      *
*                               2040 Savage Road                        *
*                               Charleston, SC 29407                   *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM28_CAN.CNF;2
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM28.CNF;194
                   Background date   : 26-JUL-2015 10:07:00
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 28-JUL-2015 10:25:18
Sample ID        : VER_GAM28_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM28              Detector geometry: CAN
Elapsed live time: 0 00:30:00.00      Elapsed real time: 0 00:30:16.29 0.9%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID         :                    Detector SN#       :
Matrix Spike ID  :                    LCS ID             :
*****

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	36.74	1007	4209	1.66	73.65	72	6	5.59E-01	10.5	
2	2	44.12	294	3402	1.22	88.42	87	14	1.63E-01	26.1	9.02E+00
3	2	46.51*	17151	7180	1.14	93.20	87	14	9.53E+00	1.1	
4	0	59.51	36651	12963	1.17	119.20	113	13	2.04E+01	0.8	
5	0	66.57	25	4546	1.15	133.33	132	5	1.37E-02	409.0	
6	0	79.54	208	7315	1.43	159.26	157	7	1.16E-01	68.3	
7	0	88.07	56298	12213	1.18	176.33	170	13	3.13E+01	0.6	
8	0	122.13	21389	5936	1.22	244.47	239	12	1.19E+01	1.0	
9	0	131.53	126	2398	1.00	263.27	261	6	6.99E-02	62.2	
10	0	136.54	2553	4061	1.23	273.30	269	10	1.42E+00	5.1	
11	1	165.92	8510	2436	1.20	332.07	326	13	4.73E+00	1.4	1.44E+00
12	1	167.76	287	1854	1.34	335.76	326	13	1.60E-01	31.2	
13	0	255.30	25	2578	0.67	510.87	508	8	1.40E-02	351.1	
14	0	279.00	156	2255	0.67	558.28	555	8	8.65E-02	53.4	
15	0	326.32	165	1695	1.97	652.94	650	7	9.17E-02	42.1	
16	0	391.75	4219	2847	1.45	783.84	778	12	2.34E+00	3.0	
17	0	510.93*	1212	3107	2.33	1022.25	1014	17	6.73E-01	10.9	
18	0	631.59	94	873	1.33	1263.64	1261	6	5.24E-02	50.6	
19	0	661.73*	32390	2898	1.60	1323.93	1315	18	1.80E+01	0.7	
20	0	841.16	32	1352	0.95	1682.89	1682	8	1.76E-02	2201.1	
21	0	898.08*	4088	2609	1.62	1796.76	1791	13	2.27E+00	3.0	
22	0	1115.64	11849	2240	1.83	2231.99	2223	19	6.58E+00	1.3	
23	0	1173.31*	31910	1430	1.94	2347.36	2337	21	1.77E+01	0.6	
24	0	1274.32	21	299	3.47	2549.45	2537	15	1.16E-02	181.3	
25	0	1318.84	53	242	4.51	2638.50	2632	14	2.96E-02	63.4	
26	2	1326.01	152	263	2.45	2652.85	2645	32	8.42E-02	28.3	1.10E+01
27	2	1332.58	28777	277	2.10	2666.00	2645	32	1.60E+01	0.6	
28	0	1381.94	64	159	5.34	2764.75	2757	15	3.56E-02	44.9	
29	0	1422.67	19	172	2.21	2846.24	2838	13	1.03E-02	147.1	
30	0	1484.01	13	132	1.81	2968.95	2965	9	7.19E-03	159.0	
31	0	1499.47	39	271	10.46	2999.88	2993	24	2.16E-02	113.0	
32	0	1560.75	33	202	1.07	3122.48	3114	16	1.81E-02	99.7	
33	3	1633.31	35	30	2.87	3267.63	3265	23	1.94E-02	26.7	5.47E+00
34	3	1636.71	40	87	2.38	3274.43	3265	23	2.21E-02	53.5	

Sample ID : VER_GAM28_CAN

Acquisition date : 28-JUL-2015 10:25:18

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	3	1641.99	44	32	2.16	3285.00	3265	23	2.43E-02	22.2	
36	0	1654.94	47	166	7.80	3310.92	3300	19	2.61E-02	67.4	
37	0	1836.18	2499	166	2.34	3673.51	3662	22	1.39E+00	2.4	
38	1	2026.37*	26	52	2.32	4054.00	4048	18	1.43E-02	56.2	7.47E+00
39	1	2028.87*	30	42	2.32	4059.00	4048	18	1.67E-02	53.6	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2--Sigma %Error
CO-57	122.06	21389	85.60*	6.573E+00	5.708E+03	1.957E+04	1.99
	136.47	2553	10.68	6.543E+00	5.485E+03	1.880E+04	10.15
CO-60	1173.23	31910	99.85	1.503E+00	3.193E+04	3.799E+04	1.27
	1332.49	28777	99.98*	1.349E+00	3.204E+04	3.813E+04	1.21
ZN-65	1115.54	11849	50.60*	1.568E+00	2.242E+04	8.836E+04	2.66
Y-88	898.04	4088	93.70	1.877E+00	3.489E+03	8.057E+04	6.02
	1836.06	2499	99.20*	1.033E+00	3.661E+03	8.452E+04	4.78
CD-109	88.03	56298	3.70*	5.554E+00	4.114E+05	8.498E+05	1.17
SN-113	391.70	4219	64.97*	3.539E+00	2.755E+03	5.050E+04	5.92
CS-137	661.66	32390	85.10*	2.390E+00	2.392E+04	2.466E+04	1.36
CE-139	165.86	8510	80.00*	6.182E+00	2.584E+03	2.941E+04	2.90
PB-210	46.54	17151	4.25*	9.093E-01	6.664E+05	6.945E+05	2.25
AM-241	59.54	36651	35.90*	2.524E+00	6.074E+04	6.087E+04	1.66

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM28.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 26-JUL-2015 10:07:00 Acquisition date : 26-JUL-2015 10:07:00
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.00

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.5076E+00	-2.07	Investigate <i>OK</i>
[1.55950+/-0.02509]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: *RF* Approval Date: 7 / 28 / 15

Sample ID : Bkg

Acquisition date : 26-JUL-2015 10:07:00

VMS Gamma Spectroscopy Report generated 27-JUL-2015 02:47:01

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM28__337968.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 337968 Sptarm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 26-JUL-2015 10:07:00

---- Sample Decay/Count Information ----

Sample Date : 26-JUL-2015 10:07:00 Acquisition date : 26-JUL-2015 10:07:00
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:03.00

---- Detector Parameters ----

Energy cal. time : 14-MAY-2015 11:45:57 Energy cal. oper.: gamma spec user
 Detector name : GAMMA28 Counting geometry:
 Effic. cal. time : 23-JUL-2014 11:06:42 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.65	200	674	1.17	93.48	89	9	3.33E-03	24.6	
2	0	52.89	61	520	1.22	105.97	104	7	1.02E-03	63.1	
3	0	63.33	306	790	1.01	126.85	123	9	5.10E-03	17.5	
4	0	74.70	75	433	1.27	149.59	148	5	1.24E-03	43.6	
5	0	77.67	56	529	1.04	155.54	152	6	9.35E-04	66.2	
6	0	84.21	132	779	1.81	168.61	165	9	2.20E-03	39.0	
7	0	92.53	1073	1148	1.22	185.25	178	14	1.79E-02	7.4	
8	0	99.60	32	531	1.27	199.40	194	7	5.40E-04	119.6	
9	0	139.55	33	481	0.71	279.32	278	6	5.56E-04	105.3	
10	0	144.06	214	903	1.49	288.35	284	12	3.57E-03	29.0	
11	0	182.27	61	407	0.91	364.78	362	6	1.02E-03	54.4	
12	0	185.70	735	700	1.34	371.63	368	11	1.23E-02	7.9	
13	0	205.24	44	362	0.66	410.74	409	5	7.36E-04	66.4	
14	0	231.00	60	471	1.60	462.25	459	8	1.00E-03	63.7	
15	0	238.31	253	756	1.51	476.89	471	12	4.22E-03	22.6	
16	0	247.99	50	693	3.70	496.26	492	12	8.29E-04	106.9	
17	0	322.30	111	594	5.71	644.91	638	14	1.85E-03	47.6	
18	0	339.30	84	676	4.56	678.92	671	15	1.40E-03	68.9	
19	0	345.89	71	414	3.60	692.09	687	11	1.18E-03	57.2	

20	0	351.08	33	401	1.86	702.47	700	9	5.47E-04	111.0
21	0	386.31	14	370	3.51	772.96	769	10	2.40E-04	253.8
22	0	510.78	1394	558	2.85	1021.96	1014	18	2.32E-02	4.8
23	4	583.16	112	246	2.35	1166.76	1159	22	1.86E-03	31.6
24	4	588.74	42	85	2.35	1177.91	1159	22	7.08E-04	39.3
25	0	655.44	12	159	0.57	1311.35	1311	8	1.97E-04	185.6
26	0	661.38	147	244	1.50	1323.24	1318	12	2.45E-03	22.8
27	0	669.43	38	105	1.13	1339.33	1336	6	6.33E-04	45.6
28	5	692.80	89	251	2.70	1386.10	1377	23	1.48E-03	42.0
29	5	697.39	62	143	2.21	1395.28	1377	23	1.03E-03	37.8
30	0	701.04	40	164	1.58	1402.58	1400	8	6.72E-04	56.8
31	0	712.57	15	241	0.74	1425.63	1422	12	2.47E-04	211.8
32	0	719.43	14	155	0.47	1439.36	1436	9	2.25E-04	169.9
33	0	728.37	41	223	3.01	1457.24	1448	14	6.79E-04	79.9
34	0	765.91	24	120	1.03	1532.34	1529	8	3.92E-04	83.3
35	0	785.46	27	125	1.18	1571.46	1567	10	4.43E-04	81.2
36	0	802.48	142	134	2.24	1605.50	1599	14	2.37E-03	19.1
37	0	892.68	30	95	0.74	1785.96	1780	10	4.93E-04	64.3
38	0	898.30	33	71	0.77	1797.20	1794	8	5.57E-04	47.1
39	0	909.61	78	154	4.31	1819.81	1813	14	1.29E-03	35.8
40	0	968.53	48	70	2.23	1937.69	1934	8	7.97E-04	33.9
41	0	985.36	68	150	7.04	1971.36	1960	20	1.13E-03	45.8
42	0	1001.52	68	124	2.37	2003.69	1995	15	1.14E-03	37.5
43	0	1088.10	22	74	2.30	2176.90	2171	9	3.67E-04	74.4
44	0	1107.02	52	97	4.46	2214.74	2208	14	8.63E-04	42.9
45	0	1140.60	16	77	1.64	2281.92	2276	9	2.63E-04	104.1
46	0	1172.92	16	108	2.90	2346.58	2336	12	2.73E-04	130.7
47	0	1200.81	25	117	4.11	2402.38	2394	16	4.17E-04	98.3
48	0	1269.88	32	61	0.61	2540.55	2535	12	5.31E-04	51.9
49	0	1374.04	36	82	4.83	2748.93	2742	17	5.96E-04	60.0
50	0	1417.93	15	39	1.67	2836.74	2829	10	2.56E-04	80.6
51	0	1460.01	105	78	1.61	2920.93	2913	17	1.75E-03	21.9
52	0	1763.00	30	39	2.57	3527.10	3520	13	5.00E-04	46.6
53	0	1838.33	58	63	11.05	3677.80	3664	28	9.75E-04	40.5
54	0	1884.50	7	51	3.73	3770.18	3757	15	1.10E-04	242.4
55	0	1951.36	15	46	3.38	3903.94	3894	14	2.52E-04	98.3

Sample ID : Bkg

Acquisition date : 26-JUL-2015 10:07:00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
56	0	1962.93	37	38	4.41	3927.08	3916	19	6.17E-04	43.2	
57	1	2021.87	21	23	2.32	4045.00	4037	19	3.58E-04	53.4	2.01E+00
58	1	2024.87	30	9	2.32	4051.00	4037	19	5.00E-04	29.2	
59	0	2029.26	20	10	2.45	4059.78	4056	9	3.39E-04	34.8	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 28

Calibration Date: 7/27/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.087E+04	7.60
Cs-137	661.7	0.851	735.7	2.3365E+04	2.466E+04	5.54
Co-60	1173.2	0.9985	1383	3.7435E+04	3.799E+04	1.48
Co-60	1332.5	0.9998	1385	3.7440E+04	3.813E+04	1.84

Prepared By: R. Fuen

Date: 7/28/15

Reviewed By: M. Stamp

Date: 8/5/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 28

Date Performed: 7/28/15

Performed By: RF

High Voltage Power Supply Model No. <u>3106 D</u> High Voltage <u>3.00 kV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>20</u> Fine Gain <u>1.196</u> Time Constant <u>4 μsec</u> Input polarity <u>positive</u> BSLR rate <u>NA</u> BSLR mode <u>NA</u> Threshold <u>NA</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>ND556</u> Address <u>2C2: 1</u>	

GEL Laboratories, LLC2040 Savage Road, Charleston, SC 29414
(843)556-8171**Gamma Spectrometer Geometry Calibration Package**Detector: Gamma 36Geometry: Can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1782
the secondard standard(s) documentation?	☒		1738
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R. FatchDate: 6/3/16Reviewed By: mmmmmmmmmmDate: 6-9-16Effective Date: 6-1-16

CERTIFICATE OF CALIBRATION

Standard Reference Source

SRS Number: 103141B
Source Description: 100 mL Solid in Aluminum Can
Product Code: 8403-EG-SD
Customer: GEL Laboratories, LLC
P.O. Number: GEL1613700, Item 3

This standard radionuclide source was prepared from an aliquot measured gravimetrically from a master radionuclide solution calibrated with a germanium gamma-ray spectrometer system. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using germanium gamma-ray spectrometry. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology (NIST) through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Density of solid matrix: 1.17 g/cm³ ± 3 %.

Reference Date: 01-April-2016 12:00 PM EST

MGS Mixture

Isotope	Gamma-Ray Energy, keV	Half-Life, d	Activity, Bq	Flux, s ⁻¹	Uncertainty			Calibration Method**
					u _A , %	u _B , %	U, %*	
Pb-210	46.5	8.109E+03	2.877E+04	1.223E+03	0.1	2.1	4.2	4π LS
Am-241	59.5	1.580E+05	2.262E+03	8.120E+02	0.1	1.8	3.6	4π LS
Cd-109	88.0	4.614E+02	3.136E+04	1.160E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	7.785E+02	6.664E+02	0.4	1.7	3.4	HPGe
Ce-139	165.9	1.376E+02	1.086E+03	8.688E+02	0.4	1.7	3.6	HPGe
Hg-203	279.2	4.659E+01	2.635E+03	2.149E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.161E+02	1.893E+03	1.230E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	9.294E+02	7.909E+02	0.7	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	3.113E+03	2.917E+03	0.7	1.7	3.7	HPGe
Y-88	1836.1			3.089E+03	0.7	1.7	3.7	
Co-60	1173.2	1.925E+03	1.460E+03	1.458E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5			1.459E+03	0.7	1.8	3.9	

Mixed Gamma (MGS) master solution is EZA's eight isotope mixture which is calibrated quarterly and consists of Cd-109, Co-57, Ce-139, Hg-203, Sn-113, Cs-137, Y-88, and Co-60. *Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results." **Calibration Methods: 4π LS - 4π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber.

(Certificate continued on reverse side)

SRS Number: 103141B

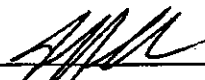
This source was wipe tested in its inactive areas with leak test results < 185 Bq (5 nCi) of removable activity per ISO 9978:1992.

Source Prepared by:



Z. Dimitrova, Radiochemist

QC Approved by:



J. Lahr, Spectroscopist

Date: 13-MAY-16

Standard Logbook

Serial ID: 1782 **Open/Reference Date:** 01-APR-16
Name: Mixed Gamma CAN **Received:** 01-APR-16
Type: Source Material **Expires:** 01-APR-17
Employee: Maggie Stamps **Verified:** 20-MAY-16
Supplier: Eckert & Zeigler Analytics
Description: 103141B
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0068951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty* , %			Calibration Method*
					Type			
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+08	————	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	————	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Latus
J. S. Latus, Spectroscopist

Date: 14 MAY 15

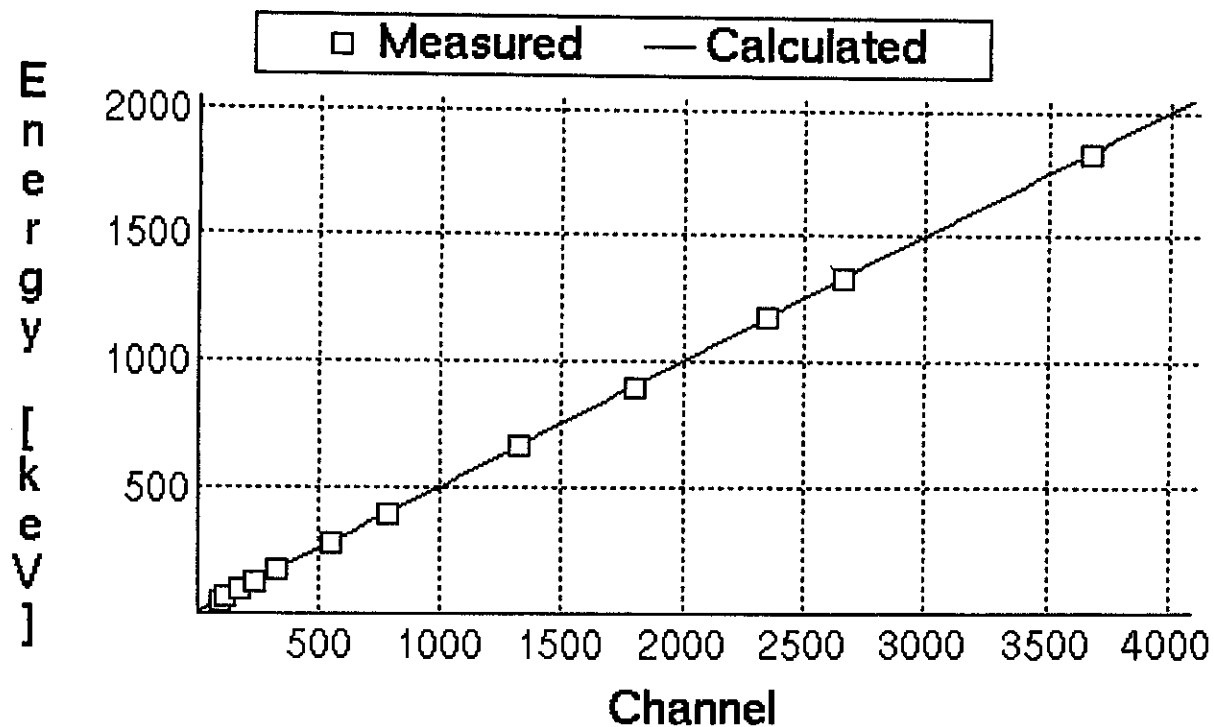
Title: Mixed Gamma + Am-241 & Pb-210

Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 103141B
Quantity: 1.00

Assay date: 1-APR-2016 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1223	4.20	4.3	Yes
AM-241	432.60Y	59.5	812	3.60	35.9	Yes
CD-109	461.40D	88.0	1160	4.10	3.7	Yes
CO-57	271.74D	122.1	666	3.40	85.6	Yes
CE-139	137.64D	165.9	869	3.60	80.0	Yes
HG-203	46.59D	279.2	2149	3.50	81.6	Yes
SN-113	115.09D	391.7	1230	3.90	65.0	Yes
CS-137	30.08Y	661.7	791	4.10	85.1	Yes
Y-88	106.63D	898.0	2917	3.70	93.7	Yes
CO-60	1925.28D	1173.2	1458	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1459	3.90	100.0	Yes
Y-88	106.63D	1836.1	3089	3.70	99.2	Yes



Datasource:

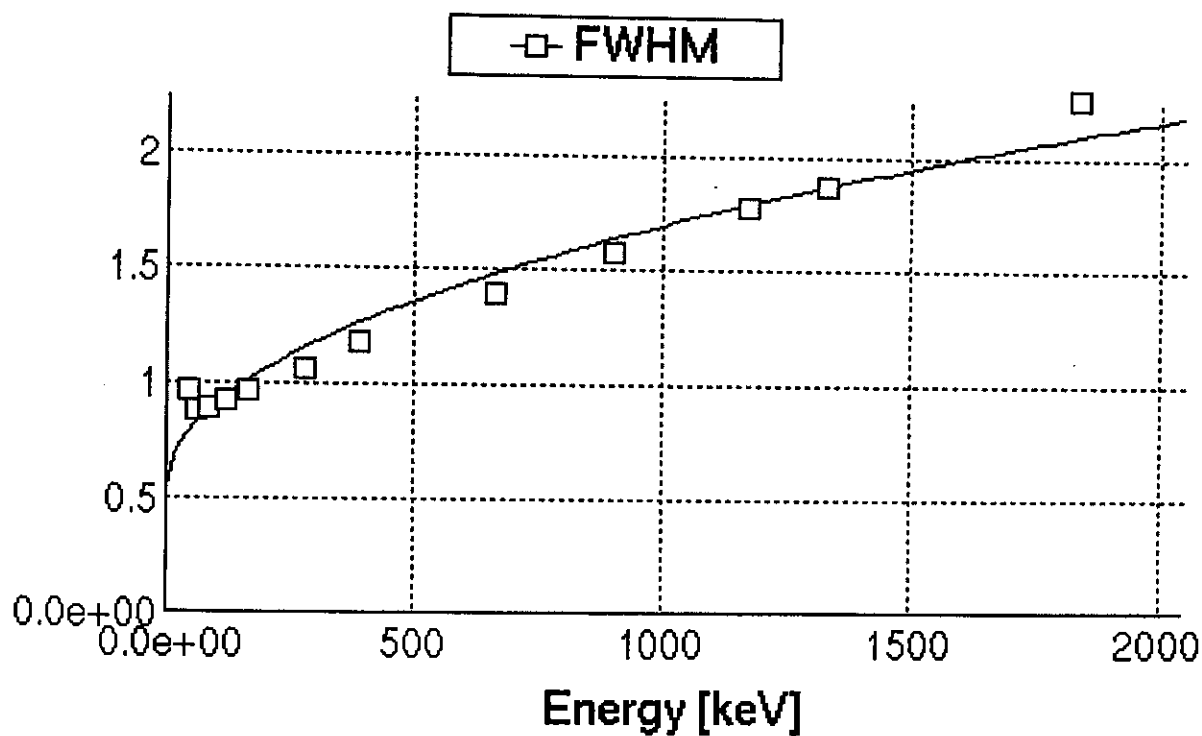
Energy = $2.117\text{e-}02 \text{ keV} + 4.999\text{e-}01 * \text{Ch} + 6.021\text{e-}08 * \text{Ch}^2$ [CHISQ = $7.467\text{e-}03$]

FWHM = $5.405\text{e-}01 \text{ keV} + 3.653\text{e-}02 * \text{E}^{1/2}$ [CHISQ = $8.804\text{e-}03$]

Lo Tail = $0.000\text{e+}00 \text{ keV} + 0.000\text{e+}00 * \text{E}$ [CHISQ = $0.000\text{e+}00$]

gam36 energy calibration

5/12/16



Datasource:

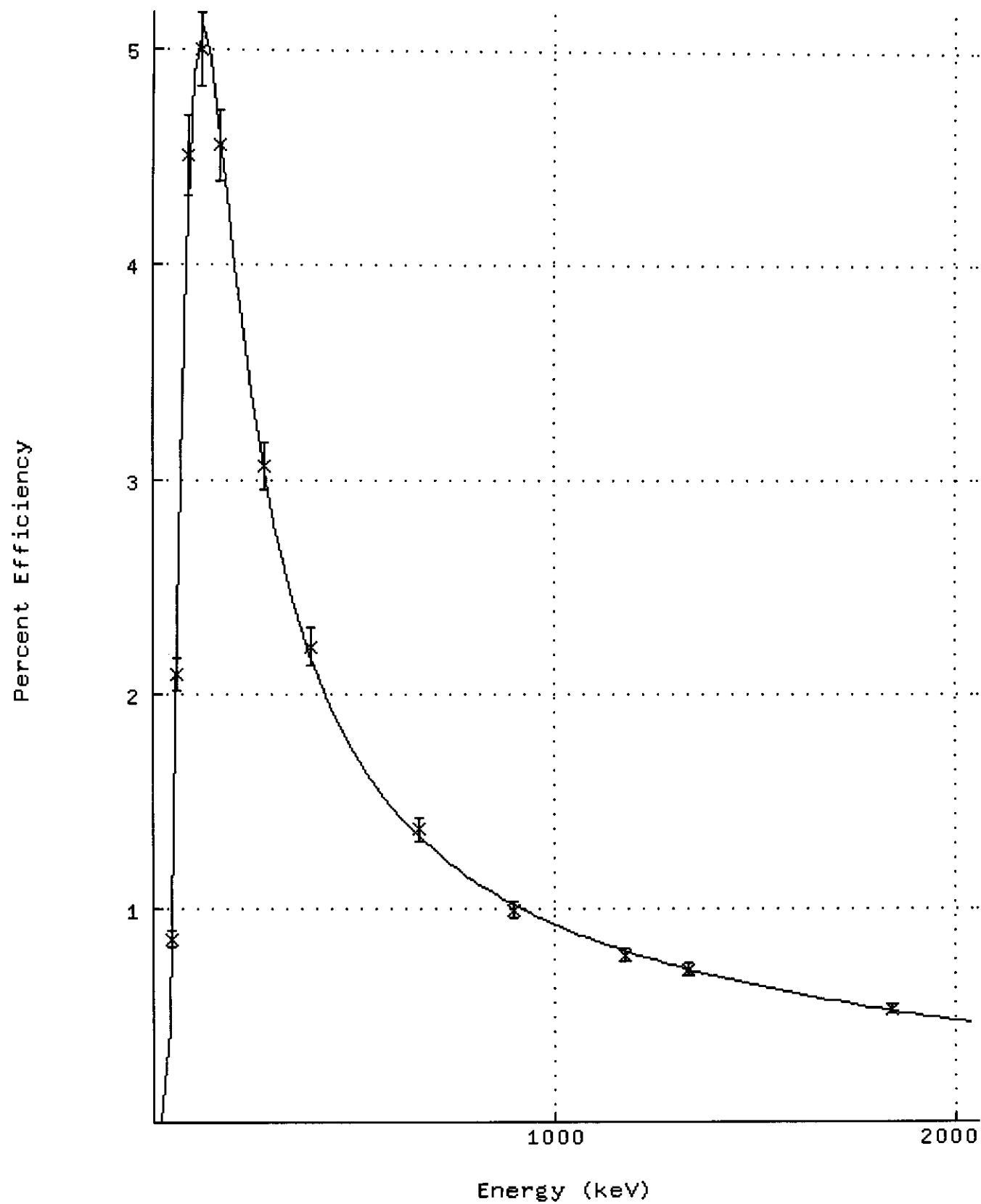
Energy = $2.117e-02 \text{ keV} + 4.999e-01 * \text{Ch} + 6.021e-08 * \text{Ch}^2$ [CHISQ = $7.467e-03$]

FWHM = $5.405e-01 \text{ keV} + 3.653e-02 * E^{1/2}$ [CHISQ = $8.804e-03$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

gam36 shape calibration
J/12/16

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM36_CAN.CNF;7
Calib Date: 1-JUN-2016 09:39;
Detector : GAMMA36 Geometry : CAN
Fit type : 5 Deg. Linear



$$\text{Energy} = 2.1168\text{E-}02 + 0.4999 \cdot \text{Channel} + 6.0213\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.02	46.54	46.53	0.014
2	119.07	59.54	59.55	-0.012
3	176.07	88.03	88.05	-0.017
4	244.10	122.06	122.06	-0.003
5	331.70	165.86	165.86	0.003
6	558.37	279.20	279.19	0.006
7	783.36	391.70	391.69	0.009
8	1323.20	661.66	661.65	0.011
9	1795.85	898.04	898.04	0.003
10	2346.04	1173.23	1173.24	-0.008
11	2664.42	1332.49	1332.51	-0.015
12	3670.86	1836.06	1836.05	0.009

FWHM Calibration Report

$$\text{FWHM} = 0.5405 + 3.6532\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	0.96	0.79	0.172
2	59.54	0.88	0.82	0.061
3	88.03	0.89	0.88	0.009
4	122.06	0.92	0.94	-0.023
5	165.86	0.97	1.01	-0.042
6	279.20	1.07	1.15	-0.085
7	391.70	1.18	1.26	-0.086
8	661.66	1.39	1.48	-0.090
9	898.04	1.57	1.64	-0.064
10	1173.23	1.78	1.79	-0.008
11	1332.49	1.87	1.87	-0.004
12	1836.06	2.27	2.11	0.159

$$\text{Eff} = \exp(a1 \cdot E + a2 + a3/E + a4/E^{**2} + a5/E^{**3} + a6/E^{**4} + a7/E^{**5})$$

a1	a2	a3	a4	a5	a6	a7
-1.8783E-04	-2.064	242.1	-2.4051E+04	8.8218E+05	-1.3347E+07	0.0000E+00

Reduced Chi-Square = 0.575

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	8.57E-03	3.65E-04	8.55E-03	0.07	0.29
2	59.54	2.09E-02	7.65E-04	2.11E-02	-0.29	-1.05
3	88.03	4.50E-02	1.85E-03	4.34E-02	0.91	3.73
4	122.06	4.99E-02	1.71E-03	5.10E-02	-0.61	-2.10
5	165.86	4.55E-02	1.65E-03	4.63E-02	-0.49	-1.78
6	279.20	3.07E-02	1.08E-03	3.02E-02	0.40	1.41
7	391.70	2.22E-02	8.72E-04	2.18E-02	0.50	1.95
8	661.66	1.37E-02	5.69E-04	1.33E-02	0.59	2.46
9	898.04	9.94E-03	3.70E-04	1.02E-02	-0.67	-2.50
10	1173.23	7.81E-03	3.08E-04	8.03E-03	-0.71	-2.79
11	1332.49	7.13E-03	2.82E-04	7.14E-03	-0.04	-0.15
12	1836.06	5.29E-03	1.98E-04	5.20E-03	0.46	1.73

VMS Gamma Spectroscopy Report generated 1-JUN-2016 12:58:35

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM36_CAN_372142.CNF

---- Sample Information ----

Sample Title : CAN 103141B
 Sample ID : 103141B Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 371926 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2016 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2016 12:00:00. Acquisition date : 31-MAY-2016 07:41:27
 Decay time : 59 19:41:27.06 % dead time : 1.8%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:05.50

---- Detector Parameters ----

Energy cal. time : 12-MAY-2016 13:49:35 Energy cal. oper.: gamma spec user
 Detector name : GAMMA36 Counting geometry: CAN
 Effic. cal. time : 1-JUN-2016 09:39:12. Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : LINEAR Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	8	43.91	13442	6533	1.67	87.78	83	14	3.73E+00	2.1	7.85E+02
2	8	46.51	37560	13090	1.04	92.99	83	14	1.04E+01	0.7	
3	0	50.38	504	21119	1.86	100.73	98	6	1.40E-01	45.7	
4	0	59.50	62264	32739	0.86	118.97	114	9	1.73E+01	0.7	
5	4	68.06	935	18624	1.23	136.10	133	17	2.60E-01	22.2	7.51E+00
6	4	70.84	5701	26264	1.24	141.65	133	17	1.58E+00	4.9	
7	4	72.88	8405	18874	0.91	145.73	133	17	2.33E+00	2.7	
8	9	82.78	7524	39014	2.06	165.54	160	23	2.09E+00	4.8	7.96E+01
9	9	85.32	4567	30089	1.41	170.61	160	23	1.27E+00	6.7	
10	9	88.02	171898	18894	0.95	176.01	160	23	4.77E+01	0.3	
11	1	120.01	288	6084	0.94	240.00	239	13	8.00E-02	32.7	3.81E+00
12	1	122.06	102922	15969	0.92	244.09	239	13	2.86E+01	0.4	
13	0	136.43	13043	23796	0.93	272.85	268	10	3.62E+00	2.4	
14	0	165.86	106100	20190	1.05	331.70	327	11	2.95E+01	0.4	
15	0	255.18	3076	10861	1.07	510.35	506	9	8.54E-01	6.4	
16	0	279.18	97652	11024	1.14	558.35	553	11	2.71E+01	0.4	
17	0	391.69	68698	8872	1.21	783.36	777	13	1.91E+01	0.5	
18	0	449.80	74	5031	2.70	899.57	897	8	2.04E-02	167.5	
19	0	510.91	1231	7241	2.63	1021.78	1015	14	3.42E-01	14.9	
20	0	661.66	38882	7315	1.45	1323.23	1317	13	1.08E+01	0.7	
21	0	813.98	1466	3556	1.66	1627.78	1623	11	4.07E-01	8.3	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	898.06	71151	5646	1.61	1795.90	1788	16	1.98E+01	0.4	
23	0	960.84	163	2782	1.20	1921.42	1918	8	4.53E-02	56.7	
24	0	1038.54	81	2200	1.45	2076.77	2076	8	2.24E-02	101.3	
25	0	1111.34	129	2130	1.27	2222.30	2219	8	3.58E-02	62.7	
26	0	1173.27	40320	3108	1.82	2346.10	2338	17	1.12E+01	0.6	
27	0	1325.06	1272	1891	2.49	2649.54	2643	14	3.53E-01	7.8	
28	0	1332.55	36850	2285	1.97	2664.51	2657	18	1.02E+01	0.6	
29	0	1341.30	24	907	1.25	2682.01	2679	8	6.68E-03	217.9	
30	0	1374.62	85	1181	3.55	2748.60	2743	11	2.37E-02	78.9	
31	0	1406.27	63	1013	1.30	2811.87	2806	9	1.75E-02	91.8	
32	0	1527.50	53	1232	0.92	3054.19	3051	8	1.46E-02	116.0	
33	0	1578.74	86	1418	1.29	3156.59	3153	8	2.40E-02	76.1	
34	0	1750.42	28	551	1.02	3499.73	3489	17	7.77E-03	193.3	
35	0	1836.13	40043	539	2.29	3671.02	3660	22	1.11E+01	0.5	
36	0	1929.34	75	199	5.23	3857.28	3846	19	2.09E-02	46.3	

VAX/VMS Nuclide Identification Report Generated 1-JUN-2016 09:39:36.65

```

*****
*                                     GEL Laboratories LLC                               *
*                                     2040 Savage Road                               *
*                                     Charleston, SC 29407                          *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM36_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM36_CAN.CNF;34
Sample date       : 1-APR-2015 12:00:00. Acquisition date : 30-MAY-2016 07:35:41
Sample ID        : VER_GAM36_CAN           Sample quantity : 1.00000E+00 SAMPLE
Detector name    : GAM36                 Detector geometry: CAN
Elapsed live time: 0 01:00:00.00          Elapsed real time: 0 01:00:28.60 0.8%
Energy tolerance : 1.50000 keV           Analyst Initials :
Abundance limit  : 75.00000              Sensitivity       : 3.00000
Batch ID        :                        Detector SN#      :
Matrix Spike ID  :                        LCS ID          :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	9	44.08	9254	4177	1.84	88.12	83	14	2.57E+00	2.8	4.68E+02
2	9	46.48*	32825	6502	1.03	92.93	83	14	9.12E+00	0.7	
3	0	59.52	57966	16496	0.83	119.00	114	9	1.61E+01	0.6	
4	0	66.25	330	7807	0.95	132.48	131	5	9.16E-02	40.4	
5	0	88.02*	91950	15971	0.86	176.02	171	10	2.55E+01	0.4	
6	0	98.56*	219	5425	0.97	197.10	196	6	6.07E-02	53.6	
7	0	122.05	36211	8475	0.93	244.09	240	10	1.01E+01	0.7	
8	0	136.45	4685	6607	0.88	272.88	268	10	1.30E+00	3.6	
9	0	155.16	124	3750	1.26	310.29	308	6	3.45E-02	78.5	
10	0	165.87	16042	5861	1.04	331.73	327	10	4.46E+00	1.2	
11	0	218.99	247	4234	1.80	437.97	435	7	6.86E-02	44.1	
12	0	255.28*	466	3922	1.04	510.55	507	8	1.29E-01	23.8	
13	0	279.46	405	3526	1.21	558.90	555	8	1.12E-01	25.9	
14	0	391.78	7280	4329	1.21	783.53	778	12	2.02E+00	2.2	
15	0	434.83	43	2150	1.22	869.63	866	6	1.21E-02	169.3	
16	0	511.23*	1798	4349	2.61	1022.40	1015	16	4.99E-01	8.6	
17	0	529.09	23	2014	1.25	1058.12	1053	8	6.42E-03	337.6	
18	0	661.78	35846	3624	1.43	1323.47	1315	16	9.96E+00	0.6	
19	0	767.75	109	1417	0.88	1535.35	1533	7	3.02E-02	58.3	
20	0	821.72	152	1817	1.78	1643.26	1640	8	4.23E-02	49.2	
21	0	884.82	126	2108	1.56	1769.42	1767	8	3.49E-02	64.0	
22	0	898.23	6441	3908	1.54	1796.24	1790	14	1.79E+00	2.4	
23	0	971.73	22	2209	1.37	1943.19	1936	10	5.98E-03	410.3	
24	0	973.90	102	1627	1.66	1947.53	1945	8	2.82E-02	69.5	
25	0	978.32	55	1665	1.22	1956.37	1954	8	1.52E-02	130.0	
26	0	1115.79	14688	2723	1.79	2231.20	2223	17	4.08E+00	1.2	
27	0	1173.50	34894	1240	1.84	2346.56	2339	16	9.69E+00	0.6	
28	0	1178.77*	66	464	1.39	2357.10	2355	7	1.82E-02	56.0	
29	0	1231.71	26	272	1.34	2462.94	2460	8	7.19E-03	111.8	
30	0	1257.78	35	230	1.47	2515.05	2511	9	9.73E-03	79.8	
31	0	1332.81	31058	469	1.93	2665.04	2656	19	8.63E+00	0.6	
32	0	1368.98	46	271	5.32	2737.34	2730	19	1.28E-02	87.2	
33	0	1416.95	26	126	0.80	2833.22	2829	8	7.28E-03	76.7	
34	0	1665.43	41	128	4.15	3329.86	3322	13	1.15E-02	58.7	

Peak Search Report (continued)

Sample ID : VER_GAM36_CAN

Page : 2

Acquisition date : 1-JUN-2016 08:02:20

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1801.80	36	14	2.82	3602.42	3599	8	9.91E-03	24.8	
36	0	1836.50	3548	142	2.22	3671.76	3661	19	9.86E-01	1.9	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	36211	85.60*	5.095E+00	6.233E+03	1.852E+04	1.42
	136.47	4685	10.68	5.030E+00	6.547E+03	1.945E+04	7.13
CO-60	1173.23	34894	99.85	8.029E-01	3.268E+04	3.810E+04	1.16
	1332.49	31058	99.98*	7.142E-01	3.265E+04	3.808E+04	1.18
ZN-65	1115.54	14688	50.60*	8.402E-01	2.594E+04	8.718E+04	2.32
Y-88	898.04	6441	93.70	1.018E+00	5.068E+03	8.126E+04	4.81
	1836.06	3548	99.20*	5.195E-01	5.169E+03	8.289E+04	3.72
CD-109	88.03	91950	3.70*	4.335E+00	4.304E+05	8.172E+05	0.84
SN-113	391.70	7280	64.97*	2.175E+00	3.867E+03	5.057E+04	4.31
CS-137	661.66	35846	85.10*	1.334E+00	2.370E+04	2.434E+04	1.30
CE-139	165.86	16042	80.00*	4.633E+00	3.250E+03	2.789E+04	2.39
HG-203	70.83	-----	3.69	3.156E+00	-----	Line Not Found	-----
	72.87	-----	6.19	3.327E+00	-----	Line Not Found	-----
	279.20	405	81.56*	3.019E+00	1.233E+02	7.066E+04	51.77
PB-210	46.54	32825	4.25*	8.497E-01	6.824E+05	7.078E+05	1.35
AM-241	59.54	57966	35.90*	2.108E+00	5.752E+04	5.763E+04	1.15

Flag: "*" = Keyline

Sample ID : Bkg Acquisition date : 30-MAY-2016 07:35:41 Page : 1

VMS Gamma Spectroscopy Report generated 31-MAY-2016 00:16:19

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM36__371870.CN

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 371870 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 30-MAY-2016 07:35:41

---- Sample Decay/Count Information ----

Sample Date : 30-MAY-2016 07:35:41 Acquisition date : 30-MAY-2016 07:35:41
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:02.46

---- Detector Parameters ----

Energy cal. time : 12-MAY-2016 13:49:35 Energy cal. oper.: gamma spec user
 Detector name : GAMMA36 Counting geometry:
 Effic. cal. time : 23-MAY-2016 09:32:46 Effic. cal. oper.:

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.38	102	393	0.72	92.72	90	6	1.70E-03	32.4	
2	0	63.27	142	540	0.91	126.52	123	8	2.37E-03	29.5	
3	0	75.09	83	576	0.66	150.16	146	7	1.39E-03	49.2	
4	0	77.25	89	432	0.84	154.48	153	6	1.48E-03	38.7	
5	0	84.70	47	277	0.83	169.38	168	4	7.78E-04	52.8	
6	0	86.88	83	302	1.44	173.74	172	5	1.38E-03	33.6	
7	0	92.55	479	616	1.04	185.08	180	9	7.98E-03	10.4	
8	0	98.38	58	434	0.66	196.74	193	7	9.64E-04	61.3	
9	0	110.06	38	442	0.86	220.09	218	6	6.37E-04	88.5	
10	0	140.06	45	566	0.63	280.10	276	8	7.49E-04	92.8	
11	0	143.89	91	370	1.12	287.75	285	6	1.51E-03	35.4	
12	0	163.57	36	378	0.58	327.12	324	6	5.93E-04	88.1	
13	0	185.88	332	522	1.06	371.75	368	9	5.54E-03	13.6	
14	0	190.54	47	374	1.51	381.07	378	7	7.85E-04	69.6	
15	0	197.33	95	463	0.74	394.64	390	9	1.59E-03	41.9	
16	0	205.44	74	256	0.65	410.86	409	6	1.23E-03	36.2	
17	0	234.92	29	284	1.32	469.82	467	6	4.82E-04	93.9	
18	0	238.64	183	387	1.48	477.26	474	8	3.06E-03	19.9	
19	0	256.76	70	266	1.92	513.51	510	8	1.16E-03	42.2	

20	0	338.25	33	208	0.73	676.49	674	7	5.51E-04	74.5
21	0	351.96	119	223	1.40	703.91	700	9	1.98E-03	24.5
22	0	409.68	30	112	1.38	819.32	817	6	5.02E-04	59.0
23	0	451.35	13	165	0.78	902.66	899	9	2.24E-04	174.9
24	0	510.82	720	332	2.66	1021.58	1014	15	1.20E-02	6.7
25	0	559.14	59	92	2.42	1118.21	1114	9	9.83E-04	32.1
26	0	569.90	38	139	1.58	1139.74	1136	10	6.36E-04	59.8
27	0	583.08	120	159	1.41	1166.08	1158	14	2.00E-03	24.2
28	0	609.22	119	124	1.41	1218.36	1213	12	1.98E-03	20.9
29	0	688.47	36	198	6.83	1376.82	1359	21	5.98E-04	99.8
30	0	695.11	23	150	2.36	1390.10	1385	10	3.76E-04	104.2
31	0	699.65	38	128	1.90	1399.18	1394	10	6.25E-04	59.1
32	0	738.08	18	81	0.70	1476.03	1469	9	3.05E-04	91.6
33	0	795.23	62	55	2.34	1590.30	1585	12	1.03E-03	27.0
34	0	803.17	39	61	1.46	1606.17	1602	9	6.50E-04	39.5
35	0	911.53	60	79	1.09	1822.83	1817	12	9.94E-04	32.8
36	0	939.38	24	33	1.98	1878.51	1875	7	3.96E-04	44.5
37	0	983.23	21	46	2.49	1966.18	1958	11	3.54E-04	65.8
38	0	1104.86	46	44	0.60	2209.35	2202	16	7.61E-04	35.7
39	0	1120.37	29	84	1.33	2240.36	2233	15	4.79E-04	71.5
40	0	1178.81	45	49	4.49	2357.18	2349	17	7.56E-04	38.9
41	0	1238.67	10	28	3.01	2476.84	2472	7	1.66E-04	95.3
42	0	1299.15	41	51	4.42	2597.75	2589	16	6.79E-04	42.5
43	0	1378.42	15	34	0.68	2756.20	2747	11	2.46E-04	82.3
44	0	1460.76	90	23	2.78	2920.78	2912	19	1.50E-03	16.7
45	0	1511.75	7	38	3.73	3022.70	3012	12	1.19E-04	183.3
46	0	1729.43	22	52	7.68	3457.77	3440	26	3.67E-04	92.3
47	0	1765.15	42	33	0.75	3529.17	3520	17	6.94E-04	35.6
48	0	1793.14	9	14	3.34	3585.10	3579	11	1.57E-04	87.8
49	0	1873.38	30	5	3.74	3745.46	3737	18	5.05E-04	24.5
50	2	1900.63	12	4	1.85	3799.91	3798	15	1.98E-04	28.2 1.13E+00
51	2	1903.99	23	11	2.58	3806.63	3798	15	3.90E-04	36.8
52	0	1996.61	6	11	0.93	3991.73	3984	9	9.17E-05	123.8
53	2	2024.35	14	1	2.02	4047.16	4044	17	2.29E-04	30.5 1.01E+00
54	2	2027.70	15	9	2.40	4053.86	4044	17	2.51E-04	49.0

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM36.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 30-MAY-2016 07:35:41 Acquisition date : 30-MAY-2016 07:35:41
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:02.46

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.0208E+00	-9.66	Action <i>OK</i>
[1.14234+/-0.01258]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: *RF* Approval Date: 6 / 3 / 16

Gamma Spectroscopy Calibration Verification

Calibration Date: 6/1/2016

Manufacturer Standard Id: 100218

GEL Standard Id: 1738

Date: 6-9-16

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)566-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 36

Date Performed: 8/13/16

Performed By: RF

High Voltage Power Supply Model No. <u>3105</u> High Voltage <u>4.00kV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>10</u> Fine Gain <u>0.819</u> Time Constant <u>4 μsec</u> Input polarity <u>positive</u> BSLR rate <u>na</u> BSLR mode <u>na</u> Threshold <u>na</u>
ADC Model No. <u>ND579</u> Gain <u>4K</u>	
AIM Module Model No. <u>556B</u> Address <u>10E0.11</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 41

Geometry: can

	YES	NO	Comments
1) Is all calibration standard information enclosed for:			
the primary standard certificate?	☒		1738
the second standard(s) documentation?	☒		1701
the nuclide library used?	☒		
the VMS certificate file?	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for:			
the calibration peak report?	☒		
the calibration verification PEAK report?	☒		
the calibration verification NID report?	☒		
the last instrument background?	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included:			
amp, HVPS, ADC settings?	☒		

Prepared By: R Futch

Date: 1/27/16

Reviewed By: M. Stamp

Date: 1/28/16

Effective Date: 1/26/16



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2015

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					u_A	u_B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+05	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.161E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.409E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by:

K. Eardley
K. Eardley, Radiochemist

QC Approved:

J. S. Laff
J. S. Laff, Spectroscopist

Date:

14 May 15

Standard Logbook

Serial ID: 1738 Open/Reference Date: 01-APR-15
Name: Mixed Gamma CAN Received: 01-APR-15
Type: Source Material Expires: 01-APR-16
Employee: Maggie Stamps Verified: 22-MAY-15
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST

Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* γ ps/gram	This Source γ ps	Uncertainty* , %			Calibration Method*
					Type	u_A	u_B	
Pb-210	46.5	8.109E+03	————	1.218E+03	0.1	1.6	3.2	4 π LS
Am-241	59.5	1.580E+05	————	7.514E+02	0.1	1.6	3.2	4 π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1115.6	2.439E+02	————	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

ANA Form005 Rev. --

MGS Certificate Rev 5, 1 October 2013



RC-S-065-130

Page 1 of 2

Corporate Office

24937 Avenue Tibbitts Valencia, California 91355

Laboratory

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: 4/10
K. Eardley, Radiochemist

QC Approved: 28/11
A. Chen, Spectroscopist

Date: 20/04/14



Standard Logbook

Serial ID: 1701 Open/Reference Date: 01-APR-14
Name: Mixed Gamma CAN Received: 01-APR-14
Type: Source Material Expires: 01-APR-40
Employee: Maggie Stamps Verified: 28-MAY-14
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

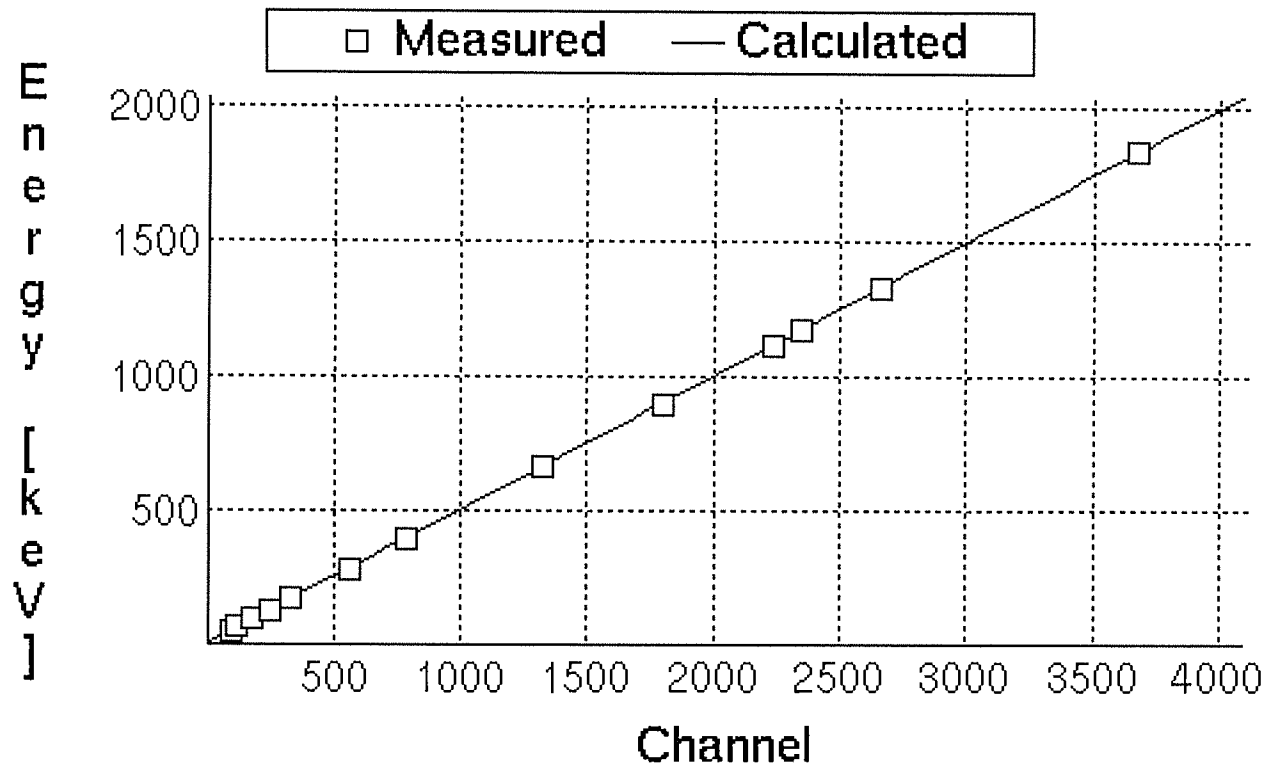
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
					136.47	10.68
CO-60		1925.28D			1173.23	99.85
			*		1332.49	99.98
ZN-65		244.06D	*		1115.54	50.60
SR-85		64.84D	*		514.00	96.00
Y-88		106.63D			898.04	93.70
			*		1836.06	99.20
CD-109		461.40D	*		88.03	3.70
SN-113		115.09D	*		391.70	64.97
I-129	FISSION	1.57E+07Y	*		29.62	56.60
					33.59	10.04
					39.58	7.51
CS-137		30.08Y	*		661.66	85.10
CE-139		137.64D	*		165.86	80.00
HG-203		46.59D			70.83	3.69
					72.87	6.19
			*		279.20	81.56
PB-210		22.20Y	*		46.54	4.25
AM-241		432.60Y	*		59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



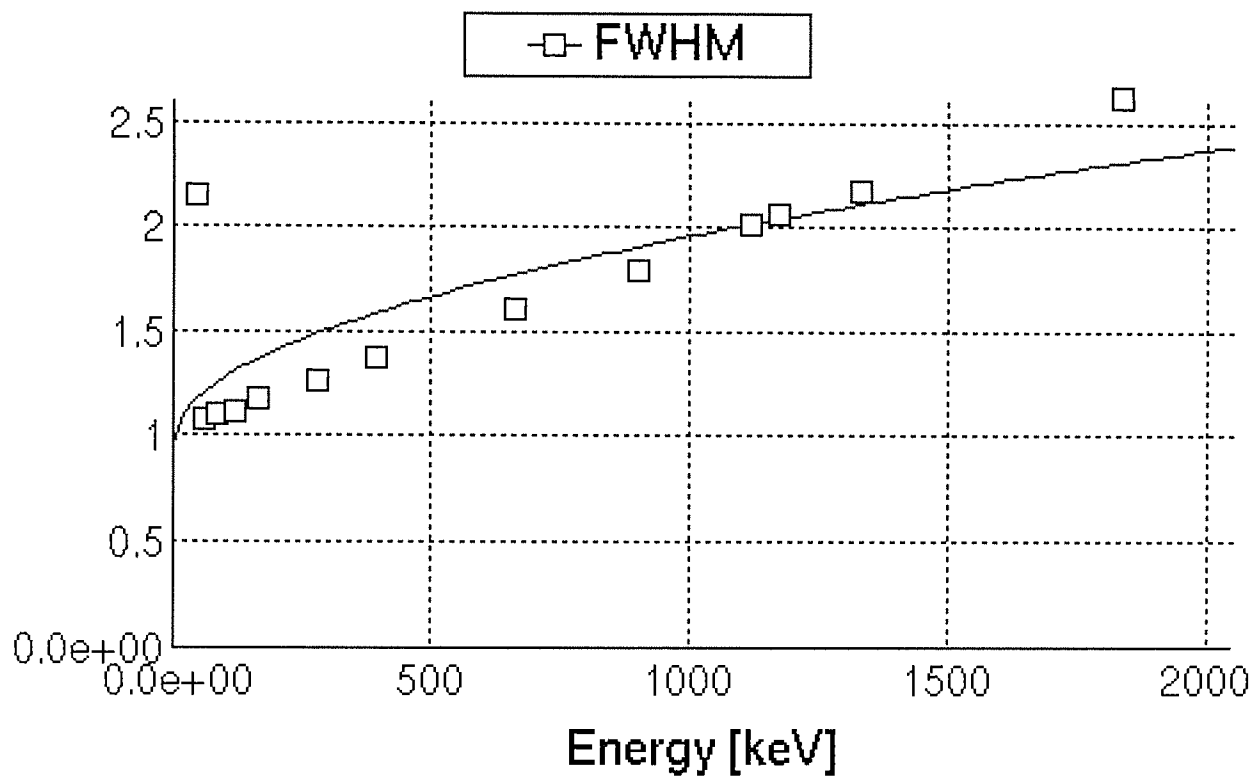
Datasource:

Energy = -1.636×10^{-1} keV + $5.002 \times 10^{-1} \cdot \text{Ch}$ + $-6.528 \times 10^{-8} \cdot \text{Ch}^2$ [CHISQ = 5.925×10^{-3}]

FWHM = 9.568×10^{-1} keV + $3.170 \times 10^{-2} \cdot E^{1/2}$ [CHISQ = 1.164×10^{-1}]

Lo Tail = 0.000×10^0 keV + $0.000 \times 10^0 \cdot E$ [CHISQ = 0.000×10^0]

energy calibration γ41 1/26/16



Datasource:

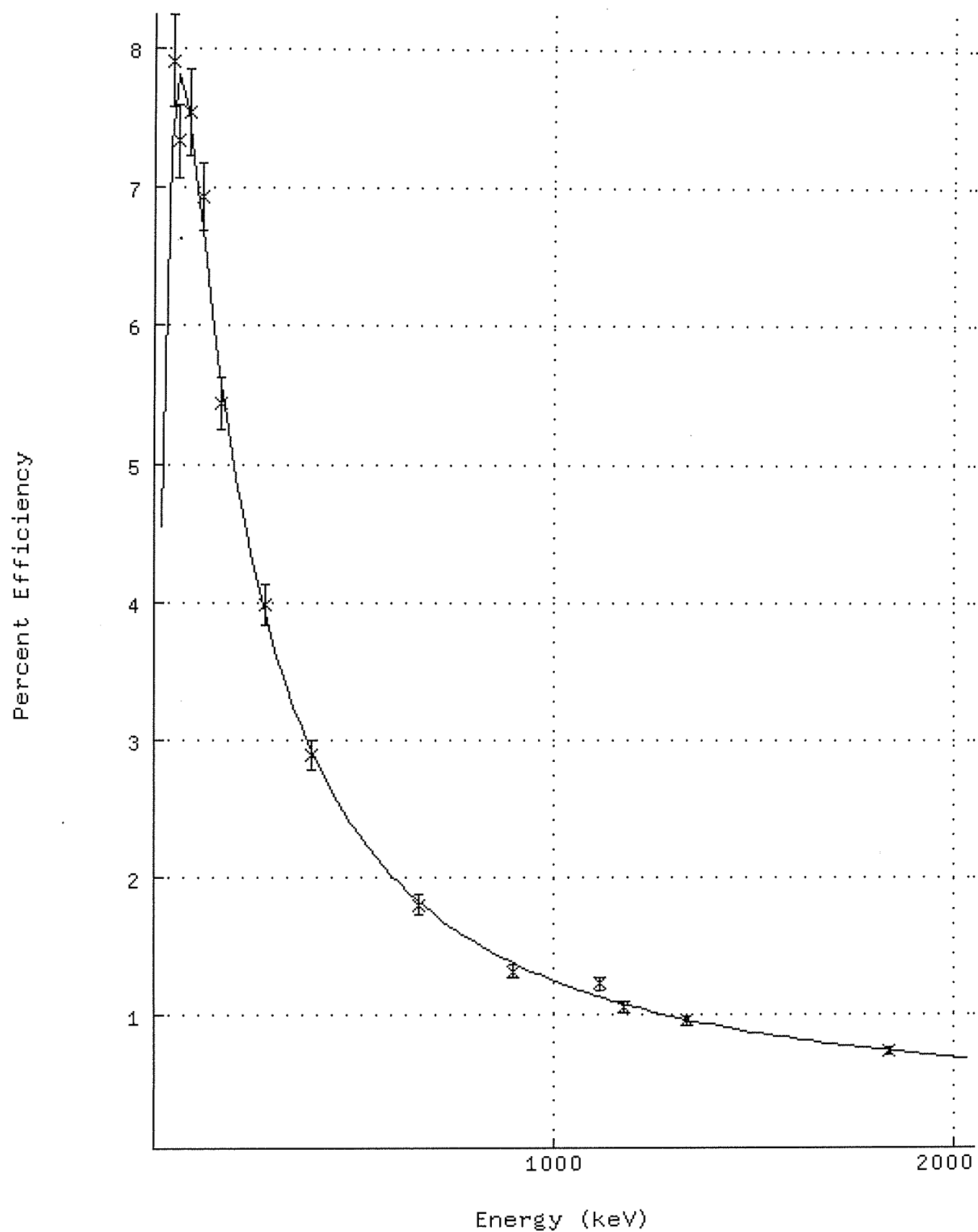
Energy = $-1.636e-01 \text{ keV} + 5.002e-01 * \text{Ch} + -6.528e-08 * \text{Ch}^2$ [CHISQ = $5.925e-03$]

FWHM = $9.568e-01 \text{ keV} + 3.170e-02 * E^{1/2}$ [CHISQ = $1.164e-01$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

shape calibration run 1/26/06

Spectrum : DKA100:[CANBERRA.GAMMA]EFF_GAM41_CAN.CNF;3
Calib Date: 26-JAN-2016 06:01
Detector : GAMMA41 Geometry : CAN
Fit type : 4 Deg. Empirical



$$\text{Energy} = -0.1636 + 0.5002 \cdot \text{Channel} + -6.5281\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	93.33	46.54	46.52	0.022
2	119.33	59.54	59.52	0.018
3	176.33	88.03	88.03	0.000
4	244.37	122.06	122.06	-0.002
5	331.96	165.86	165.87	-0.008
6	558.59	279.20	279.21	-0.012
7	783.59	391.70	391.73	-0.028
8	1323.45	661.66	661.68	-0.024
9	1796.21	898.04	898.05	-0.010
10	2231.27	1115.60	1115.54	0.056
11	2346.66	1173.23	1173.22	0.007
12	2665.29	1332.49	1332.49	-0.004
13	3672.93	1836.06	1836.07	-0.014

FWHM Calibration Report

$$\text{FWHM} = 0.9568 + 3.1700\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	2.15	1.17	0.974
2	59.54	1.08	1.20	-0.119
3	88.03	1.11	1.25	-0.146
4	122.06	1.12	1.31	-0.185
5	165.86	1.17	1.37	-0.191
6	279.20	1.26	1.49	-0.224
7	391.70	1.37	1.58	-0.211
8	661.66	1.61	1.77	-0.163
9	898.04	1.80	1.91	-0.108
10	1115.60	2.01	2.02	-0.005
11	1173.23	2.06	2.04	0.017
12	1332.49	2.18	2.11	0.062
13	1836.06	2.61	2.32	0.299

Sample ID : 100218

Acquisition date : 25-JAN-2016 11:49:06

$$\text{Eff} = \exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), \quad x = \ln(a1/\text{energy})$$

a1	a2	a3	a4	a5	a6	a7
941.3	-4.327	0.9138	3.4162E-02	-4.3656E-02	-1.5430E-03	0.0000E+00

Average Deviation = 3.19 % Reduced Chi-Square = 1.82

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	7.90E-02	3.32E-03	7.55E-02	1.04	4.37
2	59.54	7.33E-02	2.64E-03	7.79E-02	-1.77	-6.37
3	88.03	7.53E-02	3.09E-03	7.43E-02	0.32	1.31
4	122.06	6.93E-02	2.43E-03	6.61E-02	1.31	4.60
5	165.86	5.43E-02	1.90E-03	5.61E-02	-0.96	-3.37
6	279.20	3.97E-02	1.50E-03	3.89E-02	0.59	2.21
7	391.70	2.89E-02	1.13E-03	2.93E-02	-0.39	-1.52
8	661.66	1.80E-02	7.22E-04	1.83E-02	-0.33	-1.33
9	898.04	1.32E-02	4.89E-04	1.38E-02	-1.24	-4.61
10	1115.60	1.23E-02	4.30E-04	1.13E-02	2.20	7.71
11	1173.23	1.06E-02	4.14E-04	1.08E-02	-0.51	-1.99
12	1332.49	9.59E-03	3.74E-04	9.67E-03	-0.23	-0.88
13	1836.06	7.29E-03	2.70E-04	7.38E-03	-0.31	-1.15

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM41_CAN_358378.CNF;1

---- Sample Information ----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.00000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 358323 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

---- Sample Decay/Count Information ----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 25-JAN-2016 11:49:06
 Decay time : 298 23:49:06.25 % dead time : 3.5%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 17:16:27.33

---- Detector Parameters ----

Energy cal. time : 26-JAN-2016 06:01:24 Energy cal. oper.: gamma spec user
 Detector name : GAMMA41 Counting geometry: CAN
 Effic. cal. time : 26-JAN-2016 06:01:47 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	1	36.42	161810	528056	1.26	73.15	69	38	2.70E+00	0.9	4.63E+04
2	1	37.96	186300	536334	1.27	76.23	69	38	3.11E+00	0.8	
3	1	39.97	350036	550083	1.27	80.23	69	38	5.83E+00	0.5	
4	1	46.47	5612172	654207	1.29	93.23	69	38	9.35E+01	0.0	
5	1	49.74	68274	731555	1.30	99.76	69	38	1.14E+00	2.2	
6	0	59.51	3401828	861669	1.04	119.30	113	12	5.67E+01	0.1	
7	6	66.83	30502	279633	1.75	133.95	132	13	5.08E-01	2.7	1.12E+01
8	6	68.55	31388	559166	2.00	137.38	132	13	5.23E-01	4.5	
9	6	70.62	10136	391293	1.22	141.52	132	13	1.69E-01	10.4	
10	0	72.72	2941	324574	0.80	145.72	144	6	4.90E-02	30.8	
11	0	78.23	8946	466652	2.92	156.72	152	9	1.49E-01	13.8	
12	0	88.03	3174777	563655	1.05	176.32	170	12	5.29E+01	0.1	
13	0	102.94	2627	151945	1.10	206.14	204	6	4.38E-02	23.5	
14	0	109.38	2271	147472	1.09	219.02	217	6	3.79E-02	26.9	
15	0	112.14	1571	118826	1.38	224.53	223	5	2.62E-02	33.0	
16	0	122.06	1172949	261666	1.09	244.37	238	12	1.95E+01	0.1	
17	0	136.48	139715	183974	1.06	273.20	268	11	2.33E+00	0.7	
18	0	143.68	2330	108706	2.13	287.59	285	7	3.88E-02	23.6	
19	0	165.87	603601	176594	1.07	331.96	326	12	1.01E+01	0.2	
20	4	186.44	2850	106543	2.03	373.09	369	15	4.75E-02	20.0	3.82E+00
21	4	189.38	1133	93857	1.12	378.97	369	15	1.89E-02	45.0	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	199.10	27523	139399	1.32	398.40	394	10	4.59E-01	2.6	
23	0	203.82	6075	95326	1.18	407.84	405	7	1.01E-01	8.5	
24	0	219.94	1094	116627	1.63	440.08	437	8	1.82E-02	54.2	
25	0	234.64	1340	91914	1.51	469.48	467	7	2.23E-02	37.6	
26	0	255.18	15560	101740	1.22	510.55	507	9	2.59E-01	3.8	
27	0	279.21	49438	111636	1.22	558.58	554	11	8.24E-01	1.4	
28	0	310.34	2675	64627	1.01	620.83	618	7	4.46E-02	15.9	
29	0	326.38	159	62498	1.33	652.91	650	7	2.64E-03	261.7	
30	0	351.92	1317	66901	2.00	703.98	701	8	2.19E-02	34.1	
31	0	381.01	510	65653	0.97	762.16	760	8	8.50E-03	87.1	
32	0	391.73	336570	124480	1.32	783.60	776	15	5.61E+00	0.3	
33	0	511.03	56840	109645	2.71	1022.15	1014	17	9.47E-01	1.4	
34	0	532.41	594	47294	1.39	1064.92	1062	8	9.91E-03	63.6	
35	0	636.54	373	45123	2.65	1273.17	1272	8	6.22E-03	98.8	
36	0	661.69	797359	105693	1.57	1323.46	1315	17	1.33E+01	0.1	
37	0	683.42	973	53825	1.76	1366.92	1363	9	1.62E-02	43.1	
38	0	692.48	324	46860	2.30	1385.04	1380	8	5.41E-03	115.7	
39	0	803.25	542	43468	1.39	1606.60	1604	8	9.03E-03	66.8	
40	0	813.82	5849	55877	1.94	1627.74	1623	10	9.75E-02	7.7	
41	0	821.43	1384	46222	1.32	1642.95	1640	8	2.31E-02	27.0	
42	0	898.04	318141	122371	1.75	1796.19	1788	17	5.30E+00	0.3	
43	0	980.78	416	38837	1.74	1961.69	1960	8	6.93E-03	82.3	
44	0	1115.54	477252	77479	1.94	2231.27	2221	21	7.95E+00	0.2	
45	0	1163.47	294	16531	1.86	2327.14	2321	8	4.90E-03	76.0	
46	0	1173.21	811550	48778	1.96	2346.64	2336	22	1.35E+01	0.1	
47	0	1187.30	229	16322	1.01	2374.83	2371	9	3.81E-03	101.0	
48	0	1194.64	1060	16685	2.11	2389.50	2385	10	1.77E-02	23.0	
49	4	1325.83	6387	14022	3.09	2651.96	2640	53	1.06E-01	5.3	1.69E+02
50	4	1332.48	726994	10042	2.22	2665.27	2640	53	1.21E+01	0.1	
51	4	1339.90	695	12068	2.56	2680.11	2640	53	1.16E-02	34.5	
52	4	1343.47	445	8856	2.44	2687.25	2640	53	7.42E-03	40.6	
53	0	1352.73	1619	13155	3.30	2705.78	2697	18	2.70E-02	16.8	
54	0	1546.17	99	8401	1.24	3092.82	3090	10	1.65E-03	173.9	
55	0	1585.38	162	9293	0.86	3171.28	3166	10	2.71E-03	111.3	
56	0	1599.52	159	8607	1.48	3199.57	3196	9	2.64E-03	105.8	
57	0	1796.46	96	2273	3.09	3593.66	3591	12	1.60E-03	99.6	
58	0	1836.04	185879	5710	2.45	3672.87	3661	25	3.10E+00	0.3	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****
Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM41_CAN.CNF;1
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM41.CNF;76
Background date    : 23-JAN-2016 09:08:47
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 26-JAN-2016 07:12:01
Sample ID        : VER_GAM41_CAN      Sample quantity   : 1.00000E+00 SAMPLE
Detector name    : GAM41              Detector geometry: CAN
Elapsed live time: 0 01:30:00.00      Elapsed real time: 0 01:32:18.70  2.5%
Energy tolerance : 1.50000 keV        Analyst Initials :
Abundance limit  : 75.00000           Sensitivity      : 3.00000
Batch ID        :                     Detector SN#       :
Matrix Spike ID :                     LCS ID             :
*****

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BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	10	41.69	51038	160269	3.00	83.69	75	23	9.45E+00	2.0	1.36E+03
2	10	46.37*	477329	52840	1.02	93.03	75	23	8.84E+01	0.2	
3	0	49.83	4130	56088	1.01	99.96	98	7	7.65E-01	9.7	
4	0	59.40	309444	52942	0.88	119.09	114	10	5.73E+01	0.2	
5	7	66.44	4595	30591	2.37	133.16	127	21	8.51E-01	8.0	3.14E+00
6	7	68.28	2902	28962	1.90	136.85	127	21	5.37E-01	11.8	
7	7	70.21	2409	35483	2.14	140.70	127	21	4.46E-01	16.4	
8	7	72.25	613	14116	0.87	144.77	127	21	1.14E-01	29.1	
9	0	78.92	393	20265	0.83	158.11	156	7	7.29E-02	60.2	
10	0	87.92	170159	27510	0.92	176.12	170	12	3.15E+01	0.3	
11	0	102.92	189	7240	0.85	206.11	204	6	3.50E-02	71.6	
12	0	121.96	42383	12743	1.00	244.16	238	12	7.85E+00	0.7	
13	0	136.39	5179	8375	1.01	273.02	269	10	9.59E-01	3.6	
14	0	165.83	9110	9061	1.04	331.89	326	12	1.69E+00	2.3	
15	0	198.95	588	6909	1.29	398.11	394	9	1.09E-01	25.8	
16	0	255.07	169	4688	1.14	510.32	507	7	3.12E-02	67.9	
17	0	309.93	264	5163	1.37	620.02	616	9	4.89E-02	49.5	
18	0	330.24	203	4239	2.31	660.63	657	8	3.75E-02	56.1	
19	0	391.67	3377	6389	1.31	783.46	778	12	6.25E-01	5.0	
20	0	435.39	118	4239	1.38	870.89	869	8	2.18E-02	96.0	
21	0	494.54	40	3314	0.50	989.18	989	8	7.43E-03	249.0	
22	0	511.07*	1597	5580	2.73	1022.24	1016	14	2.96E-01	10.3	
23	0	590.38	119	1970	1.72	1180.85	1177	7	2.20E-02	62.8	
24	0	661.74*	72422	5181	1.51	1323.57	1315	17	1.34E+01	0.4	
25	0	667.39	223	1940	2.24	1334.86	1332	7	4.13E-02	33.5	
26	0	682.46	98	2262	1.44	1365.02	1364	8	1.81E-02	84.8	
27	0	747.11	135	2268	1.59	1494.31	1491	8	2.51E-02	61.4	
28	0	848.89	119	2828	1.76	1697.88	1696	8	2.20E-02	78.2	
29	0	898.15	2680	5152	1.76	1796.41	1791	12	4.96E-01	5.7	
30	0	1049.34	102	2194	0.77	2098.83	2095	8	1.89E-02	80.2	
31	0	1079.09	97	2153	2.57	2158.34	2156	8	1.79E-02	83.8	
32	0	1091.11	115	3082	3.70	2182.39	2175	11	2.14E-02	93.6	
33	0	1115.77	15278	4069	1.85	2231.73	2224	17	2.83E+00	1.3	
34	0	1173.42	64497	2921	1.91	2347.05	2336	22	1.19E+01	0.4	

Sample ID : VER_GAM41_CAN

Acquisition date : 26-JAN-2016 07:12:01

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
35	0	1251.84	51	561	4.81	2503.93	2496	16	9.44E-03	105.3	
36	0	1332.72	58169	812	2.04	2665.76	2655	22	1.08E+01	0.4	
37	0	1502.61	53	511	9.95	3005.65	2993	33	9.90E-03	129.3	
38	0	1612.68	19	236	1.13	3225.89	3214	15	3.61E-03	176.6	
39	0	1617.05	66	165	4.79	3234.65	3228	14	1.23E-02	42.8	
40	0	1704.64	47	171	1.22	3409.91	3401	17	8.68E-03	66.1	
41	0	1823.60	20	153	4.97	3647.96	3641	16	3.68E-03	140.5	
42	0	1836.47	1668	242	2.39	3673.73	3662	23	3.09E-01	3.4	
43	0	1910.63	49	225	8.55	3822.13	3804	29	9.09E-03	88.9	
44	0	1962.18	43	126	3.99	3925.30	3915	21	7.96E-03	67.0	

Flag: "*" = Peak area was modified by background subtraction

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	42383	85.60*	6.613E+00	3.748E+03	2.043E+04	1.44
	136.47	5179	10.68	6.264E+00	3.875E+03	2.112E+04	7.18
CO-60	1173.23	64497	99.85	1.082E+00	2.987E+04	3.795E+04	0.90
	1332.49	58169	99.98*	9.671E-01	3.011E+04	3.825E+04	0.87
ZN-65	1115.54	15278	50.60*	1.132E+00	1.335E+04	8.819E+04	2.52
Y-88	898.04	2680	93.70	1.379E+00	1.038E+03	7.820E+04	11.39
	1836.06	1668	99.20*	7.375E-01	1.141E+03	8.597E+04	6.88
CD-109	88.03	170159	3.70*	7.436E+00	3.095E+05	8.404E+05	0.62
SN-113	391.70	3377	64.97*	2.932E+00	8.874E+02	4.865E+04	10.07
CS-137	661.66	72422	85.10*	1.827E+00	2.331E+04	2.431E+04	0.87
CE-139	165.86	9110	80.00*	5.615E+00	1.015E+03	2.888E+04	4.68
PB-210	46.54	477329	4.25*	7.546E+00	7.449E+05	7.885E+05	0.32
AM-241	59.54	309444	35.90*	7.793E+00	5.536E+04	5.552E+04	0.46

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM41.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 23-JAN-2016 09:08:47 Acquisition date : 23-JAN-2016 09:08:47
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:41:24.96

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.3325E+00	-0.36	
[1.33784+/-0.01494]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: R. Futch Approval Date: 1 / 27 / 16

VMS Gamma Spectroscopy Report generated 24-JAN-2016 01:50:07

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM41__358162.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
Sample Type : bkg Sample Geometry :
Sample Number : 358162 Spctrm Collector : gamma spec user
Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
Deposition Start : Deposition End : 23-JAN-2016 09:08:47

---- Sample Decay/Count Information ----

Sample Date : 23-JAN-2016 09:08:47 Acquisition date : 23-JAN-2016 09:08:47
Decay time : 0 00:00:00.00 % dead time : 0.1%
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:41:24.96

---- Detector Parameters ----

Energy cal. time : 22-JAN-2016 15:51:27 Energy cal. oper.: gamma spec user
Detector name : GAMMA41 Counting geometry:
Effic. cal. time : Effic. cal. oper.:

---- Processing Parameters ----

Start channel : 1 End channel : 4096
Sensitivity : 3.00000 Gaussian Sens. : 10.00000
Critical level? : No Propagate Errors?: No
Efficiency Type : SPLINE Library-based eff: No
Energy tolerance : 2.00000 Half life ratio : 8.00000
Abundance limit : 75.00000 WTM error limit : 3.00000
MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.52	723	1083	1.54	93.42	88	12	1.21E-02	9.8	
2	0	53.80	104	829	2.55	107.97	102	10	1.73E-03	52.9	
3	0	63.35	1436	1333	1.72	127.06	121	15	2.39E-02	6.1	
4	3	74.83	261	712	1.91	150.00	146	13	4.34E-03	17.4	3.64E+00
5	3	77.12	101	869	1.44	154.59	146	13	1.69E-03	54.9	
6	0	84.26	179	973	1.83	168.86	164	10	2.99E-03	33.3	
7	0	92.63	1972	1600	1.82	185.60	177	19	3.29E-02	5.4	
8	0	98.61	39	651	0.59	197.55	195	8	6.42E-04	116.4	
9	0	112.54	57	697	1.28	225.40	222	9	9.48E-04	84.8	
10	0	143.60	112	662	1.42	287.48	284	9	1.86E-03	42.6	
11	0	163.56	59	768	1.04	327.39	322	12	9.83E-04	94.8	
12	0	185.76	759	795	1.54	371.78	366	13	1.26E-02	8.5	
13	0	205.74	52	588	2.75	411.72	407	10	8.69E-04	88.2	
14	0	239.00	265	643	1.44	478.21	472	13	4.41E-03	20.7	
15	0	294.83	24	486	0.97	589.83	583	11	3.99E-04	179.8	
16	0	352.46	141	375	1.44	705.05	699	14	2.35E-03	30.3	
17	0	376.71	40	324	1.57	753.55	749	11	6.68E-04	88.1	
18	0	498.82	7	342	1.38	997.70	989	14	1.18E-04	553.9	
19	0	511.06	1167	419	2.67	1022.17	1013	23	1.95E-02	5.4	

20	0	569.68	31	203	0.98	1139.39	1137	10	5.13E-04	89.2	
21	0	583.21	93	255	1.99	1166.44	1158	14	1.54E-03	38.1	
22	4	609.89	60	136	2.03	1219.78	1216	15	9.97E-04	35.2	5.71E-01
23	4	613.29	61	120	1.89	1226.58	1216	15	1.02E-03	36.7	
24	0	635.55	18	213	5.52	1271.11	1263	13	3.01E-04	169.8	
25	0	661.09	37	296	0.63	1322.17	1312	18	6.16E-04	110.5	
26	3	694.25	52	131	2.17	1388.47	1385	15	8.67E-04	38.6	1.80E+00
27	3	698.17	44	119	2.18	1396.31	1385	15	7.30E-04	43.5	
28	0	712.89	46	151	4.35	1425.75	1421	12	7.73E-04	54.8	
29	0	803.48	67	128	1.61	1606.91	1602	12	1.12E-03	35.5	
30	0	813.91	22	98	0.85	1627.78	1622	10	3.73E-04	86.8	
31	0	820.16	36	141	4.77	1640.27	1632	16	6.01E-04	75.2	
32	0	846.54	80	283	3.56	1693.03	1684	25	1.33E-03	57.7	
33	0	912.15	104	137	1.83	1824.24	1815	19	1.73E-03	28.9	
34	0	1001.67	56	122	2.21	2003.28	1998	14	9.34E-04	43.9	
35	0	1038.87	35	63	4.47	2077.68	2070	13	5.76E-04	50.9	
36	0	1081.89	53	103	5.13	2163.71	2154	19	8.82E-04	49.1	
37	0	1095.88	85	95	7.16	2191.71	2182	21	1.42E-03	30.6	
38	1	1184.52	37	68	2.68	2369.00	2359	23	6.14E-04	53.4	3.54E+00
39	1	1187.79	47	53	2.95	2375.54	2359	23	7.89E-04	32.1	
40	8	1292.48	9	14	1.51	2584.95	2583	15	1.49E-04	64.5	6.28E+00
41	8	1295.51	44	71	2.73	2591.00	2583	15	7.38E-04	41.1	
42	0	1335.86	157	120	21.42	2671.71	2649	48	2.62E-03	26.4	
43	0	1461.21	36	73	2.69	2922.48	2914	16	6.08E-04	54.6	
44	0	1499.07	44	48	1.82	2998.22	2988	20	7.39E-04	41.7	
45	0	1551.04	49	37	7.74	3102.17	3092	21	8.16E-04	34.1	
46	0	1679.50	15	33	3.21	3359.19	3350	14	2.53E-04	85.9	
47	0	1685.80	43	17	4.97	3371.77	3363	18	7.16E-04	27.6	
48	0	1702.52	25	13	4.80	3405.24	3399	13	4.09E-04	36.5	

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 41

Calibration Date: 1/25/2016

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	5.552E+04	-1.85
Cs-137	661.7	0.851	735.7	2.3365E+04	2.431E+04	4.04
Co-60	1173.2	0.9985	1383	3.7435E+04	3.795E+04	1.38
Co-60	1332.5	0.9998	1385	3.7440E+04	3.825E+04	2.16

Prepared By: R. Euteh

Date: 1/27/16

Reviewed By: M. J. Tampr

Date: 1/28/16

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gamma 41

Date Performed: 1/26/16

Performed By: RF

High Voltage Power Supply Model No. <u>3106 D</u> High Voltage <u>3.30 KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>50</u> Fine Gain <u>0.918</u> Time Constant <u>6 μsec</u> Input polarity <u>Negative</u> BSLR rate <u>NA</u> BSLR mode <u>NA</u> Threshold <u>NA</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>AD556</u> Address <u>4DC1</u>	

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Geometry Calibration Package

Detector: Gamma 43

Geometry: Coax

	YES	NO	Comments
1) Is all calibration standard information enclosed (or: the primary standard certificate? the second standard standard(s) documentation? the nuclide library used? the VMS certificate file?	☒		1738
	☒		1701
	☒		
	☒		
2) Is the energy calibration graph included?	☒		
3) Is the detector efficiency curve printout included?	☒		
4) Is the efficiency calibration report included and reviewed?	☒		
5) Is the raw count data included for: the calibration peak report? the calibration verification PEAK report? the calibration verification NID report? the last instrument background?	☒		
	☒		
	☒		
	☒		
6) Are the calibration verification calculations included?	☒		
7) Are the instrument settings included: amp, HVPS, ADC settings?	☒		

Prepared By: R. F. Fitch

Date: 9/16/15

Reviewed By: M. Stamp

Date: 9/18/15

Effective Date: 9/10/15



Eckert & Ziegler

Analytics

1738

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION

Standard Reference Source

100218

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL 1510843, Item 4

Reference Date: 01-Apr-2015

Product Code: MIX-8400-EG-SD

12:00 PM EST Grams of Master Source: 0.0066951

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." Density of solid matrix 1.17 g/cc $\pm$ 3 %.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source*	This Source yps	Uncertainty*, %			Calibration Method*
			yps/gram		u _A	u _B	U	
Pb-210	46.5	8.109E+03	—	1.215E+03	0.1	2.1	4.2	4 π LS
Am-241	59.5	1.580E+05	—	7.608E+02	0.1	1.8	3.6	4 π LS
Cd-109	88.0	4.614E+02	1.625E+05	1.088E+03	0.5	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.905E+04	5.962E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.234E+06	8.263E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.617E+05	1.752E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.735E+05	1.151E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.107E+05	7.408E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.159E+05	2.784E+03	0.7	1.7	3.7	HPGe
Zn-65	1115.5	2.439E+02	—	1.499E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.098E+05	1.405E+03	0.7	1.8	3.9	HPGe
Co-60	1332.5	1.925E+03	2.101E+05	1.407E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.403E+05	2.948E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: J. S. Laffin
J. S. Laffin, Spectroscopist

Date: 14 May 15

Standard Logbook

Serial ID: 1738
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 100218
Comments: None

Open/Reference Date: 01-APR-15
Received: 01-APR-15
Expires: 01-APR-16
Verified: 22-MAY-15

Analyte	Concentration	Analyte	Concentration



Eckert & Ziegler

Analytics

1701

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsInc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

96485

100 mL Solid in Aluminum Can

Customer: GEL Laboratories, LLC

P.O. No.: GEL1407230, Item 1

Product Code: MIX-8400-EG-SD

Reference Date: 01-Apr-2014

12:00 PM EST Grams of Master Source: 0.0065886

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Additional radionuclides were added gravimetrically from solutions calibrated by gamma-ray spectrometry, ionization chamber, or liquid scintillation counting. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma-ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101.

Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* yps/gram	This Source yps	Uncertainty*, %			Calibration Method*
					Type	u _A	u _B	U
Pb-210	46.5	8.109E+03	—	1.218E+03	0.1	1.6	3.2	4π LS
Am-241	59.5	1.580E+05	—	7.514E+02	0.1	1.6	3.2	4π LS
Cd-109	88.0	4.614E+02	1.648E+05	1.086E+03	0.6	2.0	4.1	HPGe
Co-57	122.1	2.717E+02	8.913E+04	5.872E+02	0.4	1.7	3.5	HPGe
Ce-139	165.9	1.376E+02	1.257E+05	8.283E+02	0.4	1.7	3.5	HPGe
Hg-203	279.2	4.659E+01	2.682E+05	1.767E+03	0.3	1.7	3.5	HPGe
Sn-113	391.7	1.151E+02	1.781E+05	1.173E+03	0.4	1.9	3.9	HPGe
Cs-137	661.7	1.099E+04	1.117E+05	7.357E+02	0.7	1.9	4.0	HPGe
Y-88	898.0	1.066E+02	4.294E+05	2.829E+03	0.5	1.7	3.5	HPGe
Zn-65	1116.6	2.439E+02	—	1.474E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.099E+05	1.383E+03	0.6	1.8	3.8	HPGe
Co-60	1332.5	1.925E+03	2.102E+05	1.385E+03	0.7	1.8	3.9	HPGe
Y-88	1836.1	1.066E+02	4.546E+05	2.995E+03	0.7	1.7	3.7	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4π LS - 4 pi Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. Uncertainty: U - Relative expanded uncertainty, k = 2. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



MGS Certificate Rev 5, 1 October 2013

RC-S-065-130

Page 1 of 2

Corporate Office

Laboratory

24937 Avenue Tibblitts Valencia, California 91355

1380 Seaboard Industrial Blvd. Atlanta, Georgia, 30318

Source Prepared by: K. Eardley
K. Eardley, Radiochemist

QC Approved: A. Chen
A. Chen, Spectroscopist

Date: 2014/4/14



Standard Logbook

Serial ID: 1701
Name: Mixed Gamma CAN
Type: Source Material
Employee: Maggie Stamps
Supplier: Eckert & Zeigler Analytics
Description: 96485
Comments: None

Open/Reference Date: 01-APR-14
Received: 01-APR-14
Expires: 01-APR-40
Verified: 28-MAY-14

Analyte	Concentration	Analyte	Concentration

Title: Mixed Gamma + Am-241 & Pb-210

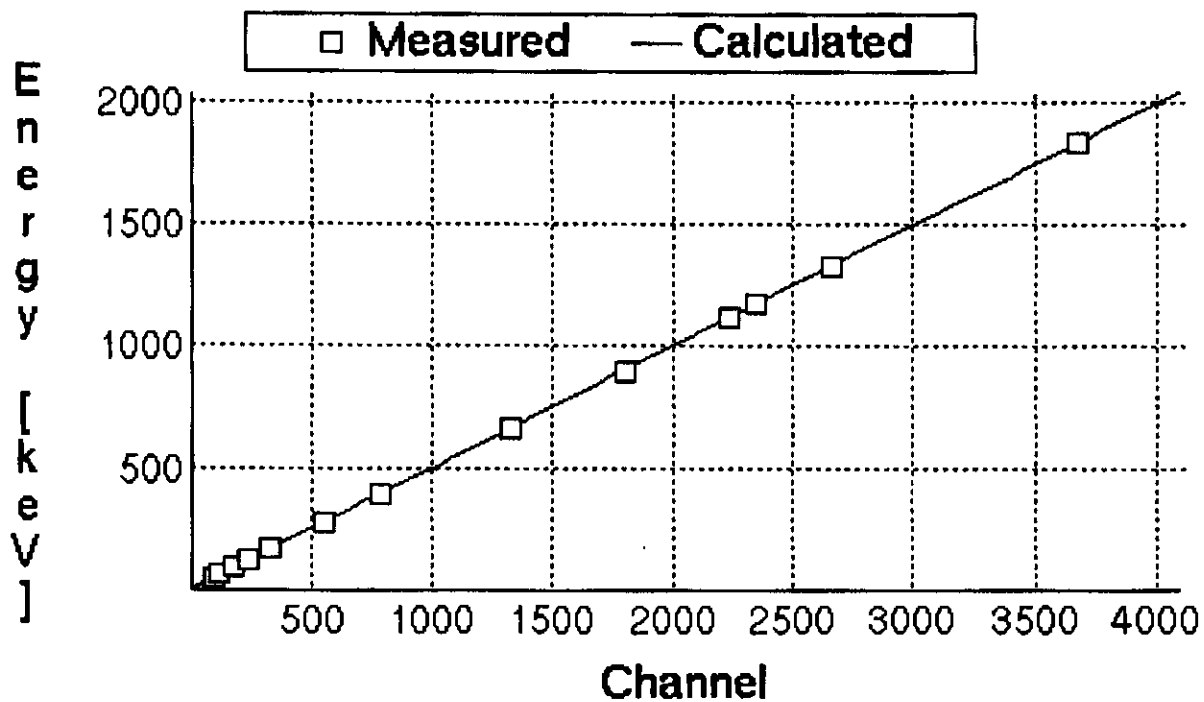
Nuclide Name	Nuclide Type	Half Life	Key Line?	No Wtmean?	Energy (keV)	%Abn
CO-57		271.74D	*		122.06	85.60
CO-60		1925.28D			136.47	10.68
					1173.23	99.85
ZN-65		244.06D	*		1332.49	99.98
SR-85		64.84D	*		1115.54	50.60
Y-88		106.63D	*		514.00	96.00
					898.04	93.70
CD-109		461.40D	*		1836.06	99.20
SN-113		115.09D	*		88.03	3.70
I-129	FISSION	1.57E+07Y	*		391.70	64.97
					29.62	56.60
					33.59	10.04
CS-137		30.08Y	*		39.58	7.51
CE-139		137.64D	*		661.66	85.10
HG-203		46.59D			165.86	80.00
					70.83	3.69
					72.87	6.19
PB-210		22.20Y	*		279.20	81.56
AM-241		432.60Y	*		46.54	4.25
					59.54	35.90
					0.00	0.00

Title: CAN 100218

Quantity: 1.00

Assay date: 1-APR-2015 12:00:00.0

Nuclide Name	Half Life	Energy (keV)	Rate	% Err	% Abn	CAL/INIT
PB-210	22.20Y	46.5	1215	4.20	4.3	Yes
AM-241	432.60Y	59.5	761	3.60	35.9	Yes
CD-109	461.40D	88.0	1088	4.10	3.7	Yes
CO-57	271.74D	122.1	596	3.50	85.6	Yes
CE-139	137.64D	165.9	826	3.50	80.0	Yes
HG-203	46.59D	279.2	1752	3.50	81.6	Yes
SN-113	115.09D	391.7	1161	3.90	65.0	Yes
CS-137	30.08Y	661.7	741	4.00	85.1	Yes
Y-88	106.63D	898.0	2784	3.70	93.7	Yes
ZN-65	244.06D	1115.6	1499	3.50	50.6	Yes
CO-60	1925.28D	1173.2	1405	3.90	99.8	Yes
CO-60	1925.28D	1332.5	1407	3.90	100.0	Yes
Y-88	106.63D	1836.1	2948	3.70	99.2	Yes



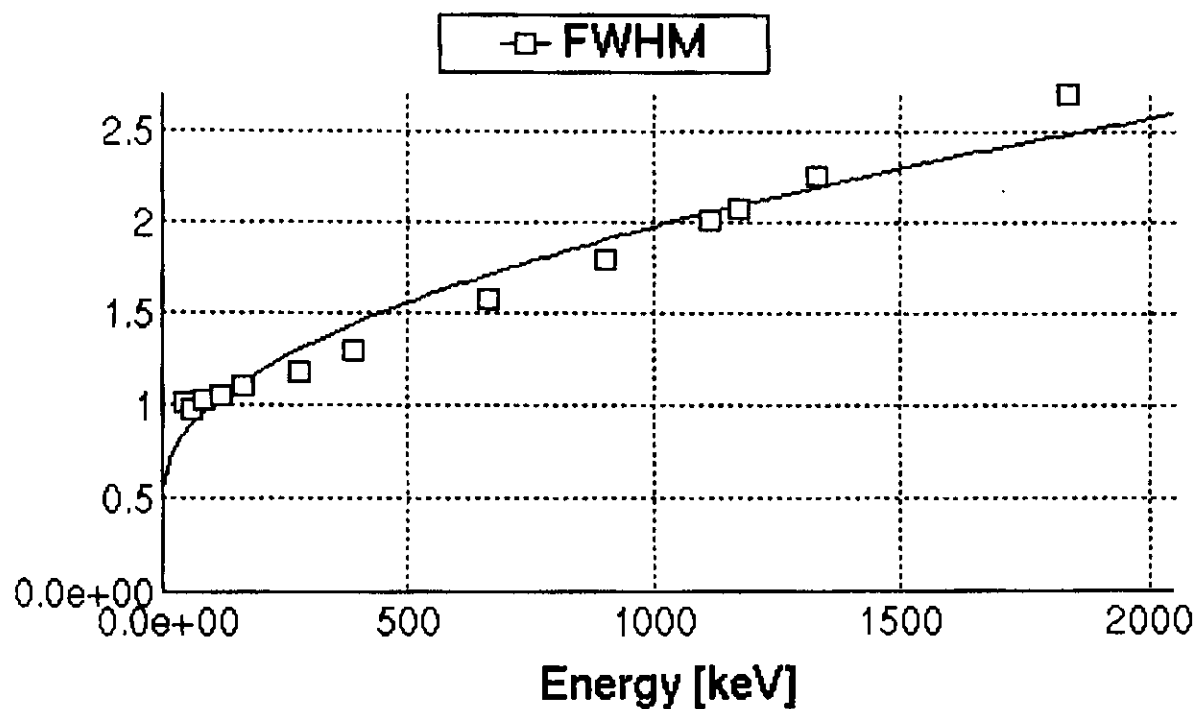
Datasource:

Energy = $2.545e-01 \text{ keV} + 4.999e-01 * \text{Ch} + 1.585e-08 * \text{Ch}^2$ [CHISQ = $1.242e-03$]

FWHM = $5.473e-01 \text{ keV} + 4.537e-02 * E^{1/2}$ [CHISQ = $1.423e-02$]

Lo Tail = $0.000e+00 \text{ keV} + 0.000e+00 * E$ [CHISQ = $0.000e+00$]

energy calibration 843 3/3/15



Datasource:

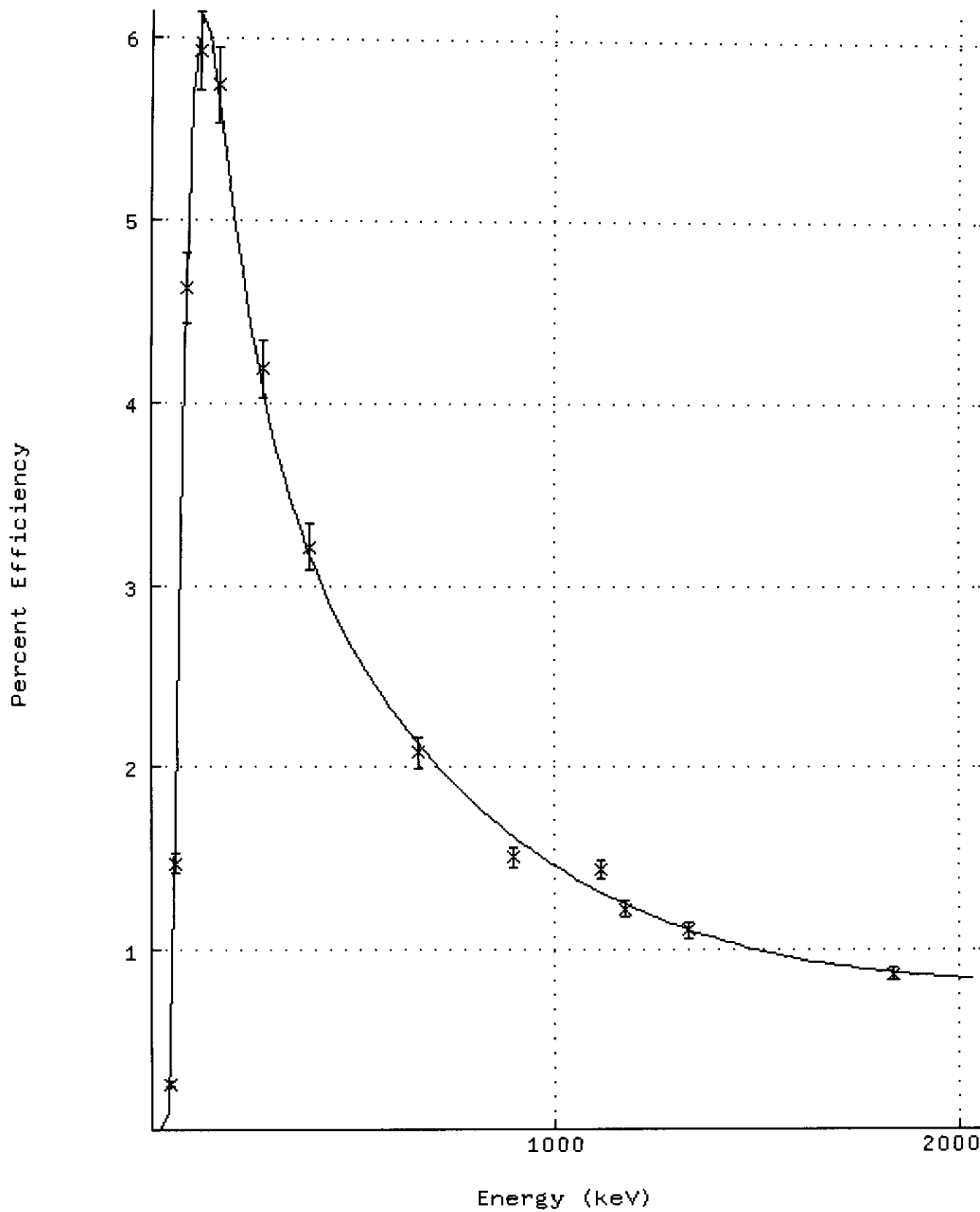
Energy = $2.545e-01$ keV + $4.999e-01$ *Ch + $1.585e-08$ *Ch² [CHISQ = $1.242e-03$]

FWHM = $5.473e-01$ keV + $4.537e-02$ *E^{1/2} [CHISQ = $1.423e-02$]

Lo Tail = $0.000e+00$ keV + $0.000e+00$ *E [CHISQ = $0.000e+00$]

Shape calibration Y43 3/3/15

Spectrum : DKA100:[CANBERRA,GAMMA]EFF_GAM43_CAN.CNF;6
Calib Date: 10-SEP-2015 10:32
Detector : GAMMA43 Geometry : CAN
Fit type : 5 Deg. Empirical



$$\text{Energy} = 0.2545 + 0.4999 \cdot \text{Channel} + 1.5847\text{E-}08 \cdot (\text{Channel}^2)$$

Nbr	Centroid Channel	True Energy	Computed Energy	Difference
1	92.45	46.54	46.47	0.071
2	118.55	59.54	59.52	0.023
3	175.61	88.03	88.04	-0.008
4	243.71	122.06	122.08	-0.018
5	331.36	165.86	165.89	-0.035
6	558.08	279.20	279.23	-0.029
7	783.13	391.70	391.73	-0.032
8	1323.11	661.66	661.67	-0.015
9	1795.92	898.04	898.04	-0.004
10	2230.97	1115.60	1115.54	0.056
11	2346.35	1173.23	1173.23	0.005
12	2664.89	1332.49	1332.48	0.005
13	3672.13	1836.06	1836.08	-0.020

FWHM Calibration Report

$$\text{FWHM} = 0.5473 + 4.5371\text{E-}02 \cdot (\text{Energy}^{1/2})$$

Nbr	Energy	True FWHM	Computed FWHM	Difference
1	46.54	1.02	0.86	0.162
2	59.54	0.98	0.90	0.086
3	88.03	1.04	0.97	0.062
4	122.06	1.05	1.05	0.003
5	165.86	1.10	1.13	-0.027
6	279.20	1.19	1.31	-0.118
7	391.70	1.30	1.45	-0.141
8	661.66	1.58	1.71	-0.131
9	898.04	1.80	1.91	-0.108
10	1115.60	2.02	2.06	-0.042
11	1173.23	2.08	2.10	-0.025
12	1332.49	2.26	2.20	0.055
13	1836.06	2.72	2.49	0.224

Eff = exp(a2 + a3*x + a4*x**2 + a5*x**3 + a6*x**4 + a7*x**5), x=ln(a1/energy)

a1	a2	a3	a4	a5	a6	a7
941.3	-4.170	0.9619	-0.1200	-0.2025	0.2426	-7.2808E-02

Average Deviation = 3.19 % Reduced Chi-Square = 2.22

Nbr	Energy (keV)	Measured Efficiency	Efficiency Error	Computed Efficiency	Diff/ /Error	% Diff
1	46.54	2.55E-03	1.21E-04	2.65E-03	-0.84	-3.98
2	59.54	1.47E-02	5.52E-04	1.39E-02	1.38	5.17
3	88.03	4.62E-02	1.90E-03	4.74E-02	-0.61	-2.49
4	122.06	5.92E-02	2.09E-03	6.10E-02	-0.85	-3.01
5	165.86	5.73E-02	2.03E-03	5.69E-02	0.18	0.65
6	279.20	4.18E-02	1.56E-03	4.05E-02	0.84	3.12
7	391.70	3.21E-02	1.27E-03	3.18E-02	0.24	0.94
8	661.66	2.08E-02	8.41E-04	2.12E-02	-0.59	-2.38
9	898.04	1.50E-02	5.65E-04	1.62E-02	-1.99	-7.48
10	1115.60	1.43E-02	5.10E-04	1.31E-02	2.46	8.75
11	1173.23	1.22E-02	4.80E-04	1.25E-02	-0.54	-2.14
12	1332.49	1.10E-02	4.32E-04	1.10E-02	-0.08	-0.31
13	1836.06	8.58E-03	3.22E-04	8.67E-03	-0.28	-1.05

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]CAL_GAM43_CAN_343430.CNF;1

----- Sample Information -----

Sample Title : CAN 100218
 Sample ID : 100218 Sample Quantity : 1.000000E+00 SAMPLE
 Sample Type : CAL Sample Geometry :
 Sample Number : 343376 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

----- Sample Deposition Information -----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 1-APR-2015 12:00:00.

----- Sample Decay/Count Information -----

Sample Date : 1-APR-2015 12:00:00. Acquisition date : 10-SEP-2015 07:43:55
 Decay time : 161 19:43:55.02 % dead time : 2.0%
 Elapsed live time: 0 01:00:00.00 Elapsed real time: 0 01:01:12.13

----- Detector Parameters -----

Energy cal. time : 3-MAR-2015 06:03:47. Energy cal. oper.: gamma spec user
 Detector name : GAMMA43 Counting geometry: CAN
 Effic. cal. time : 10-SEP-2015 10:32:19 Effic. cal. oper.: gamma spec user

----- Processing Parameters -----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : EMPIRICA Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	38.12	3106	16099	1.39	75.75	74	6	8.63E-01	6.6	
2	8	45.01	1450	13056	1.70	89.54	87	11	4.03E-01	11.3	1.66E+00
3	8	46.61	10984	18611	0.94	92.74	87	11	3.05E+00	2.2	
4	0	59.57	41431	35154	1.01	118.66	113	12	1.15E+01	1.0	
5	0	66.04	240	17730	1.37	131.60	130	6	6.66E-02	87.8	
6	3	70.84	658	15636	0.86	141.20	138	12	1.83E-01	28.8	1.79E+00
7	3	72.96	1158	15797	0.91	145.44	138	12	3.22E-01	16.5	
8	10	83.63	4555	37910	2.49	166.80	161	24	1.27E+00	8.0	9.26E+01
9	10	85.65	7159	36400	1.88	170.83	161	24	1.99E+00	6.0	
10	10	88.14	141938	16539	1.06	175.81	161	24	3.94E+01	0.3	
11	0	122.20	85761	27442	1.02	243.95	238	12	2.38E+01	0.5	
12	0	136.62	11037	18099	1.08	272.80	268	10	3.07E+00	2.5	
13	0	166.04	76656	23356	1.14	331.64	325	14	2.13E+01	0.6	
14	0	174.06	210	8137	1.29	347.70	345	6	5.84E-02	68.3	
15	0	255.31	2647	11782	1.22	510.23	506	10	7.35E-01	7.9	
16	0	279.37	24224	15252	1.22	558.36	551	14	6.73E+00	1.3	
17	0	391.88	51148	13372	1.32	783.43	775	16	1.42E+01	0.7	
18	0	439.84	236	5781	1.63	879.37	877	8	6.56E-02	56.1	
19	0	511.16	6123	13075	2.71	1022.03	1013	21	1.70E+00	4.8	
20	0	567.22	129	4643	1.62	1134.16	1132	8	3.58E-02	92.0	
21	0	593.20	207	4384	1.62	1186.14	1183	8	5.76E-02	55.8	

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
22	0	661.82	55459	11712	1.59	1323.40	1314	18	1.54E+01	0.6	
23	0	683.50	172	4093	1.70	1366.77	1363	7	4.77E-02	62.3	
24	0	744.80	200	3918	1.91	1489.38	1486	8	5.54E-02	54.8	
25	0	813.92	960	5393	1.98	1627.66	1623	11	2.67E-01	15.2	
26	0	898.20	53217	11335	1.83	1796.23	1787	18	1.48E+01	0.6	
27	0	911.71	178	3616	1.00	1823.25	1820	7	4.95E-02	56.5	
28	0	1060.30	201	3186	1.54	2120.47	2116	10	5.57E-02	53.1	
29	0	1115.71	49474	6883	2.06	2231.30	2221	21	1.37E+01	0.6	
30	0	1173.38	58621	4550	2.12	2346.66	2337	20	1.63E+01	0.5	
31	5	1326.02	1099	2197	3.54	2651.96	2640	37	3.05E-01	12.2	1.04E+01
32	5	1332.68	52576	1573	2.27	2665.29	2640	37	1.46E+01	0.5	
33	0	1405.50	53	940	1.27	2810.93	2808	10	1.46E-02	109.9	
34	0	1467.52	43	1291	4.07	2934.97	2932	12	1.20E-02	167.1	
35	0	1624.08	83	779	1.38	3248.12	3244	8	2.31E-02	59.3	
36	0	1690.71	41	729	1.86	3381.39	3372	11	1.13E-02	130.2	
37	0	1836.26	31973	956	2.75	3672.49	3660	26	8.88E+00	0.6	

```

*****
*                               GEL Laboratories LLC                               *
*                               2040 Savage Road                               *
*                               Charleston, SC 29407                           *
*****

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Configuration      : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]VER_GAM43_CAN.CNF;4
Background file    : DKA100:[CANBERRA.GAMMA.ARCHIVE.GAMMA]BKG_GAM43.CNF;89
Background date    : 7-SEP-2015 11:12:23.
Sample date       : 1-APR-2014 12:00:00. Acquisition date : 11-SEP-2015 06:51:19
Sample ID        : VER_GAM43_CAN Sample quantity : 1.00000E+00 SAMPLE
Detector name     : GAM43 Detector geometry: CAN
Elapsed live time: 0 00:15:00.00 Elapsed real time: 0 00:15:09.20 1.0%
Energy tolerance : 1.50000 keV Analyst Initials :
Abundance limit  : 75.00000 Sensitivity : 3.00000
Batch ID         : Detector SN# :
Matrix Spike ID  : LCS ID :

```

BACKGROUND CORRECTED SAMPLE PEAK REPORT

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	46.41	2909	4800	1.03	92.34	87	10	3.23E+00	4.8	
2	0	59.55	10193	4669	1.02	118.63	114	11	1.13E+01	1.7	
3	0	88.07	21032	4946	1.03	175.66	170	12	2.34E+01	1.0	
4	0	122.12	8642	2776	1.02	243.78	238	12	9.60E+00	1.6	
5	0	136.59	1221	1655	1.06	272.73	269	9	1.36E+00	6.7	
6	0	165.98	3280	2065	1.11	331.53	326	12	3.64E+00	3.3	
7	0	180.96	82	938	1.14	361.50	360	6	9.11E-02	60.0	
8	0	201.70	69	764	1.26	402.98	401	5	7.61E-02	61.7	
9	0	233.36	123	1114	0.88	466.32	464	7	1.37E-01	45.9	
10	0	262.66	72	1143	2.06	524.93	521	8	8.03E-02	81.7	
11	0	384.39	90	884	2.32	768.45	765	8	9.98E-02	58.3	
12	0	391.76	1582	1569	1.20	783.18	776	14	1.76E+00	5.9	
13	0	511.33*	351	1244	2.47	1022.37	1016	13	3.90E-01	21.4	
14	0	527.73	32	1048	3.69	1055.18	1051	13	3.52E-02	211.3	
15	0	661.97	13924	1168	1.55	1323.69	1317	16	1.55E+01	1.0	
16	1	813.10	79	657	1.84	1626.00	1621	14	8.76E-02	58.9	2.17E+00
17	1	815.59	90	642	1.84	1631.00	1621	14	9.98E-02	52.3	
18	0	898.44	1286	1241	1.90	1796.71	1790	13	1.43E+00	6.3	
19	0	1065.82	52	599	1.51	2131.51	2128	11	5.81E-02	91.6	
20	0	1090.37	114	369	1.97	2180.62	2177	8	1.26E-01	30.7	
21	0	1116.06	4230	1093	1.97	2232.00	2221	18	4.70E+00	2.4	
22	0	1143.61	33	331	1.08	2287.12	2282	10	3.64E-02	105.5	
23	0	1173.74	13029	641	2.07	2347.37	2336	22	1.45E+01	1.0	
24	0	1265.88	35	55	0.98	2531.67	2528	8	3.94E-02	40.1	
25	0	1333.03	11609	252	2.24	2665.98	2654	24	1.29E+01	1.0	
26	0	1373.99	24	102	2.98	2747.91	2734	20	2.62E-02	108.1	
27	0	1450.80	16	79	1.36	2901.54	2891	15	1.83E-02	119.8	
28	0	1585.68	46	93	3.48	3171.31	3159	21	5.08E-02	55.2	
29	0	1626.50	37	52	7.67	3252.97	3243	18	4.13E-02	49.0	
30	0	1836.83	773	54	2.32	3673.63	3662	22	8.58E-01	4.3	
31	0	1901.24	22	10	3.87	3802.45	3794	14	2.43E-02	37.9	
32	0	1928.24	52	17	2.13	3856.46	3847	22	5.78E-02	24.3	
33	0	1945.70	23	23	6.19	3891.38	3883	16	2.58E-02	51.4	

Nuclide Type:

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/SAMPLE	Decay Corr pCi/SAMPLE	2-Sigma %Error
CO-57	122.06	8642	85.60*	6.095E+00	4.974E+03	1.911E+04	3.26
	136.47	1221	10.68	6.080E+00	5.645E+03	2.169E+04	13.31
CO-60	1173.23	13029	99.85	1.246E+00	3.146E+04	3.804E+04	2.01
	1332.49	11609	99.98*	1.103E+00	3.160E+04	3.822E+04	1.99
ZN-65	1115.54	4230	50.60*	1.309E+00	1.918E+04	8.589E+04	4.75
Y-88	898.04	1286	93.70	1.615E+00	2.552E+03	7.887E+04	12.59
	1836.06	773	99.20*	8.668E-01	2.698E+03	8.339E+04	8.70
CD-109	88.03	21032	3.70*	4.739E+00	3.602E+05	7.959E+05	1.93
SN-113	391.70	1582	64.97*	3.175E+00	2.303E+03	5.532E+04	11.75
CS-137	661.66	13924	85.10*	2.124E+00	2.313E+04	2.391E+04	2.03
CE-139	165.86	3280	80.00*	5.691E+00	2.164E+03	3.087E+04	6.55
PB-210	46.54	2909	4.25*	2.585E-01	7.952E+05	8.319E+05	9.67
AM-241	59.54	10193	35.90*	1.394E+00	6.114E+04	6.129E+04	3.31

Flag: "*" = Keyline

QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM43.QAF;1

Sample ID : Bkg Sample quantity : 1.00 ea
Sample date : 7-SEP-2015 11:12:23 Acquisition date : 7-SEP-2015 11:12:23
Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.42

Out-of-range Test: N-SIGMA

Parameter Description	Value	Deviation	Flag
[Mean+/-Stdev]			
*Spectrum Background Rate	1.0893E+00	-0.95	
[1.10118+/-0.01248]			

Flags: "*" means the out-of-range test is parameter-dependent

Approved by: RR Approval Date: 9 / 11 / 15

VMS Gamma Spectroscopy Report generated 8-SEP-2015 03:52:51

Configuration : DKA100:[CANBERRA.GAMMA.SCUSR.ARCHIVE]BKG_BKG_GAM43__342965.CNF;1

---- Sample Information ----

Sample Title : Weekly Background
 Sample ID : Bkg Sample Quantity : 1.00000E+00 ea
 Sample Type : bkg Sample Geometry :
 Sample Number : 342965 Spctrm Collector : gamma spec user
 Sample Collector : Sample Analyst : gamma spec user

---- Sample Deposition Information ----

Dep. Correction? : No Dep. Duration :
 Deposition Start : Deposition End : 7-SEP-2015 11:12:23.

---- Sample Decay/Count Information ----

Sample Date : 7-SEP-2015 11:12:23. Acquisition date : 7-SEP-2015 11:12:23.
 Decay time : 0 00:00:00.00 % dead time : 0.0%
 Elapsed live time: 0 16:40:00.00 Elapsed real time: 0 16:40:06.42

---- Detector Parameters ----

Energy cal. time : 3-MAR-2015 06:03:47. Energy cal. oper.: gamma spec user
 Detector name : GAMMA43 Counting geometry:
 Effic. cal. time : 13-MAR-2015 12:42:22 Effic. cal. oper.: gamma spec user

---- Processing Parameters ----

Start channel : 1 End channel : 4096
 Sensitivity : 3.00000 Gaussian Sens. : 10.00000
 Critical level? : No Propagate Errors?: No
 Efficiency Type : SPLINE Library-based eff: No
 Energy tolerance : 2.00000 Half life ratio : 8.00000
 Abundance limit : 75.00000 WTM error limit : 3.00000
 MDA Width (FWHM) : 3.00000 MDA Confid Level : 5.00000 %

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	Fit
1	0	63.17	107	474	0.99	125.86	123	7	1.78E-03	35.1	
2	0	77.68	90	381	1.54	154.88	152	6	1.49E-03	36.3	
3	0	84.65	54	411	1.24	168.83	166	6	8.93E-04	61.3	
4	0	92.91	611	678	1.11	185.36	180	12	1.02E-02	9.5	
5	4	142.62	55	195	1.01	284.80	283	8	9.11E-04	38.7	2.25E+00
6	4	143.90	113	339	1.17	287.35	283	8	1.89E-03	29.1	
7	0	186.05	361	495	1.10	371.67	368	9	6.02E-03	12.2	
8	0	191.86	29	287	1.37	383.29	382	6	4.83E-04	94.6	
9	0	197.90	84	489	1.99	395.38	392	9	1.40E-03	48.5	
10	0	205.36	104	383	1.40	410.30	407	8	1.74E-03	33.9	
11	0	238.33	243	451	1.03	476.26	471	11	4.05E-03	18.0	
12	0	282.46	79	854	9.18	564.55	553	22	1.32E-03	95.1	
13	0	295.33	32	417	1.14	590.28	585	10	5.29E-04	121.8	
14	0	329.44	39	347	2.27	658.52	651	11	6.42E-04	95.8	
15	0	339.15	71	249	1.55	677.94	674	8	1.19E-03	40.4	
16	0	352.10	44	224	1.19	703.84	701	7	7.29E-04	58.6	
17	0	416.08	56	285	3.08	831.84	823	12	9.26E-04	62.4	
18	0	423.62	16	214	2.17	846.92	843	10	2.61E-04	177.5	
19	0	511.36	1115	416	2.80	1022.44	1013	21	1.86E-02	5.5	

20	0	570.31	57	140	2.92	1140.35	1136	10	9.42E-04	41.4
21	0	640.82	60	184	3.66	1281.39	1273	16	9.99E-04	52.2
22	0	679.67	48	83	2.06	1359.10	1354	9	8.06E-04	36.9
23	0	728.34	2	139	0.78	1456.46	1452	10	3.75E-05	985.6
24	0	795.59	37	125	3.52	1590.98	1583	14	6.11E-04	67.0
25	0	911.45	43	99	0.72	1822.75	1817	13	7.14E-04	50.6
26	0	970.11	46	93	1.15	1940.07	1935	11	7.75E-04	43.6
27	0	1159.37	29	94	6.48	2318.63	2304	21	4.76E-04	89.0
28	0	1222.14	86	85	11.13	2444.19	2432	26	1.44E-03	31.1
29	0	1447.09	40	87	10.94	2894.13	2877	29	6.58E-04	69.6
30	0	1461.76	82	62	1.94	2923.47	2913	19	1.37E-03	25.4
31	0	1533.58	42	56	7.97	3067.12	3057	22	6.95E-04	48.0
32	0	1580.41	19	35	2.76	3160.77	3151	14	3.24E-04	68.4
33	0	1767.50	13	39	1.25	3534.96	3526	13	2.13E-04	107.7
34	0	1801.35	18	26	0.54	3602.67	3596	13	2.96E-04	63.8
35	0	1939.88	13	15	2.80	3879.73	3875	10	2.17E-04	62.3

Master Verification Spreadsheet (solid standard)

Gamma Spectroscopy Calibration Verification

Instrument: GAMMA 43

Calibration Date: 9/10/2015

Geometry: CAN

Manufacturer Standard Id: 96485

GEL Standard Id: 1701

Nuclide	Energy	Abundance (decimal)	Emission Rate (dps)	Calibrated Activity (pCi)	Measured Activity (pCi)	DIFFERENCE (%)
Am-241	59.5	0.359	751.4	5.6569E+04	6.129E+04	8.35
Cs-137	661.7	0.851	735.7	2.3365E+04	2.391E+04	2.33
Co-60	1173.2	0.9985	1383	3.7435E+04	3.804E+04	1.62
Co-60	1332.5	0.9998	1385	3.7440E+04	3.822E+04	2.08

Prepared By: R. F. Allen

Date: 9/11/15

Reviewed By: M. Stamp

Date: 9/18/15

Validated by MJSH on 3/10/11

Verification results are considered acceptable if all differences are less than +/- 10%.

GEL Laboratories, LLC

2040 Savage Road, Charleston, SC 29414
(843)556-8171

Gamma Spectrometer Front End Electronics Setup

Detector: Gammac 43

Date Performed: 9/9/15

Performed By: RF

High Voltage Power Supply Model No. <u>3105</u> High Voltage <u>2.00KV</u>	Spectroscopy Amplifier Model No. <u>2026</u> Course Gain <u>20</u> Fine Gain <u>1.321</u> Time Constant <u>6 μsec</u> Input polarity <u>Positive</u> BSLR rate <u>no</u> BSLR mode <u>no</u> Threshold <u>no</u>
ADC Model No. <u>8701</u> Gain <u>4K</u>	
AIM Module Model No. <u>356B</u> Address <u>1117.2</u>	

Continuing Calibration Data

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
 28-JUN-2016 10:39:39.31

Run Date	Detector	Parameter		Flag
28-JUN-2016	GAM01	All Parameters Passed		
28-JUN-2016	GAM02	Cal Check	PSFWHM-59	Investigate <i>OK</i>
28-JUN-2016	GAM03	Cal Check	PSFWHM-662	Action
28-JUN-2016	GAM03	Cal Check	PSFWHM-59	Action <i>looked out</i>
28-JUN-2016	GAM05	All Parameters Passed		
28-JUN-2016	GAM06	All Parameters Passed		
7-JUN-2016	GAM07	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM07	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM08	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
28-JUN-2016	GAM09	All Parameters Passed		
28-JUN-2016	GAM10	All Parameters Passed		
28-JUN-2016	GAM11	All Parameters Passed		
		Weekly Background check completed on 28-JUN-2016.		
		No daily Bkg Check necessary.		
28-JUN-2016	GAM12	All Parameters Passed		
		Weekly Background check completed on 28-JUN-2016.		
		No daily Bkg Check necessary.		
-----	GAM13	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM13	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM14	Cal Check	PSFWHM-1332	Investigate <i>OK</i>
27-JUN-2016	GAM15	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM15	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM16	All Parameters Passed		
28-JUN-2016	GAM17	Cal Check	PSFWHM-662	Action
28-JUN-2016	GAM17	Cal Check	PSFWHM-59	Action <i>below -OK</i>
27-JUN-2016	GAM18	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM18	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM19	All Parameters Passed		<i>OK</i>
27-JUN-2016	GAM20	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM20	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM22	Cal Check	PSFWHM-1332	Investigate <i>OK</i>

28-JUN-2016	GAM24	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
28-JUN-2016	GAM25	All Parameters Passed		
28-JUN-2016	GAM26	All Parameters Passed		
28-JUN-2016	GAM27	Cal Check	PSFWHM-662	Action <i>below-OK</i>
28-JUN-2016	GAM28	All Parameters Passed		
27-JUN-2016	GAM29	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM29	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM30	All Parameters Passed		
28-JUN-2016	GAM31	All Parameters Passed		
28-JUN-2016	GAM32	Cal Check	PSFWHM-662	Investigate <i>OK</i>
28-JUN-2016	GAM33	All Parameters Passed		
		Weekly Background check completed on 28-JUN-2016.		
		No daily Bkg Check necessary.		
28-JUN-2016	GAM36	Cal Check	PSFWHM-662	Investigate <i>OK</i>
-----	GAM40	Cal Check may not have run since 28-JUN-2016		
26-JUN-2016	GAM40	Bkg Check may not have run since 28-JUN-2016		
28-JUN-2016	GAM41	All Parameters Passed		
28-JUN-2016	GAM43	All Parameters Passed		
28-JUN-2016	GAM44	Cal Check	PSFWHM-1332	Investigate <i>OK</i>
28-JUN-2016	GAM44	Cal Check	NLACTVTY-59	Investigate <i>OK</i>
28-JUN-2016	WELL	All Parameters Passed		
28-JUN-2016	XRAY1	All Parameters Passed		
28-JUN-2016	XRAY2	All Parameters Passed		
28-JUN-2016	XRAY3	Cal Check	NLACTVTY-109	Investigate <i>OK</i>
28-JUN-2016	XRAY4	All Parameters Passed		
28-JUN-2016	XRAY5	All Parameters Passed		
28-JUN-2016	XRAY6	All Parameters Passed		

APPROVAL DATE: 6/28/16

APPROVAL TIME: 11:06

APPROVED BY: *Uftampv*

PROCEDURE # GL-RAD-I-001

Report completed at 28-JUN-2016 10:43:30.74

Review of Gamma Spectrometer QA results (Daily calibration & background checks)
 29-JUN-2016 11:52:58.50

Run Date	Detector	Parameter		Flag
29-JUN-2016	GAM01	All Parameters Passed		
29-JUN-2016	GAM02	Cal Check	PSFWHM-1332	Investigate OK
29-JUN-2016	GAM03	Cal Check	PSFWHM-662	Action
29-JUN-2016	GAM03	Cal Check	PSFWHM-1332	Investigate
29-JUN-2016	GAM03	Cal Check	PSFWHM-59	Action
26-JUN-2016	GAM03	Bkg Check may not have run since 29-JUN-2016		} Locked out
29-JUN-2016	GAM05	All Parameters Passed		
29-JUN-2016	GAM06	All Parameters Passed		
7-JUN-2016	GAM07	Cal Check may not have run since 29-JUN-2016		
26-JUN-2016	GAM07	Bkg Check may not have run since 29-JUN-2016		
29-JUN-2016	GAM08	Cal Check	PSFWHM-662	Investigate
29-JUN-2016	GAM08	Cal Check	NLACTVTY-1332	Investigate
29-JUN-2016	GAM08	Cal Check	PSFWHM-59	Investigate OK
29-JUN-2016	GAM09	Bkg Check	BACKRATE	Investigate OK
29-JUN-2016	GAM10	All Parameters Passed		
29-JUN-2016	GAM11	All Parameters Passed		
29-JUN-2016	GAM12	Bkg Check	BACKRATE	Action Locked Out
-----	GAM13	Cal Check may not have run since 29-JUN-2016		
26-JUN-2016	GAM13	Bkg Check may not have run since 29-JUN-2016		
29-JUN-2016	GAM14	All Parameters Passed		
27-JUN-2016	GAM15	Cal Check may not have run since 29-JUN-2016		
26-JUN-2016	GAM15	Bkg Check may not have run since 29-JUN-2016		
29-JUN-2016	GAM16	All Parameters Passed		
29-JUN-2016	GAM17	Cal Check	NLACTVTY-59	Investigate OK
27-JUN-2016	GAM18	Cal Check may not have run since 29-JUN-2016		
26-JUN-2016	GAM18	Bkg Check may not have run since 29-JUN-2016		
29-JUN-2016	GAM19	Cal Check	NLACTVTY-1332	Investigate OK
27-JUN-2016	GAM20	Cal Check may not have run since 29-JUN-2016		
26-JUN-2016	GAM20	Bkg Check may not have run since 29-JUN-2016		
29-JUN-2016	GAM22	Bkg Check	BACKRATE	Investigate OK

29-JUN-2016	GAM24	Cal Check	PSFWHM-662	Investigate <i>OK</i>
29-JUN-2016	GAM25	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
29-JUN-2016	GAM26	All Parameters Passed		
29-JUN-2016	GAM27	All Parameters Passed		
29-JUN-2016	GAM28	Cal Check	PSFWHM-59	Action <i>below-OK</i>
29-JUN-2016	GAM28	Cal Check	PSFWHM-662	Investigate <i>OK</i>
27-JUN-2016	GAM29	Cal Check may not have run since 29-JUN-2016		
26-JUN-2016	GAM29	Bkg Check may not have run since 29-JUN-2016		
29-JUN-2016	GAM30	All Parameters Passed		
29-JUN-2016	GAM31	All Parameters Passed		
29-JUN-2016	GAM32	Cal Check	PSFWHM-662	Investigate <i>OK</i>
29-JUN-2016	GAM33	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
29-JUN-2016	GAM36	All Parameters Passed		
-----	GAM40	Cal Check may not have run since 29-JUN-2016		
26-JUN-2016	GAM40	Bkg Check may not have run since 29-JUN-2016		
29-JUN-2016	GAM41	Cal Check	PSFWHM-1332	Investigate <i>OK</i>
29-JUN-2016	GAM41	Cal Check	NLACTVTY-59	Investigate <i>OK</i>
29-JUN-2016	GAM43	Cal Check	NLACTVTY-662	Investigate <i>OK</i>
29-JUN-2016	GAM44	All Parameters Passed		
29-JUN-2016	WELL	Cal Check	PSFWHM-662	Action <i>below-OK</i>
29-JUN-2016	WELL	Cal Check	NLACTVTY-1332	Investigate <i>OK</i>
29-JUN-2016	XRAY1	Cal Check	PSFWHM-59	Investigate <i>OK</i>
29-JUN-2016	XRAY1	Cal Check	PSFWHM-46	Investigate <i>OK</i>
29-JUN-2016	XRAY1	Cal Check	NLACTVTY-46	Investigate <i>OK</i>
29-JUN-2016	XRAY2	All Parameters Passed		
29-JUN-2016	XRAY3	All Parameters Passed		
29-JUN-2016	XRAY4	All Parameters Passed		
29-JUN-2016	XRAY5	All Parameters Passed		
29-JUN-2016	XRAY6	All Parameters Passed		

APPROVAL DATE: *6/29/16*

APPROVAL TIME: *12:25*

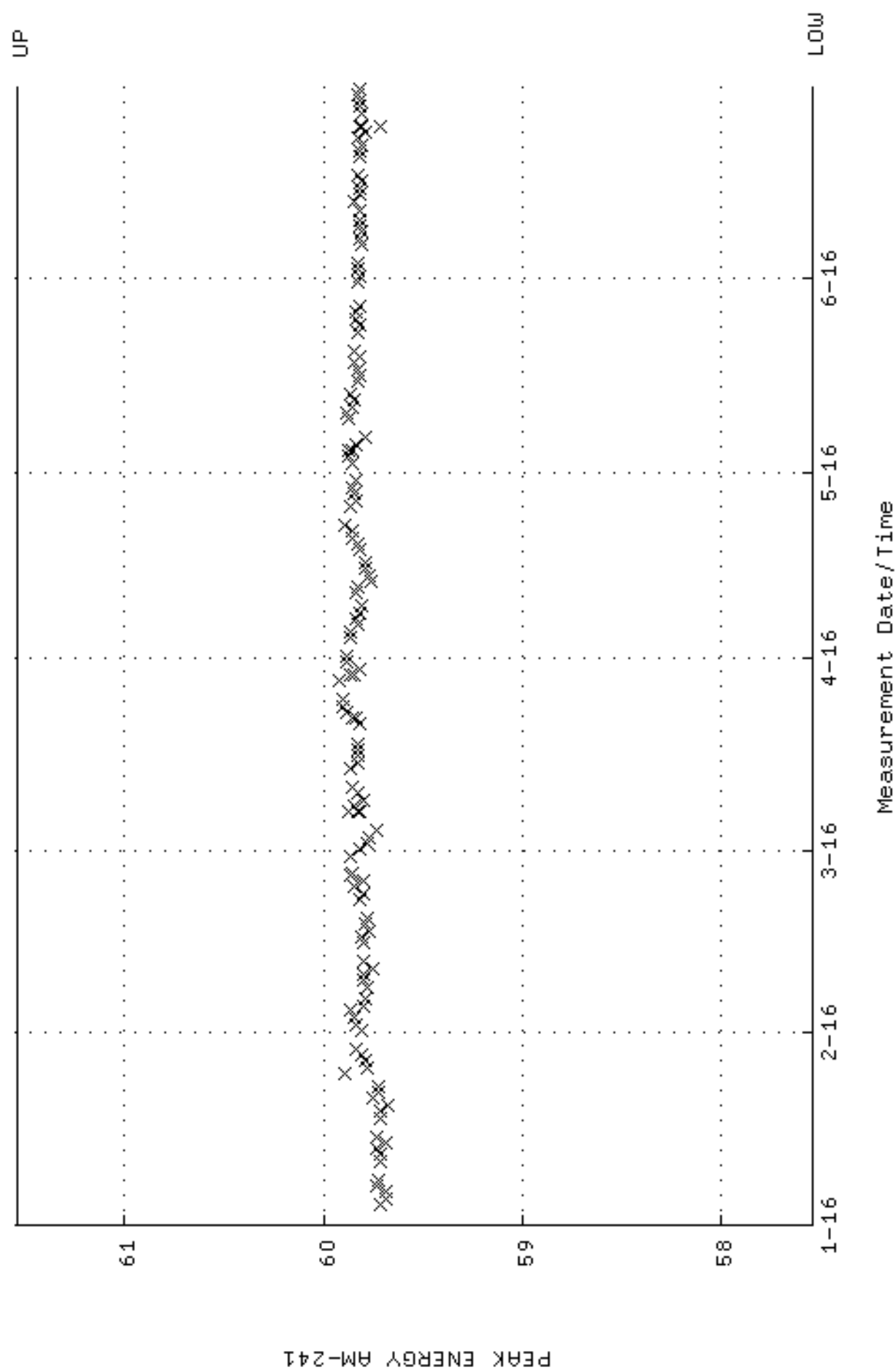
APPROVED BY: *H. Stamp*

PROCEDURE # GL-RAD-I-001

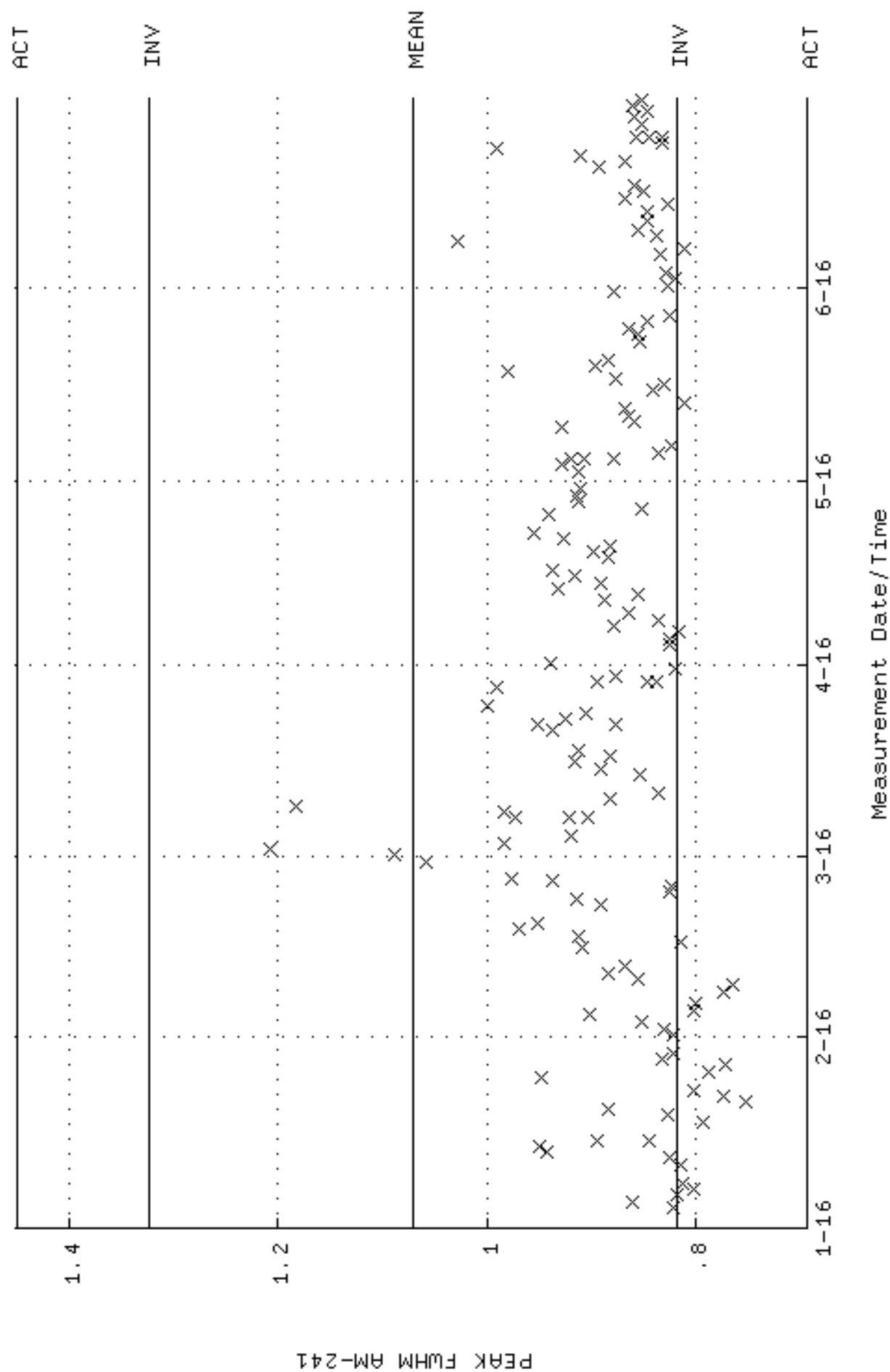
Report completed at 29-JUN-2016 11:56:42.71

Background and Efficiency Data

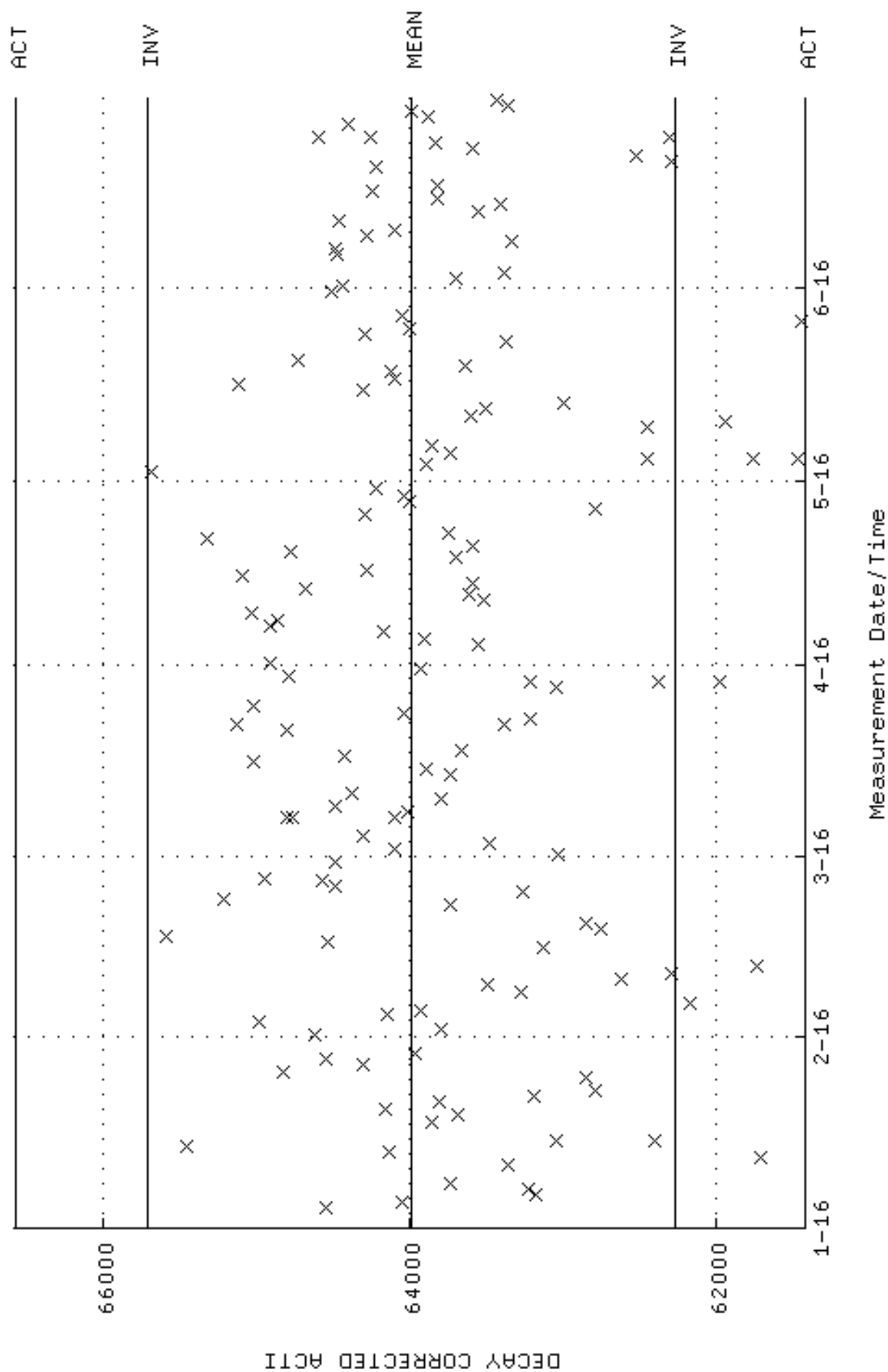
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM05_CAN.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-JAN-2016 05:56:04 through 1-JUL-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



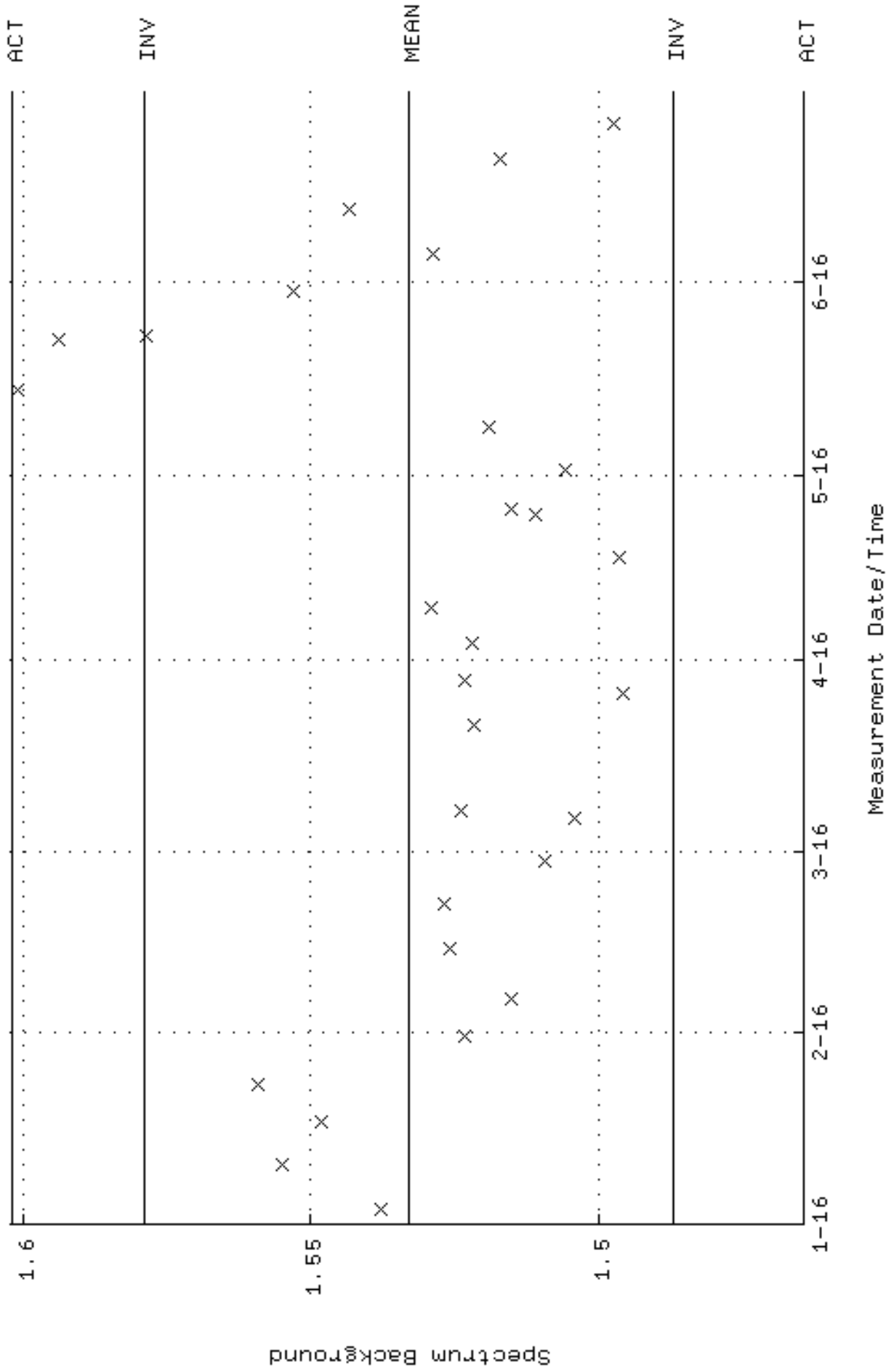
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM05_CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 4-JAN-2016 05:56:04 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 1.07179 +- 0.125868 (11.74 %)



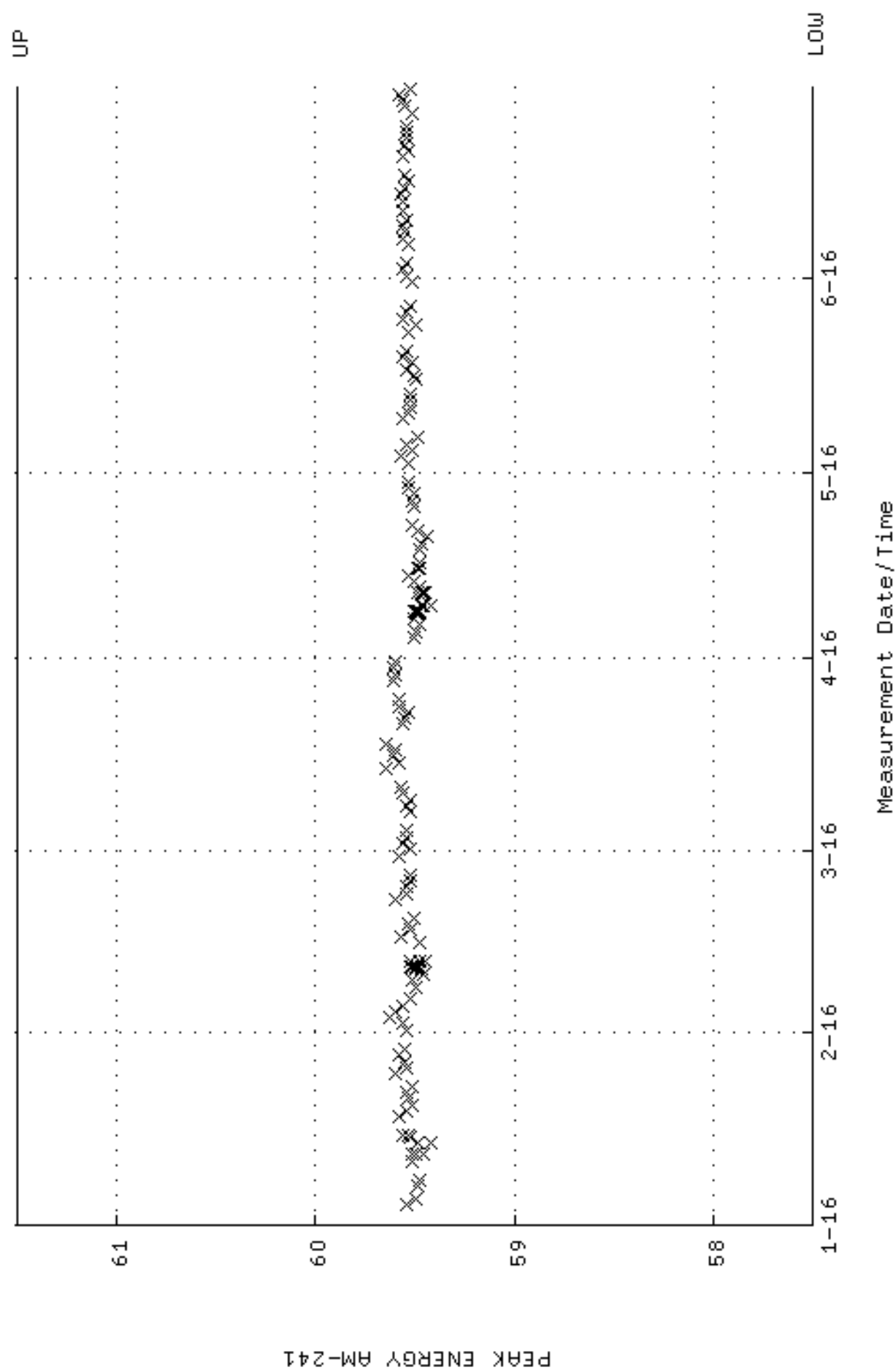
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM05_CAN.QAF;1
 Parameter Name : NLACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-JAN-2016 05:56:04 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 63988.9 +- 858.690 (1.34 %)



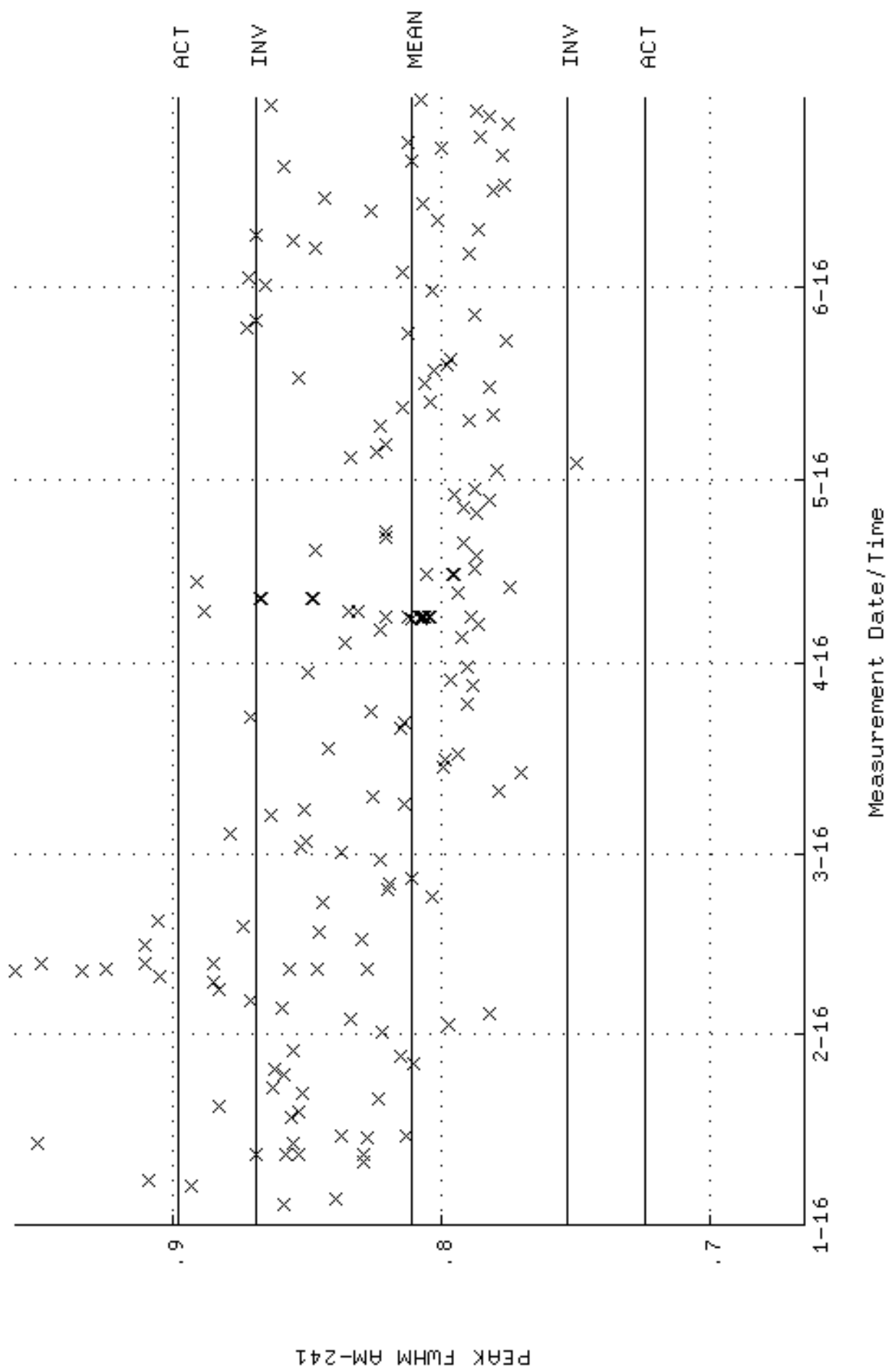
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM05.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 3-JAN-2016 11:09:42 through 1-JUL-2016 12:00:00
Mean +- Std Dev : 1.53310 +- 2.296009E-02 (1.50 %)



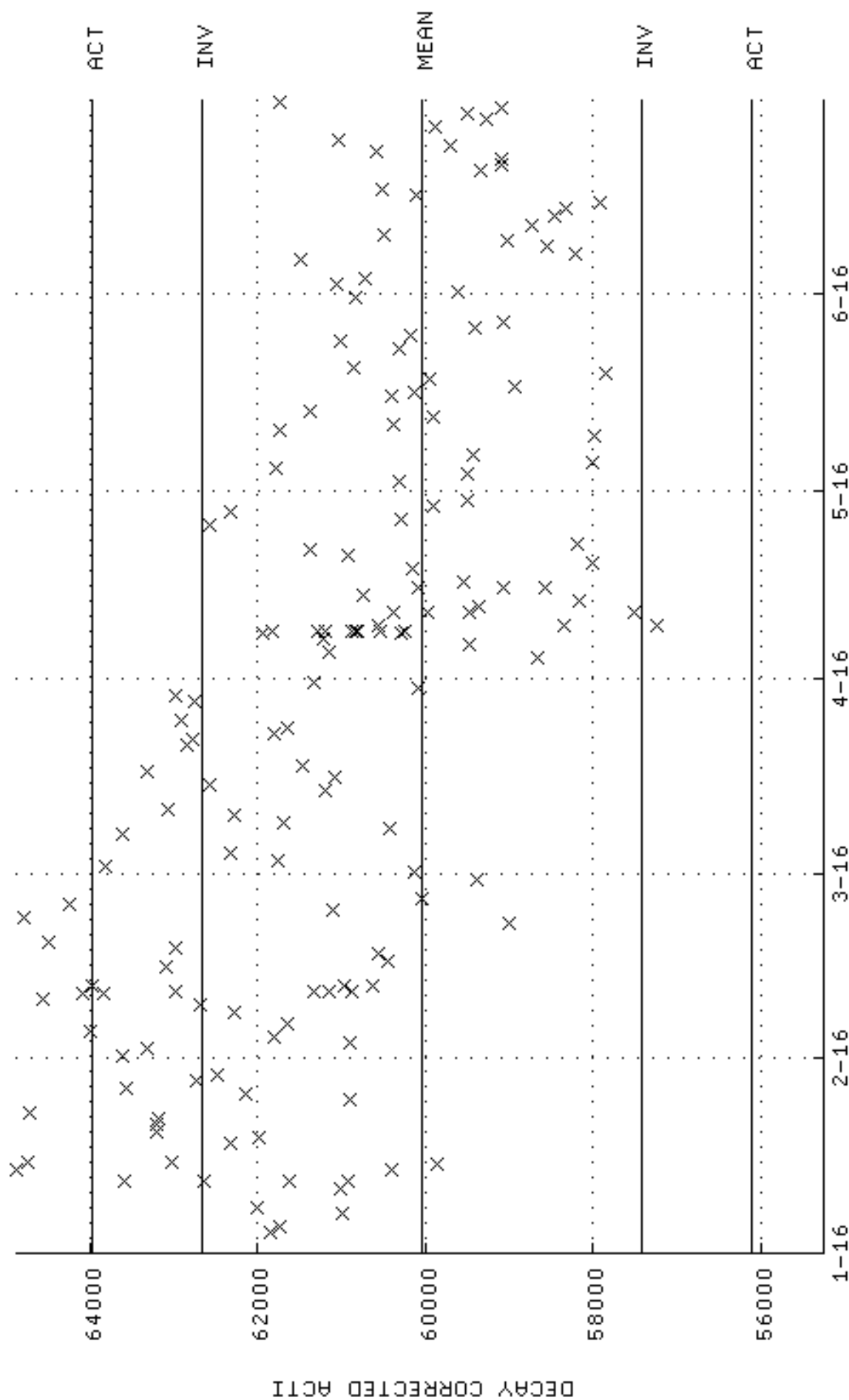
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM11_JAR.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 4-JAN-2016 06:38:35 through 1-JUL-2016 12:00:00
 Lower/Upper Lmts: 57.5000 through 61.5000



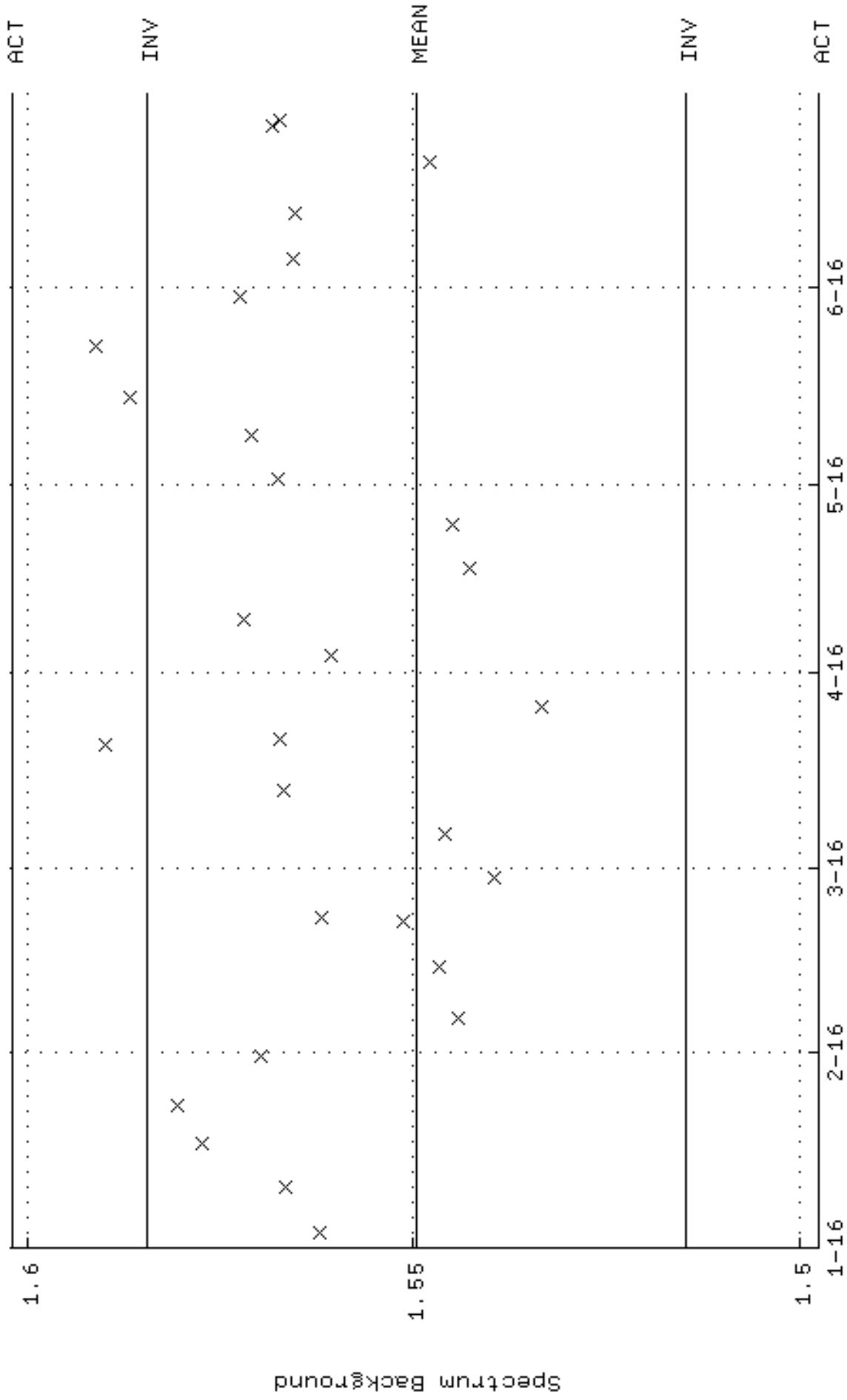
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM11_JAR.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 4-JAN-2016 06:38:35 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 0.811280 +- 2.896658E-02 (3.57 %)



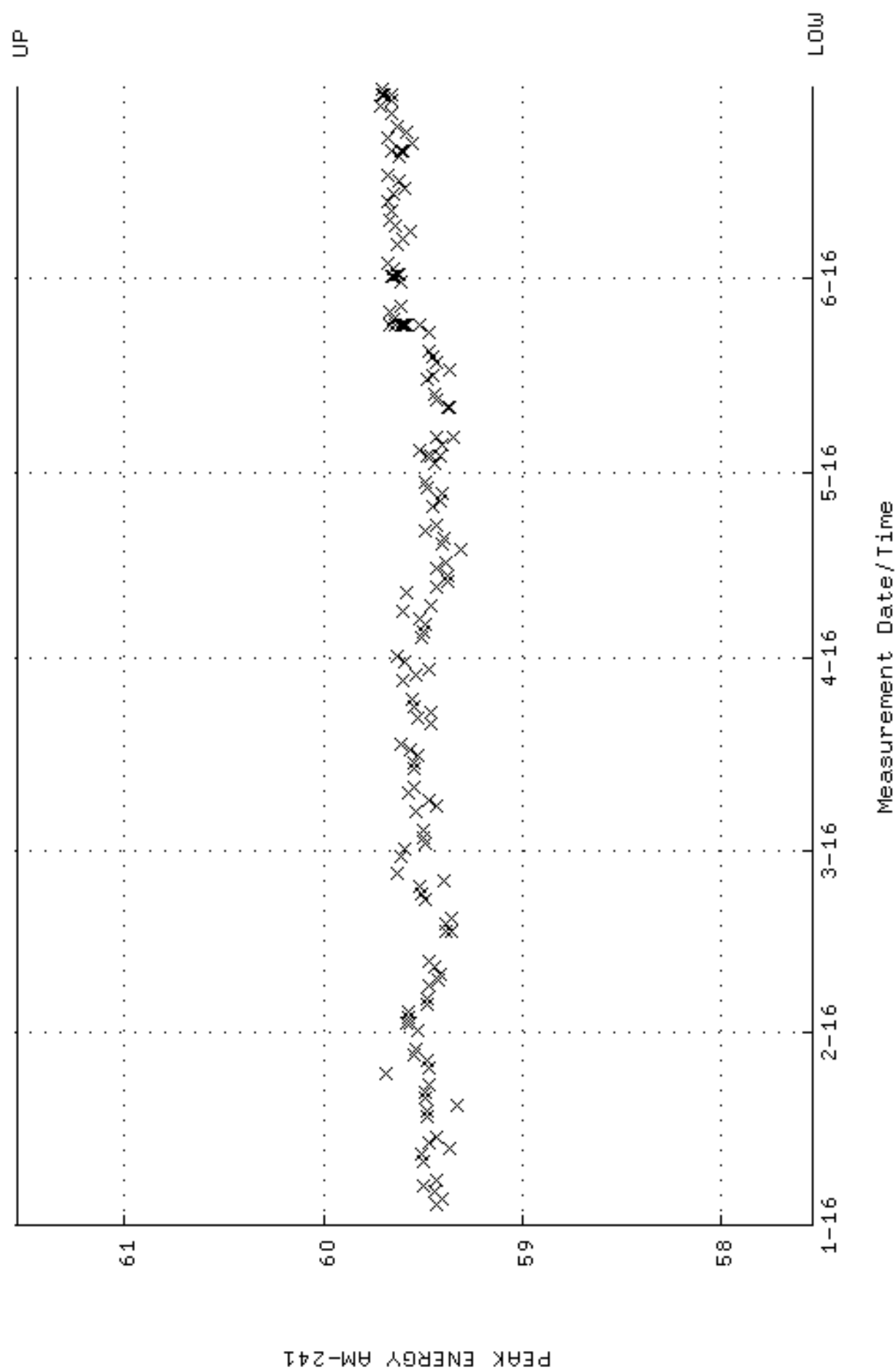
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM11_JAR.QAF;1
 Parameter Name : NLACTVY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-JAN-2016 06:38:35 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 60054.4 +- 1312.98 (2.19 %)



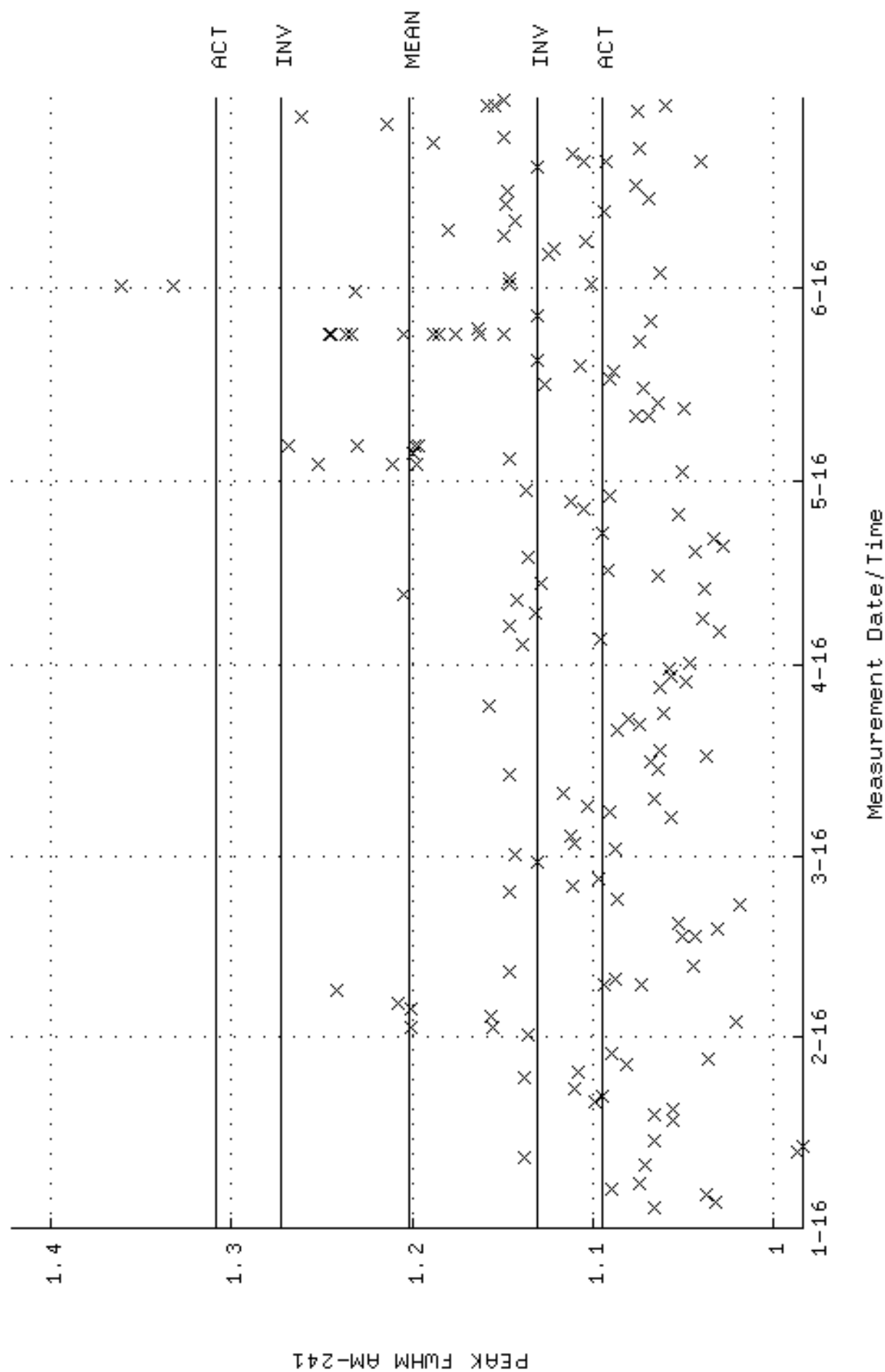
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM11.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 3-JAN-2016 11:10:10 through 1-JUL-2016 12:00:00
Mean +- Std Dev : 1.54973 +- 1.740346E-02 (1.12 %)



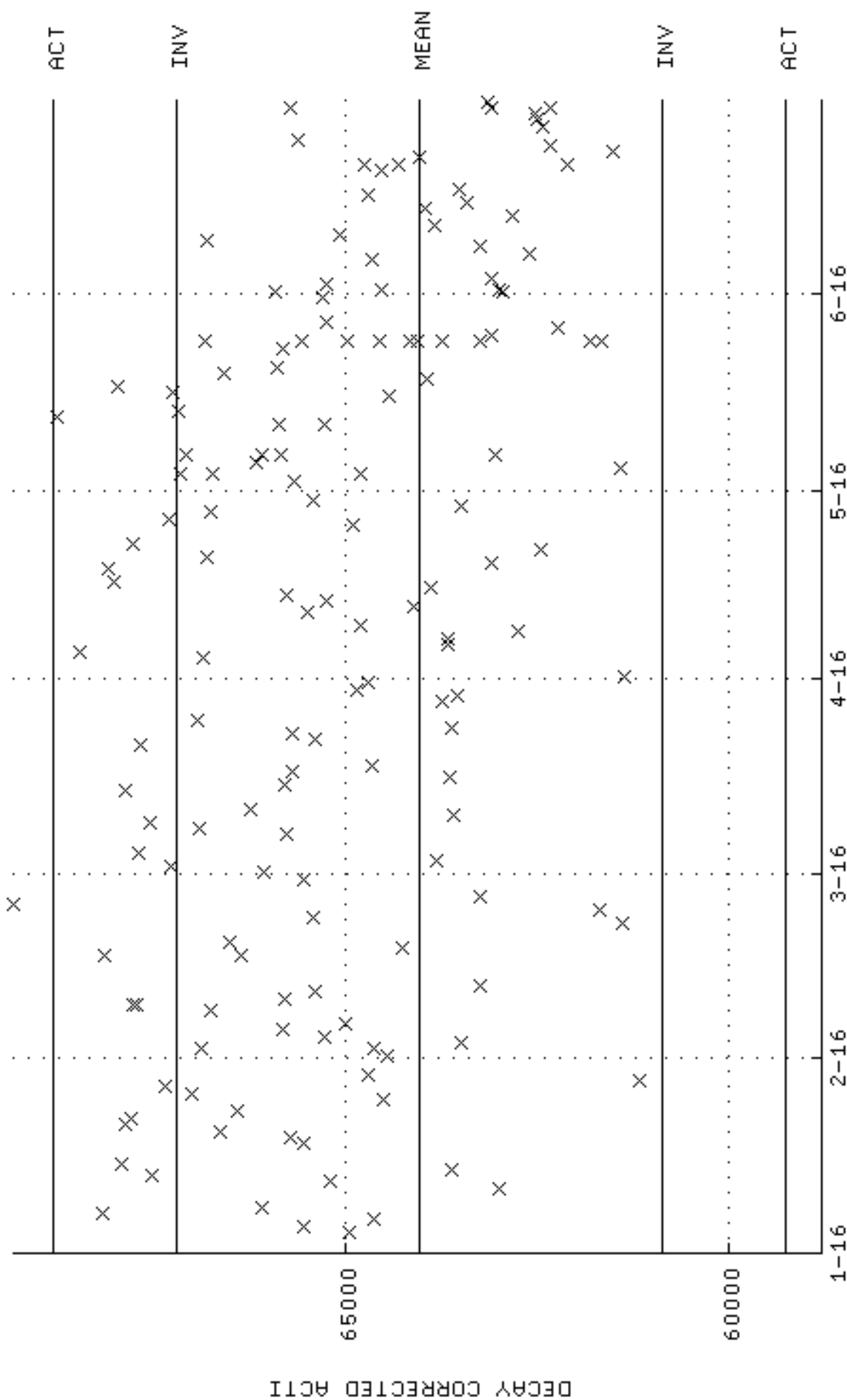
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM28_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-JAN-2016 06:51:13 through 1-JUL-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



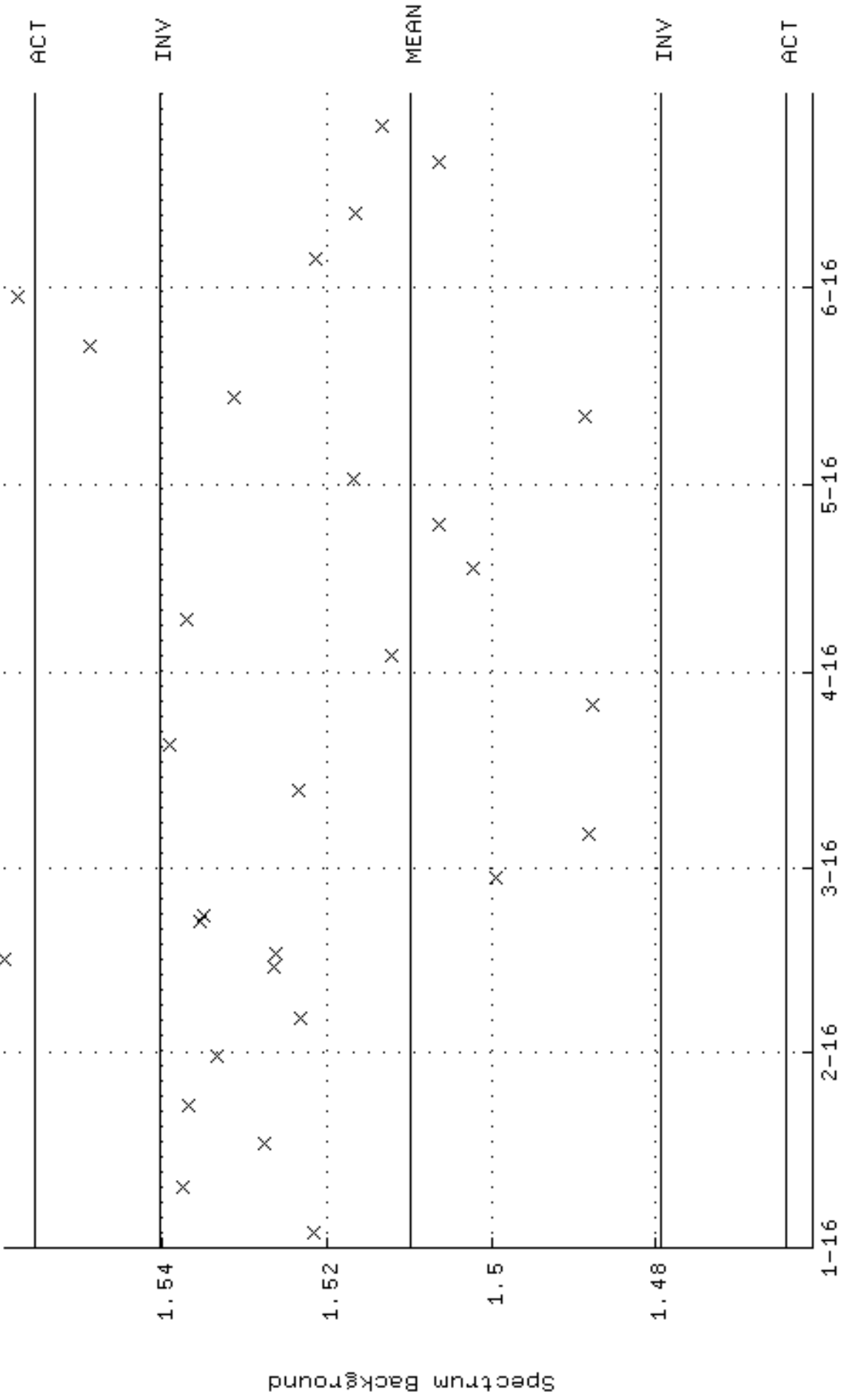
QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM28_JAR.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 4-JAN-2016 06:51:13 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 1.20208 +- 3.554162E-02 (2.96 %)



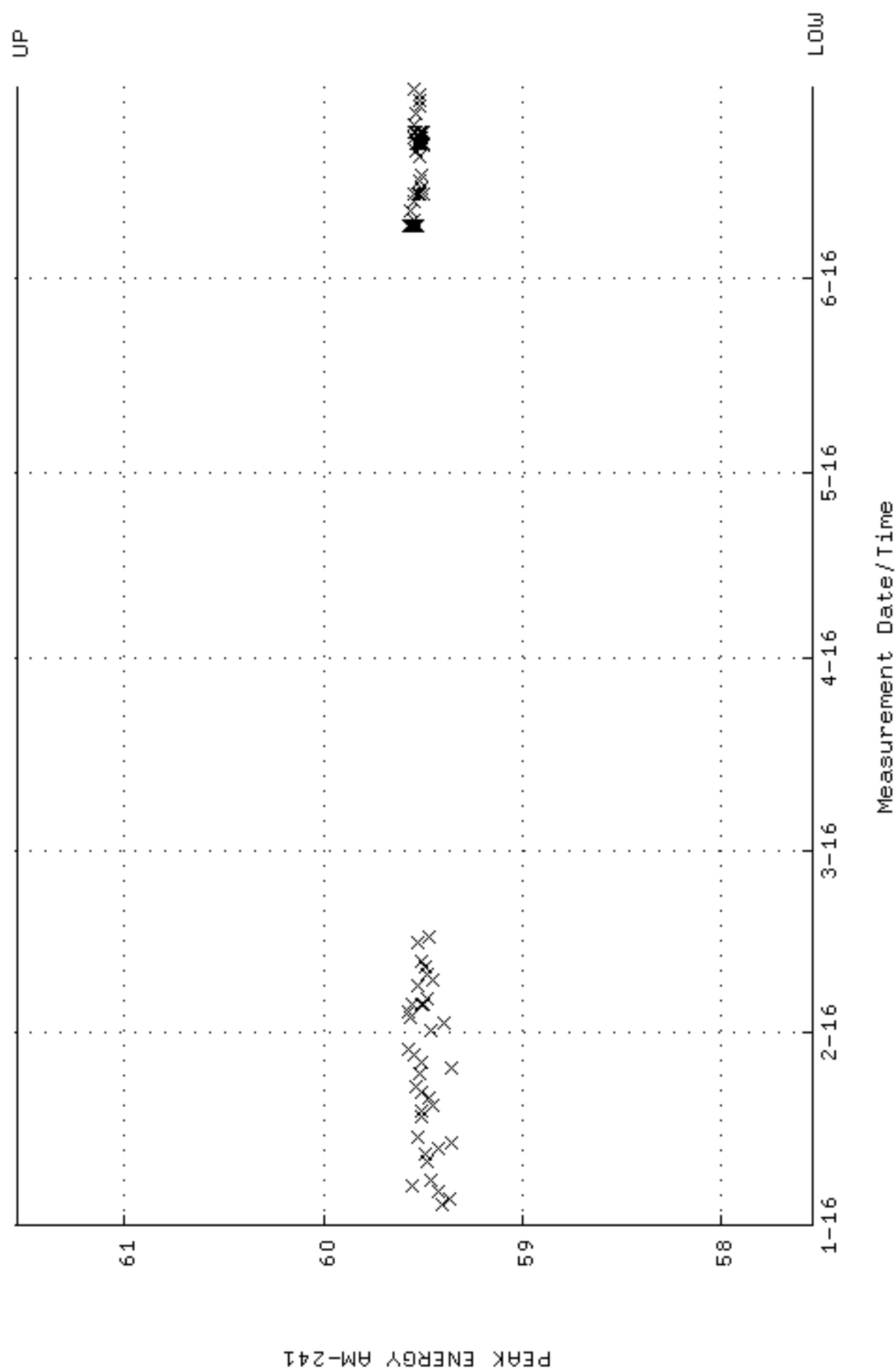
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM28-JAR.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-JAN-2016 06:51:13 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 64051.7 +- 1587.33 (2.48 %)



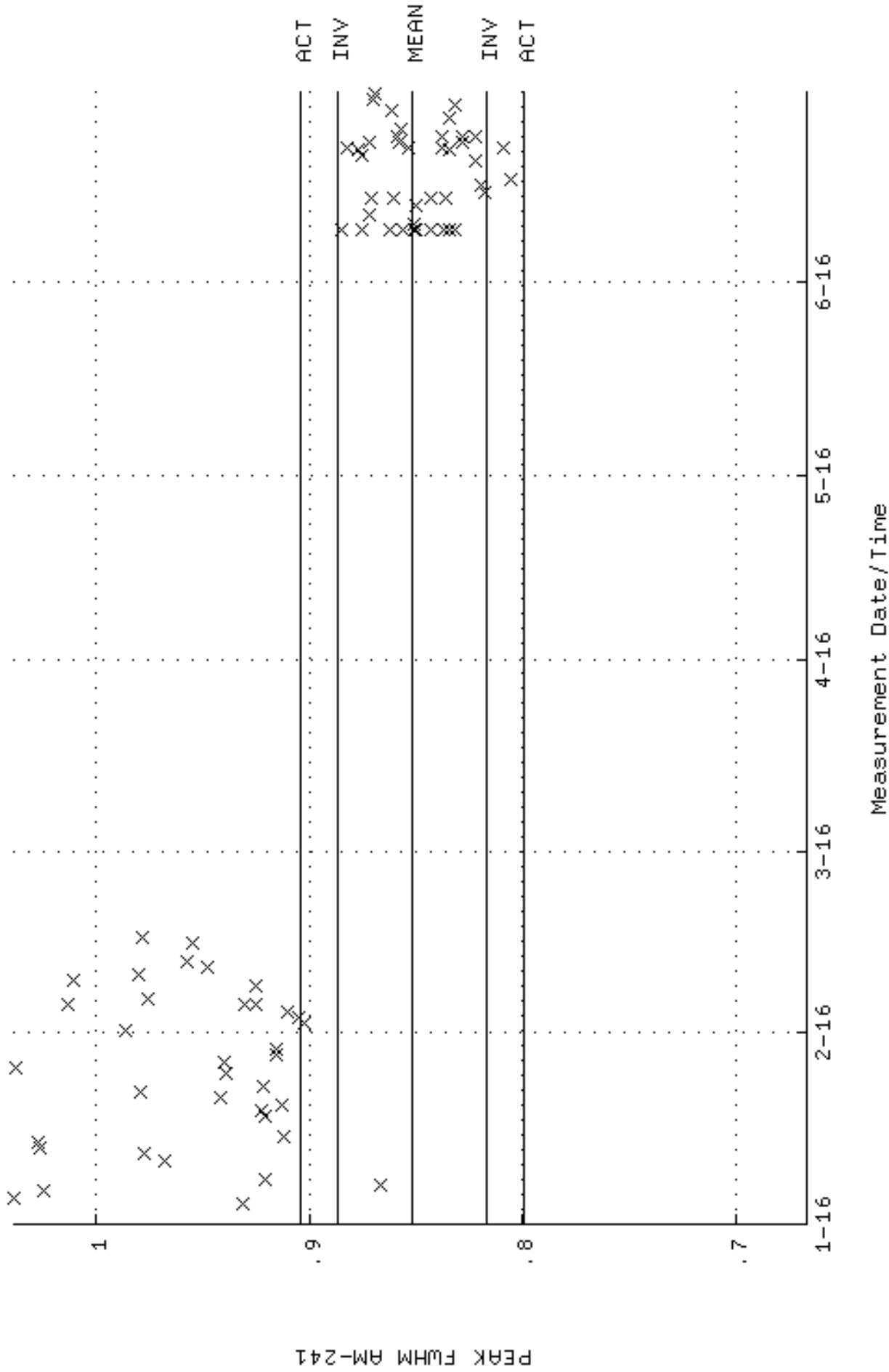
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM28.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 3-JAN-2016 11:11:30 through 1-JUL-2016 12:00:00
Mean +- Std Dev : 1.50994 +- 1.525503E-02 (1.01 %)



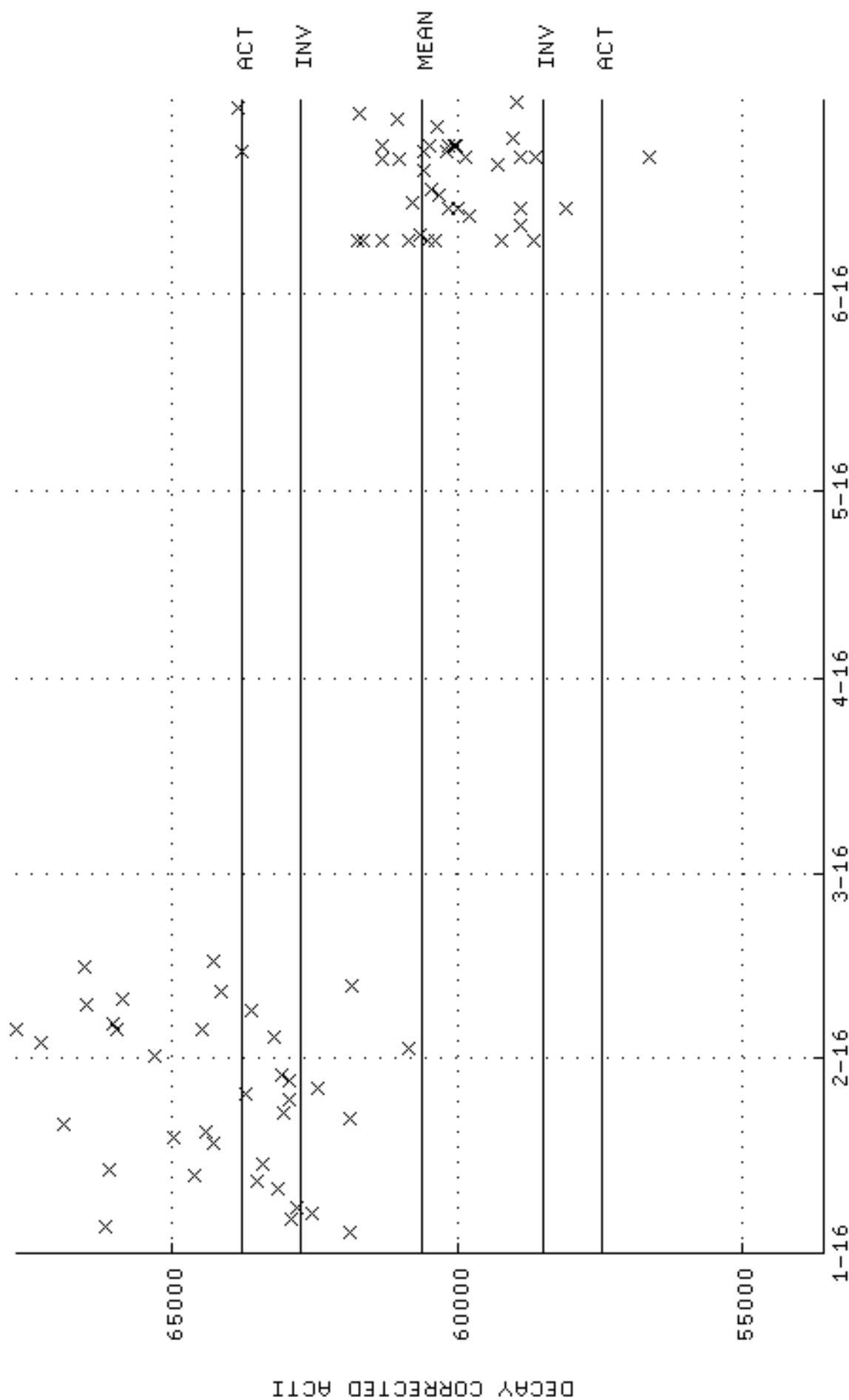
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM36_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 4-JAN-2016 06:51:23 through 1-JUL-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



QA filename : DKA100:[CANBERRA,GAMMA,SCUSR,QA]QCC_GAM36_CAN.QAF;1
Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
Start/End Dates : 4-JAN-2016 06:51:23 through 1-JUL-2016 12:00:00
Mean +- Std Dev : 0.852149 +- 1.752601E-02 (2.06 %)

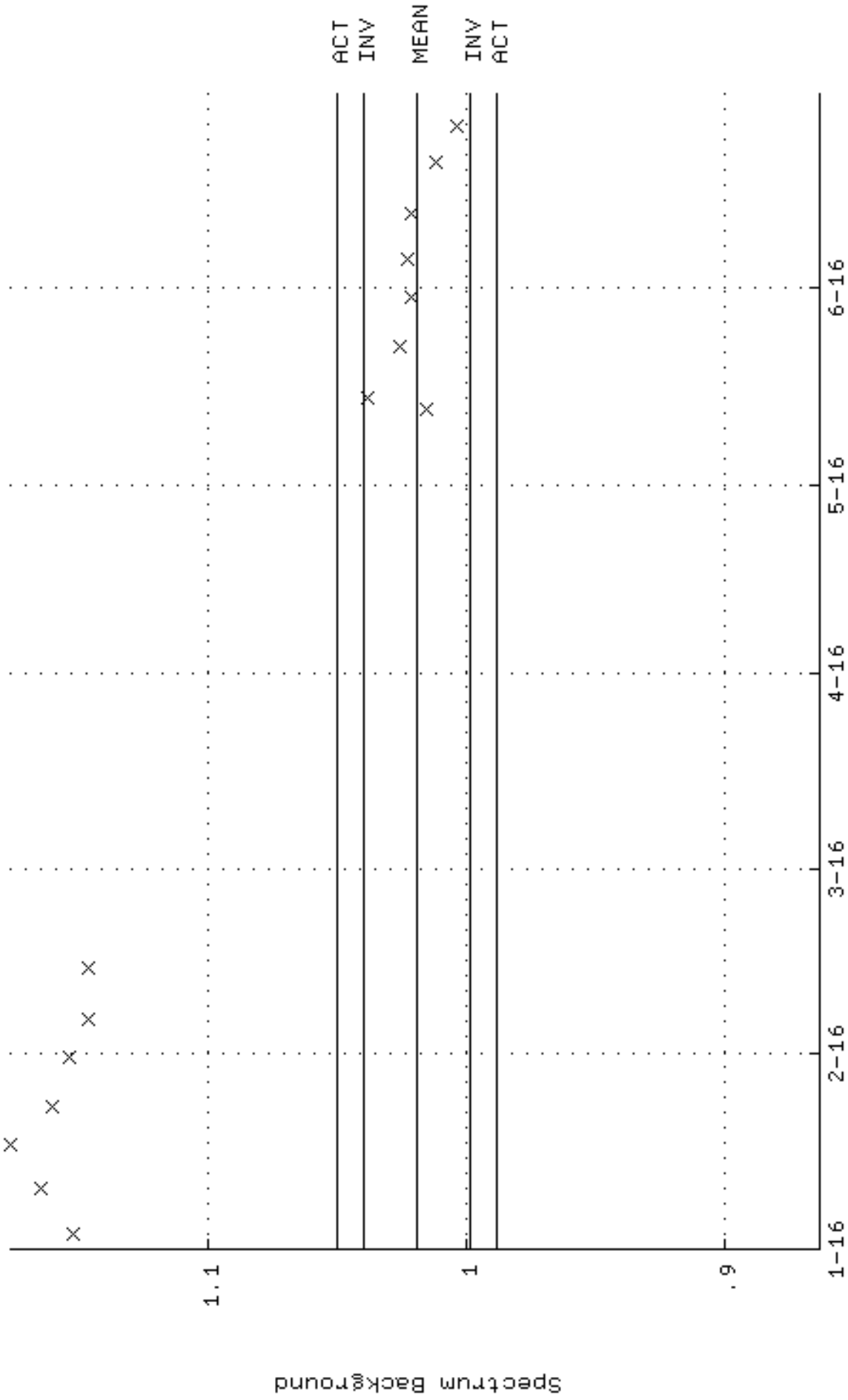


QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM36_CAN.QAF;1
 Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-JAN-2016 06:51:23 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 60639.9 +- 1057.68 (1.74 %)

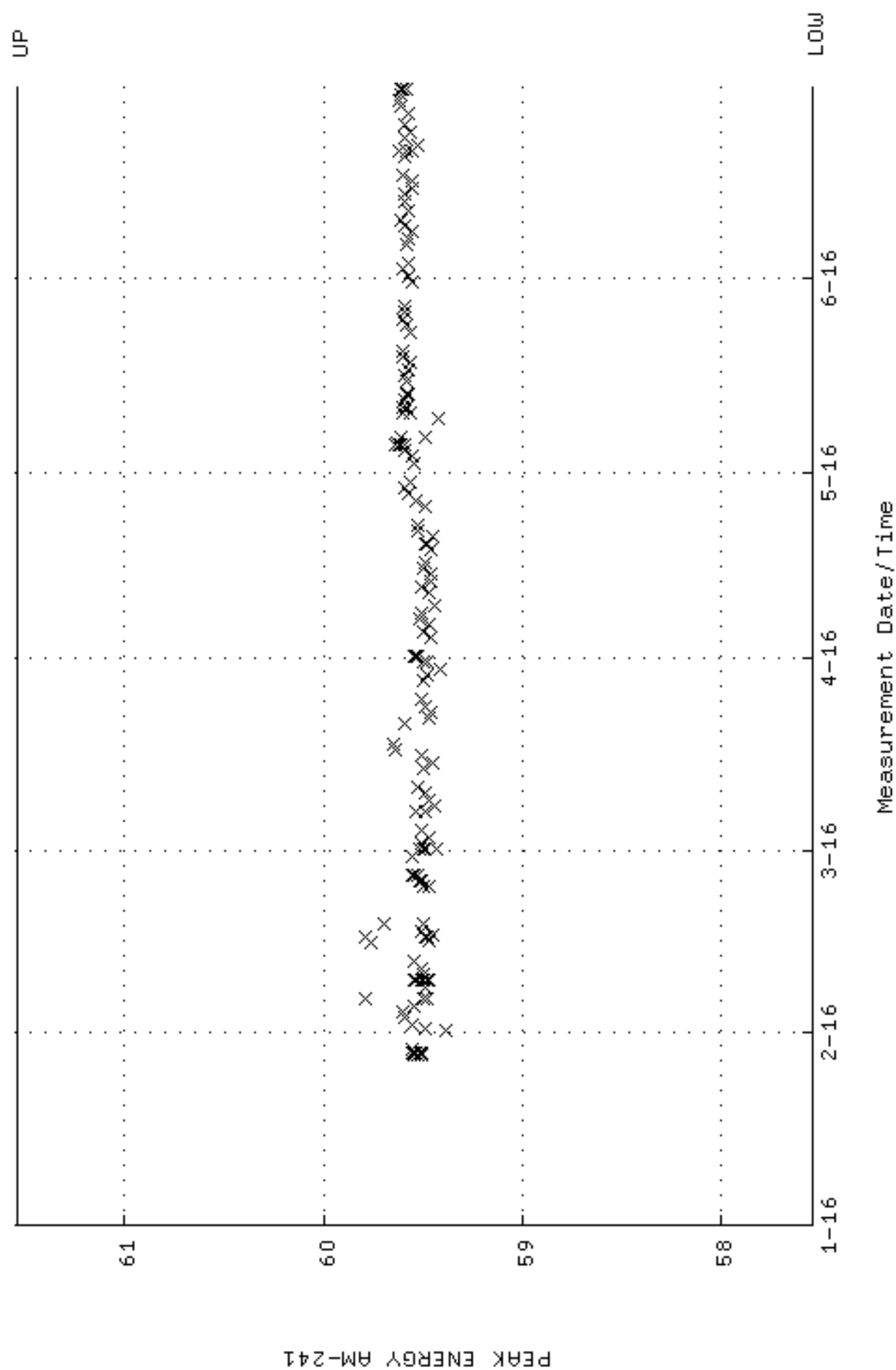


Measurement Date/Time

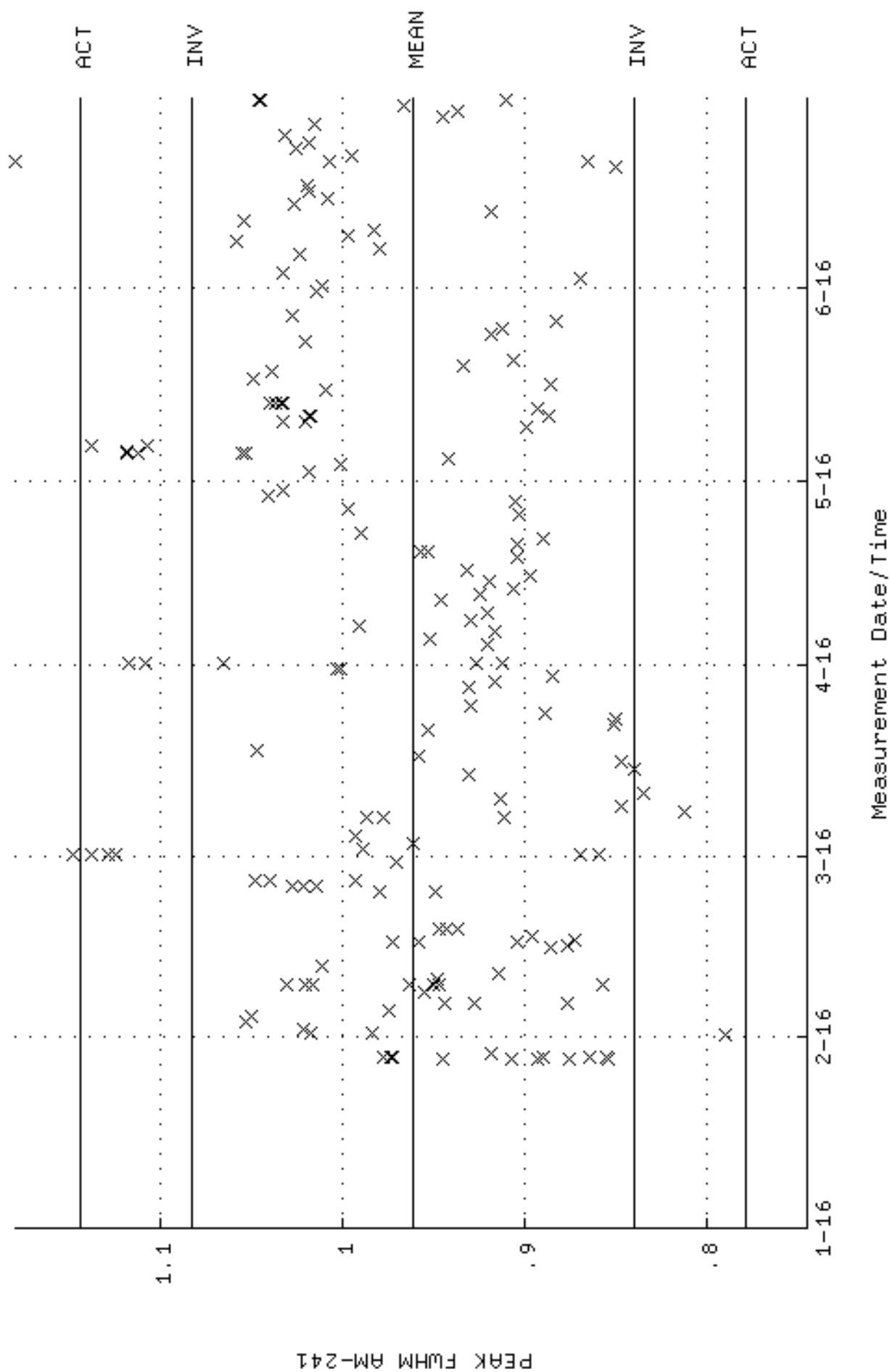
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM36.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 3-JAN-2016 11:11:58 through 1-JUL-2016 12:00:00
Mean +- Std Dev : 1.01950 +- 1.019381E-02 (1.00 %)



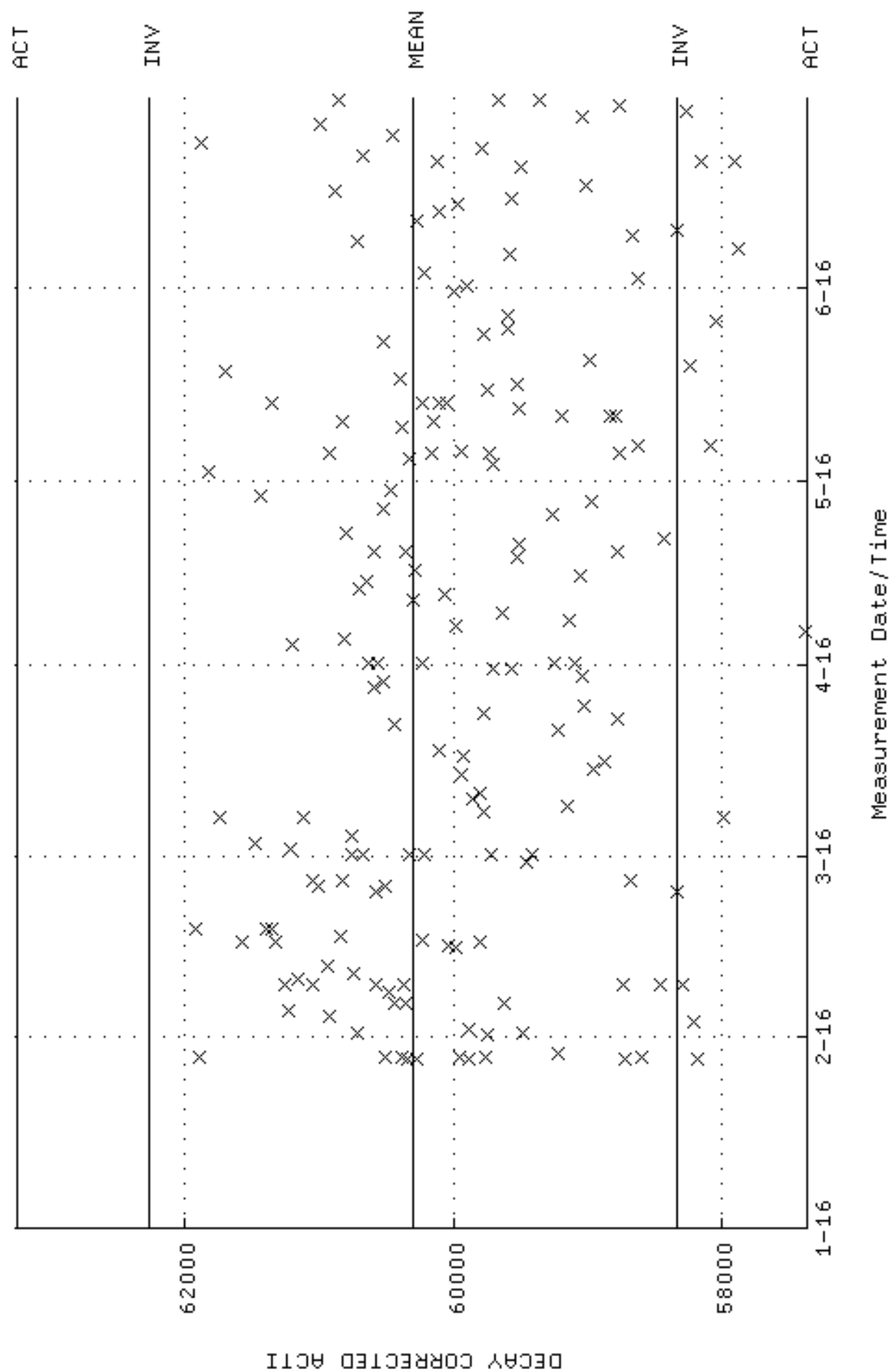
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM41_CAN.QAF;1
 Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
 Start/End Dates : 28-JAN-2016 10:31:21 through 1-JUL-2016 12:00:00
 Lower/Upper Lmts: 57.5400 through 61.5400



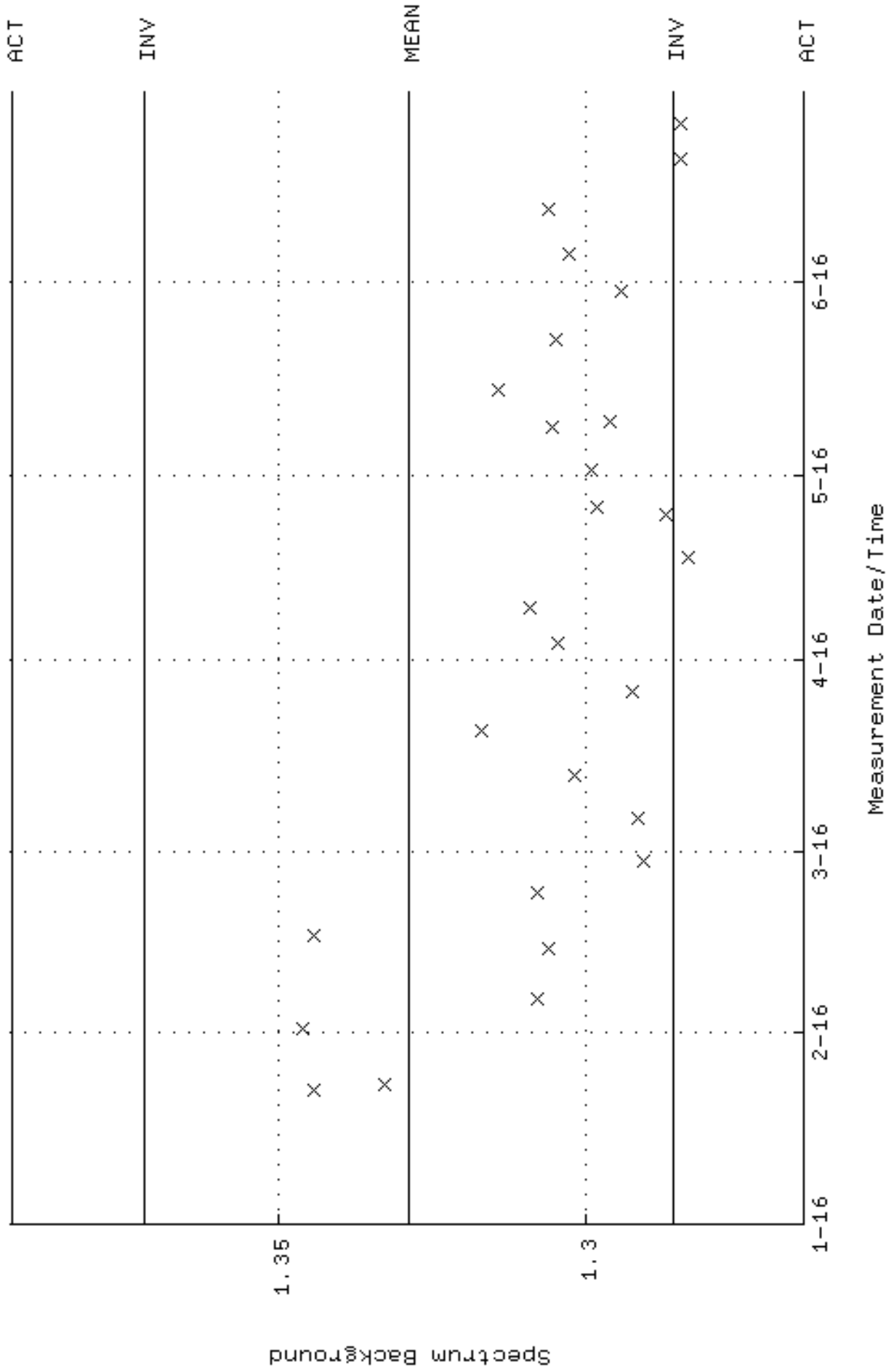
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC-GAM41-CAN.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 28-JAN-2016 10:31:21 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 0.961655 +- 6.082216E-02 (6.32 %)



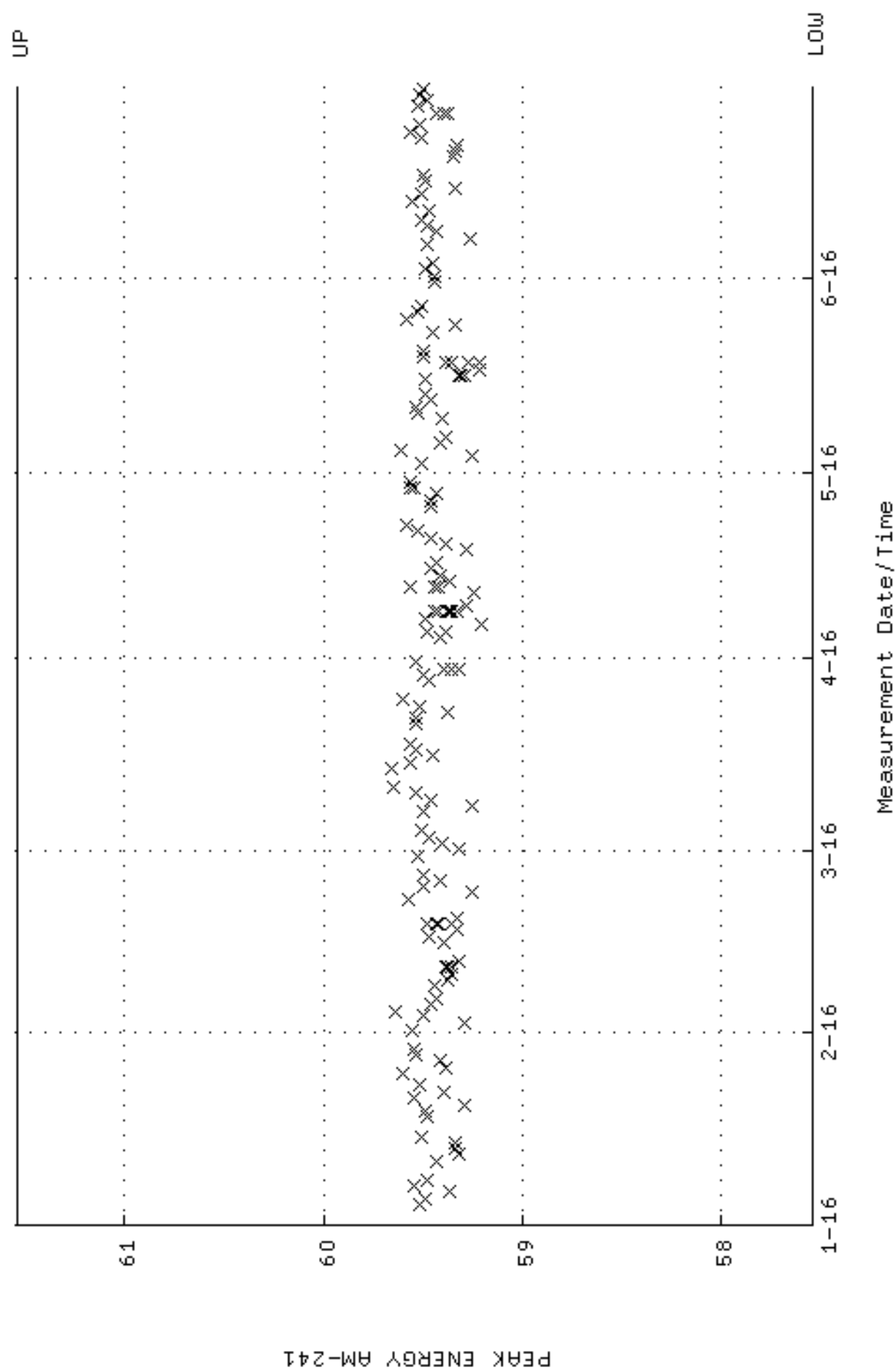
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM41_CAN.QAF;1
Parameter Name : NLAIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
Start/End Dates : 28-JAN-2016 10:31:21 through 1-JUL-2016 12:00:00
Mean +- Std Dev : 60310.9 +- 980.348 (1.63 %)



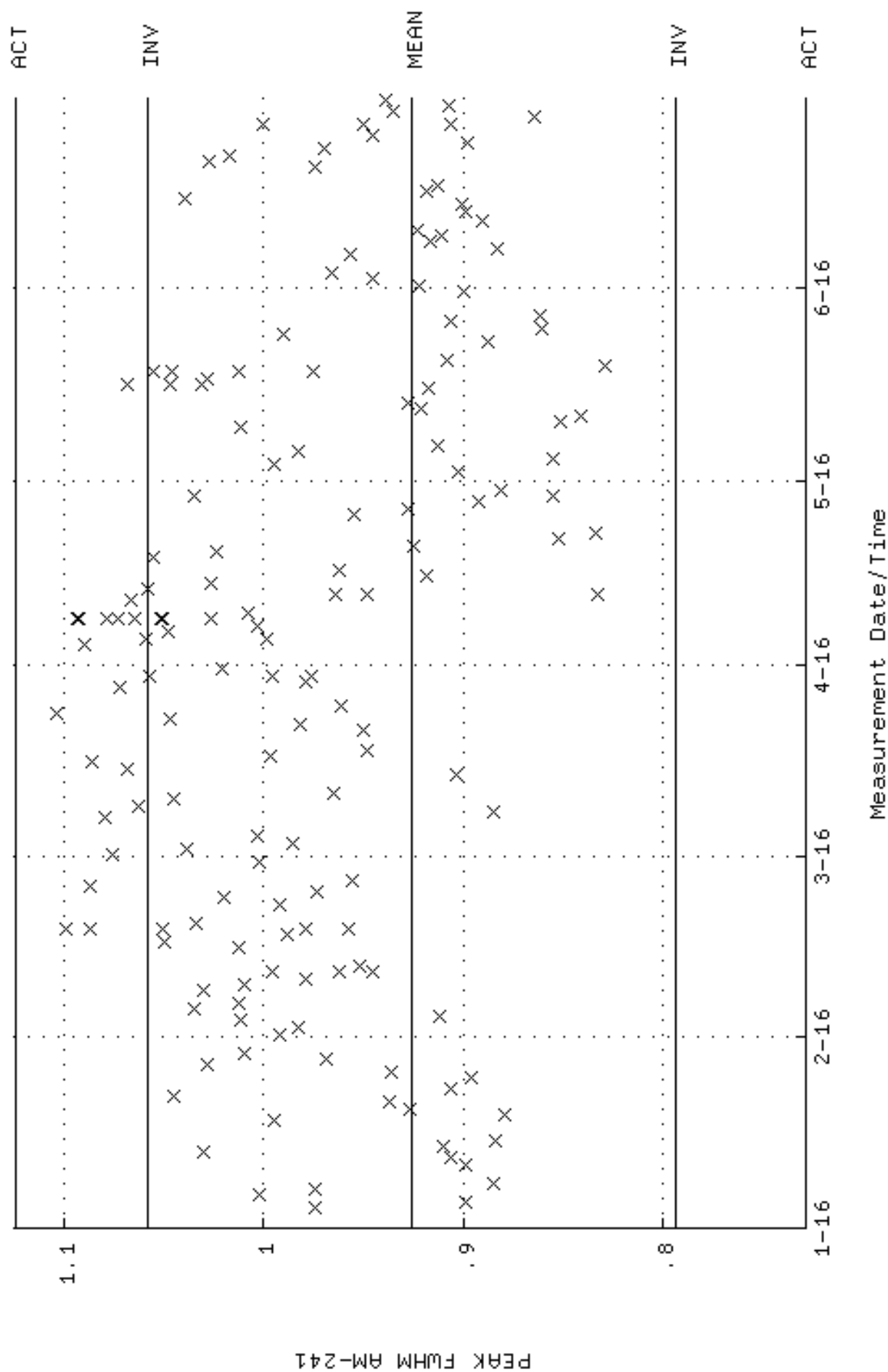
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM41.QAF;1
Parameter Name : BACKRATE (Spectrum Background Rate)
Start/End Dates : 22-JAN-2016 15:51:42 through 1-JUL-2016 12:00:00
Mean +- Std Dev : 1.32884 +- 2.148632E-02 (1.62 %)



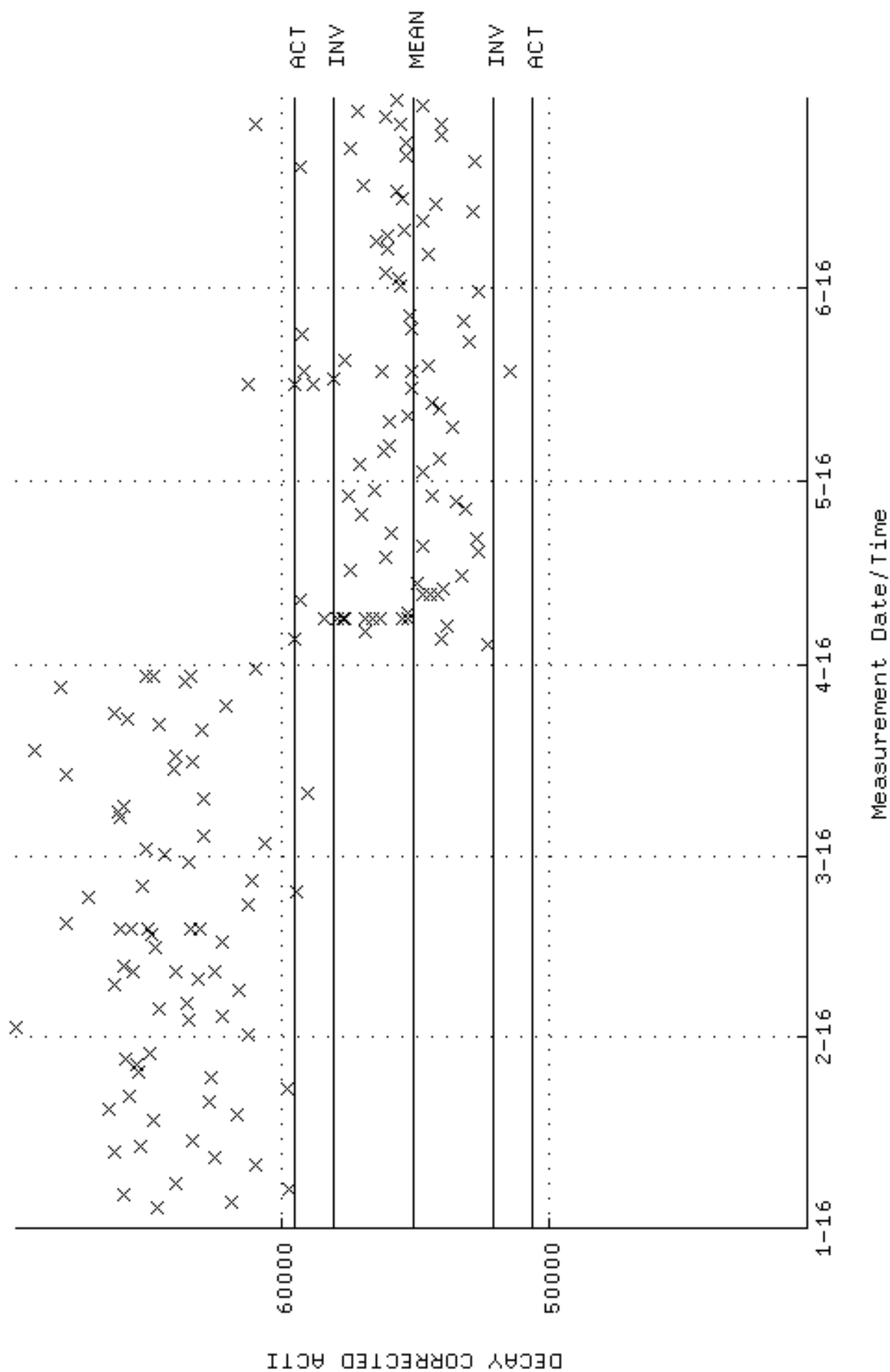
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM43_JAR.QAF;1
Parameter Name : PSENERGY-59 (PEAK ENERGY AM-241)
Start/End Dates : 4-JAN-2016 06:51:34 through 1-JUL-2016 12:00:00
Lower/Upper Lmts: 57.5400 through 61.5400



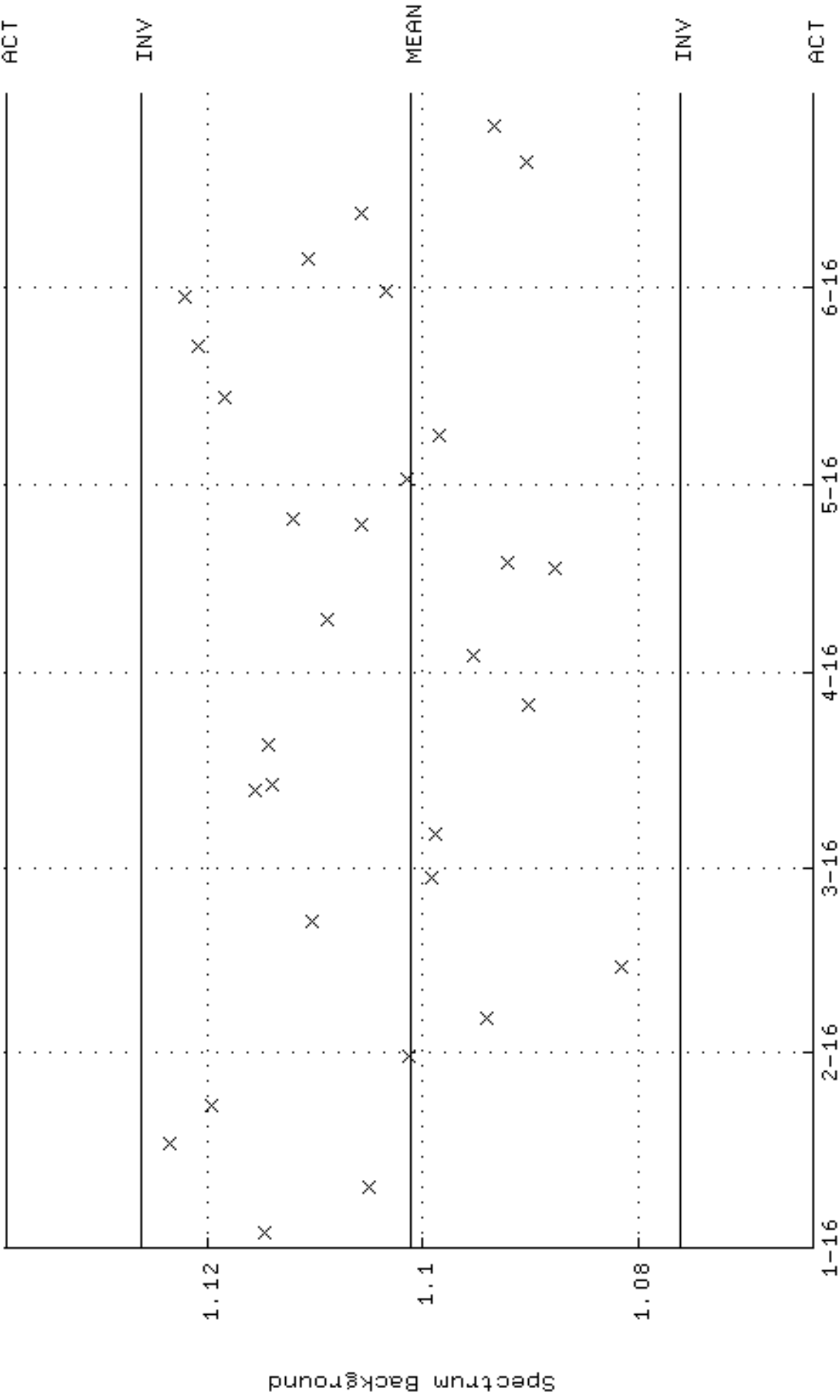
QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM43_JAR.QAF;1
 Parameter Name : PSFUHM-59 (PEAK FUHM AM-241)
 Start/End Dates : 4-JAN-2016 06:51:34 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 0.926214 +- 6.594121E-02 (7.12 %)



QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]QCC_GAM43_JAR.QAF;1
 Parameter Name : NLACTIVITY-59 (DECAY CORRECTED ACTIVITY AM-241)
 Start/End Dates : 4-JAN-2016 06:51:34 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 55119.1 +- 1484.18 (2.69 %)



QA filename : DKA100:[CANBERRA.GAMMA.SCUSR.QA]LBC_GAM43.QAF;1
 Parameter Name : BACKRATE (Spectrum Background Rate)
 Start/End Dates : 3-JAN-2016 11:12:08 through 1-JUL-2016 12:00:00
 Mean +- Std Dev : 1.10118 +- 1.247801E-02 (1.13 %)



Quality Control Charts

Data used for Gamma Spec Solids 05-JUL-2016

Americium-241 BLANK: Limits LCL = -28 UCL = 25.4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571459	1203559441	15-JUN-2016 08:02	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572084	1203561062	15-JUN-2016 10:50	DONE	-0.038	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572190	1203561289	15-JUN-2016 10:58	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572384	1203561714	16-JUN-2016 12:25	DONE	00	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572385	1203561724	16-JUN-2016 12:51	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.035	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1569039	1203553209	17-JUN-2016 07:31	DONE	-0.013	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.02	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1573929	1203565769	17-JUN-2016 11:17	DONE	-40	-4	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.099	0.12	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1575505	1203569877	21-JUN-2016 07:25	DONE	23.7	2.8	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1575357	1203569604	21-JUN-2016 07:41	DONE	-29	-3	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1571024	1203558315	22-JUN-2016 07:20	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1575812	1203570695	22-JUN-2016 08:54	DONE	-0.028	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1573772	1203565433	22-JUN-2016 09:37	DONE	-0.024	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1576217	1203571735	23-JUN-2016 07:37	DONE	-0.03	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1571803	1203560365	23-JUN-2016 07:37	DUSE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1570476	1203556811	23-JUN-2016 07:38	DONE	-0.13	0.12	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1576430	1203572280	23-JUN-2016 09:24	DONE	0.03	0.14	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1576426	1203572270	23-JUN-2016 11:01	DONE	-0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1571802	1203560362	24-JUN-2016 11:07	DONE	-0.009	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572703	1203562586	24-JUN-2016 14:22	DONE	-0.005	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572236	1203561386	24-JUN-2016 15:52	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572234	1203561383	24-JUN-2016 15:53	DONE	00	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1573057	1203563601	25-JUN-2016 07:30	DONE	-0.041	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1573059	1203563607	25-JUN-2016 09:16	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1573399	1203564536	25-JUN-2016 09:21	DONE	0.02	0.14	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1571801	1203560359	27-JUN-2016 07:16	DONE	-0.058	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572491	1203562002	27-JUN-2016 07:30	DUSE	0.02	0.14	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1576729	1203573018	27-JUN-2016 08:21	DONE	0.05	0.14	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1576941	1203573609	27-JUN-2016 09:14	DONE	0.04	0.14	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572491	1203562002	27-JUN-2016 14:08	DONE	-0.051	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572486	1203561990	28-JUN-2016 12:48	DONE	-0.031	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1577125	1203574134	28-JUN-2016 14:34	DONE	0.08	0.14	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572231	1203561373	28-JUN-2016 14:38	DONE	0.07	0.14	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1577122	1203574128	29-JUN-2016 08:49	DONE	-0.009	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1577531	1203575142	29-JUN-2016 10:17	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1577533	1203575148	29-JUN-2016 11:23	DONE	0.01	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87
1572490	1203561999	29-JUN-2016 15:32	DONE	-0.003	0.13	pCi/g	-1.2	-28	-19	16.6	25.4	8.87

Americium-241 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0		percent	0	0	0	0	20.0	0
1570346	1203556469	15-JUN-2016 06:41	DONE	0		percent	0	0	0	0	20.0	0
1571459	1203559442	15-JUN-2016 08:43	DONE	0		percent	0	0	0	0	20.0	0
1572084	1203561063	15-JUN-2016 10:51	DONE	0		percent	0	0	0	0	20.0	0
1572190	1203561290	15-JUN-2016 10:58	DONE	0		percent	0	0	0	0	20.0	0
1572384	1203561715	16-JUN-2016 12:26	DONE	0		percent	0	0	0	0	20.0	0
1569039	1203553210	17-JUN-2016 07:36	DONE	0		percent	0	0	0	0	20.0	0
1564838	1203541918	17-JUN-2016 07:41	DONE	0		percent	0	0	0	0	20.0	0
1570471	1203556800	17-JUN-2016 13:17	DONE	0		percent	0	0	0	0	20.0	0
1575505	1203569878	20-JUN-2016 07:04	DONE	0		percent	0	0	0	0	20.0	0
1572385	1203561725	20-JUN-2016 08:50	DONE	0		percent	0	0	0	0	20.0	0
1572233	1203561381	20-JUN-2016 08:52	DONE	0		percent	0	0	0	0	20.0	0
1575357	1203569605	21-JUN-2016 10:13	DONE	0		percent	0	0	0	0	20.0	0
1571024	1203558316	22-JUN-2016 07:21	DONE	0		percent	0	0	0	0	20.0	0
1575812	1203570696	22-JUN-2016 08:54	DONE	0		percent	0	0	0	0	20.0	0
1573772	1203565434	22-JUN-2016 09:38	DONE	0		percent	0	0	0	0	20.0	0
1576217	1203571736	23-JUN-2016 07:44	DONE	0		percent	0	0	0	0	20.0	0
1570476	1203556812	23-JUN-2016 08:07	DONE	0		percent	0	0	0	0	20.0	0
1571803	1203560366	23-JUN-2016 08:25	DUSE	0		percent	0	0	0	0	20.0	0
1576426	1203572271	23-JUN-2016 12:05	DONE	0		percent	0	0	0	0	20.0	0
1576430	1203572281	24-JUN-2016 08:09	DONE	0		percent	0	0	0	0	20.0	0
1572234	1203561384	24-JUN-2016 15:54	DONE	0		percent	0	0	0	0	20.0	0
1572703	1203562587	25-JUN-2016 09:16	DONE	0		percent	0	0	0	0	20.0	0
1573059	1203563608	25-JUN-2016 09:17	DONE	0		percent	0	0	0	0	20.0	0
1573399	1203564537	25-JUN-2016 09:21	DONE	0		percent	0	0	0	0	20.0	0
1573057	1203563602	25-JUN-2016 09:38	DONE	0		percent	0	0	0	0	20.0	0
1571802	1203560363	25-JUN-2016 09:38	DONE	0		percent	0	0	0	0	20.0	0
1572236	1203561387	25-JUN-2016 09:39	DONE	0		percent	0	0	0	0	20.0	0
1572491	1203562003	27-JUN-2016 08:23	DONE	0		percent	0	0	0	0	20.0	0
1576729	1203573019	27-JUN-2016 09:15	DONE	0		percent	0	0	0	0	20.0	0
1571801	1203560360	27-JUN-2016 12:07	DONE	0		percent	0	0	0	0	20.0	0
1576941	1203573610	28-JUN-2016 09:27	DONE	0		percent	0	0	0	0	20.0	0
1572486	1203561991	28-JUN-2016 12:49	DONE	0		percent	0	0	0	0	20.0	0
1577125	1203574135	28-JUN-2016 14:34	DONE	0		percent	0	0	0	0	20.0	0
1572231	1203561374	28-JUN-2016 14:39	DONE	0		percent	0	0	0	0	20.0	0
1577122	1203574129	29-JUN-2016 08:50	DONE	0		percent	0	0	0	0	20.0	0
1577531	1203575143	29-JUN-2016 11:00	DONE	0		percent	0	0	0	0	20.0	0
1577533	1203575149	29-JUN-2016 11:23	DONE	0		percent	0	0	0	0	20.0	0
1572490	1203562000	29-JUN-2016 15:33	DONE	0		percent	0	0	0	0	20.0	0

Americium-241 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1572084	1203561064	15-JUN-2016 10:52	DUSE	121	2.5	percent	100	75.0	83.3	117	125	8.33
1572190	1203561291	15-JUN-2016 10:59	DONE	103	0.37	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	16-JUN-2016 09:10	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
1572384	1203561716	16-JUN-2016 09:33	DONE	112	1.4	percent	100	75.0	83.3	117	125	8.33
1569039	1203553211	17-JUN-2016 07:36	DONE	101	0.16	percent	100	75.0	83.3	117	125	8.33
1564838	1203541919	17-JUN-2016 08:00	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
1573929	1203565771	17-JUN-2016 13:24	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1570471	1203556801	20-JUN-2016 07:03	DONE	107	0.81	percent	100	75.0	83.3	117	125	8.33
1572385	1203561726	20-JUN-2016 08:51	DONE	110	1.1	percent	100	75.0	83.3	117	125	8.33
1572233	1203561382	20-JUN-2016 08:53	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33
1575505	1203569879	21-JUN-2016 07:26	DONE	102	0.28	percent	100	75.0	83.3	117	125	8.33
1575357	1203569606	21-JUN-2016 07:44	DONE	102	0.29	percent	100	75.0	83.3	117	125	8.33
1571024	1203558317	22-JUN-2016 07:21	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1575812	1203570699	22-JUN-2016 07:51	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1573772	1203565435	22-JUN-2016 10:20	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1576217	1203571739	23-JUN-2016 07:45	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
1571803	1203560367	23-JUN-2016 08:02	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
1570476	1203556813	23-JUN-2016 08:22	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1576426	1203572272	23-JUN-2016 11:02	DONE	99.5	-0.06	percent	100	75.0	83.3	117	125	8.33
1576430	1203572282	23-JUN-2016 11:35	DONE	104	0.43	percent	100	75.0	83.3	117	125	8.33
1572234	1203561385	25-JUN-2016 09:20	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
1573057	1203563603	25-JUN-2016 09:22	DONE	98.2	-0.22	percent	100	75.0	83.3	117	125	8.33
1573399	1203564538	25-JUN-2016 09:37	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1572703	1203562588	25-JUN-2016 09:54	DONE	106	0.66	percent	100	75.0	83.3	117	125	8.33
1573059	1203563609	25-JUN-2016 10:14	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1571802	1203560364	25-JUN-2016 10:47	DONE	106	0.75	percent	100	75.0	83.3	117	125	8.33
1572236	1203561388	25-JUN-2016 11:03	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1571801	1203560361	27-JUN-2016 07:16	DONE	110	1.3	percent	100	75.0	83.3	117	125	8.33
1572491	1203562004	27-JUN-2016 07:50	DONE	116	1.9	percent	100	75.0	83.3	117	125	8.33
1576729	1203573020	27-JUN-2016 08:24	DONE	109	1	percent	100	75.0	83.3	117	125	8.33
1576941	1203573611	27-JUN-2016 12:03	DUSE	2.46	-10	percent	100	75.0	83.3	117	125	8.33
1572486	1203561992	28-JUN-2016 12:36	DONE	106	0.78	percent	100	75.0	83.3	117	125	8.33
1572231	1203561375	28-JUN-2016 12:54	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1577125	1203574136	28-JUN-2016 14:34	DONE	104	0.45	percent	100	75.0	83.3	117	125	8.33
1576941	1203573611	29-JUN-2016 09:07	DONE	95.3	-0.57	percent	100	75.0	83.3	117	125	8.33
1577122	1203574130	29-JUN-2016 09:28	DONE	107	0.89	percent	100	75.0	83.3	117	125	8.33
1577531	1203575144	29-JUN-2016 11:00	DONE	110	1.2	percent	100	75.0	83.3	117	125	8.33
1577533	1203575152	29-JUN-2016 11:20	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1572490	1203562001	29-JUN-2016 14:54	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33

Americium-241 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519622	1203423730	02-NOV-2015 10:04	DONE	0.76	-0.87	percent	5.07	0	-4.9	15	20.0	4.96
1524802	1203437209	20-NOV-2015 10:34	DONE	5.54	0.09	percent	5.07	0	-4.9	15	20.0	4.96
1533266	1203458681	22-DEC-2015 16:44	DONE	1.86	-0.65	percent	5.07	0	-4.9	15	20.0	4.96
1536364	1203466302	11-JAN-2016 11:23	DONE	2.8	-0.46	percent	5.07	0	-4.9	15	20.0	4.96
1542010	1203481039	03-FEB-2016 11:23	DONE	3.07	-0.4	percent	5.07	0	-4.9	15	20.0	4.96
1547288	1203495684	24-FEB-2016 12:31	DONE	1.21	-0.78	percent	5.07	0	-4.9	15	20.0	4.96
1548218	1203497950	29-FEB-2016 10:21	DONE	5.74	0.13	percent	5.07	0	-4.9	15	20.0	4.96
1550425	1203503644	08-MAR-2016 14:59	DONE	15.1	2	percent	5.07	0	-4.9	15	20.0	4.96
1553712	1203512070	23-MAR-2016 10:30	DONE	8.08	0.61	percent	5.07	0	-4.9	15	20.0	4.96
1555195	1203515984	28-MAR-2016 09:58	DONE	0.43	-0.94	percent	5.07	0	-4.9	15	20.0	4.96
1559978	1203528668	16-APR-2016 10:01	DONE	15.2	2	percent	5.07	0	-4.9	15	20.0	4.96
1570342	1203556453	26-MAY-2016 15:47	DONE	2.92	-0.43	percent	5.07	0	-4.9	15	20.0	4.96
1573465	1203564716	10-JUN-2016 14:52	DONE	3.22	-0.37	percent	5.07	0	-4.9	15	20.0	4.96

Americium-241 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	2.09	1.7	dec	0.81	0	-0.671	2.3	3.00	0.74
1570346	1203556469	15-JUN-2016 06:41	DONE	1.68	1.2	dec	0.81	0	-0.671	2.3	3.00	0.74
1571459	1203559442	15-JUN-2016 08:43	DONE	3.23	3.2	dec	0.81	0	-0.671	2.3	3.00	0.74
1572084	1203561063	15-JUN-2016 10:51	DONE	0.37	-0.6	dec	0.81	0	-0.671	2.3	3.00	0.74
1572190	1203561290	15-JUN-2016 10:58	DONE	1.3	0.66	dec	0.81	0	-0.671	2.3	3.00	0.74
1572384	1203561715	16-JUN-2016 12:26	DONE	0.37	-0.59	dec	0.81	0	-0.671	2.3	3.00	0.74
1569039	1203553210	17-JUN-2016 07:36	DONE	0.02	-1	dec	0.81	0	-0.671	2.3	3.00	0.74
1564838	1203541918	17-JUN-2016 07:41	DONE	0.61	-0.28	dec	0.81	0	-0.671	2.3	3.00	0.74
1570471	1203556800	17-JUN-2016 13:17	DONE	0.56	-0.35	dec	0.81	0	-0.671	2.3	3.00	0.74
1575505	1203569878	20-JUN-2016 07:04	DONE	0.62	-0.26	dec	0.81	0	-0.671	2.3	3.00	0.74
1572385	1203561725	20-JUN-2016 08:50	DONE	0.82	0.01	dec	0.81	0	-0.671	2.3	3.00	0.74
1572233	1203561381	20-JUN-2016 08:52	DONE	1.53	0.96	dec	0.81	0	-0.671	2.3	3.00	0.74
1575357	1203569605	21-JUN-2016 10:13	DONE	0.4	-0.56	dec	0.81	0	-0.671	2.3	3.00	0.74
1571024	1203558316	22-JUN-2016 07:21	DONE	0.38	-0.58	dec	0.81	0	-0.671	2.3	3.00	0.74
1575812	1203570696	22-JUN-2016 08:54	DONE	1.06	0.33	dec	0.81	0	-0.671	2.3	3.00	0.74
1573772	1203565434	22-JUN-2016 09:38	DONE	0.38	-0.59	dec	0.81	0	-0.671	2.3	3.00	0.74
1576217	1203571736	23-JUN-2016 07:44	DONE	0.55	-0.36	dec	0.81	0	-0.671	2.3	3.00	0.74
1570476	1203556812	23-JUN-2016 08:07	DONE	2.09	1.7	dec	0.81	0	-0.671	2.3	3.00	0.74
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.04	-1	dec	0.81	0	-0.671	2.3	3.00	0.74
1576426	1203572271	23-JUN-2016 12:05	DONE	0.31	-0.68	dec	0.81	0	-0.671	2.3	3.00	0.74
1576430	1203572281	24-JUN-2016 08:09	DONE	0.39	-0.57	dec	0.81	0	-0.671	2.3	3.00	0.74
1572234	1203561384	24-JUN-2016 15:54	DONE	0.18	-0.85	dec	0.81	0	-0.671	2.3	3.00	0.74
1572703	1203562587	25-JUN-2016 09:16	DONE	0.07	-1	dec	0.81	0	-0.671	2.3	3.00	0.74
1573059	1203563608	25-JUN-2016 09:17	DONE	0.34	-0.64	dec	0.81	0	-0.671	2.3	3.00	0.74
1573399	1203564537	25-JUN-2016 09:21	DONE	0.73	-0.12	dec	0.81	0	-0.671	2.3	3.00	0.74

1573057	1203563602	25-JUN-2016 09:38	DONE	0.18	-0.85	dec	0.81	0	-0.671	2.3	3.00	0.74
1571802	1203560363	25-JUN-2016 09:38	DONE	1.8	1.3	dec	0.81	0	-0.671	2.3	3.00	0.74
1572236	1203561387	25-JUN-2016 09:39	DONE	2.07	1.7	dec	0.81	0	-0.671	2.3	3.00	0.74
1572491	1203562003	27-JUN-2016 08:23	DONE	0.34	-0.64	dec	0.81	0	-0.671	2.3	3.00	0.74
1576729	1203573019	27-JUN-2016 09:15	DONE	1.96	1.5	dec	0.81	0	-0.671	2.3	3.00	0.74
1571801	1203560360	27-JUN-2016 12:07	DONE	0.01	-1	dec	0.81	0	-0.671	2.3	3.00	0.74
1576941	1203573610	28-JUN-2016 09:27	DONE	0.94	0.17	dec	0.81	0	-0.671	2.3	3.00	0.74
1572486	1203561991	28-JUN-2016 12:49	DONE	0.24	-0.78	dec	0.81	0	-0.671	2.3	3.00	0.74
1577125	1203574135	28-JUN-2016 14:34	DONE	0.33	-0.65	dec	0.81	0	-0.671	2.3	3.00	0.74
1572231	1203561374	28-JUN-2016 14:39	DONE	0.49	-0.44	dec	0.81	0	-0.671	2.3	3.00	0.74
1577122	1203574129	29-JUN-2016 08:50	DONE	0.58	-0.32	dec	0.81	0	-0.671	2.3	3.00	0.74
1577531	1203575143	29-JUN-2016 11:00	DONE	0.78	-0.05	dec	0.81	0	-0.671	2.3	3.00	0.74
1577533	1203575149	29-JUN-2016 11:23	DONE	1.41	0.8	dec	0.81	0	-0.671	2.3	3.00	0.74
1572490	1203562000	29-JUN-2016 15:33	DONE	0.55	-0.36	dec	0.81	0	-0.671	2.3	3.00	0.74

Beryllium-7 BLANK: Limits LCL = -34 UCL = 36.6

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.014	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572084	1203561062	15-JUN-2016 10:50	DUSE	0.13	-0.1	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572190	1203561289	15-JUN-2016 10:58	DONE	-0.129	-0.13	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572384	1203561714	16-JUN-2016 12:25	DUSE	-0.018	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572385	1203561724	16-JUN-2016 12:51	DUSE	0.01	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572233	1203561380	16-JUN-2016 12:53	DONE	0.01	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1569039	1203553209	17-JUN-2016 07:31	DONE	0.05	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.019	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1573929	1203565769	17-JUN-2016 11:17	DONE	71.4	6	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.026	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1575505	1203569877	21-JUN-2016 07:25	DONE	-6.1	-0.63	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1575357	1203569604	21-JUN-2016 07:41	DONE	-13	-1	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1571024	1203558315	22-JUN-2016 07:20	DONE	0.05	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1575812	1203570695	22-JUN-2016 08:54	DUSE	-0.079	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1573772	1203565433	22-JUN-2016 09:37	DUSE	0.01	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1576217	1203571735	23-JUN-2016 07:37	DUSE	-0.031	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1571803	1203560365	23-JUN-2016 07:37	DUSE	0.26	-0.09	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1570476	1203556811	23-JUN-2016 07:38	DONE	0.02	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1576430	1203572280	23-JUN-2016 09:24	DONE	0.07	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1576426	1203572270	23-JUN-2016 11:01	DONE	0.04	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1571802	1203560362	24-JUN-2016 11:07	DONE	0.03	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572703	1203562586	24-JUN-2016 14:22	DUSE	-0.112	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572236	1203561386	24-JUN-2016 15:52	DONE	-0.028	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572234	1203561383	24-JUN-2016 15:53	DONE	0.01	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1573057	1203563601	25-JUN-2016 07:30	DONE	0.14	-0.1	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1573059	1203563607	25-JUN-2016 09:16	DUSE	0.22	-0.1	pCi/g	1.35	-34	-22	24.9	36.6	11.8

1573399	1203564536	25-JUN-2016 09:21	DUSE	0.09	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1571801	1203560359	27-JUN-2016 07:16	DUSE	-0.095	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572491	1203562002	27-JUN-2016 07:30	DUSE	-0.083	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1576729	1203573018	27-JUN-2016 08:21	DUSE	-0.258	-0.14	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1576941	1203573609	27-JUN-2016 09:14	DONE	0.01	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572491	1203562002	27-JUN-2016 14:08	DONE	-0.013	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572486	1203561990	28-JUN-2016 12:48	DONE	0.28	-0.09	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1577125	1203574134	28-JUN-2016 14:34	DONE	-0.088	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572231	1203561373	28-JUN-2016 14:38	DONE	0.03	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1577122	1203574128	29-JUN-2016 08:49	DONE	-0.019	-0.12	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1577531	1203575142	29-JUN-2016 10:17	DUSE	0.14	-0.1	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1577533	1203575148	29-JUN-2016 11:23	DUSE	0.02	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8
1572490	1203561999	29-JUN-2016 15:32	DONE	0.01	-0.11	pCi/g	1.35	-34	-22	24.9	36.6	11.8

Beryllium-7 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1569039	1203553210	17-JUN-2016 07:36	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1570471	1203556800	17-JUN-2016 13:17	DONE	4.86	0.2	percent	3.04	0	-15	21.4	20.0	9.16
1575505	1203569878	20-JUN-2016 07:04	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572233	1203561381	20-JUN-2016 08:52	DONE	4.42	0.15	percent	3.04	0	-15	21.4	20.0	9.16
1575357	1203569605	21-JUN-2016 10:13	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1571024	1203558316	22-JUN-2016 07:21	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1570476	1203556812	23-JUN-2016 08:07	DONE	32.3	3.2	percent	3.04	0	-15	21.4	20.0	9.16
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572703	1203562587	25-JUN-2016 09:16	DUSE	43.6	4.4	percent	3.04	0	-15	21.4	20.0	9.16
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1573057	1203563602	25-JUN-2016 09:38	DONE	15.4	1.3	percent	3.04	0	-15	21.4	20.0	9.16
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16

1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1576729	1203573019	27-JUN-2016 09:15	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1571801	1203560360	27-JUN-2016 12:07	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1576941	1203573610	28-JUN-2016 09:27	DONE	18	1.6	percent	3.04	0	-15	21.4	20.0	9.16
1572486	1203561991	28-JUN-2016 12:49	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572231	1203561374	28-JUN-2016 14:39	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1577533	1203575149	29-JUN-2016 11:23	DUSE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16
1572490	1203562000	29-JUN-2016 15:33	DONE	0	-0.33	percent	3.04	0	-15	21.4	20.0	9.16

Beryllium-7 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.87	0.14	dec	0.79	0	-0.359	1.95	3.00	0.58
1570346	1203556469	15-JUN-2016 06:41	DONE	0.84	0.08	dec	0.79	0	-0.359	1.95	3.00	0.58
1571459	1203559442	15-JUN-2016 08:43	DONE	2.13	2.3	dec	0.79	0	-0.359	1.95	3.00	0.58
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.24	-0.95	dec	0.79	0	-0.359	1.95	3.00	0.58
1572190	1203561290	15-JUN-2016 10:58	DONE	0.69	-0.18	dec	0.79	0	-0.359	1.95	3.00	0.58
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.63	1.5	dec	0.79	0	-0.359	1.95	3.00	0.58
1569039	1203553210	17-JUN-2016 07:36	DONE	0.61	-0.31	dec	0.79	0	-0.359	1.95	3.00	0.58
1564838	1203541918	17-JUN-2016 07:41	DONE	1.16	0.64	dec	0.79	0	-0.359	1.95	3.00	0.58
1570471	1203556800	17-JUN-2016 13:17	DONE	0.11	-1	dec	0.79	0	-0.359	1.95	3.00	0.58
1575505	1203569878	20-JUN-2016 07:04	DONE	2	2.1	dec	0.79	0	-0.359	1.95	3.00	0.58
1572385	1203561725	20-JUN-2016 08:50	DUSE	0.82	0.05	dec	0.79	0	-0.359	1.95	3.00	0.58
1572233	1203561381	20-JUN-2016 08:52	DONE	0.68	-0.2	dec	0.79	0	-0.359	1.95	3.00	0.58
1575357	1203569605	21-JUN-2016 10:13	DONE	0.26	-0.92	dec	0.79	0	-0.359	1.95	3.00	0.58
1571024	1203558316	22-JUN-2016 07:21	DONE	0.26	-0.92	dec	0.79	0	-0.359	1.95	3.00	0.58
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.16	-1	dec	0.79	0	-0.359	1.95	3.00	0.58
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.11	-1	dec	0.79	0	-0.359	1.95	3.00	0.58
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.35	-0.76	dec	0.79	0	-0.359	1.95	3.00	0.58
1570476	1203556812	23-JUN-2016 08:07	DONE	1.79	1.7	dec	0.79	0	-0.359	1.95	3.00	0.58
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.84	0.07	dec	0.79	0	-0.359	1.95	3.00	0.58
1576426	1203572271	23-JUN-2016 12:05	DONE	0.44	-0.62	dec	0.79	0	-0.359	1.95	3.00	0.58
1576430	1203572281	24-JUN-2016 08:09	DONE	1.16	0.64	dec	0.79	0	-0.359	1.95	3.00	0.58
1572234	1203561384	24-JUN-2016 15:54	DONE	0.92	0.22	dec	0.79	0	-0.359	1.95	3.00	0.58
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.55	-0.42	dec	0.79	0	-0.359	1.95	3.00	0.58
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.17	-1	dec	0.79	0	-0.359	1.95	3.00	0.58
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.31	-0.83	dec	0.79	0	-0.359	1.95	3.00	0.58
1573057	1203563602	25-JUN-2016 09:38	DONE	0.63	-0.29	dec	0.79	0	-0.359	1.95	3.00	0.58
1571802	1203560363	25-JUN-2016 09:38	DONE	0.66	-0.23	dec	0.79	0	-0.359	1.95	3.00	0.58
1572236	1203561387	25-JUN-2016 09:39	DONE	0.63	-0.28	dec	0.79	0	-0.359	1.95	3.00	0.58

1572491	1203562003	27-JUN-2016 08:23	DONE	0.66	-0.23	dec	0.79	0	-0.359	1.95	3.00	0.58
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.47	-0.57	dec	0.79	0	-0.359	1.95	3.00	0.58
1571801	1203560360	27-JUN-2016 12:07	DUSE	2.27	2.6	dec	0.79	0	-0.359	1.95	3.00	0.58
1576941	1203573610	28-JUN-2016 09:27	DONE	0.98	0.33	dec	0.79	0	-0.359	1.95	3.00	0.58
1572486	1203561991	28-JUN-2016 12:49	DONE	1.21	0.72	dec	0.79	0	-0.359	1.95	3.00	0.58
1577125	1203574135	28-JUN-2016 14:34	DONE	1.12	0.56	dec	0.79	0	-0.359	1.95	3.00	0.58
1572231	1203561374	28-JUN-2016 14:39	DONE	0.56	-0.4	dec	0.79	0	-0.359	1.95	3.00	0.58
1577122	1203574129	29-JUN-2016 08:50	DONE	0.19	-1	dec	0.79	0	-0.359	1.95	3.00	0.58
1577531	1203575143	29-JUN-2016 11:00	DUSE	1.59	1.4	dec	0.79	0	-0.359	1.95	3.00	0.58
1577533	1203575149	29-JUN-2016 11:23	DUSE	0.16	-1	dec	0.79	0	-0.359	1.95	3.00	0.58
1572490	1203562000	29-JUN-2016 15:33	DONE	0.7	-0.17	dec	0.79	0	-0.359	1.95	3.00	0.58

Cesium-134 BLANK: Limits LCL = -2.0 UCL = 2.3

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571459	1203559441	15-JUN-2016 08:02	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572084	1203561062	15-JUN-2016 10:50	DUSE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572190	1203561289	15-JUN-2016 10:58	DONE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572384	1203561714	16-JUN-2016 12:25	DUSE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572385	1203561724	16-JUN-2016 12:51	DUSE	0.02	-0.18	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572233	1203561380	16-JUN-2016 12:53	DONE	0.06	-0.13	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1569039	1203553209	17-JUN-2016 07:31	DUSE	-0.004	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.023	-0.24	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573929	1203565769	17-JUN-2016 11:17	DONE	2.82	3.7	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.003	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1575505	1203569877	21-JUN-2016 07:25	DONE	3.54	4.7	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1575357	1203569604	21-JUN-2016 07:41	DONE	-0.517	-0.93	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571024	1203558315	22-JUN-2016 07:20	DUSE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1575812	1203570695	22-JUN-2016 08:54	DUSE	0.02	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573772	1203565433	22-JUN-2016 09:37	DONE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1576217	1203571735	23-JUN-2016 07:37	DUSE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.008	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1570476	1203556811	23-JUN-2016 07:38	DONE	-0.014	-0.23	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1576430	1203572280	23-JUN-2016 09:24	DONE	-0.02	-0.24	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1576426	1203572270	23-JUN-2016 11:01	DONE	-0	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571802	1203560362	24-JUN-2016 11:07	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572703	1203562586	24-JUN-2016 14:22	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572236	1203561386	24-JUN-2016 15:52	DONE	-0	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572234	1203561383	24-JUN-2016 15:53	DONE	-0.006	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573057	1203563601	25-JUN-2016 07:30	DONE	-0.015	-0.23	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573059	1203563607	25-JUN-2016 09:16	DONE	0.03	-0.17	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1573399	1203564536	25-JUN-2016 09:21	DUSE	0.02	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1571801	1203560359	27-JUN-2016 07:16	DUSE	0.01	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572491	1203562002	27-JUN-2016 07:30	DUSE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72

1576729	1203573018	27-JUN-2016 08:21	DUSE	-0.012	-0.23	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1576941	1203573609	27-JUN-2016 09:14	DONE	-0.007	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572491	1203562002	27-JUN-2016 14:08	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572486	1203561990	28-JUN-2016 12:48	DUSE	0.01	-0.2	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1577125	1203574134	28-JUN-2016 14:34	DONE	-0	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572231	1203561373	28-JUN-2016 14:38	DUSE	0.02	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1577122	1203574128	29-JUN-2016 08:49	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1577531	1203575142	29-JUN-2016 10:17	DUSE	0.02	-0.19	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1577533	1203575148	29-JUN-2016 11:23	DUSE	-0.005	-0.22	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72
1572490	1203561999	29-JUN-2016 15:32	DONE	00	-0.21	pCi/g	0.15	-2	-1.3	1.6	2.32	0.72

Cesium-134 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1572084	1203561063	15-JUN-2016 10:51	DUSE	13.3	0.59	percent	6.6	0	-16	29.4	20.0	11.4
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1569039	1203553210	17-JUN-2016 07:36	DUSE	29.5	2	percent	6.6	0	-16	29.4	20.0	11.4
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1570471	1203556800	17-JUN-2016 13:17	DONE	14.2	0.67	percent	6.6	0	-16	29.4	20.0	11.4
1575505	1203569878	20-JUN-2016 07:04	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1572385	1203561725	20-JUN-2016 08:50	DUSE	7.06	0.04	percent	6.6	0	-16	29.4	20.0	11.4
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1575357	1203569605	21-JUN-2016 10:13	DONE	35.8	2.6	percent	6.6	0	-16	29.4	20.0	11.4
1571024	1203558316	22-JUN-2016 07:21	DUSE	27.7	1.9	percent	6.6	0	-16	29.4	20.0	11.4
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1576430	1203572281	24-JUN-2016 08:09	DONE	37.2	2.7	percent	6.6	0	-16	29.4	20.0	11.4
1572234	1203561384	24-JUN-2016 15:54	DONE	0.36	-0.55	percent	6.6	0	-16	29.4	20.0	11.4
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1571802	1203560363	25-JUN-2016 09:38	DONE	19.4	1.1	percent	6.6	0	-16	29.4	20.0	11.4
1572236	1203561387	25-JUN-2016 09:39	DONE	11	0.38	percent	6.6	0	-16	29.4	20.0	11.4
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1576729	1203573019	27-JUN-2016 09:15	DUSE	19	1.1	percent	6.6	0	-16	29.4	20.0	11.4

1571801	1203560360	27-JUN-2016 12:07	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1572486	1203561991	28-JUN-2016 12:49	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1572231	1203561374	28-JUN-2016 14:39	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.58	percent	6.6	0	-16	29.4	20.0	11.4
1577533	1203575149	29-JUN-2016 11:23	DUSE	29.2	2	percent	6.6	0	-16	29.4	20.0	11.4
1572490	1203562000	29-JUN-2016 15:33	DONE	13.5	0.61	percent	6.6	0	-16	29.4	20.0	11.4

Cesium-134 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.44	-0.43	dec	0.69	0	-0.462	1.84	3.00	0.58
1570346	1203556469	15-JUN-2016 06:41	DONE	1.23	0.93	dec	0.69	0	-0.462	1.84	3.00	0.58
1571459	1203559442	15-JUN-2016 08:43	DONE	2.1	2.5	dec	0.69	0	-0.462	1.84	3.00	0.58
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.39	1.2	dec	0.69	0	-0.462	1.84	3.00	0.58
1572190	1203561290	15-JUN-2016 10:58	DONE	0.38	-0.54	dec	0.69	0	-0.462	1.84	3.00	0.58
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.45	-0.41	dec	0.69	0	-0.462	1.84	3.00	0.58
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.22	-0.81	dec	0.69	0	-0.462	1.84	3.00	0.58
1564838	1203541918	17-JUN-2016 07:41	DONE	1.83	2	dec	0.69	0	-0.462	1.84	3.00	0.58
1570471	1203556800	17-JUN-2016 13:17	DONE	0.37	-0.55	dec	0.69	0	-0.462	1.84	3.00	0.58
1575505	1203569878	20-JUN-2016 07:04	DONE	0.46	-0.4	dec	0.69	0	-0.462	1.84	3.00	0.58
1572385	1203561725	20-JUN-2016 08:50	DUSE	0.3	-0.67	dec	0.69	0	-0.462	1.84	3.00	0.58
1572233	1203561381	20-JUN-2016 08:52	DONE	1.28	1	dec	0.69	0	-0.462	1.84	3.00	0.58
1575357	1203569605	21-JUN-2016 10:13	DONE	2.22	2.7	dec	0.69	0	-0.462	1.84	3.00	0.58
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.21	-0.84	dec	0.69	0	-0.462	1.84	3.00	0.58
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.25	-0.77	dec	0.69	0	-0.462	1.84	3.00	0.58
1573772	1203565434	22-JUN-2016 09:38	DONE	0.02	-1	dec	0.69	0	-0.462	1.84	3.00	0.58
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.54	-0.26	dec	0.69	0	-0.462	1.84	3.00	0.58
1570476	1203556812	23-JUN-2016 08:07	DONE	0.86	0.29	dec	0.69	0	-0.462	1.84	3.00	0.58
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.34	-0.61	dec	0.69	0	-0.462	1.84	3.00	0.58
1576426	1203572271	23-JUN-2016 12:05	DONE	00	-1	dec	0.69	0	-0.462	1.84	3.00	0.58
1576430	1203572281	24-JUN-2016 08:09	DONE	0.97	0.48	dec	0.69	0	-0.462	1.84	3.00	0.58
1572234	1203561384	24-JUN-2016 15:54	DONE	0.01	-1	dec	0.69	0	-0.462	1.84	3.00	0.58
1572703	1203562587	25-JUN-2016 09:16	DONE	0.34	-0.61	dec	0.69	0	-0.462	1.84	3.00	0.58
1573059	1203563608	25-JUN-2016 09:17	DONE	0.54	-0.27	dec	0.69	0	-0.462	1.84	3.00	0.58
1573399	1203564537	25-JUN-2016 09:21	DUSE	1.46	1.3	dec	0.69	0	-0.462	1.84	3.00	0.58
1573057	1203563602	25-JUN-2016 09:38	DONE	0.7	0.01	dec	0.69	0	-0.462	1.84	3.00	0.58
1571802	1203560363	25-JUN-2016 09:38	DONE	0.41	-0.48	dec	0.69	0	-0.462	1.84	3.00	0.58
1572236	1203561387	25-JUN-2016 09:39	DONE	0.25	-0.76	dec	0.69	0	-0.462	1.84	3.00	0.58
1572491	1203562003	27-JUN-2016 08:23	DONE	0.48	-0.37	dec	0.69	0	-0.462	1.84	3.00	0.58
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.51	-0.31	dec	0.69	0	-0.462	1.84	3.00	0.58
1571801	1203560360	27-JUN-2016 12:07	DUSE	0.49	-0.35	dec	0.69	0	-0.462	1.84	3.00	0.58

1576941	1203573610	28-JUN-2016 09:27	DONE	0.61	-0.14	dec	0.69	0	-0.462	1.84	3.00	0.58
1572486	1203561991	28-JUN-2016 12:49	DUSE	0.55	-0.25	dec	0.69	0	-0.462	1.84	3.00	0.58
1577125	1203574135	28-JUN-2016 14:34	DONE	0.12	-0.98	dec	0.69	0	-0.462	1.84	3.00	0.58
1572231	1203561374	28-JUN-2016 14:39	DUSE	1.13	0.76	dec	0.69	0	-0.462	1.84	3.00	0.58
1577122	1203574129	29-JUN-2016 08:50	DONE	0.32	-0.65	dec	0.69	0	-0.462	1.84	3.00	0.58
1577531	1203575143	29-JUN-2016 11:00	DUSE	1.42	1.3	dec	0.69	0	-0.462	1.84	3.00	0.58
1577533	1203575149	29-JUN-2016 11:23	DUSE	1.43	1.3	dec	0.69	0	-0.462	1.84	3.00	0.58
1572490	1203562000	29-JUN-2016 15:33	DONE	0.29	-0.69	dec	0.69	0	-0.462	1.84	3.00	0.58

Cesium-137 BLANK: Limits LCL = -12 UCL = 13.4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571459	1203559441	15-JUN-2016 08:02	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572084	1203561062	15-JUN-2016 10:50	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572190	1203561289	15-JUN-2016 10:58	DONE	-0.007	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572384	1203561714	16-JUN-2016 12:25	DONE	0.01	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572385	1203561724	16-JUN-2016 12:51	DONE	-0.006	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.011	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1569039	1203553209	17-JUN-2016 07:31	DONE	-0.002	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.008	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1573929	1203565769	17-JUN-2016 11:17	DONE	26.4	6	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1570471	1203556799	17-JUN-2016 12:56	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1575505	1203569877	21-JUN-2016 07:25	DONE	-3.1	-0.83	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1575357	1203569604	21-JUN-2016 07:41	DONE	-3.6	-0.96	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1571024	1203558315	22-JUN-2016 07:20	DONE	0.01	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1575812	1203570695	22-JUN-2016 08:54	DONE	-0.022	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1573772	1203565433	22-JUN-2016 09:37	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1576217	1203571735	23-JUN-2016 07:37	DONE	-0.009	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.003	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1570476	1203556811	23-JUN-2016 07:38	DONE	-0.015	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1576430	1203572280	23-JUN-2016 09:24	DONE	0.02	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1576426	1203572270	23-JUN-2016 11:01	DONE	-0.006	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1571802	1203560362	24-JUN-2016 11:07	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572703	1203562586	24-JUN-2016 14:22	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572236	1203561386	24-JUN-2016 15:52	DONE	-0.002	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572234	1203561383	24-JUN-2016 15:53	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1573057	1203563601	25-JUN-2016 07:30	DONE	-0.024	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1573059	1203563607	25-JUN-2016 09:16	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1573399	1203564536	25-JUN-2016 09:21	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1571801	1203560359	27-JUN-2016 07:16	DONE	-0.001	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572491	1203562002	27-JUN-2016 07:30	DUSE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1576729	1203573018	27-JUN-2016 08:21	DONE	0.01	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1576941	1203573609	27-JUN-2016 09:14	DONE	-0.001	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572491	1203562002	27-JUN-2016 14:08	DONE	0.03	-0.11	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31

1572486	1203561990	28-JUN-2016 12:48	DONE	-0.004	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1577125	1203574134	28-JUN-2016 14:34	DONE	-0.006	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572231	1203561373	28-JUN-2016 14:38	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1577122	1203574128	29-JUN-2016 08:49	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1577531	1203575142	29-JUN-2016 10:17	DONE	-0.017	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1577533	1203575148	29-JUN-2016 11:23	DONE	0.01	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31
1572490	1203561999	29-JUN-2016 15:32	DONE	00	-0.12	pCi/g	0.5	-12	-8.1	9.13	13.4	4.31

Cesium-137 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1572084	1203561063	15-JUN-2016 10:51	DONE	5.02	-0.17	percent	8.42	0	-31	48.1	20.0	19.8
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1572384	1203561715	16-JUN-2016 12:26	DONE	76.4	3.4	percent	8.42	0	-31	48.1	20.0	19.8
1569039	1203553210	17-JUN-2016 07:36	DONE	24.8	0.83	percent	8.42	0	-31	48.1	20.0	19.8
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1570471	1203556800	17-JUN-2016 13:17	DONE	3.86	-0.23	percent	8.42	0	-31	48.1	20.0	19.8
1575505	1203569878	20-JUN-2016 07:04	DONE	28.1	0.99	percent	8.42	0	-31	48.1	20.0	19.8
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1572233	1203561381	20-JUN-2016 08:52	DONE	20.4	0.61	percent	8.42	0	-31	48.1	20.0	19.8
1575357	1203569605	21-JUN-2016 10:13	DONE	2.35	-0.31	percent	8.42	0	-31	48.1	20.0	19.8
1571024	1203558316	22-JUN-2016 07:21	DONE	14.3	0.29	percent	8.42	0	-31	48.1	20.0	19.8
1575812	1203570696	22-JUN-2016 08:54	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1576217	1203571736	23-JUN-2016 07:44	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1570476	1203556812	23-JUN-2016 08:07	DONE	87.6	4	percent	8.42	0	-31	48.1	20.0	19.8
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1572234	1203561384	24-JUN-2016 15:54	DONE	5.09	-0.17	percent	8.42	0	-31	48.1	20.0	19.8
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1573399	1203564537	25-JUN-2016 09:21	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1571802	1203560363	25-JUN-2016 09:38	DONE	3.98	-0.22	percent	8.42	0	-31	48.1	20.0	19.8
1572236	1203561387	25-JUN-2016 09:39	DONE	45.5	1.9	percent	8.42	0	-31	48.1	20.0	19.8
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1576729	1203573019	27-JUN-2016 09:15	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1571801	1203560360	27-JUN-2016 12:07	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1572486	1203561991	28-JUN-2016 12:49	DONE	4.02	-0.22	percent	8.42	0	-31	48.1	20.0	19.8

1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1572231	1203561374	28-JUN-2016 14:39	DONE	4.5	-0.2	percent	8.42	0	-31	48.1	20.0	19.8
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1577531	1203575143	29-JUN-2016 11:00	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1577533	1203575149	29-JUN-2016 11:23	DONE	0	-0.42	percent	8.42	0	-31	48.1	20.0	19.8
1572490	1203562000	29-JUN-2016 15:33	DONE	2.37	-0.3	percent	8.42	0	-31	48.1	20.0	19.8

Cesium-137 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1572084	1203561064	15-JUN-2016 10:52	DUSE	99	-0.12	percent	100	75.0	83.3	117	125	8.33
1572190	1203561291	15-JUN-2016 10:59	DONE	108	0.91	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	16-JUN-2016 09:10	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
1572384	1203561716	16-JUN-2016 09:33	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
1569039	1203553211	17-JUN-2016 07:36	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
1564838	1203541919	17-JUN-2016 08:00	DONE	98.8	-0.15	percent	100	75.0	83.3	117	125	8.33
1573929	1203565771	17-JUN-2016 13:24	DONE	104	0.45	percent	100	75.0	83.3	117	125	8.33
1570471	1203556801	20-JUN-2016 07:03	DONE	98.8	-0.14	percent	100	75.0	83.3	117	125	8.33
1572385	1203561726	20-JUN-2016 08:51	DONE	104	0.48	percent	100	75.0	83.3	117	125	8.33
1572233	1203561382	20-JUN-2016 08:53	DONE	93.9	-0.73	percent	100	75.0	83.3	117	125	8.33
1575505	1203569879	21-JUN-2016 07:26	DONE	105	0.61	percent	100	75.0	83.3	117	125	8.33
1575357	1203569606	21-JUN-2016 07:44	DONE	106	0.66	percent	100	75.0	83.3	117	125	8.33
1571024	1203558317	22-JUN-2016 07:21	DONE	106	0.7	percent	100	75.0	83.3	117	125	8.33
1575812	1203570699	22-JUN-2016 07:51	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
1573772	1203565435	22-JUN-2016 10:20	DONE	101	0.07	percent	100	75.0	83.3	117	125	8.33
1576217	1203571739	23-JUN-2016 07:45	DONE	101	0.17	percent	100	75.0	83.3	117	125	8.33
1571803	1203560367	23-JUN-2016 08:02	DONE	101	0.11	percent	100	75.0	83.3	117	125	8.33
1570476	1203556813	23-JUN-2016 08:22	DONE	102	0.23	percent	100	75.0	83.3	117	125	8.33
1576426	1203572272	23-JUN-2016 11:02	DONE	97.6	-0.29	percent	100	75.0	83.3	117	125	8.33
1576430	1203572282	23-JUN-2016 11:35	DONE	95.9	-0.49	percent	100	75.0	83.3	117	125	8.33
1572234	1203561385	25-JUN-2016 09:20	DONE	95.3	-0.57	percent	100	75.0	83.3	117	125	8.33
1573057	1203563603	25-JUN-2016 09:22	DONE	90.3	-1	percent	100	75.0	83.3	117	125	8.33
1573399	1203564538	25-JUN-2016 09:37	DONE	94.9	-0.61	percent	100	75.0	83.3	117	125	8.33
1572703	1203562588	25-JUN-2016 09:54	DONE	95.4	-0.55	percent	100	75.0	83.3	117	125	8.33
1573059	1203563609	25-JUN-2016 10:14	DONE	96.1	-0.47	percent	100	75.0	83.3	117	125	8.33
1571802	1203560364	25-JUN-2016 10:47	DONE	97.6	-0.29	percent	100	75.0	83.3	117	125	8.33
1572236	1203561388	25-JUN-2016 11:03	DONE	95.5	-0.54	percent	100	75.0	83.3	117	125	8.33
1571801	1203560361	27-JUN-2016 07:16	DONE	94.1	-0.7	percent	100	75.0	83.3	117	125	8.33
1572491	1203562004	27-JUN-2016 07:50	DONE	97.1	-0.34	percent	100	75.0	83.3	117	125	8.33
1576729	1203573020	27-JUN-2016 08:24	DONE	104	0.45	percent	100	75.0	83.3	117	125	8.33
1576941	1203573611	27-JUN-2016 12:03	DUSE	92.2	-0.93	percent	100	75.0	83.3	117	125	8.33
1572486	1203561992	28-JUN-2016 12:36	DONE	101	0.1	percent	100	75.0	83.3	117	125	8.33
1572231	1203561375	28-JUN-2016 12:54	DONE	99.4	-0.07	percent	100	75.0	83.3	117	125	8.33
1577125	1203574136	28-JUN-2016 14:34	DONE	96.1	-0.47	percent	100	75.0	83.3	117	125	8.33

1576941	1203573611	29-JUN-2016 09:07	DONE	106	0.7	percent	100	75.0	83.3	117	125	8.33
1577122	1203574130	29-JUN-2016 09:28	DONE	97.1	-0.35	percent	100	75.0	83.3	117	125	8.33
1577531	1203575144	29-JUN-2016 11:00	DONE	101	0.16	percent	100	75.0	83.3	117	125	8.33
1577533	1203575152	29-JUN-2016 11:20	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
1572490	1203562001	29-JUN-2016 14:54	DONE	99.4	-0.08	percent	100	75.0	83.3	117	125	8.33

Cesium-137 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519622	1203423730	02-NOV-2015 10:04	DONE	0.55	-0.98	percent	4.74	0	-3.8	13.3	20.0	4.29
1524802	1203437209	20-NOV-2015 10:34	DONE	14.7	2.3	percent	4.74	0	-3.8	13.3	20.0	4.29
1533266	1203458681	22-DEC-2015 16:44	DONE	0.54	-0.98	percent	4.74	0	-3.8	13.3	20.0	4.29
1536364	1203466302	11-JAN-2016 11:23	DONE	5.3	0.13	percent	4.74	0	-3.8	13.3	20.0	4.29
1542010	1203481039	03-FEB-2016 11:23	DONE	3.4	-0.31	percent	4.74	0	-3.8	13.3	20.0	4.29
1547288	1203495684	24-FEB-2016 12:31	DONE	1.07	-0.86	percent	4.74	0	-3.8	13.3	20.0	4.29
1548218	1203497950	29-FEB-2016 10:21	DONE	9.81	1.2	percent	4.74	0	-3.8	13.3	20.0	4.29
1550425	1203503644	08-MAR-2016 14:59	DONE	5.6	0.2	percent	4.74	0	-3.8	13.3	20.0	4.29
1553712	1203512070	23-MAR-2016 10:30	DONE	4.71	-0.01	percent	4.74	0	-3.8	13.3	20.0	4.29
1555195	1203515984	28-MAR-2016 09:58	DONE	1.32	-0.8	percent	4.74	0	-3.8	13.3	20.0	4.29
1559978	1203528668	16-APR-2016 10:01	DONE	2.35	-0.56	percent	4.74	0	-3.8	13.3	20.0	4.29
1570342	1203556453	26-MAY-2016 15:47	DONE	9.45	1.1	percent	4.74	0	-3.8	13.3	20.0	4.29
1573465	1203564716	10-JUN-2016 14:52	DONE	2.78	-0.46	percent	4.74	0	-3.8	13.3	20.0	4.29

Cesium-137 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0.91	0.15	dec	0.79	0	-0.849	2.44	3.00	0.82
1570346	1203556469	15-JUN-2016 06:41	DONE	0.13	-0.8	dec	0.79	0	-0.849	2.44	3.00	0.82
1571459	1203559442	15-JUN-2016 08:43	DONE	0.28	-0.63	dec	0.79	0	-0.849	2.44	3.00	0.82
1572084	1203561063	15-JUN-2016 10:51	DONE	0.14	-0.79	dec	0.79	0	-0.849	2.44	3.00	0.82
1572190	1203561290	15-JUN-2016 10:58	DONE	00	-0.96	dec	0.79	0	-0.849	2.44	3.00	0.82
1572384	1203561715	16-JUN-2016 12:26	DONE	1.74	1.2	dec	0.79	0	-0.849	2.44	3.00	0.82
1569039	1203553210	17-JUN-2016 07:36	DONE	0.49	-0.36	dec	0.79	0	-0.849	2.44	3.00	0.82
1564838	1203541918	17-JUN-2016 07:41	DONE	1.77	1.2	dec	0.79	0	-0.849	2.44	3.00	0.82
1570471	1203556800	17-JUN-2016 13:17	DONE	0.94	0.17	dec	0.79	0	-0.849	2.44	3.00	0.82
1575505	1203569878	20-JUN-2016 07:04	DONE	2.16	1.7	dec	0.79	0	-0.849	2.44	3.00	0.82
1572385	1203561725	20-JUN-2016 08:50	DONE	2.52	2.1	dec	0.79	0	-0.849	2.44	3.00	0.82
1572233	1203561381	20-JUN-2016 08:52	DONE	0.54	-0.3	dec	0.79	0	-0.849	2.44	3.00	0.82
1575357	1203569605	21-JUN-2016 10:13	DONE	0.32	-0.57	dec	0.79	0	-0.849	2.44	3.00	0.82
1571024	1203558316	22-JUN-2016 07:21	DONE	0.56	-0.28	dec	0.79	0	-0.849	2.44	3.00	0.82
1575812	1203570696	22-JUN-2016 08:54	DONE	0.13	-0.81	dec	0.79	0	-0.849	2.44	3.00	0.82
1573772	1203565434	22-JUN-2016 09:38	DONE	0.3	-0.6	dec	0.79	0	-0.849	2.44	3.00	0.82
1576217	1203571736	23-JUN-2016 07:44	DONE	1.35	0.68	dec	0.79	0	-0.849	2.44	3.00	0.82
1570476	1203556812	23-JUN-2016 08:07	DONE	4.32	4.3	dec	0.79	0	-0.849	2.44	3.00	0.82
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.64	-0.18	dec	0.79	0	-0.849	2.44	3.00	0.82

1576426	1203572271	23-JUN-2016 12:05	DONE	0.12	-0.82	dec	0.79	0	-0.849	2.44	3.00	0.82
1576430	1203572281	24-JUN-2016 08:09	DONE	0.89	0.12	dec	0.79	0	-0.849	2.44	3.00	0.82
1572234	1203561384	24-JUN-2016 15:54	DONE	1.02	0.28	dec	0.79	0	-0.849	2.44	3.00	0.82
1572703	1203562587	25-JUN-2016 09:16	DONE	0.8	0.01	dec	0.79	0	-0.849	2.44	3.00	0.82
1573059	1203563608	25-JUN-2016 09:17	DONE	0.17	-0.76	dec	0.79	0	-0.849	2.44	3.00	0.82
1573399	1203564537	25-JUN-2016 09:21	DONE	0.27	-0.64	dec	0.79	0	-0.849	2.44	3.00	0.82
1573057	1203563602	25-JUN-2016 09:38	DONE	0.97	0.21	dec	0.79	0	-0.849	2.44	3.00	0.82
1571802	1203560363	25-JUN-2016 09:38	DONE	0.53	-0.32	dec	0.79	0	-0.849	2.44	3.00	0.82
1572236	1203561387	25-JUN-2016 09:39	DONE	1.1	0.38	dec	0.79	0	-0.849	2.44	3.00	0.82
1572491	1203562003	27-JUN-2016 08:23	DONE	1.14	0.42	dec	0.79	0	-0.849	2.44	3.00	0.82
1576729	1203573019	27-JUN-2016 09:15	DONE	0.72	-0.09	dec	0.79	0	-0.849	2.44	3.00	0.82
1571801	1203560360	27-JUN-2016 12:07	DONE	0.29	-0.61	dec	0.79	0	-0.849	2.44	3.00	0.82
1576941	1203573610	28-JUN-2016 09:27	DONE	0.01	-0.96	dec	0.79	0	-0.849	2.44	3.00	0.82
1572486	1203561991	28-JUN-2016 12:49	DONE	0.57	-0.27	dec	0.79	0	-0.849	2.44	3.00	0.82
1577125	1203574135	28-JUN-2016 14:34	DONE	0.15	-0.78	dec	0.79	0	-0.849	2.44	3.00	0.82
1572231	1203561374	28-JUN-2016 14:39	DONE	0.6	-0.24	dec	0.79	0	-0.849	2.44	3.00	0.82
1577122	1203574129	29-JUN-2016 08:50	DONE	0.98	0.22	dec	0.79	0	-0.849	2.44	3.00	0.82
1577531	1203575143	29-JUN-2016 11:00	DONE	0.6	-0.24	dec	0.79	0	-0.849	2.44	3.00	0.82
1577533	1203575149	29-JUN-2016 11:23	DONE	0.36	-0.53	dec	0.79	0	-0.849	2.44	3.00	0.82
1572490	1203562000	29-JUN-2016 15:33	DONE	0.39	-0.5	dec	0.79	0	-0.849	2.44	3.00	0.82

Cobalt-57 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1575505	1203569878	20-JUN-2016 07:04	DONE	2.83	0.35	percent	0.94	0	-9.9	11.7	20.0	5.4
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1575357	1203569605	21-JUN-2016 10:13	DONE	33.7	6.1	percent	0.94	0	-9.9	11.7	20.0	5.4
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4

1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1576729	1203573019	27-JUN-2016 09:15	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1571801	1203560360	27-JUN-2016 12:07	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572486	1203561991	28-JUN-2016 12:49	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572231	1203561374	28-JUN-2016 14:39	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1577533	1203575149	29-JUN-2016 11:23	DUSE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4
1572490	1203562000	29-JUN-2016 15:33	DONE	0	-0.17	percent	0.94	0	-9.9	11.7	20.0	5.4

Cobalt-57 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.27	-0.81	dec	0.76	0	-0.458	1.99	3.00	0.61
1570346	1203556469	15-JUN-2016 06:41	DONE	0.38	-0.63	dec	0.76	0	-0.458	1.99	3.00	0.61
1571459	1203559442	15-JUN-2016 08:43	DONE	2.22	2.4	dec	0.76	0	-0.458	1.99	3.00	0.61
1572084	1203561063	15-JUN-2016 10:51	DUSE	2.15	2.3	dec	0.76	0	-0.458	1.99	3.00	0.61
1572190	1203561290	15-JUN-2016 10:58	DONE	1.05	0.47	dec	0.76	0	-0.458	1.99	3.00	0.61
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.13	0.6	dec	0.76	0	-0.458	1.99	3.00	0.61
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.18	-0.95	dec	0.76	0	-0.458	1.99	3.00	0.61
1564838	1203541918	17-JUN-2016 07:41	DONE	1.12	0.58	dec	0.76	0	-0.458	1.99	3.00	0.61
1570471	1203556800	17-JUN-2016 13:17	DONE	0.02	-1	dec	0.76	0	-0.458	1.99	3.00	0.61
1575505	1203569878	20-JUN-2016 07:04	DONE	0.45	-0.52	dec	0.76	0	-0.458	1.99	3.00	0.61
1572385	1203561725	20-JUN-2016 08:50	DUSE	0.6	-0.27	dec	0.76	0	-0.458	1.99	3.00	0.61
1572233	1203561381	20-JUN-2016 08:52	DONE	0.65	-0.18	dec	0.76	0	-0.458	1.99	3.00	0.61
1575357	1203569605	21-JUN-2016 10:13	DONE	1.25	0.79	dec	0.76	0	-0.458	1.99	3.00	0.61
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.45	-0.51	dec	0.76	0	-0.458	1.99	3.00	0.61
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.16	-0.99	dec	0.76	0	-0.458	1.99	3.00	0.61
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.36	-0.65	dec	0.76	0	-0.458	1.99	3.00	0.61
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.94	0.29	dec	0.76	0	-0.458	1.99	3.00	0.61
1570476	1203556812	23-JUN-2016 08:07	DONE	0.93	0.27	dec	0.76	0	-0.458	1.99	3.00	0.61
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.22	-0.89	dec	0.76	0	-0.458	1.99	3.00	0.61
1576426	1203572271	23-JUN-2016 12:05	DONE	0.21	-0.91	dec	0.76	0	-0.458	1.99	3.00	0.61
1576430	1203572281	24-JUN-2016 08:09	DONE	0.04	-1	dec	0.76	0	-0.458	1.99	3.00	0.61

1572234	1203561384	24-JUN-2016 15:54	DONE	0.52	-0.41	dec	0.76	0	-0.458	1.99	3.00	0.61
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.63	-0.23	dec	0.76	0	-0.458	1.99	3.00	0.61
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.32	-0.73	dec	0.76	0	-0.458	1.99	3.00	0.61
1573399	1203564537	25-JUN-2016 09:21	DUSE	1.94	1.9	dec	0.76	0	-0.458	1.99	3.00	0.61
1573057	1203563602	25-JUN-2016 09:38	DONE	0.19	-0.95	dec	0.76	0	-0.458	1.99	3.00	0.61
1571802	1203560363	25-JUN-2016 09:38	DONE	0.42	-0.56	dec	0.76	0	-0.458	1.99	3.00	0.61
1572236	1203561387	25-JUN-2016 09:39	DONE	2.02	2.1	dec	0.76	0	-0.458	1.99	3.00	0.61
1572491	1203562003	27-JUN-2016 08:23	DONE	0.14	-1	dec	0.76	0	-0.458	1.99	3.00	0.61
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.75	-0.02	dec	0.76	0	-0.458	1.99	3.00	0.61
1571801	1203560360	27-JUN-2016 12:07	DONE	0.74	-0.04	dec	0.76	0	-0.458	1.99	3.00	0.61
1576941	1203573610	28-JUN-2016 09:27	DONE	1.78	1.7	dec	0.76	0	-0.458	1.99	3.00	0.61
1572486	1203561991	28-JUN-2016 12:49	DONE	0.97	0.33	dec	0.76	0	-0.458	1.99	3.00	0.61
1577125	1203574135	28-JUN-2016 14:34	DONE	0.94	0.28	dec	0.76	0	-0.458	1.99	3.00	0.61
1572231	1203561374	28-JUN-2016 14:39	DONE	0.07	-1	dec	0.76	0	-0.458	1.99	3.00	0.61
1577122	1203574129	29-JUN-2016 08:50	DONE	0.48	-0.47	dec	0.76	0	-0.458	1.99	3.00	0.61
1577531	1203575143	29-JUN-2016 11:00	DUSE	0.79	0.04	dec	0.76	0	-0.458	1.99	3.00	0.61
1577533	1203575149	29-JUN-2016 11:23	DUSE	0.84	0.12	dec	0.76	0	-0.458	1.99	3.00	0.61
1572490	1203562000	29-JUN-2016 15:33	DONE	1.51	1.2	dec	0.76	0	-0.458	1.99	3.00	0.61

Cobalt-60 BLANK: Limits LCL = -6.0 UCL = 5.4

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.002	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572084	1203561062	15-JUN-2016 10:50	DONE	-0.009	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572190	1203561289	15-JUN-2016 10:58	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572384	1203561714	16-JUN-2016 12:25	DONE	-0.003	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572385	1203561724	16-JUN-2016 12:51	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.03	0.14	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1569039	1203553209	17-JUN-2016 07:31	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.028	0.14	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1573929	1203565769	17-JUN-2016 11:17	DONE	-12	-6	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1570471	1203556799	17-JUN-2016 12:56	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1575505	1203569877	21-JUN-2016 07:25	DONE	-0.391	-0.05	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1575357	1203569604	21-JUN-2016 07:41	DONE	0.63	0.49	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1571024	1203558315	22-JUN-2016 07:20	DONE	-0.004	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1575812	1203570695	22-JUN-2016 08:54	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1573772	1203565433	22-JUN-2016 09:37	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1576217	1203571735	23-JUN-2016 07:37	DONE	-0.002	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.023	0.14	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1570476	1203556811	23-JUN-2016 07:38	DONE	0.02	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1576430	1203572280	23-JUN-2016 09:24	DONE	0.04	0.18	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1576426	1203572270	23-JUN-2016 11:01	DONE	-0.016	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1571802	1203560362	24-JUN-2016 11:07	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572703	1203562586	24-JUN-2016 14:22	DONE	-0.013	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9

1572236	1203561386	24-JUN-2016 15:52	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572234	1203561383	24-JUN-2016 15:53	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1573057	1203563601	25-JUN-2016 07:30	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1573059	1203563607	25-JUN-2016 09:16	DONE	-0	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1573399	1203564536	25-JUN-2016 09:21	DONE	-0.021	0.14	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1571801	1203560359	27-JUN-2016 07:16	DONE	0.03	0.17	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572491	1203562002	27-JUN-2016 07:30	DUSE	-0.013	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1576729	1203573018	27-JUN-2016 08:21	DONE	-0.006	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1576941	1203573609	27-JUN-2016 09:14	DONE	-0.007	0.15	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572491	1203562002	27-JUN-2016 14:08	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572486	1203561990	28-JUN-2016 12:48	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1577125	1203574134	28-JUN-2016 14:34	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572231	1203561373	28-JUN-2016 14:38	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1577122	1203574128	29-JUN-2016 08:49	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1577531	1203575142	29-JUN-2016 10:17	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1577533	1203575148	29-JUN-2016 11:23	DONE	00	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9
1572490	1203561999	29-JUN-2016 15:32	DONE	0.01	0.16	pCi/g	-0.297	-6	-4.1	3.51	5.42	1.9

Cobalt-60 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572084	1203561063	15-JUN-2016 10:51	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572384	1203561715	16-JUN-2016 12:26	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1569039	1203553210	17-JUN-2016 07:36	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1575505	1203569878	20-JUN-2016 07:04	DONE	0.47	0.51	percent	0.15	0	-1.1	1.39	20.0	0.62
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1575357	1203569605	21-JUN-2016 10:13	DONE	2.77	4.3	percent	0.15	0	-1.1	1.39	20.0	0.62
1571024	1203558316	22-JUN-2016 07:21	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1575812	1203570696	22-JUN-2016 08:54	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1576217	1203571736	23-JUN-2016 07:44	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62

1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1573399	1203564537	25-JUN-2016 09:21	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1571802	1203560363	25-JUN-2016 09:38	DONE	2.73	4.2	percent	0.15	0	-1.1	1.39	20.0	0.62
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1576729	1203573019	27-JUN-2016 09:15	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1571801	1203560360	27-JUN-2016 12:07	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572486	1203561991	28-JUN-2016 12:49	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572231	1203561374	28-JUN-2016 14:39	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1577531	1203575143	29-JUN-2016 11:00	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1577533	1203575149	29-JUN-2016 11:23	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62
1572490	1203562000	29-JUN-2016 15:33	DONE	0	-0.25	percent	0.15	0	-1.1	1.39	20.0	0.62

Cobalt-60 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1572084	1203561064	15-JUN-2016 10:52	DUSE	96.8	-0.38	percent	100	75.0	83.3	117	125	8.33
1572190	1203561291	15-JUN-2016 10:59	DONE	106	0.67	percent	100	75.0	83.3	117	125	8.33
1572084	1203561064	16-JUN-2016 09:10	DONE	95.3	-0.56	percent	100	75.0	83.3	117	125	8.33
1572384	1203561716	16-JUN-2016 09:33	DONE	98.2	-0.21	percent	100	75.0	83.3	117	125	8.33
1569039	1203553211	17-JUN-2016 07:36	DONE	94.9	-0.62	percent	100	75.0	83.3	117	125	8.33
1564838	1203541919	17-JUN-2016 08:00	DONE	95.4	-0.55	percent	100	75.0	83.3	117	125	8.33
1573929	1203565771	17-JUN-2016 13:24	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1570471	1203556801	20-JUN-2016 07:03	DONE	94.1	-0.7	percent	100	75.0	83.3	117	125	8.33
1572385	1203561726	20-JUN-2016 08:51	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1572233	1203561382	20-JUN-2016 08:53	DONE	94.8	-0.62	percent	100	75.0	83.3	117	125	8.33
1575505	1203569879	21-JUN-2016 07:26	DONE	99.9	-0.01	percent	100	75.0	83.3	117	125	8.33
1575357	1203569606	21-JUN-2016 07:44	DONE	103	0.33	percent	100	75.0	83.3	117	125	8.33
1571024	1203558317	22-JUN-2016 07:21	DONE	98.2	-0.22	percent	100	75.0	83.3	117	125	8.33
1575812	1203570699	22-JUN-2016 07:51	DONE	96.4	-0.43	percent	100	75.0	83.3	117	125	8.33
1573772	1203565435	22-JUN-2016 10:20	DONE	95.3	-0.57	percent	100	75.0	83.3	117	125	8.33
1576217	1203571739	23-JUN-2016 07:45	DONE	98.6	-0.16	percent	100	75.0	83.3	117	125	8.33
1571803	1203560367	23-JUN-2016 08:02	DONE	101	0.08	percent	100	75.0	83.3	117	125	8.33
1570476	1203556813	23-JUN-2016 08:22	DONE	101	0.09	percent	100	75.0	83.3	117	125	8.33
1576426	1203572272	23-JUN-2016 11:02	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1576430	1203572282	23-JUN-2016 11:35	DONE	93.4	-0.79	percent	100	75.0	83.3	117	125	8.33
1572234	1203561385	25-JUN-2016 09:20	DONE	95.6	-0.52	percent	100	75.0	83.3	117	125	8.33
1573057	1203563603	25-JUN-2016 09:22	DONE	91.2	-1	percent	100	75.0	83.3	117	125	8.33
1573399	1203564538	25-JUN-2016 09:37	DONE	95.6	-0.52	percent	100	75.0	83.3	117	125	8.33
1572703	1203562588	25-JUN-2016 09:54	DONE	94.9	-0.61	percent	100	75.0	83.3	117	125	8.33

1573059	1203563609	25-JUN-2016 10:14	DONE	96	-0.48	percent	100	75.0	83.3	117	125	8.33
1571802	1203560364	25-JUN-2016 10:47	DONE	96.9	-0.37	percent	100	75.0	83.3	117	125	8.33
1572236	1203561388	25-JUN-2016 11:03	DONE	93.4	-0.79	percent	100	75.0	83.3	117	125	8.33
1571801	1203560361	27-JUN-2016 07:16	DONE	94.4	-0.67	percent	100	75.0	83.3	117	125	8.33
1572491	1203562004	27-JUN-2016 07:50	DONE	95.9	-0.5	percent	100	75.0	83.3	117	125	8.33
1576729	1203573020	27-JUN-2016 08:24	DONE	94.3	-0.68	percent	100	75.0	83.3	117	125	8.33
1576941	1203573611	27-JUN-2016 12:03	DUSE	95.9	-0.5	percent	100	75.0	83.3	117	125	8.33
1572486	1203561992	28-JUN-2016 12:36	DONE	94.6	-0.64	percent	100	75.0	83.3	117	125	8.33
1572231	1203561375	28-JUN-2016 12:54	DONE	94.3	-0.68	percent	100	75.0	83.3	117	125	8.33
1577125	1203574136	28-JUN-2016 14:34	DONE	90.7	-1	percent	100	75.0	83.3	117	125	8.33
1576941	1203573611	29-JUN-2016 09:07	DONE	100	0.02	percent	100	75.0	83.3	117	125	8.33
1577122	1203574130	29-JUN-2016 09:28	DONE	92.9	-0.85	percent	100	75.0	83.3	117	125	8.33
1577531	1203575144	29-JUN-2016 11:00	DONE	96.4	-0.43	percent	100	75.0	83.3	117	125	8.33
1577533	1203575152	29-JUN-2016 11:20	DONE	96.5	-0.42	percent	100	75.0	83.3	117	125	8.33
1572490	1203562001	29-JUN-2016 14:54	DONE	96.7	-0.39	percent	100	75.0	83.3	117	125	8.33

Cobalt-60 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519622	1203423730	02-NOV-2015 10:04	DONE	0.2	-0.97	percent	3.83	0	-3.7	11.3	20.0	3.76
1524802	1203437209	20-NOV-2015 10:34	DONE	8.12	1.1	percent	3.83	0	-3.7	11.3	20.0	3.76
1533266	1203458681	22-DEC-2015 16:44	DONE	4.94	0.3	percent	3.83	0	-3.7	11.3	20.0	3.76
1536364	1203466302	11-JAN-2016 11:23	DONE	0.36	-0.92	percent	3.83	0	-3.7	11.3	20.0	3.76
1542010	1203481039	03-FEB-2016 11:23	DONE	4.91	0.29	percent	3.83	0	-3.7	11.3	20.0	3.76
1547288	1203495684	24-FEB-2016 12:31	DONE	2.56	-0.34	percent	3.83	0	-3.7	11.3	20.0	3.76
1548218	1203497950	29-FEB-2016 10:21	DONE	3.32	-0.14	percent	3.83	0	-3.7	11.3	20.0	3.76
1550425	1203503644	08-MAR-2016 14:59	DONE	0.33	-0.93	percent	3.83	0	-3.7	11.3	20.0	3.76
1553712	1203512070	23-MAR-2016 10:30	DONE	2.57	-0.34	percent	3.83	0	-3.7	11.3	20.0	3.76
1555195	1203515984	28-MAR-2016 09:58	DONE	1.82	-0.53	percent	3.83	0	-3.7	11.3	20.0	3.76
1559978	1203528668	16-APR-2016 10:01	DONE	13.6	2.6	percent	3.83	0	-3.7	11.3	20.0	3.76
1570342	1203556453	26-MAY-2016 15:47	DONE	1.45	-0.63	percent	3.83	0	-3.7	11.3	20.0	3.76
1573465	1203564716	10-JUN-2016 14:52	DONE	5.63	0.48	percent	3.83	0	-3.7	11.3	20.0	3.76

Cobalt-60 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0.81	0.07	dec	0.76	0	-0.57	2.09	3.00	0.66
1570346	1203556469	15-JUN-2016 06:41	DONE	0.98	0.34	dec	0.76	0	-0.57	2.09	3.00	0.66
1571459	1203559442	15-JUN-2016 08:43	DONE	0.29	-0.71	dec	0.76	0	-0.57	2.09	3.00	0.66
1572084	1203561063	15-JUN-2016 10:51	DONE	1.55	1.2	dec	0.76	0	-0.57	2.09	3.00	0.66
1572190	1203561290	15-JUN-2016 10:58	DONE	1.32	0.84	dec	0.76	0	-0.57	2.09	3.00	0.66
1572384	1203561715	16-JUN-2016 12:26	DONE	1.02	0.4	dec	0.76	0	-0.57	2.09	3.00	0.66
1569039	1203553210	17-JUN-2016 07:36	DONE	0.14	-0.92	dec	0.76	0	-0.57	2.09	3.00	0.66
1564838	1203541918	17-JUN-2016 07:41	DONE	0.85	0.13	dec	0.76	0	-0.57	2.09	3.00	0.66
1570471	1203556800	17-JUN-2016 13:17	DONE	3.47	4.1	dec	0.76	0	-0.57	2.09	3.00	0.66

1575505	1203569878	20-JUN-2016 07:04	DONE	0.07	-1	dec	0.76	0	-0.57	2.09	3.00	0.66
1572385	1203561725	20-JUN-2016 08:50	DONE	0.49	-0.41	dec	0.76	0	-0.57	2.09	3.00	0.66
1572233	1203561381	20-JUN-2016 08:52	DONE	0.59	-0.26	dec	0.76	0	-0.57	2.09	3.00	0.66
1575357	1203569605	21-JUN-2016 10:13	DONE	0.44	-0.49	dec	0.76	0	-0.57	2.09	3.00	0.66
1571024	1203558316	22-JUN-2016 07:21	DONE	0.4	-0.55	dec	0.76	0	-0.57	2.09	3.00	0.66
1575812	1203570696	22-JUN-2016 08:54	DONE	1.11	0.53	dec	0.76	0	-0.57	2.09	3.00	0.66
1573772	1203565434	22-JUN-2016 09:38	DONE	0.02	-1	dec	0.76	0	-0.57	2.09	3.00	0.66
1576217	1203571736	23-JUN-2016 07:44	DONE	0.19	-0.86	dec	0.76	0	-0.57	2.09	3.00	0.66
1570476	1203556812	23-JUN-2016 08:07	DONE	0.23	-0.8	dec	0.76	0	-0.57	2.09	3.00	0.66
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.45	-0.47	dec	0.76	0	-0.57	2.09	3.00	0.66
1576426	1203572271	23-JUN-2016 12:05	DONE	0.04	-1	dec	0.76	0	-0.57	2.09	3.00	0.66
1576430	1203572281	24-JUN-2016 08:09	DONE	1.37	0.93	dec	0.76	0	-0.57	2.09	3.00	0.66
1572234	1203561384	24-JUN-2016 15:54	DONE	0.56	-0.3	dec	0.76	0	-0.57	2.09	3.00	0.66
1572703	1203562587	25-JUN-2016 09:16	DONE	0.02	-1	dec	0.76	0	-0.57	2.09	3.00	0.66
1573059	1203563608	25-JUN-2016 09:17	DONE	0.35	-0.62	dec	0.76	0	-0.57	2.09	3.00	0.66
1573399	1203564537	25-JUN-2016 09:21	DONE	1.06	0.45	dec	0.76	0	-0.57	2.09	3.00	0.66
1573057	1203563602	25-JUN-2016 09:38	DONE	0.53	-0.34	dec	0.76	0	-0.57	2.09	3.00	0.66
1571802	1203560363	25-JUN-2016 09:38	DONE	0.21	-0.83	dec	0.76	0	-0.57	2.09	3.00	0.66
1572236	1203561387	25-JUN-2016 09:39	DONE	0.92	0.24	dec	0.76	0	-0.57	2.09	3.00	0.66
1572491	1203562003	27-JUN-2016 08:23	DONE	1.41	0.98	dec	0.76	0	-0.57	2.09	3.00	0.66
1576729	1203573019	27-JUN-2016 09:15	DONE	0.52	-0.36	dec	0.76	0	-0.57	2.09	3.00	0.66
1571801	1203560360	27-JUN-2016 12:07	DONE	1.61	1.3	dec	0.76	0	-0.57	2.09	3.00	0.66
1576941	1203573610	28-JUN-2016 09:27	DONE	1.41	0.98	dec	0.76	0	-0.57	2.09	3.00	0.66
1572486	1203561991	28-JUN-2016 12:49	DONE	0.11	-0.98	dec	0.76	0	-0.57	2.09	3.00	0.66
1577125	1203574135	28-JUN-2016 14:34	DONE	1.4	0.96	dec	0.76	0	-0.57	2.09	3.00	0.66
1572231	1203561374	28-JUN-2016 14:39	DONE	0.51	-0.37	dec	0.76	0	-0.57	2.09	3.00	0.66
1577122	1203574129	29-JUN-2016 08:50	DONE	1.49	1.1	dec	0.76	0	-0.57	2.09	3.00	0.66
1577531	1203575143	29-JUN-2016 11:00	DONE	0.35	-0.62	dec	0.76	0	-0.57	2.09	3.00	0.66
1577533	1203575149	29-JUN-2016 11:23	DONE	0.34	-0.62	dec	0.76	0	-0.57	2.09	3.00	0.66
1572490	1203562000	29-JUN-2016 15:33	DONE	0.98	0.33	dec	0.76	0	-0.57	2.09	3.00	0.66

Europium-152 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0		percent	0	0	0	0	20.0	0
1570346	1203556469	15-JUN-2016 06:41	DUSE	0		percent	0	0	0	0	20.0	0
1571459	1203559442	15-JUN-2016 08:43	DUSE	0		percent	0	0	0	0	20.0	0
1572084	1203561063	15-JUN-2016 10:51	DUSE	0		percent	0	0	0	0	20.0	0
1572190	1203561290	15-JUN-2016 10:58	DONE	0		percent	0	0	0	0	20.0	0
1572384	1203561715	16-JUN-2016 12:26	DUSE	0		percent	0	0	0	0	20.0	0
1569039	1203553210	17-JUN-2016 07:36	DUSE	0		percent	0	0	0	0	20.0	0
1564838	1203541918	17-JUN-2016 07:41	DONE	0		percent	0	0	0	0	20.0	0
1570471	1203556800	17-JUN-2016 13:17	DONE	0		percent	0	0	0	0	20.0	0
1575505	1203569878	20-JUN-2016 07:04	DUSE	0		percent	0	0	0	0	20.0	0

1572385	1203561725	20-JUN-2016 08:50	DONE	0		percent	0	0	0	0	20.0	0
1572233	1203561381	20-JUN-2016 08:52	DONE	0		percent	0	0	0	0	20.0	0
1575357	1203569605	21-JUN-2016 10:13	DUSE	0		percent	0	0	0	0	20.0	0
1571024	1203558316	22-JUN-2016 07:21	DUSE	0		percent	0	0	0	0	20.0	0
1575812	1203570696	22-JUN-2016 08:54	DUSE	0		percent	0	0	0	0	20.0	0
1573772	1203565434	22-JUN-2016 09:38	DUSE	0		percent	0	0	0	0	20.0	0
1576217	1203571736	23-JUN-2016 07:44	DUSE	0		percent	0	0	0	0	20.0	0
1570476	1203556812	23-JUN-2016 08:07	DONE	0		percent	0	0	0	0	20.0	0
1571803	1203560366	23-JUN-2016 08:25	DUSE	0		percent	0	0	0	0	20.0	0
1576426	1203572271	23-JUN-2016 12:05	DONE	0		percent	0	0	0	0	20.0	0
1576430	1203572281	24-JUN-2016 08:09	DONE	0		percent	0	0	0	0	20.0	0
1572234	1203561384	24-JUN-2016 15:54	DONE	0		percent	0	0	0	0	20.0	0
1572703	1203562587	25-JUN-2016 09:16	DUSE	0		percent	0	0	0	0	20.0	0
1573059	1203563608	25-JUN-2016 09:17	DUSE	0		percent	0	0	0	0	20.0	0
1573399	1203564537	25-JUN-2016 09:21	DUSE	0		percent	0	0	0	0	20.0	0
1573057	1203563602	25-JUN-2016 09:38	DONE	0		percent	0	0	0	0	20.0	0
1571802	1203560363	25-JUN-2016 09:38	DONE	0		percent	0	0	0	0	20.0	0
1572236	1203561387	25-JUN-2016 09:39	DONE	0		percent	0	0	0	0	20.0	0
1572491	1203562003	27-JUN-2016 08:23	DONE	0		percent	0	0	0	0	20.0	0
1576729	1203573019	27-JUN-2016 09:15	DUSE	0		percent	0	0	0	0	20.0	0
1571801	1203560360	27-JUN-2016 12:07	DONE	0		percent	0	0	0	0	20.0	0
1576941	1203573610	28-JUN-2016 09:27	DONE	0		percent	0	0	0	0	20.0	0
1572486	1203561991	28-JUN-2016 12:49	DUSE	0		percent	0	0	0	0	20.0	0
1577125	1203574135	28-JUN-2016 14:34	DONE	0		percent	0	0	0	0	20.0	0
1572231	1203561374	28-JUN-2016 14:39	DUSE	0		percent	0	0	0	0	20.0	0
1577122	1203574129	29-JUN-2016 08:50	DONE	0		percent	0	0	0	0	20.0	0
1577531	1203575143	29-JUN-2016 11:00	DUSE	0		percent	0	0	0	0	20.0	0
1577533	1203575149	29-JUN-2016 11:23	DUSE	0		percent	0	0	0	0	20.0	0
1572490	1203562000	29-JUN-2016 15:33	DONE	0		percent	0	0	0	0	20.0	0

Europium-152 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0.57	-0.42	dec	0.82	0	-0.35	1.99	3.00	0.58
1570346	1203556469	15-JUN-2016 06:41	DUSE	2.33	2.6	dec	0.82	0	-0.35	1.99	3.00	0.58
1571459	1203559442	15-JUN-2016 08:43	DUSE	0.88	0.1	dec	0.82	0	-0.35	1.99	3.00	0.58
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.54	-0.48	dec	0.82	0	-0.35	1.99	3.00	0.58
1572190	1203561290	15-JUN-2016 10:58	DONE	0.42	-0.68	dec	0.82	0	-0.35	1.99	3.00	0.58
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.75	1.6	dec	0.82	0	-0.35	1.99	3.00	0.58
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.11	-1	dec	0.82	0	-0.35	1.99	3.00	0.58
1564838	1203541918	17-JUN-2016 07:41	DONE	0.43	-0.67	dec	0.82	0	-0.35	1.99	3.00	0.58
1570471	1203556800	17-JUN-2016 13:17	DONE	0.4	-0.71	dec	0.82	0	-0.35	1.99	3.00	0.58
1575505	1203569878	20-JUN-2016 07:04	DUSE	1.32	0.86	dec	0.82	0	-0.35	1.99	3.00	0.58
1572385	1203561725	20-JUN-2016 08:50	DONE	1.33	0.88	dec	0.82	0	-0.35	1.99	3.00	0.58

1572233	1203561381	20-JUN-2016 08:52	DONE	0.9	0.14	dec	0.82	0	-0.35	1.99	3.00	0.58
1575357	1203569605	21-JUN-2016 10:13	DUSE	0.69	-0.21	dec	0.82	0	-0.35	1.99	3.00	0.58
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.35	-0.8	dec	0.82	0	-0.35	1.99	3.00	0.58
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.71	-0.19	dec	0.82	0	-0.35	1.99	3.00	0.58
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.04	-1	dec	0.82	0	-0.35	1.99	3.00	0.58
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.57	-0.42	dec	0.82	0	-0.35	1.99	3.00	0.58
1570476	1203556812	23-JUN-2016 08:07	DONE	0.44	-0.65	dec	0.82	0	-0.35	1.99	3.00	0.58
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.27	-0.94	dec	0.82	0	-0.35	1.99	3.00	0.58
1576426	1203572271	23-JUN-2016 12:05	DONE	0.05	-1	dec	0.82	0	-0.35	1.99	3.00	0.58
1576430	1203572281	24-JUN-2016 08:09	DONE	0.92	0.17	dec	0.82	0	-0.35	1.99	3.00	0.58
1572234	1203561384	24-JUN-2016 15:54	DONE	1.12	0.51	dec	0.82	0	-0.35	1.99	3.00	0.58
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.51	-0.53	dec	0.82	0	-0.35	1.99	3.00	0.58
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.12	-1	dec	0.82	0	-0.35	1.99	3.00	0.58
1573399	1203564537	25-JUN-2016 09:21	DUSE	1.49	1.2	dec	0.82	0	-0.35	1.99	3.00	0.58
1573057	1203563602	25-JUN-2016 09:38	DONE	1.45	1.1	dec	0.82	0	-0.35	1.99	3.00	0.58
1571802	1203560363	25-JUN-2016 09:38	DONE	0.9	0.14	dec	0.82	0	-0.35	1.99	3.00	0.58
1572236	1203561387	25-JUN-2016 09:39	DONE	0.84	0.04	dec	0.82	0	-0.35	1.99	3.00	0.58
1572491	1203562003	27-JUN-2016 08:23	DONE	0.77	-0.08	dec	0.82	0	-0.35	1.99	3.00	0.58
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.56	-0.44	dec	0.82	0	-0.35	1.99	3.00	0.58
1571801	1203560360	27-JUN-2016 12:07	DONE	1.69	1.5	dec	0.82	0	-0.35	1.99	3.00	0.58
1576941	1203573610	28-JUN-2016 09:27	DONE	1.18	0.61	dec	0.82	0	-0.35	1.99	3.00	0.58
1572486	1203561991	28-JUN-2016 12:49	DUSE	1.9	1.8	dec	0.82	0	-0.35	1.99	3.00	0.58
1577125	1203574135	28-JUN-2016 14:34	DONE	0.89	0.12	dec	0.82	0	-0.35	1.99	3.00	0.58
1572231	1203561374	28-JUN-2016 14:39	DUSE	00	-1	dec	0.82	0	-0.35	1.99	3.00	0.58
1577122	1203574129	29-JUN-2016 08:50	DONE	1.78	1.6	dec	0.82	0	-0.35	1.99	3.00	0.58
1577531	1203575143	29-JUN-2016 11:00	DUSE	0.07	-1	dec	0.82	0	-0.35	1.99	3.00	0.58
1577533	1203575149	29-JUN-2016 11:23	DUSE	1.24	0.72	dec	0.82	0	-0.35	1.99	3.00	0.58
1572490	1203562000	29-JUN-2016 15:33	DONE	0.36	-0.78	dec	0.82	0	-0.35	1.99	3.00	0.58

Europium-154 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1570346	1203556469	15-JUN-2016 06:41	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571459	1203559442	15-JUN-2016 08:43	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1575505	1203569878	20-JUN-2016 07:04	DUSE	6.26	1.6	percent	0.69	0	-6.2	7.57	20.0	3.44
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44

1575357	1203569605	21-JUN-2016 10:13	DUSE	20.7	5.8	percent	0.69	0	-6.2	7.57	20.0	3.44
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576729	1203573019	27-JUN-2016 09:15	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1571801	1203560360	27-JUN-2016 12:07	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572486	1203561991	28-JUN-2016 12:49	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572231	1203561374	28-JUN-2016 14:39	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1577533	1203575149	29-JUN-2016 11:23	DUSE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44
1572490	1203562000	29-JUN-2016 15:33	DONE	0	-0.2	percent	0.69	0	-6.2	7.57	20.0	3.44

Europium-154 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
1574190	1203566582	14-JUN-2016 15:57	DONE	0.52	-0.35	dec	0.76	0	-0.566	2.08	3.00	0.66
1570346	1203556469	15-JUN-2016 06:41	DUSE	0.88	0.19	dec	0.76	0	-0.566	2.08	3.00	0.66
1571459	1203559442	15-JUN-2016 08:43	DUSE	1.36	0.91	dec	0.76	0	-0.566	2.08	3.00	0.66
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.67	1.4	dec	0.76	0	-0.566	2.08	3.00	0.66
1572190	1203561290	15-JUN-2016 10:58	DONE	1.32	0.85	dec	0.76	0	-0.566	2.08	3.00	0.66
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.43	-0.49	dec	0.76	0	-0.566	2.08	3.00	0.66
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.53	-0.35	dec	0.76	0	-0.566	2.08	3.00	0.66
1564838	1203541918	17-JUN-2016 07:41	DONE	1.14	0.57	dec	0.76	0	-0.566	2.08	3.00	0.66
1570471	1203556800	17-JUN-2016 13:17	DONE	0.62	-0.21	dec	0.76	0	-0.566	2.08	3.00	0.66
1575505	1203569878	20-JUN-2016 07:04	DUSE	0.14	-0.94	dec	0.76	0	-0.566	2.08	3.00	0.66
1572385	1203561725	20-JUN-2016 08:50	DONE	1.32	0.84	dec	0.76	0	-0.566	2.08	3.00	0.66
1572233	1203561381	20-JUN-2016 08:52	DONE	0.01	-1	dec	0.76	0	-0.566	2.08	3.00	0.66
1575357	1203569605	21-JUN-2016 10:13	DUSE	1.41	0.99	dec	0.76	0	-0.566	2.08	3.00	0.66

1571024	1203558316	22-JUN-2016 07:21	DUSE	0.39	-0.55	dec	0.76	0	-0.566	2.08	3.00	0.66
1575812	1203570696	22-JUN-2016 08:54	DUSE	1.61	1.3	dec	0.76	0	-0.566	2.08	3.00	0.66
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.36	-0.6	dec	0.76	0	-0.566	2.08	3.00	0.66
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.42	-0.51	dec	0.76	0	-0.566	2.08	3.00	0.66
1570476	1203556812	23-JUN-2016 08:07	DONE	0.27	-0.73	dec	0.76	0	-0.566	2.08	3.00	0.66
1571803	1203560366	23-JUN-2016 08:25	DUSE	1.02	0.4	dec	0.76	0	-0.566	2.08	3.00	0.66
1576426	1203572271	23-JUN-2016 12:05	DONE	0.54	-0.34	dec	0.76	0	-0.566	2.08	3.00	0.66
1576430	1203572281	24-JUN-2016 08:09	DONE	0.02	-1	dec	0.76	0	-0.566	2.08	3.00	0.66
1572234	1203561384	24-JUN-2016 15:54	DONE	0.06	-1	dec	0.76	0	-0.566	2.08	3.00	0.66
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.46	-0.44	dec	0.76	0	-0.566	2.08	3.00	0.66
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.64	-0.18	dec	0.76	0	-0.566	2.08	3.00	0.66
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.4	-0.54	dec	0.76	0	-0.566	2.08	3.00	0.66
1573057	1203563602	25-JUN-2016 09:38	DONE	1.66	1.4	dec	0.76	0	-0.566	2.08	3.00	0.66
1571802	1203560363	25-JUN-2016 09:38	DONE	0.19	-0.86	dec	0.76	0	-0.566	2.08	3.00	0.66
1572236	1203561387	25-JUN-2016 09:39	DONE	2.99	3.4	dec	0.76	0	-0.566	2.08	3.00	0.66
1572491	1203562003	27-JUN-2016 08:23	DONE	0.81	0.08	dec	0.76	0	-0.566	2.08	3.00	0.66
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.38	-0.58	dec	0.76	0	-0.566	2.08	3.00	0.66
1571801	1203560360	27-JUN-2016 12:07	DONE	0.08	-1	dec	0.76	0	-0.566	2.08	3.00	0.66
1576941	1203573610	28-JUN-2016 09:27	DONE	1.61	1.3	dec	0.76	0	-0.566	2.08	3.00	0.66
1572486	1203561991	28-JUN-2016 12:49	DUSE	0.32	-0.66	dec	0.76	0	-0.566	2.08	3.00	0.66
1577125	1203574135	28-JUN-2016 14:34	DONE	0.21	-0.83	dec	0.76	0	-0.566	2.08	3.00	0.66
1572231	1203561374	28-JUN-2016 14:39	DUSE	0.01	-1	dec	0.76	0	-0.566	2.08	3.00	0.66
1577122	1203574129	29-JUN-2016 08:50	DONE	0.4	-0.54	dec	0.76	0	-0.566	2.08	3.00	0.66
1577531	1203575143	29-JUN-2016 11:00	DUSE	1.97	1.8	dec	0.76	0	-0.566	2.08	3.00	0.66
1577533	1203575149	29-JUN-2016 11:23	DUSE	0.99	0.36	dec	0.76	0	-0.566	2.08	3.00	0.66
1572490	1203562000	29-JUN-2016 15:33	DONE	0.38	-0.57	dec	0.76	0	-0.566	2.08	3.00	0.66

Europium-155 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1570346	1203556469	15-JUN-2016 06:41	DUSE	14.6	1.6	percent	2.72	0	-12	17.7	20.0	7.47
1571459	1203559442	15-JUN-2016 08:43	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572384	1203561715	16-JUN-2016 12:26	DUSE	22	2.6	percent	2.72	0	-12	17.7	20.0	7.47
1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1575505	1203569878	20-JUN-2016 07:04	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572385	1203561725	20-JUN-2016 08:50	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1575357	1203569605	21-JUN-2016 10:13	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571024	1203558316	22-JUN-2016 07:21	DUSE	17.6	2	percent	2.72	0	-12	17.7	20.0	7.47

1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576430	1203572281	24-JUN-2016 08:09	DONE	7.35	0.62	percent	2.72	0	-12	17.7	20.0	7.47
1572234	1203561384	24-JUN-2016 15:54	DONE	7.51	0.64	percent	2.72	0	-12	17.7	20.0	7.47
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571802	1203560363	25-JUN-2016 09:38	DONE	0.9	-0.24	percent	2.72	0	-12	17.7	20.0	7.47
1572236	1203561387	25-JUN-2016 09:39	DONE	35.9	4.4	percent	2.72	0	-12	17.7	20.0	7.47
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576729	1203573019	27-JUN-2016 09:15	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1571801	1203560360	27-JUN-2016 12:07	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572486	1203561991	28-JUN-2016 12:49	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572231	1203561374	28-JUN-2016 14:39	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1577533	1203575149	29-JUN-2016 11:23	DUSE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47
1572490	1203562000	29-JUN-2016 15:33	DONE	0	-0.36	percent	2.72	0	-12	17.7	20.0	7.47

Europium-155 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	2.66	2.9	dec	0.71	0	-0.632	2.05	3.00	0.67
1570346	1203556469	15-JUN-2016 06:41	DUSE	2.61	2.8	dec	0.71	0	-0.632	2.05	3.00	0.67
1571459	1203559442	15-JUN-2016 08:43	DUSE	2.46	2.6	dec	0.71	0	-0.632	2.05	3.00	0.67
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.05	0.51	dec	0.71	0	-0.632	2.05	3.00	0.67
1572190	1203561290	15-JUN-2016 10:58	DONE	1.7	1.5	dec	0.71	0	-0.632	2.05	3.00	0.67
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.39	-0.47	dec	0.71	0	-0.632	2.05	3.00	0.67
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.16	-0.83	dec	0.71	0	-0.632	2.05	3.00	0.67
1564838	1203541918	17-JUN-2016 07:41	DONE	0.32	-0.58	dec	0.71	0	-0.632	2.05	3.00	0.67
1570471	1203556800	17-JUN-2016 13:17	DONE	0.69	-0.03	dec	0.71	0	-0.632	2.05	3.00	0.67
1575505	1203569878	20-JUN-2016 07:04	DUSE	0.96	0.37	dec	0.71	0	-0.632	2.05	3.00	0.67
1572385	1203561725	20-JUN-2016 08:50	DONE	1.06	0.52	dec	0.71	0	-0.632	2.05	3.00	0.67
1572233	1203561381	20-JUN-2016 08:52	DONE	1.4	1	dec	0.71	0	-0.632	2.05	3.00	0.67
1575357	1203569605	21-JUN-2016 10:13	DUSE	0.26	-0.67	dec	0.71	0	-0.632	2.05	3.00	0.67
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.12	-0.88	dec	0.71	0	-0.632	2.05	3.00	0.67
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.1	-0.91	dec	0.71	0	-0.632	2.05	3.00	0.67

1573772	1203565434	22-JUN-2016 09:38	DUSE	0.22	-0.73	dec	0.71	0	-0.632	2.05	3.00	0.67
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.16	-0.82	dec	0.71	0	-0.632	2.05	3.00	0.67
1570476	1203556812	23-JUN-2016 08:07	DONE	0.66	-0.07	dec	0.71	0	-0.632	2.05	3.00	0.67
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.85	0.21	dec	0.71	0	-0.632	2.05	3.00	0.67
1576426	1203572271	23-JUN-2016 12:05	DONE	0.04	-1	dec	0.71	0	-0.632	2.05	3.00	0.67
1576430	1203572281	24-JUN-2016 08:09	DONE	0.2	-0.75	dec	0.71	0	-0.632	2.05	3.00	0.67
1572234	1203561384	24-JUN-2016 15:54	DONE	0.13	-0.86	dec	0.71	0	-0.632	2.05	3.00	0.67
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.41	-0.45	dec	0.71	0	-0.632	2.05	3.00	0.67
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.35	-0.54	dec	0.71	0	-0.632	2.05	3.00	0.67
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.19	-0.77	dec	0.71	0	-0.632	2.05	3.00	0.67
1573057	1203563602	25-JUN-2016 09:38	DONE	0.51	-0.3	dec	0.71	0	-0.632	2.05	3.00	0.67
1571802	1203560363	25-JUN-2016 09:38	DONE	0.02	-1	dec	0.71	0	-0.632	2.05	3.00	0.67
1572236	1203561387	25-JUN-2016 09:39	DONE	0.68	-0.04	dec	0.71	0	-0.632	2.05	3.00	0.67
1572491	1203562003	27-JUN-2016 08:23	DONE	0.67	-0.06	dec	0.71	0	-0.632	2.05	3.00	0.67
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.36	-0.53	dec	0.71	0	-0.632	2.05	3.00	0.67
1571801	1203560360	27-JUN-2016 12:07	DONE	0.43	-0.42	dec	0.71	0	-0.632	2.05	3.00	0.67
1576941	1203573610	28-JUN-2016 09:27	DONE	0.63	-0.12	dec	0.71	0	-0.632	2.05	3.00	0.67
1572486	1203561991	28-JUN-2016 12:49	DUSE	0.96	0.38	dec	0.71	0	-0.632	2.05	3.00	0.67
1577125	1203574135	28-JUN-2016 14:34	DONE	0.79	0.12	dec	0.71	0	-0.632	2.05	3.00	0.67
1572231	1203561374	28-JUN-2016 14:39	DUSE	0.99	0.42	dec	0.71	0	-0.632	2.05	3.00	0.67
1577122	1203574129	29-JUN-2016 08:50	DONE	0.3	-0.6	dec	0.71	0	-0.632	2.05	3.00	0.67
1577531	1203575143	29-JUN-2016 11:00	DUSE	0.43	-0.42	dec	0.71	0	-0.632	2.05	3.00	0.67
1577533	1203575149	29-JUN-2016 11:23	DUSE	1.08	0.56	dec	0.71	0	-0.632	2.05	3.00	0.67
1572490	1203562000	29-JUN-2016 15:33	DONE	0.65	-0.09	dec	0.71	0	-0.632	2.05	3.00	0.67

Manganese-54 BLANK: Limits LCL = -1.8 UCL = 1.5

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.001	0.2	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572084	1203561062	15-JUN-2016 10:50	DUSE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572190	1203561289	15-JUN-2016 10:58	DONE	-0.013	0.18	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572384	1203561714	16-JUN-2016 12:25	DUSE	-0.006	0.19	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572385	1203561724	16-JUN-2016 12:51	DUSE	-0.007	0.19	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572233	1203561380	16-JUN-2016 12:53	DONE	0.02	0.24	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1569039	1203553209	17-JUN-2016 07:31	DUSE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1564838	1203541917	17-JUN-2016 07:41	DONE	0.01	0.23	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1573929	1203565769	17-JUN-2016 11:17	DONE	-3.2	-6	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.001	0.2	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1575505	1203569877	21-JUN-2016 07:25	DONE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1575357	1203569604	21-JUN-2016 07:41	DONE	-1.4	-2	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1571024	1203558315	22-JUN-2016 07:20	DUSE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1575812	1203570695	22-JUN-2016 08:54	DUSE	-0.008	0.19	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1573772	1203565433	22-JUN-2016 09:37	DUSE	0.04	0.27	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1576217	1203571735	23-JUN-2016 07:37	DUSE	-0.012	0.18	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55

1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.008	0.19	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1570476	1203556811	23-JUN-2016 07:38	DONE	0.01	0.23	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1576430	1203572280	23-JUN-2016 09:24	DONE	0.03	0.26	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1576426	1203572270	23-JUN-2016 11:01	DUSE	-0.014	0.18	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1571802	1203560362	24-JUN-2016 11:07	DONE	0.01	0.22	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572703	1203562586	24-JUN-2016 14:22	DUSE	-0.021	0.17	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572236	1203561386	24-JUN-2016 15:52	DONE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572234	1203561383	24-JUN-2016 15:53	DONE	-0.002	0.2	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1573057	1203563601	25-JUN-2016 07:30	DONE	0.01	0.22	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1573059	1203563607	25-JUN-2016 09:16	DUSE	0.01	0.22	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1573399	1203564536	25-JUN-2016 09:21	DUSE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1571801	1203560359	27-JUN-2016 07:16	DONE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572491	1203562002	27-JUN-2016 07:30	DUSE	-0.007	0.19	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1576729	1203573018	27-JUN-2016 08:21	DUSE	-0.012	0.18	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1576941	1203573609	27-JUN-2016 09:14	DONE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572491	1203562002	27-JUN-2016 14:08	DONE	0.01	0.23	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572486	1203561990	28-JUN-2016 12:48	DONE	0.03	0.27	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1577125	1203574134	28-JUN-2016 14:34	DONE	-0.004	0.2	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572231	1203561373	28-JUN-2016 14:38	DONE	00	0.21	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1577122	1203574128	29-JUN-2016 08:49	DONE	-0.002	0.2	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1577531	1203575142	29-JUN-2016 10:17	DUSE	0.02	0.24	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1577533	1203575148	29-JUN-2016 11:23	DUSE	0.01	0.22	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55
1572490	1203561999	29-JUN-2016 15:32	DONE	0.01	0.22	pCi/g	-0.113	-1.8	-1.2	0.99	1.54	0.55

Manganese-54 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1569039	1203553210	17-JUN-2016 07:36	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1575505	1203569878	20-JUN-2016 07:04	DONE	3.43	0.09	percent	2.76	0	-13	18.2	20.0	7.72
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1575357	1203569605	21-JUN-2016 10:13	DONE	6.79	0.52	percent	2.76	0	-13	18.2	20.0	7.72
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72

1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1576426	1203572271	23-JUN-2016 12:05	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1576430	1203572281	24-JUN-2016 08:09	DONE	26.2	3	percent	2.76	0	-13	18.2	20.0	7.72
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1571802	1203560363	25-JUN-2016 09:38	DONE	37.9	4.6	percent	2.76	0	-13	18.2	20.0	7.72
1572236	1203561387	25-JUN-2016 09:39	DONE	13.1	1.3	percent	2.76	0	-13	18.2	20.0	7.72
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1576729	1203573019	27-JUN-2016 09:15	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1571801	1203560360	27-JUN-2016 12:07	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1572486	1203561991	28-JUN-2016 12:49	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1572231	1203561374	28-JUN-2016 14:39	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.36	percent	2.76	0	-13	18.2	20.0	7.72
1577533	1203575149	29-JUN-2016 11:23	DUSE	8.93	0.8	percent	2.76	0	-13	18.2	20.0	7.72
1572490	1203562000	29-JUN-2016 15:33	DONE	11.5	1.1	percent	2.76	0	-13	18.2	20.0	7.72

Manganese-54 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.14	-1	dec	0.75	0	-0.45	1.96	3.00	0.6
1570346	1203556469	15-JUN-2016 06:41	DONE	0.5	-0.42	dec	0.75	0	-0.45	1.96	3.00	0.6
1571459	1203559442	15-JUN-2016 08:43	DONE	1.98	2	dec	0.75	0	-0.45	1.96	3.00	0.6
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.09	-1	dec	0.75	0	-0.45	1.96	3.00	0.6
1572190	1203561290	15-JUN-2016 10:58	DONE	0.07	-1	dec	0.75	0	-0.45	1.96	3.00	0.6
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.45	1.2	dec	0.75	0	-0.45	1.96	3.00	0.6
1569039	1203553210	17-JUN-2016 07:36	DUSE	0.48	-0.45	dec	0.75	0	-0.45	1.96	3.00	0.6
1564838	1203541918	17-JUN-2016 07:41	DONE	0.55	-0.33	dec	0.75	0	-0.45	1.96	3.00	0.6
1570471	1203556800	17-JUN-2016 13:17	DONE	1.59	1.4	dec	0.75	0	-0.45	1.96	3.00	0.6
1575505	1203569878	20-JUN-2016 07:04	DONE	0.54	-0.35	dec	0.75	0	-0.45	1.96	3.00	0.6
1572385	1203561725	20-JUN-2016 08:50	DUSE	0.13	-1	dec	0.75	0	-0.45	1.96	3.00	0.6
1572233	1203561381	20-JUN-2016 08:52	DONE	1.17	0.7	dec	0.75	0	-0.45	1.96	3.00	0.6
1575357	1203569605	21-JUN-2016 10:13	DONE	0.81	0.09	dec	0.75	0	-0.45	1.96	3.00	0.6
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.09	-1	dec	0.75	0	-0.45	1.96	3.00	0.6
1575812	1203570696	22-JUN-2016 08:54	DUSE	2.27	2.5	dec	0.75	0	-0.45	1.96	3.00	0.6
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.8	0.07	dec	0.75	0	-0.45	1.96	3.00	0.6
1576217	1203571736	23-JUN-2016 07:44	DUSE	1.05	0.48	dec	0.75	0	-0.45	1.96	3.00	0.6
1570476	1203556812	23-JUN-2016 08:07	DONE	1.2	0.75	dec	0.75	0	-0.45	1.96	3.00	0.6

1571803	1203560366	23-JUN-2016 08:25	DUSE	0.7	-0.08	dec	0.75	0	-0.45	1.96	3.00	0.6
1576426	1203572271	23-JUN-2016 12:05	DUSE	0.31	-0.74	dec	0.75	0	-0.45	1.96	3.00	0.6
1576430	1203572281	24-JUN-2016 08:09	DONE	0.83	0.12	dec	0.75	0	-0.45	1.96	3.00	0.6
1572234	1203561384	24-JUN-2016 15:54	DONE	0.69	-0.1	dec	0.75	0	-0.45	1.96	3.00	0.6
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.23	-0.87	dec	0.75	0	-0.45	1.96	3.00	0.6
1573059	1203563608	25-JUN-2016 09:17	DUSE	0.29	-0.77	dec	0.75	0	-0.45	1.96	3.00	0.6
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.6	-0.25	dec	0.75	0	-0.45	1.96	3.00	0.6
1573057	1203563602	25-JUN-2016 09:38	DONE	0.78	0.05	dec	0.75	0	-0.45	1.96	3.00	0.6
1571802	1203560363	25-JUN-2016 09:38	DONE	1.06	0.52	dec	0.75	0	-0.45	1.96	3.00	0.6
1572236	1203561387	25-JUN-2016 09:39	DONE	0.25	-0.83	dec	0.75	0	-0.45	1.96	3.00	0.6
1572491	1203562003	27-JUN-2016 08:23	DONE	0.92	0.28	dec	0.75	0	-0.45	1.96	3.00	0.6
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.23	-0.87	dec	0.75	0	-0.45	1.96	3.00	0.6
1571801	1203560360	27-JUN-2016 12:07	DONE	0.03	-1	dec	0.75	0	-0.45	1.96	3.00	0.6
1576941	1203573610	28-JUN-2016 09:27	DONE	0.09	-1	dec	0.75	0	-0.45	1.96	3.00	0.6
1572486	1203561991	28-JUN-2016 12:49	DONE	0.88	0.2	dec	0.75	0	-0.45	1.96	3.00	0.6
1577125	1203574135	28-JUN-2016 14:34	DONE	0.65	-0.17	dec	0.75	0	-0.45	1.96	3.00	0.6
1572231	1203561374	28-JUN-2016 14:39	DONE	1.03	0.47	dec	0.75	0	-0.45	1.96	3.00	0.6
1577122	1203574129	29-JUN-2016 08:50	DONE	0.62	-0.21	dec	0.75	0	-0.45	1.96	3.00	0.6
1577531	1203575143	29-JUN-2016 11:00	DUSE	2.3	2.6	dec	0.75	0	-0.45	1.96	3.00	0.6
1577533	1203575149	29-JUN-2016 11:23	DUSE	1.7	1.6	dec	0.75	0	-0.45	1.96	3.00	0.6
1572490	1203562000	29-JUN-2016 15:33	DONE	0.28	-0.79	dec	0.75	0	-0.45	1.96	3.00	0.6

Sodium-22 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1570346	1203556469	15-JUN-2016 06:41	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571459	1203559442	15-JUN-2016 08:43	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1569039	1203553210	17-JUN-2016 07:36	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1575505	1203569878	20-JUN-2016 07:04	DUSE	6.4	1.4	percent	1.02	0	-6.8	8.82	20.0	3.9
1572385	1203561725	20-JUN-2016 08:50	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1575357	1203569605	21-JUN-2016 10:13	DUSE	20.2	4.9	percent	1.02	0	-6.8	8.82	20.0	3.9
1571024	1203558316	22-JUN-2016 07:21	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1575812	1203570696	22-JUN-2016 08:54	DUSE	13	3.1	percent	1.02	0	-6.8	8.82	20.0	3.9
1573772	1203565434	22-JUN-2016 09:38	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9

1576426	1203572271	23-JUN-2016 12:05	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572703	1203562587	25-JUN-2016 09:16	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573059	1203563608	25-JUN-2016 09:17	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571802	1203560363	25-JUN-2016 09:38	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1576729	1203573019	27-JUN-2016 09:15	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1571801	1203560360	27-JUN-2016 12:07	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572486	1203561991	28-JUN-2016 12:49	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572231	1203561374	28-JUN-2016 14:39	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1577533	1203575149	29-JUN-2016 11:23	DUSE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9
1572490	1203562000	29-JUN-2016 15:33	DONE	0	-0.26	percent	1.02	0	-6.8	8.82	20.0	3.9

Sodium-22 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stddev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.24	-0.74	dec	0.78	0	-0.677	2.23	3.00	0.73
1570346	1203556469	15-JUN-2016 06:41	DUSE	1.01	0.32	dec	0.78	0	-0.677	2.23	3.00	0.73
1571459	1203559442	15-JUN-2016 08:43	DUSE	1.78	1.4	dec	0.78	0	-0.677	2.23	3.00	0.73
1572084	1203561063	15-JUN-2016 10:51	DUSE	1.76	1.3	dec	0.78	0	-0.677	2.23	3.00	0.73
1572190	1203561290	15-JUN-2016 10:58	DONE	1.31	0.72	dec	0.78	0	-0.677	2.23	3.00	0.73
1572384	1203561715	16-JUN-2016 12:26	DUSE	0.35	-0.59	dec	0.78	0	-0.677	2.23	3.00	0.73
1569039	1203553210	17-JUN-2016 07:36	DONE	0.31	-0.64	dec	0.78	0	-0.677	2.23	3.00	0.73
1564838	1203541918	17-JUN-2016 07:41	DONE	1.16	0.52	dec	0.78	0	-0.677	2.23	3.00	0.73
1570471	1203556800	17-JUN-2016 13:17	DONE	0.51	-0.37	dec	0.78	0	-0.677	2.23	3.00	0.73
1575505	1203569878	20-JUN-2016 07:04	DUSE	0.2	-0.79	dec	0.78	0	-0.677	2.23	3.00	0.73
1572385	1203561725	20-JUN-2016 08:50	DUSE	1.68	1.2	dec	0.78	0	-0.677	2.23	3.00	0.73
1572233	1203561381	20-JUN-2016 08:52	DONE	0.05	-0.1	dec	0.78	0	-0.677	2.23	3.00	0.73
1575357	1203569605	21-JUN-2016 10:13	DUSE	1.59	1.1	dec	0.78	0	-0.677	2.23	3.00	0.73
1571024	1203558316	22-JUN-2016 07:21	DONE	0.37	-0.56	dec	0.78	0	-0.677	2.23	3.00	0.73
1575812	1203570696	22-JUN-2016 08:54	DUSE	1.72	1.3	dec	0.78	0	-0.677	2.23	3.00	0.73
1573772	1203565434	22-JUN-2016 09:38	DONE	0.36	-0.58	dec	0.78	0	-0.677	2.23	3.00	0.73
1576217	1203571736	23-JUN-2016 07:44	DUSE	0.39	-0.53	dec	0.78	0	-0.677	2.23	3.00	0.73
1570476	1203556812	23-JUN-2016 08:07	DONE	0.12	-0.9	dec	0.78	0	-0.677	2.23	3.00	0.73
1571803	1203560366	23-JUN-2016 08:25	DUSE	0.88	0.14	dec	0.78	0	-0.677	2.23	3.00	0.73
1576426	1203572271	23-JUN-2016 12:05	DONE	0.65	-0.18	dec	0.78	0	-0.677	2.23	3.00	0.73

1576430	1203572281	24-JUN-2016 08:09	DONE	0.04	-1	dec	0.78	0	-0.677	2.23	3.00	0.73
1572234	1203561384	24-JUN-2016 15:54	DONE	0.01	-1	dec	0.78	0	-0.677	2.23	3.00	0.73
1572703	1203562587	25-JUN-2016 09:16	DONE	0.47	-0.43	dec	0.78	0	-0.677	2.23	3.00	0.73
1573059	1203563608	25-JUN-2016 09:17	DONE	0.65	-0.18	dec	0.78	0	-0.677	2.23	3.00	0.73
1573399	1203564537	25-JUN-2016 09:21	DUSE	0.43	-0.48	dec	0.78	0	-0.677	2.23	3.00	0.73
1573057	1203563602	25-JUN-2016 09:38	DONE	1.61	1.1	dec	0.78	0	-0.677	2.23	3.00	0.73
1571802	1203560363	25-JUN-2016 09:38	DONE	0.02	-1	dec	0.78	0	-0.677	2.23	3.00	0.73
1572236	1203561387	25-JUN-2016 09:39	DONE	3.12	3.2	dec	0.78	0	-0.677	2.23	3.00	0.73
1572491	1203562003	27-JUN-2016 08:23	DONE	0.88	0.14	dec	0.78	0	-0.677	2.23	3.00	0.73
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.37	-0.57	dec	0.78	0	-0.677	2.23	3.00	0.73
1571801	1203560360	27-JUN-2016 12:07	DONE	0.14	-0.88	dec	0.78	0	-0.677	2.23	3.00	0.73
1576941	1203573610	28-JUN-2016 09:27	DONE	1.51	1	dec	0.78	0	-0.677	2.23	3.00	0.73
1572486	1203561991	28-JUN-2016 12:49	DONE	0.29	-0.68	dec	0.78	0	-0.677	2.23	3.00	0.73
1577125	1203574135	28-JUN-2016 14:34	DONE	0.06	-0.99	dec	0.78	0	-0.677	2.23	3.00	0.73
1572231	1203561374	28-JUN-2016 14:39	DONE	0.08	-0.96	dec	0.78	0	-0.677	2.23	3.00	0.73
1577122	1203574129	29-JUN-2016 08:50	DONE	0.35	-0.59	dec	0.78	0	-0.677	2.23	3.00	0.73
1577531	1203575143	29-JUN-2016 11:00	DUSE	1.95	1.6	dec	0.78	0	-0.677	2.23	3.00	0.73
1577533	1203575149	29-JUN-2016 11:23	DUSE	1.55	1.1	dec	0.78	0	-0.677	2.23	3.00	0.73
1572490	1203562000	29-JUN-2016 15:33	DONE	0.41	-0.5	dec	0.78	0	-0.677	2.23	3.00	0.73

Zinc-65 BLANK: Limits LCL = -5.9 UCL = 5.3

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1571459	1203559441	15-JUN-2016 08:02	DONE	-0.003	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572084	1203561062	15-JUN-2016 10:50	DUSE	-0.003	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572190	1203561289	15-JUN-2016 10:58	DONE	-0	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572384	1203561714	16-JUN-2016 12:25	DUSE	0.02	0.19	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572385	1203561724	16-JUN-2016 12:51	DUSE	-0.026	0.16	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572233	1203561380	16-JUN-2016 12:53	DONE	-0.084	0.13	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1569039	1203553209	17-JUN-2016 07:31	DUSE	-0.001	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1564838	1203541917	17-JUN-2016 07:41	DONE	-0.005	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1573929	1203565769	17-JUN-2016 11:17	DONE	-12	-6	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1570471	1203556799	17-JUN-2016 12:56	DONE	-0.018	0.16	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1575505	1203569877	21-JUN-2016 07:25	DONE	-0.743	-0.22	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1575357	1203569604	21-JUN-2016 07:41	DONE	0.19	0.27	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1571024	1203558315	22-JUN-2016 07:20	DUSE	-0.014	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1575812	1203570695	22-JUN-2016 08:54	DUSE	-0.035	0.15	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1573772	1203565433	22-JUN-2016 09:37	DUSE	0.02	0.18	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1576217	1203571735	23-JUN-2016 07:37	DUSE	0.03	0.19	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1571803	1203560365	23-JUN-2016 07:37	DUSE	-0.128	0.1	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1570476	1203556811	23-JUN-2016 07:38	DONE	-0.015	0.16	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1576430	1203572280	23-JUN-2016 09:24	DONE	-0.008	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1576426	1203572270	23-JUN-2016 11:01	DUSE	-0.028	0.16	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1571802	1203560362	24-JUN-2016 11:07	DONE	00	0.18	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87

1572703	1203562586	24-JUN-2016 14:22	DUSE	0.04	0.19	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572236	1203561386	24-JUN-2016 15:52	DONE	0.01	0.18	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572234	1203561383	24-JUN-2016 15:53	DONE	0.01	0.18	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1573057	1203563601	25-JUN-2016 07:30	DONE	0.04	0.2	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1573059	1203563607	25-JUN-2016 09:16	DUSE	-0.044	0.15	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1573399	1203564536	25-JUN-2016 09:21	DUSE	-0.003	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1571801	1203560359	27-JUN-2016 07:16	DUSE	-0.014	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572491	1203562002	27-JUN-2016 07:30	DUSE	-0.052	0.15	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1576729	1203573018	27-JUN-2016 08:21	DUSE	-0.018	0.16	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1576941	1203573609	27-JUN-2016 09:14	DONE	-0.028	0.16	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572491	1203562002	27-JUN-2016 14:08	DONE	-0.072	0.13	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572486	1203561990	28-JUN-2016 12:48	DUSE	-0	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1577125	1203574134	28-JUN-2016 14:34	DONE	-0.009	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572231	1203561373	28-JUN-2016 14:38	DUSE	0.02	0.19	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1577122	1203574128	29-JUN-2016 08:49	DONE	00	0.17	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1577531	1203575142	29-JUN-2016 10:17	DUSE	0.02	0.18	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1577533	1203575148	29-JUN-2016 11:23	DUSE	-0.016	0.16	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87
1572490	1203561999	29-JUN-2016 15:32	DONE	0.01	0.18	pCi/g	-0.323	-5.9	-4.1	3.41	5.28	1.87

Zinc-65 DUP: Limits LCL = 0 UCL = 20.0

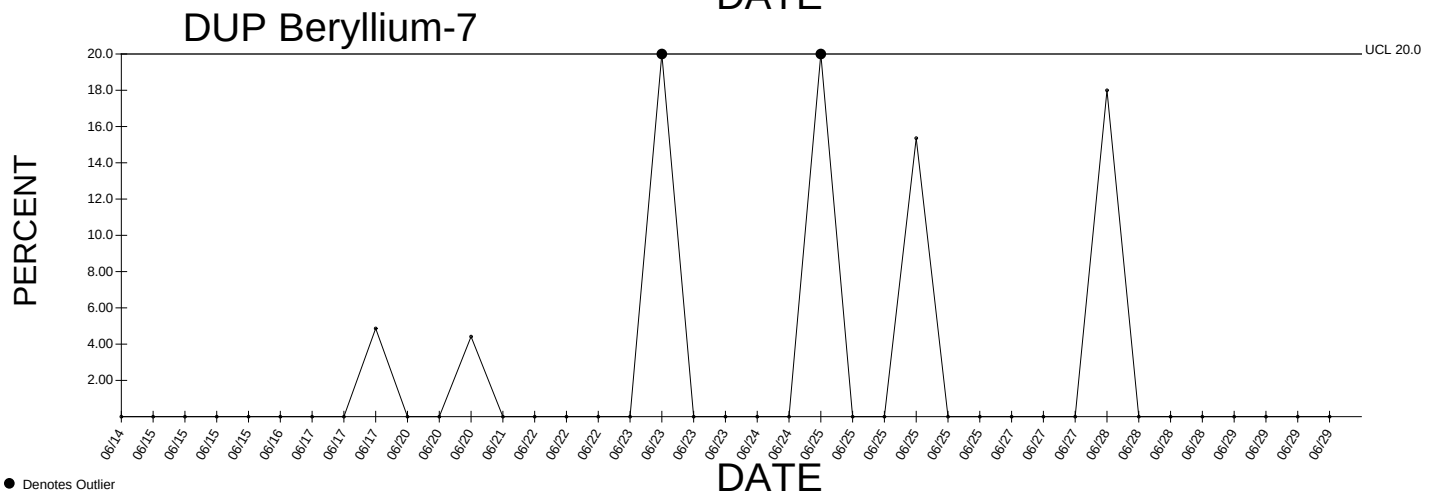
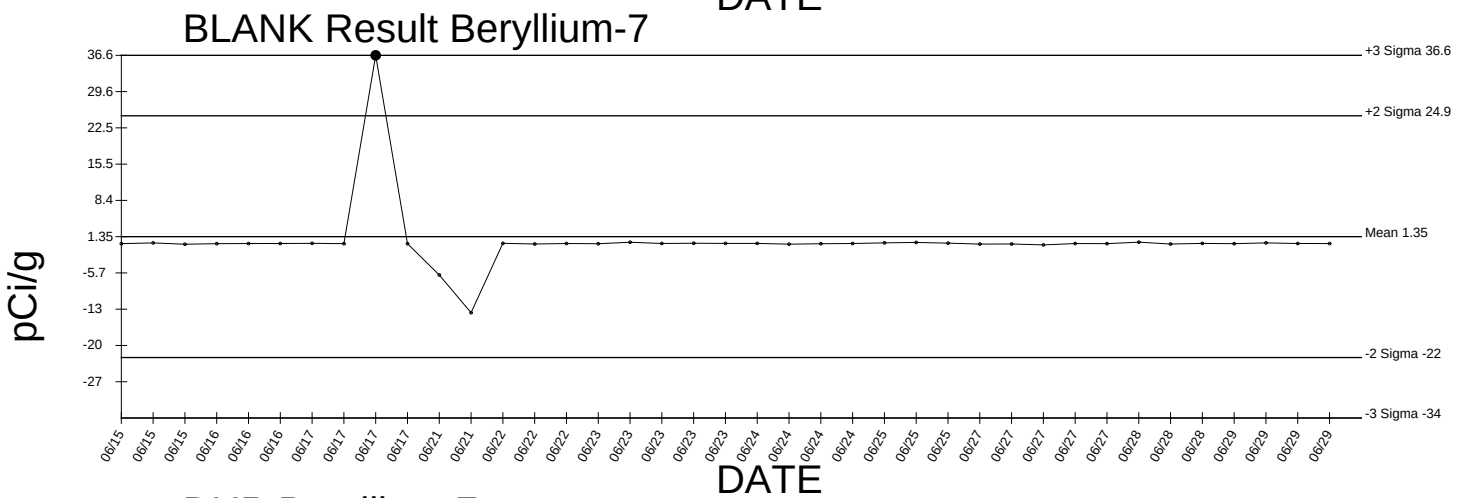
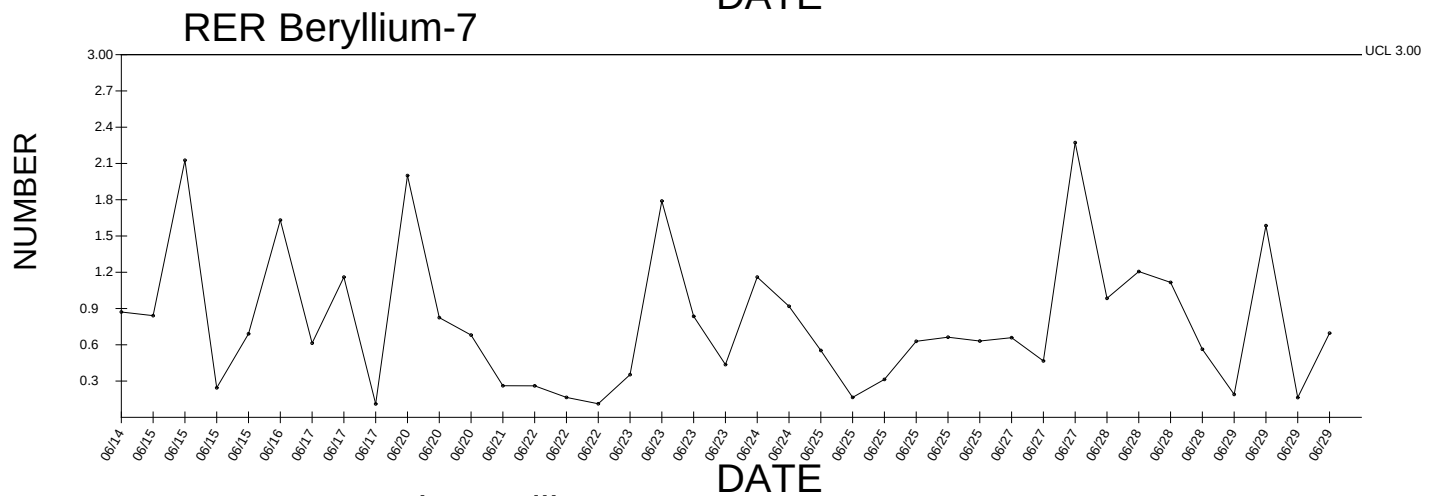
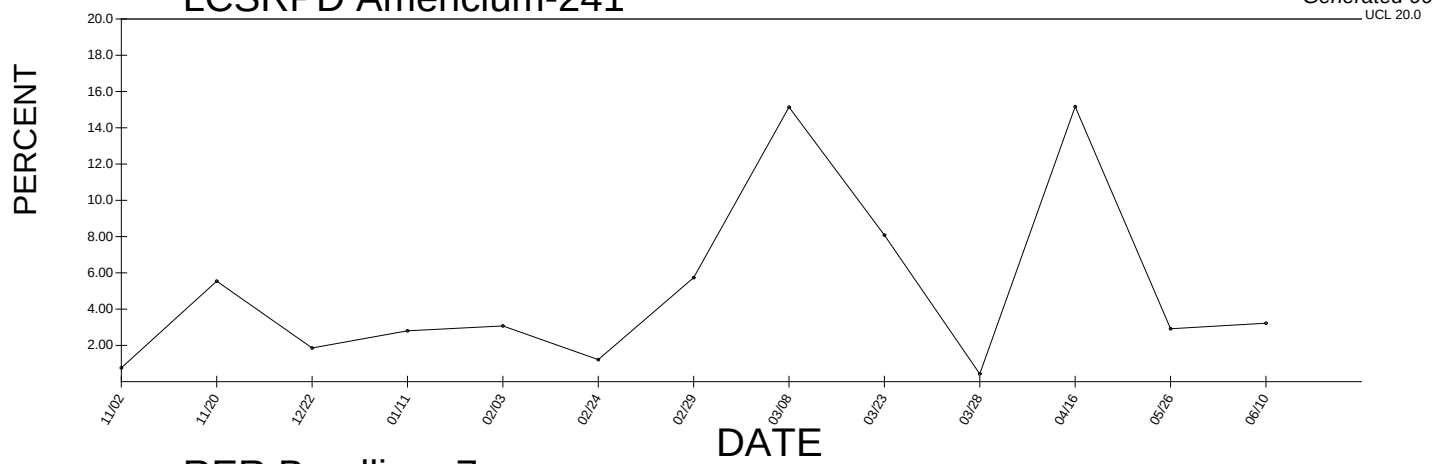
Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1570346	1203556469	15-JUN-2016 06:41	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1571459	1203559442	15-JUN-2016 08:43	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572084	1203561063	15-JUN-2016 10:51	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572190	1203561290	15-JUN-2016 10:58	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572384	1203561715	16-JUN-2016 12:26	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1569039	1203553210	17-JUN-2016 07:36	DUSE	86	3.9	percent	5.75	0	-36	47	20.0	20.6
1564838	1203541918	17-JUN-2016 07:41	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1570471	1203556800	17-JUN-2016 13:17	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1575505	1203569878	20-JUN-2016 07:04	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572385	1203561725	20-JUN-2016 08:50	DUSE	53.4	2.3	percent	5.75	0	-36	47	20.0	20.6
1572233	1203561381	20-JUN-2016 08:52	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1575357	1203569605	21-JUN-2016 10:13	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1571024	1203558316	22-JUN-2016 07:21	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1575812	1203570696	22-JUN-2016 08:54	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1573772	1203565434	22-JUN-2016 09:38	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1576217	1203571736	23-JUN-2016 07:44	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1570476	1203556812	23-JUN-2016 08:07	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1571803	1203560366	23-JUN-2016 08:25	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1576426	1203572271	23-JUN-2016 12:05	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1576430	1203572281	24-JUN-2016 08:09	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572234	1203561384	24-JUN-2016 15:54	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6

1572703	1203562587	25-JUN-2016 09:16	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1573059	1203563608	25-JUN-2016 09:17	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1573399	1203564537	25-JUN-2016 09:21	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1573057	1203563602	25-JUN-2016 09:38	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1571802	1203560363	25-JUN-2016 09:38	DONE	85.1	3.8	percent	5.75	0	-36	47	20.0	20.6
1572236	1203561387	25-JUN-2016 09:39	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572491	1203562003	27-JUN-2016 08:23	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1576729	1203573019	27-JUN-2016 09:15	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1571801	1203560360	27-JUN-2016 12:07	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1576941	1203573610	28-JUN-2016 09:27	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572486	1203561991	28-JUN-2016 12:49	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1577125	1203574135	28-JUN-2016 14:34	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572231	1203561374	28-JUN-2016 14:39	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1577122	1203574129	29-JUN-2016 08:50	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1577531	1203575143	29-JUN-2016 11:00	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1577533	1203575149	29-JUN-2016 11:23	DUSE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6
1572490	1203562000	29-JUN-2016 15:33	DONE	0	-0.28	percent	5.75	0	-36	47	20.0	20.6

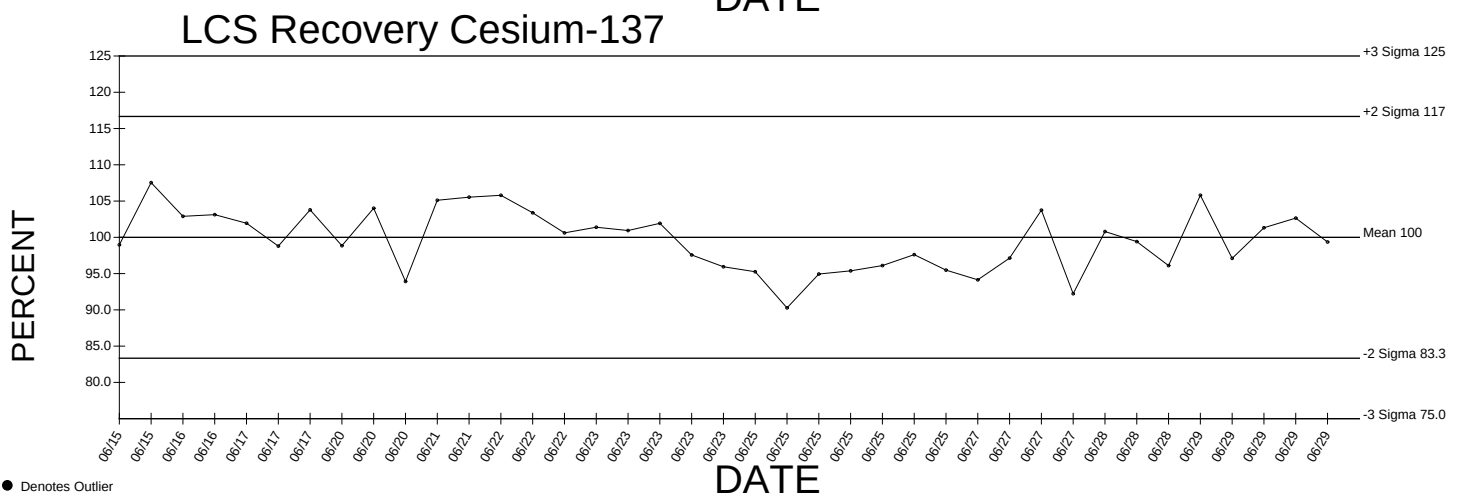
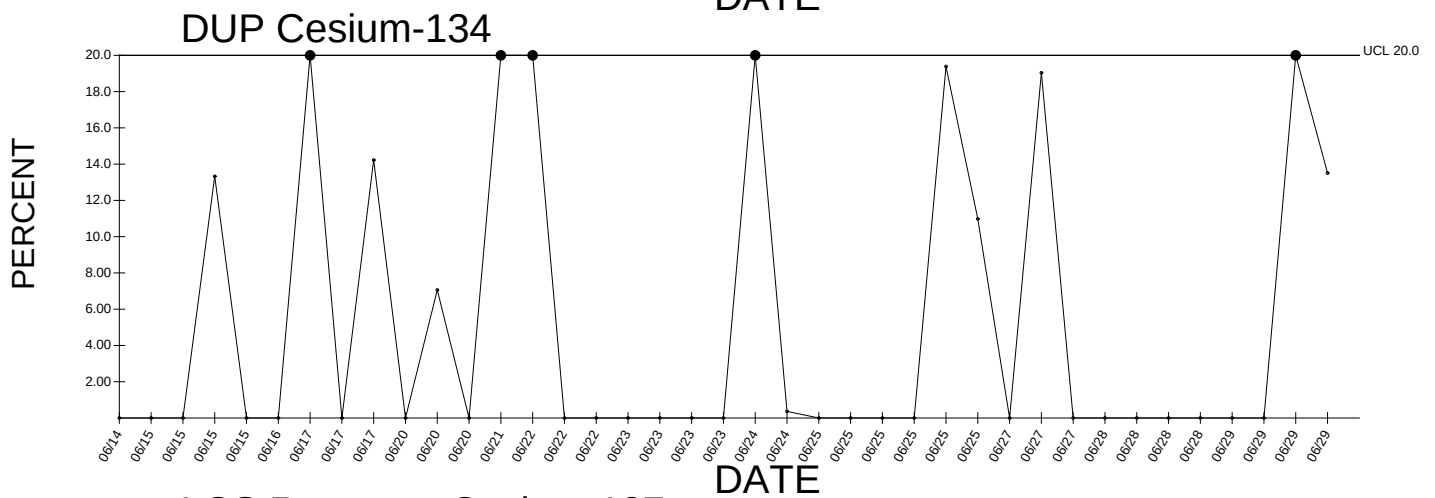
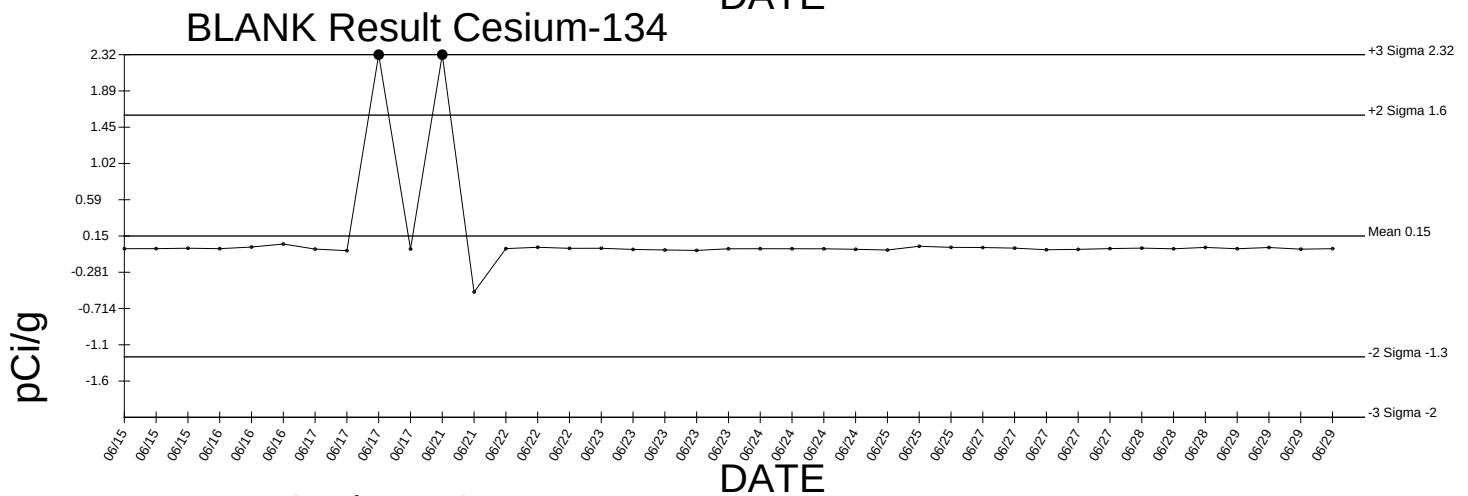
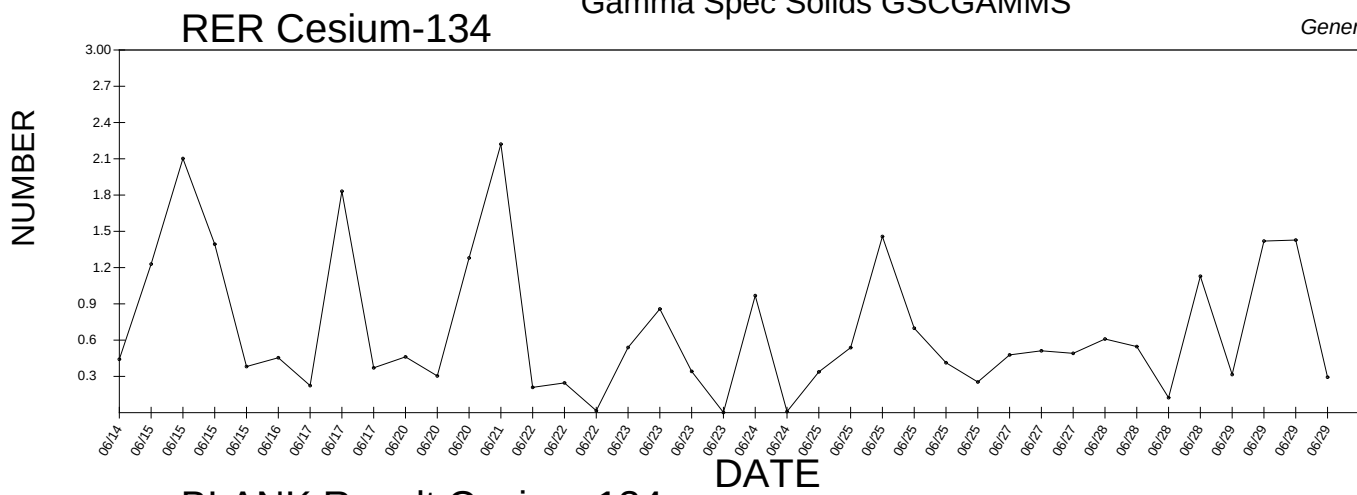
Zinc-65 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1574190	1203566582	14-JUN-2016 15:57	DUSE	0.82	-0.34	dec	1.11	0	-0.582	2.8	3.00	0.84
1570346	1203556469	15-JUN-2016 06:41	DONE	0.26	-1	dec	1.11	0	-0.582	2.8	3.00	0.84
1571459	1203559442	15-JUN-2016 08:43	DONE	2.92	2.1	dec	1.11	0	-0.582	2.8	3.00	0.84
1572084	1203561063	15-JUN-2016 10:51	DUSE	0.82	-0.34	dec	1.11	0	-0.582	2.8	3.00	0.84
1572190	1203561290	15-JUN-2016 10:58	DONE	1.11	00	dec	1.11	0	-0.582	2.8	3.00	0.84
1572384	1203561715	16-JUN-2016 12:26	DUSE	1.14	0.04	dec	1.11	0	-0.582	2.8	3.00	0.84
1569039	1203553210	17-JUN-2016 07:36	DUSE	1.08	-0.03	dec	1.11	0	-0.582	2.8	3.00	0.84
1564838	1203541918	17-JUN-2016 07:41	DONE	1.14	0.04	dec	1.11	0	-0.582	2.8	3.00	0.84
1570471	1203556800	17-JUN-2016 13:17	DONE	0.92	-0.23	dec	1.11	0	-0.582	2.8	3.00	0.84
1575505	1203569878	20-JUN-2016 07:04	DONE	3.7	3.1	dec	1.11	0	-0.582	2.8	3.00	0.84
1572385	1203561725	20-JUN-2016 08:50	DUSE	2.09	1.2	dec	1.11	0	-0.582	2.8	3.00	0.84
1572233	1203561381	20-JUN-2016 08:52	DONE	0.32	-0.93	dec	1.11	0	-0.582	2.8	3.00	0.84
1575357	1203569605	21-JUN-2016 10:13	DONE	0.4	-0.84	dec	1.11	0	-0.582	2.8	3.00	0.84
1571024	1203558316	22-JUN-2016 07:21	DUSE	0.58	-0.62	dec	1.11	0	-0.582	2.8	3.00	0.84
1575812	1203570696	22-JUN-2016 08:54	DUSE	0.74	-0.43	dec	1.11	0	-0.582	2.8	3.00	0.84
1573772	1203565434	22-JUN-2016 09:38	DUSE	0.65	-0.55	dec	1.11	0	-0.582	2.8	3.00	0.84
1576217	1203571736	23-JUN-2016 07:44	DUSE	1.53	0.5	dec	1.11	0	-0.582	2.8	3.00	0.84
1570476	1203556812	23-JUN-2016 08:07	DONE	1.01	-0.12	dec	1.11	0	-0.582	2.8	3.00	0.84
1571803	1203560366	23-JUN-2016 08:25	DUSE	1.4	0.35	dec	1.11	0	-0.582	2.8	3.00	0.84
1576426	1203572271	23-JUN-2016 12:05	DUSE	0.24	-1	dec	1.11	0	-0.582	2.8	3.00	0.84
1576430	1203572281	24-JUN-2016 08:09	DONE	1.84	0.86	dec	1.11	0	-0.582	2.8	3.00	0.84
1572234	1203561384	24-JUN-2016 15:54	DONE	1.16	0.07	dec	1.11	0	-0.582	2.8	3.00	0.84
1572703	1203562587	25-JUN-2016 09:16	DUSE	0.21	-1	dec	1.11	0	-0.582	2.8	3.00	0.84

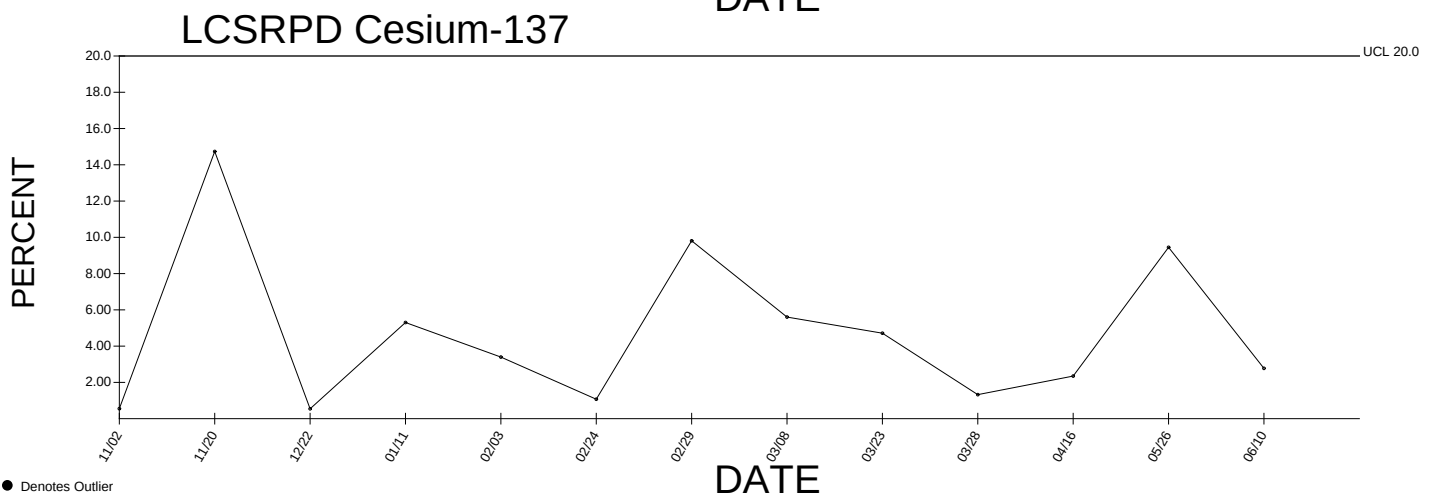
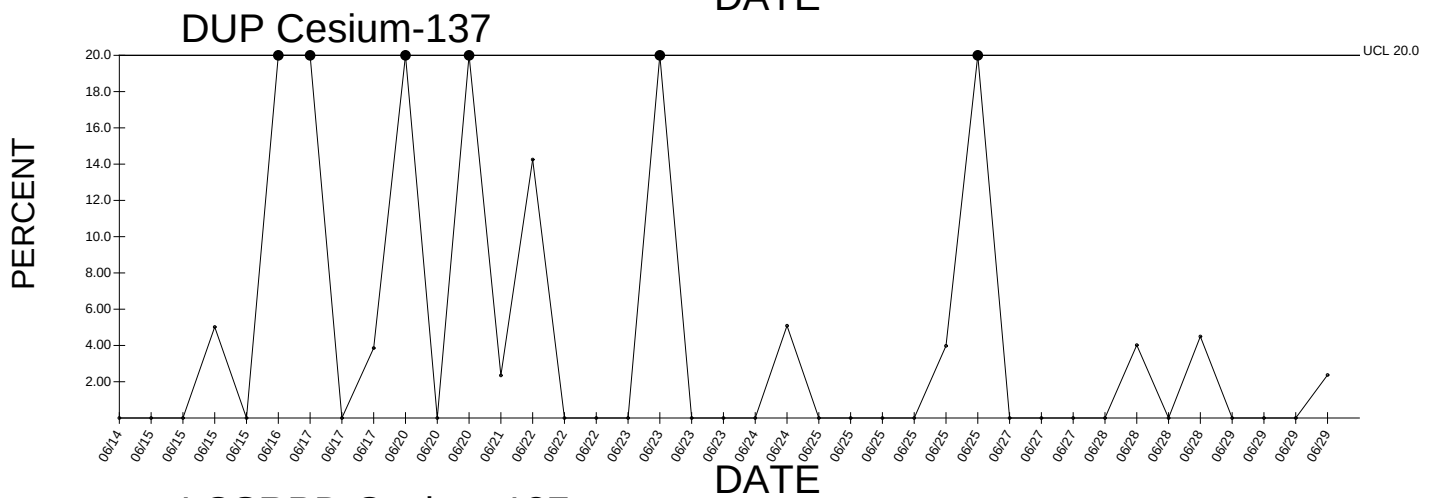
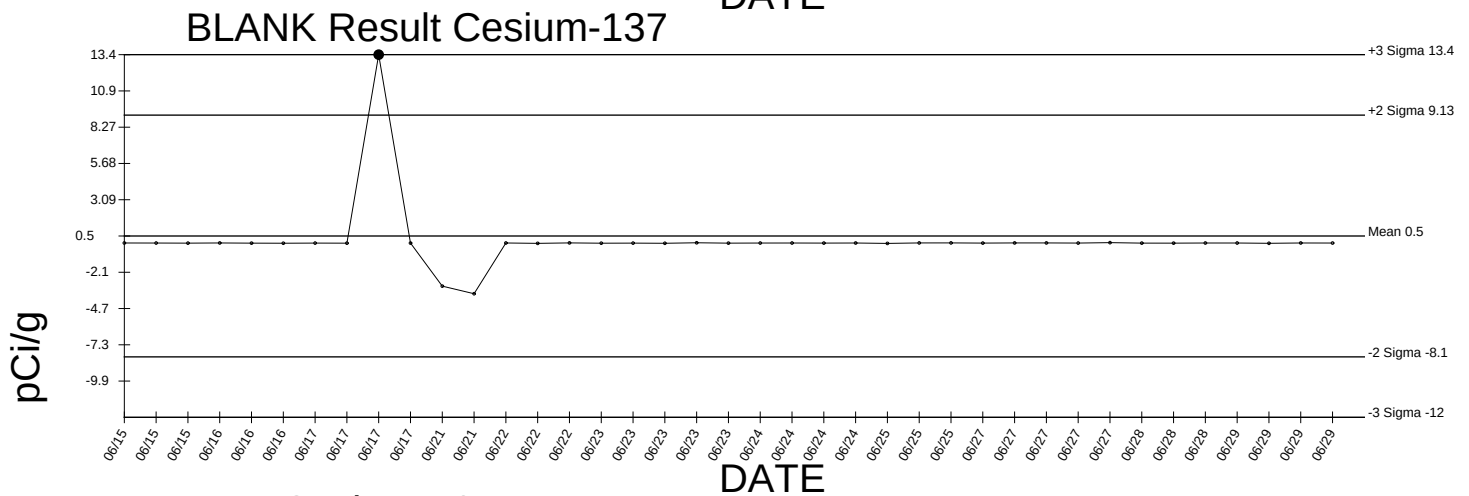
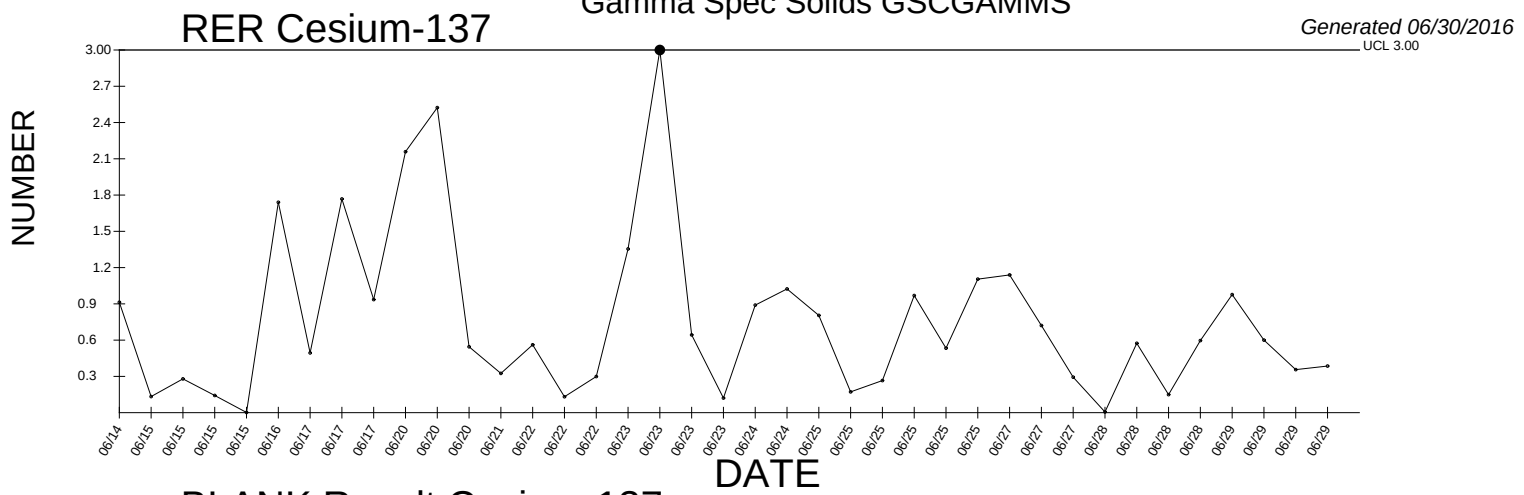
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1573399	1203564537	25-JUN-2016 09:21	DUSE	0.83	-0.33	dec	1.11	0	-0.582	2.8	3.00	0.84
1573057	1203563602	25-JUN-2016 09:38	DONE	0.07	-1	dec	1.11	0	-0.582	2.8	3.00	0.84
1571802	1203560363	25-JUN-2016 09:38	DONE	3.19	2.5	dec	1.11	0	-0.582	2.8	3.00	0.84
1572236	1203561387	25-JUN-2016 09:39	DONE	1.85	0.88	dec	1.11	0	-0.582	2.8	3.00	0.84
1572491	1203562003	27-JUN-2016 08:23	DONE	0.37	-0.88	dec	1.11	0	-0.582	2.8	3.00	0.84
1576729	1203573019	27-JUN-2016 09:15	DUSE	0.56	-0.65	dec	1.11	0	-0.582	2.8	3.00	0.84
1571801	1203560360	27-JUN-2016 12:07	DUSE	0.83	-0.32	dec	1.11	0	-0.582	2.8	3.00	0.84
1576941	1203573610	28-JUN-2016 09:27	DONE	1.37	0.31	dec	1.11	0	-0.582	2.8	3.00	0.84
1572486	1203561991	28-JUN-2016 12:49	DUSE	1.26	0.17	dec	1.11	0	-0.582	2.8	3.00	0.84
1577125	1203574135	28-JUN-2016 14:34	DONE	0.59	-0.62	dec	1.11	0	-0.582	2.8	3.00	0.84
1572231	1203561374	28-JUN-2016 14:39	DUSE	2.58	1.7	dec	1.11	0	-0.582	2.8	3.00	0.84
1577122	1203574129	29-JUN-2016 08:50	DONE	0.46	-0.76	dec	1.11	0	-0.582	2.8	3.00	0.84
1577531	1203575143	29-JUN-2016 11:00	DUSE	0.66	-0.53	dec	1.11	0	-0.582	2.8	3.00	0.84
1577533	1203575149	29-JUN-2016 11:23	DUSE	1.5	0.46	dec	1.11	0	-0.582	2.8	3.00	0.84
1572490	1203562000	29-JUN-2016 15:33	DONE	0.35	-0.9	dec	1.11	0	-0.582	2.8	3.00	0.84



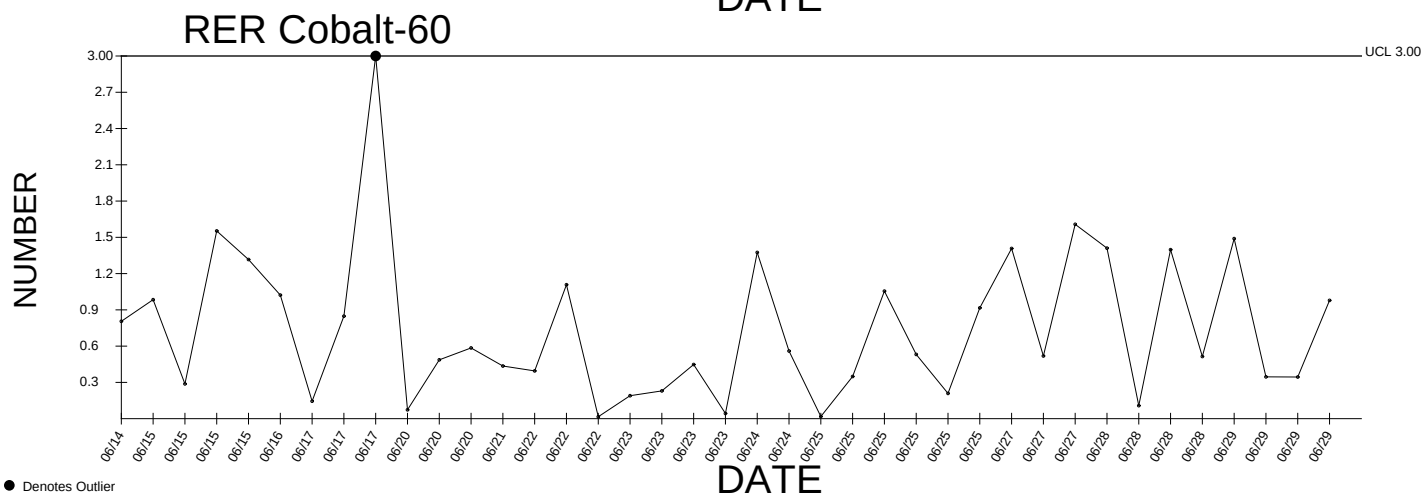
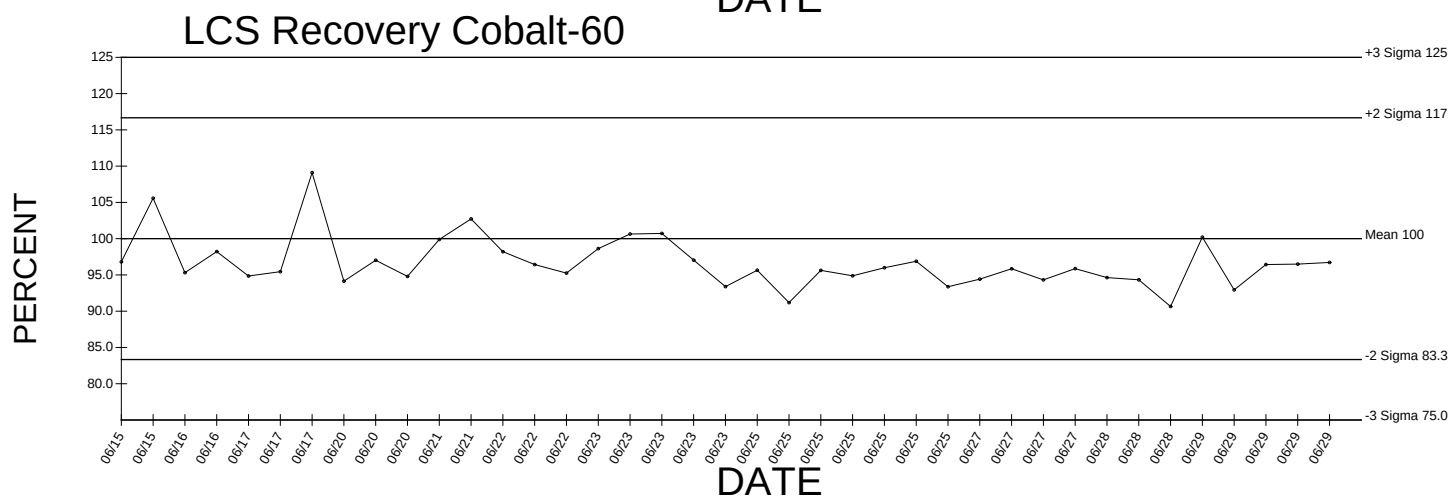
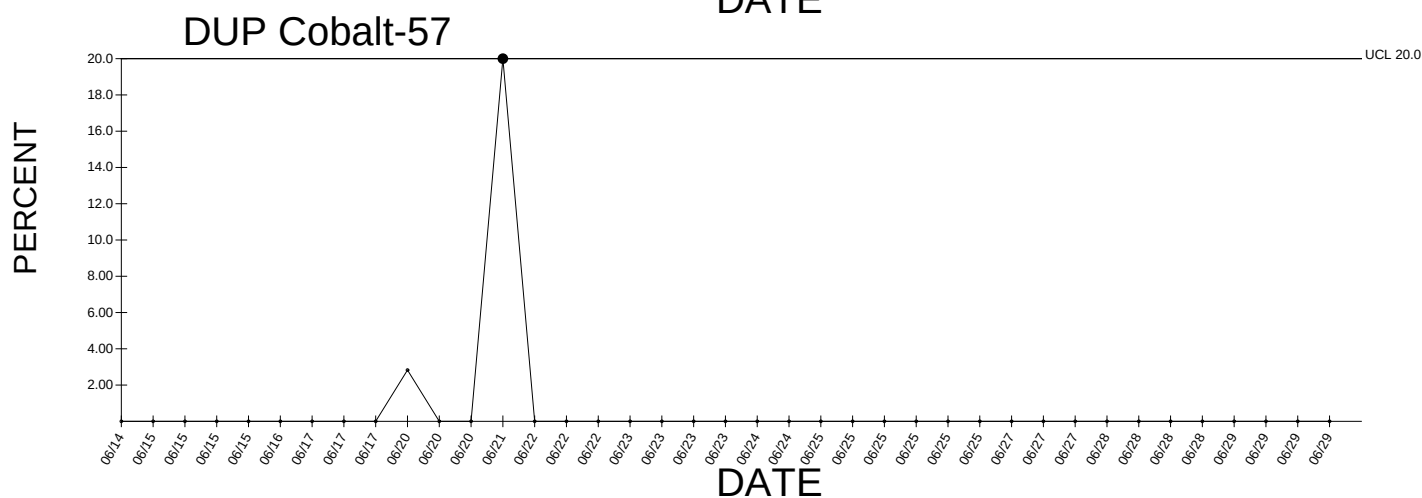
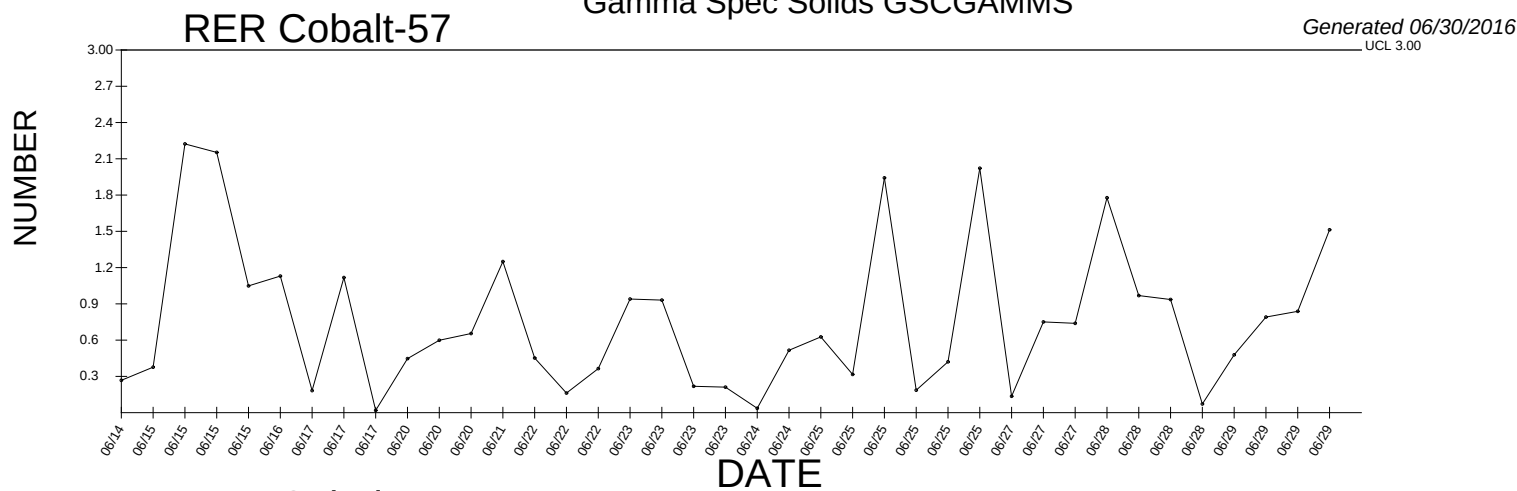
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UCL 3.00

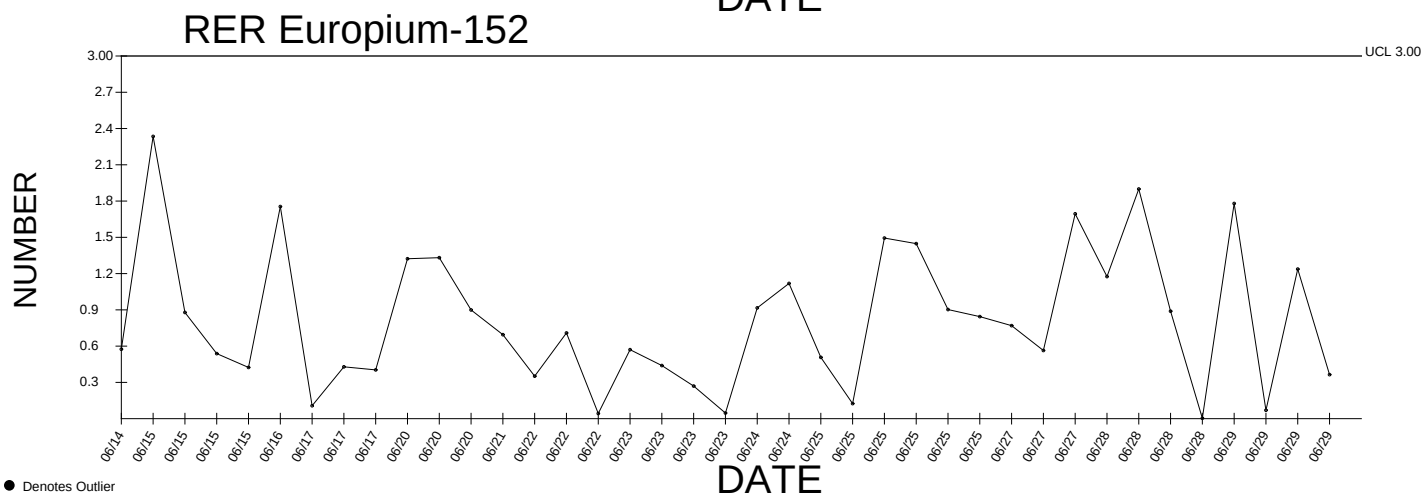
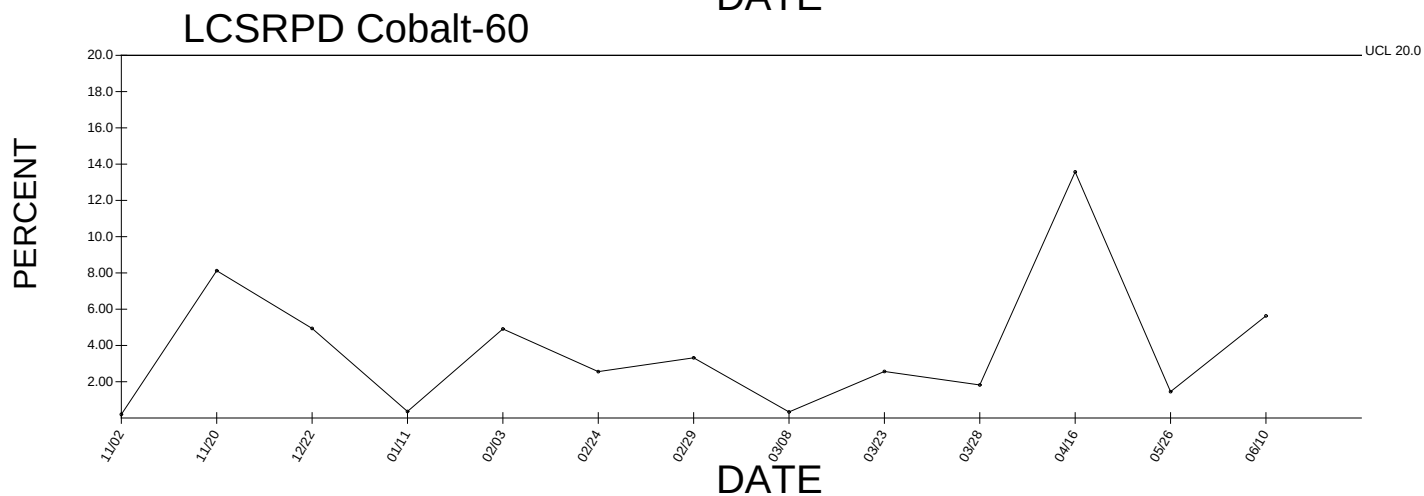
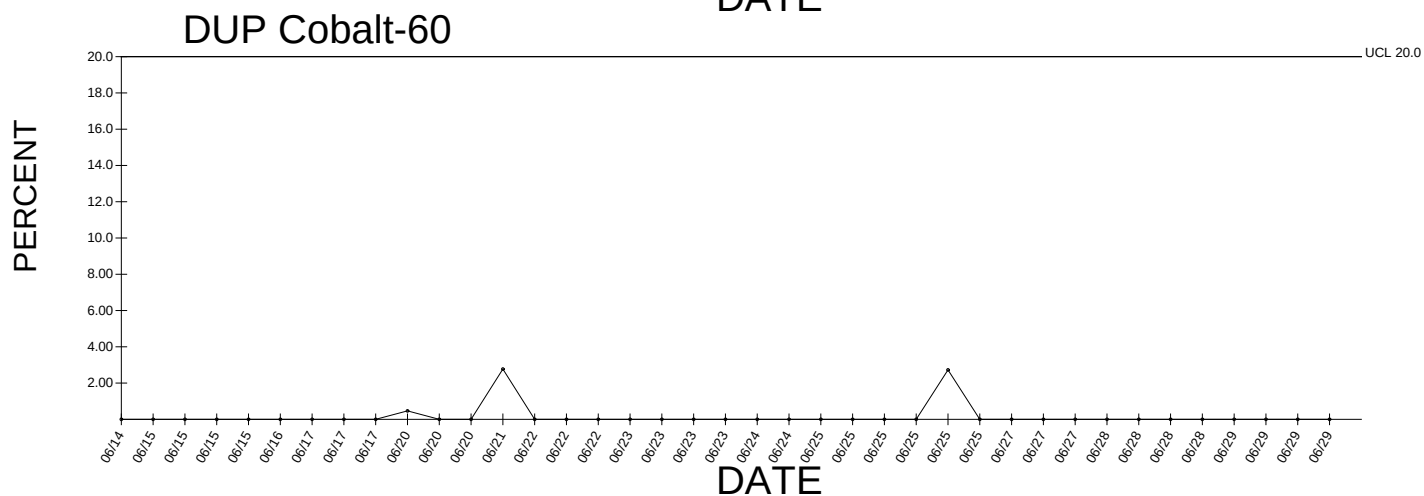
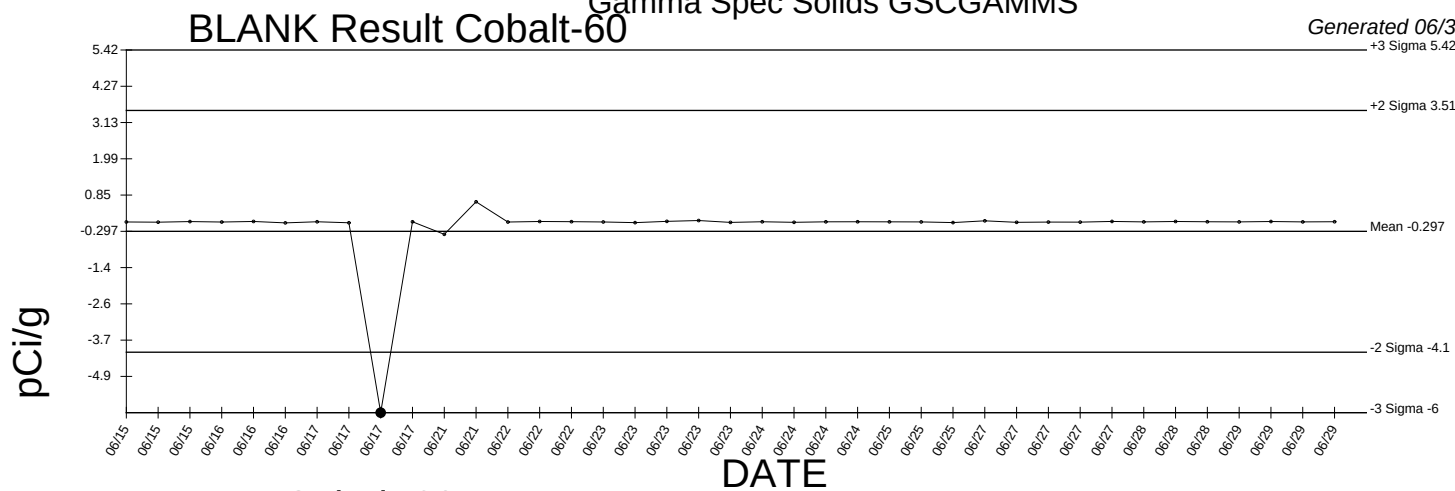


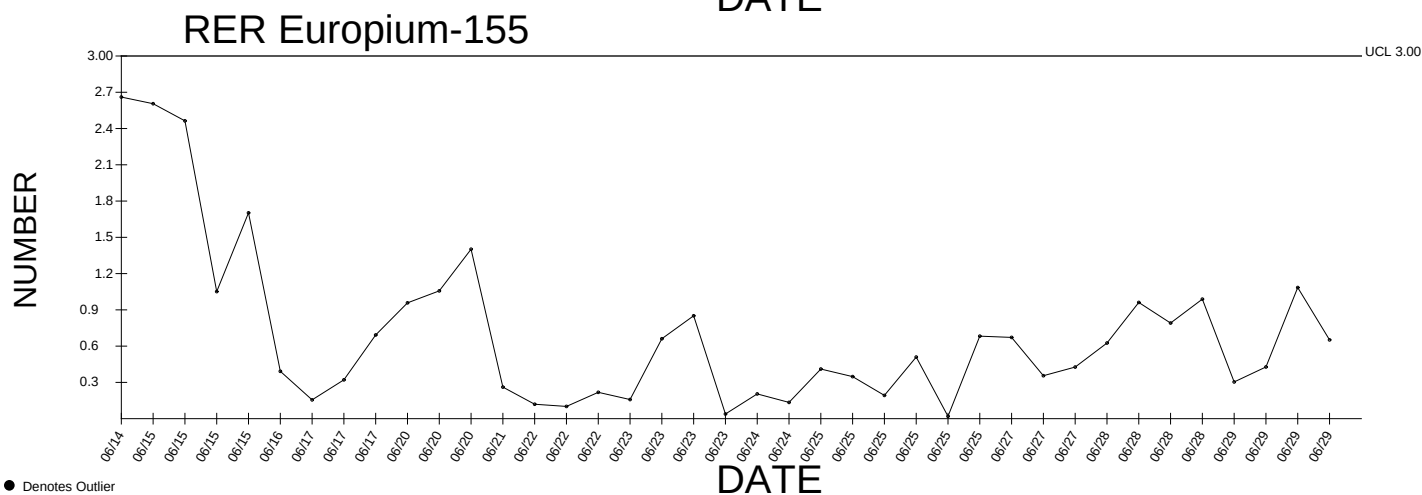
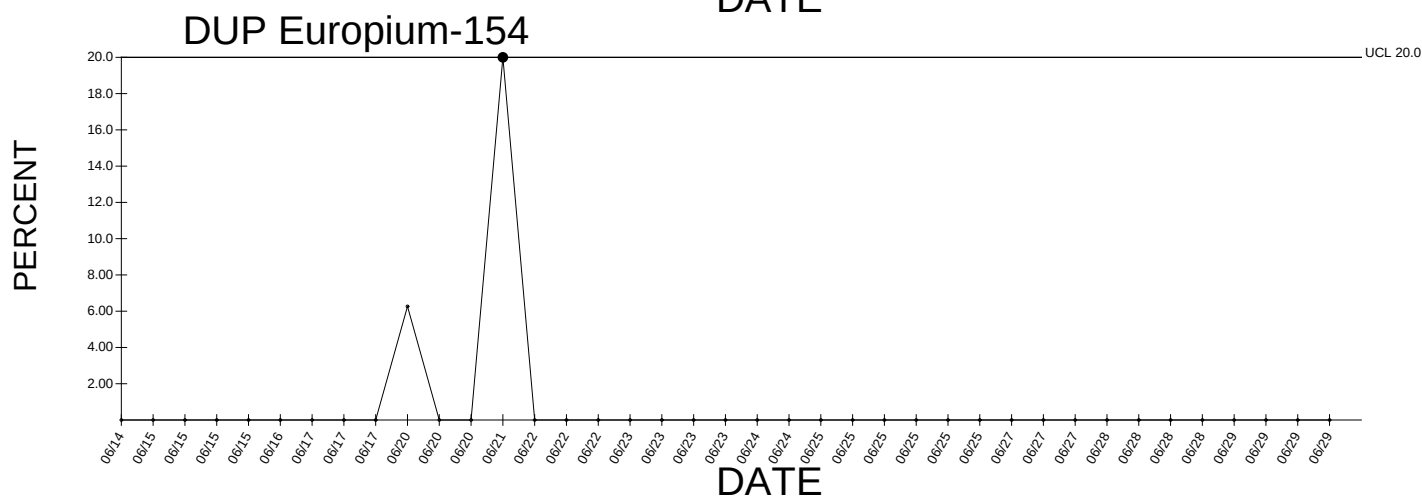
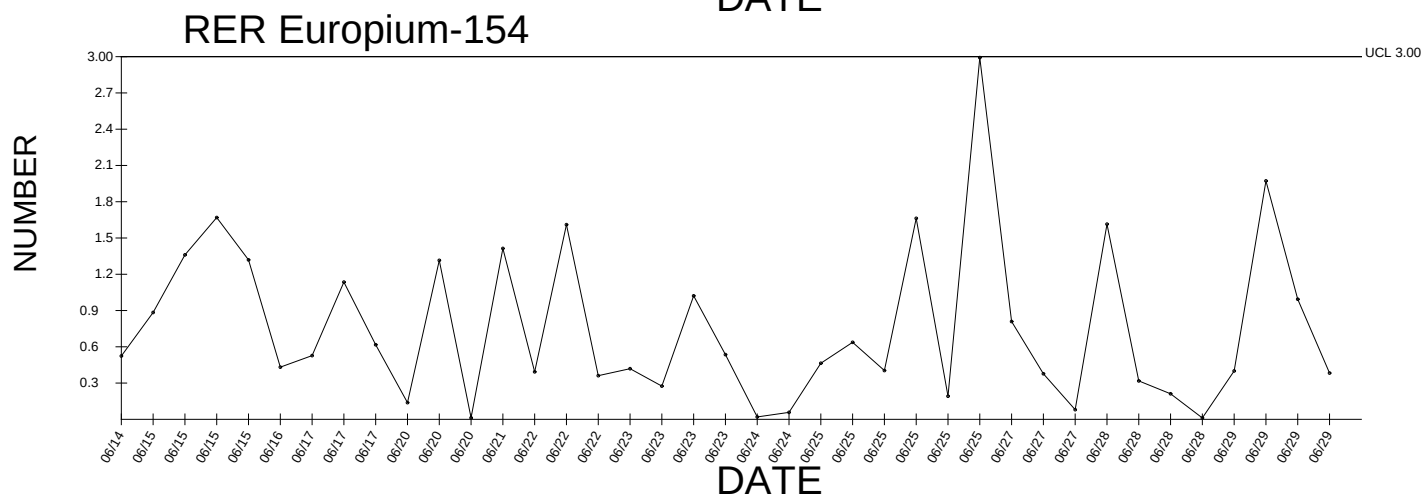
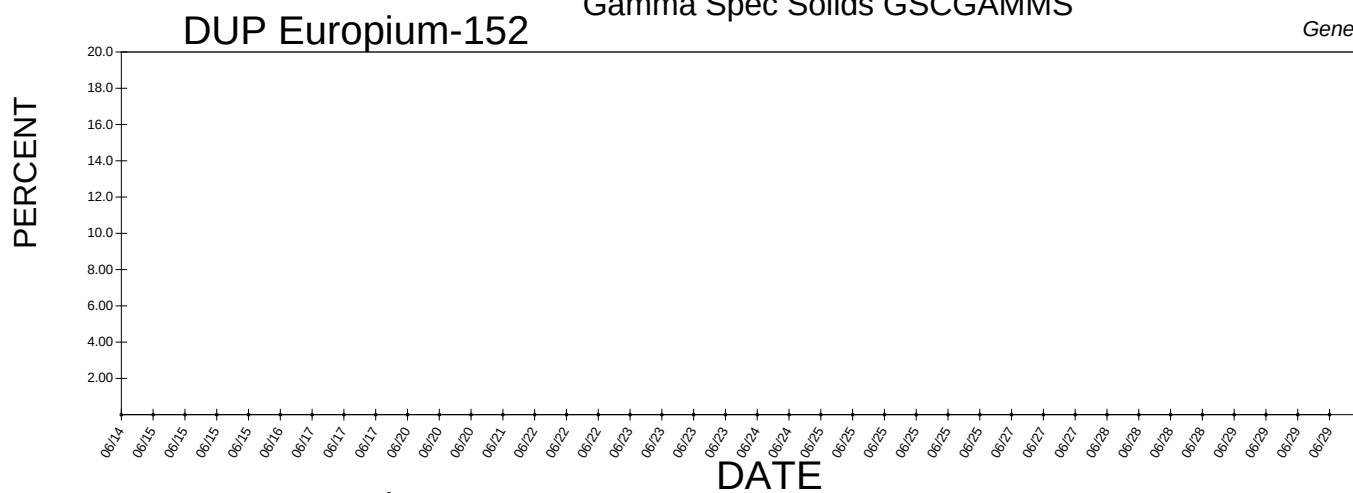
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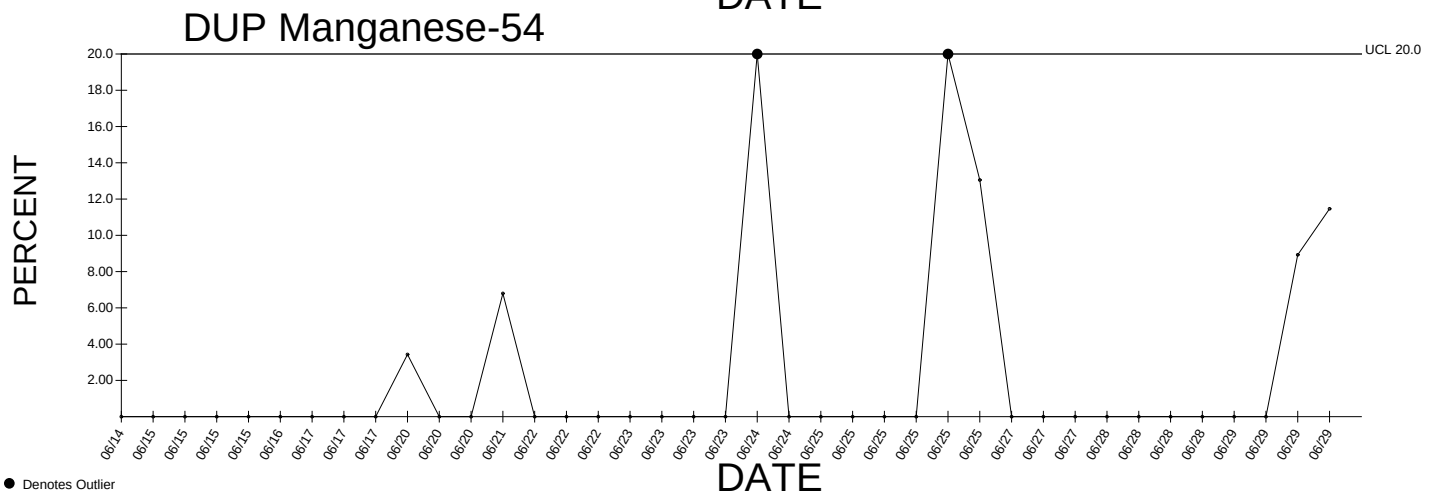
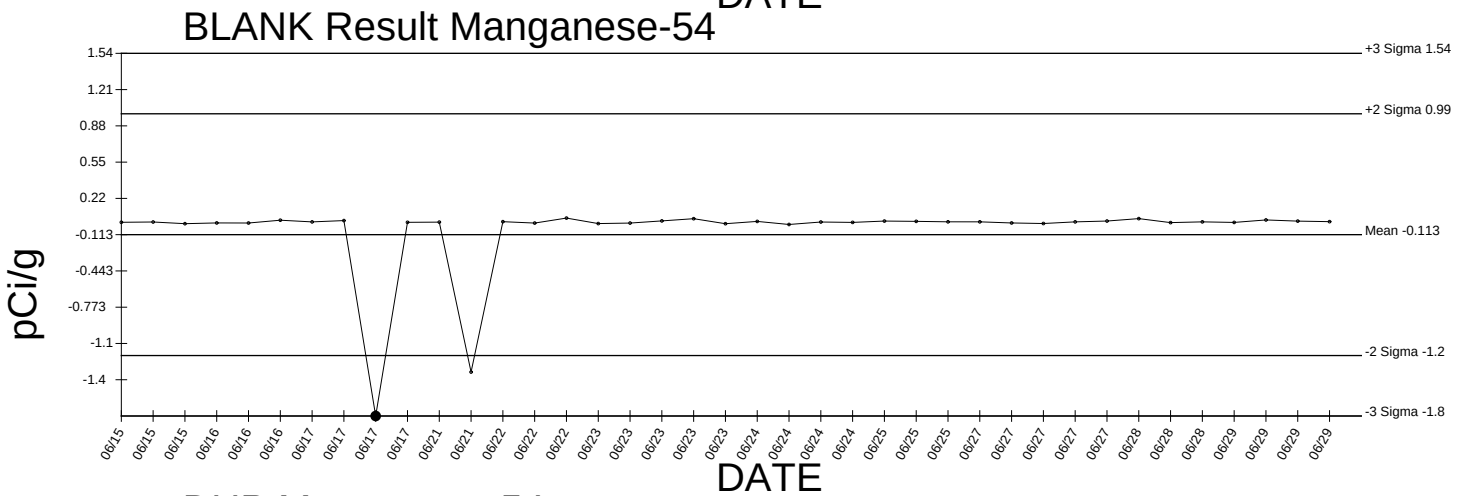
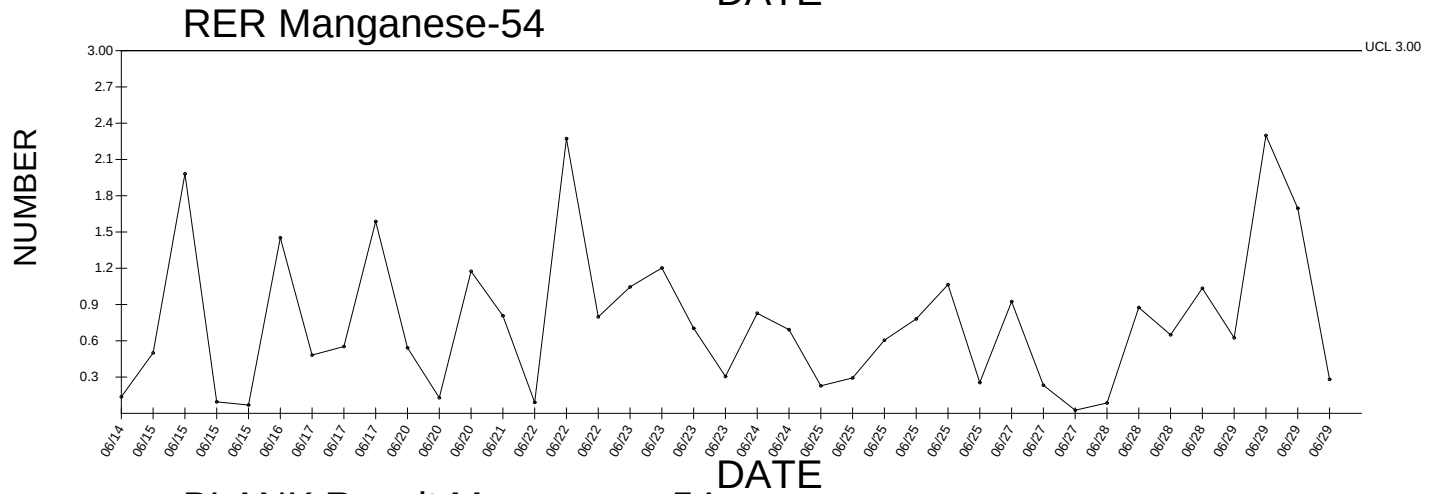
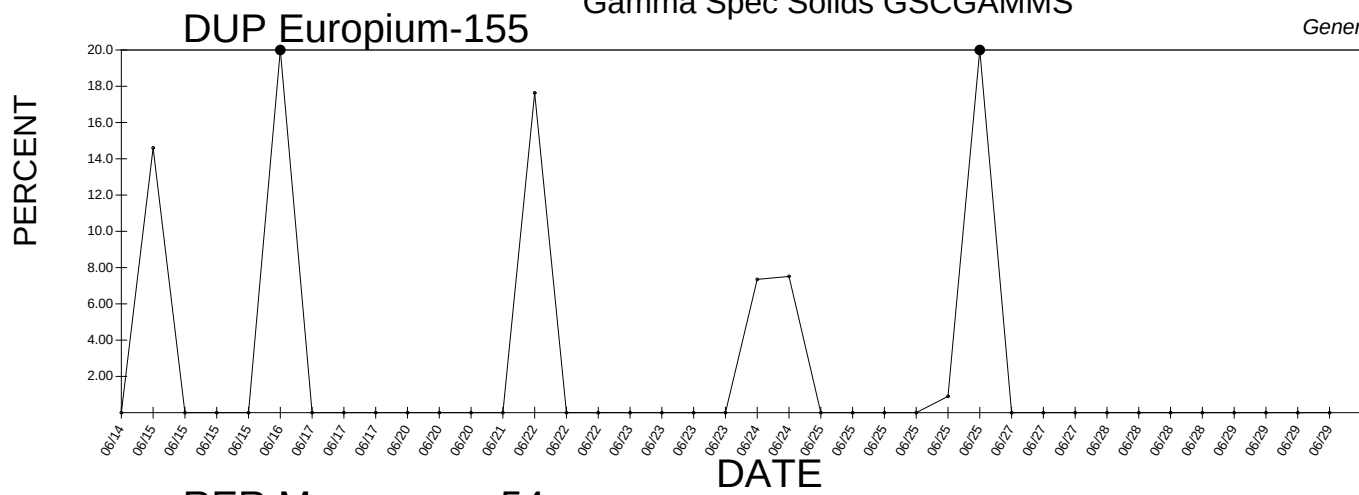
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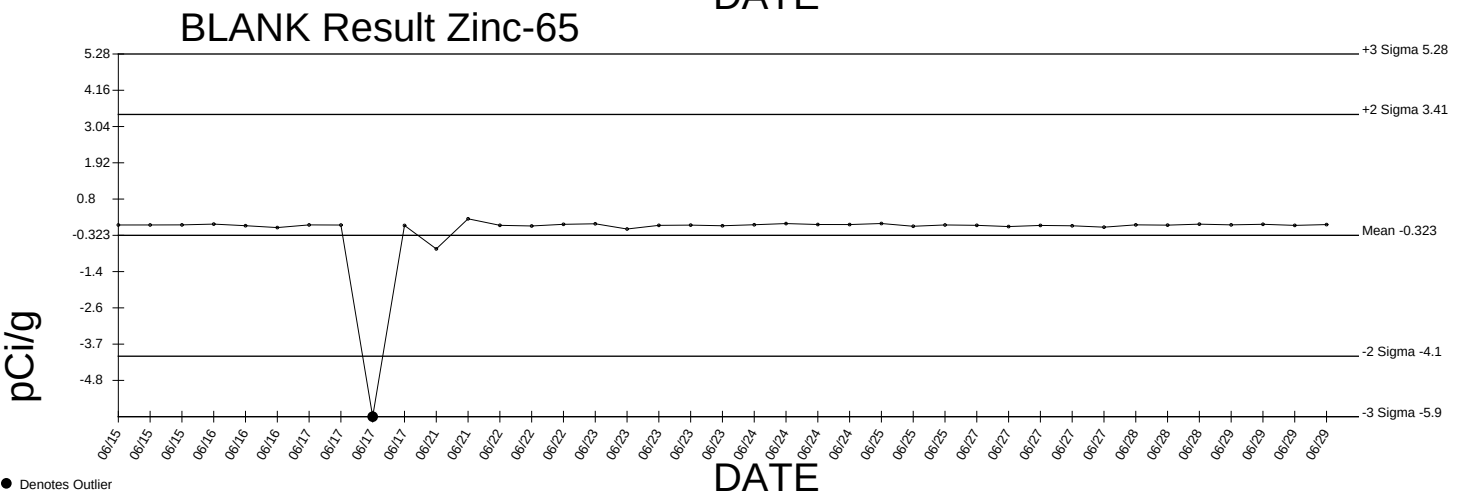
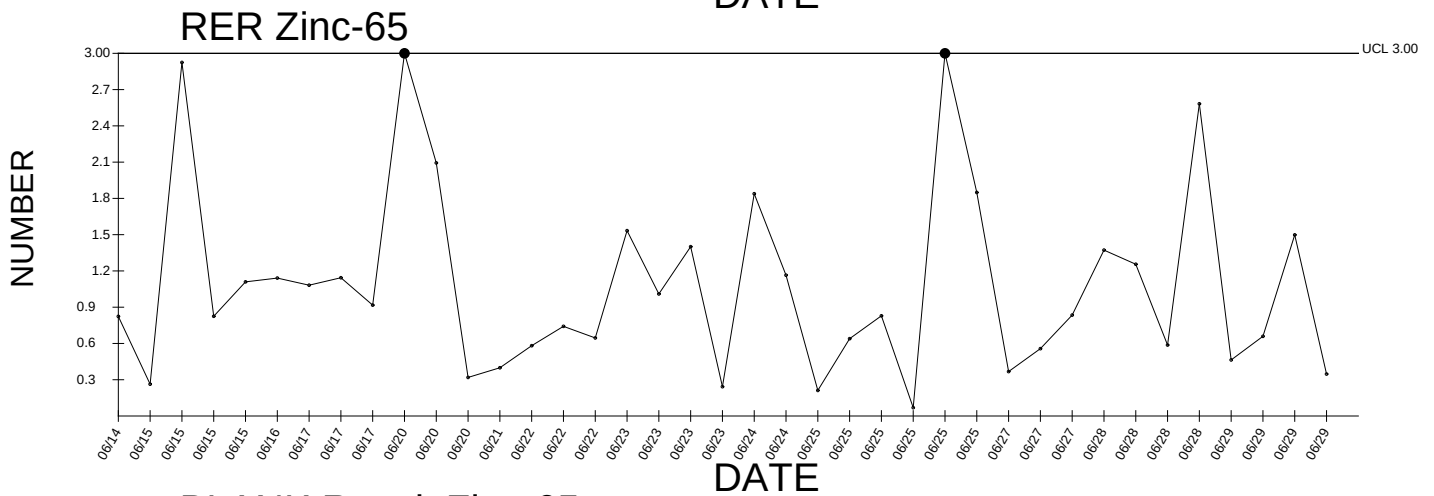
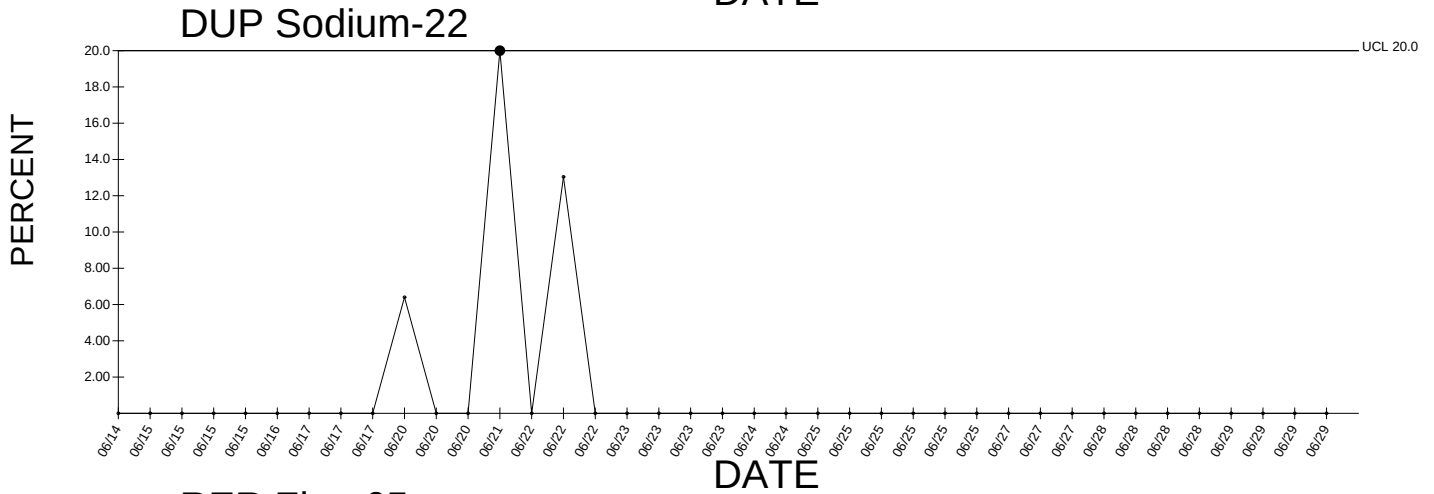
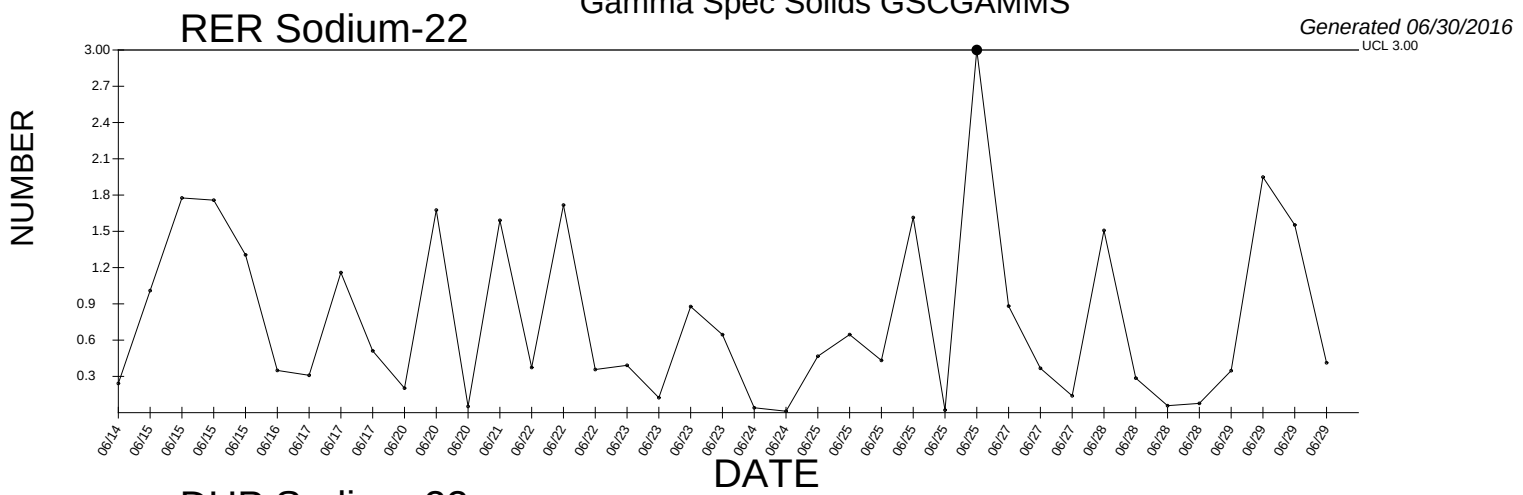


● Denotes Outlier



● Denotes Outlier

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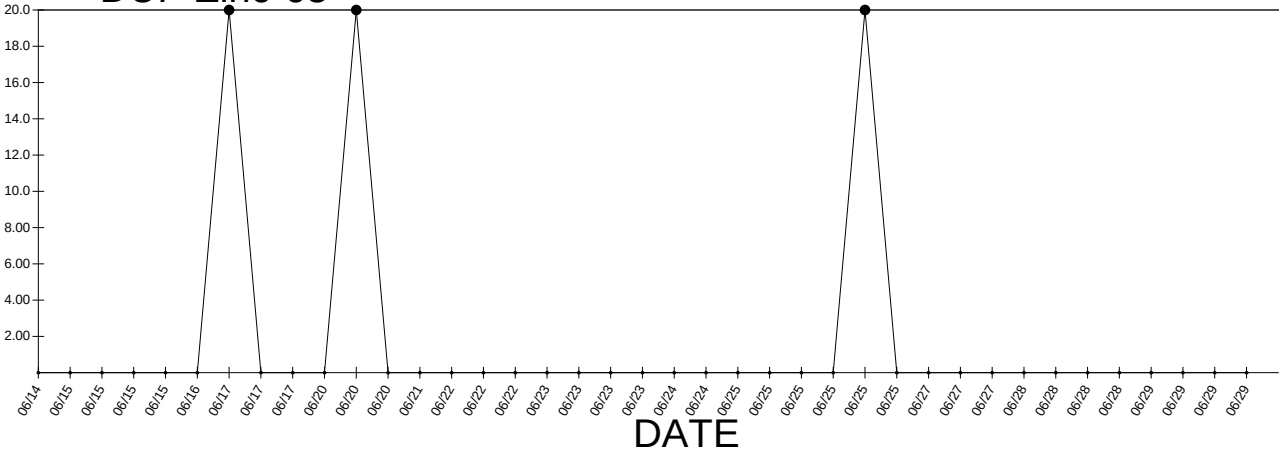


DUP Zinc-65

Gamma Spec Solids GSCGAMMS

Generated 06/30/2016
UCL 20.0

PERCENT



● Denotes Outlier

RAD Standards Traceability

CERTIFICATE OF CALIBRATION Standard Radionuclide Source

1556

84680-278

100 mL Solid in Aluminum Can

Customer: GEL Labs

P.O. No.: 489884RD, Item 3

Reference Date: 01-Apr-2011

12:00 PM EST

Grams of Master Source: 0.0066498

This standard radionuclide source was prepared using aliquots measured gravimetrically from master radionuclide solutions. Calibration and purity were checked using a germanium gamma spectrometer system. At the time of calibration no interfering gamma-ray emitting impurities were detected. The gamma ray emission rates for the most intense gamma-ray lines are given. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 1, February, 1979, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST." EZA is accredited by the Health Physics Society (HPS) for the production of NIST-traceable sources, and this source was produced in accordance with the HPS accreditation requirements. Customers may report any concerns with the accreditation program to the HPS Secretariat, 1313 Dolley Madison Blvd., Ste. 402, McLean, VA 22101. Density of solid matrix 1.15 g/cc.

Nuclide	Gamma-Ray Energy (keV)	Half-Life, Days	Master Source* $\mu\text{ps/gram}$	This Source μps	Uncertainty, %			Calibration Method
					Type	u_A	u_B	U
Pb-210	46.5	8.120E+03	—	1.129E+03	0.1	2.1	4.1	4 π LS
Am-241	59.5	1.580E+05	—	7.538E+02	0.1	1.7	3.5	4 π LS
Cd-109	88.0	4.626E+02	1.659E+05	1.103E+03	0.6	2.3	4.8	HPGe
Co-57	122.1	2.718E+02	8.949E+04	5.951E+02	0.6	2.0	4.2	HPGe
Ce-139	165.9	1.376E+02	1.247E+05	8.292E+02	0.6	1.9	4.0	HPGe
Hg-203	279.2	4.661E+01	2.899E+05	1.928E+03	0.6	1.9	4.0	HPGe
Sn-113	391.7	1.151E+02	1.739E+05	1.156E+03	0.6	1.9	4.0	HPGe
Cs-137	661.7	1.098E+04	1.107E+05	7.361E+02	0.8	1.9	4.1	HPGe
Y-88	898.0	1.066E+02	4.246E+05	2.824E+03	0.6	1.9	4.0	HPGe
Zn-65	1115.6	2.441E+02	—	1.445E+03	0.1	1.7	3.5	IC
Co-60	1173.2	1.925E+03	2.118E+05	1.408E+03	0.7	1.9	4.0	HPGe
Co-60	1332.5	1.925E+03	2.118E+05	1.408E+03	0.7	1.9	4.0	HPGe
Y-88	1836.1	1.066E+02	4.495E+05	2.989E+03	0.7	1.9	4.0	HPGe

* Master Source refers to Analytics' 8-isotope mixture which is calibrated quarterly.

Calibration Methods: 4 π LS - 4 π Liquid Scintillation Counting, HPGe - High Purity Germanium Gamma-Ray Spectrometer, IC - Ionization Chamber. **Uncertainty:** U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

(Certificate continued on reverse side)



PC-S-060-101

This standard will expire one year after the reference date.

Source Prepared by: M. Williford
M. Williford, Radiochemist

QA Approved: J. D. McCorvey
J. D. McCorvey, QA Manager Alternate

Date: 6/27/11



Standard Logbook

Serial ID: 1556 Open/Reference Date: 01-APR-11 Aliquot : 1 mL
Name: Mixed Gamma LCS CAN Received: 01-APR-11 Density : Hand Calculated
Type: Source Material Expires: 01-APR-37 Lot Number : 84680-278
Employee: Maggie Stamps Verified: 14-JUL-11
Supplier: Eckert & Zeigler Analytics
Description: 84680-278
Comments: None

Analyte	Concentration	Analyte	Concentration
Americium-241	125983.3 dpm/mL	Cesium-137	51898.9 dpm/mL
Cobalt-60	84496.9 dpm/mL		

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	Isotopic Abundance:
Pb-210	pCi/L	0.0425
Mixed Gamma N1	722900	1129
Mixed Gamma N2	752300	
Mixed Gamma N3	692100	

Mean Value (Counting) = 100.622 Pass
Stdev = Rule 3 (Pass/Fail)

Certificate Value = 717965.0
Lower Limit = 662227.9072
Upper Limit = 782638.7594
Rule 1 Pass/Fail Pass
Two sigma = 60205.42611
10 % of Mean = 72243.33333
Rule 2 (Pass/Fail) Pass

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

mg
7/20/11
H. Stamp
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope Am-241	Result pCi/L	Isotopic Abundance: Certificate Value (dps):
Mixed Gamma N1	58390	0.359
Mixed Gamma N2	60740	753.8
Mixed Gamma N3	57770	

Mean Value (Counting) = 103.9074 Pass
Sidev = pCi/L pCi/L Rule 3 (Pass/Fail)

Certificate Value = 56749.2 pCi/L
Lower Limit = 55833.21277 pCi/L
Upper Limit = 62100.12057 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 3133.453898
10 % of Mean = 5896.666667
Rule 2 (Pass/Fail) Pass

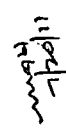
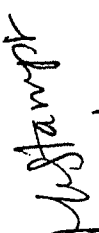
Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

msgh
7/20/11
U.S. Stamp
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton 7/14/2011	Isotope	Result	Isotopic Abundance: Certificate Value (dps):	0.856 595.1
	Co-57	pCi/L		
	Mixed Gamma N1	19090		
	Mixed Gamma N2	18820		
	Mixed Gamma N3	18830		
Mean Value (Counting) =		pCi/L	100.6592	Pass
Sidev =		pCi/L		Rule 3 (Pass/Fail)
Certificate Value =		pCi/L		
Lower Limit =		pCi/L		
Upper Limit =		pCi/L		
Rule 1 Pass/Fail		Pass		
Two sigma =		306.1590001		
10 % of Mean =		1891.333333		
Rule 2 (Pass/Fail)		Pass		



 7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton 7/14/2011	Isotope Ce-139	Result pCi/L	Isotopic Abundance: Certificate Value (dps):	0.8 829.2
	Mixed Gamma N1	28740		
	Mixed Gamma N2	29410		
	Mixed Gamma N3	27560		

Mean Value (Counting) = 101.9865 Pass
Stdev = Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

7/20/11
7/20/11
Stamp

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	Isotopic Abundance:
Hg-203	pCi/L	0.8156
Mixed Gamma N1	66300	1928
Mixed Gamma N2	68180	
Mixed Gamma N3	64480	

Mean Value (Counting) = 103.8046 Pass
Sidev = Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

might
7/20/11

W. Stanev
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Sn-113	pCi/L
Mixed Gamma N1	49560
Mixed Gamma N2	49620
Mixed Gamma N3	48300

Isotopic Abundance:
Certificate Value (dps): 0.6497
1156

Mean Value (Counting) = 49160.00 pCi/L 102.2277 Pass
Sidev = 745.386 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 48088.7 pCi/L
Lower Limit = 47669.22839 pCi/L
Upper Limit = 50650.77161 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 1490.771612
10 % of Mean = 4916
Rule 2 (Pass/Fail) Pass

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

7/20/11
7/20/11
7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result	Isotopic Abundance:
Cs-137	pCi/L	Certificate Value (dps):
Mixed Gamma N1	23710	0.851
Mixed Gamma N2	23950	736.1
Mixed Gamma N3	24040	

Mean Value (Counting) = 102.2333 Pass
 Sidev = pCi/L Rule 3 (Pass/Fail)

Certificate Value =
 Lower Limit = 23377.9
 Upper Limit = 23558.82556
 Rule 1 Pass/Fail 24241.17444
 Two sigma = Fail
 10 % of Mean = 341.1744422
 Rule 2 (Pass/Fail) 2390 Pass

*exception taken due to full recovery of standard

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

7/20/11

7/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Y-88 (898)	pCi/L
Mixed Gamma N1	82690
Mixed Gamma N2	81320
Mixed Gamma N3	80940

Isotopic Abundance:
Certificate Value (dps): 0.937 2824

Mean Value (Counting) = 81650.00 pCi/L 100.2381 Pass
Sidev = 920.489 pCi/L Rule 3 (Pass/Fail)

Certificate Value = 81456.1 pCi/L
Lower Limit = 79809.022 pCi/L
Upper Limit = 83490.978 pCi/L
Rule 1 Pass/Fail Pass
Two sigma = 1840.978001
10 % of Mean = 8165
Rule 2 (Pass/Fail) Pass

Verification Rules

- Rule 1 = The certificate value (NOT Including any uncertainty) shall lie within the 95% confidence Interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence Interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

7/20/11
7/20/11
Hilton

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Co-60 (1173)	pCi/L
Mixed Gamma N1	38910
Mixed Gamma N2	39750
Mixed Gamma N3	38840

Isotopic Abundance:
Certificate Value (dps):
0.9985
1408

Mean Value (Counting) = 39166.67
Stdev = 506.392

102.7694 Pass
Rule 3 (Pass/Fail)

Certificate Value = 38111.2
Lower Limit = 38153.88173
Upper Limit = 40179.45161
Rule 1 Pass/Fail Fail
Two sigma = 1012.784939
10 % of Mean = 3916.666667
Rule 2 (Pass/Fail) Pass

*exception taken due to full recovery of standard

msgr
7/20/11

Stamp
7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope	Result
Co-60 (1332.50)	pCi/L
Mixed Gamma N1	38940
Mixed Gamma N2	40200
Mixed Gamma N3	39150

Isotopic Abundance:
Certificate Value (dps):
0.9998
1408

Mean Value (Counting) =
Stdev =

39430.00
675.056

103.595

Pass
Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

38061.7
38079.88889
40780.11111
Fail
1350.111107
3943
Pass

*exception taken due to full recovery of standard

7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

1/20/11

Verification for Mixed Gamma Standard 1556 CAN

Michael Hilton
7/14/2011

Isotope
Y-88 (1836.1)
Mixed Gamma N1
Mixed Gamma N2
Mixed Gamma N3

Result
pCi/L
82870
83080
84640

Isotopic Abundance:
Certificate Value (dps):
0.992
2989

Mean Value (Counting) =
Stdev =

83530.00
967.006

pCi/L 102.5723
pCi/L

Pass

Rule 3 (Pass/Fail)

Certificate Value =
Lower Limit =
Upper Limit =
Rule 1 Pass/Fail
Two sigma =
10 % of Mean =
Rule 2 (Pass/Fail)

81435.3
81595.98862
85464.01138
Fail
1934.011375
8353
Pass

pCi/L
pCi/L
pCi/L

*exception taken due to full recovery of standard

mg
7/20/11

W. Stamp
7/20/11

Verification Rules

- Rule 1 = The certificate value (NOT including any uncertainty) shall lie within the 95% confidence interval determined from the mean and two sigma standard deviation of the three measurements
- Rule 2 = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.
- Rule 3 = The determined mean value shall be within 5% of the certificate value.

Runlogs

Instrument Run Log

Instrument Type: GAMMA SPECTROMETER

Batch ID: 1572490

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398732001	SAMPLE	MXR1	GAM05	JUN-28-16 16:02:44	DONE CAN		17-SEP-15 00:00
398732002	SAMPLE	MXR1	GAM11	JUN-28-16 16:03:05	DONE CAN		16-JUL-15 00:00
398732003	SAMPLE	MXR1	GAM41	JUN-28-16 16:03:27	DONE CAN		26-JAN-16 00:00
1203562001	LCS	MXR1	GAM28	JUN-29-16 14:54:21	DONE CAN		27-JUL-15 00:00
1203561999	MB	MXR1	GAM36	JUN-29-16 15:32:35	DONE CAN		01-JUN-16 00:00
1203562000	DUP	MXR1	GAM43	JUN-29-16 15:33:07	DONE CAN		10-SEP-15 00:00

Gas Flow Raw Data

01-Jul-2016

Batch# 1575874 Product: Sr-90 Date: 7/5/16

Criteria:	Yes	No	Comments
Sample Solids are less than or equal to 100 mg for GAB.			NA
Samples have been blank corrected (if required). Blank correction reported included (if required).			NA
If activity less than 10x MDA/MDC, error is less than or equal to 150% of sample activity. If greater than 10x MDA/MDC, error is 40% or less. If below the MDA/MDC, error is okay.	✓		
Instrument source check is within limits.	✓		
Instrument bkg check is within limits.	✓		
Method RDL/ LLD has been met.	✓		
If duplicate activities are: Less than 5* MDA/ MDC, then RPD is 100% or less, If greater 5* MDA/ MDC, then RPD 20% or less, If below the MDA/ MDC, the RPD is 0%, Or meets the client's required RER acceptance criteria.	✓		Case narrative
Tracer yield is 15-125% . Carrier yield 25-125%. (Or meets the client's contract acceptance criteria).	✓		
Method blank is less than the RDL/ LLD. (If rad samples, < 5% of lowest activity)	✓		
Sample was run within hold time.	✓		
Sample was correctly preserved if required.			NA
Smears Taken for Radioactive batches.			NA
Method Spike and LCS are within 75-125% (or meets the client's contract acceptance criteria).	✓		
No blank spaces on data forms. All line outs initialed and dated. No transcription errors are apparent.	✓		
Aux data is correct.			NA
Client Special requirements page has been checked.	✓		
Raw Data and/ or spectrum are included and properly stasured.	✓		
MS, LCS, and Duplicate RPD/RER values uploaded to LIMS and values verified	✓		
Hit notification complete (if necessary)			NA
Batch entered into Case Narrative.	✓		
Batch Data Exception Reports (DER) completed, if applicable.			NA
Batch Data Exception Reports (DER) second reviewed. Disposition verified to be completed.			NA
Aliquot Correction completed if required.			NA
Review sample historical results if available (If REMP, results above MDC have been verified by historical results, recount or re-analysis.)	✓		

Primary Review Performed By: Kost 7/5/16

Secondary Review Performed By: Amanda Feh

BRK L
7/6

1575874

Strontium 90 Queue Sheet

06/24/16

Batch #: 1575874 Analyst: KSD1 First Client Due Date: 07/06/2016 Internal Due Date: 06/29/2016 Comments
 Sr-90 Spike Code: 12430 Expiration Date: 12/18/16 Vol: 9.1 Sr Sep. Date/time: 6-27-16 / 1600
 Sr-90 LCS Code: 12430 Expiration Date: 12/18/16 Vol: 0.1
 Sr Carrier Code: 241495 Exp Date: 6/3/17 Vol: 0.5 Sdt Wt: 3.37
 Prep Date: 6/24/16 Initials: KSD1 Balance #: 16101662 Analytical Scale #: F30566 Witness: PL 6-24-16

Sample ID	Client Description	Type	RDL	Collection Date	Matrix	Client	Rad	Pos. #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)
398732001-1	37802-001	SAMPLE	2 pCi/g	MAY-20-16 08:40 AM	SOIL	BRKL007		1	0.340	9B	0.0246	0.0310	6.6
398732002-1	37802-002	SAMPLE	2 pCi/g	MAY-20-16 08:50 AM	SOIL	BRKL007		2	0.322	10B	0.0245	0.0309	6.4
398732003-1	37802-003	SAMPLE	2 pCi/g	MAY-20-16 12:00 AM	SOIL	BRKL007		3	0.316	9C	0.0238	0.0301	6.3
1203570898-1	MB for batch 1575874	MB	2 pCi/g		SOIL	QC ACCOUNT		4	0.327	9D	0.0245	0.0313	6.8
1203570899-1	37802-002(398732002DUP)	DUP	2 pCi/g	MAY-20-16 08:50 AM	SOIL	QC ACCOUNT		5	0.332	10B	0.0243	0.0309	6.6
1203570900-1	37802-002(398732002MS)	MS	2 pCi/g	MAY-20-16 08:50 AM	SOIL	QC ACCOUNT		6	0.327	10C	0.0244	0.0311	6.7
1203570901-1	37802-002(398732002MSD)	MSD	2 pCi/g	MAY-20-16 08:50 AM	SOIL	QC ACCOUNT		7	0.341	11A	0.0247	0.0310	6.3
1203570902-1	LCS for batch 1575874	LCS	2 pCi/g		SOIL	QC ACCOUNT		8	0.367	11B	0.0240	0.0310	6.8

✓

Solid Sample Dissolution by: LEACH or DIGESTION Data Reviewed By: Wkst 7/5/16

Circle One

Strontium-90 Solid

Filename : SR90.XLS
File type : Excel
Version # : 1.3.10

Carrier S/N : 2414995
Carrier Exp Date : 6/3/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 14.73
Carrier Weight StDev.: 0.10

Batch : 1575874
Analyst : KSD1
Prep Date : 6/24/2016
Method Uncertainty : 0.089724205

Procedure Code : GFC90SRS
Parname : Strontium-90
Required MDA : 2 pCi/G
Sr-90 Abundance : 1.00 years
Half-life of Sr-90 : 28.90 years
Half-life of Y-90 : 64.053 hours

Geometry: Tuffryn Filter

Sample Characteristics			Carrier Calculations			
Pos.	Sample ID	Sample Aliquot G	Sample Aliquot StDev. G	Sample Date/Time	Carrier Weight (mg) (Standard)	Net Weight (mg) (Sample)
1	398732001.1	0.3400	3.2545E-03	5/20/2016 8:40	14.73	6.60
2	398732002.1	0.3220	3.2527E-03	5/20/2016 8:50	14.73	6.40
3	398732003.1	0.3160	3.2520E-03	5/20/2016 0:00	14.73	6.30
4	1203570898.1	0.3670	3.2574E-03	6/24/2016 0:00	14.73	6.80
5	1203570899.1	0.3320	3.2537E-03	5/20/2016 8:50	14.73	6.60
6	1203570900.1	0.3670	3.2574E-03	5/20/2016 8:50	14.73	6.70
7	1203570901.1	0.3410	3.2546E-03	5/20/2016 8:50	14.73	6.30
8	1203570902.1	0.3670	3.2574E-03	6/24/2016 0:00	14.73	6.80
					Net Weight (mg) StDev. (mg)	Carrier Aliquot (mL)
					0.035697	0.5
					0.034837	0.5
					0.034407	0.5
					0.036556	0.5
					0.035697	0.5
					0.036127	0.5
					0.034407	0.5
					0.036556	0.5
					Carrier Aliquot StDev. (mL)	Carrier Aliquot StDev. (mL)
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000
					0.001000	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml

Analytical SOP: GL-RAD-A-004
 Instrument SOP: GL-RAD-I-016

Count Raw Data												
Pos.	Detector ID	Counting Time (min.)	Gross Counts		Gross Beta CPM	Count Start Date/Time	Strontium Separation Date/Time	Yttrium Ingrowth	Sr-90 Decay	Calculated Sample Recovery %	Sample Recovery Error %	
			Alpha	Beta								
1	9B	60	3	36	0.597	6/29/2016 11:17	6/27/2016 16:00	0.377	0.997	89.6%	1.04%	
2	2A	60	18	514	8.527	7/2/2016 12:05	6/27/2016 16:00	0.717	0.997	86.9%	1.05%	
3	9C	60	7	54	0.892	6/29/2016 11:21	6/27/2016 16:00	0.378	0.997	85.5%	1.05%	
4	9D	60	5	45	0.745	6/29/2016 11:21	6/27/2016 16:00	0.378	1.000	92.3%	1.04%	
5	2D	60	11	681	11.322	7/2/2016 12:05	6/27/2016 16:00	0.717	0.997	89.6%	1.04%	
6	10C	60	2	2147	35.775	6/29/2016 11:22	6/27/2016 16:00	0.378	0.997	91.0%	1.04%	
7	11A	60	5	2143	35.708	6/29/2016 11:26	6/27/2016 16:00	0.378	0.997	85.5%	1.05%	
8	11B	60	7	1838	30.625	6/29/2016 11:26	6/27/2016 16:00	0.378	1.000	92.3%	1.04%	

Calibration Data		Calibration		Calibration		Detector		Detector		Alpha		Weekly Bkg		Weekly Bkg		Weekly Bkg	
Pos.	Counted on	Calibration Date	Due Date	Efficiency Sr-90	Efficiency Y-90	Error (cpm/dpm)	X-Talk	CPM	Count Start Date/Time	Count Time (min.)	Count Start Date/Time	Count Time (min.)					
1	PIC	4/1/2016	2/28/2017	0.4205	0.5570	0.00754	0.05990	0.582	6/24/2016 17:31	500	6/24/2016 17:31	500					
2	PIC	4/1/2016	2/28/2017	0.4141	0.5406	0.01914	0.13165	0.608	7/1/2016 17:14	500	7/1/2016 17:14	500					
3	PIC	4/1/2016	2/28/2017	0.4149	0.5526	0.00584	0.06762	0.680	6/24/2016 17:31	500	6/24/2016 17:31	500					
4	PIC	4/1/2016	2/28/2017	0.4213	0.5596	0.02610	0.05933	1.134	6/24/2016 17:31	500	6/24/2016 17:31	500					
5	PIC	4/1/2016	2/28/2017	0.3899	0.4974	0.00745	0.15227	1.650	7/1/2016 16:59	500	7/1/2016 16:59	500					
6	PIC	4/1/2016	2/28/2017	0.4062	0.5237	0.00638	0.24092	0.716	6/24/2016 17:31	500	6/24/2016 17:31	500					
7	PIC	4/1/2016	2/28/2017	0.4247	0.5473	0.01317	0.10736	0.918	6/25/2016 12:48	500	6/25/2016 12:48	500					
8	PIC	4/1/2016	2/28/2017	0.4319	0.5589	0.00697	0.07167	0.838	6/24/2016 17:35	500	6/24/2016 17:35	500					

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Spike S/N : 1243-O
 Spike Exp Date : 12/18/2016
 Spike Activity (dpm/ml): 486.16
 Spike Volume Added: 0.10

LCS S/N : 1243-O
 LCS Exp Date : 12/18/2016
 LCS Activity (dpm/ml): 486.16
 LCS Volume Added: 0.10

Results		2 SIGMA				2 SIGMA				2 SIGMA				2 SIGMA			
Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error	Net Count Rate	Net Count Rate Error	CPM	Counting Uncertainty	Total Prop. Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal pCi/G	Recovery
1	0.5707	0.4029	2	0.9234	0.0353	702.60%	0.0150	0.1054	0.1054	0.4856	0.4856		SAMPLE				
2	0.4999	0.3529	2	0.8065	15.9479	5.35%	7.9192	0.3786	1.4944	3.3198	3.3198		SAMPLE				
3	0.7032	0.4965	2	1.1269	0.5682	60.08%	0.2121	0.1274	0.6689	0.6766	0.6766		SAMPLE				
4	0.7124	0.5030	2	1.1110	-0.8174	31.30%	-0.3889	0.1212	0.4991	0.4992	0.4992		MB				
5	0.8317	0.5872	2	1.2761	19.6723	4.81%	9.6721	0.4382	1.7468	3.9356	3.9356	398732002.1	DUP	20.9%	1.4178	59.8063	104.6%
6	0.6032	0.4258	2	0.9636	78.5049	2.67%	35.0593	0.7731	3.3930	14.4384	14.4384	398732002.1	MS			64.3663	107.7%
7	0.7474	0.5277	2	1.1779	85.2548	2.95%	34.7897	0.7726	3.7111	15.9328	15.9328	398732002.1	MSD	8.2%	0.6153	59.6704	103.2%
8	0.6024	0.4253	2	0.9539	61.5708	2.85%	29.7870	0.7156	2.8992	11.3921	11.3921		LCS				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
398732001	9B	60	3	36	6/29/2016 11:17	6/29/2016 12:17	PIC	1575874
398732002	2A	60	18	514	7/2/2016 12:05	7/2/2016 13:05	PIC	1575874
398732003	9C	60	7	54	6/29/2016 11:21	6/29/2016 12:21	PIC	1575874
1203570898	9D	60	5	45	6/29/2016 11:21	6/29/2016 12:21	PIC	1575874
1203570899	2D	60	11	681	7/2/2016 12:05	7/2/2016 13:05	PIC	1575874
1203570900	10C	60	2	2147	6/29/2016 11:22	6/29/2016 12:22	PIC	1575874
1203570901	11A	60	5	2143	6/29/2016 11:26	6/29/2016 12:26	PIC	1575874
1203570902	11B	60	7	1838	6/29/2016 11:26	6/29/2016 12:26	PIC	1575874

Method Calibration Data

Gas Flow Proportional Counter Calibration Package

Method: Strontium 89/90

Instrument (circle one): LB4100 / Protean

Part 1: Efficiency determination

- 1 Efficiency spreadsheet (eff pts, graphs, trendline equation)
- 2 Applicable portion of GFPC_Machines.XLS
- 3 Raw Data for Calibration standards
- 4 Verification Spreadsheet and Raw Data (recoveries 75%-125%)
- 5 Plateau graph and raw data
- 6 Standardization of Carrier (if applicable)

Included/ Acceptable	Comments
✓	
✓	
✓	
✓	
✓	
✓	

Part 2. Documentation for Calibration Source

- 1 Vendor Certificate
- 2 Standard Traceability Log (from LIMS)
- 3 Current Verification of Source
- 4 Source preparation sheet

✓	
✓	
✓	
✓	

Part 3. Documentation for Verification Source

- 1 Vendor Certificate
- 2 Standard Traceability Log (from LIMS)
- 3 Current Verification of Source
- 4 Source preparation sheet

✓	
✓	
✓	
✓	

Part 4. Enter into LIMS

- 1 Alpha LIMS instrument calibration updated

✓	

Primary Review of Package

[Signature]

Secondary Review of Package

Amanda Lehn

Effective Date:

4/1/16

Exp Date 2/28/17

GEL Laboratories

2040 Savage Road, Charleston, SC 29407

(843)556-8171

Rev 7 SSC 8/3/09

Sr-89 Calibration - PIC - Feb 2016

Standard Data	Isotope	Sr-89
	Standard ID number	1758-A
	Half Life (days)	50.53
	Std. Act. (dpm/mL)	60715.1145
	Reference Date	9/1/2015
	Volume of spike (mL)	2.0
	Std. Nominal (dpm)	12802.80
	Decay Date	2/12/2016

Carrier Data		Std ID	2338630	
		Std weight	18.68	mg/mL
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	1.7	0.1	1.87	91.0%
2	3.6	0.2	3.74	96.4%
3	4.9	0.3	5.60	87.4%
4	7.0	0.4	7.47	93.7%
5	8.9	0.5	9.34	95.3%
6	10.8	0.6	11.21	96.4%
7	12.2	0.7	13.08	93.3%
8	14.0	0.8	14.94	93.7%

***Recovery values exceeding 100% will be evaluated at 100%.

The following detectors were not calibrated:
6D, 13C

*Background is considered negligible.

**Decay corrected to mid-point of count

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
1A	1	2/12/2016 6:36	2	12427	6213.50	91.0%	6827.54	12754.44	0.5353	0.5310
1A	2	2/12/2016 6:55	2	13208	6604.00	96.4%	6853.48	12752.11	0.5374	0.5306
1A	3	2/12/2016 6:50	2	11754	5877.00	87.4%	6721.37	12752.67	0.5271	0.5304
1A	4	2/12/2016 6:42	2	12491	6245.50	93.7%	6666.63	12753.65	0.5227	0.5300
1A	5	2/12/2016 6:58	2	12583	6291.50	95.3%	6602.54	12751.70	0.5178	0.5297
1A	6	2/12/2016 7:12	2	13067	6533.50	96.4%	6780.32	12750.01	0.5318	0.5293
1A	7	2/12/2016 7:07	2	12713	6356.50	93.3%	6812.92	12750.62	0.5343	0.5291
1A	8	2/12/2016 7:03	2	12717	6358.50	93.7%	6787.24	12751.12	0.5323	0.5287
1B	1	2/12/2016 6:42	2	12488	6244.00	91.0%	6861.05	12753.64	0.5380	0.5332
1B	2	2/12/2016 6:36	2	13267	6633.50	96.4%	6884.10	12754.42	0.5397	0.5327
1B	3	2/12/2016 6:55	2	11650	5825.00	87.4%	6661.90	12752.09	0.5224	0.5323
1B	4	2/12/2016 6:50	2	12651	6325.50	93.7%	6752.02	12752.66	0.5295	0.5317
1B	5	2/12/2016 7:03	2	12841	6420.50	95.3%	6737.92	12751.11	0.5284	0.5312
1B	6	2/12/2016 6:58	2	12903	6451.50	96.4%	6695.22	12751.70	0.5250	0.5306
1B	7	2/12/2016 7:12	2	12701	6350.50	93.3%	6806.49	12750.00	0.5338	0.5303
1B	8	2/12/2016 7:07	2	12779	6389.50	93.7%	6820.33	12750.61	0.5349	0.5297
1C	1	2/12/2016 6:50	2	12525	6262.50	91.0%	6881.38	12752.65	0.5396	0.5382
1C	2	2/12/2016 6:42	2	13293	6646.50	96.4%	6897.59	12753.64	0.5408	0.5381
1C	3	2/12/2016 6:36	2	11907	5953.50	87.4%	6808.86	12754.41	0.5338	0.5381
1C	4	2/12/2016 6:55	2	12818	6409.00	93.7%	6841.15	12752.08	0.5365	0.5380
1C	5	2/12/2016 7:07	2	13004	6502.00	95.3%	6823.45	12750.60	0.5351	0.5379
1C	6	2/12/2016 7:03	2	13177	6588.50	96.4%	6837.40	12751.11	0.5362	0.5379
1C	7	2/12/2016 6:58	2	13095	6547.50	93.3%	7017.63	12751.69	0.5503	0.5378
1C	8	2/12/2016 7:12	2	12691	6345.50	93.7%	6773.37	12749.99	0.5312	0.5378
1D	1	2/12/2016 6:55	2	12483	6241.50	91.0%	6858.31	12752.07	0.5378	0.5320
1D	2	2/12/2016 6:51	2	12948	6474.00	96.4%	6718.57	12752.64	0.5268	0.5318
1D	3	2/12/2016 6:42	2	11880	5940.00	87.4%	6793.42	12753.63	0.5327	0.5317
1D	4	2/12/2016 6:36	2	12591	6295.50	93.7%	6720.00	12754.39	0.5269	0.5314
1D	5	2/12/2016 7:12	2	12829	6414.50	95.3%	6731.62	12749.99	0.5280	0.5312
1D	6	2/12/2016 7:07	2	13063	6531.50	96.4%	6778.25	12750.59	0.5316	0.5310
1D	7	2/12/2016 7:03	2	12875	6437.50	93.3%	6899.73	12751.10	0.5411	0.5309
1D	8	2/12/2016 6:58	2	12566	6283.00	93.7%	6706.65	12751.68	0.5259	0.5307
2A	1	2/12/2016 6:59	2	12279	6139.50	91.0%	6746.23	12751.67	0.5290	0.5230
2A	2	2/12/2016 7:12	2	12709	6354.50	96.4%	6594.56	12749.98	0.5172	0.5240
2A	3	2/12/2016 7:07	2	11820	5910.00	87.4%	6759.11	12750.58	0.5301	0.5246
2A	4	2/12/2016 7:03	2	12528	6264.00	93.7%	6686.37	12751.09	0.5244	0.5257
2A	5	2/12/2016 6:36	2	12570	6285.00	95.3%	6595.72	12754.38	0.5171	0.5266
2A	6	2/12/2016 6:55	2	12822	6411.00	96.4%	6653.19	12752.06	0.5217	0.5276
2A	7	2/12/2016 6:51	2	12867	6433.50	93.3%	6895.45	12752.64	0.5407	0.5283
2A	8	2/12/2016 6:43	2	12631	6315.50	93.7%	6741.35	12753.62	0.5286	0.5292
2B	1	2/12/2016 7:03	2	11795	5897.50	91.0%	6480.31	12751.09	0.5082	0.4963
2B	2	2/12/2016 6:59	2	12190	6095.00	96.4%	6325.26	12751.67	0.4960	0.4977
2B	3	2/12/2016 7:13	2	11039	5519.50	87.4%	6312.51	12749.97	0.4951	0.4987
2B	4	2/12/2016 7:08	2	11792	5896.00	93.7%	6293.56	12750.58	0.4936	0.5002
2B	5	2/12/2016 6:43	2	11966	5983.00	95.3%	6278.79	12753.61	0.4923	0.5016
2B	6	2/12/2016 6:36	2	12226	6113.00	96.4%	6343.94	12754.36	0.4974	0.5030
2B	7	2/12/2016 6:55	2	12210	6105.00	93.3%	6543.36	12752.05	0.5131	0.5040
2B	8	2/12/2016 6:51	2	12216	6108.00	93.7%	6519.85	12752.62	0.5113	0.5054
2C	1	2/12/2016 7:08	2	12076	6038.00	91.0%	6634.70	12750.57	0.5203	0.5110
2C	2	2/12/2016 7:03	2	12701	6350.50	96.4%	6590.41	12751.08	0.5169	0.5129
2C	3	2/12/2016 6:59	2	11357	5678.50	87.4%	6494.35	12751.66	0.5093	0.5142
2C	4	2/12/2016 7:13	2	12114	6057.00	93.7%	6465.41	12749.96	0.5071	0.5163
2C	5	2/12/2016 6:51	2	12228	6114.00	95.3%	6416.27	12752.62	0.5031	0.5182
2C	6	2/12/2016 6:43	2	12933	6466.50	96.4%	6710.79	12753.60	0.5262	0.5201
2C	7	2/12/2016 6:36	2	12558	6279.00	93.3%	6729.85	12754.35	0.5277	0.5214
2C	8	2/12/2016 6:55	2	12588	6294.00	93.7%	6718.40	12752.05	0.5268	0.5232
2D	1	2/12/2016 7:13	2	11364	5682.00	91.0%	6243.52	12749.96	0.4897	0.4801

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
2D	2	2/12/2016 7:08	2	12029	6014.50	96.4%	6241.71	12750.56	0.4895	0.4828
2D	3	2/12/2016 7:04	2	10628	5314.00	87.4%	6077.48	12751.07	0.4766	0.4846
2D	4	2/12/2016 6:59	2	11391	5695.50	93.7%	6079.54	12751.65	0.4768	0.4875
2D	5	2/12/2016 6:56	2	11786	5893.00	95.3%	6184.34	12752.04	0.4850	0.4902
2D	6	2/12/2016 6:51	2	11842	5921.00	96.4%	6144.68	12752.61	0.4818	0.4928
2D	7	2/12/2016 6:43	2	12068	6034.00	93.3%	6467.26	12753.59	0.5071	0.4948
2D	8	2/12/2016 6:37	2	12036	6018.00	93.7%	6423.79	12754.34	0.5037	0.4973
3A	1	2/12/2016 7:17	2	12099	6049.50	91.0%	6647.33	12749.46	0.5214	0.5181
3A	2	2/12/2016 7:32	2	12697	6348.50	96.4%	6588.33	12747.62	0.5168	0.5181
3A	3	2/12/2016 7:27	2	11515	5757.50	87.4%	6584.70	12748.22	0.5165	0.5181
3A	4	2/12/2016 7:24	2	12412	6206.00	93.7%	6624.46	12748.62	0.5196	0.5181
3A	5	2/12/2016 7:36	2	12472	6236.00	95.3%	6544.30	12747.17	0.5134	0.5181
3A	6	2/12/2016 7:47	2	12621	6310.50	96.4%	6548.90	12745.76	0.5138	0.5181
3A	7	2/12/2016 7:44	2	12498	6249.00	93.3%	6697.70	12746.11	0.5255	0.5181
3A	8	2/12/2016 7:41	2	12362	6181.00	93.7%	6597.78	12746.56	0.5176	0.5181
3B	1	2/12/2016 7:24	2	12341	6170.50	91.0%	6780.29	12748.61	0.5318	0.5259
3B	2	2/12/2016 7:17	2	12861	6430.50	96.4%	6673.43	12749.46	0.5234	0.5257
3B	3	2/12/2016 7:32	2	11526	5763.00	87.4%	6590.99	12747.61	0.5170	0.5257
3B	4	2/12/2016 7:27	2	12573	6286.50	93.7%	6710.39	12748.21	0.5264	0.5256
3B	5	2/12/2016 7:41	2	12877	6438.50	95.3%	6756.81	12746.55	0.5301	0.5254
3B	6	2/12/2016 7:36	2	12819	6409.50	96.4%	6651.64	12747.16	0.5218	0.5253
3B	7	2/12/2016 7:47	2	12635	6317.50	93.3%	6771.12	12745.76	0.5312	0.5253
3B	8	2/12/2016 7:44	2	12471	6235.50	93.7%	6655.95	12746.11	0.5222	0.5252
3C	1	2/20/2016 11:56	3	15683	5227.67	91.0%	5744.28	11393.99	0.5042	0.5073
3C	2	2/20/2016 11:25	2	10521	5260.50	96.4%	5459.23	11397.33	0.4790	0.4985
3C	3	2/20/2016 12:13	3	14628	4876.00	87.4%	5576.55	11392.09	0.4895	0.4925
3C	4	2/20/2016 12:19	3	15762	5254.00	93.7%	5608.27	11391.52	0.4923	0.4827
3C	5	2/20/2016 11:35	3	16928	5642.67	95.3%	5921.63	11396.19	0.5196	0.4739
3C	6	2/20/2016 11:40	3	16450	5483.33	96.4%	5690.48	11395.74	0.4994	0.4651
3C	7	2/20/2016 11:46	3	12123	4041.00	93.3%	4331.16	11395.07	0.3801	0.4586
3C	8	2/20/2016 11:50	3	14890	4963.33	93.7%	5298.00	11394.58	0.4650	0.4503
3D	1	2/20/2016 11:26	2	9525	4762.50	91.0%	5233.15	11397.33	0.4592	0.4697
3D	2	2/20/2016 11:56	3	13991	4663.67	96.4%	4839.85	11393.98	0.4248	0.4653
3D	3	2/20/2016 12:19	3	14344	4781.33	87.4%	5468.28	11391.50	0.4800	0.4622
3D	4	2/20/2016 12:13	3	15478	5159.33	93.7%	5507.22	11392.09	0.4834	0.4574
3D	5	2/20/2016 11:40	3	16293	5431.00	95.3%	5699.50	11395.74	0.5001	0.4530
3D	6	2/20/2016 11:36	3	15808	5269.33	96.4%	5468.40	11396.18	0.4798	0.4486
3D	7	2/20/2016 11:50	3	11821	3940.33	93.3%	4223.26	11394.57	0.3706	0.4453
3D	8	2/20/2016 11:46	3	14240	4746.67	93.7%	5066.73	11395.07	0.4446	0.4412
4A	1	2/20/2016 11:40	3	15827	5275.67	91.0%	5797.03	11395.73	0.5087	0.4874
4A	2	2/20/2016 11:46	3	14499	4833.00	96.4%	5015.58	11395.06	0.4402	0.4892
4A	3	2/20/2016 11:51	3	14629	4876.33	87.4%	5576.93	11394.56	0.4894	0.4904
4A	4	2/20/2016 11:56	3	15998	5332.67	93.7%	5692.24	11393.97	0.4996	0.4924
4A	5	2/20/2016 12:13	3	16942	5647.33	95.3%	5926.53	11392.08	0.5202	0.4943
4A	6	2/20/2016 12:19	3	16472	5490.67	96.4%	5698.09	11391.50	0.5002	0.4961
4A	7	2/12/2016 7:29	2	12633	6316.50	93.3%	6770.05	12747.98	0.5311	0.4974
4A	8	2/20/2016 11:36	3	14634	4878.00	93.7%	5206.92	11396.16	0.4569	0.4991
4B	1	2/12/2016 7:41	2	12496	6248.00	91.0%	6865.45	12746.52	0.5386	0.5375
4B	2	2/12/2016 7:36	2	13353	6676.50	96.4%	6928.72	12747.13	0.5436	0.5372
4B	3	2/12/2016 7:48	2	11968	5984.00	87.4%	6843.74	12745.72	0.5369	0.5369
4B	4	2/12/2016 7:45	2	12643	6321.50	93.7%	6747.75	12746.07	0.5294	0.5365
4B	5	2/12/2016 7:24	2	12727	6363.50	95.3%	6678.10	12748.58	0.5238	0.5361
4B	6	2/12/2016 7:17	2	13327	6663.50	96.4%	6915.23	12749.45	0.5424	0.5358
4B	7	2/12/2016 7:32	2	12883	6441.50	93.3%	6904.02	12747.57	0.5416	0.5355
4B	8	2/12/2016 7:27	2	12764	6382.00	93.7%	6812.33	12748.18	0.5344	0.5352
4C	1	2/12/2016 7:45	2	12761	6380.50	91.0%	7011.04	12746.06	0.5501	0.5441
4C	2	2/12/2016 7:41	2	13234	6617.00	96.4%	6866.98	12746.51	0.5387	0.5435
4C	3	2/12/2016 7:36	2	11973	5986.50	87.4%	6846.60	12747.13	0.5371	0.5431
4C	4	2/12/2016 7:48	2	13178	6589.00	93.7%	7033.29	12745.71	0.5518	0.5425
4C	5	2/12/2016 7:27	2	12993	6496.50	95.3%	6817.68	12748.17	0.5348	0.5419
4C	6	2/12/2016 7:24	2	13186	6593.00	96.4%	6842.07	12748.57	0.5367	0.5413
4C	7	2/12/2016 7:20	2	13083	6541.50	93.3%	7011.20	12749.07	0.5499	0.5409
4C	8	2/12/2016 7:32	2	12861	6430.50	93.7%	6864.10	12747.56	0.5385	0.5403
4D	1	2/12/2016 7:48	2	12214	6107.00	91.0%	6710.52	12745.70	0.5265	0.5252
4D	2	2/12/2016 7:45	2	12985	6492.50	96.4%	6737.77	12746.05	0.5286	0.5262
4D	3	2/12/2016 7:41	2	11710	5855.00	87.4%	6696.21	12746.50	0.5253	0.5270
4D	4	2/12/2016 7:36	2	12689	6344.50	93.7%	6772.30	12747.12	0.5313	0.5282
4D	5	2/12/2016 7:32	2	12641	6320.50	95.3%	6632.97	12747.56	0.5203	0.5292
4D	6	2/12/2016 7:27	2	12926	6463.00	96.4%	6707.16	12748.16	0.5261	0.5303
4D	7	2/12/2016 7:24	2	12778	6389.00	93.3%	6847.75	12748.56	0.5371	0.5311
4D	8	2/12/2016 7:20	2	12754	6377.00	93.7%	6806.99	12749.05	0.5339	0.5321
5A	1	2/12/2016 7:52	2	12457	6228.50	91.0%	6844.02	12745.19	0.5370	0.5407
5A	2	2/12/2016 8:02	2	13359	6679.50	96.4%	6931.84	12743.99	0.5439	0.5417
5A	3	2/12/2016 7:58	2	11998	5999.00	87.4%	6860.90	12744.40	0.5383	0.5424
5A	4	2/12/2016 7:55	2	13258	6629.00	93.7%	7075.98	12744.78	0.5552	0.5435
5A	5	2/12/2016 8:05	2	12979	6489.50	95.3%	6810.33	12743.58	0.5344	0.5445

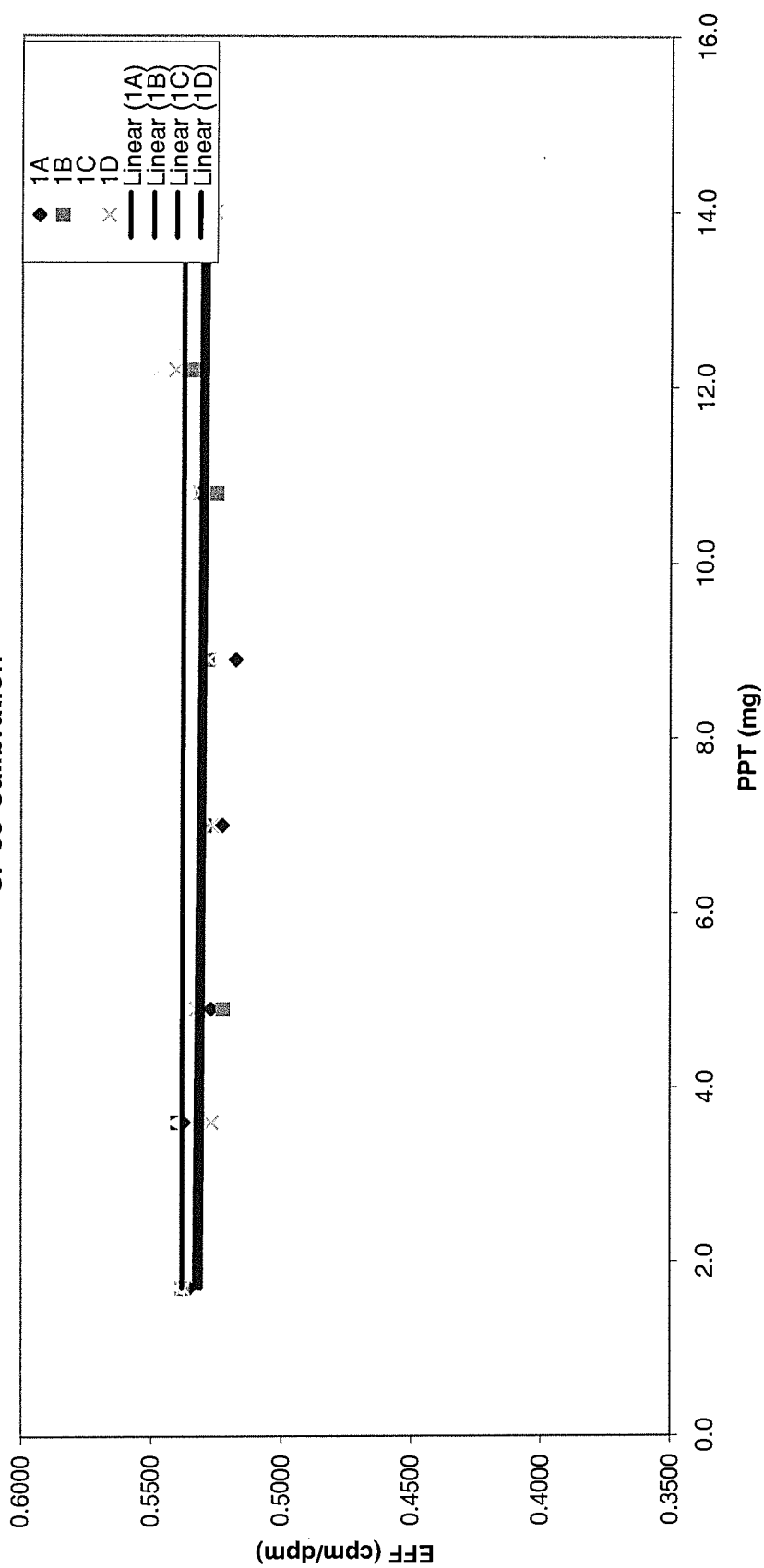
Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
5A	6	2/12/2016 8:18	2	13542	6771.00	96.4%	7026.79	12742.06	0.5515	0.5455
5A	7	2/12/2016 8:14	2	13110	6555.00	93.3%	7025.67	12742.56	0.5514	0.5463
5A	8	2/12/2016 8:10	2	12894	6447.00	93.7%	6881.71	12743.00	0.5400	0.5472
5B	1	2/12/2016 7:55	2	12623	6311.50	91.0%	6935.22	12744.78	0.5442	0.5404
5B	2	2/12/2016 7:52	2	13294	6647.00	96.4%	6898.11	12745.19	0.5412	0.5406
5B	3	2/12/2016 8:02	2	11991	5995.50	87.4%	6856.89	12743.98	0.5380	0.5406
5B	4	2/12/2016 7:59	2	13073	6536.50	93.7%	6977.25	12744.39	0.5475	0.5408
5B	5	2/12/2016 8:10	2	12595	6297.50	95.3%	6608.84	12742.99	0.5186	0.5409
5B	6	2/12/2016 8:05	2	13425	6712.50	96.4%	6966.08	12743.57	0.5466	0.5410
5B	7	2/12/2016 8:18	2	13122	6561.00	93.3%	7032.10	12742.05	0.5519	0.5411
5B	8	2/12/2016 8:14	2	12858	6429.00	93.7%	6862.50	12742.55	0.5385	0.5412
5C	1	2/12/2016 7:59	2	12800	6400.00	91.0%	7032.47	12744.38	0.5518	0.5427
5C	2	2/12/2016 7:55	2	13380	6690.00	96.4%	6942.73	12744.77	0.5448	0.5419
5C	3	2/12/2016 7:52	2	11910	5955.00	87.4%	6810.58	12745.19	0.5344	0.5414
5C	4	2/12/2016 8:02	2	12654	6327.00	93.7%	6753.62	12743.97	0.5299	0.5405
5C	5	2/12/2016 8:14	2	12938	6469.00	95.3%	6788.82	12742.54	0.5328	0.5397
5C	6	2/12/2016 8:10	2	13368	6684.00	96.4%	6936.51	12742.98	0.5443	0.5389
5C	7	2/12/2016 8:05	2	12990	6495.00	93.3%	6961.36	12743.56	0.5463	0.5383
5C	8	2/12/2016 8:18	2	12811	6405.50	93.7%	6837.41	12742.04	0.5366	0.5375
5D	1	2/12/2016 8:02	2	12811	6405.50	91.0%	7038.51	12743.96	0.5523	0.5476
5D	2	2/12/2016 7:59	2	13302	6651.00	96.4%	6902.26	12744.37	0.5416	0.5458
5D	3	2/12/2016 7:55	2	12034	6017.00	87.4%	6881.48	12744.76	0.5399	0.5446
5D	4	2/12/2016 7:52	2	13117	6558.50	93.7%	7000.73	12745.19	0.5493	0.5426
5D	5	2/12/2016 8:18	2	12876	6438.00	95.3%	6756.28	12742.03	0.5302	0.5409
5D	6	2/12/2016 8:14	2	13332	6666.00	96.4%	6917.83	12742.53	0.5429	0.5391
5D	7	2/12/2016 8:10	2	13112	6556.00	93.3%	7026.74	12742.97	0.5514	0.5378
5D	8	2/12/2016 8:05	2	12580	6290.00	93.7%	6714.13	12743.55	0.5269	0.5361
6A	1	2/12/2016 8:08	2	12279	6139.50	91.0%	6746.23	12743.27	0.5294	0.5355
6A	2	2/12/2016 8:20	2	13280	6640.00	96.4%	6890.84	12741.82	0.5408	0.5350
6A	3	2/12/2016 8:16	2	12002	6001.00	87.4%	6863.18	12742.31	0.5386	0.5346
6A	4	2/12/2016 8:12	2	12744	6372.00	93.7%	6801.65	12742.79	0.5338	0.5340
6A	5	2/12/2016 7:53	2	12775	6387.50	95.3%	6703.29	12745.02	0.5260	0.5334
6A	6	2/12/2016 8:04	2	13076	6538.00	96.4%	6784.99	12743.78	0.5324	0.5328
6A	7	2/12/2016 8:00	2	12916	6458.00	93.3%	6921.71	12744.17	0.5431	0.5324
6A	8	2/12/2016 7:57	2	12551	6275.50	93.7%	6698.65	12744.57	0.5256	0.5319
6B	1	2/12/2016 8:12	2	12782	6391.00	91.0%	7022.58	12742.78	0.5511	0.5412
6B	2	2/12/2016 8:08	2	13217	6608.50	96.4%	6858.15	12743.26	0.5382	0.5402
6B	3	2/12/2016 8:20	2	11967	5983.50	87.4%	6843.17	12741.81	0.5371	0.5395
6B	4	2/12/2016 8:16	2	12723	6361.50	93.7%	6790.45	12742.29	0.5329	0.5383
6B	5	2/12/2016 7:57	2	12759	6379.50	95.3%	6694.89	12744.56	0.5253	0.5373
6B	6	2/12/2016 7:53	2	13236	6618.00	96.4%	6868.01	12745.02	0.5389	0.5362
6B	7	2/12/2016 8:04	2	12890	6445.00	93.3%	6907.77	12743.77	0.5421	0.5355
6B	8	2/12/2016 8:00	2	12827	6413.50	93.7%	6845.95	12744.16	0.5372	0.5345
6C	1	2/12/2016 8:16	2	12525	6262.50	91.0%	6881.38	12742.27	0.5400	0.5403
6C	2	2/12/2016 8:12	2	13400	6700.00	96.4%	6953.11	12742.77	0.5457	0.5396
6C	3	2/12/2016 8:08	2	11967	5983.50	87.4%	6843.17	12743.25	0.5370	0.5392
6C	4	2/12/2016 8:20	2	12767	6383.50	93.7%	6813.93	12741.80	0.5348	0.5384
6C	5	2/12/2016 8:00	2	13001	6500.50	95.3%	6821.87	12744.16	0.5353	0.5377
6C	6	2/12/2016 7:57	2	13069	6534.50	96.4%	6781.36	12744.55	0.5321	0.5370
6C	7	2/12/2016 7:53	2	12943	6471.50	93.3%	6936.17	12745.02	0.5442	0.5365
6C	8	2/12/2016 8:04	2	12783	6391.50	93.7%	6822.47	12743.75	0.5354	0.5358
7A	1	2/13/2016 12:03	2	12376	6188.00	91.0%	6799.52	12541.55	0.5422	0.5342
7A	2	2/13/2016 12:13	2	12913	6456.50	96.4%	6700.41	12540.38	0.5343	0.5329
7A	3	2/13/2016 12:10	2	11638	5819.00	87.4%	6655.04	12540.73	0.5307	0.5320
7A	4	2/13/2016 12:06	2	12323	6161.50	93.7%	6576.96	12541.13	0.5244	0.5305
7A	5	2/13/2016 12:16	2	12280	6140.00	95.3%	6443.55	12540.00	0.5138	0.5292
7A	6	2/13/2016 12:27	2	12839	6419.50	96.4%	6662.01	12538.64	0.5313	0.5278
7A	7	2/13/2016 12:23	2	12446	6223.00	93.3%	6669.83	12539.11	0.5319	0.5268
7A	8	2/13/2016 12:19	2	12459	6229.50	93.7%	6649.55	12539.60	0.5303	0.5255
7B	1	2/13/2016 12:06	2	12440	6220.00	91.0%	6834.68	12541.12	0.5450	0.5393
7B	2	2/13/2016 12:03	2	12952	6476.00	96.4%	6720.65	12541.54	0.5359	0.5391
7B	3	2/13/2016 12:13	2	11854	5927.00	87.4%	6778.55	12540.37	0.5405	0.5390
7B	4	2/13/2016 12:10	2	12584	6292.00	93.7%	6716.26	12540.72	0.5356	0.5388
7B	5	2/13/2016 12:19	2	12675	6337.50	95.3%	6650.81	12539.59	0.5304	0.5386
7B	6	2/13/2016 12:16	2	12838	6419.00	96.4%	6661.50	12540.00	0.5312	0.5384
7B	7	2/13/2016 12:27	2	13073	6536.50	93.3%	7005.84	12538.63	0.5587	0.5383
7B	8	2/13/2016 12:23	2	12507	6253.50	93.7%	6675.16	12539.09	0.5323	0.5381
7C	1	2/13/2016 12:10	2	11936	5968.00	91.0%	6557.78	12540.72	0.5229	0.5201
7C	2	2/13/2016 12:06	2	12584	6292.00	96.4%	6529.70	12541.11	0.5207	0.5209
7C	3	2/13/2016 12:03	2	11367	5683.50	87.4%	6500.07	12541.53	0.5183	0.5214
7C	4	2/13/2016 12:13	2	12463	6231.50	93.7%	6651.68	12540.36	0.5304	0.5223
7C	5	2/13/2016 12:23	2	12111	6055.50	95.3%	6354.87	12539.09	0.5068	0.5231
7C	6	2/13/2016 12:19	2	12684	6342.00	96.4%	6581.59	12539.58	0.5249	0.5239
7C	7	2/13/2016 12:16	2	12526	6263.00	93.3%	6712.70	12539.92	0.5353	0.5244
7C	8	2/13/2016 12:27	2	12265	6132.50	93.7%	6546.01	12538.61	0.5221	0.5252
7D	1	2/13/2016 12:13	2	12204	6102.00	91.0%	6705.02	12540.35	0.5347	0.5249

Detector (#)	Source ID (#)	Raw Count Data			Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
		Start Time	Count Time (min)	Beta (counts)						
7D	2	2/13/2016 12:10	2	12695	6347.50	96.4%	6587.29	12540.71	0.5253	0.5246
7D	3	2/13/2016 12:07	2	11335	5667.50	87.4%	6481.77	12541.10	0.5168	0.5245
7D	4	2/13/2016 12:03	2	12308	6154.00	93.7%	6568.96	12541.51	0.5238	0.5242
7D	5	2/13/2016 12:27	2	12153	6076.50	95.3%	6376.91	12538.60	0.5086	0.5239
7D	6	2/13/2016 12:23	2	12650	6325.00	96.4%	6563.94	12539.08	0.5235	0.5237
7D	7	2/13/2016 12:19	2	12559	6279.50	93.3%	6730.39	12539.57	0.5367	0.5235
7D	8	2/13/2016 12:16	2	12289	6144.50	93.7%	6558.81	12539.91	0.5230	0.5232
8A	1	2/13/2016 12:16	2	12192	6096.00	91.0%	6698.43	12539.97	0.5342	0.5328
8A	2	2/13/2016 12:28	2	13036	6518.00	96.4%	6764.24	12538.58	0.5395	0.5329
8A	3	2/13/2016 12:24	2	11605	5802.50	87.4%	6636.17	12539.07	0.5292	0.5330
8A	4	2/13/2016 12:19	2	12419	6209.50	93.7%	6628.20	12539.57	0.5286	0.5331
8A	5	2/13/2016 12:03	2	12685	6342.50	95.3%	6656.06	12541.50	0.5307	0.5332
8A	6	2/13/2016 12:13	2	12787	6393.50	96.4%	6635.03	12540.34	0.5291	0.5333
8A	7	2/13/2016 12:10	2	12579	6289.50	93.3%	6741.11	12540.70	0.5375	0.5334
8A	8	2/13/2016 12:07	2	12606	6303.00	93.7%	6728.00	12541.09	0.5365	0.5335
8B	1	2/13/2016 12:19	2	12269	6134.50	91.0%	6740.73	12539.56	0.5376	0.5341
8B	2	2/13/2016 12:16	2	12968	6484.00	96.4%	6728.95	12539.96	0.5366	0.5343
8B	3	2/13/2016 12:28	2	11698	5849.00	87.4%	6689.35	12538.57	0.5335	0.5344
8B	4	2/13/2016 12:24	2	12424	6212.00	93.7%	6630.87	12539.06	0.5288	0.5347
8B	5	2/13/2016 12:07	2	12536	6268.00	95.3%	6577.88	12541.08	0.5245	0.5349
8B	6	2/13/2016 12:03	2	13107	6553.50	96.4%	6801.08	12541.49	0.5423	0.5351
8B	7	2/13/2016 12:13	2	12693	6346.50	93.3%	6802.20	12540.33	0.5424	0.5352
8B	8	2/13/2016 12:10	2	12509	6254.50	93.7%	6676.23	12540.69	0.5324	0.5354
8C	1	2/13/2016 12:24	2	12367	6183.50	91.0%	6794.58	12539.05	0.5419	0.5339
8C	2	2/13/2016 12:19	2	12879	6439.50	96.4%	6682.77	12539.55	0.5329	0.5327
8C	3	2/13/2016 12:16	2	11626	5813.00	87.4%	6648.17	12539.95	0.5302	0.5319
8C	4	2/13/2016 12:28	2	12360	6180.00	93.7%	6596.71	12538.57	0.5261	0.5307
8C	5	2/13/2016 12:10	2	12282	6141.00	95.3%	6444.60	12540.68	0.5139	0.5295
8C	6	2/13/2016 12:07	2	12880	6440.00	96.4%	6683.29	12541.07	0.5329	0.5284
8C	7	2/13/2016 12:03	2	12507	6253.50	93.3%	6702.52	12541.47	0.5344	0.5275
8C	8	2/13/2016 12:13	2	12424	6212.00	93.7%	6630.87	12540.32	0.5288	0.5265
8D	1	2/13/2016 12:28	2	12480	6240.00	91.0%	6856.66	12538.55	0.5468	0.5396
8D	2	2/13/2016 12:24	2	12937	6468.50	96.4%	6712.87	12539.05	0.5354	0.5403
8D	3	2/13/2016 12:20	2	11828	5914.00	87.4%	6763.68	12539.54	0.5394	0.5407
8D	4	2/13/2016 12:16	2	12626	6313.00	93.7%	6738.68	12539.94	0.5374	0.5414
8D	5	2/13/2016 12:13	2	12853	6426.50	95.3%	6744.21	12540.31	0.5378	0.5421
8D	6	2/13/2016 12:10	2	13155	6577.50	96.4%	6825.98	12540.68	0.5443	0.5427
8D	7	2/13/2016 12:07	2	12972	6486.00	93.3%	6951.72	12541.06	0.5543	0.5432
8D	8	2/13/2016 12:03	2	12656	6328.00	93.7%	6754.69	12541.46	0.5386	0.5438
9A	1	2/13/2016 12:30	2	12191	6095.50	91.0%	6697.88	12538.24	0.5342	0.5368
9A	2	2/13/2016 12:40	2	13057	6528.50	96.4%	6775.13	12537.07	0.5404	0.5379
9A	3	2/13/2016 12:37	2	11939	5969.50	87.4%	6827.16	12537.45	0.5445	0.5386
9A	4	2/13/2016 12:34	2	12613	6306.50	93.7%	6731.74	12537.80	0.5369	0.5398
9A	5	2/13/2016 12:43	2	12569	6284.50	95.3%	6595.19	12536.69	0.5261	0.5409
9A	6	2/13/2016 12:53	2	13313	6656.50	96.4%	6907.97	12535.56	0.5511	0.5419
9A	7	2/13/2016 12:50	2	12928	6464.00	93.3%	6928.14	12535.92	0.5527	0.5427
9A	8	2/13/2016 12:46	2	12602	6301.00	93.7%	6725.87	12536.33	0.5365	0.5438
9B	1	2/13/2016 12:34	2	12418	6209.00	91.0%	6822.60	12537.80	0.5442	0.5377
9B	2	2/13/2016 12:30	2	12913	6456.50	96.4%	6700.41	12538.24	0.5344	0.5360
9B	3	2/13/2016 12:40	2	11796	5898.00	87.4%	6745.39	12537.06	0.5380	0.5348
9B	4	2/13/2016 12:37	2	12501	6250.50	93.7%	6671.96	12537.44	0.5322	0.5328
9B	5	2/13/2016 12:46	2	12192	6096.00	95.3%	6397.38	12536.32	0.5103	0.5311
9B	6	2/13/2016 12:43	2	12780	6390.00	96.4%	6631.40	12536.68	0.5290	0.5293
9B	7	2/13/2016 12:53	2	12593	6296.50	93.3%	6748.61	12535.55	0.5384	0.5280
9B	8	2/13/2016 12:50	2	12439	6219.50	93.7%	6638.87	12535.91	0.5296	0.5263
9C	1	2/13/2016 12:37	2	12142	6071.00	91.0%	6670.96	12537.43	0.5321	0.5314
9C	2	2/13/2016 12:34	2	13005	6502.50	96.4%	6748.15	12537.79	0.5382	0.5304
9C	3	2/13/2016 12:30	2	11557	5778.50	87.4%	6608.72	12538.25	0.5271	0.5298
9C	4	2/13/2016 12:40	2	12333	6166.50	93.7%	6582.30	12537.06	0.5250	0.5288
9C	5	2/13/2016 12:50	2	12303	6151.50	95.3%	6455.62	12535.90	0.5150	0.5279
9C	6	2/13/2016 12:47	2	12863	6431.50	96.4%	6674.47	12536.31	0.5324	0.5270
9C	7	2/13/2016 12:44	2	12446	6223.00	93.3%	6669.83	12536.67	0.5320	0.5263
9C	8	2/13/2016 12:53	2	12337	6168.50	93.7%	6584.43	12535.54	0.5253	0.5254
9D	1	2/13/2016 12:40	2	12393	6196.50	91.0%	6808.86	12537.04	0.5431	0.5382
9D	2	2/13/2016 12:37	2	13114	6557.00	96.4%	6804.71	12537.42	0.5428	0.5369
9D	3	2/13/2016 12:34	2	11494	5747.00	87.4%	6572.69	12537.78	0.5242	0.5360
9D	4	2/13/2016 12:30	2	12530	6265.00	93.7%	6687.44	12538.25	0.5334	0.5345
9D	5	2/13/2016 12:53	2	12524	6262.00	95.3%	6571.58	12535.54	0.5242	0.5332
9D	6	2/13/2016 12:50	2	13041	6520.50	96.4%	6766.83	12535.89	0.5398	0.5319
9D	7	2/13/2016 12:47	2	12605	6302.50	93.3%	6755.04	12536.31	0.5388	0.5309
9D	8	2/13/2016 12:44	2	12330	6165.00	93.7%	6580.70	12536.66	0.5249	0.5297
10A	1	2/13/2016 12:44	2	11343	5671.50	91.0%	6231.98	12536.66	0.4971	0.4920
10A	2	2/13/2016 12:53	2	11861	5930.50	96.4%	6154.54	12535.53	0.4910	0.4923
10A	3	2/13/2016 12:50	2	10851	5425.50	87.4%	6205.00	12535.89	0.4950	0.4925
10A	4	2/13/2016 12:47	2	11547	5773.50	93.7%	6162.80	12536.30	0.4916	0.4928
10A	5	2/13/2016 12:30	2	11374	5687.00	95.3%	5968.16	12538.24	0.4760	0.4931

Detector (#)	Source ID (#)	Raw Count Data			Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
		Start Time	Count Time (min)	Beta (counts)						
10A	6	2/13/2016 12:41	2	11975	5987.50	96.4%	6213.69	12537.01	0.4956	0.4934
10A	7	2/13/2016 12:37	2	11786	5893.00	93.3%	6316.14	12537.41	0.5038	0.4936
10A	8	2/13/2016 12:34	2	11597	5798.50	93.7%	6189.48	12537.77	0.4937	0.4939
10B	1	2/13/2016 12:47	2	12025	6012.50	91.0%	6606.68	12536.29	0.5270	0.5193
10B	2	2/13/2016 12:44	2	12608	6304.00	96.4%	6542.15	12536.65	0.5218	0.5207
10B	3	2/13/2016 12:53	2	11275	5637.50	87.4%	6447.46	12535.52	0.5143	0.5216
10B	4	2/13/2016 12:50	2	12156	6078.00	93.7%	6487.83	12535.88	0.5175	0.5232
10B	5	2/13/2016 12:34	2	12288	6144.00	95.3%	6447.75	12537.76	0.5143	0.5246
10B	6	2/13/2016 12:30	2	12928	6464.00	96.4%	6708.20	12538.24	0.5350	0.5260
10B	7	2/13/2016 12:41	2	12615	6307.50	93.3%	6760.40	12537.01	0.5392	0.5270
10B	8	2/13/2016 12:37	2	12246	6123.00	93.7%	6535.87	12537.40	0.5213	0.5283
10C	1	2/13/2016 12:50	2	11924	5962.00	91.0%	6551.19	12535.86	0.5226	0.5187
10C	2	2/13/2016 12:47	2	12409	6204.50	96.4%	6438.89	12536.28	0.5136	0.5186
10C	3	2/13/2016 12:44	2	11567	5783.50	87.4%	6614.44	12536.64	0.5276	0.5185
10C	4	2/13/2016 12:53	2	12180	6090.00	93.7%	6500.64	12535.51	0.5186	0.5183
10C	5	2/13/2016 12:38	2	11909	5954.50	95.3%	6248.88	12537.39	0.4984	0.5182
10C	6	2/13/2016 12:35	2	12500	6250.00	96.4%	6486.11	12537.75	0.5173	0.5181
10C	7	2/13/2016 12:30	2	12404	6202.00	93.3%	6647.32	12538.24	0.5302	0.5180
10C	8	2/13/2016 12:41	2	12165	6082.50	93.7%	6492.63	12536.99	0.5179	0.5179
10D	1	2/13/2016 12:53	2	11599	5799.50	91.0%	6372.63	12535.50	0.5084	0.5061
10D	2	2/13/2016 12:50	2	12344	6172.00	96.4%	6405.16	12535.85	0.5109	0.5067
10D	3	2/13/2016 12:47	2	11102	5551.00	87.4%	6348.53	12536.27	0.5064	0.5070
10D	4	2/13/2016 12:44	2	11872	5936.00	93.7%	6336.26	12536.63	0.5054	0.5076
10D	5	2/13/2016 12:41	2	11821	5910.50	95.3%	6202.70	12536.98	0.4948	0.5082
10D	7	2/13/2016 12:35	2	12137	6068.50	93.3%	6504.24	12537.74	0.5188	0.5091
10D	8	2/13/2016 12:30	2	11972	5986.00	93.7%	6389.63	12538.23	0.5096	0.5096
11A	1	2/13/2016 12:58	2	12240	6120.00	91.0%	6724.80	12534.94	0.5365	0.5334
11A	2	2/13/2016 13:08	2	12864	6432.00	96.4%	6674.99	12533.80	0.5326	0.5328
11A	3	2/13/2016 13:05	2	11721	5860.50	87.4%	6702.50	12534.15	0.5347	0.5324
11A	4	2/13/2016 13:01	2	12367	6183.50	93.7%	6600.44	12534.55	0.5266	0.5318
11A	5	2/13/2016 13:12	2	12418	6209.00	95.3%	6515.96	12533.33	0.5199	0.5313
11A	6	2/13/2016 13:22	2	13026	6513.00	96.4%	6759.05	12532.08	0.5393	0.5307
11A	7	2/13/2016 13:19	2	12533	6266.50	93.3%	6716.46	12532.47	0.5359	0.5303
11A	8	2/13/2016 13:15	2	12375	6187.50	93.7%	6604.71	12532.89	0.5270	0.5298
11B	1	2/13/2016 13:01	2	12226	6113.00	91.0%	6717.11	12534.54	0.5359	0.5379
11B	2	2/13/2016 12:58	2	13006	6503.00	96.4%	6748.67	12534.94	0.5384	0.5375
11B	3	2/13/2016 13:08	2	11817	5908.50	87.4%	6757.39	12533.79	0.5391	0.5372
11B	4	2/13/2016 13:05	2	12632	6316.00	93.7%	6741.88	12534.15	0.5379	0.5368
11B	5	2/13/2016 13:15	2	12659	6329.50	95.3%	6642.42	12532.88	0.5300	0.5364
11B	6	2/13/2016 13:12	2	13058	6529.00	96.4%	6775.65	12533.32	0.5406	0.5360
11B	7	2/13/2016 13:22	2	12620	6310.00	93.3%	6763.08	12532.07	0.5397	0.5357
11B	8	2/13/2016 13:19	2	12472	6236.00	93.7%	6656.48	12532.47	0.5311	0.5353
11C	1	2/13/2016 13:05	2	12263	6131.50	91.0%	6737.44	12534.14	0.5375	0.5338
11C	2	2/13/2016 13:01	2	12809	6404.50	96.4%	6646.45	12534.53	0.5303	0.5320
11C	3	2/13/2016 12:58	2	11453	5726.50	87.4%	6549.25	12534.94	0.5225	0.5308
11C	4	2/13/2016 13:08	2	12528	6264.00	93.7%	6686.37	12533.78	0.5335	0.5288
11C	5	2/13/2016 13:19	2	12439	6219.50	95.3%	6526.98	12532.46	0.5208	0.5269
11C	6	2/13/2016 13:15	2	12902	6451.00	96.4%	6694.70	12532.87	0.5342	0.5251
11C	7	2/13/2016 13:12	2	12475	6237.50	93.3%	6685.37	12533.32	0.5334	0.5238
11C	8	2/13/2016 13:22	2	12001	6000.50	93.7%	6405.11	12532.06	0.5111	0.5220
11D	1	2/13/2016 13:08	2	12747	6373.50	91.0%	7003.35	12533.77	0.5588	0.5569
11D	2	2/13/2016 13:05	2	13426	6713.00	96.4%	6966.60	12534.13	0.5558	0.5537
11D	3	2/13/2016 13:02	2	11899	5949.50	87.4%	6804.29	12534.52	0.5428	0.5514
11D	4	2/13/2016 12:58	2	12990	6495.00	93.7%	6932.95	12534.94	0.5531	0.5478
11D	5	2/13/2016 13:22	2	12735	6367.50	95.3%	6682.30	12532.05	0.5332	0.5446
11D	6	2/13/2016 13:19	2	13403	6701.50	96.4%	6954.67	12532.45	0.5549	0.5413
11D	7	2/13/2016 13:15	2	12746	6373.00	93.3%	6830.60	12532.86	0.5450	0.5389
11D	8	2/13/2016 13:12	2	12369	6184.50	93.7%	6601.51	12533.31	0.5267	0.5358
12A	1	2/13/2016 13:12	2	11826	5913.00	91.0%	6497.34	12533.30	0.5184	0.5201
12A	2	2/13/2016 13:22	2	12570	6285.00	96.4%	6522.43	12532.04	0.5205	0.5190
12A	3	2/13/2016 13:19	2	11331	5665.50	87.4%	6479.48	12532.44	0.5170	0.5182
12A	4	2/13/2016 13:16	2	12092	6046.00	93.7%	6453.67	12532.85	0.5149	0.5170
12A	5	2/13/2016 12:58	2	12276	6138.00	95.3%	6441.45	12534.93	0.5139	0.5159
12A	6	2/13/2016 13:08	2	12688	6344.00	96.4%	6583.66	12533.76	0.5253	0.5148
12A	7	2/13/2016 13:05	2	12100	6050.00	93.3%	6484.41	12534.12	0.5173	0.5140
12A	8	2/13/2016 13:02	2	11845	5922.50	93.7%	6321.85	12534.51	0.5044	0.5129
12B	1	2/13/2016 13:16	2	12043	6021.50	91.0%	6616.57	12532.84	0.5279	0.5205
12B	2	2/13/2016 13:12	2	12407	6203.50	96.4%	6437.85	12533.29	0.5137	0.5203
12B	3	2/13/2016 13:22	2	11486	5743.00	87.4%	6568.12	12532.03	0.5241	0.5202
12B	4	2/13/2016 13:19	2	12229	6114.50	93.7%	6526.79	12532.43	0.5208	0.5200
12B	5	2/13/2016 13:02	2	12081	6040.50	95.3%	6339.13	12534.50	0.5057	0.5198
12B	6	2/13/2016 12:58	2	12628	6314.00	96.4%	6552.53	12534.94	0.5227	0.5196
12B	7	2/13/2016 13:08	2	12134	6067.00	93.3%	6502.63	12533.76	0.5188	0.5195
12B	8	2/13/2016 13:05	2	12339	6169.50	93.7%	6585.50	12534.11	0.5254	0.5193
12C	1	2/13/2016 13:19	2	12170	6085.00	91.0%	6686.34	12532.42	0.5335	0.5275
12C	2	2/13/2016 13:16	2	12865	6432.50	96.4%	6675.51	12532.83	0.5326	0.5276

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yield Corrected Sr-89 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-89 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)						
12C	3	2/13/2016 13:12	2	11428	5714.00	87.4%	6534.95	12533.28	0.5214	0.5277
12C	4	2/13/2016 13:22	2	12174	6087.00	93.7%	6497.44	12532.02	0.5185	0.5278
12C	5	2/13/2016 13:05	2	12339	6169.50	95.3%	6474.51	12534.10	0.5166	0.5280
12C	6	2/13/2016 13:02	2	13043	6521.50	96.4%	6767.87	12534.49	0.5399	0.5281
12C	7	2/13/2016 12:58	2	12572	6286.00	93.3%	6737.36	12534.94	0.5375	0.5282
12C	8	2/13/2016 13:08	2	12286	6143.00	93.7%	6557.21	12533.75	0.5232	0.5283
12D	1	2/13/2016 13:23	2	12042	6021.00	91.0%	6616.02	12532.01	0.5279	0.5305
12D	2	2/13/2016 13:19	2	12787	6393.50	96.4%	6635.03	12532.41	0.5294	0.5303
12D	3	2/13/2016 13:16	2	11643	5821.50	87.4%	6657.90	12532.83	0.5312	0.5301
12D	4	2/13/2016 13:12	2	12314	6157.00	93.7%	6572.16	12533.28	0.5244	0.5298
12D	5	2/13/2016 13:08	2	12837	6418.50	95.3%	6735.82	12533.74	0.5374	0.5296
12D	6	2/13/2016 13:05	2	13037	6518.50	96.4%	6764.75	12534.09	0.5397	0.5294
12D	7	2/13/2016 13:02	2	12313	6156.50	93.3%	6598.56	12534.48	0.5264	0.5292
12D	8	2/13/2016 12:58	2	12244	6122.00	93.7%	6534.80	12533.94	0.5213	0.5290
13A	1	2/13/2016 13:26	2	11415	5707.50	91.0%	6271.54	12531.65	0.5005	0.4988
13A	2	2/13/2016 13:35	2	12024	6012.00	96.4%	6239.12	12530.53	0.4979	0.4977
13A	3	2/13/2016 13:32	2	10754	5377.00	87.4%	6149.53	12530.91	0.4907	0.4970
13A	4	2/13/2016 13:29	2	11814	5907.00	93.7%	6305.30	12531.30	0.5032	0.4957
13A	5	2/13/2016 13:38	2	11536	5768.00	95.3%	6053.16	12530.14	0.4831	0.4946
13A	6	2/13/2016 13:49	2	12158	6079.00	96.4%	6308.65	12528.80	0.5035	0.4935
13A	7	2/13/2016 13:46	2	11644	5822.00	93.3%	6240.04	12529.26	0.4980	0.4927
13A	8	2/13/2016 13:41	2	11382	5691.00	93.7%	6074.74	12529.77	0.4848	0.4916
13B	1	2/13/2016 13:29	2	11770	5885.00	91.0%	6466.58	12531.29	0.5160	0.5160
13B	2	2/13/2016 13:26	2	12412	6206.00	96.4%	6440.45	12531.65	0.5139	0.5131
13B	3	2/13/2016 13:35	2	10984	5492.00	87.4%	6281.05	12530.52	0.5013	0.5111
13B	4	2/13/2016 13:32	2	12093	6046.50	93.7%	6454.21	12530.90	0.5151	0.5080
13B	5	2/13/2016 13:38	2	12415	6207.50	95.3%	6514.39	12530.13	0.5199	0.5051
13B	6	2/20/2016 11:50	3	15859	5286.33	96.4%	5486.04	11394.63	0.4815	0.5022
13B	7	2/13/2016 13:50	2	11979	5989.50	93.3%	6419.57	12528.79	0.5124	0.5001
13B	8	2/13/2016 13:46	2	11574	5787.00	93.7%	6177.21	12529.25	0.4930	0.4974
13D	1	2/13/2016 13:35	2	9891	4945.50	91.0%	5434.23	12530.52	0.4337	0.4329
13D	2	2/13/2016 13:32	2	10349	5174.50	96.4%	5369.98	12530.90	0.4285	0.4316
13D	3	2/13/2016 13:29	2	9430	4715.00	87.4%	5392.42	12531.29	0.4303	0.4307
13D	4	2/13/2016 13:26	2	10192	5096.00	93.7%	5439.62	12531.65	0.4341	0.4292
13D	5	2/13/2016 13:50	2	9942	4971.00	95.3%	5216.76	12528.78	0.4164	0.4279
13D	6	2/13/2016 13:46	2	10496	5248.00	96.4%	5446.26	12529.24	0.4347	0.4266
13D	7	2/13/2016 13:42	2	10265	5132.50	93.3%	5501.03	12529.74	0.4390	0.4256
13D	8	2/13/2016 13:38	2	9675	4837.50	93.7%	5163.69	12530.12	0.4121	0.4244
14A	1	2/13/2016 13:39	2	12594	6297.00	91.0%	6919.29	12530.11	0.5522	0.5450
14A	2	2/13/2016 13:50	2	13180	6590.00	96.4%	6838.96	12528.77	0.5459	0.5432
14A	3	2/13/2016 13:46	2	11684	5842.00	87.4%	6681.34	12529.23	0.5333	0.5420
14A	4	2/13/2016 13:42	2	12548	6274.00	93.7%	6697.05	12529.73	0.5345	0.5400
14A	5	2/13/2016 13:26	2	12664	6332.00	95.3%	6645.04	12531.64	0.5303	0.5383
14A	6	2/13/2016 13:35	2	13167	6583.50	96.4%	6832.21	12530.51	0.5452	0.5365
14A	7	2/13/2016 13:32	2	12700	6350.00	93.3%	6805.95	12530.89	0.5431	0.5352
14A	8	2/13/2016 13:29	2	12428	6214.00	93.7%	6633.00	12531.28	0.5293	0.5336
14B	1	2/13/2016 13:42	2	12207	6103.50	91.0%	6706.67	12529.72	0.5353	0.5349
14B	2	2/13/2016 13:39	2	12992	6496.00	96.4%	6741.40	12530.10	0.5380	0.5326
14B	3	2/13/2016 13:50	2	11542	5771.00	87.4%	6600.14	12528.76	0.5268	0.5310
14B	4	2/13/2016 13:46	2	12382	6191.00	93.7%	6608.45	12529.22	0.5274	0.5284
14B	5	2/13/2016 13:29	2	12355	6177.50	95.3%	6482.90	12531.27	0.5173	0.5261
14B	6	2/13/2016 13:26	2	12776	6388.00	96.4%	6629.32	12531.64	0.5290	0.5238
14B	7	2/13/2016 13:35	2	12365	6182.50	93.3%	6626.42	12530.50	0.5288	0.5222
14B	8	2/13/2016 13:32	2	12122	6061.00	93.7%	6469.68	12530.88	0.5163	0.5200
14C	1	2/13/2016 13:46	2	12309	6154.50	91.0%	6762.71	12529.21	0.5398	0.5402
14C	2	2/13/2016 13:42	2	13176	6588.00	96.4%	6836.88	12529.71	0.5457	0.5386
14C	3	2/13/2016 13:39	2	11611	5805.50	87.4%	6639.60	12530.09	0.5299	0.5375
14C	4	2/13/2016 13:50	2	12686	6343.00	93.7%	6770.70	12528.75	0.5404	0.5358
14C	5	2/13/2016 13:32	2	12353	6176.50	95.3%	6481.86	12530.87	0.5173	0.5342
14C	6	2/13/2016 13:29	2	13062	6531.00	96.4%	6777.73	12531.26	0.5409	0.5327
14C	7	2/13/2016 13:26	2	12801	6400.50	93.3%	6860.08	12531.65	0.5474	0.5315
14C	8	2/13/2016 13:35	2	12190	6095.00	93.7%	6505.98	12530.49	0.5192	0.5300
14D	1	2/13/2016 13:50	2	12285	6142.50	91.0%	6749.52	12528.73	0.5387	0.5408
14D	2	2/13/2016 13:46	2	13132	6566.00	96.4%	6814.05	12529.20	0.5439	0.5378
14D	3	2/13/2016 13:42	2	11689	5844.50	87.4%	6684.20	12529.70	0.5335	0.5357
14D	4	2/13/2016 13:39	2	12477	6238.50	93.7%	6659.15	12530.08	0.5315	0.5324
14D	5	2/13/2016 13:35	2	12497	6248.50	95.3%	6557.41	12530.48	0.5233	0.5294
14D	6	2/13/2016 13:32	2	12844	6422.00	96.4%	6664.61	12530.86	0.5319	0.5264
14D	7	2/13/2016 13:29	2	12286	6143.00	93.3%	6584.09	12531.25	0.5254	0.5242
14D	8	2/13/2016 13:26	2	12206	6103.00	93.7%	6514.52	12531.65	0.5198	0.5213

Sr-89 Calibration



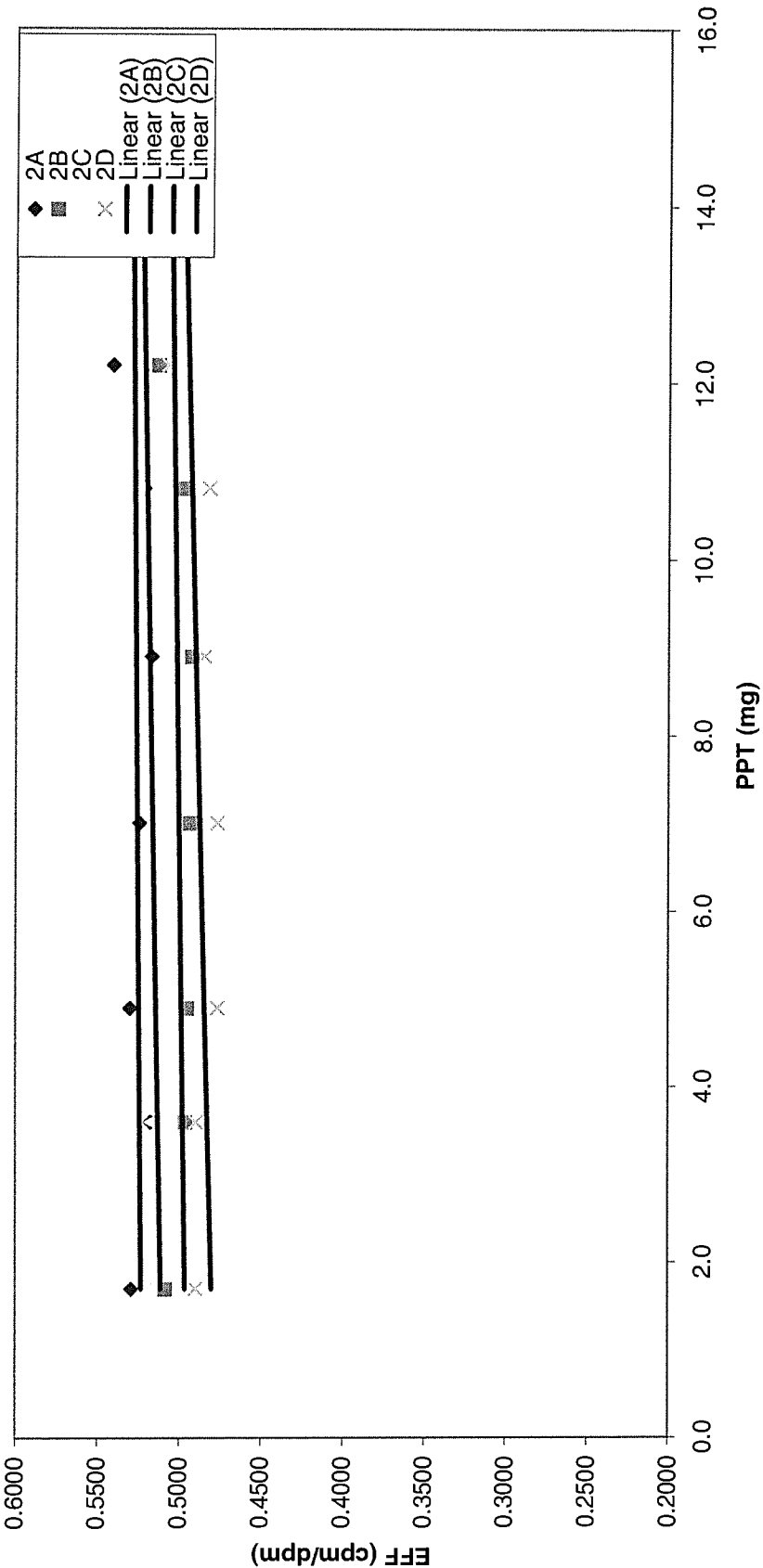
$$1A y = -1.823061E-04x + 5.312753E-01$$

$$1B y = -2.838927E-04x + 5.337135E-01$$

$$1C y = -3.407366E-05x + 5.382307E-01$$

$$1D y = -1.084148E-04x + 5.322082E-01$$

Sr-89 Calibration



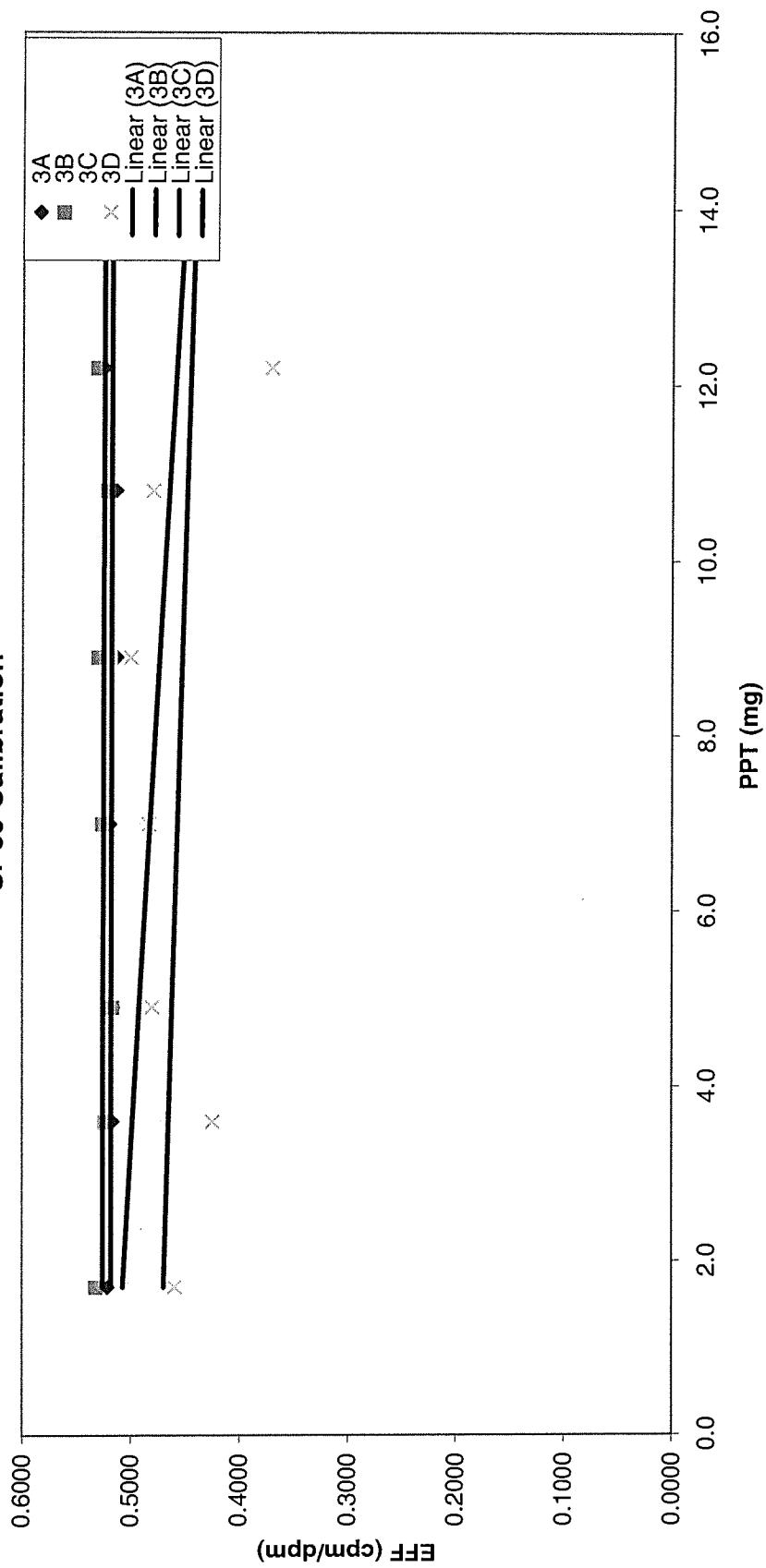
2A $y = 4.989765E-04x + 5.221775E-01$

2B $y = 7.319898E-04x + 4.951047E-01$

2C $y = 9.905720E-04x + 5.093624E-01$

2D $y = 1.395366E-03x + 4.777639E-01$

Sr-89 Calibration



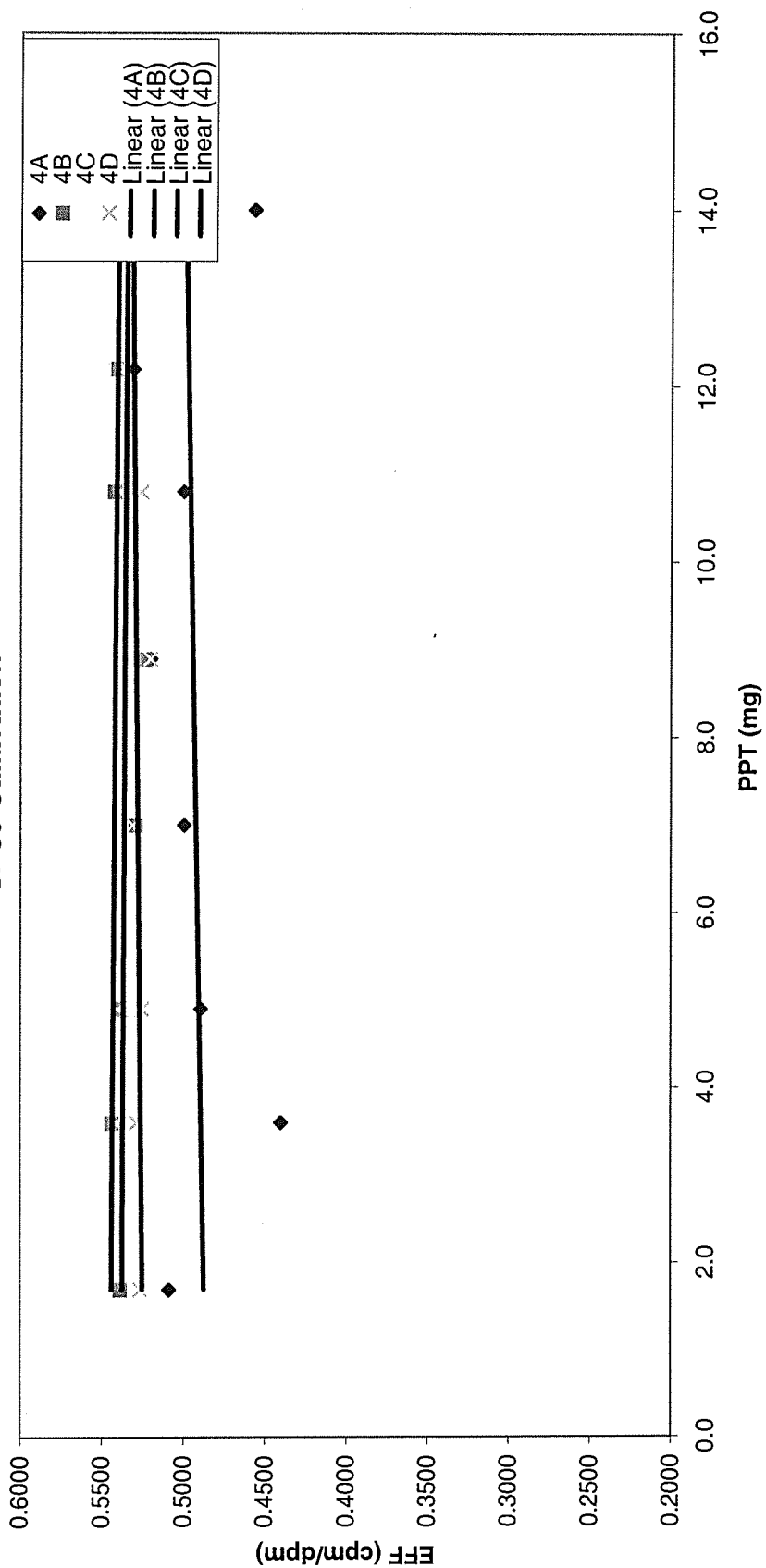
3A $y = 4.501234E-07x + 5.180758E-01$

3B $y = -5.611259E-05x + 5.259466E-01$

3C $y = -4.632474E-03x + 5.151621E-01$

3D $y = -2.314594E-03x + 4.735880E-01$

Sr-89 Calibration



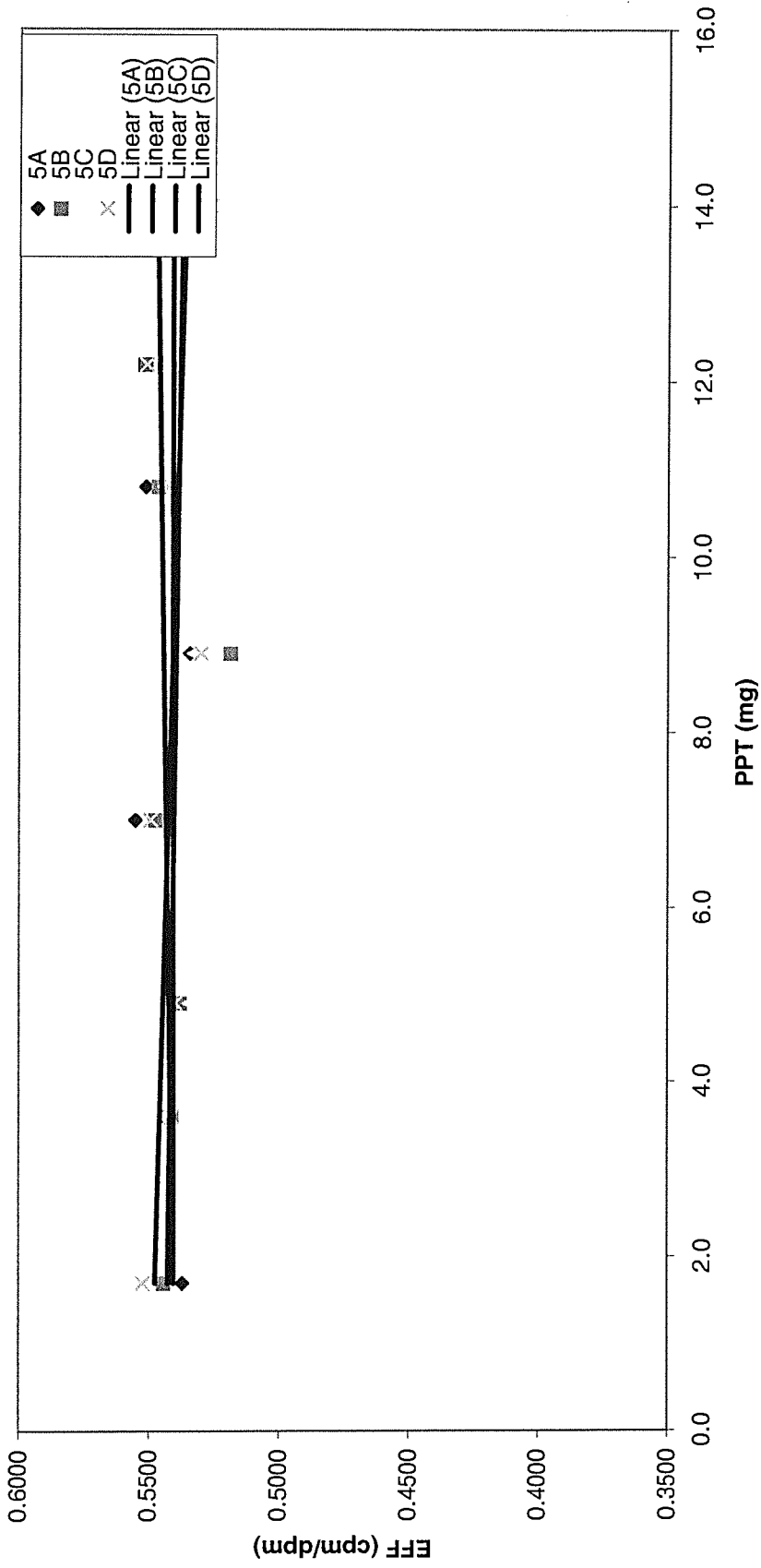
4A $y = 9.578653E-04x + 4.857303E-01$

4B $y = -1.896340E-04x + 5.378339E-01$

4C $y = -3.039450E-04x + 5.445981E-01$

4D $y = 5.621623E-04x + 5.242219E-01$

Sr-89 Calibration



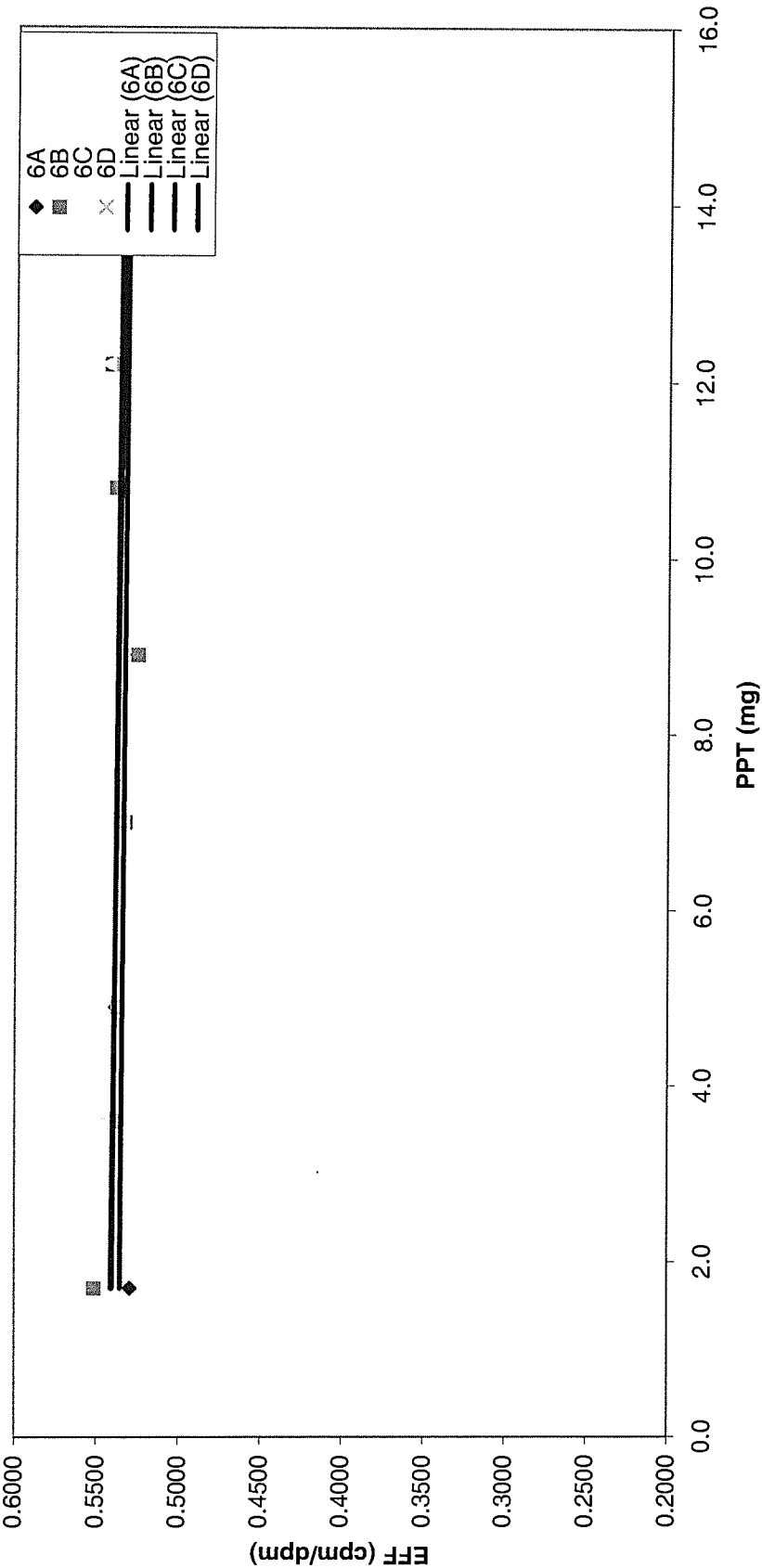
$$5A y = 5.321721E-04x + 5.397702E-01$$

$$5B y = 6.229218E-05x + 5.403352E-01$$

$$5C y = -4.256179E-04x + 5.434629E-01$$

$$5D y = -9.368761E-04x + 5.492070E-01$$

Sr-89 Calibration



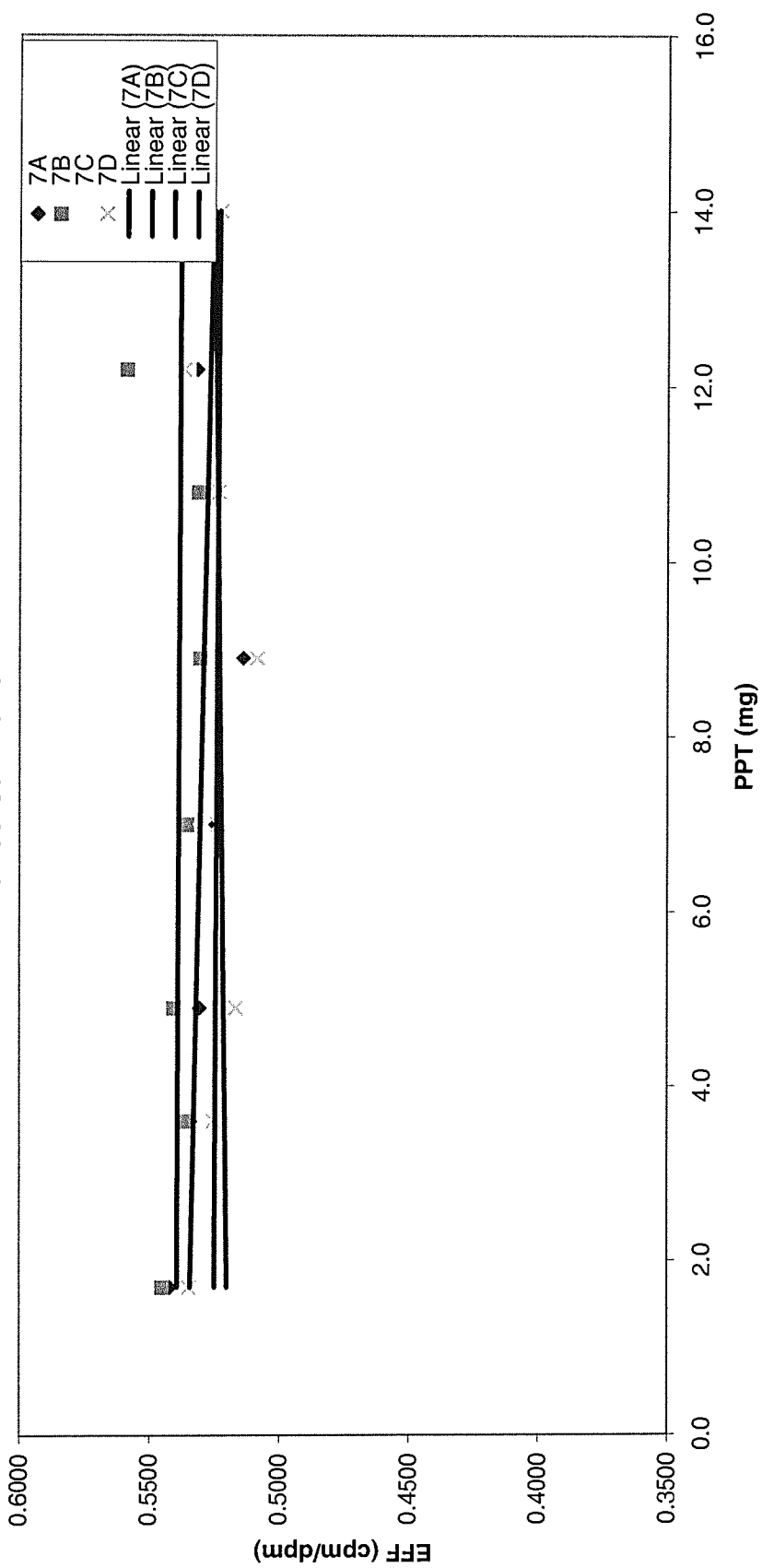
6A $y = -2.954615E-04x + 5.360409E-01$

6B $y = -5.486034E-04x + 5.421619E-01$

6C $y = -3.703655E-04x + 5.409769E-01$

6D

Sr-89 Calibration



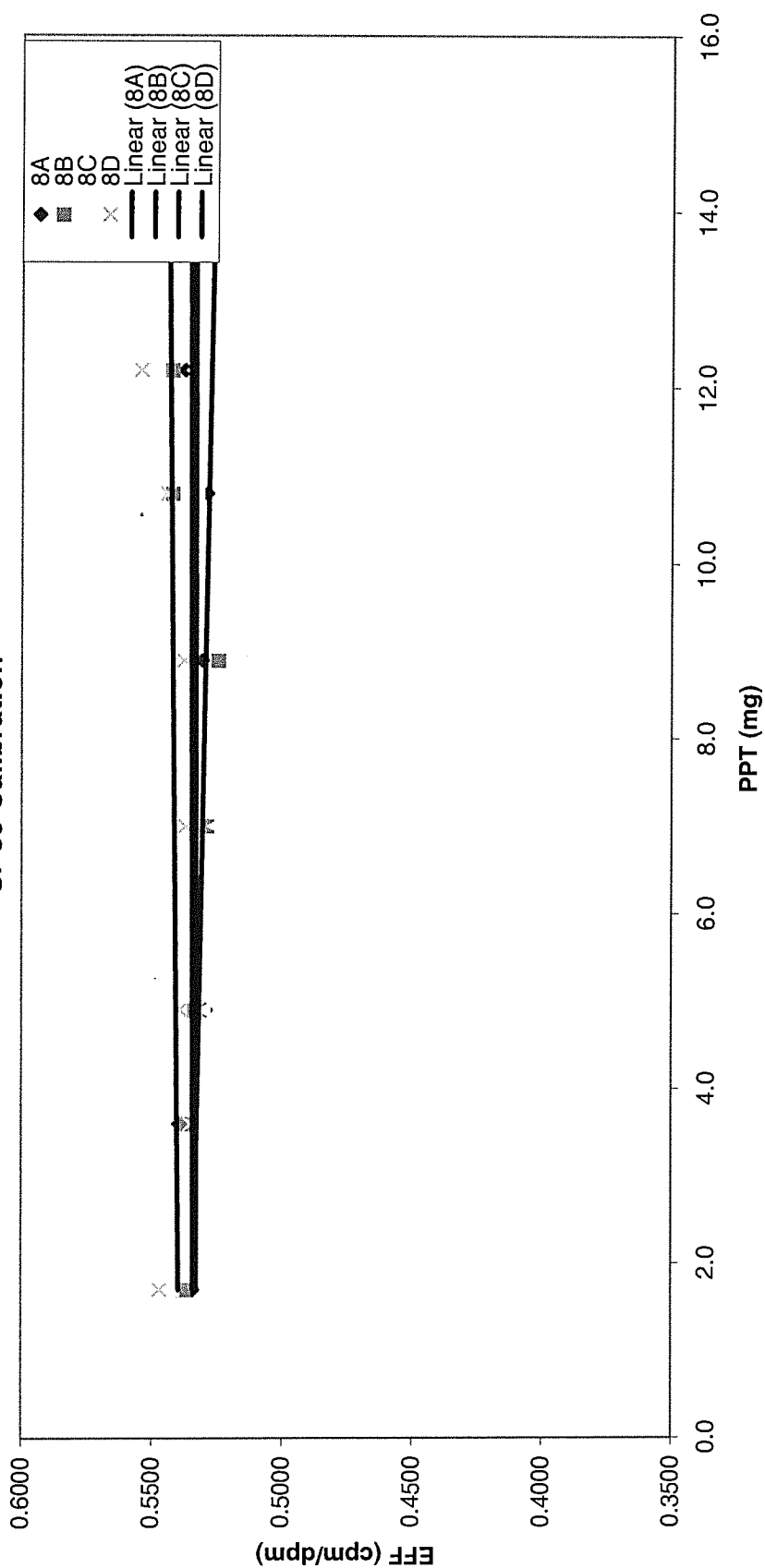
$$7A y = -7.074090E-04x + 5.354467E-01$$

$$7B y = -9.136013E-05x + 5.394258E-01$$

$$7C y = 4.128261E-04x + 5.194104E-01$$

$$7D y = -1.369024E-04x + 5.251294E-01$$

Sr-89 Calibration



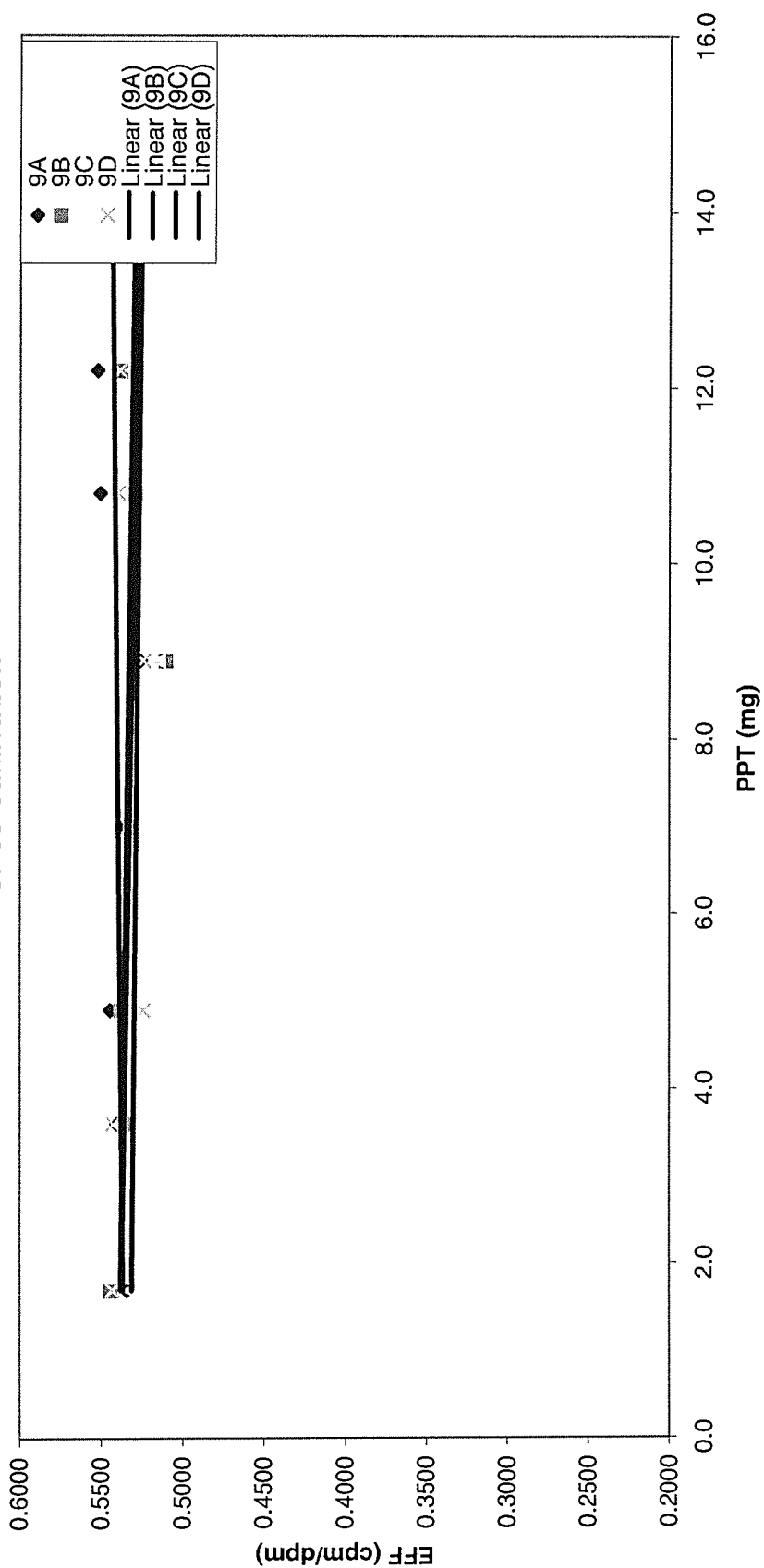
$$8A y = 5.558633E-05x + 5.327234E-01$$

$$8B y = 1.046295E-04x + 5.339323E-01$$

$$8C y = -6.019048E-04x + 5.348826E-01$$

$$8D y = 3.423211E-04x + 5.390479E-01$$

Sr-89 Calibration



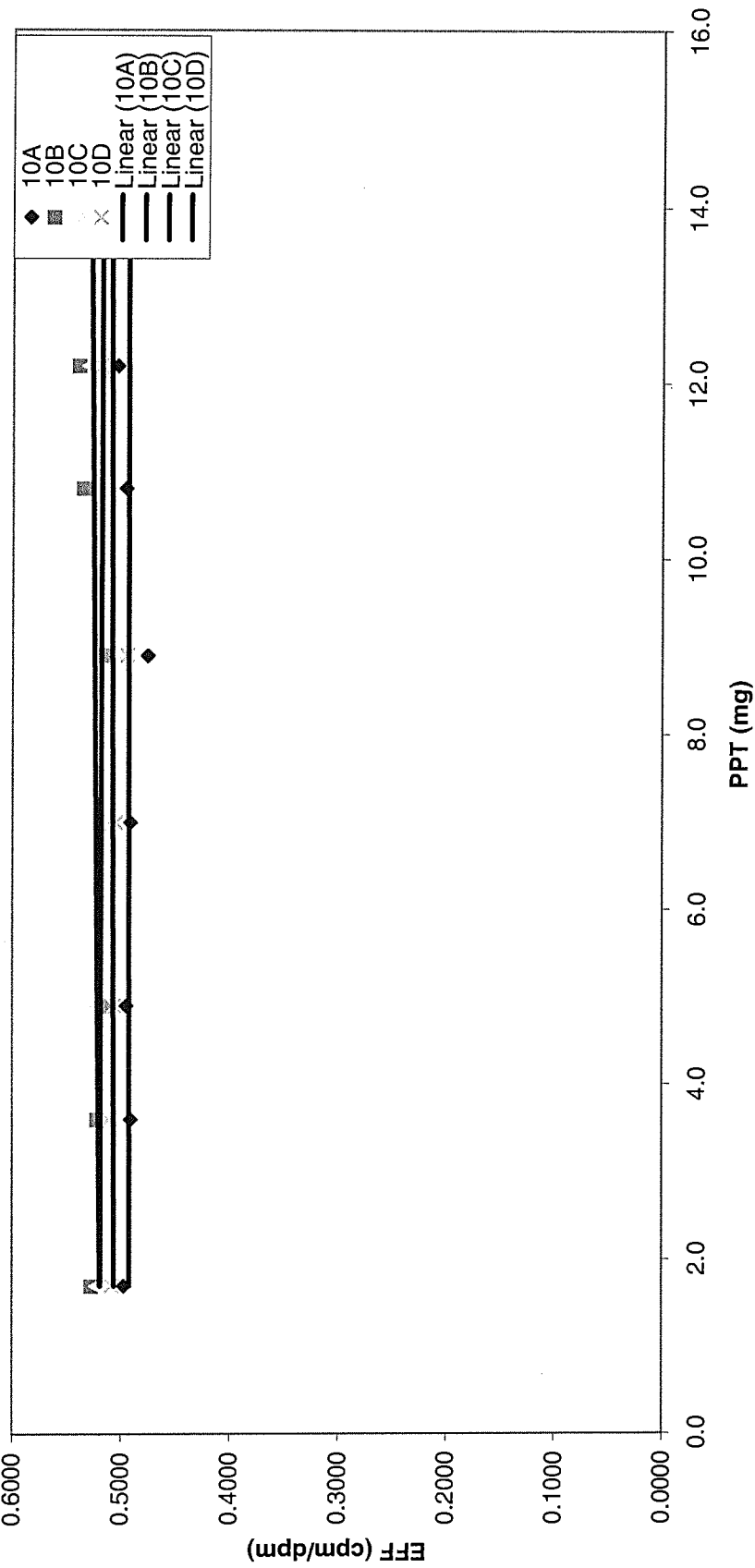
9A $y = 5.669070E-04x + 5.358253E-01$

9B $y = -9.242080E-04x + 5.392862E-01$

9C $y = -4.813122E-04x + 5.321824E-01$

9D $y = -6.958040E-04x + 5.393922E-01$

Sr-89 Calibration



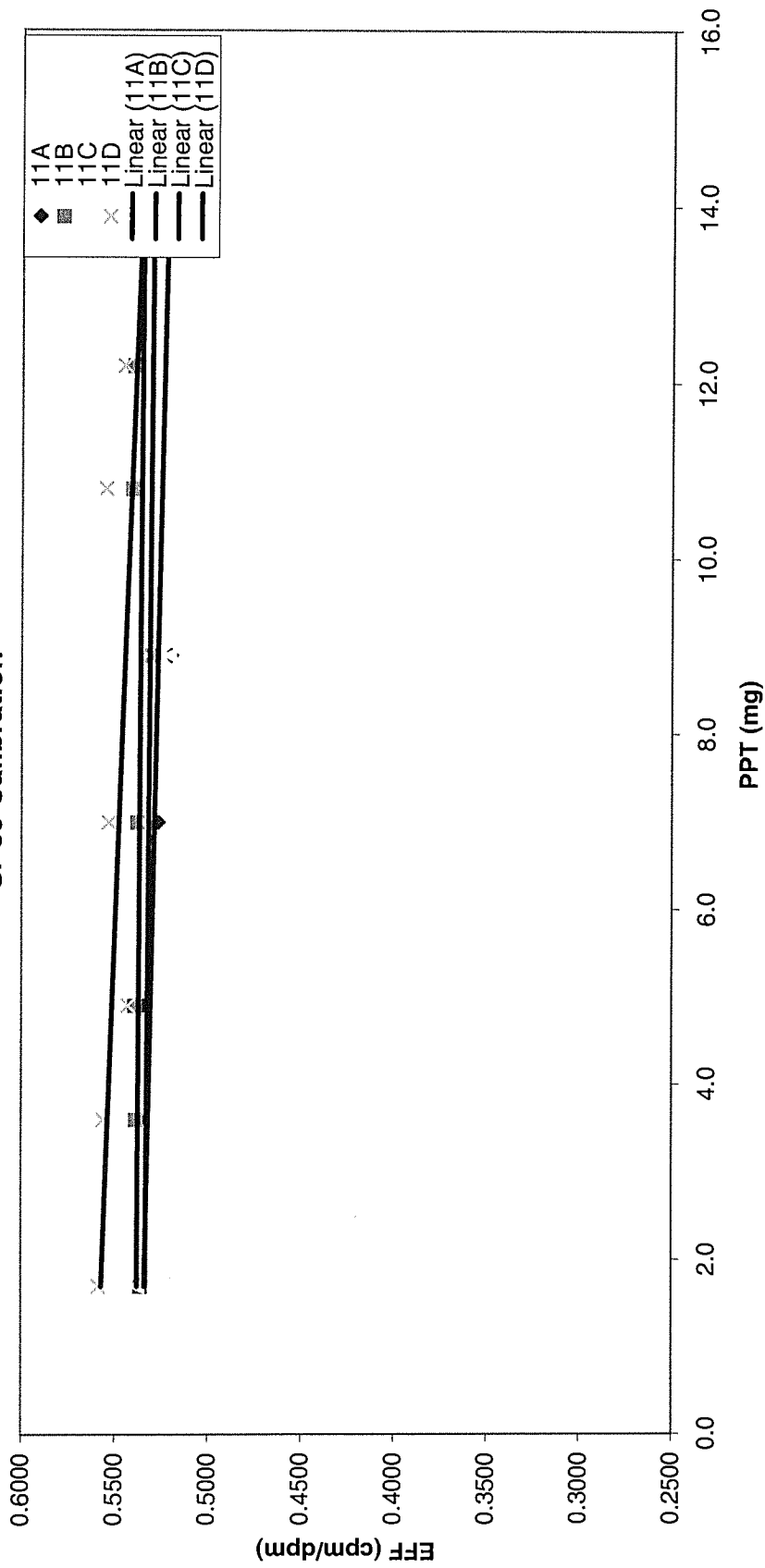
10A $y = 1.493597E-04x + 4.917867E-01$

10B $y = 7.339074E-04x + 5.180304E-01$

10C $y = -6.789001E-05x + 5.188094E-01$

10D $y = 2.808326E-04x + 5.056566E-01$

Sr-89 Calibration



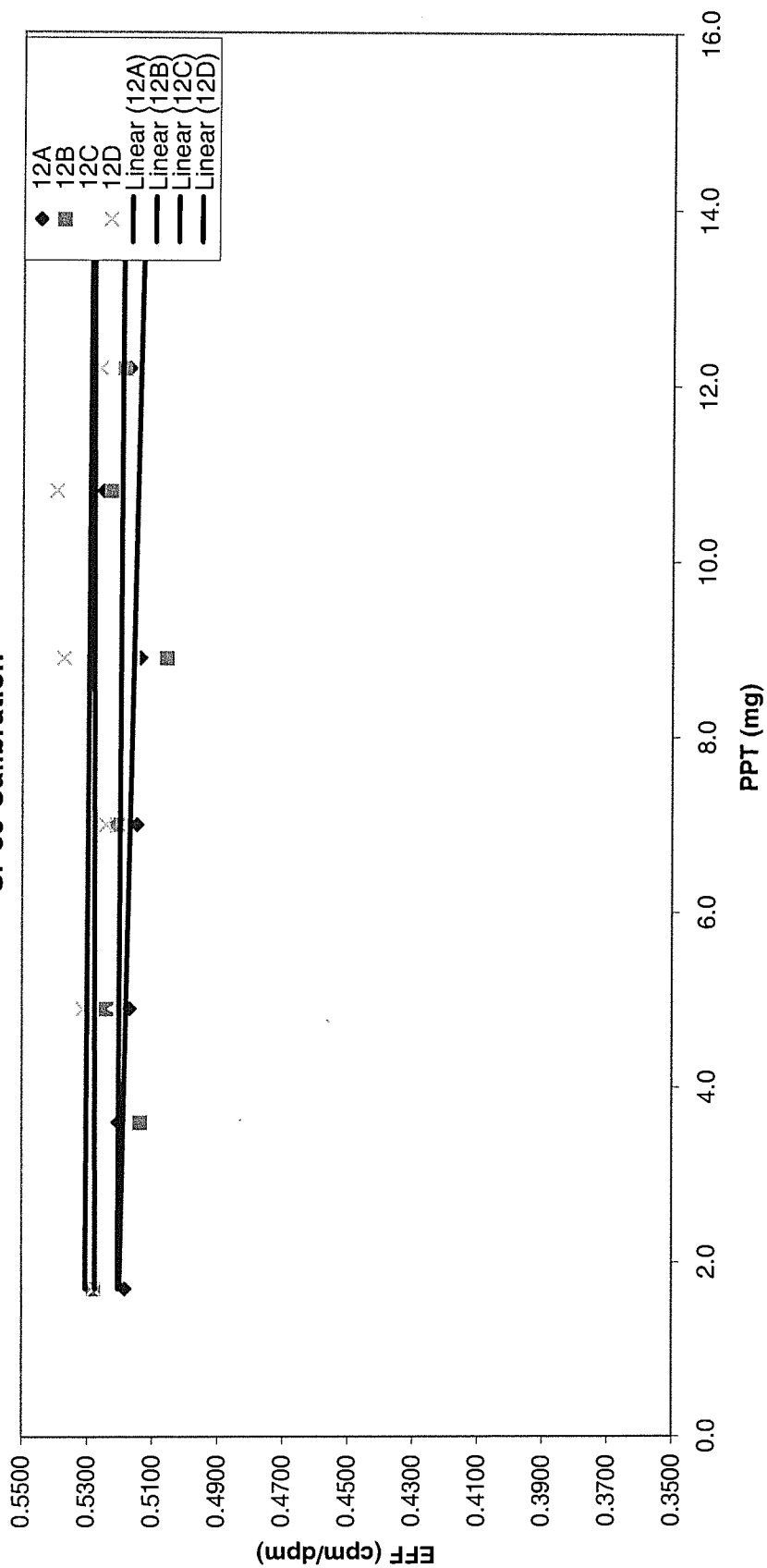
11A $y = -2.889431E-04x + 5.338425E-01$

11B $y = -2.058842E-04x + 5.382118E-01$

11C $y = -9.576148E-04x + 5.354543E-01$

11D $y = -1.720957E-03x + 5.598722E-01$

Sr-89 Calibration



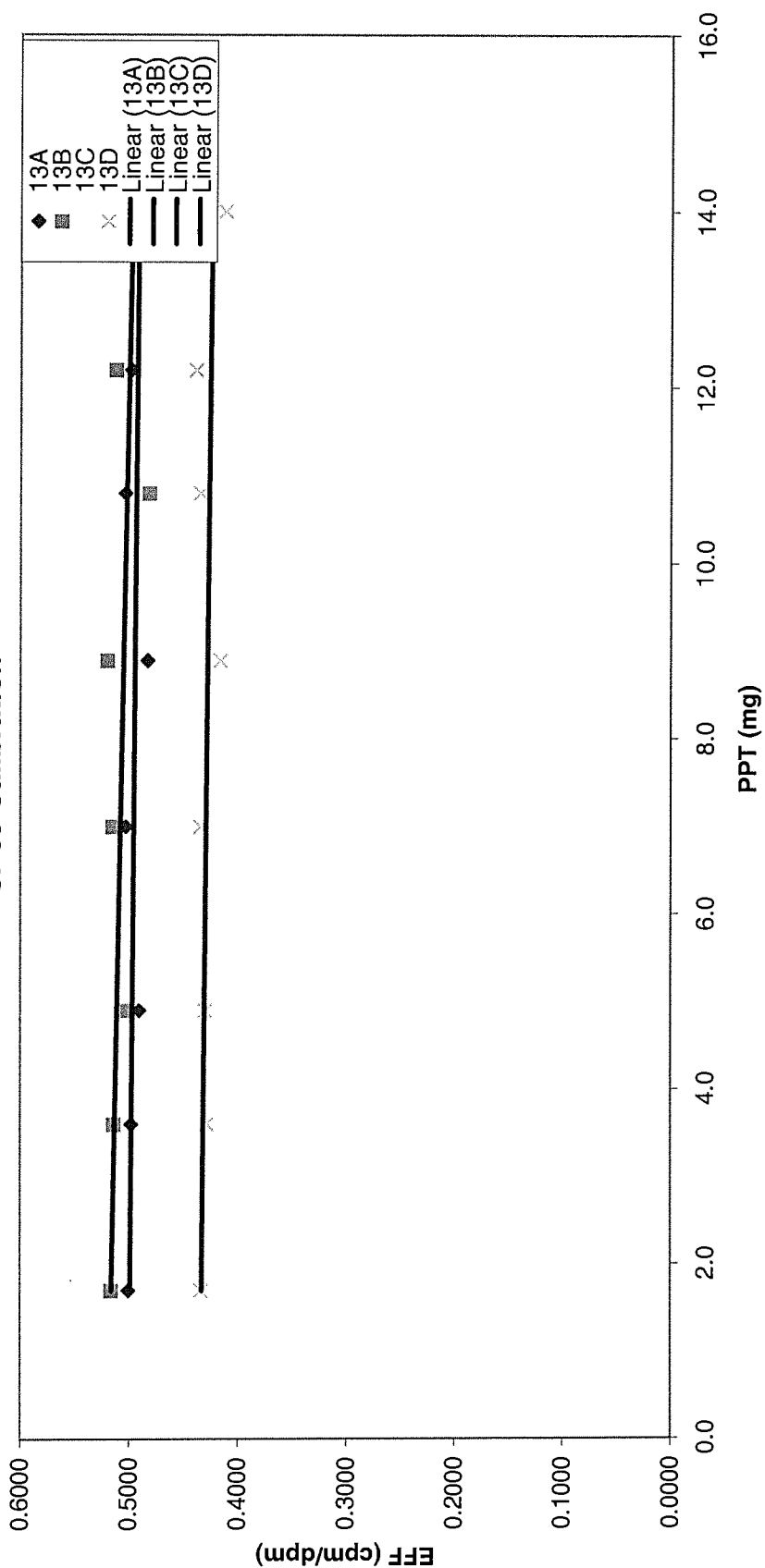
$$12A \quad y = -5.813029E-04x + 5.210444E-01$$

$$12B \quad y = -1.020456E-04x + 5.207035E-01$$

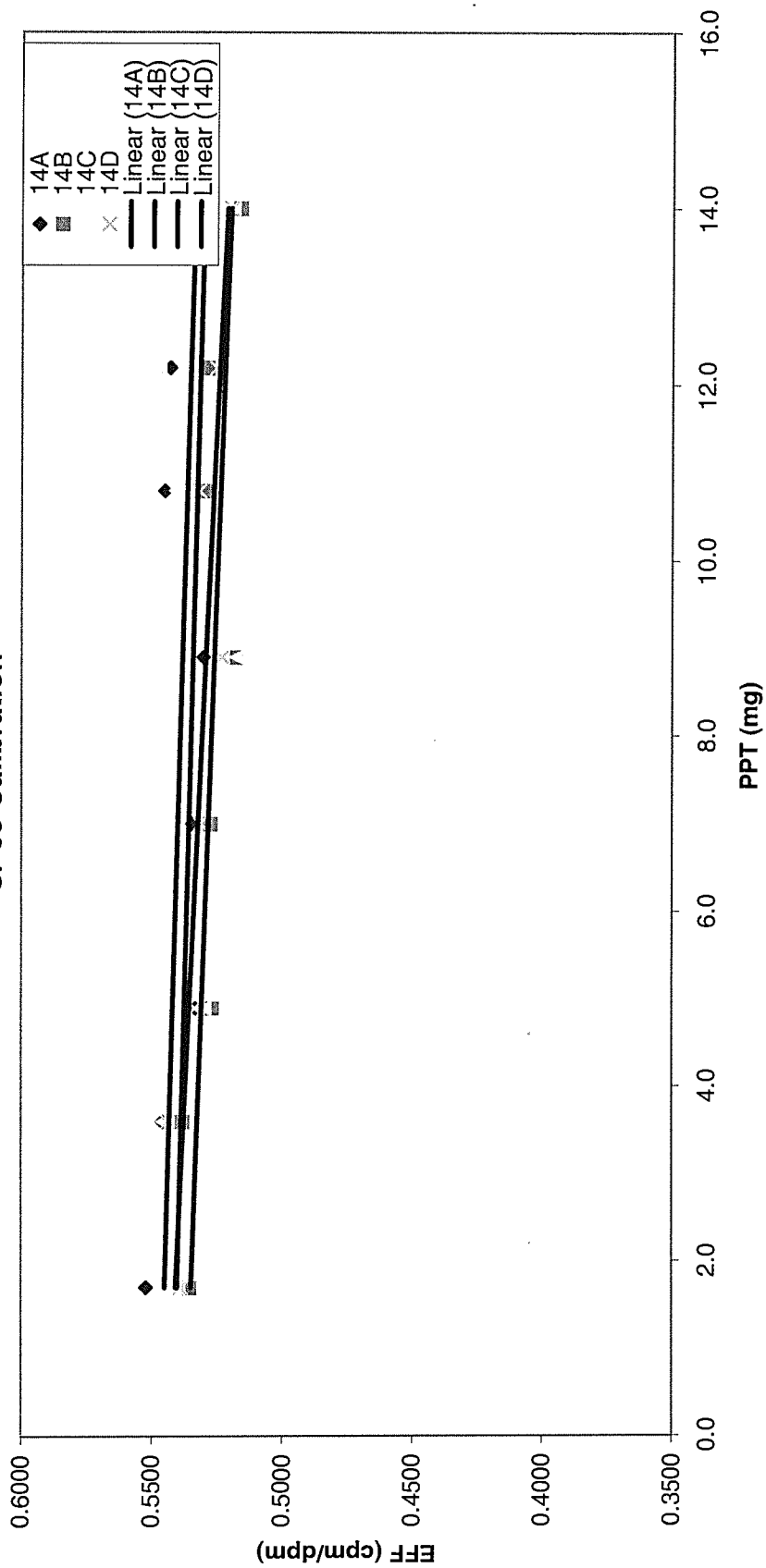
$$12C \quad y = 6.533601E-05x + 5.273823E-01$$

$$12D \quad y = -1.218315E-04x + 5.306928E-01$$

Sr-89 Calibration



Sr-89 Calibration



14A $y = -9.256442E-04x + 5.465238E-01$

14B $y = -1.210656E-03x + 5.369225E-01$

14C $y = -8.225808E-04x + 5.415484E-01$

14D $y = -1.579363E-03x + 5.434485E-01$

Current Calibration - PIC

Geometry	Tuffryn Filter	4/1/2016	Exp Date	2/28/2017	
Sr-89	Cal Date	A1	A2	A3	A4
Protean	A0				
1A	5.312753E-01	-1.823061E-04			
1B	5.337135E-01	-2.838927E-04			
1C	5.382307E-01	-3.407366E-05			
1D	5.322082E-01	-1.084148E-04			
2A	5.221775E-01	4.989765E-04			
2B	4.951047E-01	7.319898E-04			
2C	5.093624E-01	9.905720E-04			
2D	4.777639E-01	1.395366E-03			
3A	5.180758E-01	4.501234E-07			
3B	5.259466E-01	-5.611259E-05			
3C	5.151621E-01	-4.632474E-03			
3D	4.735880E-01	-2.314594E-03			
4A	4.857303E-01	9.578653E-04			
4B	5.378339E-01	-1.896340E-04			
4C	5.445981E-01	-3.039450E-04			
4D	5.242219E-01	5.621623E-04			
5A	5.397702E-01	5.321721E-04			
5B	5.403352E-01	6.229218E-05			
5C	5.434629E-01	-4.256179E-04			
5D	5.492070E-01	-9.368761E-04			
6A	5.360409E-01	-2.954615E-04			
6B	5.421619E-01	-5.486034E-04			
6C	5.409769E-01	-3.703655E-04			
6D	#N/A	#N/A			
7A	5.354467E-01	-7.074090E-04			
7B	5.394258E-01	-9.136013E-05			
7C	5.194104E-01	4.128261E-04			
7D	5.251294E-01	-1.369024E-04			
8A	5.327234E-01	5.558633E-05			
8B	5.339323E-01	1.046295E-04			
8C	5.348826E-01	-6.019048E-04			
8D	5.390479E-01	3.423211E-04			
9A	5.358253E-01	5.669070E-04			
9B	5.392862E-01	-9.242080E-04			
9C	5.321824E-01	-4.813122E-04			
9D	5.393922E-01	-6.958040E-04			
10A	4.917867E-01	1.493597E-04			
10B	5.180304E-01	7.339074E-04			
10C	5.188094E-01	-6.789001E-05			
10D	5.056566E-01	2.808326E-04			
11A	5.338425E-01	-2.889431E-04			
11B	5.382118E-01	-2.058842E-04			
11C	5.354543E-01	-9.576148E-04			
11D	5.598722E-01	-1.720957E-03			
12A	5.210444E-01	-5.813029E-04			
12B	5.207035E-01	-1.020456E-04			
12C	5.273823E-01	6.533601E-05			
12D	5.306928E-01	-1.218315E-04			
13A	4.998331E-01	-5.848099E-04			
13B	5.185476E-01	-1.510691E-03			
13C	#N/A	#N/A			
13D	4.340833E-01	-6.950143E-04			
14A	5.465238E-01	-9.256442E-04			
14B	5.369225E-01	-1.210656E-03			
14C	5.415484E-01	-8.225808E-04			
14D	5.434485E-01	-1.579363E-03			

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
C1	10A	2	0	11343	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C2	10A	2	0	11861	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C3	10A	2	1	10851	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C4	10A	2	1	11547	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C5	10A	2	0	11374	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C6	10A	2	1	11975	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C7	10A	2	0	11786	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C8	10A	2	0	11597	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C1	10B	2	2	12025	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C2	10B	2	7	12608	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C3	10B	2	3	11275	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C4	10B	2	4	12156	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C5	10B	2	5	12288	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C6	10B	2	3	12928	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C7	10B	2	6	12615	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C8	10B	2	3	12246	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C1	10C	2	3	11924	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C2	10C	2	1	12409	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C3	10C	2	4	11567	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C4	10C	2	1	12180	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C5	10C	2	2	11909	2/13/2016 12:38	2/13/2016 12:40	PIC	SR89C16
C6	10C	2	6	12500	2/13/2016 12:35	2/13/2016 12:37	PIC	SR89C16
C7	10C	2	3	12404	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C8	10C	2	3	12165	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C1	10D	2	1	11599	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C2	10D	2	0	12344	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C3	10D	2	1	12527	2/13/2016 12:38	2/13/2016 12:40	PIC	SR89C16
C3	10D	2	0	11102	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C4	10D	2	0	11872	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C5	10D	2	0	11821	2/13/2016 12:41	2/13/2016 12:43	PIC	SR89C16
C7	10D	2	0	12137	2/13/2016 12:35	2/13/2016 12:37	PIC	SR89C16
C8	10D	2	0	11972	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C1	11A	2	0	12240	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C2	11A	2	0	12864	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C3	11A	2	0	11721	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C4	11A	2	0	12367	2/13/2016 13:01	2/13/2016 13:03	PIC	SR89C16

C5	11A	2	0	12418	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C6	11A	2	1	13026	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C7	11A	2	1	12533	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C8	11A	2	0	12375	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C1	11B	2	0	12226	2/13/2016 13:01	2/13/2016 13:03	PIC	SR89C16
C2	11B	2	0	13006	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C3	11B	2	0	11817	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C4	11B	2	0	12632	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C5	11B	2	0	12659	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C6	11B	2	0	13058	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C7	11B	2	0	12620	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C8	11B	2	0	12472	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C1	11C	2	1	12263	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C2	11C	2	0	12809	2/13/2016 13:01	2/13/2016 13:03	PIC	SR89C16
C3	11C	2	0	11453	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C4	11C	2	0	12528	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C5	11C	2	0	12439	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C6	11C	2	0	12902	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C7	11C	2	0	12475	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C8	11C	2	0	12001	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C1	11D	2	0	12747	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C2	11D	2	0	13426	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C3	11D	2	1	11899	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C4	11D	2	1	12990	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C5	11D	2	0	12735	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C6	11D	2	0	13403	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C7	11D	2	0	12746	2/13/2016 13:15	2/13/2016 13:17	PIC	SR89C16
C8	11D	2	0	12369	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C1	12A	2	0	11826	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C2	12A	2	0	12570	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C3	12A	2	1	11331	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C4	12A	2	0	12092	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16
C5	12A	2	1	12276	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C6	12A	2	0	12688	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C7	12A	2	0	12100	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C8	12A	2	0	11845	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C1	12B	2	0	12043	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16

C2	12B	2	0	12407	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C3	12B	2	0	11486	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C4	12B	2	0	12229	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C5	12B	2	0	12081	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C6	12B	2	0	12628	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C7	12B	2	0	12134	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C8	12B	2	1	12339	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C1	12C	2	0	12170	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C2	12C	2	2	12865	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16
C3	12C	2	0	11428	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C4	12C	2	0	12174	2/13/2016 13:22	2/13/2016 13:24	PIC	SR89C16
C5	12C	2	0	12339	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C6	12C	2	2	13043	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C7	12C	2	0	12572	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C8	12C	2	0	12286	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C1	12D	2	0	12042	2/13/2016 13:23	2/13/2016 13:25	PIC	SR89C16
C2	12D	2	0	12787	2/13/2016 13:19	2/13/2016 13:21	PIC	SR89C16
C3	12D	2	1	11643	2/13/2016 13:16	2/13/2016 13:18	PIC	SR89C16
C4	12D	2	0	12314	2/13/2016 13:12	2/13/2016 13:14	PIC	SR89C16
C5	12D	2	0	12837	2/13/2016 13:08	2/13/2016 13:10	PIC	SR89C16
C6	12D	2	1	13037	2/13/2016 13:05	2/13/2016 13:07	PIC	SR89C16
C7	12D	2	1	12313	2/13/2016 13:02	2/13/2016 13:04	PIC	SR89C16
C8	12D	2	0	12244	2/13/2016 12:58	2/13/2016 13:00	PIC	SR89C16
C1	13A	2	0	11415	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C2	13A	2	3	12024	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C3	13A	2	1	10754	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C4	13A	2	0	11814	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C5	13A	2	0	11536	2/13/2016 13:38	2/13/2016 13:40	PIC	SR89C16
C6	13A	2	4	12158	2/13/2016 13:49	2/13/2016 13:51	PIC	SR89C16
C7	13A	2	3	11644	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C8	13A	2	1	11382	2/13/2016 13:41	2/13/2016 13:43	PIC	SR89C16
C1	13B	2	2	11770	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
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C3	13B	2	0	10984	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C4	13B	2	0	12093	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C5	13B	2	0	12415	2/13/2016 13:38	2/13/2016 13:40	PIC	SR89C16
C6	13B	3	3	15859	2/20/2016 11:50	2/20/2016 11:53	PIC	SR89C16

C7	13B	2	1	11979	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
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C1	13D	2	5	9891	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
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C3	13D	2	1	9430	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C4	13D	2	0	10192	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C5	13D	2	10	9942	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C6	13D	2	9	10496	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C7	13D	2	7	10265	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C8	13D	2	0	9675	2/13/2016 13:38	2/13/2016 13:40	PIC	SR89C16
C1	14A	2	0	12594	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C2	14A	2	0	13180	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C3	14A	2	0	11684	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C4	14A	2	2	12548	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C5	14A	2	0	12664	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C6	14A	2	1	13167	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C7	14A	2	0	12700	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C8	14A	2	0	12428	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C1	14B	2	0	12207	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C2	14B	2	2	12992	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C3	14B	2	0	11542	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C4	14B	2	2	12382	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C5	14B	2	0	12355	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C6	14B	2	0	12776	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C7	14B	2	0	12365	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C8	14B	2	0	12122	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C1	14C	2	1	12309	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C2	14C	2	0	13176	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16
C3	14C	2	0	11611	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C4	14C	2	0	12686	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C5	14C	2	1	12353	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C6	14C	2	0	13062	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C7	14C	2	2	12801	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C8	14C	2	0	12190	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C1	14D	2	1	12285	2/13/2016 13:50	2/13/2016 13:52	PIC	SR89C16
C2	14D	2	2	13132	2/13/2016 13:46	2/13/2016 13:48	PIC	SR89C16
C3	14D	2	1	11689	2/13/2016 13:42	2/13/2016 13:44	PIC	SR89C16

C4	14D	2	6	12477	2/13/2016 13:39	2/13/2016 13:41	PIC	SR89C16
C5	14D	2	0	12497	2/13/2016 13:35	2/13/2016 13:37	PIC	SR89C16
C6	14D	2	0	12844	2/13/2016 13:32	2/13/2016 13:34	PIC	SR89C16
C7	14D	2	0	12286	2/13/2016 13:29	2/13/2016 13:31	PIC	SR89C16
C8	14D	2	0	12206	2/13/2016 13:26	2/13/2016 13:28	PIC	SR89C16
C1	1A	2	1	12427	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C2	1A	2	0	13208	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C3	1A	2	1	11754	2/12/2016 6:50	2/12/2016 6:52	PIC	SR89C16
C4	1A	2	2	12491	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C5	1A	2	2	12583	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16
C6	1A	2	4	13067	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C7	1A	2	2	12713	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C8	1A	2	0	12717	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C1	1B	2	12	12488	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C2	1B	2	6	13267	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C3	1B	2	4	11650	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C4	1B	2	13	12651	2/12/2016 6:50	2/12/2016 6:52	PIC	SR89C16
C5	1B	2	8	12841	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C6	1B	2	10	12903	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16
C7	1B	2	9	12701	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C8	1B	2	14	12779	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C1	1C	2	86	12525	2/12/2016 6:50	2/12/2016 6:52	PIC	SR89C16
C2	1C	2	88	13293	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C3	1C	2	84	11907	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C4	1C	2	89	12818	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C5	1C	2	85	13004	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C6	1C	2	91	13177	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C7	1C	2	93	13095	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16
C8	1C	2	85	12691	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C1	1D	2	74	12483	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C2	1D	2	68	12948	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C3	1D	2	60	11880	2/12/2016 6:42	2/12/2016 6:44	PIC	SR89C16
C4	1D	2	67	12591	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C5	1D	2	65	12829	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C6	1D	2	63	13063	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C7	1D	2	60	12875	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C8	1D	2	46	12566	2/12/2016 6:58	2/12/2016 7:00	PIC	SR89C16

C1	2A	2	6	12279	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C2	2A	2	5	12709	2/12/2016 7:12	2/12/2016 7:14	PIC	SR89C16
C3	2A	2	2	11820	2/12/2016 7:07	2/12/2016 7:09	PIC	SR89C16
C4	2A	2	5	12528	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C5	2A	2	6	12570	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C6	2A	2	1	12822	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C7	2A	2	5	12867	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C8	2A	2	3	12631	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C1	2B	2	0	11795	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C2	2B	2	0	12190	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C3	2B	2	0	11039	2/12/2016 7:13	2/12/2016 7:15	PIC	SR89C16
C4	2B	2	0	11792	2/12/2016 7:08	2/12/2016 7:10	PIC	SR89C16
C5	2B	2	0	11966	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C6	2B	2	0	12226	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C7	2B	2	0	12210	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C8	2B	2	0	12216	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C1	2C	2	9	12076	2/12/2016 7:08	2/12/2016 7:10	PIC	SR89C16
C2	2C	2	6	12701	2/12/2016 7:03	2/12/2016 7:05	PIC	SR89C16
C3	2C	2	12	11357	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C4	2C	2	8	12114	2/12/2016 7:13	2/12/2016 7:15	PIC	SR89C16
C5	2C	2	12	12228	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C6	2C	2	9	12933	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C7	2C	2	15	12558	2/12/2016 6:36	2/12/2016 6:38	PIC	SR89C16
C8	2C	2	5	12588	2/12/2016 6:55	2/12/2016 6:57	PIC	SR89C16
C1	2D	2	0	11364	2/12/2016 7:13	2/12/2016 7:15	PIC	SR89C16
C2	2D	2	0	12029	2/12/2016 7:08	2/12/2016 7:10	PIC	SR89C16
C3	2D	2	0	10628	2/12/2016 7:04	2/12/2016 7:06	PIC	SR89C16
C4	2D	2	0	11391	2/12/2016 6:59	2/12/2016 7:01	PIC	SR89C16
C5	2D	2	0	11786	2/12/2016 6:56	2/12/2016 6:58	PIC	SR89C16
C6	2D	2	0	11842	2/12/2016 6:51	2/12/2016 6:53	PIC	SR89C16
C7	2D	2	0	12068	2/12/2016 6:43	2/12/2016 6:45	PIC	SR89C16
C8	2D	2	0	12036	2/12/2016 6:37	2/12/2016 6:39	PIC	SR89C16
C1	3A	2	195	12099	2/12/2016 7:17	2/12/2016 7:19	PIC	SR89C16
C2	3A	2	158	12697	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C3	3A	2	171	11515	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C4	3A	2	197	12412	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C5	3A	2	160	12472	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16

C6	3A	2	176	12621	2/12/2016 7:47	2/12/2016 7:49	PIC	SR89C16
C7	3A	2	201	12498	2/12/2016 7:44	2/12/2016 7:46	PIC	SR89C16
C8	3A	2	151	12362	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C1	3B	2	81	12341	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C2	3B	2	86	12861	2/12/2016 7:17	2/12/2016 7:19	PIC	SR89C16
C3	3B	2	65	11526	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C4	3B	2	76	12573	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C5	3B	2	89	12877	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C6	3B	2	81	12819	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16
C7	3B	2	60	12635	2/12/2016 7:47	2/12/2016 7:49	PIC	SR89C16
C8	3B	2	84	12471	2/12/2016 7:44	2/12/2016 7:46	PIC	SR89C16
C1	3C	3	63	15683	2/20/2016 11:56	2/20/2016 11:59	PIC	SR89C16
C2	3C	2	45	10521	2/20/2016 11:25	2/20/2016 11:27	PIC	SR89C16
C3	3C	3	83	14628	2/20/2016 12:13	2/20/2016 12:16	PIC	SR89C16
C4	3C	3	69	15762	2/20/2016 12:19	2/20/2016 12:22	PIC	SR89C16
C5	3C	3	82	16928	2/20/2016 11:35	2/20/2016 11:38	PIC	SR89C16
C6	3C	3	60	16450	2/20/2016 11:40	2/20/2016 11:43	PIC	SR89C16
C7	3C	3	34	12123	2/20/2016 11:46	2/20/2016 11:49	PIC	SR89C16
C8	3C	3	63	14890	2/20/2016 11:50	2/20/2016 11:53	PIC	SR89C16
C1	3D	2	16	9525	2/20/2016 11:26	2/20/2016 11:28	PIC	SR89C16
C2	3D	3	21	13991	2/20/2016 11:56	2/20/2016 11:59	PIC	SR89C16
C3	3D	3	20	14344	2/20/2016 12:19	2/20/2016 12:22	PIC	SR89C16
C4	3D	3	33	15478	2/20/2016 12:13	2/20/2016 12:16	PIC	SR89C16
C5	3D	3	30	16293	2/20/2016 11:40	2/20/2016 11:43	PIC	SR89C16
C6	3D	3	27	15808	2/20/2016 11:36	2/20/2016 11:39	PIC	SR89C16
C7	3D	3	24	11821	2/20/2016 11:50	2/20/2016 11:53	PIC	SR89C16
C8	3D	3	18	14240	2/20/2016 11:46	2/20/2016 11:49	PIC	SR89C16
C1	4A	3	55	15827	2/20/2016 11:40	2/20/2016 11:43	PIC	SR89C16
C2	4A	3	50	14499	2/20/2016 11:46	2/20/2016 11:49	PIC	SR89C16
C3	4A	3	38	14629	2/20/2016 11:51	2/20/2016 11:54	PIC	SR89C16
C4	4A	3	54	15998	2/20/2016 11:56	2/20/2016 11:59	PIC	SR89C16
C5	4A	3	67	16942	2/20/2016 12:13	2/20/2016 12:16	PIC	SR89C16
C6	4A	3	49	16472	2/20/2016 12:19	2/20/2016 12:22	PIC	SR89C16
C7	4A	2	41	12633	2/12/2016 7:29	2/12/2016 7:31	PIC	SR89C16
C8	4A	3	56	14634	2/20/2016 11:36	2/20/2016 11:39	PIC	SR89C16
C1	4B	2	0	12496	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C2	4B	2	0	13353	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16

C3	4B	2	0	11968	2/12/2016 7:48	2/12/2016 7:50	PIC	SR89C16
C4	4B	2	0	12643	2/12/2016 7:45	2/12/2016 7:47	PIC	SR89C16
C5	4B	2	0	12727	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C6	4B	2	0	13327	2/12/2016 7:17	2/12/2016 7:19	PIC	SR89C16
C7	4B	2	0	12883	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C8	4B	2	0	12764	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C1	4C	2	14	12761	2/12/2016 7:45	2/12/2016 7:47	PIC	SR89C16
C2	4C	2	20	13234	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C3	4C	2	25	11973	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16
C4	4C	2	17	13178	2/12/2016 7:48	2/12/2016 7:50	PIC	SR89C16
C5	4C	2	18	12993	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C6	4C	2	23	13186	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C7	4C	2	17	13083	2/12/2016 7:20	2/12/2016 7:22	PIC	SR89C16
C8	4C	2	20	12861	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C1	4D	2	87	12214	2/12/2016 7:48	2/12/2016 7:50	PIC	SR89C16
C2	4D	2	111	12985	2/12/2016 7:45	2/12/2016 7:47	PIC	SR89C16
C3	4D	2	100	11710	2/12/2016 7:41	2/12/2016 7:43	PIC	SR89C16
C4	4D	2	91	12689	2/12/2016 7:36	2/12/2016 7:38	PIC	SR89C16
C5	4D	2	104	12641	2/12/2016 7:32	2/12/2016 7:34	PIC	SR89C16
C6	4D	2	98	12926	2/12/2016 7:27	2/12/2016 7:29	PIC	SR89C16
C7	4D	2	100	12778	2/12/2016 7:24	2/12/2016 7:26	PIC	SR89C16
C8	4D	2	99	12754	2/12/2016 7:20	2/12/2016 7:22	PIC	SR89C16
C1	5A	2	22	12457	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C2	5A	2	24	13359	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C3	5A	2	20	11998	2/12/2016 7:58	2/12/2016 8:00	PIC	SR89C16
C4	5A	2	19	13258	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C5	5A	2	20	12979	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
C6	5A	2	27	13542	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16
C7	5A	2	22	13110	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C8	5A	2	10	12894	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C1	5B	2	22	12623	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C2	5B	2	26	13294	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C3	5B	2	18	11991	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C4	5B	2	31	13073	2/12/2016 7:59	2/12/2016 8:01	PIC	SR89C16
C5	5B	2	24	12595	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C6	5B	2	25	13425	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
C7	5B	2	23	13122	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16

C8	5B	2	21	12858	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C1	5C	2	26	12800	2/12/2016 7:59	2/12/2016 8:01	PIC	SR89C16
C2	5C	2	31	13380	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C3	5C	2	21	11910	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C4	5C	2	32	12654	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C5	5C	2	34	12938	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C6	5C	2	28	13368	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C7	5C	2	16	12990	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
C8	5C	2	31	12811	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16
C1	5D	2	27	12811	2/12/2016 8:02	2/12/2016 8:04	PIC	SR89C16
C2	5D	2	30	13302	2/12/2016 7:59	2/12/2016 8:01	PIC	SR89C16
C3	5D	2	27	12034	2/12/2016 7:55	2/12/2016 7:57	PIC	SR89C16
C4	5D	2	38	13117	2/12/2016 7:52	2/12/2016 7:54	PIC	SR89C16
C5	5D	2	38	12876	2/12/2016 8:18	2/12/2016 8:20	PIC	SR89C16
C6	5D	2	34	13332	2/12/2016 8:14	2/12/2016 8:16	PIC	SR89C16
C7	5D	2	37	13112	2/12/2016 8:10	2/12/2016 8:12	PIC	SR89C16
C8	5D	2	26	12580	2/12/2016 8:05	2/12/2016 8:07	PIC	SR89C16
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C2	6A	2	39	13280	2/12/2016 8:20	2/12/2016 8:22	PIC	SR89C16
C3	6A	2	33	12002	2/12/2016 8:16	2/12/2016 8:18	PIC	SR89C16
C4	6A	2	29	12744	2/12/2016 8:12	2/12/2016 8:14	PIC	SR89C16
C5	6A	2	22	12775	2/12/2016 7:53	2/12/2016 7:55	PIC	SR89C16
C6	6A	2	32	13076	2/12/2016 8:04	2/12/2016 8:06	PIC	SR89C16
C7	6A	2	36	12916	2/12/2016 8:00	2/12/2016 8:02	PIC	SR89C16
C8	6A	2	31	12551	2/12/2016 7:57	2/12/2016 7:59	PIC	SR89C16
C1	6B	2	37	12782	2/12/2016 8:12	2/12/2016 8:14	PIC	SR89C16
C2	6B	2	35	13217	2/12/2016 8:08	2/12/2016 8:10	PIC	SR89C16
C3	6B	2	44	11967	2/12/2016 8:20	2/12/2016 8:22	PIC	SR89C16
C4	6B	2	60	12723	2/12/2016 8:16	2/12/2016 8:18	PIC	SR89C16
C5	6B	2	48	12759	2/12/2016 7:57	2/12/2016 7:59	PIC	SR89C16
C6	6B	2	67	13236	2/12/2016 7:53	2/12/2016 7:55	PIC	SR89C16
C7	6B	2	38	12890	2/12/2016 8:04	2/12/2016 8:06	PIC	SR89C16
C8	6B	2	39	12827	2/12/2016 8:00	2/12/2016 8:02	PIC	SR89C16
C1	6C	2	59	12525	2/12/2016 8:16	2/12/2016 8:18	PIC	SR89C16
C2	6C	2	75	13400	2/12/2016 8:12	2/12/2016 8:14	PIC	SR89C16
C3	6C	2	64	11967	2/12/2016 8:08	2/12/2016 8:10	PIC	SR89C16
C4	6C	2	60	12767	2/12/2016 8:20	2/12/2016 8:22	PIC	SR89C16

C5	6C	2	84	13001	2/12/2016 8:00	2/12/2016 8:02	PIC	SR89C16
C6	6C	2	50	13069	2/12/2016 7:57	2/12/2016 7:59	PIC	SR89C16
C7	6C	2	69	12943	2/12/2016 7:53	2/12/2016 7:55	PIC	SR89C16
C8	6C	2	46	12783	2/12/2016 8:04	2/12/2016 8:06	PIC	SR89C16
C1	7A	2	5	12376	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C2	7A	2	6	12913	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C3	7A	2	5	11638	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C4	7A	2	7	12323	2/13/2016 12:06	2/13/2016 12:08	PIC	SR89C16
C5	7A	2	3	12280	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C6	7A	2	4	12839	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C7	7A	2	6	12446	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C8	7A	2	9	12459	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C1	7B	2	9	12440	2/13/2016 12:06	2/13/2016 12:08	PIC	SR89C16
C2	7B	2	7	12952	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C3	7B	2	6	11854	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C4	7B	2	5	12584	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C5	7B	2	11	12675	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C6	7B	2	6	12838	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C7	7B	2	6	13073	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C8	7B	2	14	12507	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C1	7C	2	1	11936	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C2	7C	2	2	12584	2/13/2016 12:06	2/13/2016 12:08	PIC	SR89C16
C3	7C	2	0	11367	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C4	7C	2	2	12463	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C5	7C	2	1	12111	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C6	7C	2	4	12684	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C7	7C	2	2	12526	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C8	7C	2	2	12265	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C1	7D	2	6	12204	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C2	7D	2	3	12695	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C3	7D	2	1	11335	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C4	7D	2	1	12308	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C5	7D	2	2	12153	2/13/2016 12:27	2/13/2016 12:29	PIC	SR89C16
C6	7D	2	3	12650	2/13/2016 12:23	2/13/2016 12:25	PIC	SR89C16
C7	7D	2	1	12559	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C8	7D	2	2	12289	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C1	8A	2	10	12192	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16

C2	8A	2	11	13036	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C3	8A	2	11	11605	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C4	8A	2	8	12419	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C5	8A	2	10	12685	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C6	8A	2	9	12787	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C7	8A	2	6	12579	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C8	8A	2	10	12606	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C1	8B	2	0	12269	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C2	8B	2	0	12968	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C3	8B	2	0	11698	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C4	8B	2	0	12424	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C5	8B	2	0	12536	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C6	8B	2	0	13107	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C7	8B	2	0	12693	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C8	8B	2	2	12509	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C1	8C	2	2	12367	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C2	8C	2	0	12879	2/13/2016 12:19	2/13/2016 12:21	PIC	SR89C16
C3	8C	2	2	11626	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C4	8C	2	3	12360	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C5	8C	2	0	12282	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C6	8C	2	4	12880	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C7	8C	2	2	12507	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C8	8C	2	3	12424	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C1	8D	2	23	12480	2/13/2016 12:28	2/13/2016 12:30	PIC	SR89C16
C2	8D	2	33	12937	2/13/2016 12:24	2/13/2016 12:26	PIC	SR89C16
C3	8D	2	34	11828	2/13/2016 12:20	2/13/2016 12:22	PIC	SR89C16
C4	8D	2	34	12626	2/13/2016 12:16	2/13/2016 12:18	PIC	SR89C16
C5	8D	2	31	12853	2/13/2016 12:13	2/13/2016 12:15	PIC	SR89C16
C6	8D	2	42	13155	2/13/2016 12:10	2/13/2016 12:12	PIC	SR89C16
C7	8D	2	34	12972	2/13/2016 12:07	2/13/2016 12:09	PIC	SR89C16
C8	8D	2	26	12656	2/13/2016 12:03	2/13/2016 12:05	PIC	SR89C16
C1	9A	2	9	12191	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C2	9A	2	10	13057	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C3	9A	2	9	11939	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C4	9A	2	6	12613	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C5	9A	2	11	12569	2/13/2016 12:43	2/13/2016 12:45	PIC	SR89C16
C6	9A	2	5	13313	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16

C7	9A	2	8	12928	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C8	9A	2	10	12602	2/13/2016 12:46	2/13/2016 12:48	PIC	SR89C16
C1	9B	2	9	12418	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C2	9B	2	8	12913	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C3	9B	2	14	11796	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C4	9B	2	9	12501	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C5	9B	2	7	12192	2/13/2016 12:46	2/13/2016 12:48	PIC	SR89C16
C6	9B	2	8	12780	2/13/2016 12:43	2/13/2016 12:45	PIC	SR89C16
C7	9B	2	8	12593	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C8	9B	2	11	12439	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C1	9C	2	16	12142	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C2	9C	2	21	13005	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C3	9C	2	12	11557	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C4	9C	2	25	12333	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C5	9C	2	13	12303	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C6	9C	2	20	12863	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C7	9C	2	12	12446	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16
C8	9C	2	12	12337	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C1	9D	2	17	12393	2/13/2016 12:40	2/13/2016 12:42	PIC	SR89C16
C2	9D	2	24	13114	2/13/2016 12:37	2/13/2016 12:39	PIC	SR89C16
C3	9D	2	17	11494	2/13/2016 12:34	2/13/2016 12:36	PIC	SR89C16
C4	9D	2	15	12530	2/13/2016 12:30	2/13/2016 12:32	PIC	SR89C16
C5	9D	2	32	12524	2/13/2016 12:53	2/13/2016 12:55	PIC	SR89C16
C6	9D	2	25	13041	2/13/2016 12:50	2/13/2016 12:52	PIC	SR89C16
C7	9D	2	21	12605	2/13/2016 12:47	2/13/2016 12:49	PIC	SR89C16
C8	9D	2	16	12330	2/13/2016 12:44	2/13/2016 12:46	PIC	SR89C16

Sr-90 Calibration - PIC - Feb 2016

Standard Data	Isotope	
	Standard ID number	1244-A
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)	21333.9626
	Reference Date	10/1/2008
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	8935.10
Decay Date		2/20/2016

Separation Date/Time 2/19/2016 14:15
Y-90 Half Life (days) 2.668875
The following detectors were not calibrated:

6D, 13C

Carrier Data		Std ID 2338630	
		Std weight	18.68 mg/mL
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)
1	2.0	0.1	1.87
2	4.2	0.2	3.74
3	5.7	0.3	5.60
4	7.6	0.4	7.47
5	9.4	0.5	9.34
6	11.3	0.6	11.21
7	13.8	0.7	13.08
8	15.4	0.8	14.94

***Recovery values exceeding 100% will be evaluated at 100%.

*Background is considered negligible.

**Decay corrected to mid-point of cou

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
1A	1	2/20/2016 12:31	3	14186	4728.67	100.0%	0.54774	0.21443	3679.27	8934.79	0.4118	0.4265
1A	2	2/20/2016 12:45	3	14822	4940.67	100.0%	0.54774	0.21637	3881.76	8934.79	0.4345	0.4247
1A	3	2/20/2016 12:40	3	14984	4994.67	100.0%	0.54774	0.21571	3939.01	8934.79	0.4409	0.4235
1A	4	2/20/2016 12:35	3	14662	4887.33	100.0%	0.54774	0.21504	3834.94	8934.79	0.4292	0.4219
1A	5	2/20/2016 12:50	3	13922	4640.67	100.0%	0.54774	0.21704	3578.50	8934.79	0.4005	0.4205
1A	6	2/20/2016 13:06	3	14305	4768.33	100.0%	0.54774	0.21928	3695.18	8934.78	0.4136	0.4189
1A	7	2/20/2016 13:01	3	14466	4822.00	100.0%	0.54774	0.21864	3751.99	8934.78	0.4199	0.4168
1A	8	2/20/2016 12:54	3	14401	4800.33	100.0%	0.54774	0.21764	3735.22	8934.79	0.4181	0.4155
1B	1	2/20/2016 12:36	3	14674	4891.33	100.0%	0.54973	0.21505	3835.07	8934.79	0.4292	0.4342
1B	2	2/20/2016 12:31	3	14781	4927.00	100.0%	0.54973	0.21445	3873.67	8934.79	0.4335	0.4304
1B	3	2/20/2016 12:45	3	14814	4938.00	100.0%	0.54973	0.21638	3875.18	8934.79	0.4337	0.4277
1B	4	2/20/2016 12:40	3	14913	4971.00	100.0%	0.54973	0.21572	3911.46	8934.79	0.4378	0.4244
1B	5	2/20/2016 12:54	3	13971	4657.00	100.0%	0.54973	0.21765	3587.96	8934.79	0.4016	0.4212
1B	6	2/20/2016 12:50	3	14284	4761.33	100.0%	0.54973	0.21705	3695.24	8934.79	0.4136	0.4179
1B	7	2/20/2016 13:06	3	14398	4799.33	100.0%	0.54973	0.21930	3722.20	8934.78	0.4166	0.4135
1B	8	2/20/2016 13:01	3	14322	4774.00	100.0%	0.54973	0.21865	3700.02	8934.78	0.4141	0.4107
1C	1	2/20/2016 12:40	3	14441	4813.67	100.0%	0.56336	0.21573	3727.82	8934.79	0.4172	0.4339
1C	2	2/20/2016 12:36	3	14838	4946.00	100.0%	0.56336	0.21506	3863.50	8934.79	0.4324	0.4304
1C	3	2/20/2016 12:31	3	15277	5092.33	100.0%	0.56336	0.21446	4012.84	8934.79	0.4491	0.4280
1C	4	2/20/2016 12:45	3	15212	5070.67	100.0%	0.56336	0.21639	3981.46	8934.79	0.4456	0.4249
1C	5	2/20/2016 13:01	3	13997	4665.67	100.0%	0.56336	0.21867	3565.01	8934.78	0.3990	0.4220
1C	6	2/20/2016 12:54	3	14326	4775.33	100.0%	0.56336	0.21765	3679.78	8934.79	0.4118	0.4190
1C	7	2/20/2016 12:50	3	14430	4810.00	100.0%	0.56336	0.21706	3717.44	8934.79	0.4161	0.4150
1C	8	2/20/2016 13:06	3	14415	4805.00	100.0%	0.56336	0.21930	3701.14	8934.78	0.4142	0.4124
1D	1	2/20/2016 12:45	3	14200	4733.33	100.0%	0.55457	0.21640	3661.08	8934.79	0.4098	0.4221
1D	2	2/20/2016 12:40	3	14506	4835.33	100.0%	0.55457	0.21573	3766.39	8934.79	0.4215	0.4209
1D	3	2/20/2016 12:36	3	14976	4992.00	100.0%	0.55457	0.21507	3926.35	8934.79	0.4394	0.4201
1D	4	2/20/2016 12:31	3	14726	4908.67	100.0%	0.55457	0.21448	3845.94	8934.79	0.4304	0.4192
1D	5	2/20/2016 13:06	3	13845	4615.00	100.0%	0.55457	0.21931	3528.32	8934.78	0.3949	0.4182
1D	6	2/20/2016 13:01	3	14442	4814.00	100.0%	0.55457	0.21868	3730.47	8934.78	0.4175	0.4172
1D	7	2/20/2016 12:54	3	14742	4914.00	100.0%	0.55457	0.21766	3835.49	8934.79	0.4293	0.4159
1D	8	2/20/2016 12:50	3	14106	4702.00	100.0%	0.55457	0.21707	3626.43	8934.79	0.4059	0.4151
2A	1	2/20/2016 12:50	3	14104	4701.33	100.0%	0.54062	0.21708	3652.76	8934.79	0.4088	0.4181
2A	2	2/20/2016 13:06	3	14228	4742.67	100.0%	0.54062	0.21934	3683.20	8934.78	0.4122	0.4161
2A	3	2/20/2016 13:01	3	14755	4918.33	100.0%	0.54062	0.21869	3862.01	8934.78	0.4322	0.4148
2A	4	2/20/2016 12:54	3	14565	4855.00	100.0%	0.54062	0.21767	3803.55	8934.79	0.4257	0.4130
2A	5	2/20/2016 12:32	3	13802	4600.67	100.0%	0.54062	0.21449	3564.61	8934.79	0.3990	0.4114
2A	6	2/20/2016 12:45	3	13922	4640.67	100.0%	0.54062	0.21641	3595.31	8934.79	0.4024	0.4097
2A	7	2/20/2016 12:41	3	14117	4705.67	100.0%	0.54062	0.21577	3663.43	8934.79	0.4100	0.4074
2A	8	2/20/2016 12:36	3	14004	4668.00	100.0%	0.54062	0.21508	3629.08	8934.79	0.4062	0.4060
2B	1	2/20/2016 12:54	3	13494	4498.00	100.0%	0.50913	0.21769	3507.76	8934.79	0.3926	0.4002
2B	2	2/20/2016 12:50	3	13735	4578.33	100.0%	0.50913	0.21709	3590.81	8934.79	0.4019	0.4004
2B	3	2/20/2016 13:06	3	14086	4695.33	100.0%	0.50913	0.21935	3697.55	8934.78	0.4138	0.4005
2B	4	2/20/2016 13:01	3	14101	4700.33	100.0%	0.50913	0.21869	3705.52	8934.78	0.4147	0.4007
2B	5	2/20/2016 12:36	3	13254	4418.00	100.0%	0.50913	0.21509	3439.56	8934.79	0.3850	0.4008
2B	6	2/20/2016 12:32	3	13299	4433.00	100.0%	0.50913	0.21450	3457.26	8934.79	0.3869	0.4010
2B	7	2/20/2016 12:45	3	13703	4567.67	100.0%	0.50913	0.21643	3583.16	8934.79	0.4010	0.4012
2B	8	2/20/2016 12:41	3	13940	4646.67	100.0%	0.50913	0.21578	3665.09	8934.79	0.4102	0.4013
2C	1	2/20/2016 13:01	3	13901	4633.67	100.0%	0.53312	0.21870	3591.93	8934.78	0.4020	0.4108
2C	2	2/20/2016 12:54	3	13916	4638.67	100.0%	0.53312	0.21770	3601.69	8934.79	0.4031	0.4102
2C	3	2/20/2016 12:50	3	14632	4877.33	100.0%	0.53312	0.21710	3843.22	8934.79	0.4301	0.4097
2C	4	2/20/2016 13:06	3	14370	4790.00	100.0%	0.53312	0.21936	3745.12	8934.78	0.4192	0.4092
2C	5	2/20/2016 12:41	3	13642	4547.33	100.0%	0.53312	0.21580	3519.42	8934.79	0.3939	0.4087
2C	6	2/20/2016 12:36	3	14059	4686.33	100.0%	0.53312	0.21510	3661.73	8934.79	0.4098	0.4082
2C	7	2/20/2016 12:32	3	14045	4681.67	100.0%	0.53312	0.21451	3659.89	8934.79	0.4096	0.4076
2C	8	2/20/2016 12:45	3	13916	4638.67	100.0%	0.53312	0.21643	3607.72	8934.79	0.4038	0.4071
2D	1	2/20/2016 13:06	3	13327	4442.33	100.0%	0.49743	0.21936	3467.38	8934.78	0.3881	0.3950
2D	2	2/20/2016 13:01	3	13308	4436.00	100.0%	0.49743	0.21871	3463.95	8934.78	0.3877	0.3926
2D	3	2/20/2016 12:54	3	13789	4596.33	100.0%	0.49743	0.21771	3628.73	8934.79	0.4061	0.3909
2D	4	2/20/2016 12:50	3	13740	4580.00	100.0%	0.49743	0.21711	3615.06	8934.79	0.4046	0.3888
2D	5	2/20/2016 12:45	3	12936	4312.00	100.0%	0.49743	0.21645	3350.02	8934.79	0.3749	0.3869
2D	6	2/20/2016 12:41	3	12858	4286.00	100.0%	0.49743	0.21589	3326.51	8934.79	0.3723	0.3848
2D	7	2/20/2016 12:36	3	13095	4365.00	100.0%	0.49743	0.21512	3408.92	8934.79	0.3815	0.3820
2D	8	2/20/2016 12:32	3	13204	4401.33	100.0%	0.49743	0.21452	3447.90	8934.79	0.3859	0.3802
3A	1	2/20/2016 13:11	3	13797	4599.00	100.0%	0.54222	0.22000	3533.16	8934.78	0.3954	0.4095
3A	2	2/20/2016 13:25	3	14321	4773.67	100.0%	0.54222	0.22203	3698.02	8934.77	0.4139	0.4081
3A	3	2/20/2016 13:20	3	14736	4912.00	100.0%	0.54222	0.22133	3839.72	8934.77	0.4298	0.4071
3A	4	2/20/2016 13:16	3	14372	4790.67	100.0%	0.54222	0.22070	3721.46	8934.78	0.4165	0.4059
3A	5	2/20/2016 13:30	3	13423	4474.33	100.0%	0.54222	0.22274	3395.23	8934.77	0.3800	0.4047
3A	6	2/20/2016 13:44	3	13811	4603.67	100.0%	0.54222	0.22470	3515.10	8934.77	0.3934	0.4034
3A	7	2/20/2016 13:39	3	14196	4732.00	100.0%	0.54222	0.22405	3646.56	8934.77	0.4081	0.4018

Raw Count Data						Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)									
3A	8	2/20/2016 13:36	3	14078	4692.67	100.0%	0.54222	0.22351	3609.86	8934.77	0.4040	0.4007	
3B	1	2/20/2016 13:16	3	14105	4701.67	100.0%	0.55092	0.22071	3615.27	8934.78	0.4046	0.4132	
3B	2	2/20/2016 13:11	3	14272	4757.33	100.0%	0.55092	0.22001	3674.36	8934.78	0.4112	0.4102	
3B	3	2/20/2016 13:25	3	14645	4881.67	100.0%	0.55092	0.22204	3788.73	8934.77	0.4240	0.4081	
3B	4	2/20/2016 13:20	3	14570	4856.67	100.0%	0.55092	0.22134	3767.15	8934.77	0.4216	0.4055	
3B	5	2/20/2016 13:36	3	13437	4479.00	100.0%	0.55092	0.22352	3378.77	8934.77	0.3782	0.4031	
3B	6	2/20/2016 13:30	3	13829	4609.67	100.0%	0.55092	0.22275	3513.21	8934.77	0.3932	0.4005	
3B	7	2/20/2016 13:44	3	14009	4669.67	100.0%	0.55092	0.22471	3563.58	8934.77	0.3988	0.3971	
3B	8	2/20/2016 13:40	3	14053	4684.33	100.0%	0.55092	0.22406	3581.45	8934.77	0.4008	0.3949	
3C	1	2/20/2016 13:20	3	14272	4757.33	100.0%	0.55628	0.22135	3657.15	8934.77	0.4093	0.4211	
3C	2	2/20/2016 13:16	3	14536	4845.33	100.0%	0.55628	0.22072	3748.30	8934.78	0.4195	0.4195	
3C	3	2/20/2016 13:11	3	14950	4983.33	100.0%	0.55628	0.22002	3889.78	8934.78	0.4354	0.4184	
3C	4	2/20/2016 13:25	3	14801	4933.67	100.0%	0.55628	0.22205	3830.04	8934.77	0.4287	0.4170	
3C	5	2/20/2016 13:40	3	14033	4677.67	100.0%	0.55628	0.22407	3563.99	8934.77	0.3989	0.4157	
3C	6	2/20/2016 13:36	3	14429	4809.67	100.0%	0.55628	0.22353	3698.68	8934.77	0.4140	0.4143	
3C	7	2/20/2016 13:30	3	14445	4815.00	100.0%	0.55628	0.22276	3707.82	8934.77	0.4150	0.4125	
3C	8	2/20/2016 13:44	3	14314	4771.33	100.0%	0.55628	0.22472	3654.40	8934.77	0.4090	0.4113	
3D	1	2/20/2016 13:25	3	13779	4593.00	100.0%	0.53948	0.22205	3522.68	8934.77	0.3943	0.4046	
3D	2	2/20/2016 13:20	3	13975	4658.33	100.0%	0.53948	0.22136	3591.34	8934.77	0.4020	0.4039	
3D	3	2/20/2016 13:16	3	14441	4813.67	100.0%	0.53948	0.22073	3749.73	8934.78	0.4197	0.4034	
3D	4	2/20/2016 13:11	3	14382	4794.00	100.0%	0.53948	0.22003	3733.43	8934.78	0.4179	0.4028	
3D	5	2/20/2016 13:44	3	13657	4552.33	100.0%	0.53948	0.22473	3469.10	8934.77	0.3883	0.4022	
3D	6	2/20/2016 13:40	3	13772	4590.67	100.0%	0.53948	0.22408	3510.59	8934.77	0.3929	0.4015	
3D	7	2/20/2016 13:36	3	14025	4675.00	100.0%	0.53948	0.22354	3597.52	8934.77	0.4026	0.4007	
3D	8	2/20/2016 13:30	3	13986	4662.00	100.0%	0.53948	0.22277	3588.23	8934.77	0.4016	0.4002	
4A	1	2/20/2016 13:30	3	14530	4843.33	100.0%	0.55034	0.22278	3747.90	8934.77	0.4195	0.4258	
4A	2	2/20/2016 13:44	3	14683	4894.33	100.0%	0.55034	0.22474	3789.25	8934.77	0.4221	0.4226	
4A	3	2/20/2016 13:40	3	14940	4980.00	100.0%	0.55034	0.22409	3878.13	8934.77	0.4340	0.4204	
4A	4	2/20/2016 13:36	3	14768	4922.67	100.0%	0.55034	0.22355	3823.45	8934.77	0.4279	0.4176	
4A	5	2/20/2016 13:11	3	13835	4611.67	100.0%	0.55034	0.22004	3529.70	8934.78	0.3951	0.4150	
4A	6	2/20/2016 13:26	3	14118	4706.00	100.0%	0.55034	0.22210	3613.93	8934.77	0.4045	0.4123	
4A	7	2/20/2016 13:20	3	14335	4778.33	100.0%	0.55034	0.22137	3689.80	8934.77	0.4130	0.4086	
4A	8	2/20/2016 13:16	3	14262	4754.00	100.0%	0.55034	0.22074	3668.61	8934.78	0.4106	0.4063	
4B	1	2/20/2016 13:36	3	14554	4851.33	100.0%	0.55780	0.22356	3737.15	8934.77	0.4183	0.4266	
4B	2	2/20/2016 13:30	3	14783	4927.67	100.0%	0.55780	0.22278	3817.34	8934.77	0.4272	0.4254	
4B	3	2/20/2016 13:44	3	15145	5048.33	100.0%	0.55780	0.22475	3928.22	8934.77	0.4397	0.4245	
4B	4	2/20/2016 13:40	3	15002	5000.67	100.0%	0.55780	0.22410	3883.79	8934.77	0.4347	0.4234	
4B	5	2/20/2016 13:16	3	14038	4679.33	100.0%	0.55780	0.22074	3579.17	8934.78	0.4006	0.4224	
4B	6	2/20/2016 13:11	3	14504	4834.67	100.0%	0.55780	0.22005	3737.98	8934.78	0.4184	0.4213	
4B	7	2/20/2016 13:26	3	14552	4850.67	100.0%	0.55780	0.22210	3743.73	8934.77	0.4190	0.4198	
4B	8	2/20/2016 13:20	3	14686	4895.33	100.0%	0.55780	0.22138	3792.00	8934.77	0.4244	0.4189	
4C	1	2/20/2016 13:40	3	14802	4934.00	100.0%	0.56130	0.22411	3810.08	8934.77	0.4264	0.4305	
4C	2	2/20/2016 13:36	3	14933	4977.67	100.0%	0.56130	0.22356	3856.46	8934.77	0.4316	0.4284	
4C	3	2/20/2016 13:30	3	15052	5017.33	100.0%	0.56130	0.22279	3900.01	8934.77	0.4365	0.4269	
4C	4	2/20/2016 13:45	3	15038	5012.67	100.0%	0.56130	0.22476	3885.45	8934.76	0.4349	0.4251	
4C	5	2/20/2016 13:21	3	13935	4645.00	100.0%	0.56130	0.22139	3534.69	8934.77	0.3956	0.4234	
4C	6	2/20/2016 13:16	3	14667	4889.00	100.0%	0.56130	0.22075	3781.89	8934.78	0.4233	0.4215	
4C	7	2/20/2016 13:11	3	14693	4897.67	100.0%	0.56130	0.22006	3794.04	8934.78	0.4246	0.4191	
4C	8	2/20/2016 13:26	3	14589	4863.00	100.0%	0.56130	0.22212	3749.05	8934.77	0.4196	0.4176	
4D	1	2/20/2016 13:45	3	14220	4740.00	100.0%	0.55358	0.22477	3628.26	8934.76	0.4061	0.4183	
4D	2	2/20/2016 13:40	3	14624	4874.67	100.0%	0.55358	0.22412	3766.15	8934.77	0.4215	0.4161	
4D	3	2/20/2016 13:36	3	14908	4969.33	100.0%	0.55358	0.22357	3863.52	8934.77	0.4324	0.4145	
4D	4	2/20/2016 13:31	3	14542	4847.33	100.0%	0.55358	0.22281	3745.32	8934.77	0.4192	0.4126	
4D	5	2/20/2016 13:26	3	13834	4611.33	100.0%	0.55358	0.22213	3512.67	8934.77	0.3931	0.4108	
4D	6	2/20/2016 13:21	3	14095	4698.33	100.0%	0.55358	0.22141	3603.24	8934.77	0.4033	0.4089	
4D	7	2/20/2016 13:16	3	14286	4762.00	100.0%	0.55358	0.22077	3670.06	8934.78	0.4108	0.4064	
4D	8	2/20/2016 13:11	3	14146	4715.33	100.0%	0.55358	0.22007	3626.86	8934.78	0.4059	0.4047	
5A	1	2/20/2016 14:13	3	14812	4937.33	100.0%	0.56851	0.22876	3775.35	8934.75	0.4225	0.4394	
5A	2	2/20/2016 14:27	3	15454	5151.33	100.0%	0.56851	0.23060	3979.97	8934.75	0.4454	0.4365	
5A	3	2/20/2016 14:22	3	15712	5237.33	100.0%	0.56851	0.23003	4068.90	8934.75	0.4554	0.4345	
5A	4	2/20/2016 14:18	3	15152	5050.67	100.0%	0.56851	0.22942	3885.31	8934.75	0.4349	0.4320	
5A	5	2/20/2016 14:31	3	14660	4886.67	100.0%	0.56851	0.23119	3712.35	8934.75	0.4155	0.4297	
5A	6	2/20/2016 14:44	3	14925	4975.00	100.0%	0.56851	0.23305	3791.24	8934.74	0.4243	0.4272	
5A	7	2/20/2016 14:40	3	14859	4953.00	100.0%	0.56851	0.23248	3772.12	8934.74	0.4222	0.4239	
5A	8	2/20/2016 14:35	3	14915	4971.67	100.0%	0.56851	0.23184	3794.05	8934.74	0.4246	0.4218	
5B	1	2/20/2016 14:18	3	14929	4976.33	100.0%	0.56646	0.22943	3815.16	8934.75	0.4270	0.4382	
5B	2	2/20/2016 14:13	3	15222	5074.00	100.0%	0.56646	0.22876	3916.21	8934.75	0.4383	0.4346	
5B	3	2/20/2016 14:27	3	15764	5254.67	100.0%	0.56646	0.23062	4087.49	8934.75	0.4575	0.4322	
5B	4	2/20/2016 14:22	3	15240	5080.00	100.0%	0.56646	0.23004	3915.75	8934.75	0.4383	0.4291	
5B	5	2/20/2016 14:35	3	14104	4701.33	100.0%	0.56646	0.23185	3527.92	8934.74	0.3949	0.4261	
5B	6	2/20/2016 14:31	3	14557	4852.33	100.0%	0.56646	0.23120	3682.21	8934.75	0.4121	0.4230	
5B	7	2/20/2016 14:44	3	15162	5054.00	100.0%	0.56646	0.23305	3874.48	8934.74	0.4336	0.4189	
5B	8	2/20/2016 14:40	3	14698	4899.33	100.0%	0.56646	0.23249	3722.69	8934.74	0.4167	0.4163	
5C	1	2/20/2016 14:23	3	14607	4869.00	100.0%	0.56216	0.23005	3713.52	8934.75	0.4156	0.4222	
5C	2	2/20/2016 14:18	3	14641	4880.33	100.0%	0.56216	0.22944	3727.90	8934.75	0.4172	0.4213	
5C	3	2/20/2016 14:13	3	15261	5087.00	100.0%	0.56216	0.22876	3937.99	8934.75	0.4407	0.4207	
5C	4	2/20/2016 14:27	3	15007	5002.33	100.0%	0.56216	0.23063	3843.95	8934.75	0.4302	0.4200	
5C	5	2/20/2016 14:40	3	14145	4715.00	100.0%	0.56216	0.23250	3547.23	8934.74	0.3970	0.4192	
5C	6	2/20/2016 14:36	3	14630	4876.67	100.0%	0.56216	0.23186	3712.08	8934.74	0.4155	0.4185	
5C	7	2/20/2016 14:31	3	14766	4922.00	100.0%	0.56216	0.23121	3760.69	8934.75	0.4209	0.4174	
5C	8	2/20/2016 14:44	3	14741	4913.67	100.0%	0.56216	0.23308	3742.97	8934.74	0.4189	0.4168	
5D	1	2/20/2016 14:27	3	14865	4955.00	100.0%	0.56407	0					

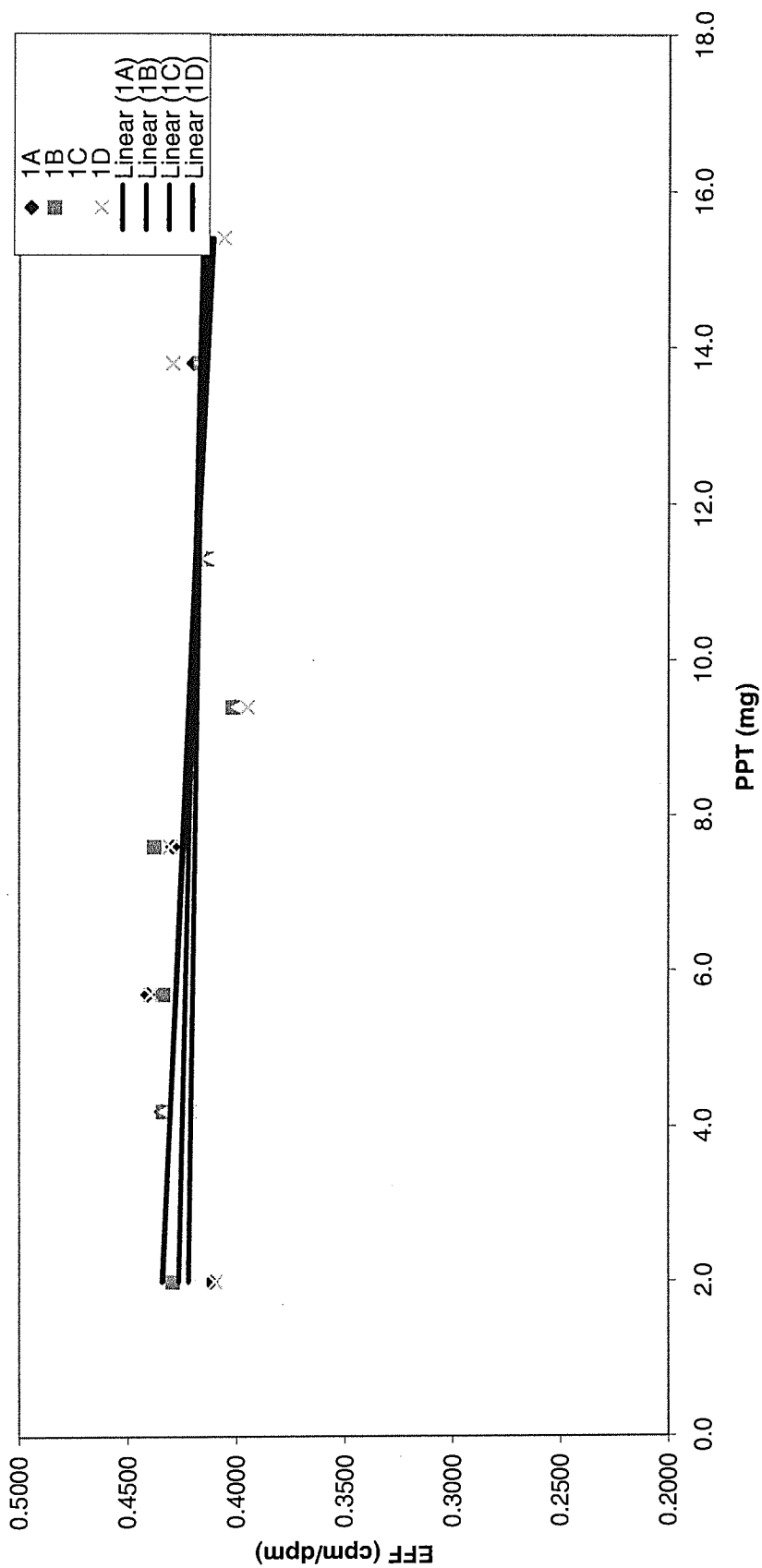
Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
6A	1	2/20/2016 14:33	3	14466	4822.00	100.0%	0.55722	0.23148	3669.57	8934.75	0.4107	0.4172
6A	2	2/20/2016 14:46	3	14472	4824.00	100.0%	0.55722	0.23334	3662.26	8934.74	0.4099	0.4154
6A	3	2/20/2016 14:42	3	14908	4969.33	100.0%	0.55722	0.23278	3810.42	8934.74	0.4265	0.4141
6A	4	2/20/2016 14:37	3	14922	4974.00	100.0%	0.55722	0.23213	3818.32	8934.74	0.4274	0.4125
6A	5	2/20/2016 14:15	3	14046	4682.00	100.0%	0.55722	0.22901	3541.86	8934.75	0.3964	0.4110
6A	6	2/20/2016 14:29	3	14394	4798.00	100.0%	0.55722	0.23089	3648.46	8934.75	0.4083	0.4094
6A	7	2/20/2016 14:25	3	14455	4818.33	100.0%	0.55722	0.23036	3671.47	8934.75	0.4109	0.4073
6A	8	2/20/2016 14:20	3	14232	4744.00	100.0%	0.55722	0.22971	3600.36	8934.75	0.4030	0.4060
6B	1	2/20/2016 14:38	3	14556	4852.00	100.0%	0.56163	0.23214	3687.10	8934.74	0.4127	0.4266
6B	2	2/20/2016 14:33	3	14963	4987.67	100.0%	0.56163	0.23149	3826.05	8934.75	0.4282	0.4243
6B	3	2/20/2016 14:46	3	15210	5070.00	100.0%	0.56163	0.23336	3899.01	8934.74	0.4364	0.4227
6B	4	2/20/2016 14:42	3	15205	5068.33	100.0%	0.56163	0.23279	3900.19	8934.74	0.4365	0.4208
6B	5	2/20/2016 14:20	3	14261	4753.67	100.0%	0.56163	0.22972	3600.94	8934.75	0.4030	0.4189
6B	6	2/20/2016 14:15	3	14449	4816.33	100.0%	0.56163	0.22901	3667.15	8934.75	0.4104	0.4169
6B	7	2/20/2016 14:29	3	14729	4909.67	100.0%	0.56163	0.23090	3750.98	8934.75	0.4198	0.4144
6B	8	2/20/2016 14:25	3	14482	4820.67	100.0%	0.56163	0.23036	3664.70	8934.75	0.4102	0.4127
6C	1	2/20/2016 14:42	3	14595	4865.00	100.0%	0.56171	0.23280	3696.63	8934.74	0.4137	0.4278
6C	2	2/20/2016 14:38	3	15094	5031.33	100.0%	0.56171	0.23215	3866.23	8934.74	0.4327	0.4255
6C	3	2/20/2016 14:33	3	15201	5067.00	100.0%	0.56171	0.23150	3905.16	8934.75	0.4371	0.4239
6C	4	2/20/2016 14:46	3	15278	5092.67	100.0%	0.56171	0.23337	3921.45	8934.74	0.4389	0.4218
6C	5	2/20/2016 14:25	3	14064	4688.00	100.0%	0.56171	0.23037	3531.81	8934.75	0.3953	0.4199
6C	6	2/20/2016 14:20	3	14589	4863.00	100.0%	0.56171	0.22973	3710.05	8934.75	0.4152	0.4178
6C	7	2/20/2016 14:15	3	14659	4886.33	100.0%	0.56171	0.22901	3736.99	8934.75	0.4183	0.4152
6C	8	2/20/2016 14:29	3	14577	4859.00	100.0%	0.56171	0.23092	3700.07	8934.75	0.4141	0.4134
7A	1	2/20/2016 14:52	3	14647	4882.33	100.0%	0.55455	0.23410	3722.42	8934.74	0.4166	0.4229
7A	2	2/20/2016 15:04	3	14683	4894.33	100.0%	0.55455	0.23579	3726.03	8934.73	0.4170	0.4216
7A	3	2/20/2016 15:00	3	15337	5112.33	100.0%	0.55455	0.23525	3946.73	8934.73	0.4417	0.4208
7A	4	2/20/2016 14:56	3	14916	4972.00	100.0%	0.55455	0.23467	3809.28	8934.74	0.4263	0.4197
7A	5	2/20/2016 15:08	3	14321	4773.67	100.0%	0.55455	0.23636	3602.56	8934.73	0.4032	0.4187
7A	6	2/20/2016 15:21	3	14526	4842.00	100.0%	0.55455	0.23812	3662.17	8934.73	0.4099	0.4176
7A	7	2/20/2016 15:16	3	14765	4921.67	100.0%	0.55455	0.23747	3745.07	8934.73	0.4192	0.4162
7A	8	2/20/2016 15:12	3	14749	4916.33	100.0%	0.55455	0.23693	3742.40	8934.73	0.4189	0.4153
7B	1	2/20/2016 14:56	3	14893	4964.33	100.0%	0.56315	0.23467	3783.55	8934.74	0.4235	0.4367
7B	2	2/20/2016 14:52	3	15359	5119.67	100.0%	0.56315	0.23411	3941.72	8934.74	0.4412	0.4338
7B	3	2/20/2016 15:04	3	15571	5190.33	100.0%	0.56315	0.23580	4003.86	8934.73	0.4481	0.4318
7B	4	2/20/2016 15:00	3	15404	5134.67	100.0%	0.56315	0.23526	3950.93	8934.73	0.4422	0.4294
7B	5	2/20/2016 15:12	3	14394	4798.00	100.0%	0.56315	0.23694	3605.81	8934.73	0.4036	0.4270
7B	6	2/20/2016 15:08	3	14760	4920.00	100.0%	0.56315	0.23637	3730.67	8934.73	0.4175	0.4245
7B	7	2/20/2016 15:21	3	14988	4996.00	100.0%	0.56315	0.23813	3797.81	8934.73	0.4251	0.4212
7B	8	2/20/2016 15:16	3	14909	4969.67	100.0%	0.56315	0.23748	3774.76	8934.73	0.4225	0.4191
7C	1	2/20/2016 15:00	3	14400	4800.00	100.0%	0.54150	0.23527	3661.73	8934.73	0.4098	0.4168
7C	2	2/20/2016 14:56	3	14617	4872.33	100.0%	0.54150	0.23468	3736.91	8934.74	0.4182	0.4159
7C	3	2/20/2016 14:52	3	15028	5009.33	100.0%	0.54150	0.23412	3876.62	8934.74	0.4339	0.4153
7C	4	2/20/2016 15:04	3	14779	4926.33	100.0%	0.54150	0.23581	3785.43	8934.73	0.4237	0.4145
7C	5	2/20/2016 15:16	3	13820	4606.67	100.0%	0.54150	0.23749	3457.65	8934.73	0.3870	0.4138
7C	6	2/20/2016 15:12	3	14385	4795.00	100.0%	0.54150	0.23695	3648.60	8934.73	0.4084	0.4130
7C	7	2/20/2016 15:08	3	14405	4801.67	100.0%	0.54150	0.23638	3658.03	8934.73	0.4094	0.4120
7C	8	2/20/2016 15:21	3	14776	4925.33	100.0%	0.54150	0.23814	3773.16	8934.73	0.4223	0.4113
7D	1	2/20/2016 15:04	3	14305	4768.33	100.0%	0.54553	0.23582	3618.88	8934.73	0.4050	0.4179
7D	2	2/20/2016 15:00	3	14672	4890.67	100.0%	0.54553	0.23527	3743.90	8934.73	0.4190	0.4158
7D	3	2/20/2016 14:56	3	15066	5022.00	100.0%	0.54553	0.23469	3878.07	8934.74	0.4340	0.4145
7D	4	2/20/2016 14:52	3	14822	4940.67	100.0%	0.54553	0.23413	3799.49	8934.74	0.4252	0.4127
7D	5	2/20/2016 15:21	3	13907	4635.67	100.0%	0.54553	0.23815	3474.87	8934.73	0.3889	0.4111
7D	6	2/20/2016 15:16	3	14305	4768.33	100.0%	0.54553	0.23750	3610.72	8934.73	0.4041	0.4094
7D	7	2/20/2016 15:13	3	14430	4810.00	100.0%	0.54553	0.23696	3655.01	8934.73	0.4091	0.4071
7D	8	2/20/2016 15:08	3	14408	4802.67	100.0%	0.54553	0.23639	3650.47	8934.73	0.4086	0.4056
8A	1	2/20/2016 15:08	3	14423	4807.67	100.0%	0.55727	0.23640	3630.63	8934.73	0.4064	0.4191
8A	2	2/20/2016 15:21	3	14724	4908.00	100.0%	0.55727	0.23817	3722.14	8934.73	0.4166	0.4161
8A	3	2/20/2016 15:17	3	15147	5049.00	100.0%	0.55727	0.23751	3866.41	8934.73	0.4327	0.4139
8A	4	2/20/2016 15:13	3	14871	4957.00	100.0%	0.55727	0.23697	3777.11	8934.73	0.4227	0.4113
8A	5	2/20/2016 14:52	3	13999	4666.33	100.0%	0.55727	0.23414	3500.55	8934.74	0.3918	0.4087
8A	6	2/20/2016 15:04	3	14350	4783.33	100.0%	0.55727	0.23584	3609.08	8934.73	0.4039	0.4061
8A	7	2/20/2016 15:00	3	14374	4791.33	100.0%	0.55727	0.23528	3619.83	8934.73	0.4051	0.4026
8A	8	2/20/2016 14:56	3	14195	4731.67	100.0%	0.55727	0.23470	3563.06	8934.74	0.3988	0.4003
8B	1	2/20/2016 15:13	3	14877	4959.00	100.0%	0.55670	0.23698	3780.26	8934.73	0.4231	0.4355
8B	2	2/20/2016 15:09	3	15242	5080.67	100.0%	0.55670	0.23641	3904.76	8934.73	0.4370	0.4327
8B	3	2/20/2016 15:21	3	15644	5214.67	100.0%	0.55670	0.23818	4029.98	8934.73	0.4510	0.4308
8B	4	2/20/2016 15:17	3	15353	5117.67	100.0%	0.55670	0.23752	3936.25	8934.73	0.4406	0.4284
8B	5	2/20/2016 14:56	3	14319	4773.00	100.0%	0.55670	0.23471	3605.57	8934.74	0.4035	0.4262
8B	6	2/20/2016 14:52	3	14609	4869.67	100.0%	0.55670	0.23415	3705.02	8934.74	0.4147	0.4238
8B	7	2/20/2016 15:04	3	14795	4931.67	100.0%	0.55670	0.23585	3758.58	8934.73	0.4207	0.4206
8B	8	2/20/2016 15:00	3	14930	4976.67	100.0%	0.55670	0.23529	3806.32	8934.73	0.4260	0.4186
8C	1	2/20/2016 15:17	3	14653	4884.33	100.0%	0.55141	0.23753	3714.07	8934.73	0.4157	0.4228
8C	2	2/20/2016 15:13	3	14695	4898.33	100.0%	0.55141	0.23699	3730.75	8934.73	0.4176	0.4201
8C	3	2/20/2016 15:09	3	15230	5076.67	100.0%	0.55141	0.23642	3911.88	8934.73	0.4378	0.4183
8C	4	2/20/2016 15:21	3	15016	5005.33	100.0%	0.55141	0.23819	3831.85	8934.73	0.4289	0.4159
8C	5	2/20/2016 15:01	3	13933	4644.33	100.0%	0.55141	0.23531	3485.04	8934.73	0.3901	0.4137
8C	6	2/20/2016 14:56	3	14256	4752.00	100.0%	0.55141	0.23472	3595.59	8934.74	0.4024	0.4114
8C	7	2/20/2016 14:52	3	14597	4865.67	100.0%	0.55141	0.23416	3712.04	8934.74	0.4155	0.4084
8C	8	2/20/2016 15:04	3	14450	4816.67	100.0%	0.55141	0.23585	3654.68	8934.73	0.4090	0.4064
8D	1	2/20/2016 15:21	3	14816	4938.67	100.0%	0.56737	0.23820	3731.19	8934.73	0.4176	0.4269
8D	2	2/20/2016 15:17	3	15164	5054.67	100.0%	0.56737	0.23754	3850.			

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
9A	2	2/20/2016 16:09	3	15041	5013.67	100.0%	0.55907	0.24475	3791.10	8934.71	0.4243	0.4256
9A	3	2/20/2016 16:04	3	15584	5194.67	100.0%	0.55907	0.24407	3975.54	8934.71	0.4450	0.4247
9A	4	2/20/2016 16:00	3	15300	5100.00	100.0%	0.55907	0.24342	3884.09	8934.71	0.4347	0.4236
9A	5	2/20/2016 16:15	3	14556	4852.00	100.0%	0.55907	0.24545	3625.94	8934.70	0.4058	0.4225
9A	6	2/20/2016 16:33	3	14685	4895.00	100.0%	0.55907	0.24798	3656.32	8934.70	0.4092	0.4213
9A	7	2/20/2016 16:26	3	15337	5112.33	100.0%	0.55907	0.24706	3878.23	8934.70	0.4341	0.4198
9A	8	2/20/2016 16:22	3	14784	4928.00	100.0%	0.55907	0.24645	3696.98	8934.70	0.4138	0.4188
9B	1	2/20/2016 16:00	3	14662	4887.33	100.0%	0.55703	0.24343	3675.83	8934.71	0.4114	0.4251
9B	2	2/20/2016 15:55	3	14896	4965.33	100.0%	0.55703	0.24284	3756.78	8934.71	0.4205	0.4229
9B	3	2/20/2016 16:10	3	15801	5267.00	100.0%	0.55703	0.24477	4048.83	8934.71	0.4532	0.4214
9B	4	2/20/2016 16:04	3	15011	5003.67	100.0%	0.55703	0.24407	3788.94	8934.71	0.4241	0.4196
9B	5	2/20/2016 16:22	3	14329	4776.33	100.0%	0.55703	0.24646	3549.75	8934.70	0.3973	0.4178
9B	6	2/20/2016 16:15	3	14696	4898.67	100.0%	0.55703	0.24546	3677.03	8934.70	0.4115	0.4159
9B	7	2/20/2016 16:33	3	14916	4972.00	100.0%	0.55703	0.24799	3737.81	8934.70	0.4183	0.4135
9B	8	2/20/2016 16:26	3	14724	4908.00	100.0%	0.55703	0.24707	3678.37	8934.70	0.4117	0.4119
9C	1	2/20/2016 16:05	3	14642	4860.67	100.0%	0.55261	0.24408	3675.52	8934.71	0.4114	0.4183
9C	2	2/20/2016 16:00	3	14781	4927.00	100.0%	0.55261	0.24344	3725.04	8934.71	0.4169	0.4165
9C	3	2/20/2016 15:55	3	15345	5115.00	100.0%	0.55261	0.24285	3915.96	8934.71	0.4383	0.4154
9C	4	2/20/2016 16:10	3	14841	4947.00	100.0%	0.55261	0.24478	3738.43	8934.71	0.4184	0.4139
9C	5	2/20/2016 16:27	3	14117	4705.67	100.0%	0.55261	0.24708	3485.72	8934.70	0.3901	0.4125
9C	6	2/20/2016 16:22	3	14469	4823.00	100.0%	0.55261	0.24646	3606.10	8934.70	0.4036	0.4110
9C	7	2/20/2016 16:15	3	14512	4837.33	100.0%	0.55261	0.24547	3625.34	8934.70	0.4058	0.4090
9C	8	2/20/2016 16:33	3	14925	4975.00	100.0%	0.55261	0.24802	3750.43	8934.70	0.4198	0.4077
9D	1	2/20/2016 16:10	3	14850	4950.00	100.0%	0.55962	0.24479	3726.07	8934.71	0.4170	0.4265
9D	2	2/20/2016 16:05	3	14953	4984.33	100.0%	0.55962	0.24409	3763.88	8934.71	0.4213	0.4241
9D	3	2/20/2016 16:00	3	15419	5139.67	100.0%	0.55962	0.24345	3922.43	8934.71	0.4390	0.4225
9D	4	2/20/2016 15:56	3	15387	5129.00	100.0%	0.55962	0.24286	3914.72	8934.71	0.4381	0.4205
9D	5	2/20/2016 16:34	3	14444	4814.67	100.0%	0.55962	0.24803	3574.52	8934.70	0.4001	0.4185
9D	6	2/20/2016 16:27	3	14687	4895.67	100.0%	0.55962	0.24709	3660.22	8934.70	0.4097	0.4165
9D	7	2/20/2016 16:22	3	14778	4926.00	100.0%	0.55962	0.24648	3693.63	8934.70	0.4134	0.4138
9D	8	2/20/2016 16:15	3	14829	4943.00	100.0%	0.55962	0.24548	3715.60	8934.70	0.4159	0.4121
10A	1	2/20/2016 16:15	3	12922	4307.33	100.0%	0.46076	0.24549	3296.70	8934.70	0.3690	0.3734
10A	2	2/20/2016 16:34	3	12861	4287.00	100.0%	0.46076	0.24804	3265.88	8934.70	0.3655	0.3726
10A	3	2/20/2016 16:27	3	13500	4500.00	100.0%	0.46076	0.24710	3482.76	8934.70	0.3898	0.3720
10A	4	2/20/2016 16:22	3	13160	4386.67	100.0%	0.46076	0.24648	3371.95	8934.70	0.3774	0.3712
10A	5	2/20/2016 15:56	3	12567	4189.00	100.0%	0.46076	0.24287	3189.17	8934.71	0.3569	0.3705
10A	6	2/20/2016 16:10	3	12886	4295.33	100.0%	0.46076	0.24479	3287.57	8934.71	0.3680	0.3698
10A	7	2/20/2016 16:05	3	13012	4337.33	100.0%	0.46076	0.24410	3332.42	8934.71	0.3730	0.3688
10A	8	2/20/2016 16:00	3	12844	4281.33	100.0%	0.46076	0.24346	3279.08	8934.71	0.3670	0.3682
10B	1	2/20/2016 16:22	3	14323	4774.33	100.0%	0.53252	0.24649	3601.55	8934.70	0.4031	0.4142
10B	2	2/20/2016 16:15	3	14603	4867.67	100.0%	0.53252	0.24550	3699.60	8934.70	0.4141	0.4121
10B	3	2/20/2016 16:34	3	14838	4946.00	100.0%	0.53252	0.24805	3765.83	8934.70	0.4215	0.4106
10B	4	2/20/2016 16:27	3	14943	4981.00	100.0%	0.53252	0.24711	3805.28	8934.70	0.4259	0.4088
10B	5	2/20/2016 16:00	3	13926	4642.00	100.0%	0.53252	0.24347	3483.62	8934.71	0.3899	0.4070
10B	6	2/20/2016 15:56	3	14266	4755.33	100.0%	0.53252	0.24288	3599.75	8934.71	0.4029	0.4052
10B	7	2/20/2016 16:10	3	14283	4761.00	100.0%	0.53252	0.24481	3596.22	8934.71	0.4025	0.4027
10B	8	2/20/2016 16:05	3	14256	4752.00	100.0%	0.53252	0.24411	3590.55	8934.71	0.4019	0.4012
10C	1	2/20/2016 16:27	3	14058	4686.00	100.0%	0.52374	0.24712	3529.63	8934.70	0.3950	0.4106
10C	2	2/20/2016 16:22	3	14516	4838.67	100.0%	0.52374	0.24650	3685.18	8934.70	0.4125	0.4085
10C	3	2/20/2016 16:15	3	14951	4983.67	100.0%	0.52374	0.24551	3834.84	8934.70	0.4292	0.4071
10C	4	2/20/2016 16:34	3	14842	4947.33	100.0%	0.52374	0.24806	3786.57	8934.70	0.4238	0.4053
10C	5	2/20/2016 16:05	3	13540	4513.33	100.0%	0.52374	0.24412	3370.99	8934.71	0.3773	0.4037
10C	6	2/20/2016 16:00	3	13892	4630.67	100.0%	0.52374	0.24347	3491.34	8934.71	0.3908	0.4019
10C	7	2/20/2016 15:56	3	14278	4759.33	100.0%	0.52374	0.24289	3622.76	8934.71	0.4055	0.3996
10C	8	2/20/2016 16:10	3	14177	4725.67	100.0%	0.52374	0.24482	3580.04	8934.71	0.4007	0.3981
10D	1	2/20/2016 16:34	3	14309	4769.67	100.0%	0.51644	0.24806	3625.04	8934.70	0.4057	0.4067
10D	2	2/20/2016 16:27	3	14103	4701.00	100.0%	0.51644	0.24712	3560.70	8934.70	0.3985	0.4061
10D	3	2/20/2016 16:22	3	14773	4924.33	100.0%	0.51644	0.24651	3786.87	8934.70	0.4238	0.4057
10D	4	2/20/2016 16:15	3	14526	4842.00	100.0%	0.51644	0.24552	3709.11	8934.70	0.4151	0.4052
10D	5	2/20/2016 16:10	3	13512	4504.00	100.0%	0.51644	0.24483	3374.30	8934.71	0.3777	0.4047
10D	6	2/20/2016 16:05	3	14175	4725.00	100.0%	0.51644	0.24413	3598.52	8934.71	0.4028	0.4041
10D	7	2/20/2016 16:00	3	14398	4799.33	100.0%	0.51644	0.24349	3675.81	8934.71	0.4114	0.4034
10D	8	2/20/2016 15:56	3	14188	4729.33	100.0%	0.51644	0.24290	3608.54	8934.71	0.4039	0.4030
11A	1	2/20/2016 16:42	3	14797	4932.33	100.0%	0.54729	0.24912	3714.18	8934.69	0.4157	0.4288
11A	2	2/20/2016 16:55	3	15262	5087.33	100.0%	0.54729	0.25100	3859.99	8934.69	0.4320	0.4267
11A	3	2/20/2016 16:52	3	15478	5159.33	100.0%	0.54729	0.25047	3934.56	8934.69	0.4404	0.4253
11A	4	2/20/2016 16:46	3	15433	5144.33	100.0%	0.54729	0.24974	3923.15	8934.69	0.4391	0.4235
11A	5	2/20/2016 17:00	3	14575	4858.33	100.0%	0.54729	0.25156	3628.25	8934.69	0.4061	0.4219
11A	6	2/20/2016 17:12	3	14644	4881.33	100.0%	0.54729	0.25329	3642.78	8934.68	0.4077	0.4201
11A	7	2/20/2016 17:08	3	14795	4931.67	100.0%	0.54729	0.25269	3696.05	8934.68	0.4137	0.4177
11A	8	2/20/2016 17:03	3	15105	5035.00	100.0%	0.54729	0.25208	3802.36	8934.68	0.4256	0.4162
11B	1	2/20/2016 16:46	3	15305	5101.67	100.0%	0.55895	0.24975	3854.40	8934.69	0.4314	0.4403
11B	2	2/20/2016 16:42	3	15420	5140.00	100.0%	0.55895	0.24913	3895.82	8934.69	0.4360	0.4364
11B	3	2/20/2016 16:56	3	16014	5338.00	100.0%	0.55895	0.25101	4084.46	8934.69	0.4571	0.4338
11B	4	2/20/2016 16:52	3	15514	5171.33	100.0%	0.55895	0.25048	3920.41	8934.69	0.4388	0.4305
11B	5	2/20/2016 17:04	3	14545	4848.33	100.0%	0.55895	0.25209	3589.39	8934.68	0.4017	0.4273
11B	6	2/20/2016 17:00	3	14961	4987.00	100.0%	0.55895	0.25157	3730.67	8934.69	0.4175	0.4240
11B	7	2/20/2016 17:13	3	15234	5078.00	100.0%	0.55895	0.25330	3813.02	8934.68	0.4268	0.4196
11B	8	2/20/2016 17:08	3	15022	5007.33	100.0%	0.55895	0.25270	3745.35	8934.68	0.4192	0.4168
11C	1	2/20/2016 16:52	3	14640	4880.00	100.0%	0.54966	0.25049	3649.83	8934.69	0.4085	0.4197
11C	2	2/20/2016 16:46	3	14953	4984.33	100.0%	0.54966	0.24976	3757.74	8934.69	0.4206	0.4185
11C	3	2/20/2016 16:42	3	15344								

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)								
11D	3	2/20/2016 16:46	3	15847	5282.33	100.0%	0.56991	0.24977	4010.51	8934.69	0.4489	0.4310
11D	4	2/20/2016 16:42	3	15521	5173.67	100.0%	0.56991	0.24915	3904.97	8934.69	0.4371	0.4287
11D	5	2/20/2016 17:13	3	14754	4918.00	100.0%	0.56991	0.25332	3628.08	8934.68	0.4061	0.4265
11D	6	2/20/2016 17:08	3	15205	5068.33	100.0%	0.56991	0.25272	3781.48	8934.68	0.4232	0.4242
11D	7	2/20/2016 17:04	3	15097	5032.33	100.0%	0.56991	0.25211	3748.57	8934.68	0.4196	0.4211
11D	8	2/20/2016 17:00	3	15174	5058.00	100.0%	0.56991	0.25159	3776.93	8934.69	0.4227	0.4192
12A	1	2/20/2016 17:00	3	14288	4762.67	100.0%	0.54096	0.25159	3546.64	8934.69	0.3970	0.4112
12A	2	2/20/2016 17:13	3	14780	4926.67	100.0%	0.54096	0.25333	3702.25	8934.68	0.4144	0.4083
12A	3	2/20/2016 17:08	3	15080	5026.67	100.0%	0.54096	0.25273	3805.14	8934.68	0.4259	0.4063
12A	4	2/20/2016 17:04	3	14890	4963.33	100.0%	0.54096	0.25213	3744.74	8934.68	0.4191	0.4038
12A	5	2/20/2016 16:42	3	13722	4574.00	100.0%	0.54096	0.24916	3369.72	8934.69	0.3772	0.4014
12A	6	2/20/2016 16:56	3	13985	4661.67	100.0%	0.54096	0.25104	3448.32	8934.69	0.3859	0.3989
12A	7	2/20/2016 16:52	3	14442	4814.00	100.0%	0.54096	0.25051	3603.22	8934.69	0.4033	0.3956
12A	8	2/20/2016 16:46	3	14248	4749.33	100.0%	0.54096	0.24978	3542.07	8934.69	0.3964	0.3935
12B	1	2/20/2016 17:04	3	14776	4925.33	100.0%	0.53735	0.25213	3714.82	8934.68	0.4158	0.4215
12B	2	2/20/2016 17:00	3	14767	4922.33	100.0%	0.53735	0.25160	3714.37	8934.69	0.4157	0.4195
12B	3	2/20/2016 17:13	3	15179	5059.67	100.0%	0.53735	0.25334	3843.36	8934.68	0.4302	0.4182
12B	4	2/20/2016 17:08	3	15305	5101.67	100.0%	0.53735	0.25274	3888.22	8934.68	0.4352	0.4165
12B	5	2/20/2016 16:47	3	14273	4757.67	100.0%	0.53735	0.24979	3558.41	8934.69	0.3983	0.4150
12B	6	2/20/2016 16:42	3	14352	4784.00	100.0%	0.53735	0.24917	3587.70	8934.69	0.4015	0.4133
12B	7	2/20/2016 16:56	3	14745	4915.00	100.0%	0.53735	0.25105	3709.69	8934.69	0.4152	0.4111
12B	8	2/20/2016 16:52	3	14677	4892.33	100.0%	0.53735	0.25052	3689.58	8934.69	0.4130	0.4097
12C	1	2/20/2016 17:09	3	14773	4924.33	100.0%	0.54563	0.25283	3691.80	8934.68	0.4132	0.4234
12C	2	2/20/2016 17:04	3	15021	5007.00	100.0%	0.54563	0.25214	3777.80	8934.68	0.4228	0.4218
12C	3	2/20/2016 17:00	3	15306	5102.00	100.0%	0.54563	0.25161	3875.39	8934.69	0.4337	0.4207
12C	4	2/20/2016 17:13	3	15413	5137.67	100.0%	0.54563	0.25335	3902.58	8934.68	0.4368	0.4193
12C	5	2/20/2016 16:52	3	14339	4779.67	100.0%	0.54563	0.25053	3558.35	8934.69	0.3983	0.4180
12C	6	2/20/2016 16:47	3	14668	4889.33	100.0%	0.54563	0.24980	3671.57	8934.69	0.4109	0.4166
12C	7	2/20/2016 16:42	3	14815	4938.33	100.0%	0.54563	0.24918	3723.57	8934.69	0.4168	0.4147
12C	8	2/20/2016 16:56	3	14808	4936.00	100.0%	0.54563	0.25106	3712.09	8934.69	0.4155	0.4136
12D	1	2/20/2016 17:13	3	14800	4933.33	100.0%	0.54872	0.25336	3691.20	8934.68	0.4131	0.4268
12D	2	2/20/2016 17:09	3	15289	5096.33	100.0%	0.54872	0.25284	3856.78	8934.68	0.4317	0.4243
12D	3	2/20/2016 17:04	3	15580	5193.33	100.0%	0.54872	0.25216	3957.07	8934.68	0.4429	0.4225
12D	4	2/20/2016 17:00	3	15090	5030.00	100.0%	0.54872	0.25162	3796.40	8934.69	0.4249	0.4203
12D	5	2/20/2016 16:56	3	14309	4769.67	100.0%	0.54872	0.25107	3538.77	8934.69	0.3961	0.4183
12D	6	2/20/2016 16:52	3	14777	4925.67	100.0%	0.54872	0.25053	3697.39	8934.69	0.4138	0.4161
12D	7	2/20/2016 16:47	3	14910	4970.00	100.0%	0.54872	0.24981	3745.28	8934.69	0.4192	0.4132
12D	8	2/20/2016 16:42	3	14683	4894.33	100.0%	0.54872	0.24919	3672.65	8934.69	0.4111	0.4113
13A	1	2/20/2016 17:19	3	14445	4815.00	100.0%	0.51126	0.25420	3653.85	8934.68	0.4090	0.4168
13A	2	2/20/2016 17:31	3	14462	4820.67	100.0%	0.51126	0.25579	3652.26	8934.67	0.4088	0.4151
13A	3	2/20/2016 17:27	3	15261	5087.00	100.0%	0.51126	0.25524	3921.10	8934.67	0.4389	0.4139
13A	4	2/20/2016 17:23	3	14764	4921.33	100.0%	0.51126	0.25471	3757.83	8934.68	0.4206	0.4123
13A	5	2/20/2016 17:35	3	14031	4677.00	100.0%	0.51126	0.25639	3505.85	8934.67	0.3924	0.4109
13A	6	2/20/2016 17:48	3	14343	4781.00	100.0%	0.51126	0.25809	3602.09	8934.67	0.4032	0.4094
13A	7	2/20/2016 17:43	3	14538	4846.00	100.0%	0.51126	0.25745	3669.98	8934.67	0.4108	0.4074
13A	8	2/20/2016 17:39	3	14467	4822.33	100.0%	0.51126	0.25691	3648.79	8934.67	0.4084	0.4061
13B	1	2/20/2016 17:23	3	14640	4880.00	100.0%	0.52143	0.25472	3693.32	8934.68	0.4134	0.4232
13B	2	2/20/2016 17:19	3	14968	4989.33	100.0%	0.52143	0.25420	3805.05	8934.68	0.4259	0.4215
13B	3	2/20/2016 17:31	3	15216	5072.00	100.0%	0.52143	0.25579	3880.32	8934.67	0.4343	0.4204
13B	4	2/20/2016 17:27	3	15115	5038.33	100.0%	0.52143	0.25525	3849.19	8934.67	0.4308	0.4189
13B	5	2/20/2016 17:39	3	14264	4754.67	100.0%	0.52143	0.25692	3557.74	8934.67	0.3982	0.4175
13B	6	2/20/2016 17:36	3	14475	4825.00	100.0%	0.52143	0.25640	3630.51	8934.67	0.4063	0.4160
13B	7	2/20/2016 17:48	3	14885	4961.67	100.0%	0.52143	0.25809	3759.27	8934.67	0.4208	0.4141
13B	8	2/20/2016 17:44	3	14716	4905.33	100.0%	0.52143	0.25746	3705.88	8934.67	0.4148	0.4128
13D	1	2/20/2016 17:31	3	12872	4290.67	100.0%	0.42969	0.25580	3308.61	8934.67	0.3703	0.3862
13D	2	2/20/2016 17:27	3	13301	4433.67	100.0%	0.42969	0.25526	3453.71	8934.67	0.3866	0.3836
13D	3	2/20/2016 17:23	3	13662	4554.00	100.0%	0.42969	0.25473	3576.07	8934.68	0.4002	0.3818
13D	4	2/20/2016 17:19	3	13376	4458.67	100.0%	0.42969	0.25422	3482.71	8934.68	0.3898	0.3796
13D	5	2/20/2016 17:48	3	12780	4260.00	100.0%	0.42969	0.25811	3269.11	8934.67	0.3659	0.3774
13D	6	2/20/2016 17:44	3	12940	4313.33	100.0%	0.42969	0.25747	3324.87	8934.67	0.3721	0.3752
13D	7	2/20/2016 17:40	3	12971	4323.67	100.0%	0.42969	0.25693	3337.30	8934.67	0.3735	0.3722
13D	8	2/20/2016 17:36	3	12811	4270.33	100.0%	0.42969	0.25640	3285.98	8934.67	0.3678	0.3703
14A	1	2/20/2016 17:36	3	15248	5082.67	100.0%	0.55824	0.25642	3803.72	8934.67	0.4257	0.4363
14A	2	2/20/2016 17:48	3	15506	5168.67	100.0%	0.55824	0.25812	3881.25	8934.67	0.4344	0.4338
14A	3	2/20/2016 17:44	3	15834	5278.00	100.0%	0.55824	0.25748	3993.76	8934.67	0.4470	0.4320
14A	4	2/20/2016 17:40	3	15730	5243.33	100.0%	0.55824	0.25694	3961.79	8934.67	0.4434	0.4298
14A	5	2/20/2016 17:19	3	14803	4934.33	100.0%	0.55824	0.25423	3666.32	8934.68	0.4103	0.4277
14A	6	2/20/2016 17:31	3	15115	5038.33	100.0%	0.55824	0.25582	3762.39	8934.67	0.4211	0.4255
14A	7	2/20/2016 17:27	3	15259	5086.33	100.0%	0.55824	0.25527	3813.14	8934.67	0.4268	0.4226
14A	8	2/20/2016 17:23	3	15067	5022.33	100.0%	0.55824	0.25474	3751.76	8934.68	0.4199	0.4208
14B	1	2/20/2016 17:40	3	14909	4969.67	100.0%	0.55237	0.25695	3701.55	8934.67	0.4143	0.4261
14B	2	2/20/2016 17:36	3	15150	5050.00	100.0%	0.55237	0.25643	3784.44	8934.67	0.4236	0.4245
14B	3	2/20/2016 17:48	3	15908	5302.67	100.0%	0.55237	0.25812	4028.76	8934.67	0.4509	0.4234
14B	4	2/20/2016 17:44	3	15248	5082.67	100.0%	0.55237	0.25749	3811.87	8934.67	0.4266	0.4220
14B	5	2/20/2016 17:23	3	14596	4865.33	100.0%	0.55237	0.25475	3608.08	8934.68	0.4038	0.4206
14B	6	2/20/2016 17:19	3	14700	4900.00	100.0%	0.55237	0.25424	3645.27	8934.68	0.4080	0.4192
14B	7	2/20/2016 17:31	3	15189	5063.00	100.0%	0.55237	0.25583	3800.42	8934.67	0.4254	0.4174
14B	8	2/20/2016 17:27	3	14952	4984.00	100.0%	0.55237	0.25528	3724.15	8934.67	0.4168	0.4162
14C	1	2/20/2016 17:44	3	15205	5068.33	100.0%	0.56455	0.25750	3769.49	8934.67	0.4219	0.4309
14C	2	2/20/2016 17:40	3	15225	5075.00	100.0%	0.56455	0.25696	3778.90	8934.67	0.4229	0.4288
14C	3	2/20/2016 17:36	3	15939	5313.00	100.0%	0.56455	0.25644	4019.51	8934.67	0.4499	0.4275
14C	4	2/20/										

Detector (#)	Source ID (#)	Raw Count Data			Raw Beta (cpm)	Recovery (%)	Yttrium Efficiency (cpm/dpm)	Y-90 Ingrowth	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Calculated Efficiency (cpm/dpm)
		Start Time	Count Time (min)	Beta (counts)								
14D	4	2/20/2016 17:36	3	15552	5184.00	100.0%	0.55708	0.25645	3907.55	8934.67	0.4373	0.4224
14D	5	2/20/2016 17:31	3	14468	4822.67	100.0%	0.55708	0.25585	3549.22	8934.67	0.3972	0.4206
14D	6	2/20/2016 17:27	3	15017	5005.67	100.0%	0.55708	0.25530	3734.97	8934.67	0.4180	0.4188
14D	7	2/20/2016 17:23	3	15176	5058.67	100.0%	0.55708	0.25477	3790.60	8934.68	0.4243	0.4163
14D	8	2/20/2016 17:20	3	14830	4943.33	100.0%	0.55708	0.25426	3677.80	8934.68	0.4116	0.4148

Sr-90 Calibration



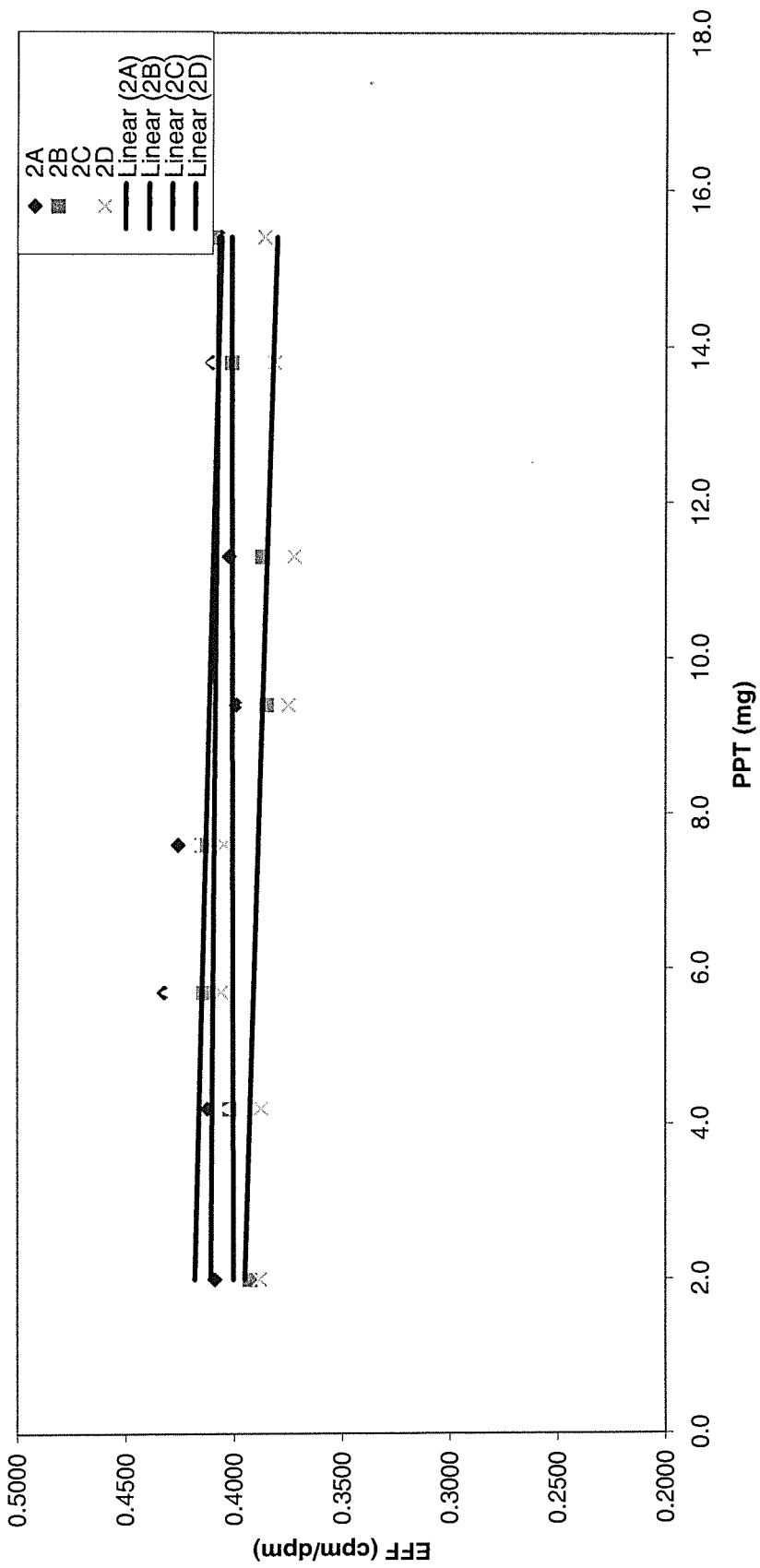
1A $y = -8.228737E-04x + 4.281876E-01$

1B $y = -1.755067E-03x + 4.377424E-01$

1C $y = -1.607365E-03x + 4.371351E-01$

1D $y = -5.194364E-04x + 4.231015E-01$

Sr-90 Calibration



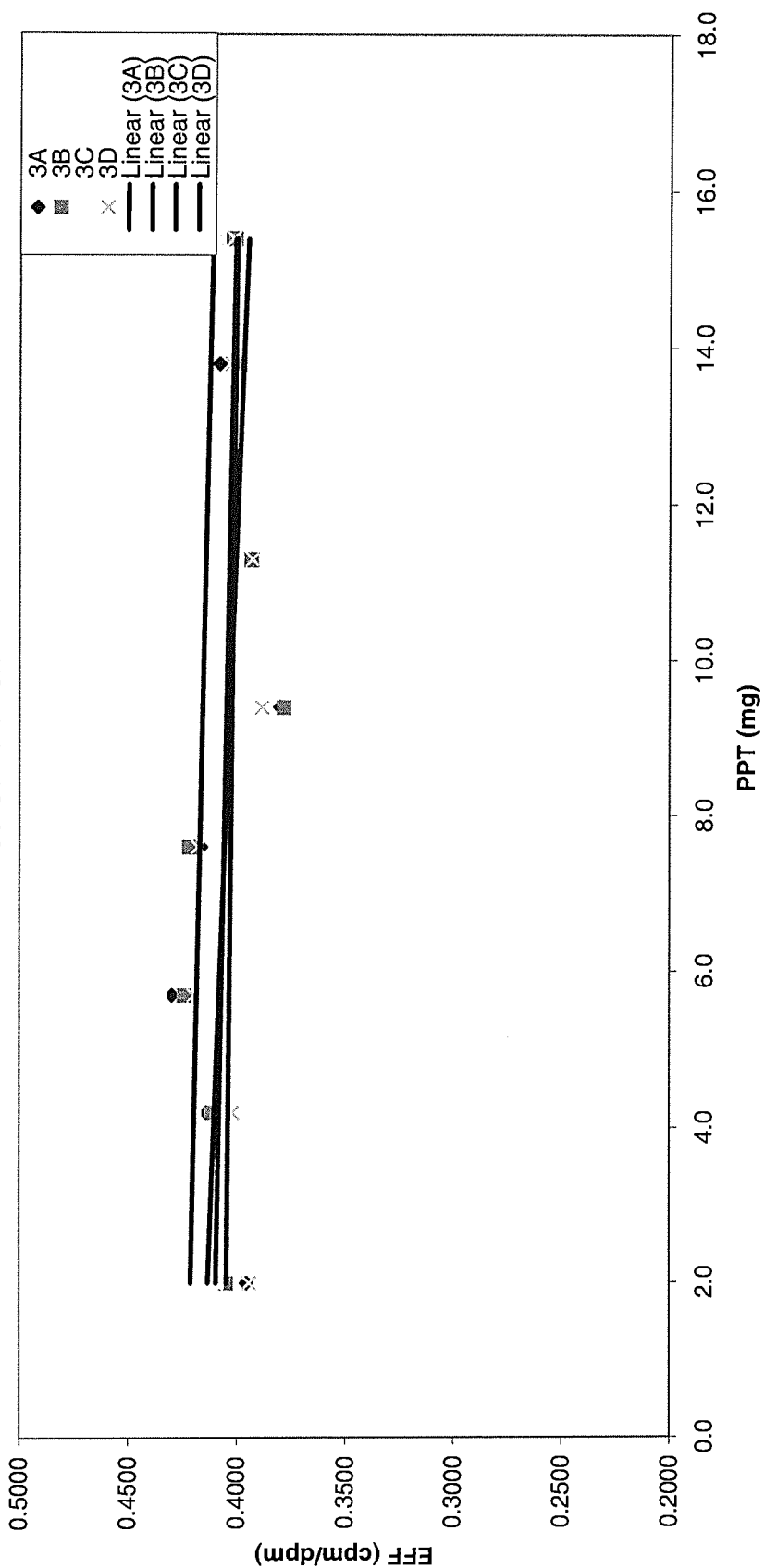
2A $y = -9.042596E-04x + 4.199130E-01$

2B $y = 8.281956E-05x + 4.000563E-01$

2C $y = -2.704466E-04x + 4.112915E-01$

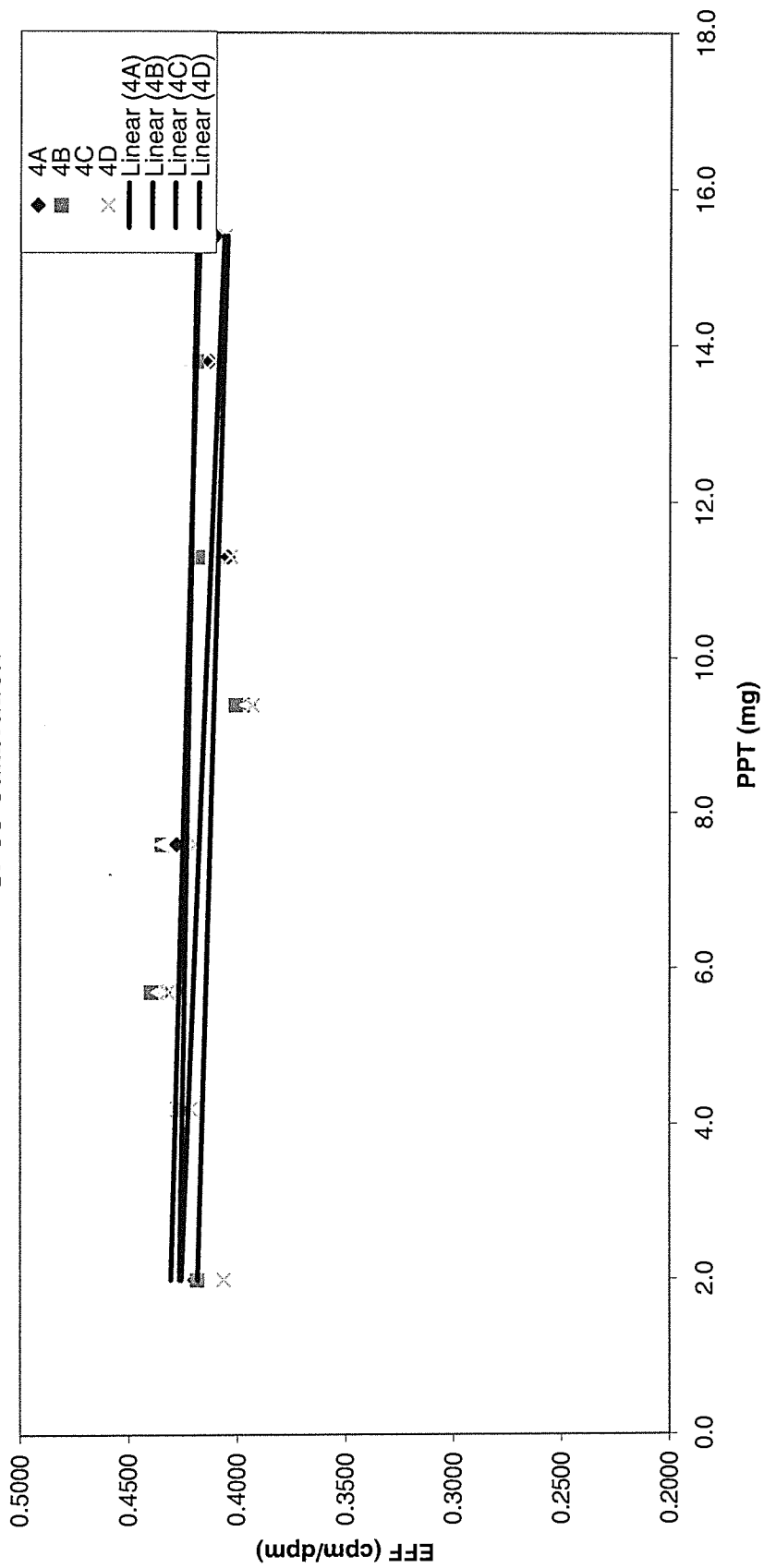
2D $y = -1.100277E-03x + 3.971936E-01$

Sr-90 Calibration



3A $y = -6.581329E-04x + 4.108555E-01$
 3B $y = -1.367469E-03x + 4.159376E-01$
 3C $y = -7.314480E-04x + 4.225585E-01$
 3D $y = -3.320990E-04x + 4.052781E-01$

Sr-90 Calibration



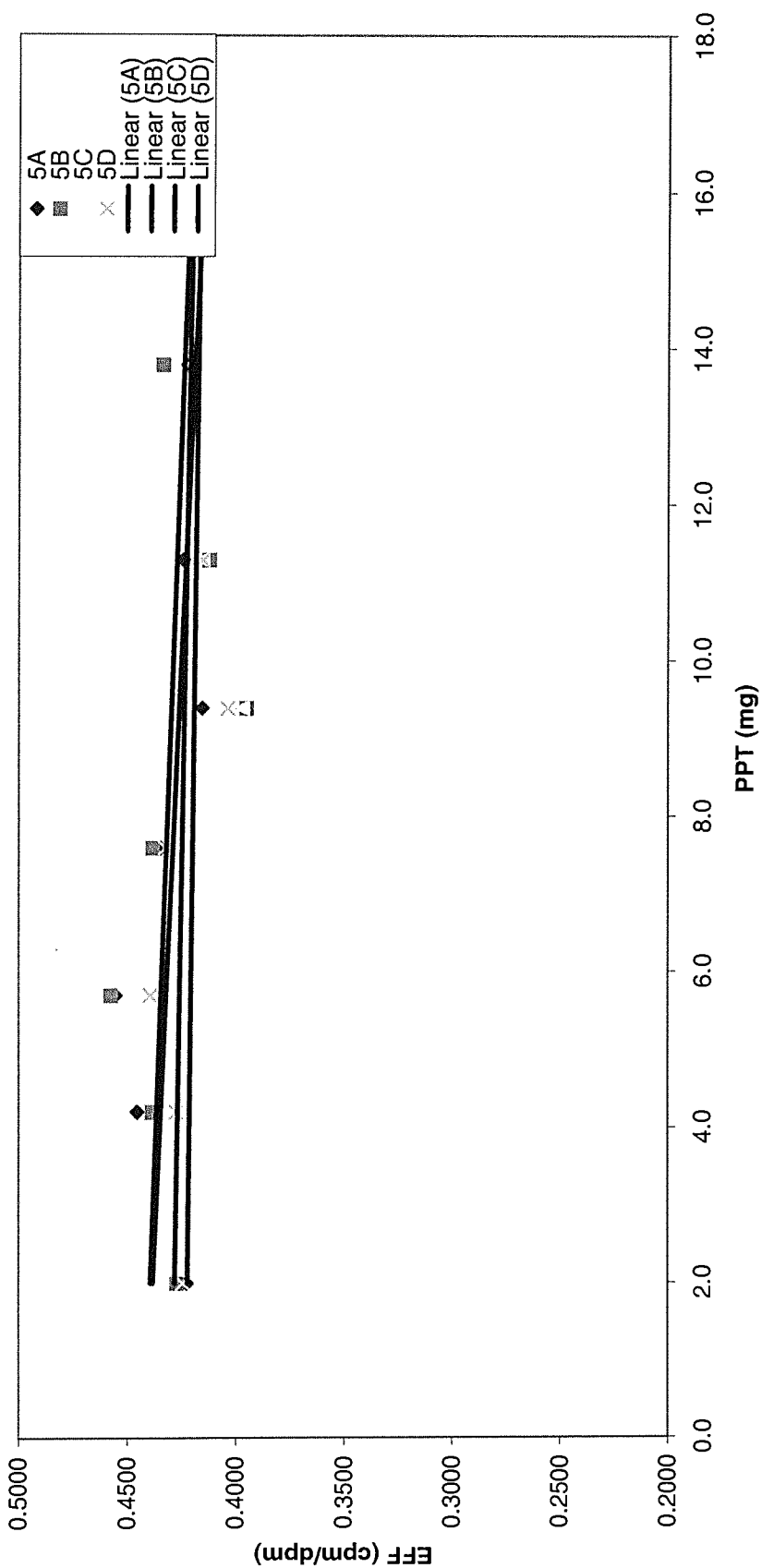
4A $y = -1.454402E-03x + 4.286988E-01$

4B $y = -5.794616E-04x + 4.278046E-01$

4C $y = -9.643192E-04x + 4.324343E-01$

4D $y = -1.011721E-03x + 4.203162E-01$

Sr-90 Calibration



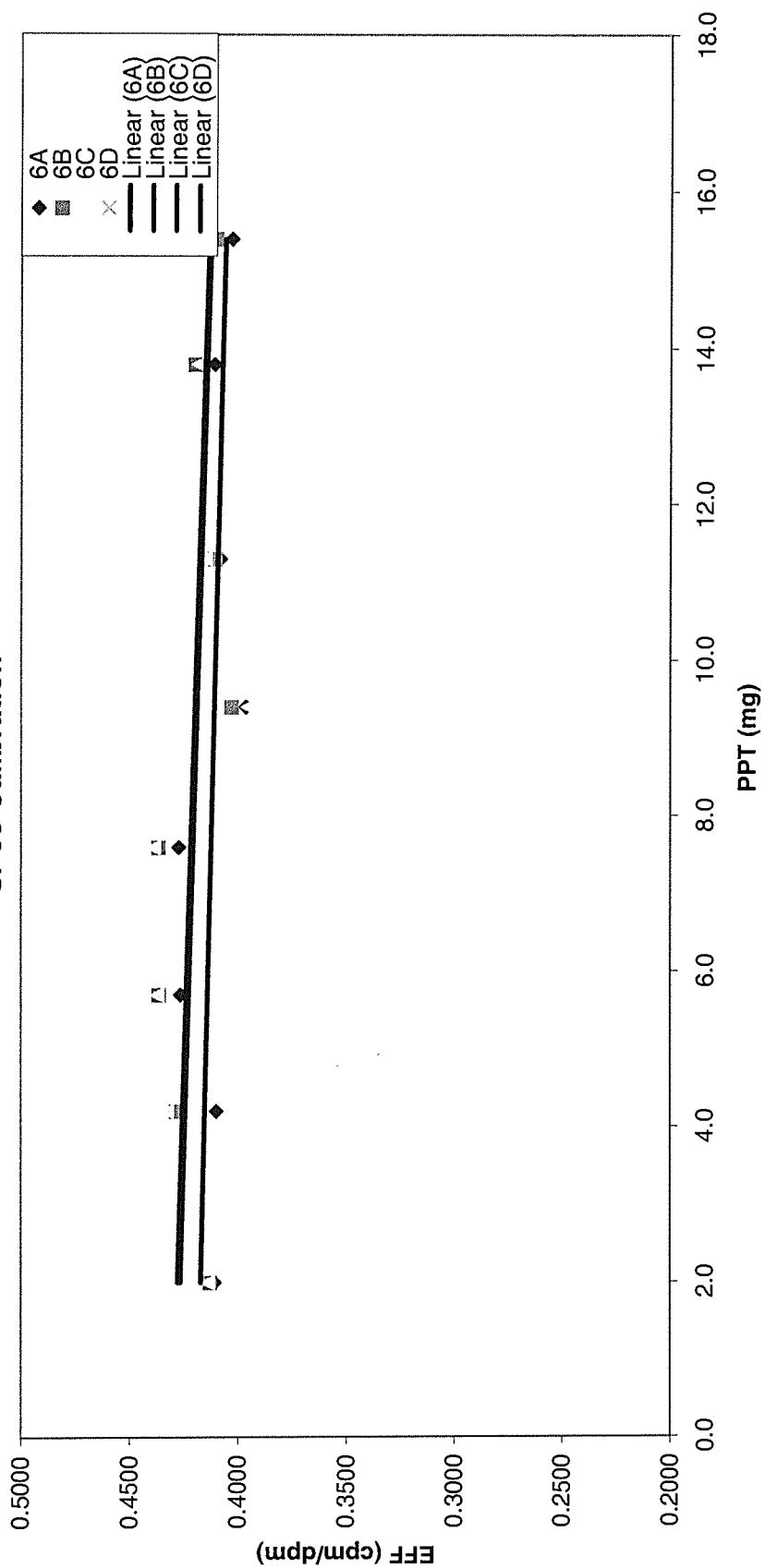
5A $y = -1.313849E-03x + 4.420099E-01$

5B $y = -1.637392E-03x + 4.414956E-01$

5C $y = -4.060476E-04x + 4.230409E-01$

5D $y = -5.926161E-04x + 4.292586E-01$

Sr-90 Calibration



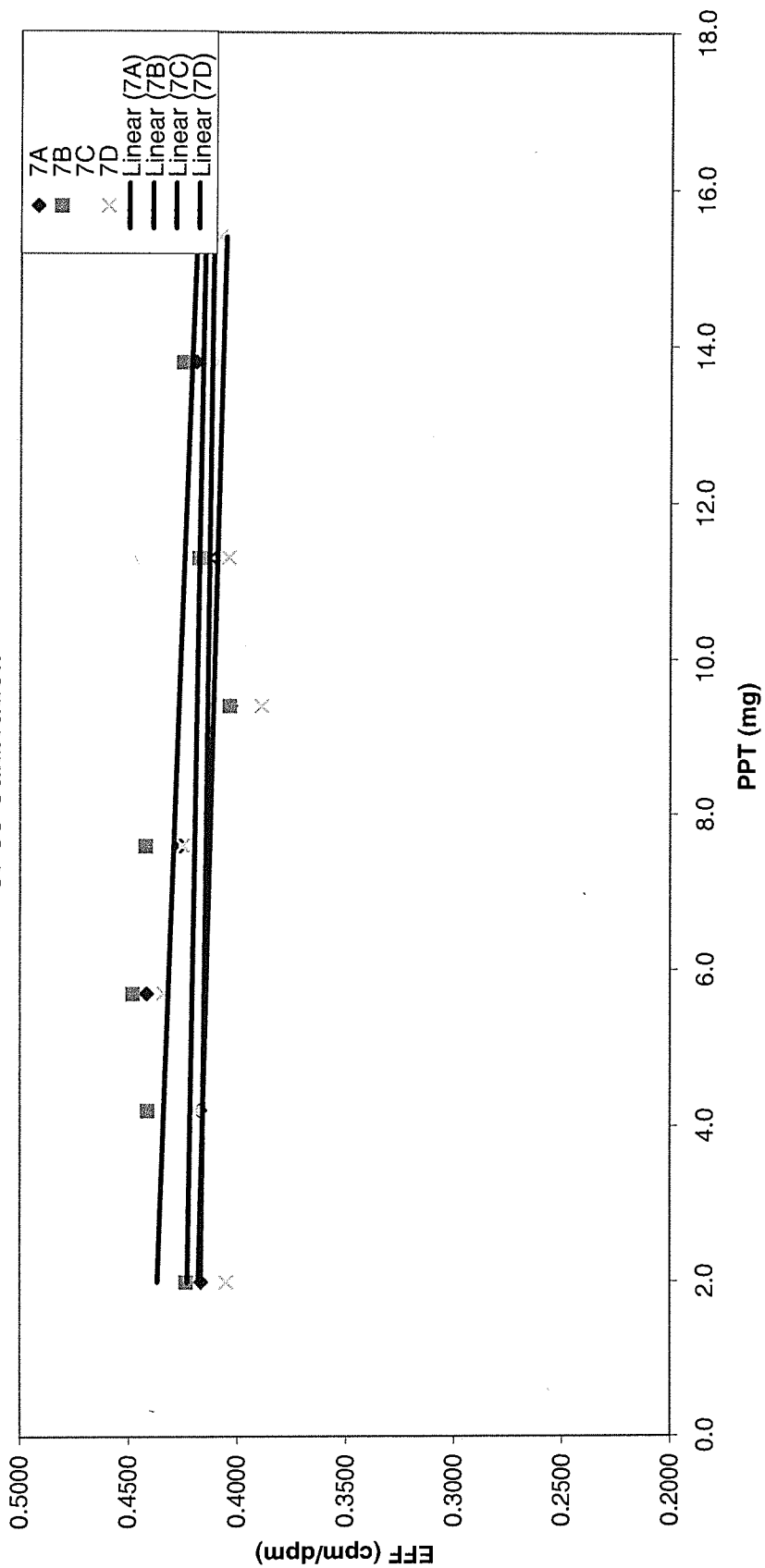
6A $y = -8.384785E-04x + 4.189072E-01$

6B $y = -1.034978E-03x + 4.286339E-01$

6C $y = -1.075743E-03x + 4.299989E-01$

6D

Sr-90 Calibration



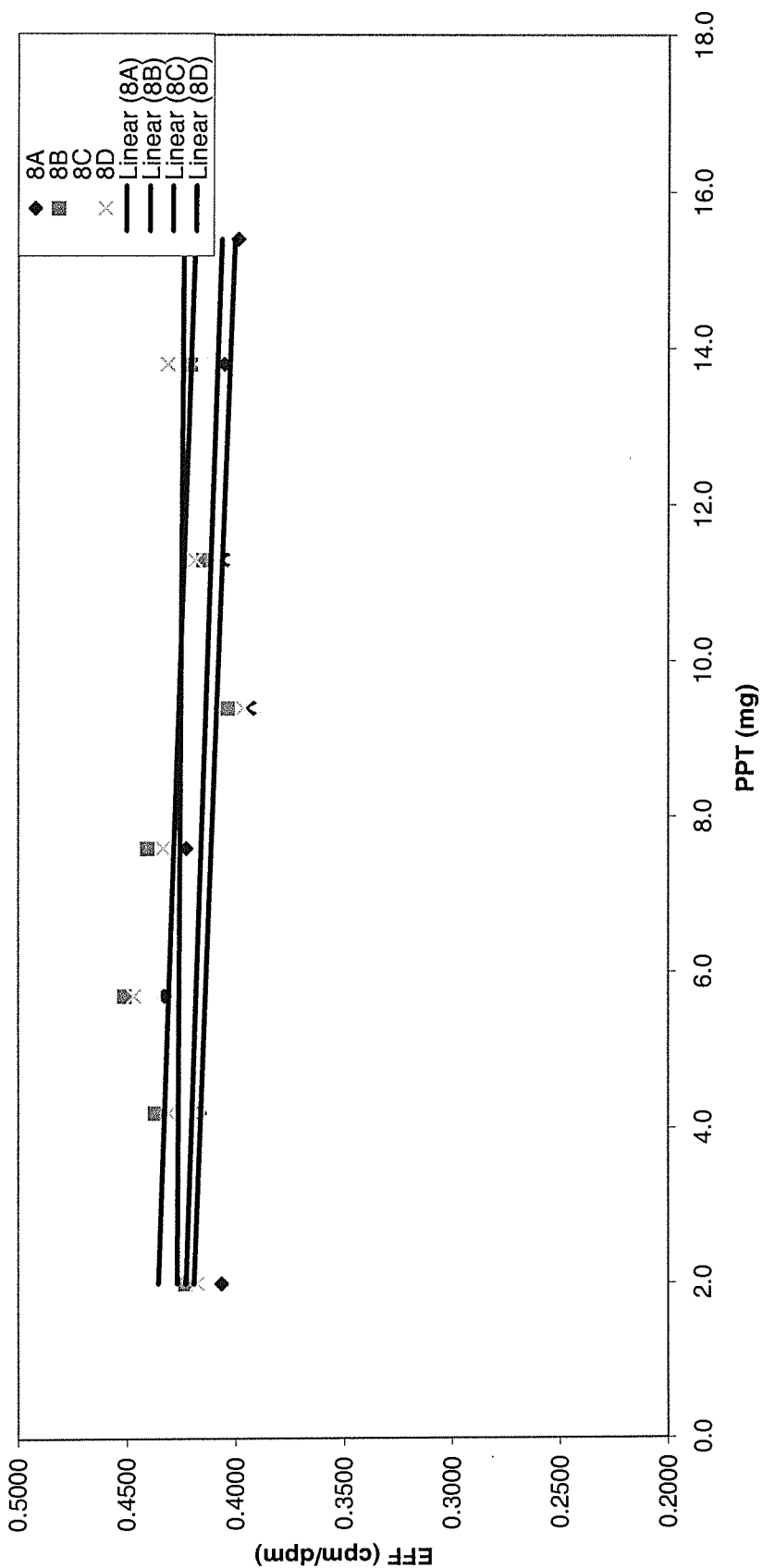
7A $y = -5.624966E-04x + 4.239837E-01$

7B $y = -1.310130E-03x + 4.393176E-01$

7C $y = -4.088183E-04x + 4.176348E-01$

7D $y = -9.135731E-04x + 4.196809E-01$

Sr-90 Calibration



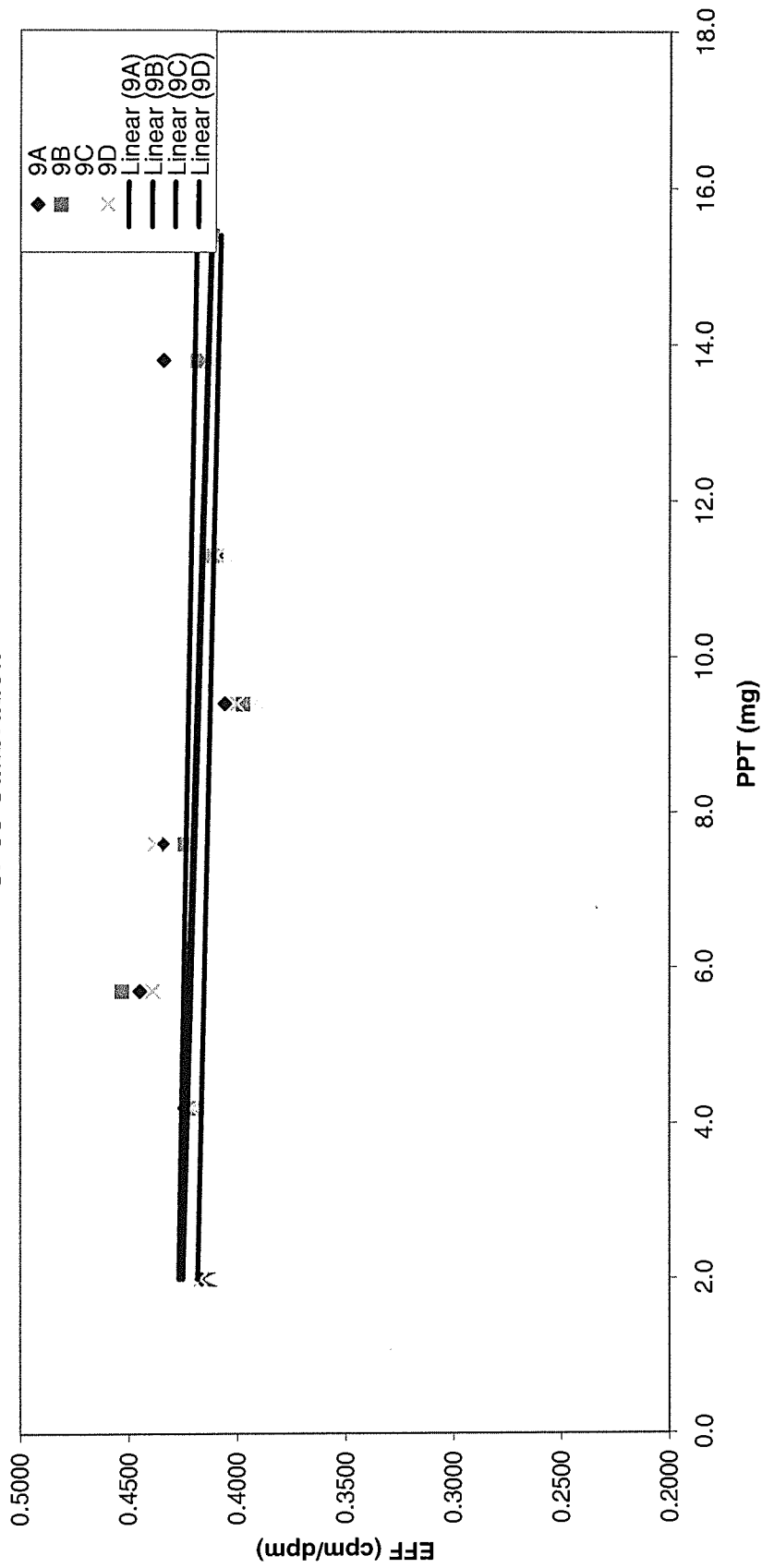
8A $y = -1.406602E-03x + 4.219628E-01$

8B $y = -1.259831E-03x + 4.380086E-01$

8C $y = -1.222559E-03x + 4.252222E-01$

8D $y = -2.293344E-04x + 4.273960E-01$

Sr-90 Calibration



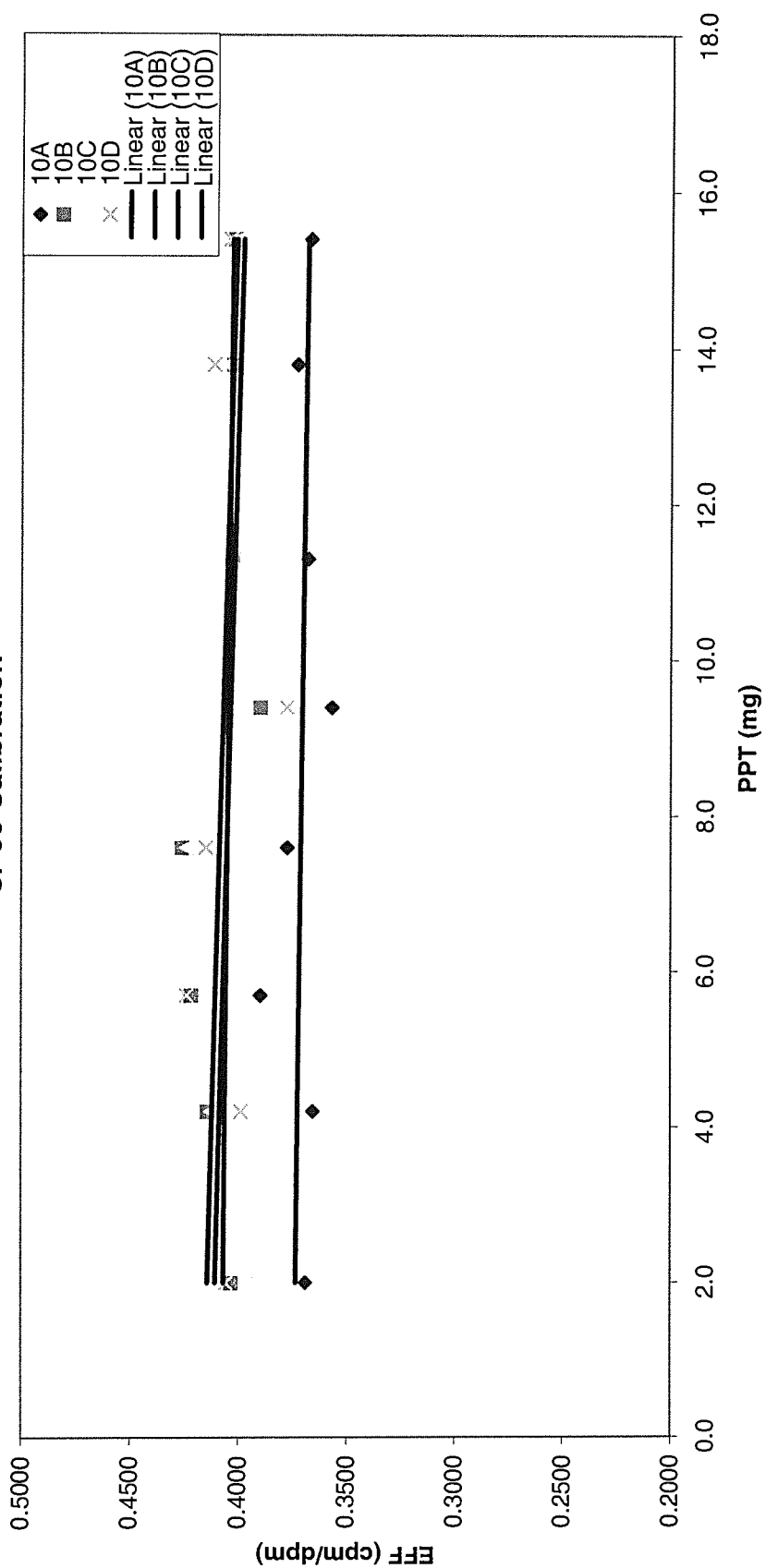
9A $y = -6.083237E-04x + 4.281823E-01$

9B $y = -9.821921E-04x + 4.270197E-01$

9C $y = -7.858394E-04x + 4.198491E-01$

9D $y = -1.075914E-03x + 4.286406E-01$

Sr-90 Calibration



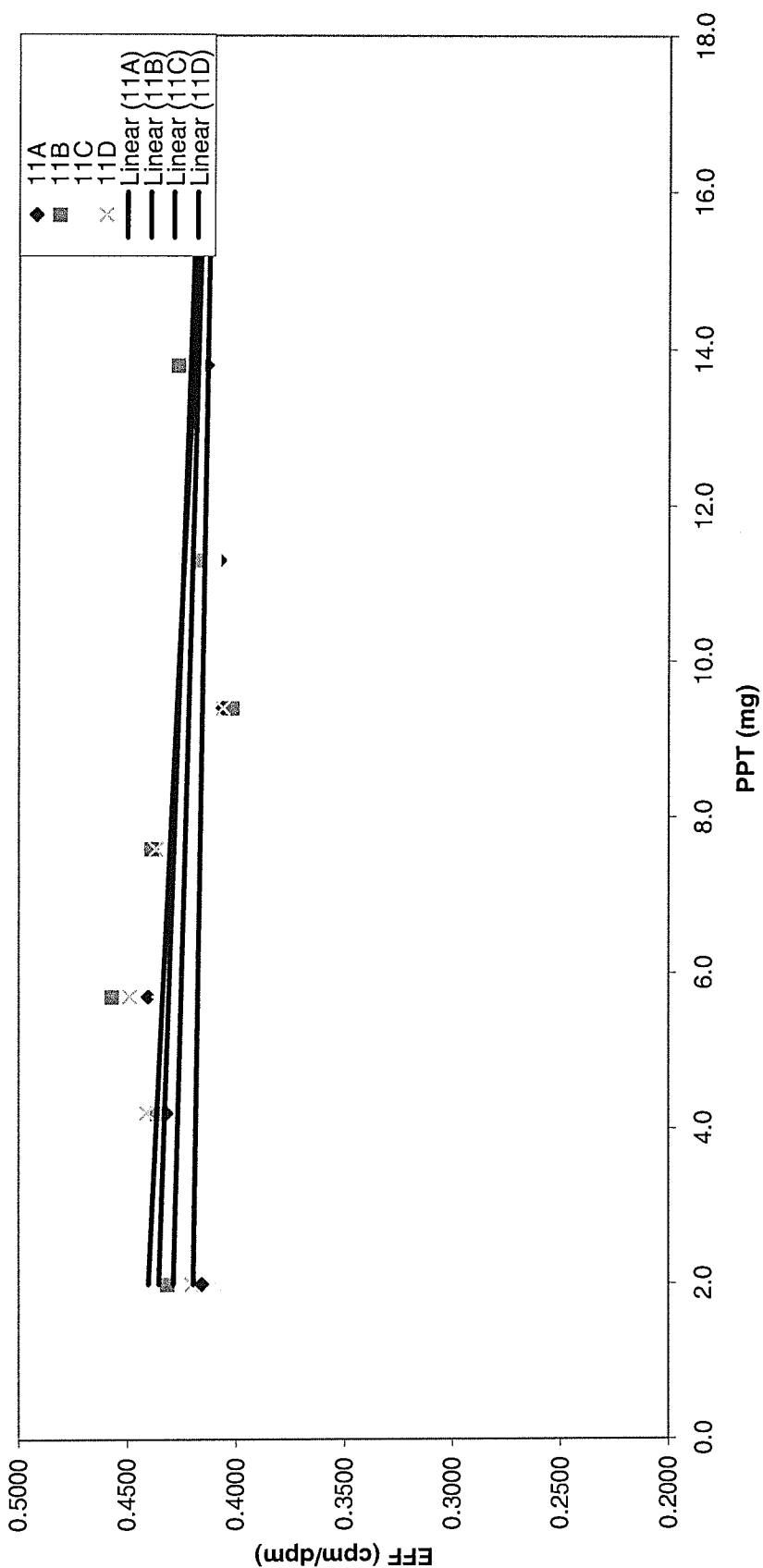
10A $y = -3.893197E-04x + 3.742001E-01$

10B $y = -9.756952E-04x + 4.161778E-01$

10C $y = -9.330272E-04x + 4.124353E-01$

10D $y = -2.815846E-04x + 4.073091E-01$

Sr-90 Calibration



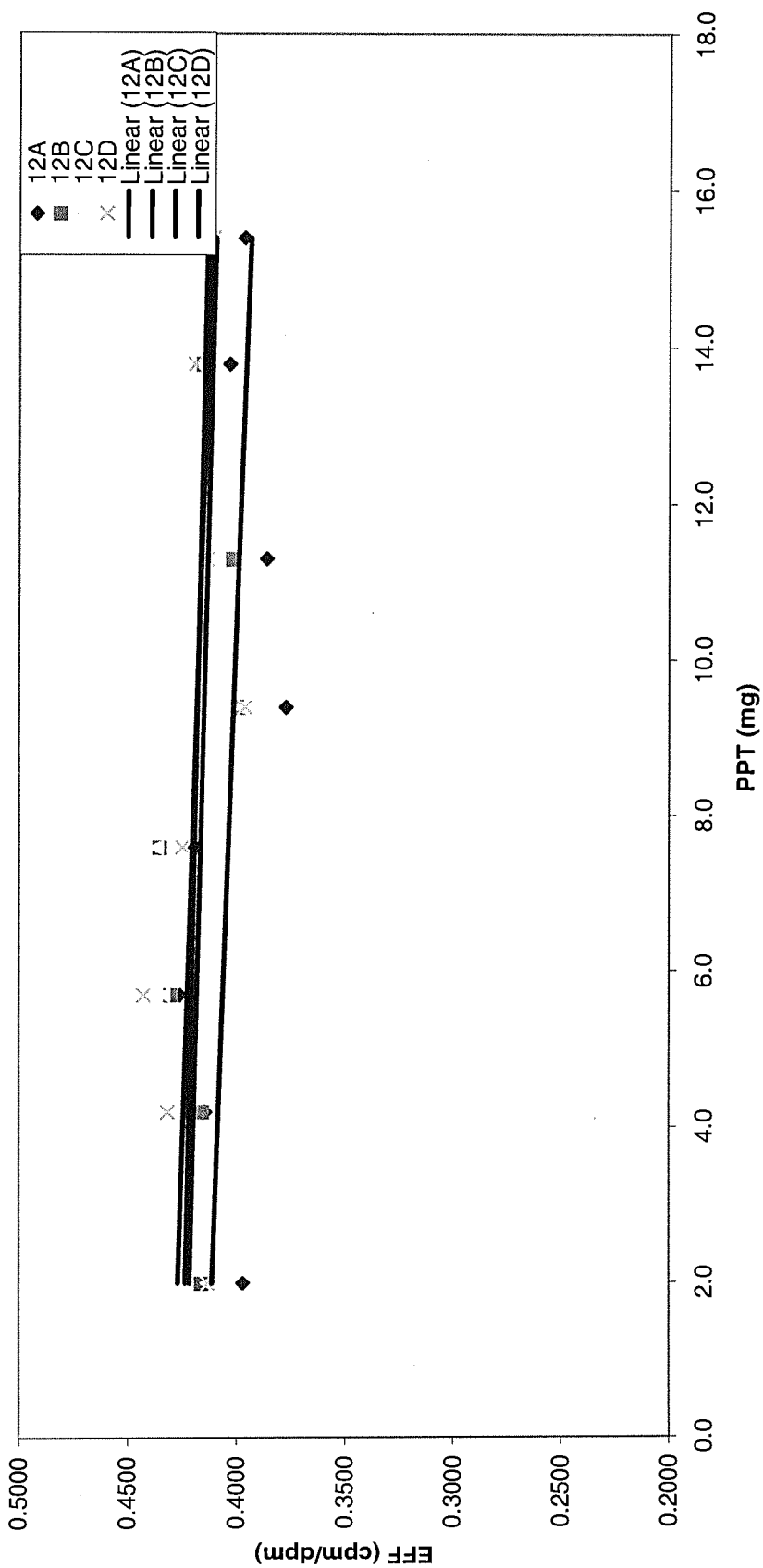
11A $y = -9.350527E-04x + 4.306408E-01$

11B $y = -1.752265E-03x + 4.437766E-01$

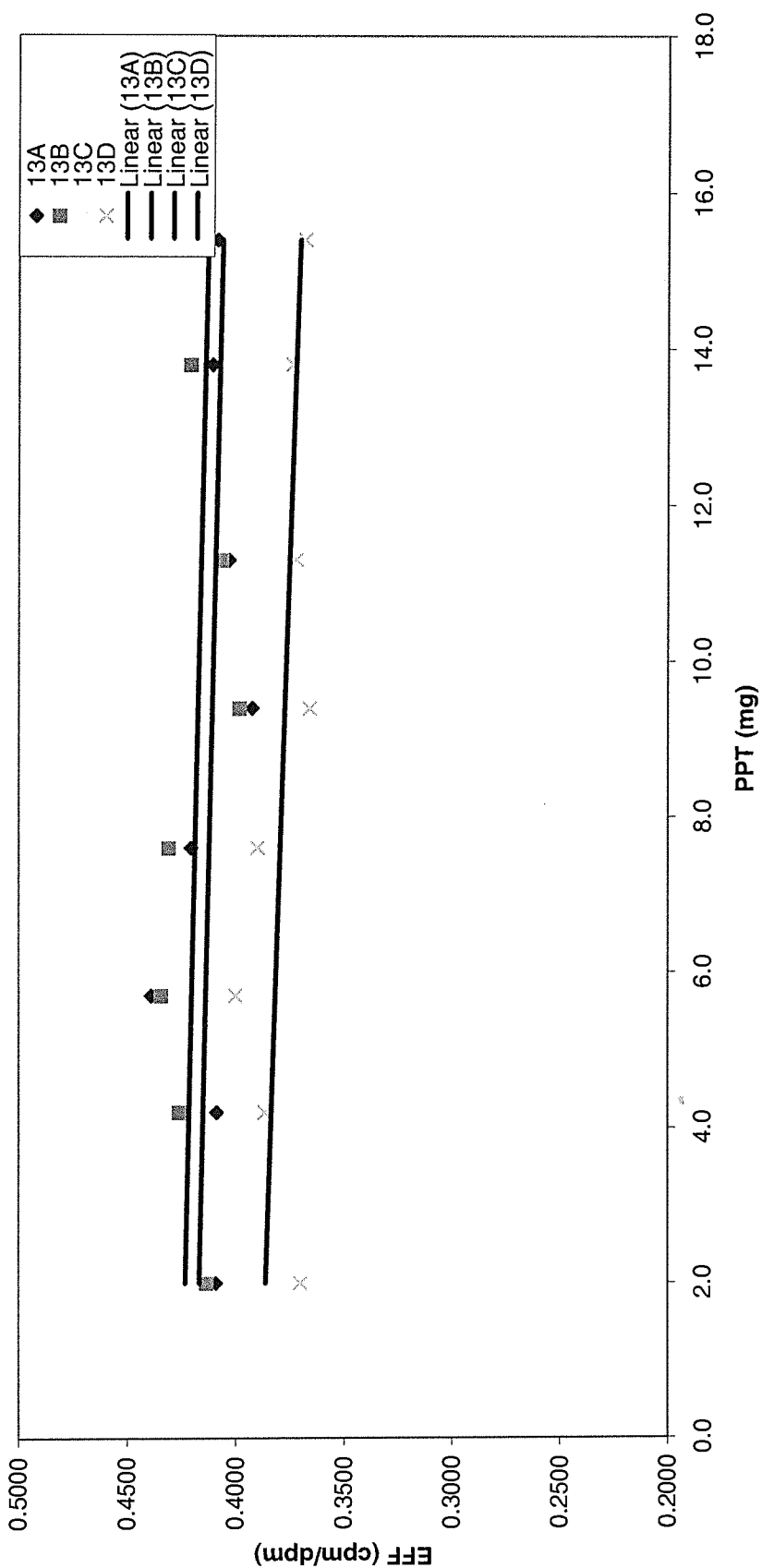
11C $y = -5.397978E-04x + 4.207411E-01$

11D $y = -1.218421E-03x + 4.379456E-01$

Sr-90 Calibration



Sr-90 Calibration



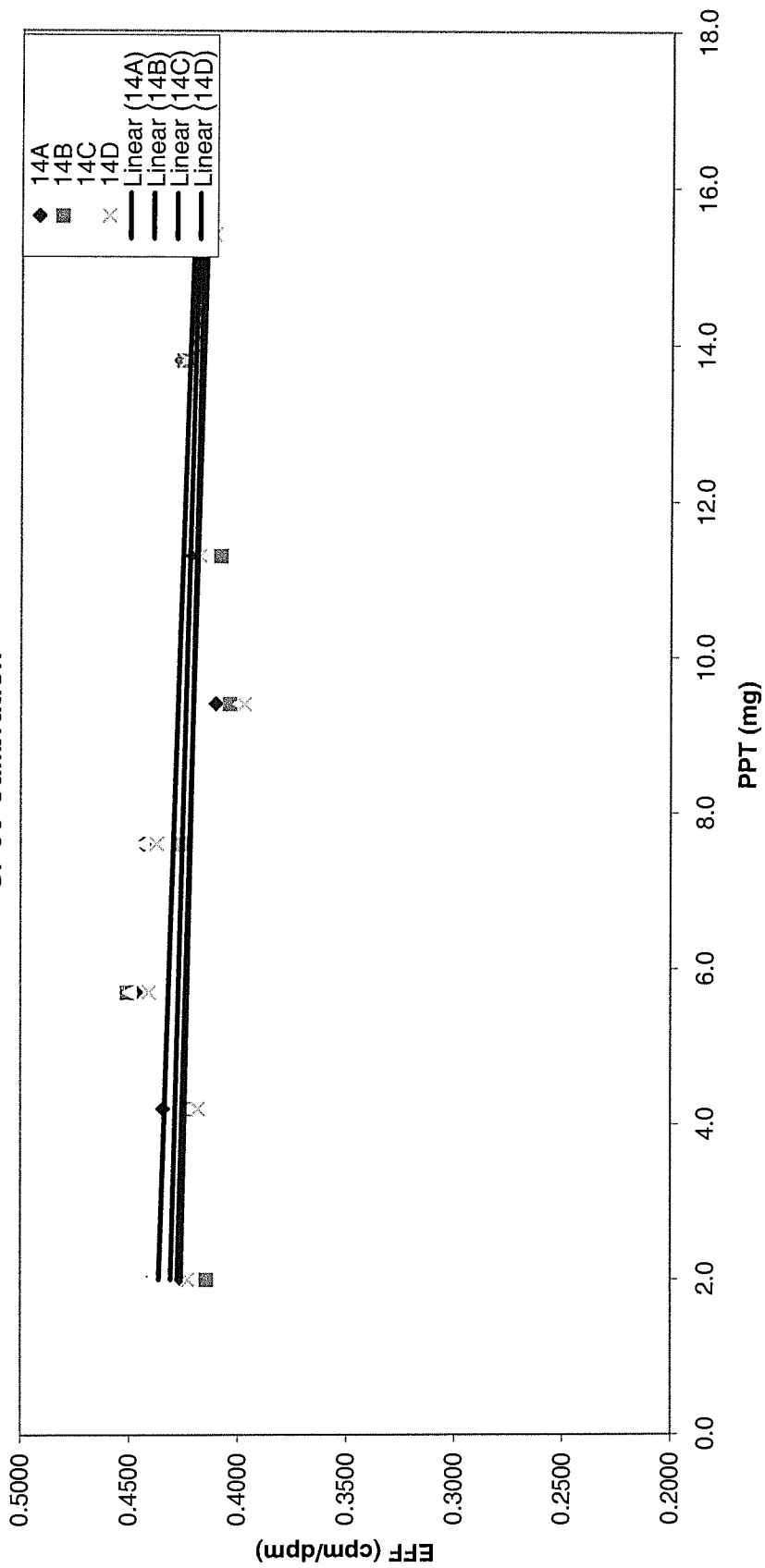
13A $y = -7.978554E-04x + 4.184046E-01$

13B $y = -7.762188E-04x + 4.247861E-01$

13C

13D $y = -1.183649E-03x + 3.885465E-01$

Sr-90 Calibration



Current Calibration - PIC

Geometry	Tuffryn Filter		4/1/2016	Exp Date	2/28/2017	
Sr-90	Cal Date					
Protean	A0	A1	A2	A3	A4	
1A	0.42818758	-0.000822874				
1B	0.437742392	-0.001755067				
1C	0.437135072	-0.001607365				
1D	0.423101465	-0.000519436				
2A	0.419912966	-0.00090426				
2B	0.400056346	8.28196E-05				
2C	0.411291508	-0.000270447				
2D	0.397193638	-0.001100277				
3A	0.410855485	-0.000658133				
3B	0.415937606	-0.001367469				
3C	0.422558538	-0.000731448				
3D	0.405278098	-0.000332099				
4A	0.428698808	-0.001454402				
4B	0.427804603	-0.000579462				
4C	0.432434334	-0.000964319				
4D	0.420316176	-0.001011721				
5A	0.442009856	-0.001313849				
5B	0.441495563	-0.001637392				
5C	0.423040881	-0.000406048				
5D	0.429258595	-0.000592616				
6A	0.4189072	-0.000838479				
6B	0.428633875	-0.001034978				
6C	0.429998919	-0.001075743				
6D	#N/A	#N/A				
7A	0.423983729	-0.000562497				
7B	0.439317611	-0.00131013				
7C	0.417634818	-0.000408818				
7D	0.41968091	-0.000913573				
8A	0.42196284	-0.001406602				
8B	0.438008632	-0.001259831				
8C	0.425222242	-0.001222559				
8D	0.427396045	-0.000229334				
9A	0.428182297	-0.000608324				
9B	0.427019668	-0.000982192				
9C	0.419849088	-0.000785839				
9D	0.428640561	-0.001075914				
10A	0.374200057	-0.00038932				
10B	0.416177786	-0.000975695				
10C	0.412435251	-0.000933027				
10D	0.407309091	-0.000281585				
11A	0.430640813	-0.000935053				
11B	0.443776601	-0.001752265				
11C	0.420741068	-0.000539798				
11D	0.437945559	-0.001218421				
12A	0.413814738	-0.001316525				
12B	0.423255367	-0.000882285				
12C	0.424875251	-0.000735198				
12D	0.429128794	-0.001157148				
13A	0.418404589	-0.000797855				
13B	0.424786059	-0.000776219				
13C	#N/A	#N/A				
13D	0.388546529	-0.001183649				
14A	0.43865257	-0.001160524				
14B	0.427626909	-0.000743622				
14C	0.432700652	-0.000917652				
14D	0.429808582	-0.000975827				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
S1	10A	3	1	12922	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S2	10A	3	7	12861	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S3	10A	3	1	13500	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S4	10A	3	1	13160	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S5	10A	3	0	12567	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S6	10A	3	1	12886	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S7	10A	3	0	13012	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S8	10A	3	0	12844	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S1	10B	3	2	14323	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S2	10B	3	2	14603	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S3	10B	3	7	14838	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S4	10B	3	6	14943	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S5	10B	3	3	13926	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S6	10B	3	3	14266	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S7	10B	3	5	14283	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S8	10B	3	4	14256	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S1	10C	3	1	14058	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S2	10C	3	5	14516	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S3	10C	3	1	14951	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S4	10C	3	1	14842	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S5	10C	3	2	13540	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S6	10C	3	4	13892	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S7	10C	3	3	14278	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S8	10C	3	0	14177	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S1	10D	3	0	14309	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S2	10D	3	3	14103	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S3	10D	3	0	14773	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S4	10D	3	0	14526	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S5	10D	3	1	13512	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S6	10D	3	1	14175	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S7	10D	3	0	14398	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S8	10D	3	0	14188	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S1	11A	3	0	14797	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S2	11A	3	4	15262	2/20/2016 16:55	2/20/2016 16:58	PIC	SR90S16
S3	11A	3	1	15478	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S4	11A	3	0	15433	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16

S5	11A	3	0	14575	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S6	11A	3	0	14644	2/20/2016 17:12	2/20/2016 17:15	PIC	SR90S16
S7	11A	3	0	14795	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S8	11A	3	1	15105	2/20/2016 17:03	2/20/2016 17:06	PIC	SR90S16
S1	11B	3	1	15305	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S2	11B	3	2	15420	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S3	11B	3	1	16014	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S4	11B	3	0	15514	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S5	11B	3	0	14545	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S6	11B	3	0	14961	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S7	11B	3	1	15234	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S8	11B	3	3	15022	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S1	11C	3	1	14640	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S2	11C	3	4	14953	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S3	11C	3	0	15344	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S4	11C	3	0	15224	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S5	11C	3	0	14231	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S6	11C	3	0	14717	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S7	11C	3	0	14913	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S8	11C	3	0	14810	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S1	11D	3	1	15105	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S2	11D	3	8	15648	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S3	11D	3	1	15847	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S4	11D	3	0	15521	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S5	11D	3	0	14754	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S6	11D	3	0	15205	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S7	11D	3	0	15097	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S8	11D	3	0	15174	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S1	12A	3	0	14288	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S2	12A	3	3	14780	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S3	12A	3	0	15080	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S4	12A	3	0	14890	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S5	12A	3	0	13722	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S6	12A	3	0	13985	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S7	12A	3	0	14442	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S8	12A	3	0	14248	2/20/2016 16:46	2/20/2016 16:49	PIC	SR90S16
S1	12B	3	0	14776	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16

S2	12B	3	4	14767	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S3	12B	3	1	15179	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S4	12B	3	0	15305	2/20/2016 17:08	2/20/2016 17:11	PIC	SR90S16
S5	12B	3	0	14273	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90S16
S6	12B	3	1	14352	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S7	12B	3	0	14745	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S8	12B	3	0	14677	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S1	12C	3	0	14773	2/20/2016 17:09	2/20/2016 17:12	PIC	SR90S16
S2	12C	3	6	15021	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S3	12C	3	2	15306	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S4	12C	3	0	15413	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S5	12C	3	0	14339	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S6	12C	3	1	14668	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90S16
S7	12C	3	2	14815	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S8	12C	3	4	14808	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S1	12D	3	0	14800	2/20/2016 17:13	2/20/2016 17:16	PIC	SR90S16
S2	12D	3	2	15289	2/20/2016 17:09	2/20/2016 17:12	PIC	SR90S16
S3	12D	3	0	15580	2/20/2016 17:04	2/20/2016 17:07	PIC	SR90S16
S4	12D	3	0	15090	2/20/2016 17:00	2/20/2016 17:03	PIC	SR90S16
S5	12D	3	0	14309	2/20/2016 16:56	2/20/2016 16:59	PIC	SR90S16
S6	12D	3	0	14777	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90S16
S7	12D	3	0	14910	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90S16
S8	12D	3	2	14683	2/20/2016 16:42	2/20/2016 16:45	PIC	SR90S16
S1	13A	3	0	14445	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S2	13A	3	2	14462	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S3	13A	3	0	15261	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S4	13A	3	1	14764	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S5	13A	3	0	14031	2/20/2016 17:35	2/20/2016 17:38	PIC	SR90S16
S6	13A	3	0	14343	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S7	13A	3	0	14538	2/20/2016 17:43	2/20/2016 17:46	PIC	SR90S16
S8	13A	3	0	14467	2/20/2016 17:39	2/20/2016 17:42	PIC	SR90S16
S1	13B	3	0	14640	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S2	13B	3	2	14968	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S3	13B	3	0	15216	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S4	13B	3	0	15115	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S5	13B	3	0	14264	2/20/2016 17:39	2/20/2016 17:42	PIC	SR90S16
S6	13B	3	0	14475	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16

S7	13B	3	0	14885	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S8	13B	3	1	14716	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S1	13D	3	0	12872	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S2	13D	3	5	13301	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S3	13D	3	0	13662	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S4	13D	3	0	13376	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S5	13D	3	0	12780	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S6	13D	3	0	12940	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S7	13D	3	0	12971	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S8	13D	3	1	12811	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S1	14A	3	0	15248	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S2	14A	3	3	15506	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S3	14A	3	1	15834	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S4	14A	3	1	15730	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S5	14A	3	1	14803	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S6	14A	3	0	15115	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S7	14A	3	0	15259	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S8	14A	3	0	15067	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S1	14B	3	1	14909	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S2	14B	3	5	15150	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S3	14B	3	1	15908	2/20/2016 17:48	2/20/2016 17:51	PIC	SR90S16
S4	14B	3	0	15248	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S5	14B	3	0	14596	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S6	14B	3	0	14700	2/20/2016 17:19	2/20/2016 17:22	PIC	SR90S16
S7	14B	3	1	15189	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S8	14B	3	1	14952	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S1	14C	3	0	15205	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S2	14C	3	2	15225	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16
S3	14C	3	1	15939	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S4	14C	3	0	15805	2/20/2016 17:49	2/20/2016 17:52	PIC	SR90S16
S5	14C	3	0	14564	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S6	14C	3	0	14987	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S7	14C	3	0	15187	2/20/2016 17:20	2/20/2016 17:23	PIC	SR90S16
S8	14C	3	0	15174	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S1	14D	3	1	15195	2/20/2016 17:49	2/20/2016 17:52	PIC	SR90S16
S2	14D	3	3	15057	2/20/2016 17:44	2/20/2016 17:47	PIC	SR90S16
S3	14D	3	0	15654	2/20/2016 17:40	2/20/2016 17:43	PIC	SR90S16

S4	14D	3	0	15552	2/20/2016 17:36	2/20/2016 17:39	PIC	SR90S16
S5	14D	3	1	14468	2/20/2016 17:31	2/20/2016 17:34	PIC	SR90S16
S6	14D	3	0	15017	2/20/2016 17:27	2/20/2016 17:30	PIC	SR90S16
S7	14D	3	0	15176	2/20/2016 17:23	2/20/2016 17:26	PIC	SR90S16
S8	14D	3	0	14830	2/20/2016 17:20	2/20/2016 17:23	PIC	SR90S16
S1	1A	3	1	14186	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S2	1A	3	4	14822	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S3	1A	3	5	14984	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S4	1A	3	4	14662	2/20/2016 12:35	2/20/2016 12:38	PIC	SR90S16
S5	1A	3	3	13922	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S6	1A	3	2	14305	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S7	1A	3	3	14466	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S8	1A	3	1	14401	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S1	1B	3	13	14674	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S2	1B	3	12	14781	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S3	1B	3	13	14814	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S4	1B	3	18	14913	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S5	1B	3	18	13971	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S6	1B	3	16	14284	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S7	1B	3	20	14398	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S8	1B	3	19	14322	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S1	1C	3	161	14441	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S2	1C	3	151	14838	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S3	1C	3	144	15277	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S4	1C	3	167	15212	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S5	1C	3	166	13997	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S6	1C	3	174	14326	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S7	1C	3	151	14430	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S8	1C	3	194	14415	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S1	1D	3	112	14200	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S2	1D	3	126	14506	2/20/2016 12:40	2/20/2016 12:43	PIC	SR90S16
S3	1D	3	116	14976	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S4	1D	3	128	14726	2/20/2016 12:31	2/20/2016 12:34	PIC	SR90S16
S5	1D	3	135	13845	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S6	1D	3	115	14442	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S7	1D	3	117	14742	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S8	1D	3	117	14106	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16

S1	2A	3	8	14104	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S2	2A	3	8	14228	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S3	2A	3	12	14755	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S4	2A	3	6	14565	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S5	2A	3	8	13802	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S6	2A	3	8	13922	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S7	2A	3	9	14117	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S8	2A	3	6	14004	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S1	2B	3	0	13494	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S2	2B	3	6	13735	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S3	2B	3	0	14086	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S4	2B	3	0	14101	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S5	2B	3	0	13254	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S6	2B	3	2	13299	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S7	2B	3	0	13703	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S8	2B	3	0	13940	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S1	2C	3	18	13901	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S2	2C	3	17	13916	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S3	2C	3	9	14632	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S4	2C	3	9	14370	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S5	2C	3	9	13642	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S6	2C	3	11	14059	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S7	2C	3	16	14045	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S8	2C	3	12	13916	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S1	2D	3	0	13327	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90S16
S2	2D	3	7	13308	2/20/2016 13:01	2/20/2016 13:04	PIC	SR90S16
S3	2D	3	0	13789	2/20/2016 12:54	2/20/2016 12:57	PIC	SR90S16
S4	2D	3	1	13740	2/20/2016 12:50	2/20/2016 12:53	PIC	SR90S16
S5	2D	3	0	12936	2/20/2016 12:45	2/20/2016 12:48	PIC	SR90S16
S6	2D	3	0	12858	2/20/2016 12:41	2/20/2016 12:44	PIC	SR90S16
S7	2D	3	0	13095	2/20/2016 12:36	2/20/2016 12:39	PIC	SR90S16
S8	2D	3	0	13204	2/20/2016 12:32	2/20/2016 12:35	PIC	SR90S16
S1	3A	3	348	13797	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S2	3A	3	370	14321	2/20/2016 13:25	2/20/2016 13:28	PIC	SR90S16
S3	3A	3	370	14736	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S4	3A	3	332	14372	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S5	3A	3	343	13423	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16

S6	3A	3	356	13811	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S7	3A	3	352	14196	2/20/2016 13:39	2/20/2016 13:42	PIC	SR90S16
S8	3A	3	370	14078	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S1	3B	3	160	14105	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S2	3B	3	164	14272	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S3	3B	3	155	14645	2/20/2016 13:25	2/20/2016 13:28	PIC	SR90S16
S4	3B	3	164	14570	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S5	3B	3	157	13437	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S6	3B	3	146	13829	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S7	3B	3	153	14009	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S8	3B	3	149	14053	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S1	3C	3	111	14272	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S2	3C	3	103	14536	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S3	3C	3	122	14950	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S4	3C	3	104	14801	2/20/2016 13:25	2/20/2016 13:28	PIC	SR90S16
S5	3C	3	94	14033	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S6	3C	3	99	14429	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S7	3C	3	94	14445	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S8	3C	3	88	14314	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
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S4	3D	3	28	14382	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S5	3D	3	39	13657	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S6	3D	3	26	13772	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S7	3D	3	34	14025	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S8	3D	3	33	13986	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S1	4A	3	83	14530	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S2	4A	3	72	14683	2/20/2016 13:44	2/20/2016 13:47	PIC	SR90S16
S3	4A	3	70	14940	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
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S5	4A	3	76	13835	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S6	4A	3	83	14118	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S7	4A	3	84	14335	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S8	4A	3	62	14262	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S1	4B	3	1	14554	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
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S5	4B	3	0	14038	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S6	4B	3	2	14504	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S7	4B	3	0	14552	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S8	4B	3	0	14686	2/20/2016 13:20	2/20/2016 13:23	PIC	SR90S16
S1	4C	3	42	14802	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
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S3	4C	3	28	15052	2/20/2016 13:30	2/20/2016 13:33	PIC	SR90S16
S4	4C	3	32	15038	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90S16
S5	4C	3	16	13935	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90S16
S6	4C	3	50	14667	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S7	4C	3	38	14693	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
S8	4C	3	45	14589	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S1	4D	3	227	14220	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90S16
S2	4D	3	234	14624	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90S16
S3	4D	3	232	14908	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90S16
S4	4D	3	234	14542	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90S16
S5	4D	3	207	13834	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90S16
S6	4D	3	186	14095	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90S16
S7	4D	3	206	14286	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90S16
S8	4D	3	198	14146	2/20/2016 13:11	2/20/2016 13:14	PIC	SR90S16
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S3	5A	3	35	15712	2/20/2016 14:22	2/20/2016 14:25	PIC	SR90S16
S4	5A	3	36	15152	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S5	5A	3	38	14660	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S6	5A	3	40	14925	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16
S7	5A	3	32	14859	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S8	5A	3	32	14915	2/20/2016 14:35	2/20/2016 14:38	PIC	SR90S16
S1	5B	3	49	14929	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S2	5B	3	44	15222	2/20/2016 14:13	2/20/2016 14:16	PIC	SR90S16
S3	5B	3	46	15764	2/20/2016 14:27	2/20/2016 14:30	PIC	SR90S16
S4	5B	3	41	15240	2/20/2016 14:22	2/20/2016 14:25	PIC	SR90S16
S5	5B	3	47	14104	2/20/2016 14:35	2/20/2016 14:38	PIC	SR90S16
S6	5B	3	41	14557	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S7	5B	3	51	15162	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16

S8	5B	3	42	14698	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S1	5C	3	44	14607	2/20/2016 14:23	2/20/2016 14:26	PIC	SR90S16
S2	5C	3	49	14641	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S3	5C	3	45	15261	2/20/2016 14:13	2/20/2016 14:16	PIC	SR90S16
S4	5C	3	47	15007	2/20/2016 14:27	2/20/2016 14:30	PIC	SR90S16
S5	5C	3	36	14145	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S6	5C	3	34	14630	2/20/2016 14:36	2/20/2016 14:39	PIC	SR90S16
S7	5C	3	38	14766	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S8	5C	3	59	14741	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16
S1	5D	3	57	14865	2/20/2016 14:27	2/20/2016 14:30	PIC	SR90S16
S2	5D	3	58	14939	2/20/2016 14:23	2/20/2016 14:26	PIC	SR90S16
S3	5D	3	61	15249	2/20/2016 14:18	2/20/2016 14:21	PIC	SR90S16
S4	5D	3	58	15051	2/20/2016 14:13	2/20/2016 14:16	PIC	SR90S16
S5	5D	3	37	14346	2/20/2016 14:44	2/20/2016 14:47	PIC	SR90S16
S6	5D	3	61	14646	2/20/2016 14:40	2/20/2016 14:43	PIC	SR90S16
S7	5D	3	54	14739	2/20/2016 14:36	2/20/2016 14:39	PIC	SR90S16
S8	5D	3	55	15045	2/20/2016 14:31	2/20/2016 14:34	PIC	SR90S16
S1	6A	3	71	14466	2/20/2016 14:33	2/20/2016 14:36	PIC	SR90S16
S2	6A	3	70	14472	2/20/2016 14:46	2/20/2016 14:49	PIC	SR90S16
S3	6A	3	66	14908	2/20/2016 14:42	2/20/2016 14:45	PIC	SR90S16
S4	6A	3	63	14922	2/20/2016 14:37	2/20/2016 14:40	PIC	SR90S16
S5	6A	3	57	14046	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90S16
S6	6A	3	74	14394	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90S16
S7	6A	3	80	14455	2/20/2016 14:25	2/20/2016 14:28	PIC	SR90S16
S8	6A	3	76	14232	2/20/2016 14:20	2/20/2016 14:23	PIC	SR90S16
S1	6B	3	84	14556	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90S16
S2	6B	3	81	14963	2/20/2016 14:33	2/20/2016 14:36	PIC	SR90S16
S3	6B	3	85	15210	2/20/2016 14:46	2/20/2016 14:49	PIC	SR90S16
S4	6B	3	98	15205	2/20/2016 14:42	2/20/2016 14:45	PIC	SR90S16
S5	6B	3	84	14261	2/20/2016 14:20	2/20/2016 14:23	PIC	SR90S16
S6	6B	3	95	14449	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90S16
S7	6B	3	89	14729	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90S16
S8	6B	3	65	14462	2/20/2016 14:25	2/20/2016 14:28	PIC	SR90S16
S1	6C	3	97	14595	2/20/2016 14:42	2/20/2016 14:45	PIC	SR90S16
S2	6C	3	121	15094	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90S16
S3	6C	3	124	15201	2/20/2016 14:33	2/20/2016 14:36	PIC	SR90S16
S4	6C	3	118	15278	2/20/2016 14:46	2/20/2016 14:49	PIC	SR90S16

S5	6C	3	101	14064	2/20/2016 14:25	2/20/2016 14:28	PIC	SR90S16
S6	6C	3	128	14589	2/20/2016 14:20	2/20/2016 14:23	PIC	SR90S16
S7	6C	3	109	14659	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90S16
S8	6C	3	110	14577	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90S16
S1	7A	3	4	14647	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S2	7A	3	13	14683	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S3	7A	3	7	15337	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S4	7A	3	10	14916	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S5	7A	3	6	14321	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S6	7A	3	6	14526	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S7	7A	3	11	14765	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S8	7A	3	5	14749	2/20/2016 15:12	2/20/2016 15:15	PIC	SR90S16
S1	7B	3	11	14893	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S2	7B	3	14	15359	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S3	7B	3	9	15571	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S4	7B	3	12	15404	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S5	7B	3	15	14394	2/20/2016 15:12	2/20/2016 15:15	PIC	SR90S16
S6	7B	3	17	14760	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S7	7B	3	15	14988	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S8	7B	3	14	14909	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S1	7C	3	2	14400	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S2	7C	3	8	14617	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S3	7C	3	0	15028	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S4	7C	3	1	14779	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S5	7C	3	1	13820	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S6	7C	3	4	14385	2/20/2016 15:12	2/20/2016 15:15	PIC	SR90S16
S7	7C	3	3	14405	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S8	7C	3	0	14776	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S1	7D	3	2	14305	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S2	7D	3	4	14672	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S3	7D	3	2	15066	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S4	7D	3	2	14822	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S5	7D	3	2	13907	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S6	7D	3	2	14305	2/20/2016 15:16	2/20/2016 15:19	PIC	SR90S16
S7	7D	3	3	14430	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S8	7D	3	3	14408	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16
S1	8A	3	17	14423	2/20/2016 15:08	2/20/2016 15:11	PIC	SR90S16

S2	8A	3	20	14724	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S3	8A	3	13	15147	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S4	8A	3	21	14871	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S5	8A	3	15	13999	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S6	8A	3	16	14350	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S7	8A	3	17	14374	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S8	8A	3	15	14195	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S1	8B	3	0	14877	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S2	8B	3	2	15242	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90S16
S3	8B	3	4	15644	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S4	8B	3	1	15353	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S5	8B	3	1	14319	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S6	8B	3	1	14609	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S7	8B	3	2	14795	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S8	8B	3	3	14930	2/20/2016 15:00	2/20/2016 15:03	PIC	SR90S16
S1	8C	3	2	14653	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S2	8C	3	9	14695	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S3	8C	3	2	15230	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90S16
S4	8C	3	1	15016	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S5	8C	3	0	13933	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90S16
S6	8C	3	7	14256	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S7	8C	3	2	14597	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S8	8C	3	2	14450	2/20/2016 15:04	2/20/2016 15:07	PIC	SR90S16
S1	8D	3	57	14816	2/20/2016 15:21	2/20/2016 15:24	PIC	SR90S16
S2	8D	3	58	15164	2/20/2016 15:17	2/20/2016 15:20	PIC	SR90S16
S3	8D	3	47	15580	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90S16
S4	8D	3	55	15210	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90S16
S5	8D	3	44	14216	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90S16
S6	8D	3	35	14800	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90S16
S7	8D	3	51	15132	2/20/2016 14:56	2/20/2016 14:59	PIC	SR90S16
S8	8D	3	51	15035	2/20/2016 14:52	2/20/2016 14:55	PIC	SR90S16
S1	9A	3	9	14799	2/20/2016 15:55	2/20/2016 15:58	PIC	SR90S16
S2	9A	3	8	15041	2/20/2016 16:09	2/20/2016 16:12	PIC	SR90S16
S3	9A	3	14	15584	2/20/2016 16:04	2/20/2016 16:07	PIC	SR90S16
S4	9A	3	6	15300	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S5	9A	3	9	14556	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S6	9A	3	14	14685	2/20/2016 16:33	2/20/2016 16:36	PIC	SR90S16

S7	9A	3	8	15337	2/20/2016 16:26	2/20/2016 16:29	PIC	SR90S16
S8	9A	3	15	14784	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S1	9B	3	20	14662	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S2	9B	3	24	14896	2/20/2016 15:55	2/20/2016 15:58	PIC	SR90S16
S3	9B	3	13	15801	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S4	9B	3	22	15011	2/20/2016 16:04	2/20/2016 16:07	PIC	SR90S16
S5	9B	3	18	14329	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S6	9B	3	17	14696	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S7	9B	3	18	14916	2/20/2016 16:33	2/20/2016 16:36	PIC	SR90S16
S8	9B	3	26	14724	2/20/2016 16:26	2/20/2016 16:29	PIC	SR90S16
S1	9C	3	21	14642	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S2	9C	3	17	14781	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S3	9C	3	21	15345	2/20/2016 15:55	2/20/2016 15:58	PIC	SR90S16
S4	9C	3	25	14841	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S5	9C	3	19	14117	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S6	9C	3	26	14469	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S7	9C	3	28	14512	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16
S8	9C	3	28	14925	2/20/2016 16:33	2/20/2016 16:36	PIC	SR90S16
S1	9D	3	43	14850	2/20/2016 16:10	2/20/2016 16:13	PIC	SR90S16
S2	9D	3	48	14953	2/20/2016 16:05	2/20/2016 16:08	PIC	SR90S16
S3	9D	3	46	15419	2/20/2016 16:00	2/20/2016 16:03	PIC	SR90S16
S4	9D	3	41	15387	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90S16
S5	9D	3	29	14444	2/20/2016 16:34	2/20/2016 16:37	PIC	SR90S16
S6	9D	3	31	14687	2/20/2016 16:27	2/20/2016 16:30	PIC	SR90S16
S7	9D	3	36	14778	2/20/2016 16:22	2/20/2016 16:25	PIC	SR90S16
S8	9D	3	39	14829	2/20/2016 16:15	2/20/2016 16:18	PIC	SR90S16

Y-90 Calibration - PIC - Feb 2016

Standard Data	Isotope	Sr-90
	Standard ID number	1244-A
	Half Life (days)	10555.725
	Std. Act. (dpm/mL)	21333.9626
	Reference Date	10/1/2008
	Volume of spike (mL)	0.5
	Std. Nominal (dpm)	8935.10
	Decay Date	2/20/2016

Separation Date/Time 2/19/2016 13:25
Y-90 Half Life (days) 2.668875

The following detectors were not calibrated:

6D, 13C

Carrier Data		Std ID	2354207	
		Std weight	31.78	mg/mL
Source	Measured weight (mg)	Vol. Carrier Added (mL)	Theoretical weight (mg)	***Recovery
1	15.9	0.5	15.89	100.0%
2	16.4	0.5	15.89	100.0%
3	16.3	0.5	15.89	100.0%
4	16.4	0.5	15.89	100.0%
5	15.8	0.5	15.89	99.4%
6	15.7	0.5	15.89	98.8%
7	16.1	0.5	15.89	100.0%
8	16.3	0.5	15.89	100.0%

***Recovery values exceeding 100% will be evaluated at 100%.

***Recovery values exceeding 100% will be evaluated at 100%.

*Background is considered negligible.

**Decay corrected to mid-point of count

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Sr-90		Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)				Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	
1A	1	2/20/2016 11:40	3	11488	3829.33	100.0%	0.78576	4873.42	8934.82	0.5454
1A	2	2/20/2016 11:57	3	11289	3763.00	100.0%	0.78337	4803.59	8934.81	0.5376
1A	3	2/20/2016 11:52	3	11459	3819.67	100.0%	0.78409	4871.47	8934.81	0.5452
1A	4	2/20/2016 11:48	3	11426	3808.67	100.0%	0.78467	4853.87	8934.81	0.5433
1A	5	2/20/2016 12:13	3	11352	3784.00	99.4%	0.78112	4871.94	8934.80	0.5453
1A	6	2/20/2016 12:26	3	11462	3820.67	98.8%	0.77931	4961.98	8934.80	0.5554
1A	7	2/20/2016 12:21	3	11527	3842.33	100.0%	0.77993	4926.48	8934.80	0.5514
1A	8	2/20/2016 12:17	3	11681	3893.67	100.0%	0.78049	4988.76	8934.80	0.5584
1B	1	2/20/2016 11:48	3	11409	3803.00	100.0%	0.78466	4846.71	8934.81	0.5425
1B	2	2/20/2016 11:40	3	11539	3846.33	100.0%	0.78576	4895.07	8934.82	0.5479
1B	3	2/20/2016 11:57	3	11612	3870.67	100.0%	0.78336	4941.09	8934.81	0.5530
1B	4	2/20/2016 11:52	3	11274	3758.00	100.0%	0.78408	4792.87	8934.81	0.5364
1B	5	2/20/2016 12:17	3	11426	3808.67	99.4%	0.78048	4907.71	8934.80	0.5493
1B	6	2/20/2016 12:13	3	11568	3856.00	98.8%	0.78111	4996.32	8934.80	0.5592
1B	7	2/20/2016 12:26	3	11471	3823.67	100.0%	0.77930	4906.54	8934.80	0.5491
1B	8	2/20/2016 12:21	3	11717	3905.67	100.0%	0.77993	5007.71	8934.80	0.5605
1C	1	2/20/2016 11:52	3	11651	3883.67	100.0%	0.78407	4953.22	8934.81	0.5544
1C	2	2/20/2016 11:48	3	12039	4013.00	100.0%	0.78465	5114.38	8934.81	0.5724
1C	3	2/20/2016 11:40	3	11920	3973.33	100.0%	0.78576	5056.70	8934.82	0.5660
1C	4	2/20/2016 11:57	3	11958	3986.00	100.0%	0.78335	5088.38	8934.81	0.5695
1C	5	2/20/2016 12:21	3	11406	3802.00	99.4%	0.77992	4902.62	8934.80	0.5487
1C	6	2/20/2016 12:17	3	11675	3891.67	98.8%	0.78047	5046.67	8934.80	0.5648
1C	7	2/20/2016 12:13	3	11909	3969.67	100.0%	0.78110	5082.14	8934.80	0.5688
1C	8	2/20/2016 12:26	3	11745	3915.00	100.0%	0.77929	5023.80	8934.80	0.5623
1D	1	2/20/2016 11:57	3	11531	3843.67	100.0%	0.78334	4906.76	8934.81	0.5492
1D	2	2/20/2016 11:52	3	11636	3878.67	100.0%	0.78406	4946.88	8934.81	0.5537
1D	3	2/20/2016 11:48	3	11610	3870.00	100.0%	0.78464	4932.21	8934.81	0.5520
1D	4	2/20/2016 11:40	3	11651	3883.67	100.0%	0.78576	4942.58	8934.82	0.5532
1D	5	2/20/2016 12:26	3	11243	3747.67	99.4%	0.77928	4836.53	8934.80	0.5413
1D	6	2/20/2016 12:21	3	11548	3849.33	98.8%	0.77991	4995.35	8934.80	0.5591
1D	7	2/20/2016 12:17	3	11712	3904.00	100.0%	0.78046	5002.18	8934.80	0.5599
1D	8	2/20/2016 12:13	3	11897	3965.67	100.0%	0.78109	5077.10	8934.80	0.5682
2A	1	2/20/2016 12:13	3	11215	3738.33	100.0%	0.78108	4786.11	8934.80	0.5357
2A	2	2/20/2016 12:26	3	11258	3752.67	100.0%	0.77927	4815.61	8934.80	0.5390
2A	3	2/20/2016 12:21	3	11174	3724.67	100.0%	0.77988	4775.93	8934.80	0.5345
2A	4	2/20/2016 12:17	3	11358	3786.00	100.0%	0.78045	4851.06	8934.80	0.5429
2A	5	2/20/2016 11:40	3	11096	3698.67	99.4%	0.78575	4734.00	8934.82	0.5298
2A	6	2/20/2016 11:57	3	11399	3799.67	98.8%	0.78333	4909.33	8934.81	0.5495
2A	7	2/20/2016 11:52	3	11522	3840.67	100.0%	0.78405	4898.49	8934.81	0.5482
2A	8	2/20/2016 11:48	3	11469	3823.00	100.0%	0.78463	4872.36	8934.81	0.5453
2B	1	2/20/2016 12:18	3	10681	3560.33	100.0%	0.78044	4561.98	8934.80	0.5106
2B	2	2/20/2016 12:13	3	10820	3606.67	100.0%	0.78107	4617.58	8934.80	0.5168
2B	3	2/20/2016 12:26	3	10681	3560.33	100.0%	0.77926	4568.87	8934.80	0.5114
2B	4	2/20/2016 12:21	3	10767	3589.00	100.0%	0.77988	4602.01	8934.80	0.5151
2B	5	2/20/2016 11:48	3	10490	3496.67	99.4%	0.78462	4481.90	8934.81	0.5016
2B	6	2/20/2016 11:40	3	10544	3514.67	98.8%	0.78575	4527.16	8934.82	0.5067
2B	7	2/20/2016 11:57	3	10580	3526.67	100.0%	0.78333	4502.17	8934.81	0.5039
2B	8	2/20/2016 11:52	3	10655	3551.67	100.0%	0.78404	4529.95	8934.81	0.5070
2C	1	2/20/2016 12:22	3	10973	3657.67	100.0%	0.77984	4690.29	8934.80	0.5249
2C	2	2/20/2016 12:18	3	11113	3704.33	100.0%	0.78043	4746.55	8934.80	0.5312
2C	3	2/20/2016 12:13	3	11053	3684.33	100.0%	0.78107	4717.06	8934.80	0.5279
2C	4	2/20/2016 12:26	3	11288	3762.67	100.0%	0.77925	4828.56	8934.80	0.5404
2C	5	2/20/2016 11:52	3	11069	3689.67	99.4%	0.78403	4732.82	8934.81	0.5297
2C	6	2/20/2016 11:48	3	11080	3693.33	98.8%	0.78461	4764.18	8934.81	0.5332
2C	7	2/20/2016 11:40	3	11217	3739.00	100.0%	0.78575	4758.53	8934.82	0.5326
2C	8	2/20/2016 11:57	3	11441	3813.67	100.0%	0.78331	4868.63	8934.81	0.5449
2D	1	2/20/2016 12:26	3	10272	3424.00	100.0%	0.77924	4394.02	8934.80	0.4918
2D	2	2/20/2016 12:22	3	10579	3526.33	100.0%	0.77983	4521.92	8934.80	0.5061
2D	3	2/20/2016 12:18	3	10303	3434.33	100.0%	0.78042	4400.62	8934.80	0.4925
2D	4	2/20/2016 12:13	3	10554	3518.00	100.0%	0.78105	4504.18	8934.80	0.5041
2D	5	2/20/2016 11:57	3	10233	3411.00	99.4%	0.78330	4379.44	8934.81	0.4902
2D	6	2/20/2016 11:52	3	10298	3432.67	98.8%	0.78402	4431.25	8934.81	0.4960

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
2D	7	2/20/2016 11:48	3	10587	3529.00	100.0%	0.78460	4497.83	8934.81	0.5034	0.4974
2D	8	2/20/2016 11:40	3	10434	3478.00	100.0%	0.78575	4426.36	8934.82	0.4954	
3A	1	2/20/2016 12:30	3	11273	3757.67	100.0%	0.77863	4826.00	8934.80	0.5401	
3A	2	2/20/2016 12:47	3	11284	3761.33	100.0%	0.77627	4845.42	8934.79	0.5423	
3A	3	2/20/2016 12:43	3	11107	3702.33	100.0%	0.77681	4766.05	8934.79	0.5334	0.5422
3A	4	2/20/2016 12:39	3	11467	3822.33	100.0%	0.77742	4916.71	8934.79	0.5503	
3A	5	2/20/2016 12:52	3	11239	3746.33	99.4%	0.77559	4857.84	8934.79	0.5437	
3A	6	2/20/2016 13:06	3	11073	3691.00	98.8%	0.77362	4828.84	8934.78	0.5405	
3A	7	2/20/2016 13:02	3	11260	3753.33	100.0%	0.77425	4847.72	8934.78	0.5426	0.5509
3A	8	2/20/2016 12:56	3	11320	3773.33	100.0%	0.77503	4868.60	8934.78	0.5449	
3B	1	2/20/2016 12:39	3	11423	3807.67	100.0%	0.77741	4897.88	8934.79	0.5482	
3B	2	2/20/2016 12:30	3	11571	3857.00	100.0%	0.77863	4953.57	8934.80	0.5544	
3B	3	2/20/2016 12:47	3	11541	3847.00	100.0%	0.77625	4955.89	8934.79	0.5547	0.5563
3B	4	2/20/2016 12:43	3	11617	3872.33	100.0%	0.77680	4984.95	8934.79	0.5579	
3B	5	2/20/2016 12:56	3	11011	3670.33	99.4%	0.77502	4762.74	8934.78	0.5331	
3B	6	2/20/2016 12:52	3	11274	3758.00	98.8%	0.77557	4904.11	8934.79	0.5489	
3B	7	2/20/2016 13:06	3	11395	3798.33	100.0%	0.77360	4909.91	8934.78	0.5495	0.5395
3B	8	2/20/2016 13:02	3	11636	3878.67	100.0%	0.77424	5009.64	8934.78	0.5607	
3C	1	2/20/2016 12:43	3	11185	3728.33	100.0%	0.77679	4799.64	8934.79	0.5372	
3C	2	2/20/2016 12:39	3	11678	3892.67	100.0%	0.77740	5007.29	8934.79	0.5604	
3C	3	2/20/2016 12:35	3	11565	3855.00	100.0%	0.77801	4954.95	8934.79	0.5546	0.5503
3C	4	2/20/2016 12:47	3	11547	3849.00	100.0%	0.77624	4958.52	8934.79	0.5550	
3C	5	2/20/2016 13:02	3	11531	3843.67	99.4%	0.77423	4992.78	8934.78	0.5588	
3C	6	2/20/2016 12:56	3	11514	3838.00	98.8%	0.77501	5012.11	8934.78	0.5610	
3C	7	2/20/2016 12:52	3	11706	3902.00	100.0%	0.77556	5031.23	8934.79	0.5631	0.5578
3C	8	2/20/2016 13:06	3	11617	3872.33	100.0%	0.77360	5005.62	8934.78	0.5602	
3D	1	2/20/2016 12:47	3	11025	3675.00	100.0%	0.77623	4734.42	8934.79	0.5299	
3D	2	2/20/2016 12:44	3	11414	3804.67	100.0%	0.77678	4898.01	8934.79	0.5482	
3D	3	2/20/2016 12:39	3	11196	3732.00	100.0%	0.77739	4800.68	8934.79	0.5373	0.5613
3D	4	2/20/2016 12:30	3	11361	3787.00	100.0%	0.77863	4863.69	8934.80	0.5444	
3D	5	2/20/2016 13:06	3	11022	3674.00	99.4%	0.77359	4776.35	8934.78	0.5346	
3D	6	2/20/2016 13:02	3	11046	3682.00	98.8%	0.77422	4813.30	8934.78	0.5387	
3D	7	2/20/2016 12:57	3	11204	3734.67	100.0%	0.77492	4819.41	8934.78	0.5394	0.5536
3D	8	2/20/2016 12:52	3	11296	3765.33	100.0%	0.77554	4855.10	8934.79	0.5434	
4A	1	2/20/2016 12:52	3	11097	3699.00	100.0%	0.77553	4769.63	8934.79	0.5338	
4A	2	2/20/2016 13:07	3	11327	3775.67	100.0%	0.77357	4880.86	8934.78	0.5463	0.5578
4A	3	2/20/2016 13:02	3	11357	3785.67	100.0%	0.77421	4889.70	8934.78	0.5473	
4A	4	2/20/2016 12:56	3	11420	3806.67	100.0%	0.77499	4911.91	8934.78	0.5498	
4A	5	2/20/2016 12:30	3	11511	3837.00	99.4%	0.77862	4956.00	8934.80	0.5547	
4A	6	2/20/2016 12:48	3	11509	3836.33	98.8%	0.77622	5002.13	8934.79	0.5598	0.5503
4A	7	2/20/2016 12:44	3	11689	3896.33	100.0%	0.77677	5016.08	8934.79	0.5614	
4A	8	2/20/2016 12:39	3	11453	3817.67	100.0%	0.77738	4910.93	8934.79	0.5496	
4B	1	2/20/2016 12:56	3	11640	3880.00	100.0%	0.77498	5006.59	8934.78	0.5603	0.5578
4B	2	2/20/2016 12:53	3	11586	3862.00	100.0%	0.77552	4979.89	8934.79	0.5574	
4B	3	2/20/2016 13:07	3	11585	3861.67	100.0%	0.77355	4992.11	8934.78	0.5587	
4B	4	2/20/2016 13:02	3	11605	3868.33	100.0%	0.77420	4996.57	8934.78	0.5592	
4B	5	2/20/2016 12:39	3	11376	3792.00	99.4%	0.77737	4905.76	8934.79	0.5491	0.5613
4B	6	2/20/2016 12:30	3	11735	3911.67	98.8%	0.77862	5084.62	8934.80	0.5691	
4B	7	2/20/2016 12:48	3	11421	3807.00	100.0%	0.77621	4904.59	8934.79	0.5489	
4B	8	2/20/2016 12:44	3	11653	3884.33	100.0%	0.77676	5000.69	8934.79	0.5597	
4C	1	2/20/2016 13:02	3	11389	3796.33	100.0%	0.77419	4903.61	8934.78	0.5488	0.5536
4C	2	2/20/2016 12:57	3	11814	3938.00	100.0%	0.77496	5081.53	8934.78	0.5687	
4C	3	2/20/2016 12:53	3	11728	3909.33	100.0%	0.77551	5040.99	8934.79	0.5642	
4C	4	2/20/2016 13:07	3	11461	3820.33	100.0%	0.77354	4938.75	8934.78	0.5528	
4C	5	2/20/2016 12:44	3	11538	3846.00	99.4%	0.77675	4979.60	8934.79	0.5573	0.5685
4C	6	2/20/2016 12:39	3	11745	3915.00	98.8%	0.77736	5097.21	8934.79	0.5705	
4C	7	2/20/2016 12:30	3	11671	3890.33	100.0%	0.77862	4996.43	8934.80	0.5592	
4C	8	2/20/2016 12:48	3	11836	3945.33	100.0%	0.77620	5082.90	8934.79	0.5689	
4D	1	2/20/2016 13:07	3	11384	3794.67	100.0%	0.77353	4905.65	8934.78	0.5491	0.5536
4D	2	2/20/2016 13:02	3	11387	3795.67	100.0%	0.77418	4902.83	8934.78	0.5487	
4D	3	2/20/2016 12:57	3	11719	3906.33	100.0%	0.77496	5040.71	8934.78	0.5642	
4D	4	2/20/2016 12:53	3	11606	3868.67	100.0%	0.77550	4988.62	8934.79	0.5583	
4D	5	2/20/2016 12:48	3	11295	3765.00	99.4%	0.77619	4878.24	8934.79	0.5460	0.5536
4D	6	2/20/2016 12:44	3	11469	3823.00	98.8%	0.77674	4981.41	8934.79	0.5575	
4D	7	2/20/2016 12:39	3	11446	3815.33	100.0%	0.77735	4908.12	8934.79	0.5493	
4D	8	2/20/2016 12:30	3	11593	3864.33	100.0%	0.77862	4963.05	8934.80	0.5555	
5A	1	2/20/2016 13:10	3	11610	3870.00	100.0%	0.77302	5006.33	8934.78	0.5603	0.5685
5A	2	2/20/2016 13:26	3	11816	3938.67	100.0%	0.77085	5109.48	8934.77	0.5719	
5A	3	2/20/2016 13:21	3	11784	3928.00	100.0%	0.77158	5090.82	8934.77	0.5698	
5A	4	2/20/2016 13:16	3	11642	3880.67	100.0%	0.77222	5025.34	8934.78	0.5624	
5A	5	2/20/2016 13:31	3	11576	3858.67	99.4%	0.77021	5038.46	8934.77	0.5639	0.5685
5A	6	2/20/2016 13:45	3	11655	3885.00	98.8%	0.76819	5118.54	8934.76	0.5729	
5A	7	2/20/2016 13:40	3	11976	3992.00	100.0%	0.76885	5192.20	8934.77	0.5811	
5A	8	2/20/2016 13:36	3	11669	3889.67	100.0%	0.76944	5055.16	8934.77	0.5658	
5B	1	2/20/2016 13:16	3	11386	3795.33	100.0%	0.77221	4914.88	8934.78	0.5501	0.5685
5B	2	2/20/2016 13:10	3	11752	3917.33	100.0%	0.77303	5067.53	8934.78	0.5672	
5B	3	2/20/2016 13:26	3	11513	3837.67	100.0%	0.77084	4978.54	8934.77	0.5572	
5B	4	2/20/2016 13:21	3	11951	3983.67	100.0%	0.77158	5163.03	8934.77	0.5779	
5B	5	2/20/2016 13:36	3	11451	3817.00	99.4%	0.76943	4989.04	8934.77	0.5584	0.5685
5B	6	2/20/2016 13:31	3	11634	3878.00	98.8%	0.77020	5096.01	8934.77	0.5704	
5B	7	2/20/2016 13:45	3	12023	4007.67	100.0%	0.76818	5217.06	8934.76	0.5839	

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
5B	8	2/20/2016 13:41	3	11678	3892.67	100.0%	0.76883	5063.08	8934.77	0.5667	0.5665
5C	1	2/20/2016 13:21	3	11404	3801.33	100.0%	0.77157	4926.78	8934.77	0.5514	
5C	2	2/20/2016 13:16	3	11597	3865.67	100.0%	0.77220	5006.03	8934.78	0.5603	0.5622
5C	3	2/20/2016 13:10	3	11650	3883.33	100.0%	0.77303	5023.55	8934.78	0.5622	
5C	4	2/20/2016 13:26	3	11656	3885.33	100.0%	0.77083	5040.43	8934.77	0.5641	
5C	5	2/20/2016 13:41	3	11393	3797.67	99.4%	0.76882	4967.73	8934.77	0.5560	
5C	6	2/20/2016 13:36	3	11588	3862.67	98.8%	0.76943	5080.95	8934.77	0.5687	
5C	7	2/20/2016 13:31	3	11807	3935.67	100.0%	0.77019	5110.01	8934.77	0.5719	
5C	8	2/20/2016 13:45	3	11584	3861.33	100.0%	0.76817	5026.64	8934.76	0.5626	
5D	1	2/20/2016 13:26	3	11538	3846.00	100.0%	0.77082	4989.47	8934.77	0.5584	
5D	2	2/20/2016 13:21	3	11772	3924.00	100.0%	0.77156	5085.82	8934.77	0.5692	
5D	3	2/20/2016 13:16	3	11453	3817.67	100.0%	0.77219	4943.92	8934.78	0.5533	0.5641
5D	4	2/20/2016 13:10	3	11705	3901.67	100.0%	0.77303	5047.26	8934.78	0.5649	
5D	5	2/20/2016 13:45	3	11556	3852.00	99.4%	0.76816	5043.16	8934.76	0.5644	
5D	6	2/20/2016 13:41	3	11479	3826.33	98.8%	0.76881	5037.18	8934.77	0.5638	
5D	7	2/20/2016 13:36	3	11695	3898.33	100.0%	0.76941	5066.63	8934.77	0.5671	
5D	8	2/20/2016 13:31	3	11796	3932.00	100.0%	0.77018	5105.30	8934.77	0.5714	
6A	1	2/20/2016 13:33	3	11135	3711.67	100.0%	0.76992	4820.84	8934.77	0.5396	
6A	2	2/20/2016 13:47	3	11515	3838.33	100.0%	0.76790	4998.46	8934.76	0.5594	
6A	3	2/20/2016 13:43	3	11509	3836.33	100.0%	0.76856	4991.61	8934.77	0.5587	
6A	4	2/20/2016 13:38	3	11510	3836.67	100.0%	0.76916	4988.13	8934.77	0.5583	0.5572
6A	5	2/20/2016 13:14	3	11525	3841.67	99.4%	0.77259	5000.78	8934.78	0.5597	
6A	6	2/20/2016 13:28	3	11634	3878.00	98.8%	0.77056	5093.59	8934.77	0.5701	
6A	7	2/20/2016 13:23	3	11481	3827.00	100.0%	0.77130	4961.74	8934.77	0.5553	
6A	8	2/20/2016 13:18	3	11519	3839.67	100.0%	0.77193	4974.08	8934.78	0.5567	
6B	1	2/20/2016 13:38	3	11454	3818.00	100.0%	0.76915	4963.92	8934.77	0.5556	
6B	2	2/20/2016 13:33	3	11666	3888.67	100.0%	0.76991	5050.80	8934.77	0.5653	
6B	3	2/20/2016 13:47	3	11441	3813.67	100.0%	0.76789	4966.40	8934.76	0.5559	
6B	4	2/20/2016 13:43	3	11517	3839.00	100.0%	0.76855	4995.14	8934.77	0.5591	
6B	5	2/20/2016 13:18	3	11469	3823.00	99.4%	0.77192	4980.78	8934.78	0.5575	0.5616
6B	6	2/20/2016 13:14	3	11679	3893.00	98.8%	0.77258	5099.97	8934.78	0.5708	
6B	7	2/20/2016 13:28	3	11635	3878.33	100.0%	0.77055	5033.18	8934.77	0.5633	
6B	8	2/20/2016 13:23	3	11695	3898.33	100.0%	0.77129	5054.29	8934.77	0.5657	
6C	1	2/20/2016 13:43	3	11305	3768.33	100.0%	0.76854	4903.25	8934.77	0.5488	
6C	2	2/20/2016 13:38	3	11639	3879.67	100.0%	0.76914	5044.14	8934.77	0.5646	
6C	3	2/20/2016 13:33	3	11562	3854.00	100.0%	0.76990	5005.83	8934.77	0.5603	
6C	4	2/20/2016 13:47	3	11731	3910.33	100.0%	0.76788	5092.35	8934.76	0.5699	
6C	5	2/20/2016 13:23	3	11364	3788.00	99.4%	0.77128	4939.30	8934.77	0.5528	
6C	6	2/20/2016 13:18	3	11547	3849.00	98.8%	0.77191	5046.65	8934.78	0.5648	0.5617
6C	7	2/20/2016 13:14	3	11758	3919.33	100.0%	0.77255	5073.21	8934.78	0.5678	
6C	8	2/20/2016 13:28	3	11663	3887.67	100.0%	0.77053	5045.42	8934.77	0.5647	
7A	1	2/20/2016 14:15	3	11186	3728.67	100.0%	0.76406	4880.04	8934.75	0.5462	
7A	2	2/20/2016 14:29	3	11378	3792.67	100.0%	0.76209	4976.65	8934.75	0.5570	
7A	3	2/20/2016 14:26	3	11157	3719.00	100.0%	0.76263	4876.57	8934.75	0.5458	
7A	4	2/20/2016 14:21	3	11467	3822.33	100.0%	0.76328	5007.81	8934.75	0.5605	
7A	5	2/20/2016 14:34	3	11220	3740.00	99.4%	0.76151	4939.27	8934.74	0.5528	
7A	6	2/20/2016 14:47	3	11226	3742.00	98.8%	0.75968	4985.39	8934.74	0.5580	
7A	7	2/20/2016 14:43	3	11353	3784.33	100.0%	0.76023	4977.87	8934.74	0.5571	0.5546
7A	8	2/20/2016 14:38	3	11401	3800.33	100.0%	0.76088	4994.65	8934.74	0.5590	
7B	1	2/20/2016 14:21	3	11326	3775.33	100.0%	0.76326	4946.30	8934.75	0.5536	
7B	2	2/20/2016 14:15	3	11678	3892.67	100.0%	0.76406	5094.68	8934.75	0.5702	
7B	3	2/20/2016 14:29	3	11233	3744.33	100.0%	0.76209	4913.27	8934.75	0.5499	
7B	4	2/20/2016 14:26	3	11597	3865.67	100.0%	0.76262	5068.95	8934.75	0.5673	
7B	5	2/20/2016 14:38	3	11165	3721.67	99.4%	0.76087	4919.16	8934.74	0.5506	
7B	6	2/20/2016 14:34	3	12008	4002.67	98.8%	0.76150	5319.91	8934.74	0.5954	
7B	7	2/20/2016 14:47	3	11458	3819.33	100.0%	0.75967	5027.64	8934.74	0.5627	
7B	8	2/20/2016 14:43	3	11319	3773.00	100.0%	0.76022	4963.03	8934.74	0.5555	0.5632
7C	1	2/20/2016 14:26	3	10736	3578.67	100.0%	0.76261	4692.66	8934.75	0.5252	
7C	2	2/20/2016 14:21	3	11144	3714.67	100.0%	0.76325	4866.88	8934.75	0.5447	
7C	3	2/20/2016 14:15	3	11211	3737.00	100.0%	0.76406	4890.95	8934.75	0.5474	
7C	4	2/20/2016 14:30	3	11002	3667.33	100.0%	0.76206	4812.38	8934.75	0.5386	
7C	5	2/20/2016 14:43	3	10826	3608.67	99.4%	0.76021	4773.96	8934.74	0.5343	
7C	6	2/20/2016 14:38	3	10956	3652.00	98.8%	0.76087	4857.89	8934.74	0.5437	
7C	7	2/20/2016 14:34	3	11283	3761.00	100.0%	0.76149	4939.00	8934.74	0.5528	
7C	8	2/20/2016 14:47	3	11102	3700.67	100.0%	0.75966	4871.50	8934.74	0.5452	0.5415
7D	1	2/20/2016 14:30	3	10933	3644.33	100.0%	0.76205	4782.26	8934.75	0.5352	
7D	2	2/20/2016 14:26	3	11299	3766.33	100.0%	0.76260	4938.82	8934.75	0.5528	
7D	3	2/20/2016 14:21	3	10989	3663.00	100.0%	0.76324	4799.30	8934.75	0.5372	
7D	4	2/20/2016 14:15	3	11334	3778.00	100.0%	0.76406	4944.62	8934.75	0.5534	
7D	5	2/20/2016 14:47	3	10896	3632.00	99.4%	0.75965	4808.40	8934.74	0.5382	
7D	6	2/20/2016 14:43	3	10916	3638.67	98.8%	0.76020	4844.37	8934.74	0.5422	
7D	7	2/20/2016 14:38	3	11388	3796.00	100.0%	0.76085	4989.13	8934.74	0.5584	
7D	8	2/20/2016 14:34	3	11163	3721.00	100.0%	0.76148	4886.55	8934.74	0.5469	0.5455
8A	1	2/20/2016 14:34	3	11275	3758.33	100.0%	0.76147	4935.65	8934.74	0.5524	
8A	2	2/20/2016 14:47	3	11432	3810.67	100.0%	0.75964	5016.44	8934.74	0.5615	
8A	3	2/20/2016 14:43	3	11321	3773.67	100.0%	0.76019	4964.10	8934.74	0.5556	
8A	4	2/20/2016 14:38	3	11461	3820.33	100.0%	0.76084	5021.19	8934.74	0.5620	
8A	5	2/20/2016 14:15	3	11128	3709.33	99.4%	0.76406	4882.43	8934.75	0.5465	
8A	6	2/20/2016 14:30	3	11400	3800.00	98.8%	0.76204	5046.98	8934.75	0.5649	
8A	7	2/20/2016 14:26	3	11477	3825.67	100.0%	0.76258	5016.71	8934.75	0.5615	
8A	8	2/20/2016 14:21	3	11332	3777.33	100.0%	0.76322	4949.19	8934.75	0.5539	0.5573

Raw Count Data											
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)	Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency : (cpm/dpm)	Average Efficiency : (cpm/dpm)
8B	1	2/20/2016 14:39	3	11227	3742.33	100.0%	0.76083	4918.73	8934.74	0.5505	0.5567
8B	2	2/20/2016 14:34	3	11388	3796.00	100.0%	0.76146	4985.19	8934.74	0.5580	
8B	3	2/20/2016 14:47	3	11464	3821.33	100.0%	0.75963	5030.53	8934.74	0.5630	
8B	4	2/20/2016 14:43	3	11355	3785.00	100.0%	0.76018	4979.06	8934.74	0.5573	
8B	5	2/20/2016 14:21	3	11165	3721.67	99.4%	0.76321	4904.10	8934.75	0.5489	0.5514
8B	6	2/20/2016 14:15	3	11308	3769.33	98.8%	0.76406	4993.01	8934.75	0.5588	
8B	7	2/20/2016 14:30	3	11392	3797.33	100.0%	0.76203	4983.19	8934.75	0.5577	
8B	8	2/20/2016 14:26	3	11434	3811.33	100.0%	0.76258	4997.97	8934.75	0.5594	
8C	1	2/20/2016 14:43	3	11197	3732.33	100.0%	0.76017	4909.85	8934.74	0.5495	0.5674
8C	2	2/20/2016 14:39	3	11018	3672.67	100.0%	0.76082	4827.22	8934.74	0.5403	
8C	3	2/20/2016 14:34	3	11236	3745.33	100.0%	0.76144	4918.75	8934.74	0.5505	
8C	4	2/20/2016 14:47	3	11473	3824.33	100.0%	0.75962	5034.54	8934.74	0.5635	
8C	5	2/20/2016 14:26	3	10971	3657.00	99.4%	0.76257	4822.96	8934.75	0.5398	0.5591
8C	6	2/20/2016 14:21	3	11097	3699.00	98.8%	0.76320	4905.33	8934.75	0.5490	
8C	7	2/20/2016 14:15	3	11455	3818.33	100.0%	0.76406	4997.44	8934.75	0.5593	
8C	8	2/20/2016 14:40	3	11425	3808.33	100.0%	0.76202	4997.67	8934.75	0.5594	
8D	1	2/20/2016 14:37	3	11365	3788.33	100.0%	0.75961	4987.20	8934.74	0.5582	0.5570
8D	2	2/20/2016 14:43	3	11521	3840.33	100.0%	0.76016	5051.98	8934.74	0.5654	
8D	3	2/20/2016 14:39	3	11493	3831.00	100.0%	0.76081	5035.41	8934.74	0.5636	
8D	4	2/20/2016 14:34	3	11713	3904.33	100.0%	0.76143	5127.65	8934.74	0.5739	
8D	5	2/20/2016 14:30	3	11399	3799.67	99.4%	0.76201	5014.76	8934.75	0.5613	0.5526
8D	6	2/20/2016 14:26	3	11590	3863.33	98.8%	0.76256	5127.58	8934.75	0.5739	
8D	7	2/20/2016 14:21	3	11685	3895.00	100.0%	0.76319	5103.55	8934.75	0.5712	
8D	8	2/20/2016 14:15	3	11704	3901.33	100.0%	0.76406	5106.07	8934.75	0.5715	
9A	1	2/20/2016 14:51	3	11268	3756.00	100.0%	0.75909	4948.00	8934.74	0.5538	0.5596
9A	2	2/20/2016 15:05	3	11327	3775.67	100.0%	0.75720	4986.38	8934.73	0.5581	
9A	3	2/20/2016 15:01	3	11409	3803.00	100.0%	0.75774	5018.90	8934.73	0.5617	
9A	4	2/20/2016 14:57	3	11425	3808.33	100.0%	0.75833	5022.03	8934.74	0.5621	
9A	5	2/20/2016 15:09	3	11114	3704.67	99.4%	0.75662	4924.25	8934.73	0.5511	0.4608
9A	6	2/20/2016 15:22	3	11250	3750.00	98.8%	0.75488	5027.78	8934.73	0.5627	
9A	7	2/20/2016 15:18	3	11367	3789.00	100.0%	0.75548	5015.34	8934.73	0.5613	
9A	8	2/20/2016 15:13	3	11382	3794.00	100.0%	0.75606	5018.13	8934.73	0.5616	
9B	1	2/20/2016 14:57	3	11078	3692.67	100.0%	0.75831	4869.58	8934.74	0.5450	0.5292
9B	2	2/20/2016 14:51	3	11497	3832.33	100.0%	0.75909	5048.56	8934.74	0.5650	
9B	3	2/20/2016 15:05	3	11216	3738.67	100.0%	0.75718	4937.59	8934.73	0.5526	
9B	4	2/20/2016 15:01	3	11260	3753.33	100.0%	0.75772	4953.43	8934.73	0.5544	
9B	5	2/20/2016 15:14	3	11136	3712.00	99.4%	0.75605	4937.71	8934.73	0.5526	0.5325
9B	6	2/20/2016 15:09	3	11184	3728.00	98.8%	0.75660	4986.90	8934.73	0.5581	
9B	7	2/20/2016 15:22	3	11480	3826.67	100.0%	0.75487	5069.30	8934.73	0.5674	
9B	8	2/20/2016 15:18	3	11359	3786.33	100.0%	0.75547	5011.89	8934.73	0.5609	
9C	1	2/20/2016 15:01	3	10936	3645.33	100.0%	0.75772	4810.95	8934.73	0.5385	0.5237
9C	2	2/20/2016 14:57	3	11269	3756.33	100.0%	0.75831	4953.59	8934.74	0.5544	
9C	3	2/20/2016 14:51	3	11335	3778.33	100.0%	0.75909	4977.42	8934.74	0.5571	
9C	4	2/20/2016 15:05	3	11112	3704.00	100.0%	0.75718	4891.86	8934.73	0.5475	
9C	5	2/20/2016 15:18	3	10955	3651.67	99.4%	0.75546	4861.22	8934.73	0.5441	0.5237
9C	6	2/20/2016 15:14	3	11548	3849.33	98.8%	0.75604	5153.05	8934.73	0.5767	
9C	7	2/20/2016 15:10	3	11191	3730.33	100.0%	0.75659	4930.43	8934.73	0.5518	
9C	8	2/20/2016 15:22	3	11144	3714.67	100.0%	0.75486	4920.99	8934.73	0.5508	
9D	1	2/20/2016 15:05	3	11296	3765.33	100.0%	0.75717	4972.92	8934.73	0.5566	0.5325
9D	2	2/20/2016 15:01	3	11464	3821.33	100.0%	0.75770	5043.31	8934.73	0.5645	
9D	3	2/20/2016 14:57	3	11324	3774.67	100.0%	0.75829	4977.84	8934.74	0.5571	
9D	4	2/20/2016 14:51	3	11305	3768.33	100.0%	0.75909	4964.26	8934.74	0.5556	
9D	5	2/20/2016 15:22	3	11180	3726.67	99.4%	0.75485	4965.06	8934.73	0.5557	0.5325
9D	6	2/20/2016 15:18	3	11235	3745.00	98.8%	0.75545	5017.29	8934.73	0.5615	
9D	7	2/20/2016 15:14	3	11398	3799.33	100.0%	0.75603	5025.38	8934.73	0.5625	
9D	8	2/20/2016 15:10	3	11426	3808.67	100.0%	0.75658	5034.03	8934.73	0.5634	
10A	1	2/20/2016 15:10	3	9194	3064.67	100.0%	0.75658	4050.70	8934.73	0.4534	0.4608
10A	2	2/20/2016 15:22	3	9308	3102.67	100.0%	0.75484	4110.38	8934.73	0.4600	
10A	3	2/20/2016 15:18	3	9298	3099.33	100.0%	0.75544	4102.69	8934.73	0.4592	
10A	4	2/20/2016 15:14	3	9314	3104.67	100.0%	0.75602	4106.60	8934.73	0.4596	
10A	5	2/20/2016 14:51	3	9303	3101.00	99.4%	0.75909	4108.44	8934.74	0.4598	0.5325
10A	6	2/20/2016 15:05	3	9405	3135.00	98.8%	0.75716	4190.61	8934.73	0.4690	
10A	7	2/20/2016 15:01	3	9408	3136.00	100.0%	0.75770	4138.86	8934.73	0.4632	
10A	8	2/20/2016 14:57	3	9386	3128.67	100.0%	0.75829	4125.98	8934.74	0.4618	
10B	1	2/20/2016 15:14	3	10723	3574.33	100.0%	0.75600	4727.93	8934.73	0.5292	0.5237
10B	2	2/20/2016 15:10	3	10731	3577.00	100.0%	0.75656	4727.97	8934.73	0.5292	
10B	3	2/20/2016 15:23	3	10752	3584.00	100.0%	0.75482	4748.13	8934.73	0.5314	
10B	4	2/20/2016 15:18	3	10831	3610.33	100.0%	0.75543	4779.19	8934.73	0.5349	
10B	5	2/20/2016 14:57	3	10593	3531.00	99.4%	0.75828	4683.13	8934.74	0.5241	0.5325
10B	6	2/20/2016 14:51	3	10847	3615.67	98.8%	0.75909	4820.82	8934.74	0.5396	
10B	7	2/20/2016 15:06	3	10908	3636.00	100.0%	0.75714	4802.26	8934.73	0.5375	
10B	8	2/20/2016 15:02	3	10851	3617.00	100.0%	0.75768	4773.76	8934.73	0.5343	
10C	1	2/20/2016 15:18	3	10070	3356.67	100.0%	0.75540	4443.57	8934.73	0.4973	0.5237
10C	2	2/20/2016 15:14	3	10511	3503.67	100.0%	0.75600	4634.51	8934.73	0.5187	
10C	3	2/20/2016 15:10	3	10578	3526.00	100.0%	0.75655	4660.62	8934.73	0.5216	
10C	4	2/20/2016 15:23	3	10677	3559.00	100.0%	0.75481	4715.06	8934.73	0.5277	
10C	5	2/20/2016 15:02	3	10589	3529.67	99.4%	0.75767	4685.09	8934.73	0.5244	0.5237
10C	6	2/20/2016 14:57	3	10719	3573.00	98.8%	0.75826	4769.10	8934.74	0.5338	
10C	7	2/20/2016 14:51	3	10916	3638.67	100.0%	0.75909	4793.47	8934.74	0.5365	
10C	8	2/20/2016 15:06	3	10753	3584.33	100.0%	0.75713	4734.09	8934.73	0.5299	
10D	1	2/20/2016 15:23	3	10091	3363.67	100.0%	0.75480	4456.35	8934.72	0.4988	

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm)	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
10D	2	2/20/2016 15:18	3	10482	3494.00	100.0%	0.75538	4625.47	8934.73	0.5177	0.5164
10D	3	2/20/2016 15:14	3	10388	3462.67	100.0%	0.75594	4580.60	8934.73	0.5127	
10D	4	2/20/2016 15:10	3	10604	3534.67	100.0%	0.75654	4672.15	8934.73	0.5229	
10D	5	2/20/2016 15:06	3	10371	3457.00	99.4%	0.75712	4591.99	8934.73	0.5139	
10D	6	2/20/2016 15:02	3	10496	3498.67	98.8%	0.75766	4673.60	8934.73	0.5231	
10D	7	2/20/2016 14:57	3	10739	3579.67	100.0%	0.75826	4720.92	8934.74	0.5284	
10D	8	2/20/2016 14:51	3	10460	3486.67	100.0%	0.75909	4593.25	8934.74	0.5141	
11A	1	2/20/2016 15:56	3	10780	3593.33	100.0%	0.75025	4789.50	8934.71	0.5361	
11A	2	2/20/2016 16:12	3	11079	3693.00	100.0%	0.74818	4935.96	8934.71	0.5524	
11A	3	2/20/2016 16:06	3	10985	3661.67	100.0%	0.74888	4889.52	8934.71	0.5473	
11A	4	2/20/2016 16:02	3	10980	3660.00	100.0%	0.74951	4883.17	8934.71	0.5465	0.5473
11A	5	2/20/2016 16:17	3	10839	3613.00	99.4%	0.74744	4861.35	8934.70	0.5441	
11A	6	2/20/2016 16:35	3	10844	3614.67	98.8%	0.74498	4910.74	8934.70	0.5496	
11A	7	2/20/2016 16:28	3	11160	3720.00	100.0%	0.74591	4987.23	8934.70	0.5582	
11A	8	2/20/2016 16:24	3	10887	3629.00	100.0%	0.74652	4861.21	8934.70	0.5441	
11B	1	2/20/2016 16:02	3	11062	3687.33	100.0%	0.74950	4919.74	8934.71	0.5506	
11B	2	2/20/2016 15:56	3	11452	3817.33	100.0%	0.75025	5088.07	8934.71	0.5695	
11B	3	2/20/2016 16:12	3	10954	3651.33	100.0%	0.74817	4880.33	8934.71	0.5462	
11B	4	2/20/2016 16:06	3	11196	3732.00	100.0%	0.74887	4983.50	8934.71	0.5578	
11B	5	2/20/2016 16:24	3	10932	3644.00	99.4%	0.74651	4909.16	8934.70	0.5494	0.5589
11B	6	2/20/2016 16:17	3	11261	3753.67	98.8%	0.74743	5082.85	8934.70	0.5689	
11B	7	2/20/2016 16:35	3	11099	3699.67	100.0%	0.74497	4966.19	8934.70	0.5558	
11B	8	2/20/2016 16:28	3	11462	3820.67	100.0%	0.74590	5122.23	8934.70	0.5733	
11C	1	2/20/2016 16:07	3	10836	3612.00	100.0%	0.74886	4823.35	8934.71	0.5398	
11C	2	2/20/2016 16:02	3	11131	3710.33	100.0%	0.74949	4950.48	8934.71	0.5541	
11C	3	2/20/2016 15:56	3	10920	3640.00	100.0%	0.75025	4851.70	8934.71	0.5430	
11C	4	2/20/2016 16:12	3	11187	3729.00	100.0%	0.74816	4984.20	8934.71	0.5578	
11C	5	2/20/2016 16:29	3	10831	3610.33	99.4%	0.74589	4867.86	8934.70	0.5448	
11C	6	2/20/2016 16:24	3	10786	3595.33	98.8%	0.74650	4874.51	8934.70	0.5456	0.5497
11C	7	2/20/2016 16:17	3	11203	3734.33	100.0%	0.74742	4996.30	8934.70	0.5592	
11C	8	2/20/2016 16:35	3	11041	3680.33	100.0%	0.74496	4940.31	8934.70	0.5529	
11D	1	2/20/2016 16:12	3	11130	3710.00	100.0%	0.74815	4958.88	8934.71	0.5550	
11D	2	2/20/2016 16:07	3	11439	3813.00	100.0%	0.74885	5091.80	8934.71	0.5699	
11D	3	2/20/2016 16:02	3	11507	3835.67	100.0%	0.74948	5117.76	8934.71	0.5728	
11D	4	2/20/2016 15:56	3	11475	3825.00	100.0%	0.75025	5098.30	8934.71	0.5706	
11D	5	2/20/2016 16:36	3	11186	3728.67	99.4%	0.74495	5033.75	8934.70	0.5634	
11D	6	2/20/2016 16:29	3	11347	3782.33	98.8%	0.74588	5132.33	8934.70	0.5744	
11D	7	2/20/2016 16:24	3	11653	3884.33	100.0%	0.74650	5203.41	8934.70	0.5824	0.5699
11D	8	2/20/2016 16:17	3	11435	3811.67	100.0%	0.74741	5099.82	8934.70	0.5708	
12A	1	2/20/2016 16:17	3	10628	3542.67	100.0%	0.74740	4739.99	8934.70	0.5305	
12A	2	2/20/2016 16:36	3	10921	3640.33	100.0%	0.74494	4886.73	8934.70	0.5469	
12A	3	2/20/2016 16:29	3	10604	3534.67	100.0%	0.74587	4738.99	8934.70	0.5304	
12A	4	2/20/2016 16:24	3	11049	3683.00	100.0%	0.74649	4933.78	8934.70	0.5522	
12A	5	2/20/2016 15:56	3	10630	3543.33	99.4%	0.75024	4749.82	8934.71	0.5316	
12A	6	2/20/2016 16:12	3	10768	3589.33	98.8%	0.74814	4855.72	8934.70	0.5435	
12A	7	2/20/2016 16:07	3	10908	3636.00	100.0%	0.74884	4855.51	8934.71	0.5434	
12A	8	2/20/2016 16:02	3	11030	3676.67	100.0%	0.74947	4905.69	8934.71	0.5491	0.5410
12B	1	2/20/2016 16:24	3	10555	3518.33	100.0%	0.74648	4713.25	8934.70	0.5275	
12B	2	2/20/2016 16:17	3	10887	3629.00	100.0%	0.74739	4855.57	8934.70	0.5435	
12B	3	2/20/2016 16:36	3	10540	3513.33	100.0%	0.74493	4716.31	8934.70	0.5279	
12B	4	2/20/2016 16:29	3	10768	3589.33	100.0%	0.74586	4812.34	8934.70	0.5386	
12B	5	2/20/2016 16:02	3	10634	3544.67	99.4%	0.74946	4756.56	8934.71	0.5324	
12B	6	2/20/2016 15:56	3	10782	3594.00	98.8%	0.75024	4848.44	8934.71	0.5427	
12B	7	2/20/2016 16:12	3	10830	3610.00	100.0%	0.74813	4825.35	8934.70	0.5401	
12B	8	2/20/2016 16:07	3	10965	3655.00	100.0%	0.74883	4880.96	8934.71	0.5463	0.5374
12C	1	2/20/2016 16:29	3	10678	3559.33	100.0%	0.74585	4772.17	8934.70	0.5341	
12C	2	2/20/2016 16:24	3	11015	3671.67	100.0%	0.74647	4918.72	8934.70	0.5505	
12C	3	2/20/2016 16:17	3	10969	3656.33	100.0%	0.74738	4892.20	8934.70	0.5476	
12C	4	2/20/2016 16:36	3	10878	3626.00	100.0%	0.74493	4867.60	8934.70	0.5448	
12C	5	2/20/2016 16:07	3	10601	3533.67	99.4%	0.74882	4745.85	8934.71	0.5312	
12C	6	2/20/2016 16:02	3	11030	3676.67	98.8%	0.74945	4965.18	8934.71	0.5557	
12C	7	2/20/2016 15:56	3	10984	3661.33	100.0%	0.75024	4880.21	8934.71	0.5462	
12C	8	2/20/2016 16:12	3	11128	3709.33	100.0%	0.74812	4958.18	8934.70	0.5549	0.5456
12D	1	2/20/2016 16:36	3	10743	3581.00	100.0%	0.74491	4807.29	8934.70	0.5380	
12D	2	2/20/2016 16:29	3	11032	3677.33	100.0%	0.74584	4930.44	8934.70	0.5518	
12D	3	2/20/2016 16:24	3	10861	3620.33	100.0%	0.74646	4850.02	8934.70	0.5428	
12D	4	2/20/2016 16:18	3	11084	3694.67	100.0%	0.74737	4943.58	8934.70	0.5533	
12D	5	2/20/2016 16:12	3	10958	3652.67	99.4%	0.74811	4910.31	8934.70	0.5496	
12D	6	2/20/2016 16:07	3	10838	3612.67	98.8%	0.74881	4882.94	8934.71	0.5465	
12D	7	2/20/2016 16:02	3	11248	3749.33	100.0%	0.74944	5002.86	8934.71	0.5599	
12D	8	2/20/2016 15:56	3	11014	3671.33	100.0%	0.75024	4893.54	8934.71	0.5477	0.5487
13A	1	2/20/2016 16:41	3	10111	3370.33	100.0%	0.74417	4528.98	8934.69	0.5069	
13A	2	2/20/2016 16:57	3	10271	3423.67	100.0%	0.74213	4613.32	8934.69	0.5163	
13A	3	2/20/2016 16:52	3	10171	3390.33	100.0%	0.74271	4564.78	8934.69	0.5109	
13A	4	2/20/2016 16:47	3	10219	3406.33	100.0%	0.74345	4581.81	8934.69	0.5128	
13A	5	2/20/2016 17:01	3	9850	3283.33	99.4%	0.74155	4452.85	8934.68	0.4984	
13A	6	2/20/2016 17:14	3	10178	3392.67	98.8%	0.73985	4641.08	8934.68	0.5194	
13A	7	2/20/2016 17:10	3	10054	3351.33	100.0%	0.74038	4526.51	8934.68	0.5066	
13A	8	2/20/2016 17:05	3	10302	3434.00	100.0%	0.74104	4634.04	8934.68	0.5187	0.5113
13B	1	2/20/2016 16:47	3	10109	3369.67	100.0%	0.74344	4532.56	8934.69	0.5073	
13B	2	2/20/2016 16:41	3	10408	3469.33	100.0%	0.74417	4662.02	8934.69	0.5218	

Raw Count Data					Raw Beta (cpm)	Recovery (%)	Y-90 Decay	Corrected Sr-90 (cpm)*	Decay Corrected Nominal (dpm)**	Sr-90 Efficiency (cpm/dpm) i	Average Efficiency (cpm/dpm)
Detector (#)	Source ID (#)	Start Time	Count Time (min)	Beta (counts)							
13B	3	2/20/2016 16:57	3	10328	3442.67	100.0%	0.74211	4639.04	8934.69	0.5192	0.5214
13B	4	2/20/2016 16:52	3	10574	3524.67	100.0%	0.74271	4745.69	8934.69	0.5312	
13B	5	2/20/2016 17:05	3	10176	3392.00	99.4%	0.74103	4603.51	8934.68	0.5152	
13B	6	2/20/2016 17:01	3	10424	3474.67	98.8%	0.74155	4742.41	8934.68	0.5308	
13B	7	2/20/2016 17:14	3	10270	3423.33	100.0%	0.73984	4627.10	8934.68	0.5179	
13B	8	2/20/2016 17:10	3	10479	3493.00	100.0%	0.74037	4717.91	8934.68	0.5280	
13D	1	2/20/2016 16:57	3	8446	2815.33	100.0%	0.74209	3793.78	8934.69	0.4246	
13D	2	2/20/2016 16:52	3	8686	2895.33	100.0%	0.74269	3898.42	8934.69	0.4363	0.4297
13D	3	2/20/2016 16:47	3	8626	2875.33	100.0%	0.74342	3867.73	8934.69	0.4329	
13D	4	2/20/2016 16:41	3	8359	2786.33	100.0%	0.74417	3744.22	8934.69	0.4191	
13D	5	2/20/2016 17:14	3	8277	2759.00	99.4%	0.73983	3750.47	8934.68	0.4198	
13D	6	2/20/2016 17:10	3	8759	2919.67	98.8%	0.74036	3991.30	8934.68	0.4467	
13D	7	2/20/2016 17:05	3	8397	2799.00	100.0%	0.74101	3777.28	8934.68	0.4228	
13D	8	2/20/2016 17:01	3	8653	2884.33	100.0%	0.74154	3889.67	8934.68	0.4353	
14A	1	2/20/2016 17:01	3	11001	3667.00	100.0%	0.74152	4945.22	8934.68	0.5535	0.5582
14A	2	2/20/2016 17:14	3	11281	3760.33	100.0%	0.73981	5082.81	8934.68	0.5689	
14A	3	2/20/2016 17:10	3	10981	3660.33	100.0%	0.74035	4944.06	8934.68	0.5534	
14A	4	2/20/2016 17:05	3	11108	3702.67	100.0%	0.74100	4996.87	8934.68	0.5593	
14A	5	2/20/2016 16:41	3	10721	3573.67	99.4%	0.74417	4829.60	8934.69	0.5405	
14A	6	2/20/2016 16:57	3	11075	3691.67	98.8%	0.74208	5034.97	8934.69	0.5635	
14A	7	2/20/2016 16:52	3	11186	3728.67	100.0%	0.74268	5020.55	8934.69	0.5619	
14A	8	2/20/2016 16:47	3	11257	3752.33	100.0%	0.74337	5047.75	8934.69	0.5650	
14B	1	2/20/2016 17:05	3	10706	3568.67	100.0%	0.74099	4816.09	8934.68	0.5390	0.5524
14B	2	2/20/2016 17:01	3	11009	3669.67	100.0%	0.74152	4948.86	8934.68	0.5539	
14B	3	2/20/2016 17:14	3	10979	3659.67	100.0%	0.73981	4946.78	8934.68	0.5537	
14B	4	2/20/2016 17:10	3	11120	3706.67	100.0%	0.74034	5006.72	8934.68	0.5604	
14B	5	2/20/2016 16:47	3	10794	3598.00	99.4%	0.74336	4867.77	8934.69	0.5448	
14B	6	2/20/2016 16:41	3	11040	3680.00	98.8%	0.74416	5005.00	8934.69	0.5602	
14B	7	2/20/2016 16:57	3	11067	3689.00	100.0%	0.74207	4971.21	8934.69	0.5564	
14B	8	2/20/2016 16:53	3	10961	3653.67	100.0%	0.74267	4919.65	8934.69	0.5506	
14C	1	2/20/2016 17:10	3	11116	3705.33	100.0%	0.74033	5004.99	8934.68	0.5602	0.5645
14C	2	2/20/2016 17:05	3	11307	3769.00	100.0%	0.74098	5086.54	8934.68	0.5693	
14C	3	2/20/2016 17:01	3	10892	3630.67	100.0%	0.74151	4896.34	8934.68	0.5480	
14C	4	2/20/2016 17:14	3	11292	3764.00	100.0%	0.73980	5087.89	8934.68	0.5695	
14C	5	2/20/2016 16:53	3	11049	3683.00	99.4%	0.74266	4987.44	8934.69	0.5582	
14C	6	2/20/2016 16:47	3	11282	3760.67	98.8%	0.74335	5120.31	8934.69	0.5731	
14C	7	2/20/2016 16:41	3	11437	3812.33	100.0%	0.74416	5122.98	8934.69	0.5734	
14C	8	2/20/2016 16:57	3	11233	3744.33	100.0%	0.74206	5045.89	8934.69	0.5648	
14D	1	2/20/2016 17:14	3	10807	3602.33	100.0%	0.73978	4869.43	8934.68	0.5450	0.5571
14D	2	2/20/2016 17:10	3	11068	3689.33	100.0%	0.74032	4983.45	8934.68	0.5578	
14D	3	2/20/2016 17:05	3	10977	3659.00	100.0%	0.74096	4938.16	8934.68	0.5527	
14D	4	2/20/2016 17:01	3	11209	3736.33	100.0%	0.74150	5038.89	8934.68	0.5640	
14D	5	2/20/2016 16:57	3	11107	3702.33	99.4%	0.74205	5017.77	8934.69	0.5616	
14D	6	2/20/2016 16:53	3	11072	3690.67	98.8%	0.74265	5029.75	8934.69	0.5629	
14D	7	2/20/2016 16:48	3	11087	3695.67	100.0%	0.74334	4971.72	8934.69	0.5565	
14D	8	2/20/2016 16:41	3	11095	3698.33	100.0%	0.74416	4969.79	8934.69	0.5562	

Current Calibration - PIC

Geometry	Tuffryn Filter	4/1/2016	Exp Date	2/28/2017	
Y-90	Cal Date	A1	A2	A3	A4
Protean	A0				
1A	0.547738654				
1B	0.549732395				
1C	0.563357513				
1D	0.554567001				
2A	0.540622834				
2B	0.509127127				
2C	0.53312029				
2D	0.497431303				
3A	0.542223164				
3B	0.550918206				
3C	0.55628251				
3D	0.539477667				
4A	0.550338286				
4B	0.557803313				
4C	0.561303485				
4D	0.553575475				
5A	0.568513858				
5B	0.566455055				
5C	0.5621594				
5D	0.564070701				
6A	0.557222468				
6B	0.561632649				
6C	0.561712056				
6D	#N/A				
7A	0.554551868				
7B	0.563151918				
7C	0.541498557				
7D	0.545531				
8A	0.557272426				
8B	0.556700081				
8C	0.551411455				
8D	0.567366508				
9A	0.559065424				
9B	0.55702501				
9C	0.552611935				
9D	0.559615087				
10A	0.460761521				
10B	0.532517046				
10C	0.523735808				
10D	0.516444501				
11A	0.547285616				
11B	0.558945191				
11C	0.549664322				
11D	0.569913355				
12A	0.54095571				
12B	0.537353683				
12C	0.545626738				
12D	0.548716815				
13A	0.511257326				
13B	0.521426145				
13C	#N/A				
13D	0.429685721				
14A	0.558243255				
14B	0.552370848				
14C	0.564546641				
14D	0.557083867				

SampleID	Instr	Time (min.)	Alpha Counts	Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
Y1	10A	3	1	9194	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y2	10A	3	9	9308	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y3	10A	3	0	9298	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y4	10A	3	1	9314	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y5	10A	3	2	9303	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y6	10A	3	0	9405	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y7	10A	3	0	9408	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y8	10A	3	0	9386	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y1	10B	3	2	10723	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y2	10B	3	5	10731	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y3	10B	3	4	10752	2/20/2016 15:23	2/20/2016 15:26	PIC	SR90Y16
Y4	10B	3	3	10831	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y5	10B	3	5	10593	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y6	10B	3	3	10847	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y7	10B	3	2	10908	2/20/2016 15:06	2/20/2016 15:09	PIC	SR90Y16
Y8	10B	3	3	10851	2/20/2016 15:02	2/20/2016 15:05	PIC	SR90Y16
Y1	10C	3	0	10070	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y2	10C	3	4	10511	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y3	10C	3	3	10578	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y4	10C	3	2	10677	2/20/2016 15:23	2/20/2016 15:26	PIC	SR90Y16
Y5	10C	3	2	10589	2/20/2016 15:02	2/20/2016 15:05	PIC	SR90Y16
Y6	10C	3	0	10719	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y7	10C	3	2	10916	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y8	10C	3	1	10753	2/20/2016 15:06	2/20/2016 15:09	PIC	SR90Y16
Y1	10D	3	1	10091	2/20/2016 15:23	2/20/2016 15:26	PIC	SR90Y16
Y2	10D	3	8	10482	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y3	10D	3	0	10388	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y4	10D	3	1	10604	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y5	10D	3	3	10371	2/20/2016 15:06	2/20/2016 15:09	PIC	SR90Y16
Y6	10D	3	0	10496	2/20/2016 15:02	2/20/2016 15:05	PIC	SR90Y16
Y7	10D	3	0	10739	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y8	10D	3	0	10460	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y1	11A	3	0	10780	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y2	11A	3	9	11079	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y3	11A	3	0	10985	2/20/2016 16:06	2/20/2016 16:09	PIC	SR90Y16
Y4	11A	3	0	10980	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16

Y5	11A	3	1	10839	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y6	11A	3	0	10844	2/20/2016 16:35	2/20/2016 16:38	PIC	SR90Y16
Y7	11A	3	1	11160	2/20/2016 16:28	2/20/2016 16:31	PIC	SR90Y16
Y8	11A	3	1	10887	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y1	11B	3	0	11062	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y2	11B	3	2	11452	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y3	11B	3	1	10954	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y4	11B	3	1	11196	2/20/2016 16:06	2/20/2016 16:09	PIC	SR90Y16
Y5	11B	3	0	10932	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y6	11B	3	1	11261	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y7	11B	3	2	11099	2/20/2016 16:35	2/20/2016 16:38	PIC	SR90Y16
Y8	11B	3	0	11462	2/20/2016 16:28	2/20/2016 16:31	PIC	SR90Y16
Y1	11C	3	2	10836	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y2	11C	3	4	11131	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y3	11C	3	0	10920	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y4	11C	3	1	11187	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y5	11C	3	7	10831	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y6	11C	3	0	10786	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y7	11C	3	0	11203	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y8	11C	3	2	11041	2/20/2016 16:35	2/20/2016 16:38	PIC	SR90Y16
Y1	11D	3	0	11130	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y2	11D	3	1	11439	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y3	11D	3	2	11507	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y4	11D	3	0	11475	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y5	11D	3	4	11186	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y6	11D	3	0	11347	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y7	11D	3	0	11653	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y8	11D	3	0	11435	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y1	12A	3	1	10628	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y2	12A	3	5	10921	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y3	12A	3	1	10604	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y4	12A	3	0	11049	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y5	12A	3	0	10630	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y6	12A	3	0	10768	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y7	12A	3	1	10908	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y8	12A	3	2	11030	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y1	12B	3	0	10555	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16

Y2	12B	3	4	10887	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y3	12B	3	0	10540	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y4	12B	3	0	10768	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y5	12B	3	2	10634	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y6	12B	3	0	10782	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y7	12B	3	0	10830	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y8	12B	3	0	10965	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y1	12C	3	0	10678	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y2	12C	3	6	11015	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y3	12C	3	0	10969	2/20/2016 16:17	2/20/2016 16:20	PIC	SR90Y16
Y4	12C	3	1	10878	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y5	12C	3	2	10601	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y6	12C	3	0	11030	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y7	12C	3	0	10984	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y8	12C	3	1	11128	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y1	12D	3	0	10743	2/20/2016 16:36	2/20/2016 16:39	PIC	SR90Y16
Y2	12D	3	7	11032	2/20/2016 16:29	2/20/2016 16:32	PIC	SR90Y16
Y3	12D	3	2	10861	2/20/2016 16:24	2/20/2016 16:27	PIC	SR90Y16
Y4	12D	3	0	11084	2/20/2016 16:18	2/20/2016 16:21	PIC	SR90Y16
Y5	12D	3	1	10958	2/20/2016 16:12	2/20/2016 16:15	PIC	SR90Y16
Y6	12D	3	3	10838	2/20/2016 16:07	2/20/2016 16:10	PIC	SR90Y16
Y7	12D	3	0	11248	2/20/2016 16:02	2/20/2016 16:05	PIC	SR90Y16
Y8	12D	3	1	11014	2/20/2016 15:56	2/20/2016 15:59	PIC	SR90Y16
Y1	13A	3	1	10111	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y2	13A	3	7	10271	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y3	13A	3	0	10171	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y4	13A	3	0	10219	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y5	13A	3	5	9850	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y6	13A	3	1	10178	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y7	13A	3	0	10054	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y8	13A	3	1	10302	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y1	13B	3	0	10109	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y2	13B	3	6	10408	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y3	13B	3	0	10328	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y4	13B	3	0	10574	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y5	13B	3	0	10176	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y6	13B	3	0	10424	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16

Y7	13B	3	1	10270	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y8	13B	3	1	10479	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y1	13D	3	1	8446	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y2	13D	3	23	8686	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y3	13D	3	0	8626	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y4	13D	3	0	8359	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y5	13D	3	5	8277	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y6	13D	3	0	8759	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y7	13D	3	0	8397	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y8	13D	3	1	8653	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y1	14A	3	1	11001	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y2	14A	3	2	11281	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y3	14A	3	0	10981	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y4	14A	3	0	11108	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y5	14A	3	1	10721	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y6	14A	3	0	11075	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y7	14A	3	0	11186	2/20/2016 16:52	2/20/2016 16:55	PIC	SR90Y16
Y8	14A	3	0	11257	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y1	14B	3	1	10706	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y2	14B	3	8	11009	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y3	14B	3	0	10979	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y4	14B	3	0	11120	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y5	14B	3	1	10794	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y6	14B	3	0	11040	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y7	14B	3	0	11067	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y8	14B	3	0	10961	2/20/2016 16:53	2/20/2016 16:56	PIC	SR90Y16
Y1	14C	3	0	11116	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y2	14C	3	7	11307	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16
Y3	14C	3	0	10892	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y4	14C	3	0	11292	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y5	14C	3	4	11049	2/20/2016 16:53	2/20/2016 16:56	PIC	SR90Y16
Y6	14C	3	0	11282	2/20/2016 16:47	2/20/2016 16:50	PIC	SR90Y16
Y7	14C	3	1	11437	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y8	14C	3	0	11233	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y1	14D	3	0	10807	2/20/2016 17:14	2/20/2016 17:17	PIC	SR90Y16
Y2	14D	3	4	11068	2/20/2016 17:10	2/20/2016 17:13	PIC	SR90Y16
Y3	14D	3	1	10977	2/20/2016 17:05	2/20/2016 17:08	PIC	SR90Y16

Y4	14D	3	0	11209	2/20/2016 17:01	2/20/2016 17:04	PIC	SR90Y16
Y5	14D	3	2	11107	2/20/2016 16:57	2/20/2016 17:00	PIC	SR90Y16
Y6	14D	3	0	11072	2/20/2016 16:53	2/20/2016 16:56	PIC	SR90Y16
Y7	14D	3	0	11087	2/20/2016 16:48	2/20/2016 16:51	PIC	SR90Y16
Y8	14D	3	0	11095	2/20/2016 16:41	2/20/2016 16:44	PIC	SR90Y16
Y1	1A	3	3	11488	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y2	1A	3	6	11289	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y3	1A	3	1	11459	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y4	1A	3	1	11426	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y5	1A	3	5	11352	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y6	1A	3	2	11462	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y7	1A	3	0	11527	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y8	1A	3	0	11681	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y1	1B	3	6	11409	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y2	1B	3	17	11539	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y3	1B	3	6	11612	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y4	1B	3	4	11274	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y5	1B	3	11	11426	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y6	1B	3	8	11568	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y7	1B	3	9	11471	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y8	1B	3	7	11717	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y1	1C	3	55	11651	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y2	1C	3	52	12039	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y3	1C	3	52	11920	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y4	1C	3	42	11958	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y5	1C	3	67	11406	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y6	1C	3	76	11675	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y7	1C	3	57	11909	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y8	1C	3	60	11745	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y1	1D	3	41	11531	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y2	1D	3	56	11636	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y3	1D	3	41	11610	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y4	1D	3	38	11651	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y5	1D	3	35	11243	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y6	1D	3	42	11548	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y7	1D	3	40	11712	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y8	1D	3	44	11897	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16

Y1	2A	3	4	11215	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y2	2A	3	10	11258	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y3	2A	3	2	11174	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y4	2A	3	1	11358	2/20/2016 12:17	2/20/2016 12:20	PIC	SR90Y16
Y5	2A	3	10	11096	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y6	2A	3	3	11399	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y7	2A	3	5	11522	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y8	2A	3	1	11469	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y1	2B	3	1	10681	2/20/2016 12:18	2/20/2016 12:21	PIC	SR90Y16
Y2	2B	3	11	10820	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y3	2B	3	1	10681	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y4	2B	3	0	10767	2/20/2016 12:21	2/20/2016 12:24	PIC	SR90Y16
Y5	2B	3	5	10490	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y6	2B	3	0	10544	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y7	2B	3	0	10580	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y8	2B	3	1	10655	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y1	2C	3	10	10973	2/20/2016 12:22	2/20/2016 12:25	PIC	SR90Y16
Y2	2C	3	14	11113	2/20/2016 12:18	2/20/2016 12:21	PIC	SR90Y16
Y3	2C	3	9	11053	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y4	2C	3	7	11288	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y5	2C	3	10	11069	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y6	2C	3	6	11080	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y7	2C	3	3	11217	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y8	2C	3	5	11441	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y1	2D	3	0	10272	2/20/2016 12:26	2/20/2016 12:29	PIC	SR90Y16
Y2	2D	3	1	10579	2/20/2016 12:22	2/20/2016 12:25	PIC	SR90Y16
Y3	2D	3	0	10303	2/20/2016 12:18	2/20/2016 12:21	PIC	SR90Y16
Y4	2D	3	0	10554	2/20/2016 12:13	2/20/2016 12:16	PIC	SR90Y16
Y5	2D	3	0	10233	2/20/2016 11:57	2/20/2016 12:00	PIC	SR90Y16
Y6	2D	3	2	10298	2/20/2016 11:52	2/20/2016 11:55	PIC	SR90Y16
Y7	2D	3	0	10587	2/20/2016 11:48	2/20/2016 11:51	PIC	SR90Y16
Y8	2D	3	0	10434	2/20/2016 11:40	2/20/2016 11:43	PIC	SR90Y16
Y1	3A	3	125	11273	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y2	3A	3	120	11284	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y3	3A	3	111	11107	2/20/2016 12:43	2/20/2016 12:46	PIC	SR90Y16
Y4	3A	3	119	11467	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y5	3A	3	115	11239	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16

Y6	3A	3	113	11073	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y7	3A	3	105	11260	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y8	3A	3	116	11320	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y1	3B	3	59	11423	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y2	3B	3	62	11571	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y3	3B	3	51	11541	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y4	3B	3	45	11617	2/20/2016 12:43	2/20/2016 12:46	PIC	SR90Y16
Y5	3B	3	54	11011	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y6	3B	3	46	11274	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y7	3B	3	52	11395	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y8	3B	3	57	11636	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y1	3C	3	33	11185	2/20/2016 12:43	2/20/2016 12:46	PIC	SR90Y16
Y2	3C	3	40	11678	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y3	3C	3	38	11565	2/20/2016 12:35	2/20/2016 12:38	PIC	SR90Y16
Y4	3C	3	41	11547	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y5	3C	3	50	11531	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y6	3C	3	40	11514	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y7	3C	3	35	11706	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y8	3C	3	44	11617	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y1	3D	3	11	11025	2/20/2016 12:47	2/20/2016 12:50	PIC	SR90Y16
Y2	3D	3	15	11414	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y3	3D	3	12	11196	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y4	3D	3	14	11361	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y5	3D	3	15	11022	2/20/2016 13:06	2/20/2016 13:09	PIC	SR90Y16
Y6	3D	3	13	11046	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y7	3D	3	11	11204	2/20/2016 12:57	2/20/2016 13:00	PIC	SR90Y16
Y8	3D	3	12	11296	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y1	4A	3	34	11097	2/20/2016 12:52	2/20/2016 12:55	PIC	SR90Y16
Y2	4A	3	28	11327	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
Y3	4A	3	25	11357	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y4	4A	3	40	11420	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y5	4A	3	30	11511	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y6	4A	3	30	11509	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y7	4A	3	25	11689	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y8	4A	3	35	11453	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y1	4B	3	0	11640	2/20/2016 12:56	2/20/2016 12:59	PIC	SR90Y16
Y2	4B	3	2	11586	2/20/2016 12:53	2/20/2016 12:56	PIC	SR90Y16

Y3	4B	3	0	11585	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
Y4	4B	3	0	11605	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y5	4B	3	4	11376	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y6	4B	3	0	11735	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y7	4B	3	0	11421	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y8	4B	3	1	11653	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y1	4C	3	25	11389	2/20/2016 13:02	2/20/2016 13:05	PIC	SR90Y16
Y2	4C	3	12	11814	2/20/2016 12:57	2/20/2016 13:00	PIC	SR90Y16
Y3	4C	3	16	11728	2/20/2016 12:53	2/20/2016 12:56	PIC	SR90Y16
Y4	4C	3	20	11461	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
Y5	4C	3	11	11538	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y6	4C	3	19	11745	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y7	4C	3	19	11671	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y8	4C	3	10	11836	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y1	4D	3	77	11384	2/20/2016 13:07	2/20/2016 13:10	PIC	SR90Y16
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Y3	4D	3	74	11719	2/20/2016 12:57	2/20/2016 13:00	PIC	SR90Y16
Y4	4D	3	77	11606	2/20/2016 12:53	2/20/2016 12:56	PIC	SR90Y16
Y5	4D	3	84	11295	2/20/2016 12:48	2/20/2016 12:51	PIC	SR90Y16
Y6	4D	3	71	11469	2/20/2016 12:44	2/20/2016 12:47	PIC	SR90Y16
Y7	4D	3	78	11446	2/20/2016 12:39	2/20/2016 12:42	PIC	SR90Y16
Y8	4D	3	87	11593	2/20/2016 12:30	2/20/2016 12:33	PIC	SR90Y16
Y1	5A	3	16	11610	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
Y2	5A	3	17	11816	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90Y16
Y3	5A	3	16	11784	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90Y16
Y4	5A	3	14	11642	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90Y16
Y5	5A	3	15	11576	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y6	5A	3	16	11655	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16
Y7	5A	3	12	11976	2/20/2016 13:40	2/20/2016 13:43	PIC	SR90Y16
Y8	5A	3	22	11669	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90Y16
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Y2	5B	3	19	11752	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
Y3	5B	3	11	11513	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90Y16
Y4	5B	3	19	11951	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90Y16
Y5	5B	3	21	11451	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90Y16
Y6	5B	3	20	11634	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y7	5B	3	22	12023	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16

Y8	5B	3	20	11678	2/20/2016 13:41	2/20/2016 13:44	PIC	SR90Y16
Y1	5C	3	17	11404	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90Y16
Y2	5C	3	24	11597	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90Y16
Y3	5C	3	17	11650	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
Y4	5C	3	22	11656	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90Y16
Y5	5C	3	18	11393	2/20/2016 13:41	2/20/2016 13:44	PIC	SR90Y16
Y6	5C	3	24	11588	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90Y16
Y7	5C	3	20	11807	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y8	5C	3	21	11584	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16
Y1	5D	3	21	11538	2/20/2016 13:26	2/20/2016 13:29	PIC	SR90Y16
Y2	5D	3	18	11772	2/20/2016 13:21	2/20/2016 13:24	PIC	SR90Y16
Y3	5D	3	27	11453	2/20/2016 13:16	2/20/2016 13:19	PIC	SR90Y16
Y4	5D	3	21	11705	2/20/2016 13:10	2/20/2016 13:13	PIC	SR90Y16
Y5	5D	3	29	11556	2/20/2016 13:45	2/20/2016 13:48	PIC	SR90Y16
Y6	5D	3	24	11479	2/20/2016 13:41	2/20/2016 13:44	PIC	SR90Y16
Y7	5D	3	26	11695	2/20/2016 13:36	2/20/2016 13:39	PIC	SR90Y16
Y8	5D	3	14	11796	2/20/2016 13:31	2/20/2016 13:34	PIC	SR90Y16
Y1	6A	3	27	11135	2/20/2016 13:33	2/20/2016 13:36	PIC	SR90Y16
Y2	6A	3	34	11515	2/20/2016 13:47	2/20/2016 13:50	PIC	SR90Y16
Y3	6A	3	27	11509	2/20/2016 13:43	2/20/2016 13:46	PIC	SR90Y16
Y4	6A	3	29	11510	2/20/2016 13:38	2/20/2016 13:41	PIC	SR90Y16
Y5	6A	3	26	11525	2/20/2016 13:14	2/20/2016 13:17	PIC	SR90Y16
Y6	6A	3	30	11634	2/20/2016 13:28	2/20/2016 13:31	PIC	SR90Y16
Y7	6A	3	21	11481	2/20/2016 13:23	2/20/2016 13:26	PIC	SR90Y16
Y8	6A	3	23	11519	2/20/2016 13:18	2/20/2016 13:21	PIC	SR90Y16
Y1	6B	3	33	11454	2/20/2016 13:38	2/20/2016 13:41	PIC	SR90Y16
Y2	6B	3	38	11666	2/20/2016 13:33	2/20/2016 13:36	PIC	SR90Y16
Y3	6B	3	43	11441	2/20/2016 13:47	2/20/2016 13:50	PIC	SR90Y16
Y4	6B	3	25	11517	2/20/2016 13:43	2/20/2016 13:46	PIC	SR90Y16
Y5	6B	3	32	11469	2/20/2016 13:18	2/20/2016 13:21	PIC	SR90Y16
Y6	6B	3	28	11679	2/20/2016 13:14	2/20/2016 13:17	PIC	SR90Y16
Y7	6B	3	25	11635	2/20/2016 13:28	2/20/2016 13:31	PIC	SR90Y16
Y8	6B	3	28	11695	2/20/2016 13:23	2/20/2016 13:26	PIC	SR90Y16
Y1	6C	3	30	11305	2/20/2016 13:43	2/20/2016 13:46	PIC	SR90Y16
Y2	6C	3	42	11639	2/20/2016 13:38	2/20/2016 13:41	PIC	SR90Y16
Y3	6C	3	41	11562	2/20/2016 13:33	2/20/2016 13:36	PIC	SR90Y16
Y4	6C	3	41	11731	2/20/2016 13:47	2/20/2016 13:50	PIC	SR90Y16

Y5	6C	3	44	11364	2/20/2016 13:23	2/20/2016 13:26	PIC	SR90Y16
Y6	6C	3	38	11547	2/20/2016 13:18	2/20/2016 13:21	PIC	SR90Y16
Y7	6C	3	33	11758	2/20/2016 13:14	2/20/2016 13:17	PIC	SR90Y16
Y8	6C	3	44	11663	2/20/2016 13:28	2/20/2016 13:31	PIC	SR90Y16
Y1	7A	3	7	11186	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y2	7A	3	16	11378	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90Y16
Y3	7A	3	5	11157	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y4	7A	3	4	11467	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y5	7A	3	12	11220	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y6	7A	3	3	11226	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y7	7A	3	6	11353	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y8	7A	3	6	11401	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y1	7B	3	6	11326	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y2	7B	3	12	11678	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y3	7B	3	8	11233	2/20/2016 14:29	2/20/2016 14:32	PIC	SR90Y16
Y4	7B	3	4	11597	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y5	7B	3	10	11165	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y6	7B	3	3	12008	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y7	7B	3	6	11458	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y8	7B	3	8	11319	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y1	7C	3	1	10736	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y2	7C	3	9	11144	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y3	7C	3	2	11211	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y4	7C	3	0	11002	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y5	7C	3	4	10826	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y6	7C	3	1	10956	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y7	7C	3	1	11283	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y8	7C	3	1	11102	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y1	7D	3	1	10933	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y2	7D	3	6	11299	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y3	7D	3	2	10989	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y4	7D	3	0	11334	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y5	7D	3	7	10896	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y6	7D	3	2	10916	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y7	7D	3	1	11388	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y8	7D	3	2	11163	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y1	8A	3	11	11275	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16

Y2	8A	3	11	11432	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y3	8A	3	3	11321	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y4	8A	3	10	11461	2/20/2016 14:38	2/20/2016 14:41	PIC	SR90Y16
Y5	8A	3	9	11128	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y6	8A	3	3	11400	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y7	8A	3	7	11477	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y8	8A	3	7	11332	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y1	8B	3	3	11227	2/20/2016 14:39	2/20/2016 14:42	PIC	SR90Y16
Y2	8B	3	3	11388	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y3	8B	3	0	11464	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y4	8B	3	0	11355	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y5	8B	3	5	11165	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y6	8B	3	3	11308	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y7	8B	3	3	11392	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y8	8B	3	2	11434	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y1	8C	3	1	11197	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y2	8C	3	13	11018	2/20/2016 14:39	2/20/2016 14:42	PIC	SR90Y16
Y3	8C	3	1	11236	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y4	8C	3	4	11473	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y5	8C	3	5	10971	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y6	8C	3	1	11097	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y7	8C	3	2	11455	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y8	8C	3	1	11425	2/20/2016 14:47	2/20/2016 14:50	PIC	SR90Y16
Y1	8D	3	11	11365	2/20/2016 14:43	2/20/2016 14:46	PIC	SR90Y16
Y2	8D	3	17	11521	2/20/2016 14:39	2/20/2016 14:42	PIC	SR90Y16
Y3	8D	3	12	11493	2/20/2016 14:34	2/20/2016 14:37	PIC	SR90Y16
Y4	8D	3	26	11713	2/20/2016 14:30	2/20/2016 14:33	PIC	SR90Y16
Y5	8D	3	19	11399	2/20/2016 14:26	2/20/2016 14:29	PIC	SR90Y16
Y6	8D	3	14	11590	2/20/2016 14:21	2/20/2016 14:24	PIC	SR90Y16
Y7	8D	3	15	11685	2/20/2016 14:15	2/20/2016 14:18	PIC	SR90Y16
Y8	8D	3	14	11704	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y1	9A	3	4	11268	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y2	9A	3	6	11327	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y3	9A	3	4	11409	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y4	9A	3	6	11425	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90Y16
Y5	9A	3	5	11114	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y6	9A	3	6	11250			PIC	SR90Y16

Y7	9A	3	3	11367	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y8	9A	3	6	11382	2/20/2016 15:13	2/20/2016 15:16	PIC	SR90Y16
Y1	9B	3	5	11078	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y2	9B	3	14	11497	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y3	9B	3	8	11216	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y4	9B	3	7	11260	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y5	9B	3	13	11136	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y6	9B	3	6	11184	2/20/2016 15:09	2/20/2016 15:12	PIC	SR90Y16
Y7	9B	3	5	11480	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y8	9B	3	9	11359	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y1	9C	3	9	10936	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y2	9C	3	12	11269	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y3	9C	3	11	11335	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y4	9C	3	16	11112	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y5	9C	3	14	10955	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y6	9C	3	9	11548	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y7	9C	3	16	11191	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16
Y8	9C	3	10	11144	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y1	9D	3	12	11296	2/20/2016 15:05	2/20/2016 15:08	PIC	SR90Y16
Y2	9D	3	21	11464	2/20/2016 15:01	2/20/2016 15:04	PIC	SR90Y16
Y3	9D	3	9	11324	2/20/2016 14:57	2/20/2016 15:00	PIC	SR90Y16
Y4	9D	3	9	11305	2/20/2016 14:51	2/20/2016 14:54	PIC	SR90Y16
Y5	9D	3	15	11180	2/20/2016 15:22	2/20/2016 15:25	PIC	SR90Y16
Y6	9D	3	18	11235	2/20/2016 15:18	2/20/2016 15:21	PIC	SR90Y16
Y7	9D	3	17	11398	2/20/2016 15:14	2/20/2016 15:17	PIC	SR90Y16
Y8	9D	3	19	11426	2/20/2016 15:10	2/20/2016 15:13	PIC	SR90Y16

Sr-89 Method Uncertainty : 0.0829

Filename : SR8990.XLS
File type : Excel
Version # : 1.3.9

Batch : 1082959
Analyst : KSD1
Prep Date : 2/26/2016
Sr-89 Method Uncertainty : 0.0829
Sr-90 Method Uncertainty : 0.0821

Geometry: Tuffryn Filter

Sr Carrier S/N : 2370334
Carrier Exp Date : 2/23/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 15.53
Carrier Weight StDev.: 0.15

Y Carrier S/N : 2354207
Carrier Exp Date : 1/12/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 31.78
Carrier Weight StDev.: 0.05

Procedure Code : GFCGANBL
Parmname1 : Strontium-89
Parmname2 : Strontium-90
Required MDA Sr-89 : 1 pCi/L
Required MDA Sr-90 : 1 pCi/L
Sr-89 Abundance : 1.00
Sr-90 Abundance : 1.00
Half-life of Sr-89 : 50.53 days
Half-life of Sr-90 : 28.9 years
Half-life of Y-90 : 64.053 hours

Sample Characteristics				Carrier Calculations			
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Net Weight (mg) Sr	Net Weight StDev. (mg) Y	Carrier Aliquot (mL) Sr Y
1	1202347886.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
2	1202347887.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
3	1202347888.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
4	1202347889.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
5	1202347890.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
6	1202347891.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
7	1202347892.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
8	1202347893.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
9	1202347894.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
10	1202347895.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
11	1202347896.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
12	1202347897.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
13	1202347898.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
14	1202347899.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
15	1202347900.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
16	1202347901.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
17	1202347902.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
18	1202347903.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
19	1202347904.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
20	1202347905.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
21	1202347906.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
22	1202347907.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
23	1202347908.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
24	1202347909.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
25	1202347910.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
26	1202347911.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
27	1202347912.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
28	1202347913.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
29	1202347914.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
30	1202347915.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
31	1202347916.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
32	1202347917.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000
33	1202347918.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
34	1202347919.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
35	1202347920.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	0.039995	0.5 0.001000
36	1202347921.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
37	1202347922.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	0.039135	0.5 0.001000
38	1202347923.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
39	1202347924.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	0.040854	0.5 0.001000
40	1202347925.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	0.039565	0.5 0.001000

Pipet, 0.1 ml Sidev : +/- 0.000200 ml
 Pipet, 0.5 ml Sidev : +/- 0.001000 ml
 Pipet, 1 ml Sidev : +/- 0.002000 ml
 Pipet, 5 ml Sidev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-001
 Instrument SOP: GL-RAD-I-016

1st Count Raw Data						1st Count Calibration Data					Detector Efficiency (cpm/dpm)				Alpha X-Talk		Weekly Bkg Count		Weekly Bkg Count Time (min.)	
Pos.	Detector ID	Counting Time (min.)	Gross Counts Alpha	Gross Beta	Gross CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Sr-89	Detector Efficiency Sr-90	Detector Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)				
1	1A	10	6035	603.450	603.450	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5299	0.4219	0.00738	0.08306	0.762	2/26/2016 18:27	500				
2	1B	10	5803	580.190	580.190	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5316	0.4248	0.00711	0.08433	0.796	2/26/2016 18:27	500				
3	1C	10	6156	615.358	615.358	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5380	0.4249	0.00847	0.04240	1.426	2/26/2016 18:51	500				
4	1D	10	45	5732	572.975	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5314	0.4193	0.00692	0.05002	1.058	2/26/2016 18:31	500				
5	2A	10	8	5971	596.992	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5259	0.4132	0.01914	0.13467	0.566	2/26/2016 18:28	500				
6	2B	10	0	5989	598.900	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5008	0.4007	0.02111	0.28043	1.504	2/26/2016 18:31	500				
7	2C	10	10	5623	562.235	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.5171	0.4092	0.01274	0.06541	0.484	2/26/2016 18:28	500				
8	2D	10	1	5631	563.085	2/29/2016 11:13	PIC	2/1/2016	3/15/2017	0.4882	0.3889	0.00745	0.15461	1.526	2/26/2016 18:28	500				
9	3A	10	132	5656	565.161	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.5181	0.4059	0.01401	0.03329	0.502	2/26/2016 18:28	500				
10	3B	10	66	5676	567.308	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.5255	0.4058	0.01614	0.04428	1.590	2/26/2016 18:28	500				
11	3C	10	53	5908	590.572	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.4800	0.4170	0.00988	0.04300	0.474	2/26/2016 18:28	500				
12	3D	10	17	5885	588.398	2/29/2016 13:23	PIC	2/1/2016	3/15/2017	0.4565	0.4028	0.02297	0.06027	0.550	2/26/2016 18:31	500				
13	4A	10	45	5990	598.780	2/29/2016 11:38	PIC	2/1/2016	3/15/2017	0.4928	0.4179	0.01123	0.04880	0.704	2/26/2016 18:28	500				
14	4B	10	1	6427	642.686	2/29/2016 11:39	PIC	2/1/2016	3/15/2017	0.5364	0.4233	0.01519	0.13819	1.654	2/26/2016 18:31	500				
15	4C	10	23	5813	581.191	2/29/2016 11:39	PIC	2/1/2016	3/15/2017	0.5422	0.4249	0.00889	0.04737	0.780	2/26/2016 18:31	500				
16	4D	10	90	5662	565.826	2/29/2016 11:39	PIC	2/1/2016	3/15/2017	0.5284	0.4127	0.00773	0.04161	1.650	2/26/2016 18:31	500				
17	5A	10	20	5979	597.795	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5438	0.4320	0.00851	0.05241	1.350	2/26/2016 18:29	500				
18	5B	10	21	5903	590.209	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5408	0.4294	0.00426	0.04330	0.418	2/26/2016 18:29	500				
19	5C	10	20	6106	610.511	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5402	0.4200	0.00657	0.04445	0.664	2/26/2016 18:29	500				
20	5D	10	30	6351	634.960	2/29/2016 11:27	PIC	2/1/2016	3/15/2017	0.5423	0.4249	0.00925	0.04680	0.786	2/26/2016 18:29	500				
21	6A	10	37	6003	600.061	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5339	0.4127	0.02228	0.06461	1.692	2/26/2016 17:18	500				
22	6B	10	39	6275	627.317	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5379	0.4206	0.00851	0.04699	0.796	2/26/2016 17:18	500				
23	6C	10	35	5828	582.639	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5381	0.4216	0.01970	0.04586	1.170	2/26/2016 17:18	500				
24	6D	40	0	0	0.000	2/29/2016 11:29	PIC	2/1/2016	3/15/2017	0.5381	0.4216	0.01970	0.04586	1.170	2/26/2016 17:18	500				
25	7A	10	7	5998	599.744	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5301	0.4197	0.00594	0.07982	0.860	2/26/2016 17:18	500				
26	7B	10	2	5932	593.189	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5387	0.4296	0.00627	0.05433	0.534	2/26/2016 17:18	500				
27	7C	10	4	6068	606.753	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5225	0.4145	0.00790	0.11870	0.484	2/26/2016 17:18	500				
28	7D	10	1	6107	610.692	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5241	0.4129	0.01113	0.08122	0.698	2/26/2016 17:19	500				
29	8A	10	17	6176	617.489	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5331	0.4116	0.01579	0.06550	0.756	2/26/2016 17:19	500				
30	8B	10	2	6369	636.884	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5347	0.4282	0.02148	0.07770	0.388	2/26/2016 17:19	500				
31	8C	10	6	5812	581.102	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5302	0.4157	0.01955	0.16360	1.388	2/26/2016 17:19	500				
32	8D	10	21	5841	583.988	2/29/2016 11:52	PIC	2/1/2016	3/15/2017	0.5416	0.4257	0.00609	0.05310	0.548	2/26/2016 17:19	500				
33	9A	10	11	5988	598.659	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5401	0.4236	0.00758	0.12801	0.790	2/26/2016 17:19	500				
34	9B	10	11	5825	582.432	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5324	0.4198	0.00754	0.06171	0.728	2/26/2016 17:19	500				
35	9C	10	15	5947	594.595	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5285	0.4139	0.00584	0.06991	0.680	2/26/2016 17:19	500				
36	9D	10	13	6227	622.622	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5342	0.4207	0.02610	0.06030	0.902	2/26/2016 17:19	500				
37	10A	10	3	5297	529.541	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.4929	0.3713	0.00651	0.53165	0.412	2/26/2016 17:19	500				
38	10B	10	3	6193	619.247	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5238	0.4086	0.00652	0.17540	0.708	2/26/2016 17:19	500				
39	10C	10	2	5487	548.651	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5183	0.4052	0.00638	0.24341	0.572	2/26/2016 17:19	500				
40	10D	10	3	5510	550.871	2/29/2016 12:03	PIC	2/1/2016	3/15/2017	0.5078	0.4052	0.00557	0.42900	0.782	2/26/2016 17:20	500				

2nd Count Raw Data							2nd Count Calibration Data					Detector Efficiency					Weekly Bkg	
Pos.	Detector ID	Counting Time (min.)	Gross Alpha	Gross Beta	Gross CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Y-90 (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Count Start Date/Time	Weekly Bkg Count Time (min.)			
1	1A	20	20	1523	76.067	3/5/2016 13:38	PIC	2/1/2016	3/15/2017	0.5477	0.00738	0.08306	0.774	3/4/2016 17:55	1000			
2	1B	20	4	1209	60.433	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5497	0.00711	0.08433	0.754	3/4/2016 17:55	1000			
3	1C	20	19	1571	78.510	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5634	0.00847	0.04240	1.682	3/4/2016 17:55	1000			
4	1D	20	9	1382	69.077	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5546	0.00692	0.05002	1.044	3/4/2016 17:55	1000			
5	2A	20	5	1322	66.066	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5406	0.01914	0.13467	0.606	3/4/2016 17:55	1000			
6	2B	20	3	1486	74.258	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5091	0.02111	0.28043	1.378	3/4/2016 17:55	1000			
7	2C	20	5	1344	67.184	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.5331	0.01274	0.06541	0.519	3/4/2016 17:55	1000			
8	2D	20	7	1441	71.996	3/5/2016 13:39	PIC	2/1/2016	3/15/2017	0.4974	0.00745	0.15461	1.425	3/4/2016 17:55	1000			
9	3A	20	38	1411	70.487	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5422	0.01401	0.03329	0.396	3/4/2016 17:55	1000			
10	3B	20	16	1202	60.065	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5509	0.01614	0.04428	1.376	3/4/2016 17:56	1000			
11	3C	20	19	1477	73.809	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5583	0.00988	0.04300	0.470	3/4/2016 17:56	1000			
12	3D	20	3	1359	67.941	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5395	0.02297	0.06027	0.563	3/4/2016 17:56	1000			
13	4A	20	4	1324	66.190	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5503	0.01123	0.04880	0.634	3/4/2016 17:56	1000			
14	4B	20	3	1539	76.929	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5578	0.01519	0.13819	1.754	3/4/2016 17:56	1000			
15	4C	20	6	1340	66.986	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5613	0.00889	0.04737	0.676	3/4/2016 17:56	1000			
16	4D	20	20	1429	71.408	3/5/2016 14:01	PIC	2/1/2016	3/15/2017	0.5536	0.00773	0.04161	1.718	3/4/2016 17:56	1000			
17	5A	20	22	1491	74.492	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5685	0.00851	0.05241	1.204	3/4/2016 17:56	1000			
18	5B	20	8	1268	63.383	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5665	0.00426	0.04330	0.418	2/26/2016 18:29	500			
19	5C	20	12	1533	76.623	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5622	0.00657	0.04445	0.542	3/4/2016 17:56	1000			
20	5D	20	4	1358	67.891	3/5/2016 14:23	PIC	2/1/2016	3/15/2017	0.5641	0.00925	0.04680	0.832	3/4/2016 17:56	1000			
21	6A	20	6	1346	67.281	3/5/2016 14:26	PIC	2/1/2016	3/15/2017	0.5572	0.02228	0.06461	1.678	3/4/2016 17:56	1000			
22	6B	20	7	1466	73.284	3/5/2016 14:26	PIC	2/1/2016	3/15/2017	0.5617	0.00851	0.04699	0.977	3/4/2016 17:56	1000			
23	6C	20	16	1396	69.763	3/5/2016 14:26	PIC	2/1/2016	3/15/2017	0.5617	0.01970	0.04586	1.614	3/4/2016 17:56	1000			
24	6D	20	0	0	0.000	3/5/2016-14:26	PIC	2/1/2016	3/15/2017	0.0000	0.01341	0.00000	FAIL	12:00:00 AM	0			
25	7A	20	27	1445	72.142	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5546	0.00594	0.07982	0.775	3/4/2016 17:56	1000			
26	7B	20	1	1233	61.647	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5632	0.00627	0.05433	0.384	3/4/2016 17:56	1000			
27	7C	20	8	1456	72.753	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5415	0.00790	0.11870	0.455	3/4/2016 17:56	1000			
28	7D	20	0	1345	67.250	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5455	0.01113	0.08122	0.690	3/4/2016 17:56	1000			
29	8A	20	6	1380	68.980	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5573	0.01579	0.06550	0.852	3/4/2016 17:57	1000			
30	8B	20	5	1483	74.131	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5567	0.02148	0.07770	0.388	2/26/2016 17:19	500			
31	8C	20	10	1344	67.118	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5514	0.01955	0.16360	1.517	3/4/2016 17:57	1000			
32	8D	20	8	1373	68.629	3/5/2016 14:48	PIC	2/1/2016	3/15/2017	0.5674	0.00609	0.05310	0.539	3/4/2016 17:57	1000			
33	9A	20	25	1473	73.490	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5591	0.00758	0.12801	0.695	3/4/2016 17:57	1000			
34	9B	20	5	1187	59.335	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5570	0.00754	0.06171	0.823	3/4/2016 16:51	1000			
35	9C	20	6	1511	75.529	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5526	0.00584	0.06991	0.656	3/4/2016 16:51	1000			
36	9D	20	1	1291	64.547	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5596	0.02610	0.06030	0.962	3/4/2016 16:51	1000			
37	10A	20	0	1154	57.700	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.4608	0.00651	0.53165	0.412	2/26/2016 17:19	500			
38	10B	20	2	1507	75.332	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5325	0.00652	0.17540	0.768	3/4/2016 16:52	1000			
39	10C	20	4	1225	61.201	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5237	0.00638	0.24341	0.608	3/4/2016 16:52	1000			
40	10D	20	2	1360	67.957	3/5/2016 16:00	PIC	2/1/2016	3/15/2017	0.5164	0.00557	0.42900	0.759	3/4/2016 16:52	1000			

Correction Factors														Sample Recovery			
Pos.	Strontium	Separation Date/Time	Yttrium	Yttrium Ingrowth (Sr-89 calc)	Yttrium Decay	Decay from Sample Date	Net Count Rate	Gross CPM	Sample Recovery	Calculated	Sample Recovery	% Error	Y	Sr	Y	Sr	Y
1	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	62.4727	88.9225	452.054959	97.9%	100%	1.24%	100%	1.24%	100%	1.24%	0.72%
2	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	50.8572	73.9537	455.379491	95.3%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
3	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	63.7494	92.9397	458.669267	97.9%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
4	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	57.9793	75.9943	439.001346	95.3%	104%	1.24%	99.4%	1.24%	99.4%	1.24%	0.72%
5	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	55.7875	77.2031	464.001636	95.3%	102%	1.24%	102%	1.24%	102%	1.24%	0.72%
6	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	58.9268	86.3223	453.650881	100%	91.3%	1.23%	91.3%	1.23%	91.3%	1.23%	0.73%
7	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	53.9031	86.0333	422.298236	100%	96.9%	1.24%	96.9%	1.24%	96.9%	1.24%	0.72%
8	2/26/2016 13:40	3/4/2016 14:30		0.5294	0.8391	0.9535	59.3461	87.3614	416.377047	96.6%	100%	1.24%	100%	1.24%	100%	1.24%	0.72%
9	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.9533	58.6211	80.7549	425.784579	97.9%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
10	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.9533	50.4122	69.6095	447.286122	95.3%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
11	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.9533	61.3402	88.5210	440.710925	97.9%	104%	1.24%	104%	1.24%	104%	1.24%	0.72%
12	2/26/2016 13:40	3/4/2016 14:30		0.5402	0.8391	0.9533	58.8280	74.6256	454.943917	95.3%	99.4%	1.24%	99.4%	1.24%	99.4%	1.24%	0.72%
13	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.9533	56.3133	77.1169	465.35018	95.3%	102%	1.23%	102%	1.23%	102%	1.23%	0.72%
14	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.9533	61.2654	86.1835	495.237221	100%	91.3%	1.23%	91.3%	1.23%	91.3%	1.23%	0.73%
15	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.9533	54.0415	84.7275	442.422086	100%	96.9%	1.24%	96.9%	1.24%	96.9%	1.24%	0.72%
16	2/26/2016 13:40	3/4/2016 14:30		0.5315	0.8391	0.9533	59.0698	82.5757	424.180077	96.6%	100%	1.24%	100%	1.24%	100%	1.24%	0.72%
17	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.9534	61.4396	86.0808	450.27485	97.9%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
18	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.9534	54.2117	77.1669	458.830474	95.3%	104%	1.24%	104%	1.24%	104%	1.24%	0.72%
19	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.9534	63.7814	91.8925	454.83728	95.3%	99.4%	1.24%	99.4%	1.24%	99.4%	1.24%	0.72%
20	2/26/2016 13:40	3/4/2016 14:30		0.5305	0.8391	0.9534	57.7374	75.2313	501.990898	95.3%	102%	1.24%	102%	1.24%	102%	1.24%	0.72%
21	2/26/2016 13:40	3/4/2016 14:30		0.5307	0.8391	0.9534	56.5249	75.6058	467.930284	95.3%	99.4%	1.24%	99.4%	1.24%	99.4%	1.24%	0.72%
22	2/26/2016 13:40	3/4/2016 14:30		0.5307	0.8391	0.9534	59.1066	82.1718	486.038312	100%	100%	1.23%	100%	1.23%	100%	1.23%	0.72%
23	2/26/2016 13:40	3/4/2016 14:30		0.5307	0.8391	0.9534	55.7086	86.7306	440.200315	100%	96.6%	1.23%	96.6%	1.23%	96.6%	1.23%	0.73%
24	2/26/2016 13:40	3/4/2016 14:30		0.5307	0.8391	0.9534	60.3371	83.8634	455.543648	97.9%	100%	1.24%	100%	1.24%	100%	1.24%	0.72%
25	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	53.1943	75.9068	464.088087	95.3%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
26	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	61.1236	89.8876	455.741378	97.9%	104%	1.24%	104%	1.24%	104%	1.24%	0.72%
27	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	57.7937	75.3772	477.52101	95.3%	104%	1.24%	104%	1.24%	104%	1.24%	0.72%
28	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	59.1548	82.1718	479.721456	95.3%	99.4%	1.24%	99.4%	1.24%	99.4%	1.24%	0.72%
29	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	60.7460	86.4313	489.707125	100%	100%	1.24%	100%	1.24%	100%	1.24%	0.72%
30	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	54.0393	84.1966	442.8659	96.6%	96.9%	1.23%	96.9%	1.23%	96.9%	1.23%	0.73%
31	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	58.3329	81.8912	423.764369	96.6%	100%	1.24%	100%	1.24%	100%	1.24%	0.72%
32	2/26/2016 13:40	3/4/2016 14:30		0.5326	0.8391	0.9531	62.4513	86.7351	449.47278	97.9%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
33	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530	51.5539	72.5362	458.342011	95.3%	95.7%	1.24%	95.7%	1.24%	95.7%	1.24%	0.72%
34	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530	64.2337	92.2512	438.110258	97.9%	104%	1.24%	104%	1.24%	104%	1.24%	0.72%
35	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530	56.0240	72.4388	494.158827	95.3%	99.4%	1.24%	99.4%	1.24%	99.4%	1.24%	0.72%
36	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530	50.4782	73.0702	495.992015	100%	100%	1.23%	100%	1.23%	100%	1.23%	0.72%
37	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530	62.3315	88.3100	468.605911	96.6%	96.9%	1.24%	96.9%	1.24%	96.9%	1.24%	0.72%
38	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530	50.6522	80.8409	417.158221	100%	91.3%	1.23%	91.3%	1.23%	91.3%	1.23%	0.73%
39	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530	58.4203	85.6134	406.837598	96.6%	96.9%	1.24%	96.9%	1.24%	96.9%	1.24%	0.72%
40	2/26/2016 13:40	3/4/2016 14:30		0.5336	0.8391	0.9530											

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-89 Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Sr-89 LCS S/N : 1758-A
 LCS Exp Date : 5/10/2016
 LCS Activity (dpm/ml): 5282.88
 LCS Volume Added: 0.20

SR-89 Results										2 SIGMA				2 SIGMA				Total Prop.			
Pos.	Decision	Critical	Required	MDA	MDA	Sample Act.	Sample Act.	Net Count	Net Count	Counting	Uncertainty	Sample	Sample	Counting	Uncertainty	QC	Type	RPD	RER	Nominal	Recovery
	pCi/L	Level	pCi/L	pCi/L	pCi/L	Conc.	pCi/L	Rate	CPM	Rate Error	CPM	QC	Type	pCi/L	CPM	QC	Type			pCi/L	
1	1.9723	1.3925	1	3.6959	1	1370.2719	2.07%	451.2930	6.7236	40.0136	230.6418	LCS	LCS	40.0136	230.6418		LCS			1586.4497	86.4%
2	2.0636	1.4569	1	3.8464	1	1412.9732	2.06%	454.5835	6.7483	41.1122	237.6178	LCS	LCS	41.1122	237.6178		LCS			1586.4497	89.1%
3	2.6576	1.8763	1	4.6498	1	1367.4820	2.11%	457.2433	6.7727	39.7003	230.6683	LCS	LCS	39.7003	230.6683		LCS			1586.4497	86.2%
4	2.3801	1.6803	1	4.2935	1	1361.7808	2.07%	437.9433	6.6259	40.3821	229.1124	LCS	LCS	40.3821	229.1124		LCS			1586.4497	85.8%
5	1.7591	1.2420	1	3.4266	1	1456.2189	2.71%	463.4356	6.8118	41.9525	255.1230	LCS	LCS	41.9525	255.1230		LCS			1586.4497	91.8%
6	2.8566	2.0168	1	4.9727	1	1415.3230	2.86%	452.1469	6.7356	41.3245	250.5177	LCS	LCS	41.3245	250.5177		LCS			1586.4497	89.2%
7	1.5895	1.1081	1	3.1257	1	1276.8178	2.35%	421.8142	6.4985	38.6152	218.5866	LCS	LCS	38.6152	218.5866		LCS			1586.4497	80.6%
8	3.0697	2.1672	1	5.3363	1	1385.3340	2.12%	414.8510	6.4530	42.2355	233.5613	LCS	LCS	42.2355	233.5613		LCS			1586.4497	87.3%
9	1.6378	1.1563	1	3.2444	1	1321.0465	2.42%	425.2826	6.5253	39.7280	226.8019	LCS	LCS	39.7280	226.8019		LCS			1586.4497	83.3%
10	2.9510	2.0835	1	5.1104	1	1401.7135	2.53%	445.6961	6.6882	41.2273	242.4358	LCS	LCS	41.2273	242.4358		LCS			1586.4497	88.4%
11	1.7178	1.2128	1	3.4315	1	1476.1259	2.19%	440.2369	6.6387	43.6289	250.0000	LCS	LCS	43.6289	250.0000		LCS			1586.4497	93.0%
12	2.0003	1.4122	1	3.9117	1	1646.9508	3.00%	454.3939	6.7450	47.9169	294.4018	LCS	LCS	47.9169	294.4018		LCS			1586.4497	103.8%
13	2.0940	1.4784	1	3.9629	1	1558.3152	2.22%	484.6462	6.8218	44.8421	264.6646	LCS	LCS	44.8421	264.6646		LCS			1586.4497	98.2%
14	2.7979	1.9753	1	4.8277	1	1442.9981	2.42%	493.5832	7.0375	40.3258	248.2660	LCS	LCS	40.3258	248.2660		LCS			1586.4497	91.0%
15	1.9006	1.3418	1	3.5512	1	1277.1652	2.14%	441.6421	6.6516	37.7015	215.7227	LCS	LCS	37.7015	215.7227		LCS			1586.4497	80.5%
16	2.9498	2.0826	1	5.0910	1	1303.9335	2.12%	422.5301	6.5132	39.3954	219.8859	LCS	LCS	39.3954	219.8859		LCS			1586.4497	82.2%
17	2.5584	1.8062	1	4.5001	1	1328.3533	2.12%	448.9249	6.7105	38.9178	224.1465	LCS	LCS	38.9178	224.1465		LCS			1586.4497	83.7%
18	1.4702	1.0380	1	2.9928	1	1400.8628	1.97%	458.4125	6.7738	40.5719	234.5183	LCS	LCS	40.5719	234.5183		LCS			1586.4497	88.3%
19	1.8061	1.2752	1	3.4439	1	1352.8051	2.04%	454.1733	6.7443	39.3735	227.3273	LCS	LCS	39.3735	227.3273		LCS			1586.4497	85.3%
20	2.0106	1.4195	1	3.7532	1	1527.4590	2.09%	501.2049	7.0852	42.3219	257.7168	LCS	LCS	42.3219	257.7168		LCS			1586.4497	96.3%
21	2.9965	2.1156	1	5.1598	1	1443.3321	2.94%	466.2383	6.8408	41.5069	256.9351	LCS	LCS	41.5069	256.9351		LCS			1586.4497	91.0%
22	1.9353	1.3663	1	3.6071	1	1414.4560	2.08%	485.2423	6.9718	39.8317	238.3483	LCS	LCS	39.8317	238.3483		LCS			1586.4497	89.2%
23	2.3454	1.6559	1	4.1859	1	1279.2626	2.77%	439.0303	6.6349	37.8929	224.9312	LCS	LCS	37.8929	224.9312		LCS			1586.4497	80.6%
24	#DIV/0!	#DIV/0!	4	#DIV/0!	4	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	LCS	LCS	#VALUE!	#VALUE!		LCS			#VALUE!	#VALUE!
25	2.0954	1.4794	1	3.8696	1	1380.8039	2.02%	454.6836	6.7495	40.1688	231.7290	LCS	LCS	40.1688	231.7290		LCS			1586.4497	87.0%
26	1.6685	1.1779	1	3.2764	1	1422.2911	2.02%	463.5541	6.8125	40.9684	238.7453	LCS	LCS	40.9684	238.7453		LCS			1586.4497	89.7%
27	1.5946	1.1258	1	3.1756	1	1402.2462	2.09%	455.2574	6.7509	40.7556	236.2248	LCS	LCS	40.7556	236.2248		LCS			1586.4497	88.4%
28	1.9608	1.3843	1	3.7148	1	1503.8508	2.21%	476.8230	6.9104	42.7175	255.2377	LCS	LCS	42.7175	255.2377		LCS			1586.4497	94.8%
29	2.0061	1.4163	1	3.7628	1	1485.0541	2.47%	478.9655	6.9263	42.0916	256.2178	LCS	LCS	42.0916	256.2178		LCS			1586.4497	93.6%
30	1.3594	0.9597	1	2.7992	1	1435.0098	2.86%	489.3191	6.9980	40.2245	254.1923	LCS	LCS	40.2245	254.1923		LCS			1586.4497	90.5%
31	2.5932	1.8308	1	4.5490	1	1305.8443	2.76%	441.4779	6.6550	38.5823	229.3997	LCS	LCS	38.5823	229.3997		LCS			1586.4497	82.3%
32	1.6588	1.1711	1	3.2457	1	1274.4330	2.07%	423.2164	6.5098	38.4219	214.2263	LCS	LCS	38.4219	214.2263		LCS			1586.4497	80.3%
33	1.9711	1.3916	1	3.6773	1	1337.1445	2.08%	448.6828	6.7044	39.1611	225.1703	LCS	LCS	39.1611	225.1703		LCS			1586.4497	84.3%
34	1.9714	1.3918	1	3.7151	1	1420.8392	2.07%	457.6140	6.7702	41.2006	239.1117	LCS	LCS	41.2006	239.1117		LCS			1586.4497	89.6%
35	1.8689	1.3195	1	3.5526	1	1332.2445	2.04%	437.4303	6.6191	39.5121	223.7422	LCS	LCS	39.5121	223.7422		LCS			1586.4497	84.0%
36	2.1870	1.5440	1	4.0164	1	1526.3569	3.22%	493.2568	7.0298	42.6384	277.4988	LCS	LCS	42.6384	277.4988		LCS			1586.4497	96.2%
37	1.6020	1.1311	1	3.2683	1	1360.3377	2.10%	405.5800	6.3718	41.8880	228.9700	LCS	LCS	41.8880	228.9700		LCS			1586.4497	85.7%
38	1.8750	1.3238	1	3.5459	1	1401.1412	2.02%	467.8979	6.8456	40.1788	235.2959	LCS	LCS	40.1788	235.2959		LCS			1586.4497	88.3%
39	1.7031	1.2024	1	3.3127	1	1260.6639	2.08%	416.5862	6.4589	38.3095	212.0356	LCS	LCS	38.3095	212.0356		LCS			1586.4497	79.5%
40	2.1139	1.4925	1	3.9486	1	1304.4177	2.08%	406.0556	6.3785	40.1611	219.2595	LCS	LCS	40.1611	219.2595		LCS			1586.4497	82.2%

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-90 Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Sr-90 LCS S/N : 1243-N
 LCS Exp Date : 5/6/2016
 LCS Activity (dpm/ml): 477.42
 LCS Volume Added: 0.50

SR-90 Results										2 SIGMA		2 SIGMA		Total Prop.				
Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate	Net Count Rate Error	Counting Uncertainty	Counting Uncertainty	Uncertainty	Sample QC	Sample Type	RPD	RER	Nominal	Recovery	
	pCi/L	pCi/L	pCi/L	pCi/L	pCi/L	%	CPM	CPM	pCi/L	pCi/L	pCi/L					pCi/L		
1	1.9878	1.4034	1	3.4510	323.3114	2.79%	75.2929	1.9504	10.7026	54.9441		LCS				358.4235	90.2%	
2	2.1002	1.4828	1	3.6550	274.3198	3.08%	59.6791	1.7385	10.2117	47.1547		LCS				358.4235	76.5%	
3	2.9805	2.1042	1	4.8636	335.5432	2.81%	76.8277	1.9817	11.0597	57.0677		LCS				358.4235	93.6%	
4	2.2569	1.5934	1	3.8164	285.5849	2.91%	68.0335	1.8587	9.9700	48.7532		LCS				358.4235	79.7%	
5	1.8420	1.3005	1	3.2754	294.3660	3.45%	65.4603	1.8177	10.4443	51.3771		LCS				358.4235	82.1%	
6	2.7292	1.9268	1	4.5164	322.0134	3.46%	72.8799	1.9272	10.8805	56.2279		LCS				358.4235	89.8%	
7	1.7871	1.2617	1	3.2306	314.2843	3.12%	66.6646	1.8329	11.0410	54.0931		LCS				358.4235	87.7%	
8	3.1079	2.1942	1	5.1306	349.1733	2.88%	70.5709	1.8977	11.9965	59.5490		LCS				358.4235	97.4%	
9	1.4421	1.0181	1	2.6895	305.2481	3.11%	70.0907	1.8774	10.4069	52.5198		LCS				358.4235	85.2%	
10	2.8423	2.0067	1	4.7041	270.2541	3.44%	58.6886	1.7334	10.1596	47.1561		LCS				358.4235	75.4%	
11	1.6018	1.1309	1	2.9279	325.6600	2.89%	73.3392	1.9212	10.8583	55.5584		LCS				358.4235	90.9%	
12	1.7104	1.2075	1	3.0649	291.8851	3.64%	67.3780	1.8433	10.1636	51.3865		LCS				358.4235	81.4%	
13	1.8580	1.3118	1	3.2887	290.7203	3.08%	65.5562	1.8194	10.2696	49.9637		LCS				358.4235	81.1%	
14	2.8213	1.9918	1	4.5910	304.3436	3.10%	75.1753	1.9617	10.1085	52.3567		LCS				358.4235	84.9%	
15	1.9446	1.3729	1	3.4201	298.0555	2.99%	66.3098	1.8303	10.4714	51.0418		LCS				358.4235	83.2%	
16	3.0780	2.1731	1	5.0157	311.0240	2.91%	69.6904	1.8900	10.7362	53.1012		LCS				358.4235	86.8%	
17	2.4081	1.7001	1	4.0259	305.6689	2.86%	73.2884	1.9302	10.2048	52.0857		LCS				358.4235	85.3%	
18	1.5448	1.0906	1	2.8559	283.1559	2.95%	62.9647	1.7804	10.1492	48.4154		LCS				358.4235	79.0%	
19	1.7092	1.2067	1	3.0752	335.6841	2.75%	76.0813	1.9575	10.9478	56.9708		LCS				358.4235	93.7%	
20	1.9967	1.4097	1	3.4435	278.9812	2.99%	67.0586	1.8427	9.7172	47.7712		LCS				358.4235	77.8%	
21	2.9989	2.1173	1	4.8945	288.6379	3.65%	65.6026	1.8346	10.2274	50.8232		LCS				358.4235	80.5%	
22	2.1008	1.4832	1	3.5722	292.0563	2.87%	72.3066	1.9145	9.7978	49.7900		LCS				358.4235	81.5%	
23	3.0162	2.1295	1	4.9358	307.4936	3.45%	68.1493	1.8681	10.6799	53.6788		LCS				358.4235	85.8%	
24	#DIV/0!	#DIV/0!	4	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	LCS				358.4235	#VALUE!	
25	1.9896	1.4047	1	3.4537	306.5336	2.82%	71.3672	1.8994	10.2949	52.1555		LCS				358.4235	85.5%	
26	1.4816	1.0460	1	2.7736	278.3741	3.02%	61.2633	1.7558	10.0673	47.7320		LCS				358.4235	77.7%	
27	1.6331	1.1530	1	2.9962	332.6593	2.85%	72.2975	1.9074	11.0746	56.6577		LCS				358.4235	82.8%	
28	1.8887	1.3334	1	3.3150	287.6133	3.06%	66.5600	1.8339	9.9997	49.3859		LCS				358.4235	92.8%	
29	2.1455	1.5148	1	3.6921	300.9537	3.23%	68.1284	1.8574	10.3536	52.0454		LCS				358.4235	80.2%	
30	1.3542	0.9561	1	2.5258	301.7279	3.46%	73.7426	1.9254	9.9413	52.6811		LCS				358.4235	84.2%	
31	2.9910	2.1117	1	4.9157	302.7621	3.49%	65.6012	1.8323	10.6712	52.9280		LCS				358.4235	84.2%	
32	1.6967	1.1979	1	3.0547	299.0641	2.88%	68.0898	1.8526	10.2677	50.9991		LCS				358.4235	84.5%	
33	1.8931	1.3365	1	3.3204	314.1483	2.83%	72.7950	1.9171	10.3066	53.4774		LCS				358.4235	83.4%	
34	2.2213	1.5682	1	3.8344	272.2691	3.12%	58.5116	1.7227	9.9861	46.8765		LCS				358.4235	87.6%	
35	1.9464	1.3741	1	3.4333	341.9437	2.76%	74.8730	1.9435	11.0573	58.0437		LCS				358.4235	76.0%	
36	2.2021	1.5547	1	3.7494	271.3039	3.91%	63.5850	1.7968	9.5506	48.3615		LCS				358.4235	95.4%	
37	1.8457	1.3031	1	3.4180	310.0479	3.12%	57.2880	1.6988	11.4529	53.3732		LCS				358.4235	75.7%	
38	1.9981	1.4106	1	3.4712	323.0865	2.78%	74.5645	1.9410	10.4767	54.8856		LCS				358.4235	86.5%	
39	2.0195	1.4258	1	3.5899	298.2497	3.04%	60.5933	1.7495	10.7271	51.1867		LCS				358.4235	90.1%	
40	2.2407	1.5820	1	3.8971	328.4592	2.89%	67.1981	1.8435	11.2252	56.0353		LCS				358.4235	83.2%	
																	358.4235	91.6%

Strontium-89 & 90 Liquid

Filename : SR8990.XLS
File type : Excel
Version # : 1.3.9

Batch : 1082959
Analyst : KSD1
Prep Date : 2/26/2016
Sr-89 Method Uncertainty : 0.0829
Sr-90 Method Uncertainty : 0.0821

Geometry: Tuffryn Filter

Sr Carrier S/N : 2370334
Carrier Exp Date : 2/23/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 15.53
Carrier Weight StDev.: 0.15

Y Carrier S/N : 2354207
Carrier Exp Date : 1/12/2017
Carrier Volume Added: 0.50
Carrier Weight (mg/ml): 31.78
Carrier Weight StDev.: 0.05

Procedure Code : GFCGANBL
Parmname1 : Strontium-89
Parmname2 : Strontium-90
Required MDA Sr-89 : 1 pCi/L
Required MDA Sr-90 : 1 pCi/L
Sr-89 Abundance : 1.00
Sr-90 Abundance : 1.00
Half-life of Sr-89 : 50.53 days
Half-life of Sr-90 : 28.9 years
Half-life of Y-90 : 64.053 hours

Sample Characteristics			Carrier Calculations				Carrier Aliquot			
Pos.	Sample ID	Sample Aliquot L	Sample Aliquot StDev. L	Sample Date/Time	Net Weight (mg) Sr	Net Weight StDev. (mg) Y	Carrier Aliquot (mL) Sr	Carrier Aliquot (mL) Y	Carrier Aliquot StDev. (mL) Sr	Carrier Aliquot StDev. (mL) Y
1	1202347886.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	15.9	0.039995	0.075668	0.5	0.001000
2	1202347887.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.2	0.039135	0.072660	0.5	0.001000
3	1202347888.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	15.2	0.039995	0.072660	0.5	0.001000
4	1202347889.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	16.5	0.039135	0.078247	0.5	0.001000
5	1202347890.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.8	0.039135	0.075238	0.5	0.001000
6	1202347891.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	16.2	0.040854	0.076958	0.5	0.001000
7	1202347892.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	14.5	0.040854	0.069651	0.5	0.001000
8	1202347893.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	15.4	0.039565	0.073519	0.5	0.001000
9	1202347894.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	15.9	0.039995	0.075668	0.5	0.001000
10	1202347895.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.2	0.039135	0.072660	0.5	0.001000
11	1202347896.1	0.3000	1.8459E-05	2/26/2016 0:00	7.6	16.2	0.039995	0.072660	0.5	0.001000
12	1202347897.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	16.5	0.039135	0.078247	0.5	0.001000
13	1202347898.1	0.3000	1.8459E-05	2/26/2016 0:00	7.4	15.8	0.039135	0.075238	0.5	0.001000
14	1202347899.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	16.2	0.040854	0.076958	0.5	0.001000
15	1202347900.1	0.3000	1.8459E-05	2/26/2016 0:00	7.8	14.5	0.040854	0.069651	0.5	0.001000
16	1202347901.1	0.3000	1.8459E-05	2/26/2016 0:00	7.5	15.4	0.039565	0.073519	0.5	0.001000

Pipet, 0.1 ml Stdev : +/- 0.000200 ml
 Pipet, 0.5 ml Stdev : +/- 0.001000 ml
 Pipet, 1 ml Stdev : +/- 0.002000 ml
 Pipet, 5 ml Stdev : +/- 0.010000 ml

Analytical SOP: GL-RAD-A-001
 Instrument SOP: GL-RAD-I-016

1st Count Raw Data							1st Count Calibration Data							Detector		Weekly Bkg	
Pos.	Detector ID	Counting Time (min.)	Gross Alpha	Gross Beta	Gross CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Sr-89	Detector Efficiency (cpm/dpm) Sr-90	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly CPM	Weekly Count Start Date/Time	Weekly Count Time (min.)	
1	11A	10	1	6147	614.689	2/29/2016 12:17	PIC	2/1/2016	3/15/2017	0.5316	0.4235	0.01317	0.10871	1.108	2/26/2016 18:23	500	
2	11B	10	3	5819	581.878	2/29/2016 12:17	PIC	2/1/2016	3/15/2017	0.5367	0.4308	0.00697	0.07284	0.944	2/26/2016 18:19	500	
3	11C	10	4	5992	599.133	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5282	0.4166	0.01278	0.16742	0.378	2/26/2016 18:19	500	
4	11D	10	1	6337	633.693	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5471	0.4289	0.01068	0.06838	0.790	2/26/2016 18:19	500	
5	12A	10	3	5784	578.357	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5167	0.4041	0.01964	0.14245	1.094	2/26/2016 18:19	500	
6	12B	10	1	6186	618.586	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5199	0.4164	0.01114	0.13938	1.426	2/26/2016 18:20	500	
7	12C	10	1	5867	586.693	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5279	0.4191	0.01666	0.07486	0.672	2/26/2016 18:20	500	
8	12D	10	1	5789	578.890	2/29/2016 12:18	PIC	2/1/2016	3/15/2017	0.5298	0.4205	0.00714	0.14032	0.855	2/26/2016 18:23	500	
9	13A	10	1	5510	550.986	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.4954	0.4123	0.00714	0.14032	0.855	2/26/2016 18:23	500	
10	13B	10	0	5768	576.800	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5074	0.4190	0.00967	0.13254	1.461	2/27/2016 11:52	1000	
11	13C	10	0	0	0.000	2/29/2016 12:30	PIC	2/4/2016	3/15/2017	0.0000	0.0000	0.01708	0.00000	0.000	12-00-00 AM	0	
12	13D	10	1	5177	517.677	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.4289	0.3798	0.01144	0.23434	0.674	2/27/2016 11:52	1000	
13	14A	10	0	6269	626.900	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5397	0.4301	0.02119	0.18416	0.570	2/27/2016 11:52	1000	
14	14B	10	1	6445	644.489	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5275	0.4218	0.01028	0.10699	1.050	2/27/2016 11:52	1000	
15	14C	10	3	5888	588.753	2/29/2016 12:30	PIC	2/1/2016	3/15/2017	0.5351	0.4255	0.01828	0.15520	1.911	2/27/2016 11:52	1000	
16	14D	10	0	5708	570.800	2/29/2016 12:31	PIC	2/1/2016	3/15/2017	0.5316	0.4225	0.00738	0.26095	0.746	2/27/2016 11:52	1000	

2nd Count Raw Data							2nd Count Calibration Data							Weekly Bkg Count		
Pos.	Detector ID	Counting Time (min.)	Gross Alpha	Gross Beta	Gross CPM	Count Start Date/Time	Counted on	Calibration Date	Calibration Due Date	Detector Efficiency Y-90 (cpm/dpm)	Detector Efficiency Error (cpm/dpm)	Alpha X-Talk	Weekly Bkg CPM	Weekly Bkg Count Start Date/Time	Weekly Bkg Count Time (min.)	
1	11A	20	13	1425	71.179	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5473	0.01317	0.10871	1.101	3/4/2016 16:53	1000	
2	11B	20	4	1266	63.285	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5589	0.00697	0.07284	0.852	3/4/2016 16:53	1000	
3	11C	20	2	1435	71.733	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5497	0.01278	0.16742	0.378	2/26/2016 18:19	500	
4	11D	20	4	1391	69.536	3/5/2016 16:23	PIC	2/1/2016	3/15/2017	0.5699	0.01068	0.06838	0.732	3/4/2016 16:53	1000	
5	12A	20	1	1333	66.643	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5410	0.01964	0.14245	1.024	3/4/2016 16:53	1000	
6	12B	20	1	1323	66.143	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5374	0.01114	0.13938	1.191	3/4/2016 16:54	1000	
7	12C	20	3	1298	64.889	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5456	0.01666	0.07486	0.636	3/4/2016 16:54	1000	
8	12D	20	1	1427	71.345	3/5/2016 16:24	PIC	2/1/2016	3/15/2017	0.5487	0.01845	0.10410	1.002	3/4/2016 16:54	1000	
9	13A	20	30	1333	66.440	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5113	0.00714	0.14032	0.868	3/4/2016 16:54	1000	
10	13B	20	1	1173	58.643	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5214	0.00967	0.13254	1.332	3/4/2016 16:54	1000	
11	13C	20	0	0	0.000	3/5/2016 16:44	PIC	2/4/2016	3/4/5/2017	0.0000	0.01708	0.00000	FAIL	12:00:00AM	0	
12	13D	20	0	1053	52.650	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.4297	0.01144	0.23434	0.651	3/4/2016 16:54	1000	
13	14A	20	2	1326	66.282	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5582	0.02119	0.18416	0.540	3/4/2016 16:55	1000	
14	14B	20	0	1448	72.400	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5524	0.01028	0.10699	1.323	3/4/2016 16:55	1000	
15	14C	20	5	1354	67.661	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5645	0.01828	0.15520	1.843	3/4/2016 16:55	1000	
16	14D	20	2	1370	68.474	3/5/2016 16:44	PIC	2/1/2016	3/15/2017	0.5571	0.00738	0.26095	0.900	3/4/2016 16:55	1000	

Correction Factors																		
Pos.	Separation Date/Time		Yttrium		Yttrium Ingrowth (Sr-89 calc) (Sr-90 calc)		Yttrium Decay		Decay from Sample Date		Net Count Rate		Gross CPM		Calculated Sample Recovery %		Sample Recovery % Error	
	Strontium		Yttrium		(Sr-89 calc)	(Sr-90 calc)	Sr-89	Sr-90	Sr-89	Sr-90	Y-90	Sr-90	Sr-89	Sr-90	Sr	Y	Sr	Y
1	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	60.5126	85.6559	468.52062	97.9%	97.9%	100%	1.24%	0.72%
2	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	55.3696	79.5037	447.004846	95.3%	95.3%	95.7%	1.24%	0.72%
3	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	61.6181	89.3597	448.155203	97.9%	97.9%	95.7%	1.24%	0.72%
4	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	61.0224	78.8145	493.856302	95.3%	95.3%	104%	1.24%	0.72%
5	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	58.2011	77.9090	442.2472	95.3%	95.3%	99.4%	1.24%	0.72%
6	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	54.6564	78.0223	485.907312	100%	100%	102%	1.23%	0.72%
7	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	54.0696	85.4885	447.134443	100%	100%	91.3%	1.23%	0.73%
8	2/26/2016 13:40		3/4/2016 14:30		0.5348	0.8391	0.9529	0.9998	0.9529	0.9998	61.5635	87.8992	429.426937	96.6%	96.6%	96.9%	1.24%	0.72%
9	2/26/2016 13:40		3/4/2016 14:30		0.5358	0.8391	0.9528	0.9998	0.9528	0.9998	56.9462	83.8433	410.196516	97.9%	97.9%	100%	1.24%	0.72%
10	2/26/2016 13:40		3/4/2016 14:30		0.5358	0.8391	0.9528	0.9998	0.9528	0.9998	51.1187	76.3828	449.298532	95.3%	95.3%	95.7%	1.24%	0.72%
11	2/26/2016 13:40		3/4/2016 14:30		0.5358	0.8391	0.9528	0.9998	0.9528	0.9998	#VALUE!	#VALUE!	#VALUE!	97.9%	97.9%	95.7%	1.24%	0.72%
12	2/26/2016 13:40		3/4/2016 14:30		0.5358	0.8391	0.9528	0.9998	0.9528	0.9998	46.3814	70.2157	401.079439	95.3%	95.3%	104%	1.24%	0.72%
13	2/26/2016 13:40		3/4/2016 14:30		0.5358	0.8391	0.9528	0.9998	0.9528	0.9998	58.6399	80.8019	487.458214	95.3%	95.3%	99.4%	1.24%	0.72%
14	2/26/2016 13:40		3/4/2016 14:30		0.5359	0.8391	0.9528	0.9998	0.9528	0.9998	60.1492	84.4592	499.880971	100%	100%	102%	1.23%	0.72%
15	2/26/2016 13:40		3/4/2016 14:30		0.5359	0.8391	0.9528	0.9998	0.9528	0.9998	55.6999	86.2484	446.805143	100%	100%	91.3%	1.23%	0.73%
16	2/26/2016 13:40		3/4/2016 14:30		0.5359	0.8391	0.9528	0.9998	0.9528	0.9998	59.4744	83.8848	427.440796	96.6%	96.6%	96.9%	1.24%	0.72%

Notes:

- 1 - Results are decay corrected to Sample Date/Time
 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-89 Spike S/N : N/A
 Spike Exp Date : N/A
 Spike Activity (dpm/ml): N/A
 Spike Volume Added: N/A

Sr-89 LCS S/N : 1758-A
 LCS Exp Date : 5/10/2016
 LCS Activity (dpm/ml): 5282.88
 LCS Volume Added: 0.20

SR-89 Results													
Pos.	Decision Level	Critical Level	Required MDA	MDA pCi/L	Sample Act. Conc.	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	Counting Uncertainty pCi/L	2 SIGMA Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	Recovery
1	2.3719	1.6746	1	4.2576	1415.3904	2.33%	467.4126	6.8450	40.6262	241.8907		LCS	89.2%
2	2.2274	1.5726	1	4.0694	1374.2104	2.07%	446.0608	6.8860	40.3720	231.1254		LCS	86.6%
3	1.3945	0.9845	1	2.8835	1364.8437	2.32%	447.7772	6.6945	39.9940	233.1021		LCS	86.0%
4	1.9987	1.4111	1	3.7288	1490.0181	2.17%	493.0663	7.0276	41.6245	252.4307		LCS	93.9%
5	2.4904	1.7583	1	4.4764	1411.5553	2.77%	441.1532	6.6503	41.7069	248.0980		LCS	89.0%
6	2.6811	1.8929	1	4.6909	1461.7444	2.20%	484.4813	6.9709	41.2230	248.0201		LCS	92.1%
7	1.8127	1.2798	1	3.4510	1326.6645	2.56%	446.4624	6.8869	38.9456	229.9464		LCS	83.6%
8	2.3481	1.6578	1	4.2393	1319.1264	2.70%	428.3769	6.5532	39.5523	230.6665		LCS	83.1%
9	2.2254	1.5711	1	4.1173	1330.4247	2.12%	409.3415	6.4047	40.8001	224.1917		LCS	83.9%
10	2.9171	2.0595	1	5.0967	1459.5864	2.17%	447.8375	6.7031	42.8193	246.9461		LCS	92.0%
11	#DIV/0!	#DIV/0!	1	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS	#VALUE!
12	2.3436	1.6546	1	4.4657	1543.6068	2.31%	400.4054	6.3331	47.8533	262.9536		LCS	97.3%
13	1.7130	1.2094	1	3.3380	1491.8725	2.84%	486.8882	6.9819	41.9305	263.8741		LCS	94.0%
14	2.2567	1.5933	1	4.0788	1483.6094	2.14%	498.8310	7.0703	41.2155	251.0134		LCS	93.5%
15	3.0009	2.1187	1	5.1169	1304.2706	2.67%	444.8941	6.6845	38.4092	227.7291		LCS	82.2%
16	1.9629	1.3858	1	3.6924	1309.5912	2.10%	426.6948	6.5380	39.3293	220.6245		LCS	82.5%

Notes:

- 1 - Results are decay corrected to Sample Date/Time
- 2 - Reference date for Spike Activity (dpm/ml) is the batch Prep Date
- 3 - Spike Nominals are decay corrected to Sample Date/Time

Sr-90 Spike S/N : N/A
Spike Exp Date : N/A
Spike Activity (dpm/ml): N/A
Spike Volume Added: N/A

Sr-90 LCS S/N : 1243-N
LCS Exp Date : 5/6/2016
LCS Activity (dpm/ml): 477.42
LCS Volume Added: 0.50

SR-90 Results													
Pos.	Decision Level	Critical Level	Required MDA	MDA	Sample Act. Conc.	Sample Act. Error %	Net Count Rate CPM	Net Count Rate Error CPM	Counting Uncertainty pCi/L	Total Prop. Uncertainty pCi/L	Sample QC	Sample Type	Recovery
1	2.444	1.7258	1	4.1156	310.2575	3.08%	70.0783	1.8868	10.3622	53.3283		LCS	86.6%
2	2.2619	1.5969	1	3.8925	290.7617	3.02%	62.4334	1.7791	10.2778	49.8556		LCS	81.1%
3	1.5063	1.0635	1	2.8186	329.0303	3.03%	71.3553	1.8940	10.8339	56.4441		LCS	91.8%
4	1.8942	1.3374	1	3.3059	289.5048	3.00%	68.8043	1.8648	9.7333	49.5990		LCS	80.8%
5	2.4651	1.7403	1	4.1751	303.7832	3.48%	65.6189	1.8257	10.4840	53.0959		LCS	84.8%
6	2.4764	1.7483	1	4.1435	280.0969	3.10%	64.9520	1.8189	9.7293	48.1750		LCS	78.1%
7	1.9911	1.4058	1	3.5232	304.8740	3.34%	70.3428	1.8890	10.6023	52.9656		LCS	85.1%
8	2.4335	1.7181	1	4.1292	324.9946	3.34%	65.5715	1.8229	10.8254	56.4515		LCS	90.7%
9	2.3321	1.6465	1	4.0066	311.9360	2.96%	57.3114	1.7127	10.7165	53.3563		LCS	87.0%
10	3.0432	2.1485	1	5.0487	287.1926	3.22%	#VALUE!	#VALUE!	10.6065	49.6474		LCS	80.1%
11	#DIV/0!	#DIV/0!	4	#DIV/0!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!		LCS	#VALUE!
12	2.3783	1.6791	1	4.1985	291.2923	3.40%	51.9990	1.6227	11.2336	50.7345		LCS	81.3%
13	1.7411	1.2292	1	3.1339	296.0215	3.56%	65.7416	1.8206	10.1310	51.9219		LCS	82.6%
14	2.5485	1.7992	1	4.2301	299.2853	2.96%	71.0770	1.9030	9.9024	51.1875		LCS	83.5%
15	3.2880	2.3214	1	5.3332	302.9565	3.42%	65.8182	1.8398	10.4655	52.8063		LCS	84.5%
16	2.2801	1.6098	1	3.9047	308.6549	2.93%	67.5739	1.8506	10.4460	52.7289		LCS	86.1%

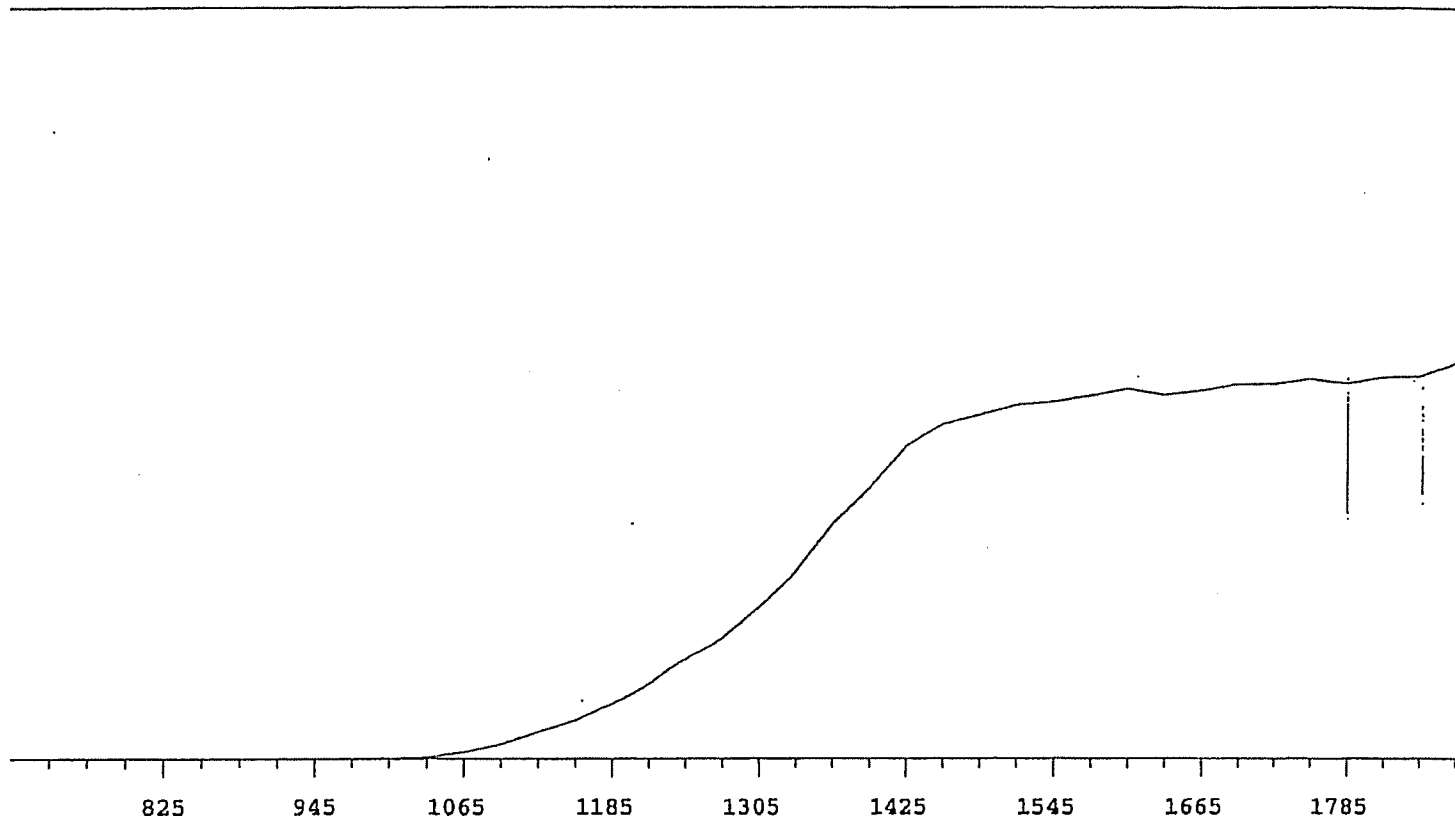
SampleID	Instr	Time (min.)	Alpha Counts		Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
1st Count									
V1	1A	10		6	6035	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V2	1B	10		13	5803	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V3	1C	10		57	6156	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V4	1D	10		45	5732	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V5	2A	10		8	5971	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V6	2B	10		0	5989	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V7	2C	10		10	5623	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V8	2D	10		1	5631	2/29/2016 11:13	2/29/2016 11:23	PIC	Sr8990
V1	3A	10		132	5656	2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V2	3B	10		66	5676	2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V3	3C	10		53	5908	2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V4	3D	10		17	5885	2/29/2016 13:23	2/29/2016 13:33	PIC	Sr8990
V5	4A	10		45	5990	2/29/2016 11:38	2/29/2016 11:48	PIC	Sr8990
V6	4B	10		1	6427	2/29/2016 11:39	2/29/2016 11:49	PIC	Sr8990
V7	4C	10		23	5813	2/29/2016 11:39	2/29/2016 11:49	PIC	Sr8990
V8	4D	10		90	5662	2/29/2016 11:39	2/29/2016 11:49	PIC	Sr8990
V1	5A	10		20	5979	2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V2	5B	10		21	5903	2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V3	5C	10		20	6106	2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V4	5D	10		30	6351	2/29/2016 11:27	2/29/2016 11:37	PIC	Sr8990
V5	6A	10		37	6003	2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V6	6B	10		39	6275	2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V7	6C	10		35	5828	2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V8	6D	10		0	0	2/29/2016 11:29	2/29/2016 11:39	PIC	Sr8990
V1	7A	10		7	5998	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V2	7B	10		2	5932	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V3	7C	10		4	6068	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V4	7D	10		1	6107	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V5	8A	10		17	6176	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V6	8B	10		2	6369	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V7	8C	10		6	5812	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V8	8D	10		21	5641	2/29/2016 11:52	2/29/2016 12:02	PIC	Sr8990
V1	9A	10		11	5988	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V2	9B	10		11	5825	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990

V3	9C	10	15	5947	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V4	9D	10	13	6227	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V5	10A	10	3	5297	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V6	10B	10	3	6193	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V7	10C	10	2	5487	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V8	10D	10	3	5510	2/29/2016 12:03	2/29/2016 12:13	PIC	Sr8990
V1	11A	10	1	6147	2/29/2016 12:17	2/29/2016 12:27	PIC	Sr8990
V2	11B	10	3	5819	2/29/2016 12:17	2/29/2016 12:27	PIC	Sr8990
V3	11C	10	4	5992	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V4	11D	10	1	6337	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V5	12A	10	3	5784	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V6	12B	10	1	6186	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V7	12C	10	1	5867	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V8	12D	10	1	5789	2/29/2016 12:18	2/29/2016 12:28	PIC	Sr8990
V1	13A	10	1	5510	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V2	13B	10	0	5768	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V3	13C	10	0	0	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V4	13D	10	1	5177	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V5	14A	10	0	6269	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V6	14B	10	1	6445	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V7	14C	10	3	5888	2/29/2016 12:30	2/29/2016 12:40	PIC	Sr8990
V8	14D	10	0	5708	2/29/2016 12:31	2/29/2016 12:41	PIC	Sr8990

SampleID	Instr	Time (min.)	Alpha Counts		Beta Counts	Count Start Time	Count End Time	Machine	Batch ID
2nd Count									
V1	1A	20	20	1523		3/5/2016 13:38	3/5/2016 13:58	PIC	8990VER16
V2	1B	20	4	1209		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V3	1C	20	19	1571		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V4	1D	20	9	1382		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V5	2A	20	5	1322		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V6	2B	20	3	1486		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V7	2C	20	5	1344		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V8	2D	20	7	1441		3/5/2016 13:39	3/5/2016 13:59	PIC	8990VER16
V1	3A	20	38	1411		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V2	3B	20	16	1202		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V3	3C	20	19	1477		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V4	3D	20	3	1359		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V5	4A	20	4	1324		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V6	4B	20	3	1539		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V7	4C	20	6	1340		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V8	4D	20	20	1429		3/5/2016 14:01	3/5/2016 14:21	PIC	8990VER16
V1	5A	20	22	1491		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V2	5B	20	8	1268		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V3	5C	20	12	1533		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V4	5D	20	4	1358		3/5/2016 14:23	3/5/2016 14:43	PIC	8990VER16
V5	6A	20	6	1346		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V6	6B	20	7	1466		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V7	6C	20	16	1396		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V8	6D	20	0	0		3/5/2016 14:26	3/5/2016 14:46	PIC	8990VER16
V1	7A	20	27	1445		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V2	7B	20	1	1233		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V3	7C	20	8	1456		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V4	7D	20	0	1345		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V5	8A	20	6	1380		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V6	8B	20	5	1483		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V7	8C	20	10	1344		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V8	8D	20	8	1373		3/5/2016 14:48	3/5/2016 15:08	PIC	8990VER16
V1	9A	20	25	1473		3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V2	9B	20	5	1187		3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16

V3	9C	20	6	1511	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V4	9D	20	1	1291	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V5	10A	20	0	1154	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V6	10B	20	2	1507	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V7	10C	20	4	1225	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V8	10D	20	2	1360	3/5/2016 16:00	3/5/2016 16:20	PIC	8990VER16
V1	11A	20	13	1425	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V2	11B	20	4	1266	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V3	11C	20	2	1435	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V4	11D	20	4	1391	3/5/2016 16:23	3/5/2016 16:43	PIC	8990VER16
V5	12A	20	1	1333	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V6	12B	20	1	1323	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V7	12C	20	3	1298	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V8	12D	20	1	1427	3/5/2016 16:24	3/5/2016 16:44	PIC	8990VER16
V1	13A	20	30	1333	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V2	13B	20	1	1173	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V3	13C	20	0	0	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V4	13D	20	0	1053	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V5	14A	20	2	1326	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V6	14B	20	0	1448	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V7	14C	20	5	1354	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16
V8	14D	20	2	1370	3/5/2016 16:44	3/5/2016 17:04	PIC	8990VER16

MPC 9600 Plateau Instrument 1 MPC 9604 Detector A 7/1/2009
Alpha Volts: 1575 Beta Volts: 1575



VOLTS COUNTS %/100 Volts

705	1	
735	1	
765	0	
795	0	+0.00
825	0	>100
855	1	>100
885	0	+55.56
915	2	+66.67
945	0	>100
975	2	>100
1005	42	>100
1035	145	>100
1065	544	>100
1095	1136	>100
1125	1967	>100
1155	2845	>100
1185	4078	>100
1215	5483	+93.18
1245	7400	+83.35
1275	9328	+75.40

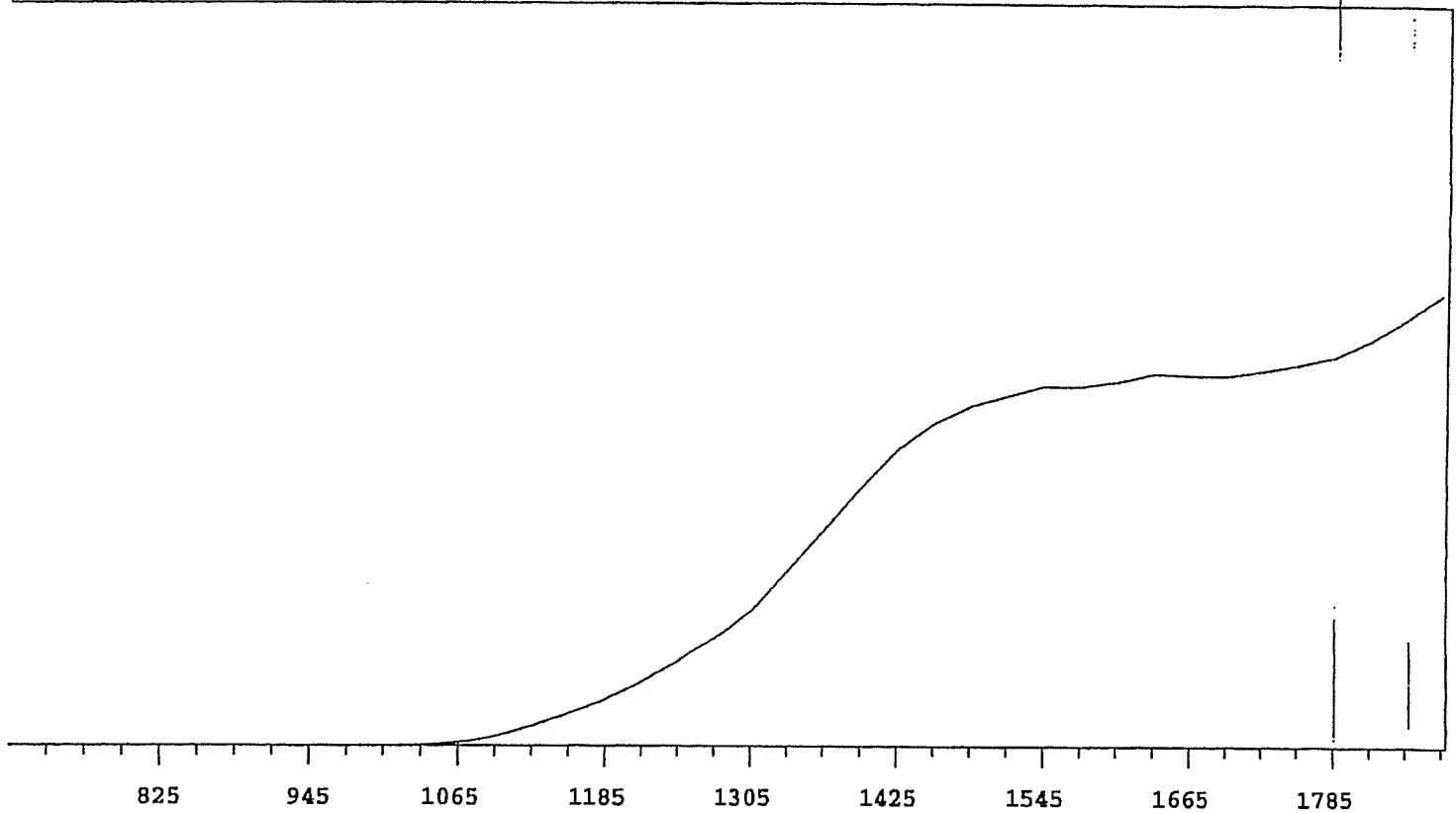
VOLTS COUNTS %/100 Volts

1305	11640	+69.78
1335	14241	+62.88
1365	17534	+55.91
1395	20127	+45.04
1425	23254	+31.29
1455	24902	+20.41
1485	25605	+10.49
1515	26310	+6.44
1545	26535	+5.31
1575	26953	+2.79
1605	27399	+1.83
1635	27000	+1.71
1665	27255	+1.62
1695	27723	+3.14
1725	27705	+1.56
1755	28072	+1.15
1785	27729	+1.43
1815	28194	+3.24
1845	28243	
1875	29191	

8
9/1/09

over 1510

MPC 9600 Plateau Instrument 1 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 1575 Beta Volts: 1575



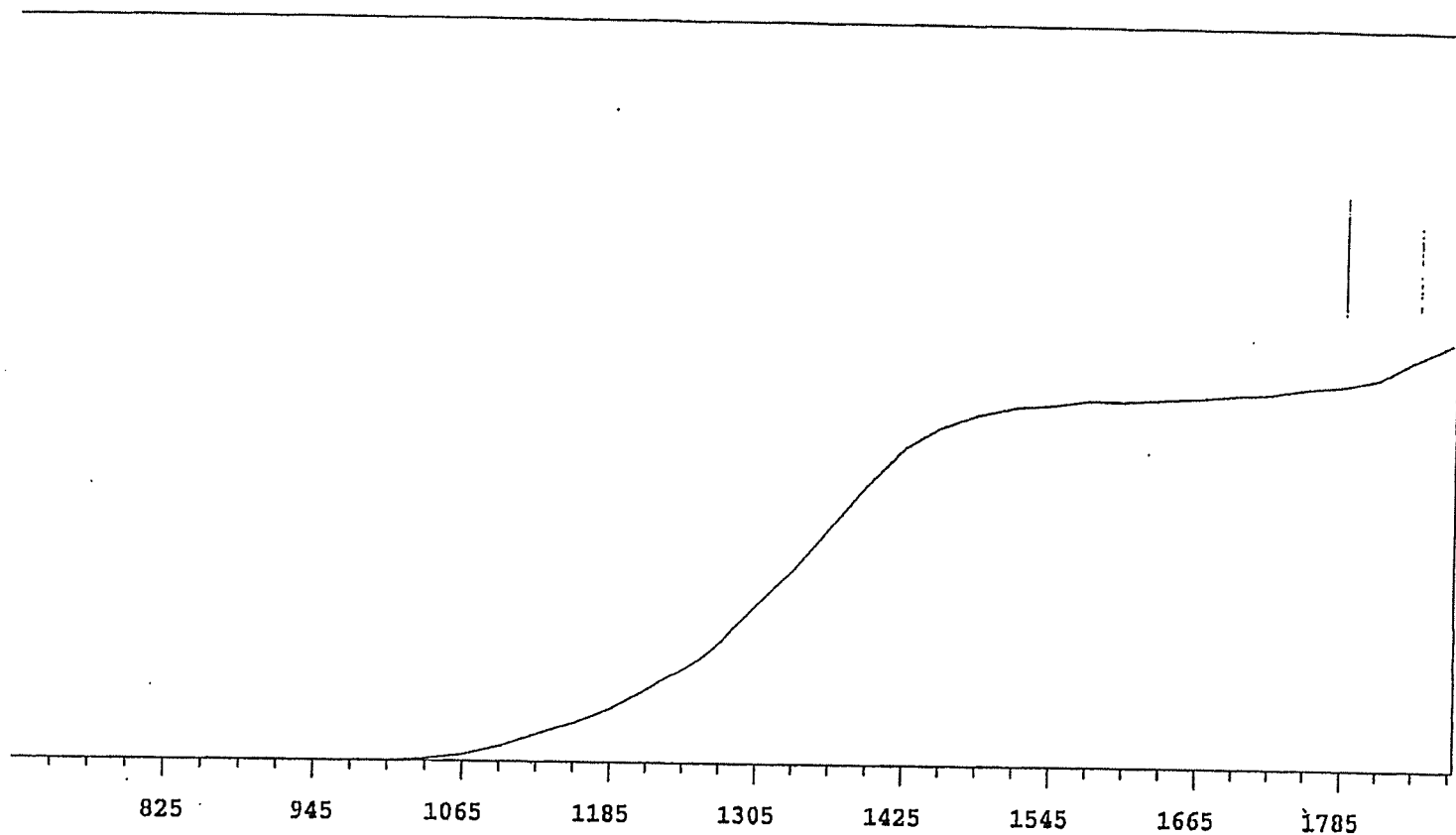
VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	+55.56
795	1	+83.33
825	1	+55.56
855	0	>100
885	1	+0.00
915	0	+0.00
945	1	>100
975	0	>100
1005	4	>100
1035	56	>100
1065	292	>100
1095	890	>100
1125	1841	>100
1155	2936	>100
1185	4179	>100
1215	5837	>100
1245	7821	+91.28
1275	10638	+83.88

VOLTS COUNTS %/100 Volts

1305	13188	+75.92
1335	16818	+67.60
1365	20420	+59.86
1395	24341	+47.85
1425	27854	+35.51
1455	30288	+23.26
1485	31798	+14.54
1515	32622	+8.32
1545	33496	+5.11
1575	33475	+4.43
1605	33903	+3.09
1635	34654	+2.46
1665	34485	+1.74
1695	34445	+1.84
1725	34908	+3.91
1755	35401	+6.80
1785	36062	+10.27
1815	37505	+14.30
1845	39508	
1875	41843	

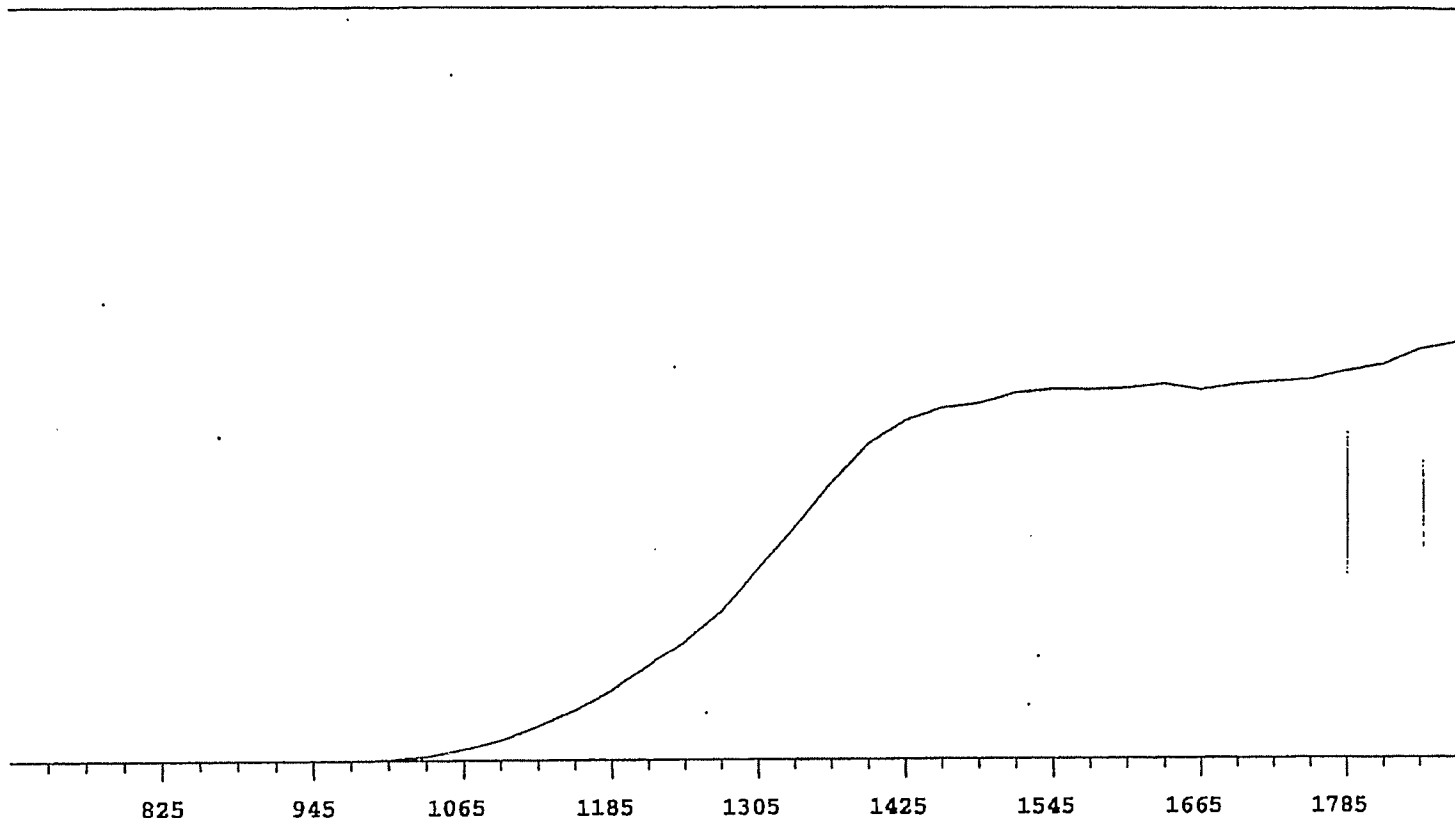
MPC 9600 Plateau Instrument 1 MPC 9604 Detector C 7/1/2009
Alpha Volts: 1575 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts
705	1	
735	0	
765	1	+0.00
795	0	>100
825	1	-55.56
855	1	+55.56
885	0	>100
915	1	>100
945	0	>100
975	4	>100
1005	32	>100
1035	206	>100
1065	639	>100
1095	1416	>100
1125	2551	>100
1155	3619	>100
1185	5037	+98.68
1215	6875	+91.19
1245	8915	+85.53
1275	11519	+77.28

VOLTS	COUNTS	%/100 Volts
1305	14817	+71.06
1335	17823	+63.34
1365	21704	+53.63
1395	25422	+42.55
1425	28424	+29.21
1455	30244	+18.11
1485	31305	+10.10
1515	31989	+6.07
1545	32223	+3.43
1575	32671	+2.15
1605	32621	+1.68
1635	32837	+1.52
1665	32961	+2.01
1695	33249	+2.64
1725	33409	+3.21
1755	33931	+4.07
1785	34234	+7.20
1815	34909	+10.28
1845	36660	
1875	38205	

MPC 9600 Plateau Instrument 1 MPC 9604 Detector D 7/1/2009
Alpha Volts: 1575 Beta Volts: 1575



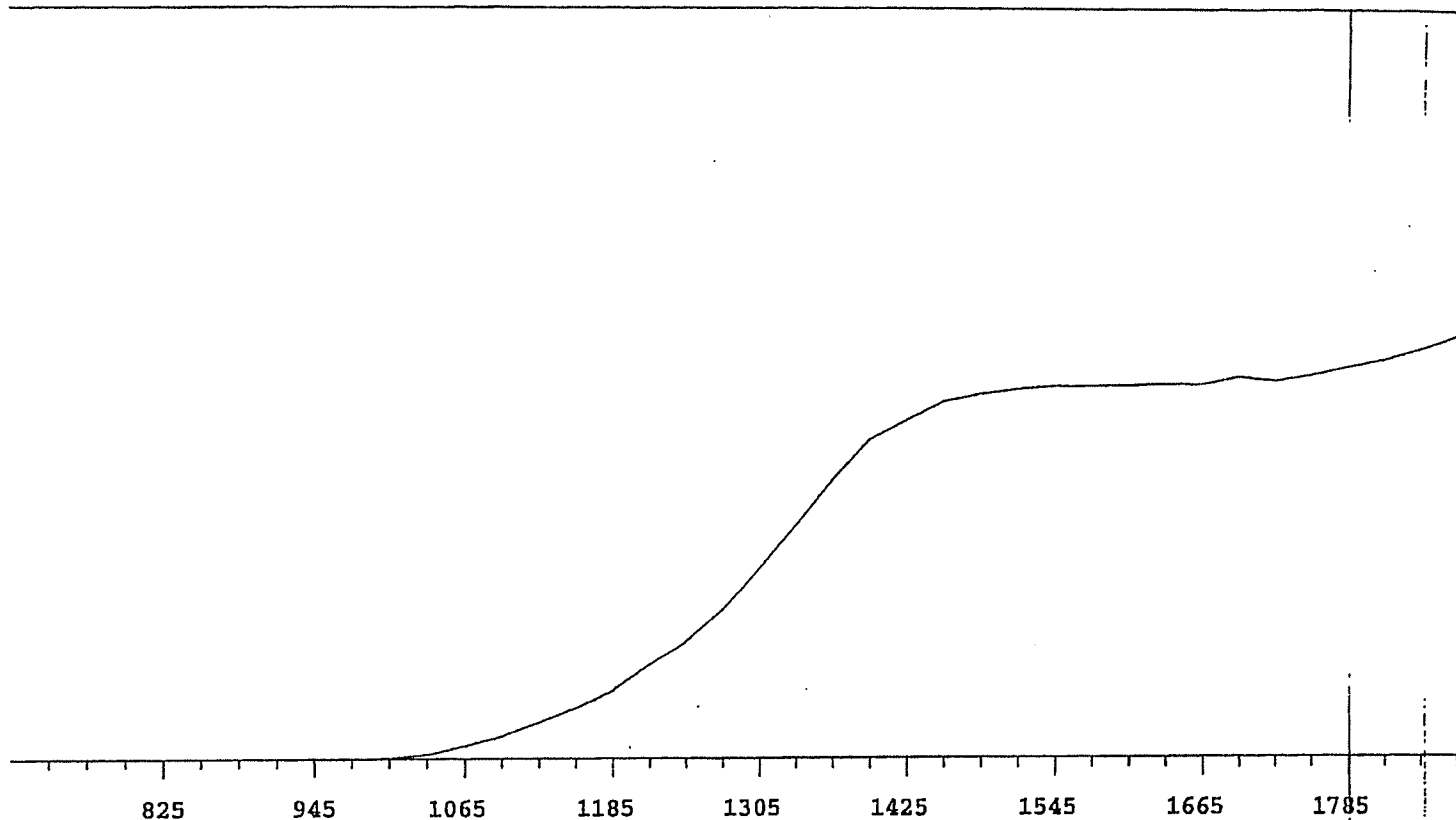
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	+0.00
795	1	+0.00
825	0	+0.00
855	1	>100
885	0	>100
915	0	>100
945	0	>100
975	8	>100
1005	75	>100
1035	303	>100
1065	872	>100
1095	1656	>100
1125	2729	>100
1155	3862	>100
1185	5425	+98.19
1215	7256	+88.82
1245	9510	+81.89
1275	11944	+74.07

VOLTS COUNTS %/100 Volts

1305	15202	+66.36
1335	18216	+57.86
1365	21597	+45.58
1395	24648	+32.96
1425	26505	+19.92
1455	27475	+11.42
1485	27836	+7.08
1515	28609	+4.51
1545	28896	+2.93
1575	28862	+1.66
1605	28969	+0.36
1635	29292	+0.80
1665	28836	+1.06
1695	29279	+1.48
1725	29439	+3.59
1755	29642	+4.07
1785	30243	+6.51
1815	30699	+7.79
1845	31876	
1875	32444	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



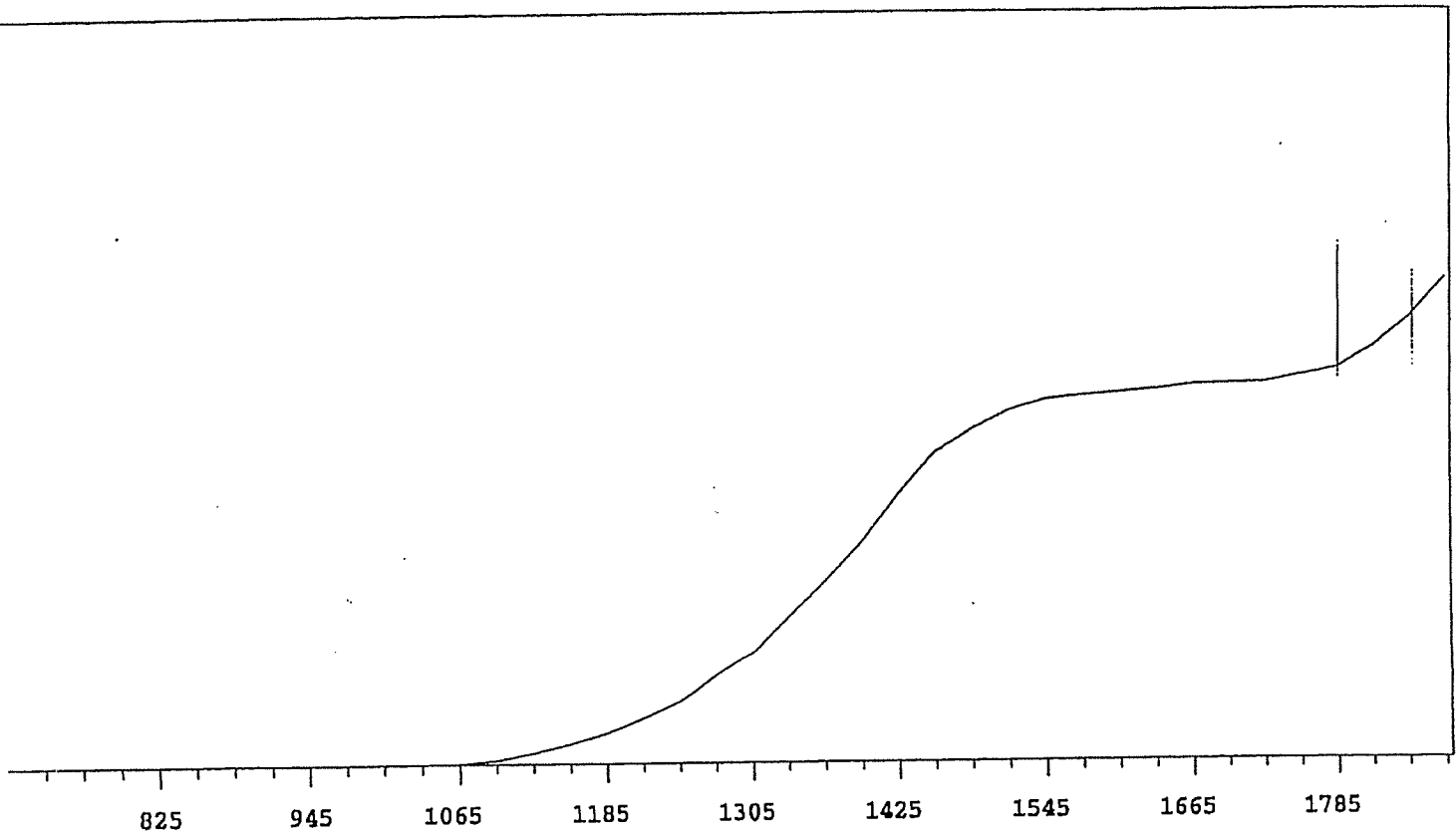
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	+83.33
795	0	-83.33
825	1	>100
855	0	>100
885	1	+100.00
915	1	>100
945	2	>100
975	12	>100
1005	91	>100
1035	421	>100
1065	1239	>100
1095	2155	>100
1125	3527	>100
1155	4974	>100
1185	6647	+97.44
1215	9250	+89.00
1245	12041	+82.15
1275	15094	+73.81

VOLTS COUNTS %/100 Volts

1305	19017	+67.45
1335	23157	+59.23
1365	27625	+45.78
1395	31465	+32.72
1425	33352	+20.41
1455	35084	+11.74
1485	35819	+7.11
1515	36292	+3.35
1545	36527	+1.63
1575	36540	+0.87
1605	36585	+0.48
1635	36742	+1.76
1665	36691	+1.53
1695	37461	+1.89
1725	37073	+3.07
1755	37603	+4.02
1785	38346	+6.58
1815	39111	+7.95
1845	40115	
1875	41409	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



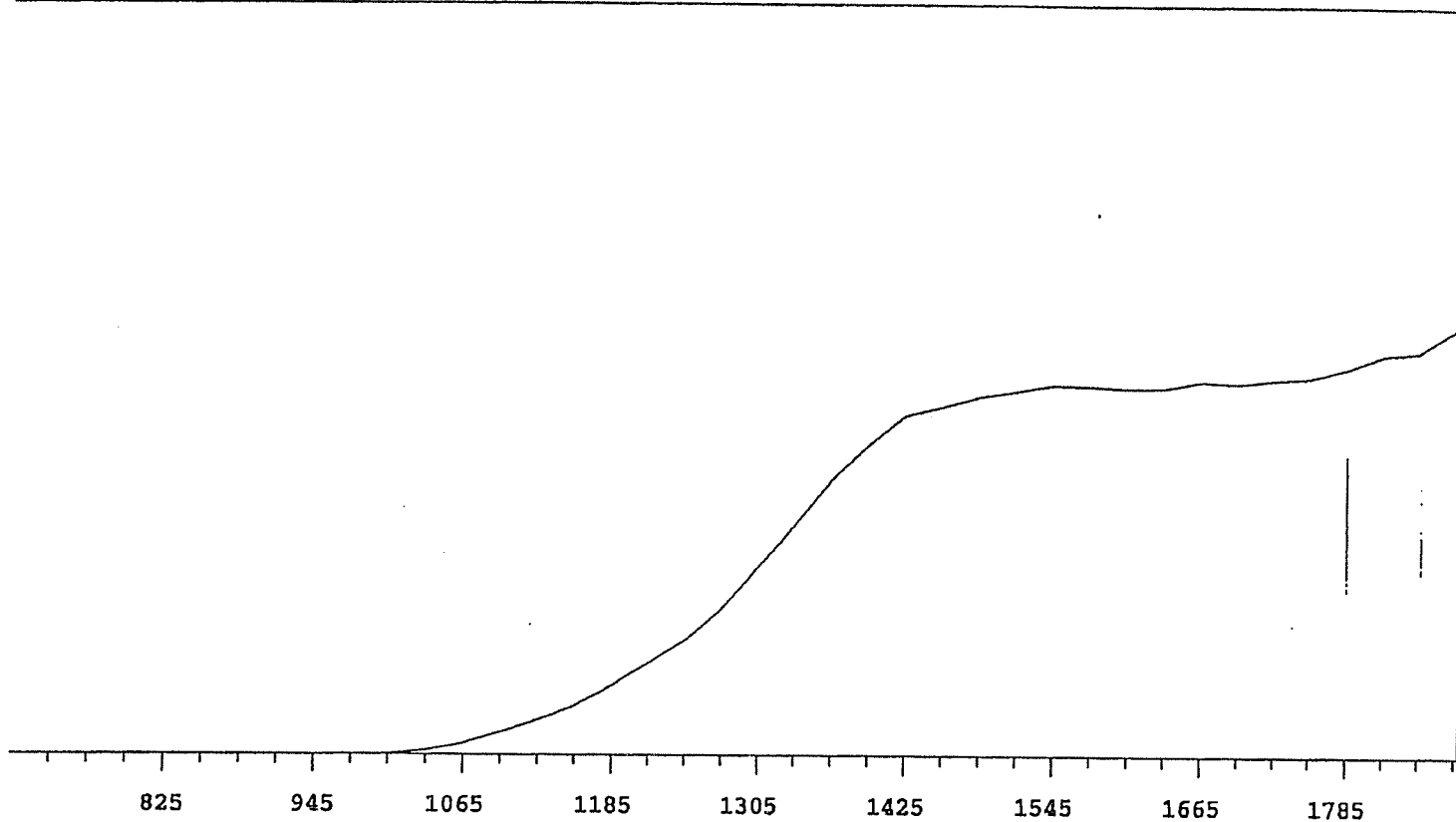
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	>100
975	2	>100
1005	3	>100
1035	14	>100
1065	127	>100
1095	500	>100
1125	1332	>100
1155	2373	>100
1185	3614	>100
1215	5227	>100
1245	7060	+97.33
1275	9574	+90.30

VOLTS COUNTS %/100 Volts

1305	12541	+83.18
1335	16192	+74.48
1365	20083	+67.17
1395	24273	+58.43
1425	29090	+46.86
1455	33223	+34.56
1485	35608	+22.67
1515	37581	+13.63
1545	38762	+8.18
1575	39185	+4.42
1605	39484	+3.06
1635	39806	+2.61
1665	40264	+2.03
1695	40353	+2.32
1725	40431	+3.28
1755	41127	+7.09
1785	41882	+12.40
1815	44049	+18.52
1845	46950	
1875	51097	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



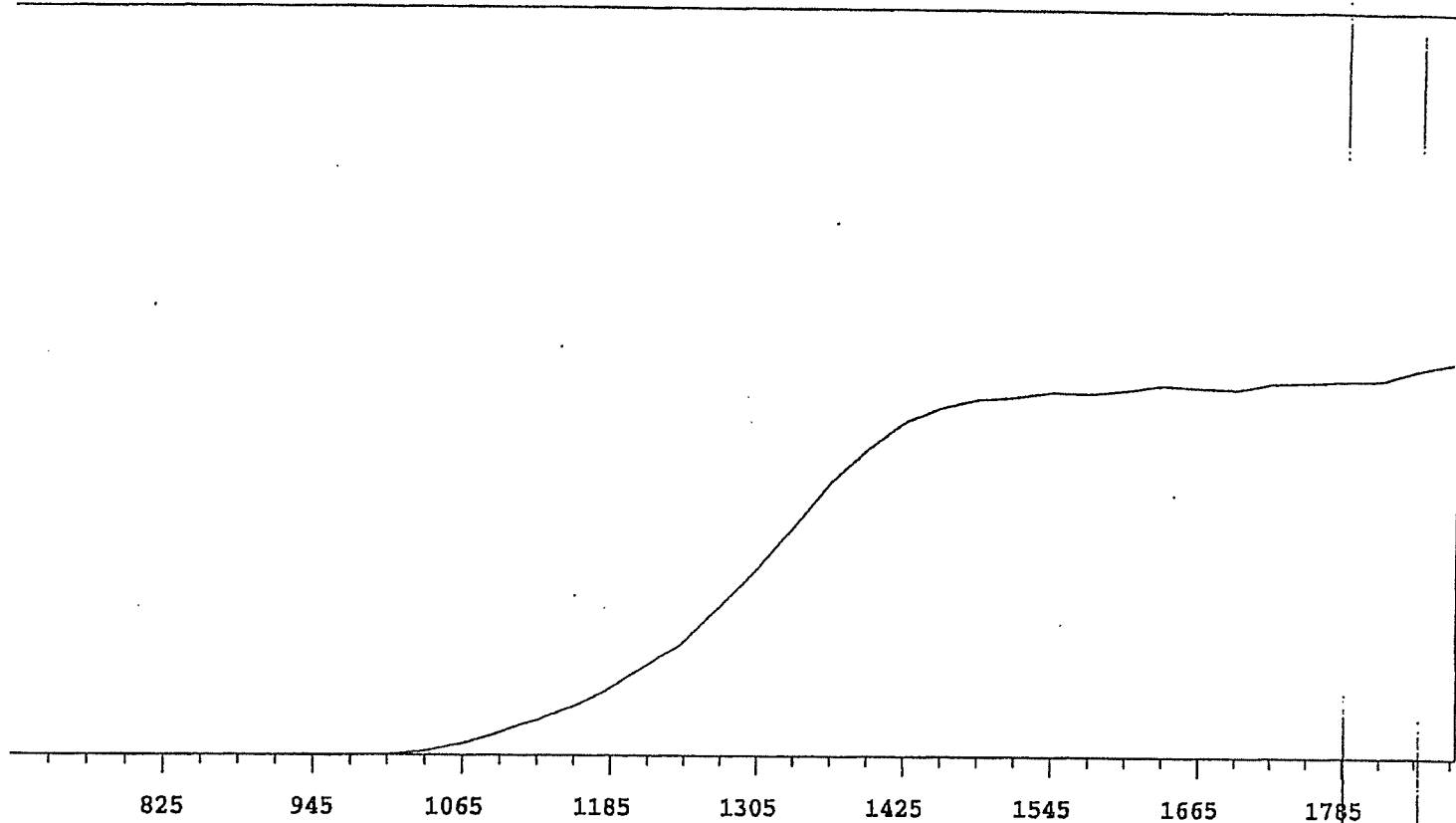
VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	17	>100
1005	87	>100
1035	438	>100
1065	1055	>100
1095	2114	>100
1125	3282	>100
1155	4625	>100
1185	6554	+97.66
1215	8743	+88.09
1245	11345	+81.31
1275	14261	+74.60

VOLTS COUNTS %/100 Volts

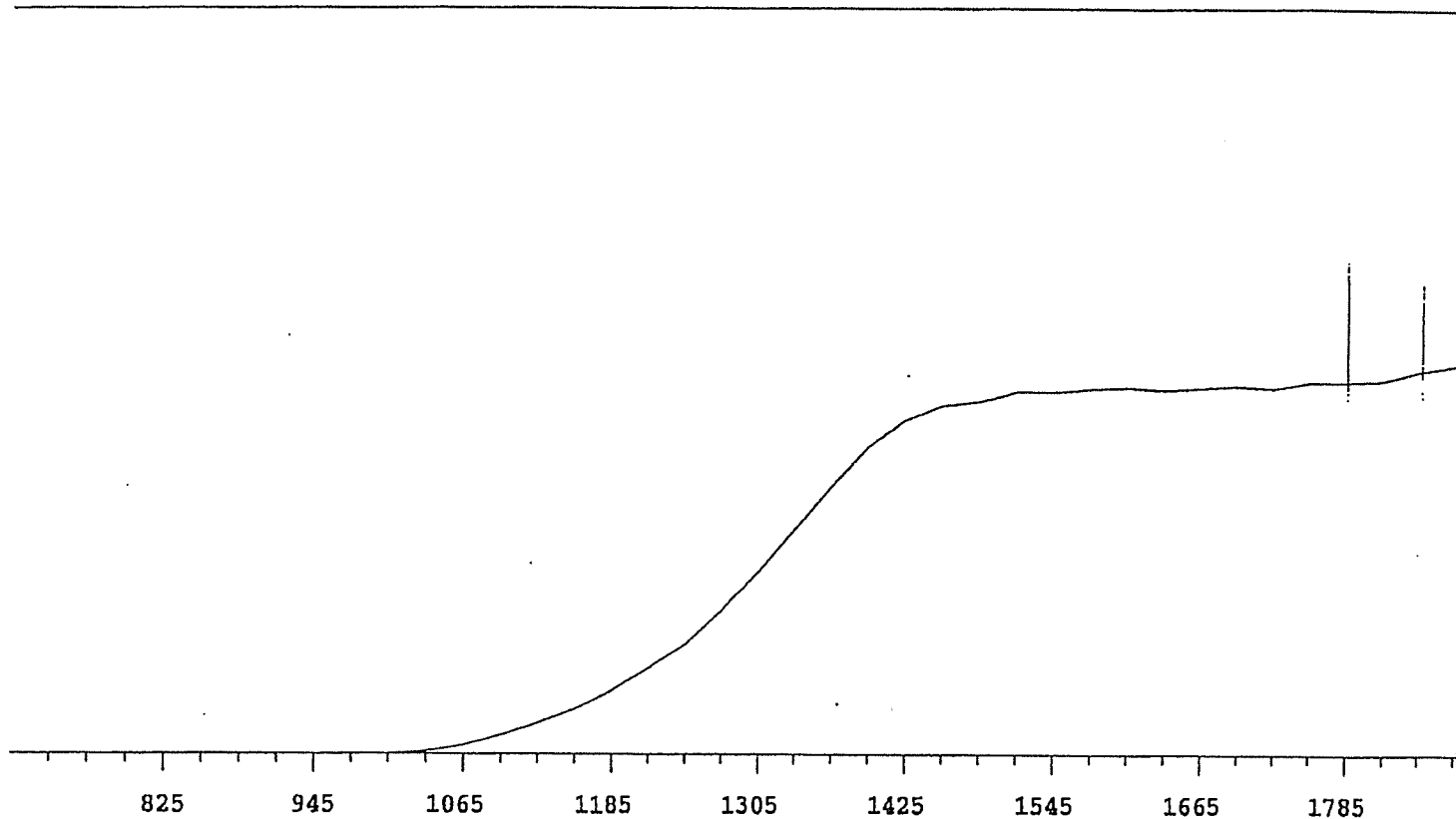
1305	18216	+67.74
1335	21995	+58.11
1365	26173	+46.11
1395	29479	+32.75
1425	32186	+20.62
1455	33022	+12.13
1485	33981	+7.22
1515	34520	+4.95
1545	35095	+2.07
1575	35014	+0.38
1605	34812	+0.55
1635	34859	+1.11
1665	35460	+1.94
1695	35273	+1.95
1725	35629	+2.73
1755	35811	+5.77
1785	36656	+6.44
1815	37896	+9.21
1845	38145	
1875	40283	

MPC 9600 Plateau Instrument 2 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



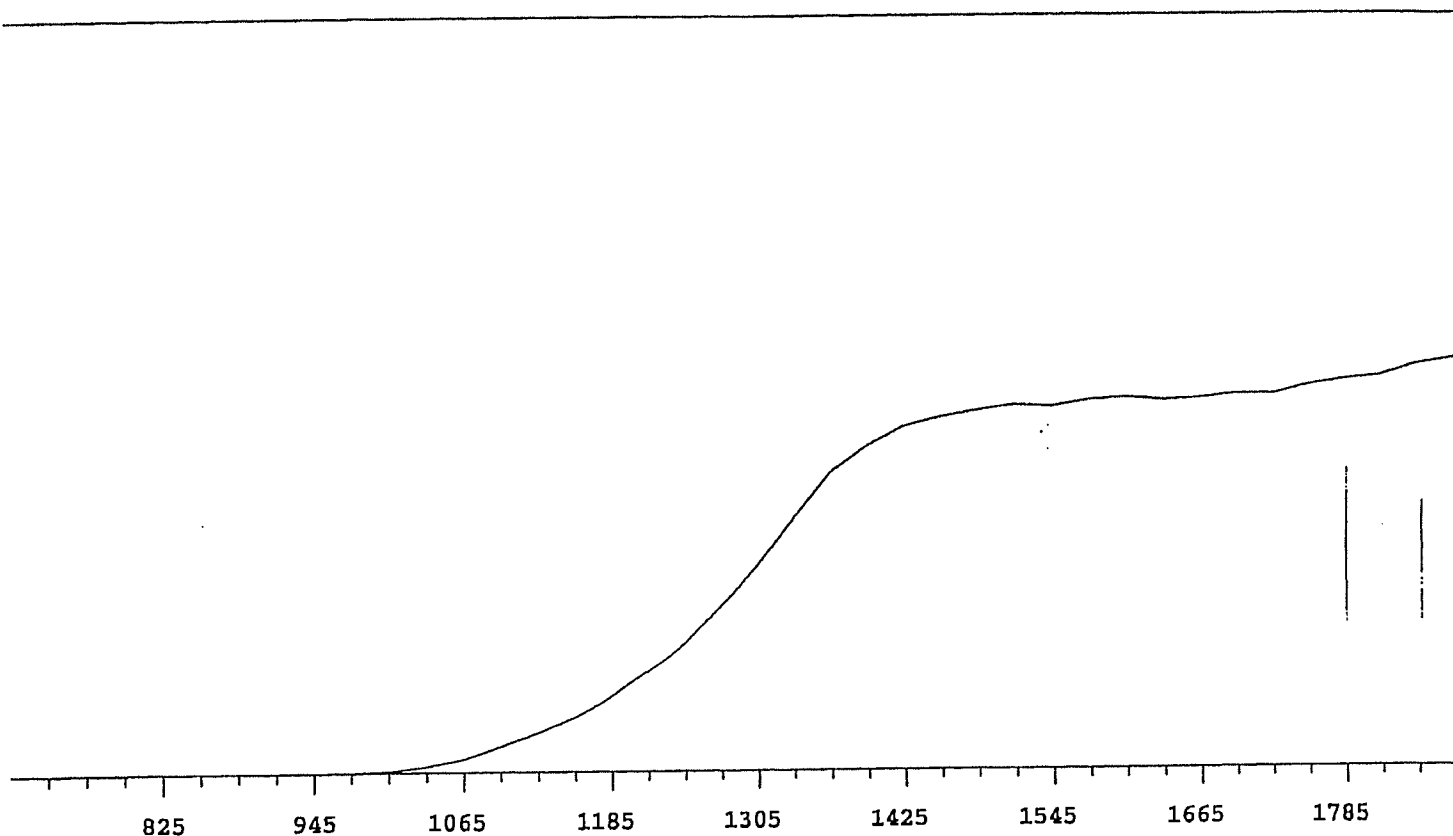
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18675	+65.94
735	0		1335	22620	+55.69
765	0	+83.33	1365	26869	+44.63
795	2	+55.56	1395	29957	+32.08
825	1	>100	1425	32494	+20.49
855	0	>100	1455	33836	+11.98
885	0	>100	1485	34627	+6.45
915	0	>100	1515	34849	+3.22
945	2	>100	1545	35298	+1.98
975	9	>100	1575	35180	+2.37
1005	89	>100	1605	35503	+1.57
1035	439	>100	1635	36006	+0.99
1065	1198	>100	1665	35722	+0.89
1095	2164	>100	1695	35597	+0.93
1125	3436	>100	1725	36188	+1.86
1155	4917	>100	1755	36272	+1.90
1185	6762	+96.59	1785	36389	+2.55
1215	9006	+89.14	1815	36529	+4.39
1245	11800	+81.34	1845	37459	
1275	15132	+73.59	1875	38170	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



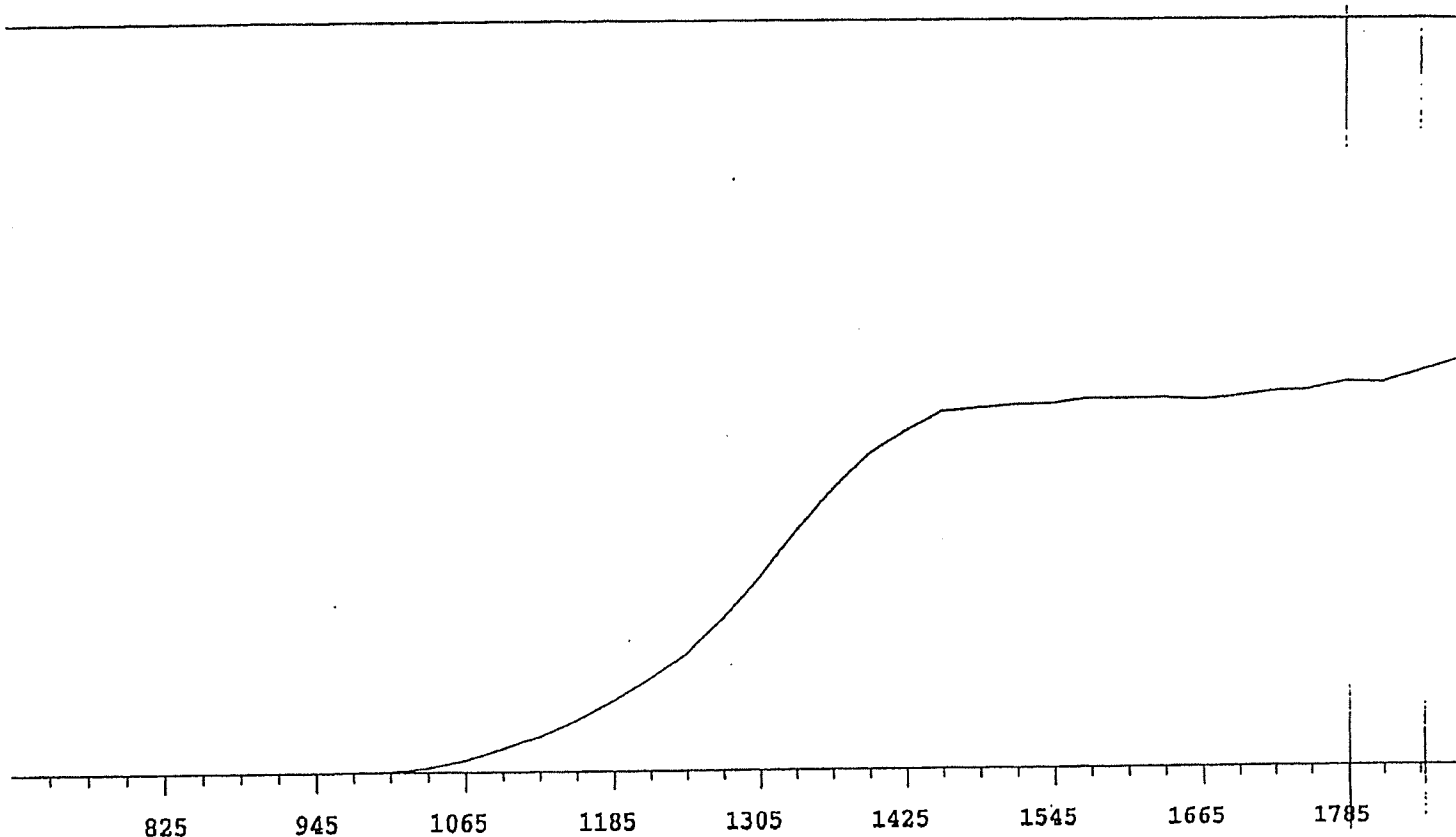
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	16654	+68.57
735	0		1335	20416	+59.26
765	0	+55.56	1365	24191	+47.28
795	1	>100	1395	27643	+34.04
825	1	+0.00	1425	29891	+21.08
855	1	>100	1455	31183	+12.30
885	0	>100	1485	31558	+6.67
915	0	>100	1515	32444	+4.05
945	0	>100	1545	32413	+2.90
975	9	>100	1575	32704	+0.81
1005	53	>100	1605	32837	+0.71
1035	302	>100	1635	32629	+0.49
1065	878	>100	1665	32797	+0.16
1095	1805	>100	1695	32964	+1.32
1125	2887	>100	1725	32746	+1.40
1155	4163	>100	1755	33308	+1.56
1185	5842	+99.81	1785	33318	+3.21
1215	7959	+90.90	1815	33456	+3.92
1245	10323	+83.03	1845	34283	
1275	13250	+75.91	1875	34815	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	19810	+64.73
735	1		1335	23962	+52.62
765	0	-55.56	1365	28091	+39.27
795	0	>100	1395	30594	+25.61
825	1	>100	1425	32381	+14.86
855	3	+33.33	1455	33206	+8.91
885	0	+0.00	1485	33832	+4.41
915	1	>100	1515	34260	+3.01
945	2	>100	1545	34071	+2.33
975	29	>100	1575	34623	+1.34
1005	165	>100	1605	34848	+1.22
1035	613	>100	1635	34564	+0.89
1065	1394	>100	1665	34733	+1.01
1095	2558	>100	1695	35144	+2.76
1125	3702	>100	1725	35084	+3.66
1155	5222	>100	1755	35839	+3.97
1185	7161	+96.06	1785	36332	+5.39
1215	9507	+89.18	1815	36654	+5.35
1245	12552	+81.52	1845	37609	
1275	16030	+73.64	1875	38164	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



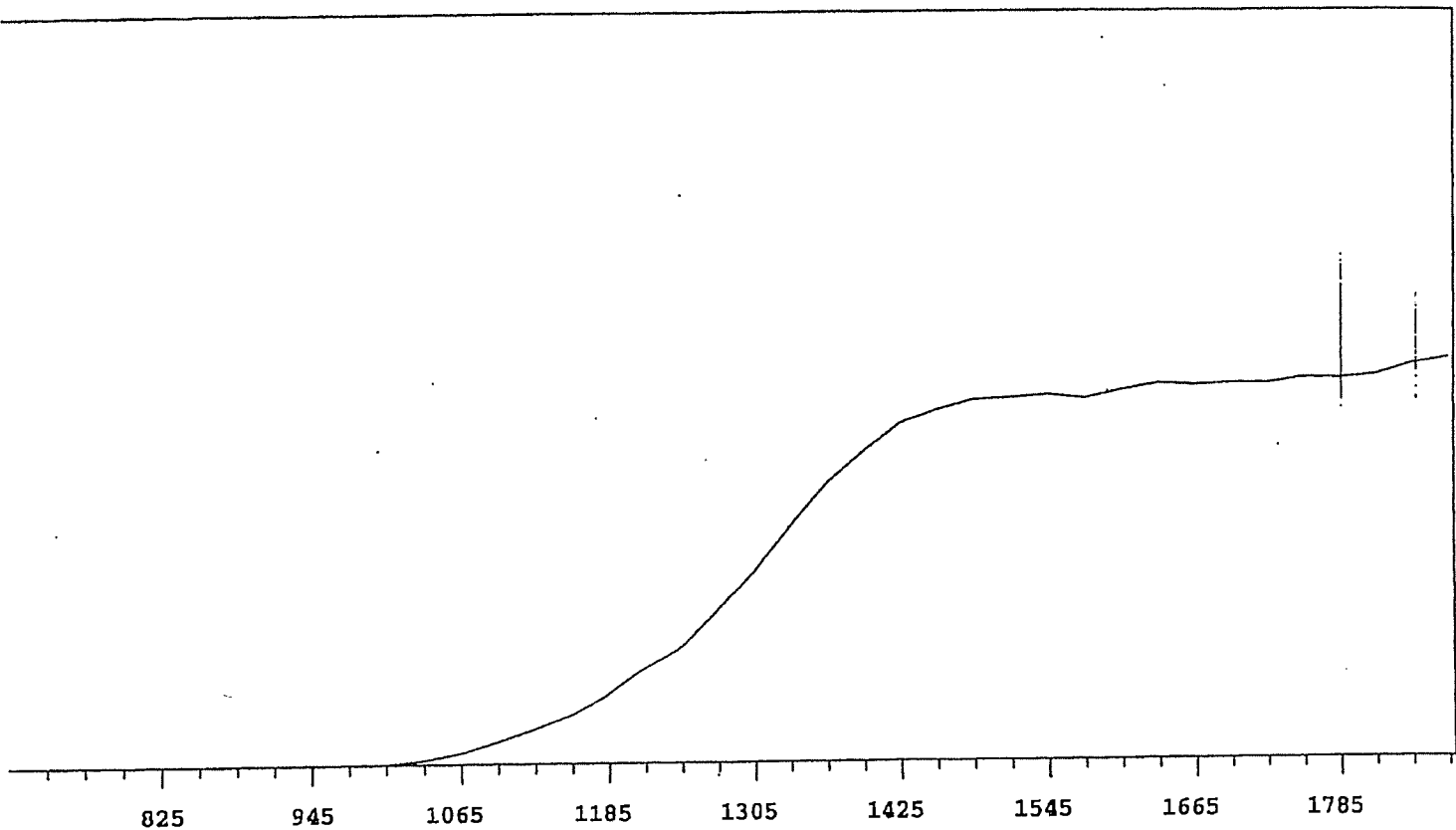
VOLTS COUNTS %/100 Volts

705	1	
735	1	
765	1	
795	0	>100
825	0	+0.00
855	0	>100
885	1	>100
915	1	>100
945	1	>100
975	17	>100
1005	122	>100
1035	533	>100
1065	1287	>100
1095	2493	>100
1125	3753	>100
1155	5482	>100
1185	7538	+99.39
1215	10305	+90.31
1245	13415	+82.57
1275	17141	+75.13

VOLTS COUNTS %/100 Volts

1305	21412	+66.80
1335	26262	+56.32
1365	30679	+43.71
1395	34466	+31.61
1425	36949	+20.14
1455	38998	+11.16
1485	39313	+5.34
1515	39625	+2.44
1545	39751	+2.04
1575	40227	+1.45
1605	40228	+0.56
1635	40255	+0.13
1665	40075	+1.22
1695	40384	+1.95
1725	40900	+3.50
1755	41028	+3.05
1785	41899	+3.71
1815	41767	+5.64
1845	42852	
1875	44132	

MPC 9600 Plateau Instrument 3 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



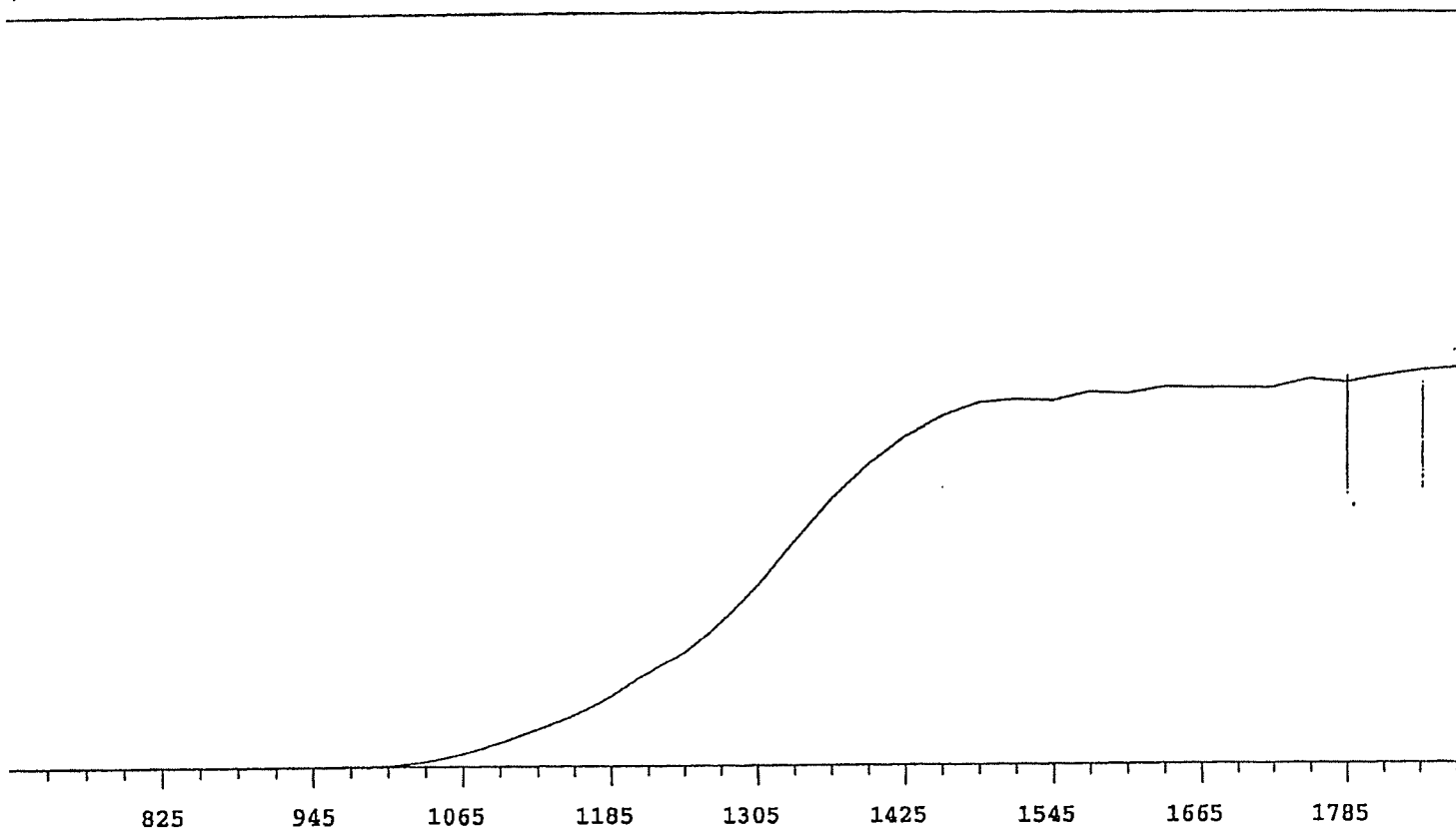
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	+0.00
795	1	>100
825	0	+83.33
855	0	-83.33
885	1	>100
915	0	>100
945	1	>100
975	12	>100
1005	51	>100
1035	298	>100
1065	848	>100
1095	1649	>100
1125	2535	>100
1155	3602	>100
1185	5036	+98.31
1215	6880	+91.37
1245	8822	+82.29
1275	11546	+74.61

VOLTS COUNTS %/100 Volts

1305	14171	+66.45
1335	17362	+54.90
1365	20310	+43.83
1395	22647	+30.82
1425	24551	+20.19
1455	25440	+11.69
1485	26124	+5.90
1515	26245	+2.21
1545	26428	+1.39
1575	26151	+2.69
1605	26721	+2.72
1635	27168	+2.80
1665	27007	+0.87
1695	27135	+0.70
1725	27089	+1.24
1755	27414	+1.43
1785	27373	+3.21
1815	27581	+4.34
1845	28332	
1875	28750	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



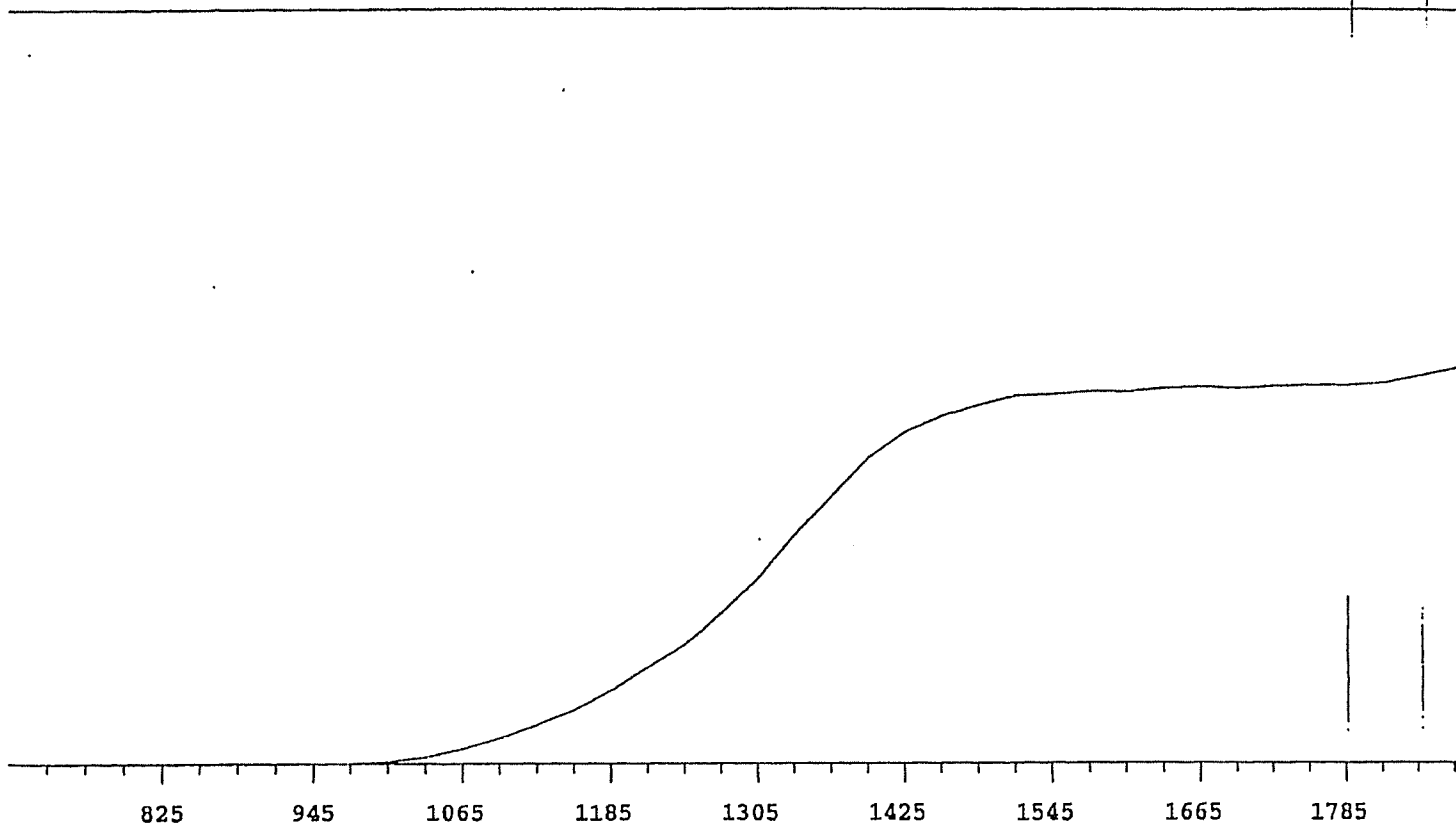
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	2	+55.56
855	1	>100
885	0	-55.56
915	3	>100
945	0	>100
975	16	>100
1005	114	>100
1035	451	>100
1065	1100	>100
1095	2068	>100
1125	3189	>100
1155	4386	>100
1185	6094	+94.81
1215	8184	+87.09
1245	10489	+78.88
1275	13273	+72.66

VOLTS COUNTS %/100 Volts

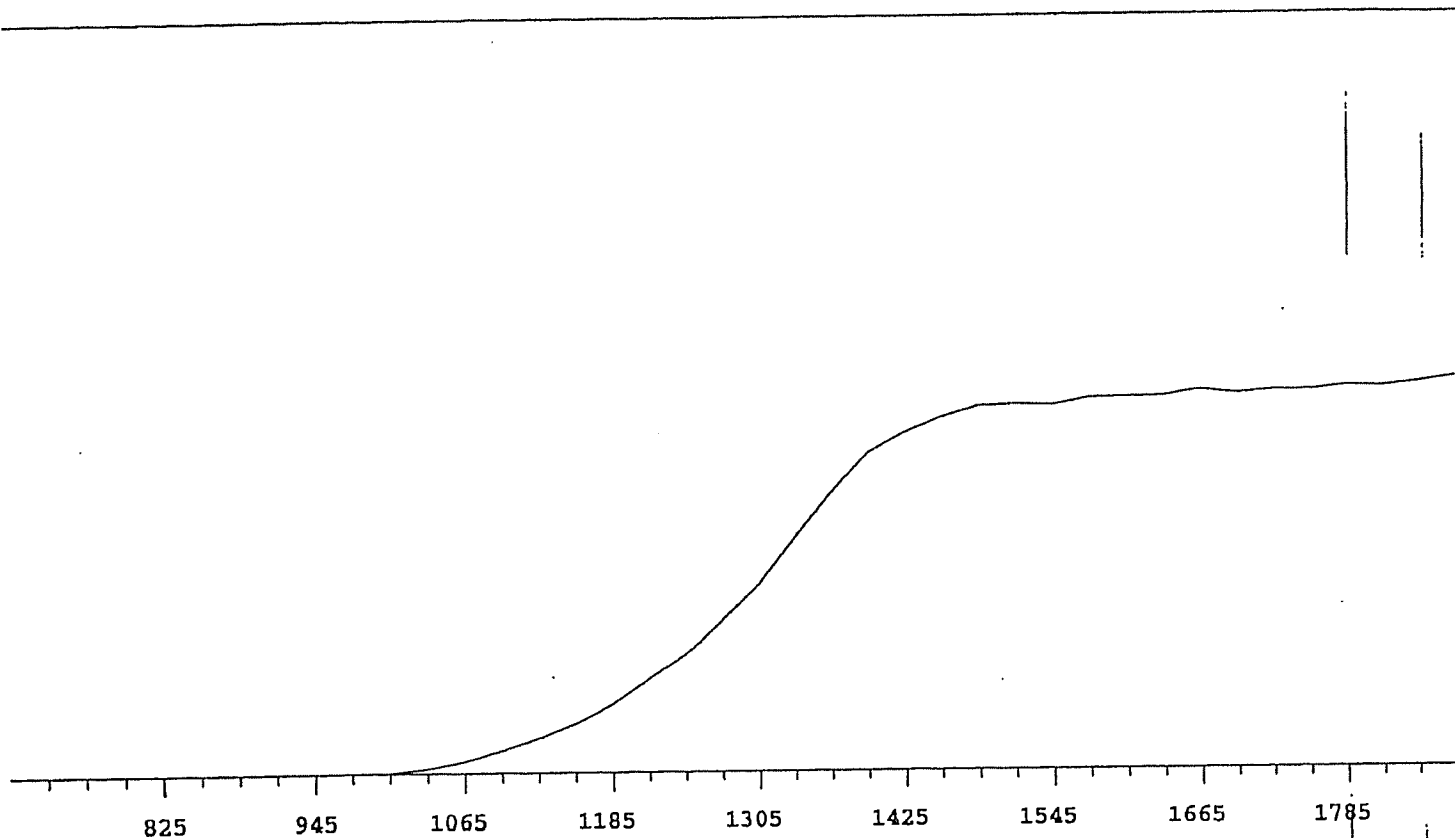
1305	16442	+66.24
1335	20146	+57.40
1365	23769	+46.40
1395	26926	+34.68
1425	29276	+24.40
1455	31037	+15.28
1485	32197	+7.91
1515	32425	+4.33
1545	32314	+2.14
1575	33071	+2.66
1605	32918	+2.52
1635	33435	+1.02
1665	33382	+0.73
1695	33349	+1.07
1725	33324	+1.28
1755	34001	+2.26
1785	33701	+3.08
1815	34304	+2.97
1845	34744	
1875	35012	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



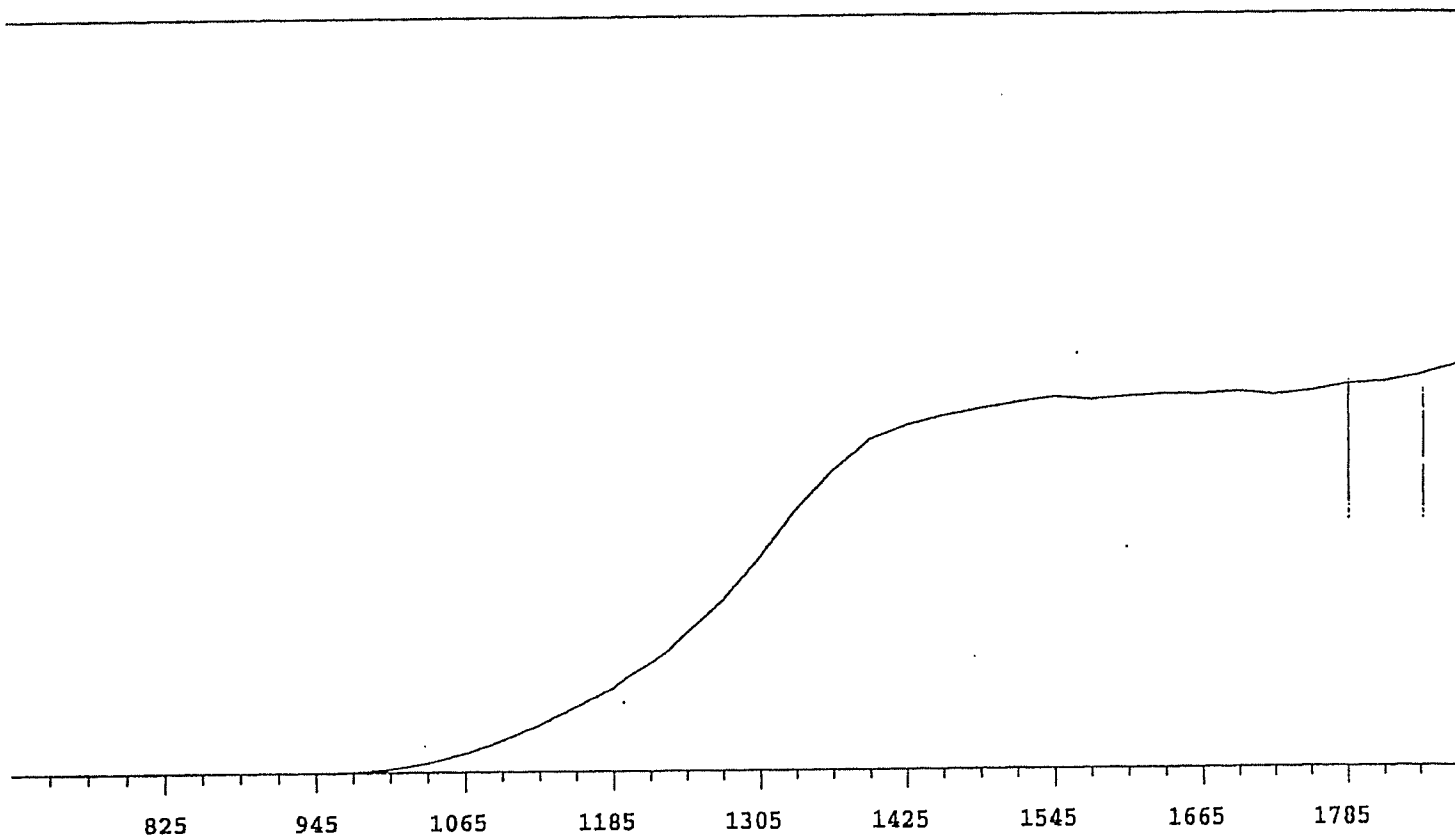
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15747	+62.38
735	1		1335	19230	+54.19
765	0	+0.00	1365	22255	+44.46
795	1	>100	1395	25299	+32.45
825	0	>100	1425	27370	+22.24
855	0	>100	1455	28625	+14.10
885	0	>100	1485	29467	+8.56
915	0	>100	1515	30213	+5.29
945	2	>100	1545	30326	+2.77
975	31	>100	1575	30564	+1.57
1005	176	>100	1605	30548	+1.52
1035	550	>100	1635	30820	+0.85
1065	1218	>100	1665	30898	+0.79
1095	2114	>100	1695	30779	+0.44
1125	3212	>100	1725	30934	+0.45
1155	4416	>100	1755	31008	+0.96
1185	6066	+92.28	1785	30991	+2.01
1215	7936	+85.60	1815	31196	+3.80
1245	10288	+76.79	1845	31781	
1275	13020	+70.59	1875	32406	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19796	+65.77
735	1		1335	24338	+57.55
765	0	+55.56	1365	28686	+45.86
795	2	+0.00	1395	32750	+32.27
825	0	-55.56	1425	34919	+20.83
855	1	>100	1455	36434	+11.45
885	0	>100	1485	37487	+5.80
915	0	>100	1515	37623	+3.32
945	2	>100	1545	37528	+2.07
975	24	>100	1575	38277	+2.12
1005	134	>100	1605	38338	+2.70
1035	558	>100	1635	38426	+1.12
1065	1361	>100	1665	39007	+1.06
1095	2511	>100	1695	38592	+0.64
1125	3762	>100	1725	38870	+0.63
1155	5246	>100	1755	38868	+1.30
1185	7268	+96.29	1785	39238	+1.45
1215	9733	+88.98	1815	39169	+2.34
1245	12701	+79.94	1845	39570	
1275	16176	+73.13	1875	40086	

MPC 9600 Plateau Instrument 4 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	+0.00
795	0	>100
825	1	+83.33
855	1	+55.56
885	0	+0.00
915	1	>100
945	1	>100
975	60	>100
1005	297	>100
1035	855	>100
1065	1647	>100
1095	2700	>100
1125	3921	>100
1155	5471	+96.54
1185	7042	+90.21
1215	9405	+82.23
1245	12266	+76.33
1275	14989	+69.38

VOLTS COUNTS %/100 Volts

1305	18491	+61.09
1335	22444	+51.56
1365	25756	+37.44
1395	28379	+23.82
1425	29517	+14.00
1455	30309	+8.08
1485	30874	+6.03
1515	31345	+3.66
1545	31782	+2.17
1575	31567	+1.31
1605	31789	+0.78
1635	31963	+1.34
1665	31956	+0.29
1695	32123	+0.20
1725	31850	+1.46
1755	32114	+2.39
1785	32665	+3.95
1815	32876	+4.96
1845	33399	
1875	34206	

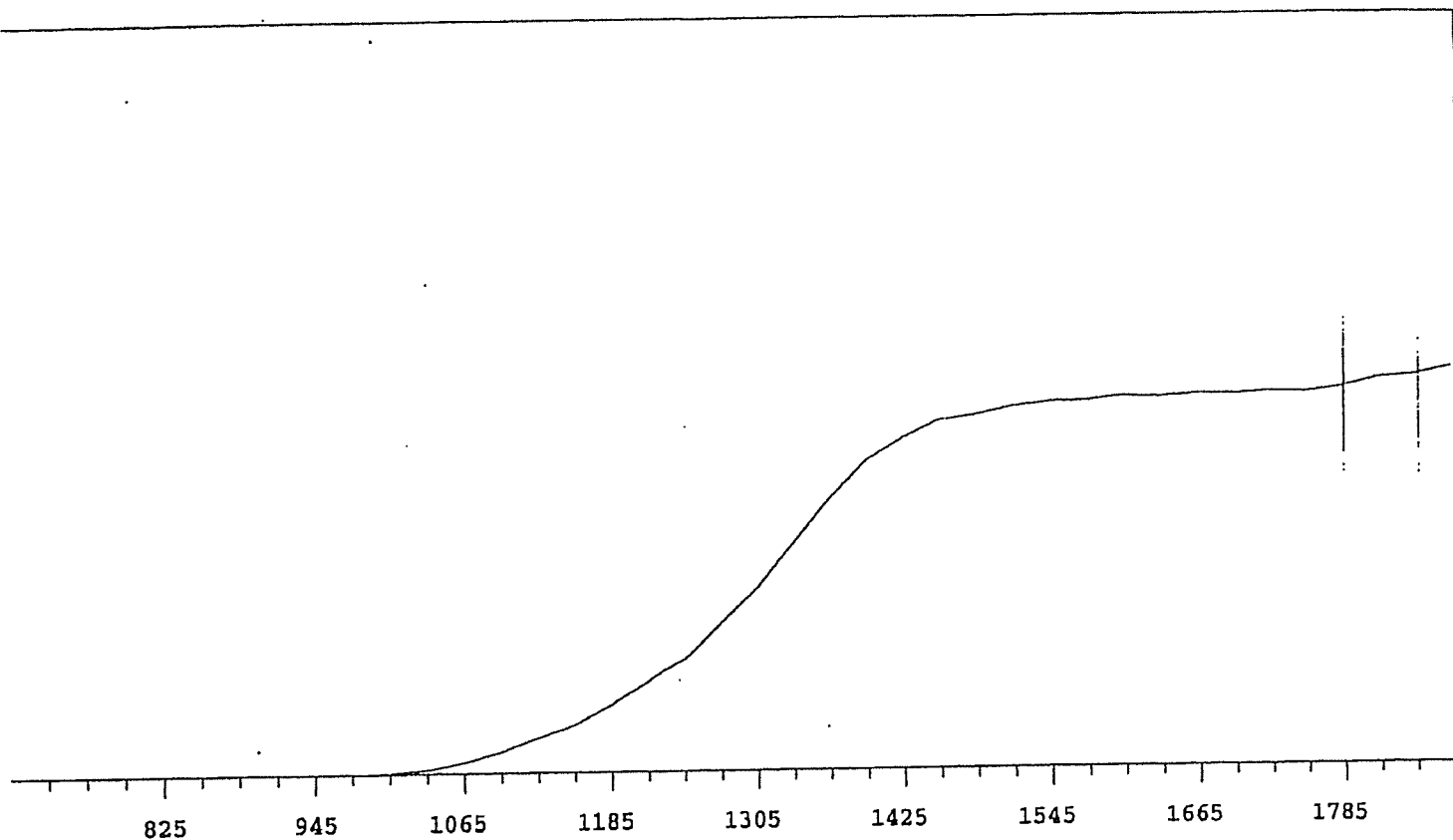
MPC 9600 Plateau

Instrument 5 MPC 9604 Detector A

7/1/2009

Alpha Volts: 705

Beta Volts: 1575

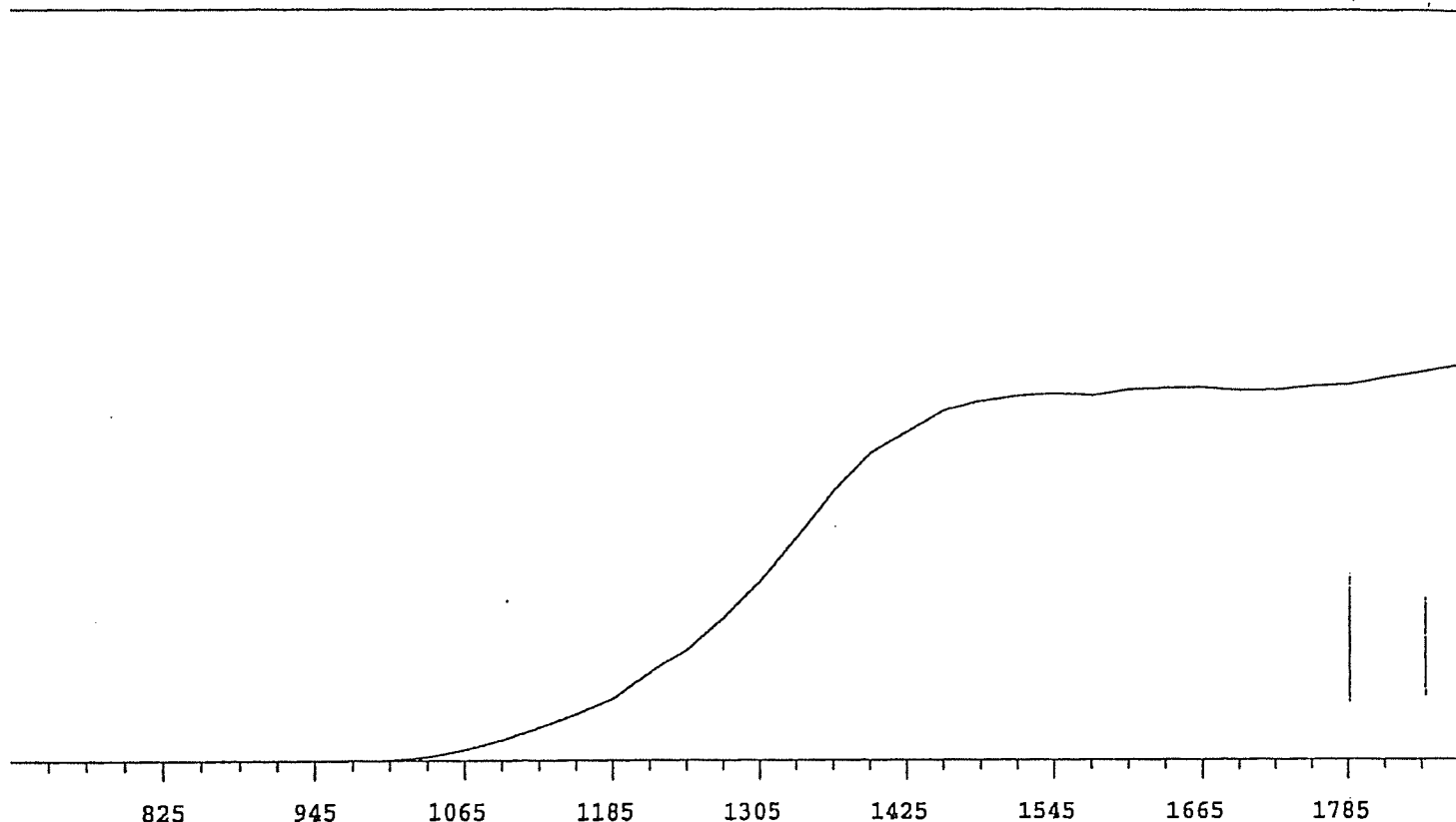


VOLTS COUNTS %/100 Volts

VOLTS COUNTS %/100 Volts

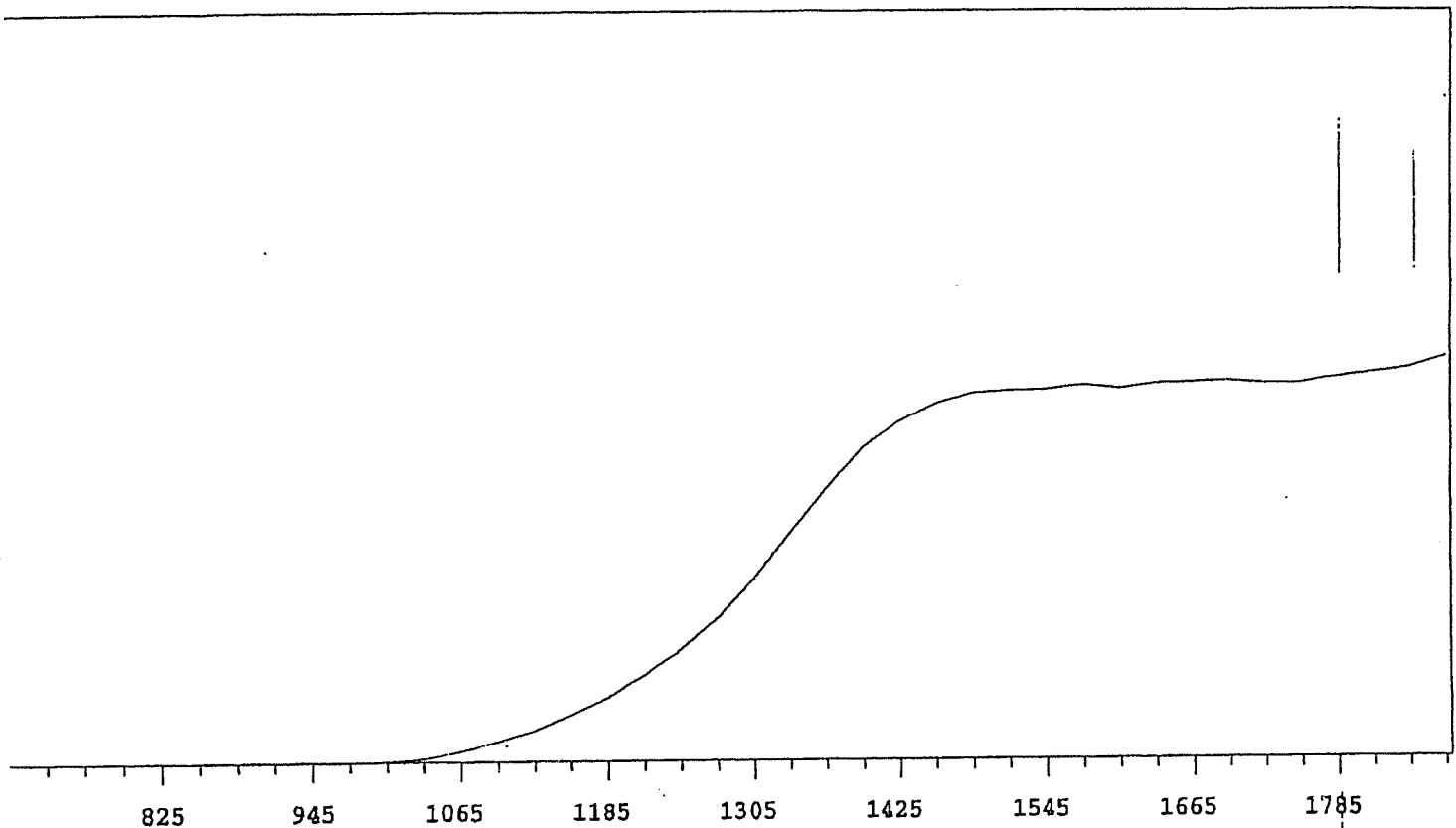
705	0		1305	13974	+68.00
735	0		1335	17170	+58.62
765	1		1365	20456	+47.04
795	1	+83.33	1395	23332	+33.83
825	1	-83.33	1425	24996	+21.10
855	1	>100	1455	26290	+12.40
885	0	-55.56	1485	26683	+7.74
915	0	>100	1515	27270	+4.43
945	1	>100	1545	27590	+3.48
975	9	>100	1575	27635	+1.71
1005	76	>100	1605	27932	+1.20
1035	308	>100	1635	27807	+0.88
1065	814	>100	1665	28006	+0.62
1095	1600	>100	1695	27964	+0.63
1125	2598	>100	1725	28112	+0.98
1155	3596	>100	1755	28020	+2.84
1185	5065	+96.05	1785	28392	+3.76
1215	6773	+90.23	1815	29028	+5.17
1245	8717	+81.43	1845	29220	
1275	11391	+74.83	1875	29849	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



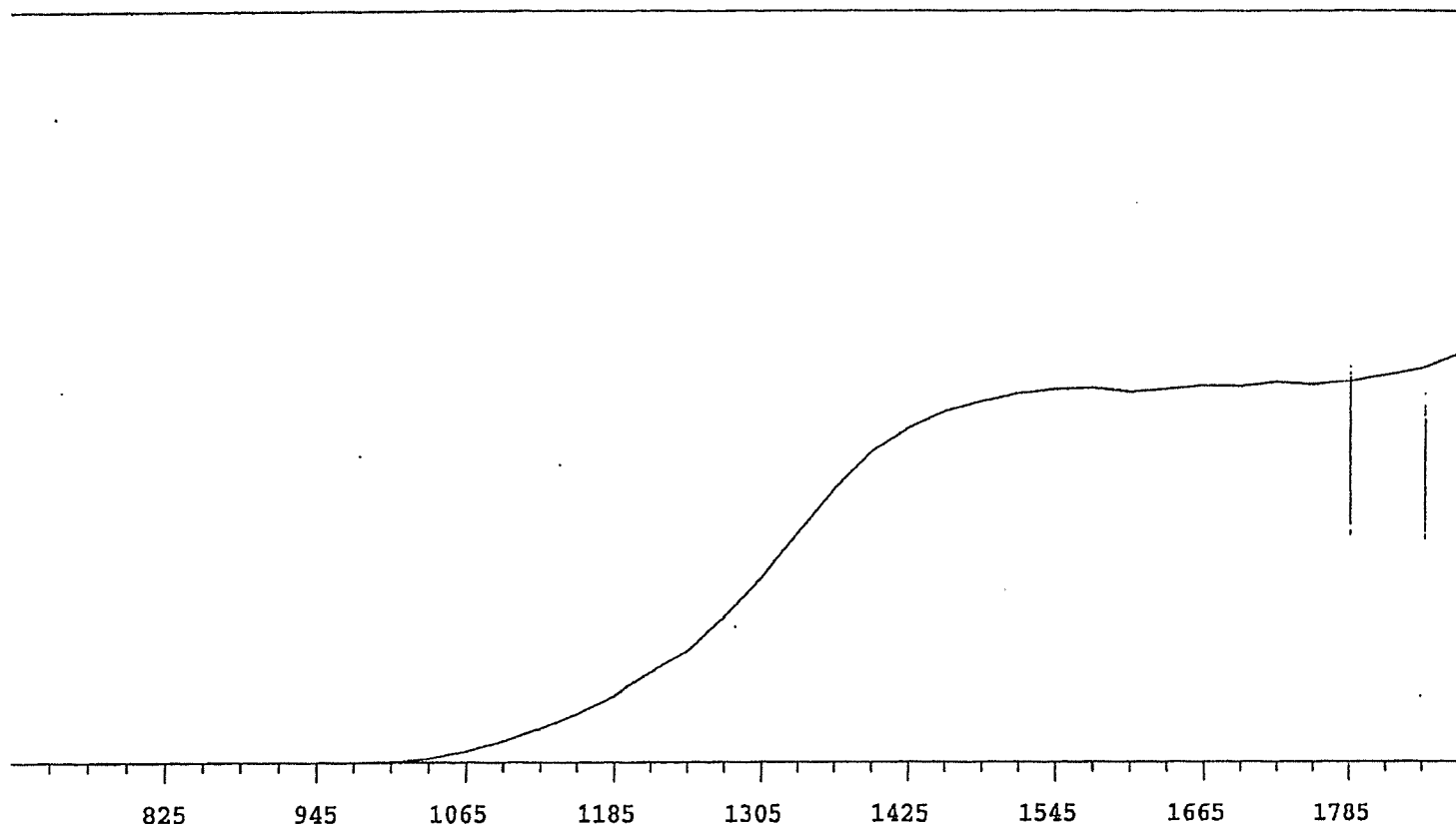
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17414	+68.46
735	0		1335	21540	+59.98
765	0		1365	25854	+46.75
795	0	>100	1395	29222	+33.38
825	1	>100	1425	31128	+21.52
855	1	+41.67	1455	32995	+13.26
885	2	-33.33	1485	33846	+8.09
915	0	>100	1515	34289	+3.25
945	1	>100	1545	34528	+2.00
975	17	>100	1575	34311	+1.78
1005	87	>100	1605	34866	+1.78
1035	336	>100	1635	35046	+1.14
1065	1010	>100	1665	35087	-0.26
1095	1955	>100	1695	34795	+0.11
1125	3124	>100	1725	34857	+0.93
1155	4486	>100	1755	35220	+2.81
1185	6017	>100	1785	35363	+3.98
1215	8507	+91.20	1815	36028	+4.79
1245	11148	+82.59	1845	36577	
1275	14003	+74.21	1875	37207	

MPC 9600 Plateau Instrument 5 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17085	+68.24
735	0		1335	21135	+59.99
765	0		1365	25066	+47.39
795	0	>100	1395	28530	+33.93
825	0	>100	1425	30823	+22.30
855	1	>100	1455	32287	+12.93
885	0	>100	1485	33217	+6.71
915	1	>100	1515	33474	+3.57
945	2	>100	1545	33517	+1.17
975	7	>100	1575	33921	+1.13
1005	56	>100	1605	33584	+1.27
1035	305	>100	1635	34014	+1.12
1065	982	>100	1665	34116	+0.98
1095	1874	>100	1695	34225	-0.22
1125	2890	>100	1725	33980	+0.58
1155	4260	>100	1755	33971	+1.96
1185	6001	>100	1785	34541	+3.64
1215	8050	+91.54	1815	34954	+5.38
1245	10895	+82.98	1845	35375	
1275	13556	+76.26	1875	36384	

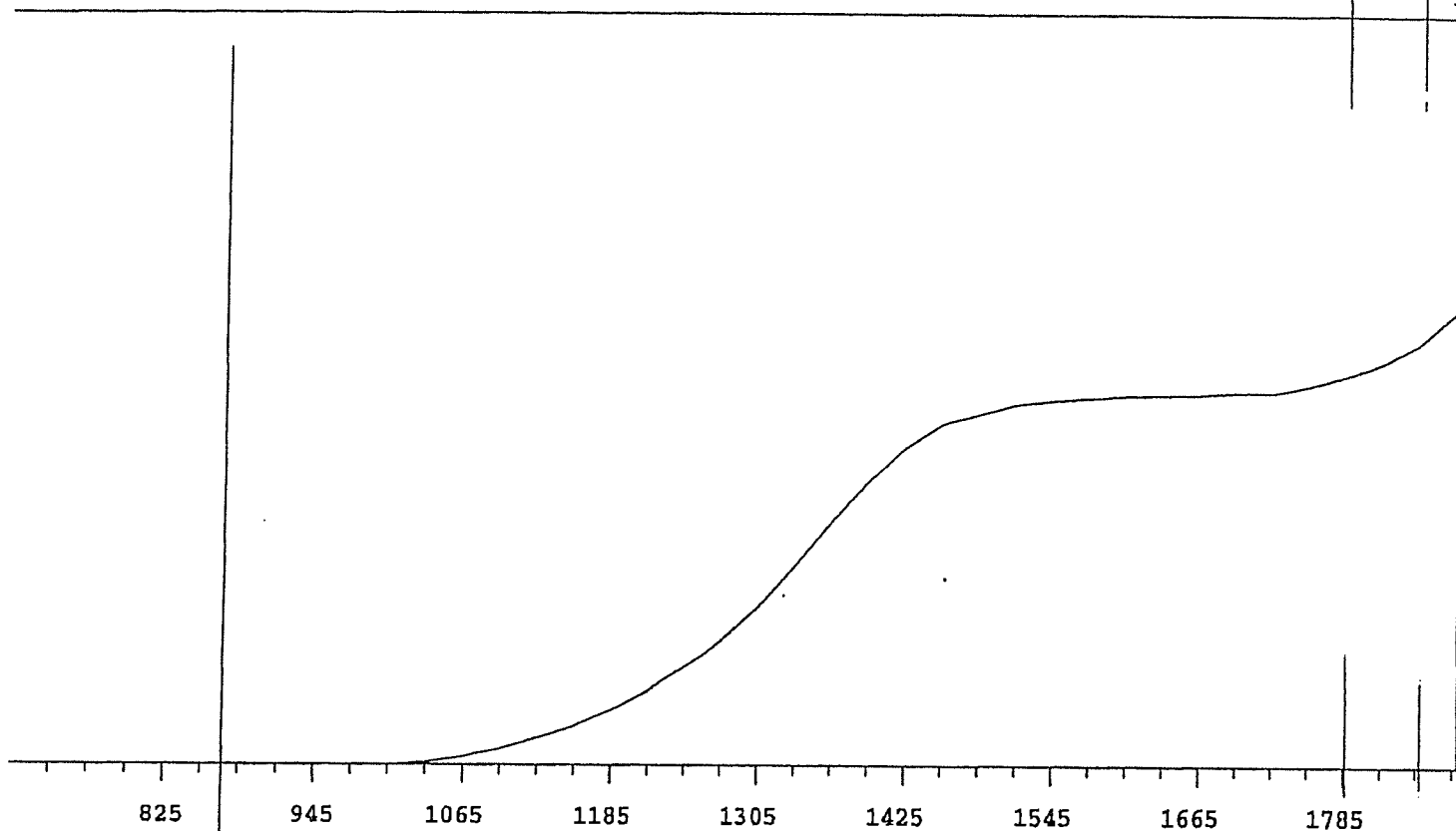
MPC 9600 Plateau Instrument 5 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15025	+68.87
735	0		1335	18640	+58.97
765	0		1365	22048	+45.84
795	0	>100	1395	24877	+32.08
825	0	>100	1425	26653	+20.83
855	0	>100	1455	27899	+13.08
885	0	>100	1485	28670	+8.43
915	0	>100	1515	29257	+5.13
945	0	>100	1545	29568	+2.06
975	6	>100	1575	29683	+0.52
1005	81	>100	1605	29362	+0.57
1035	318	>100	1635	29589	+0.80
1065	897	>100	1665	29870	+1.82
1095	1710	>100	1695	29783	+0.90
1125	2714	>100	1725	30077	+0.75
1155	3925	>100	1755	29889	+2.02
1185	5395	+97.31	1785	30152	+3.33
1215	7282	+88.49	1815	30656	+6.54
1245	9426	+81.36	1845	31211	
1275	12007	+75.65	1875	32389	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector A 7/1/2009

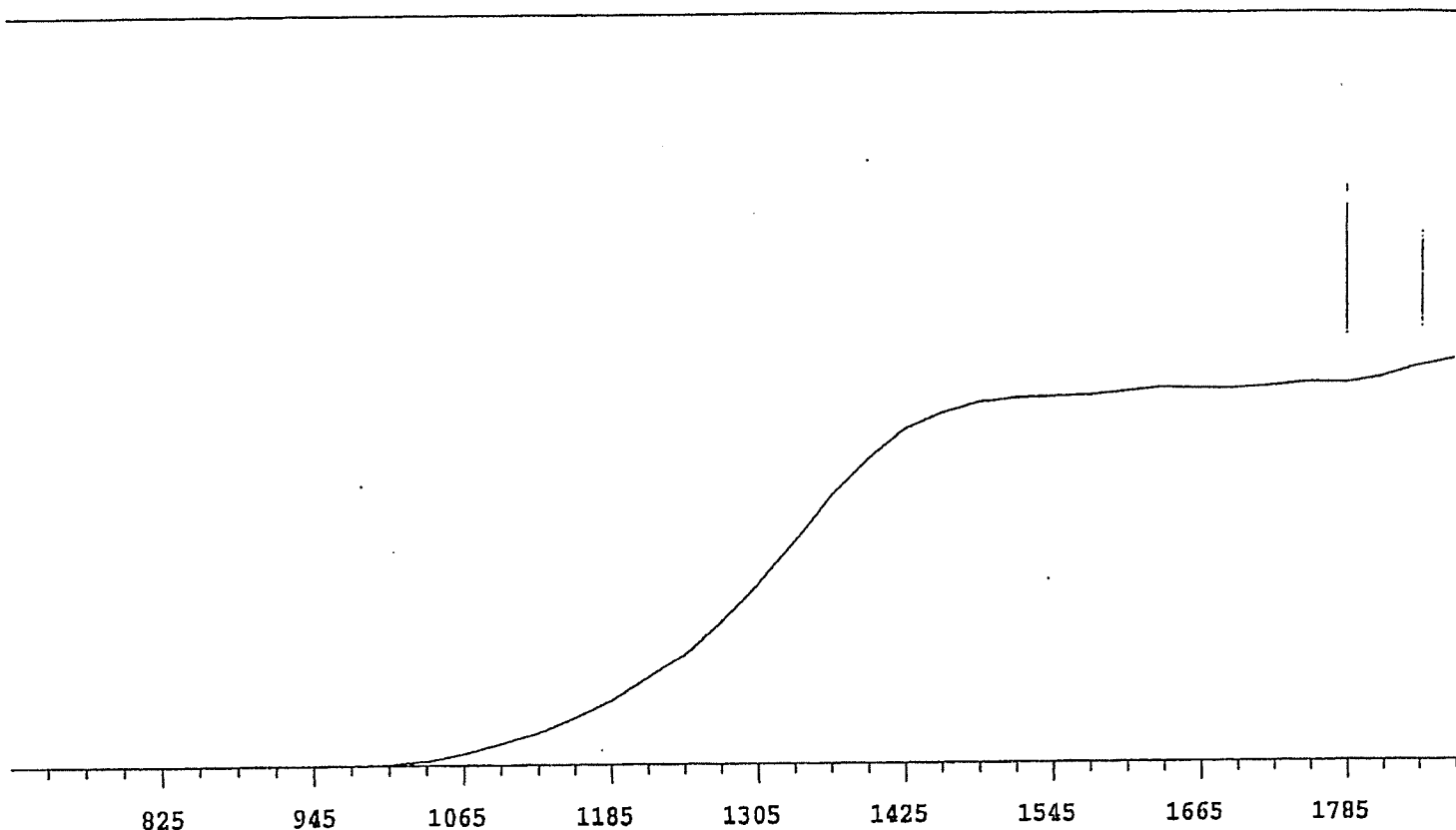
Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	7	>100
1005	31	>100
1035	238	>100
1065	810	>100
1095	1637	>100
1125	2743	>100
1155	3932	>100
1185	5579	>100
1215	7602	+94.41
1245	10078	+84.86
1275	13091	+77.67

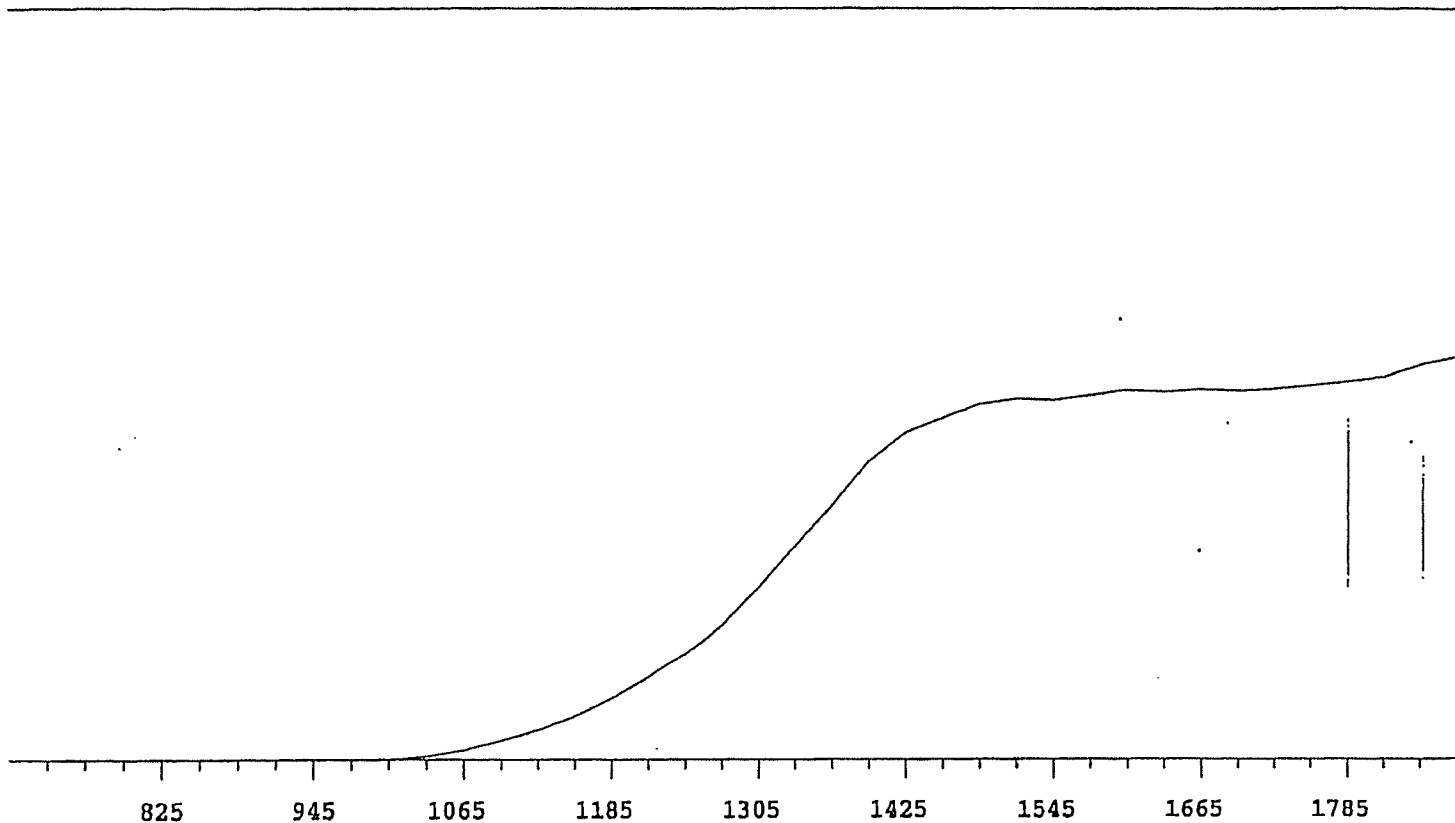
VOLTS	COUNTS	%/100 Volts
1305	16217	+71.57
1335	20184	+63.76
1365	24605	+53.98
1395	28528	+41.40
1425	31675	+28.02
1455	33899	+17.93
1485	34826	+10.65
1515	35815	+6.13
1545	36225	+4.15
1575	36456	+2.28
1605	36747	+1.47
1635	36801	+1.26
1665	36859	+0.85
1695	37095	+1.85
1725	37072	+4.01
1755	37724	+6.65
1785	38802	+10.33
1815	40036	+14.71
1845	41975	
1875	45123	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



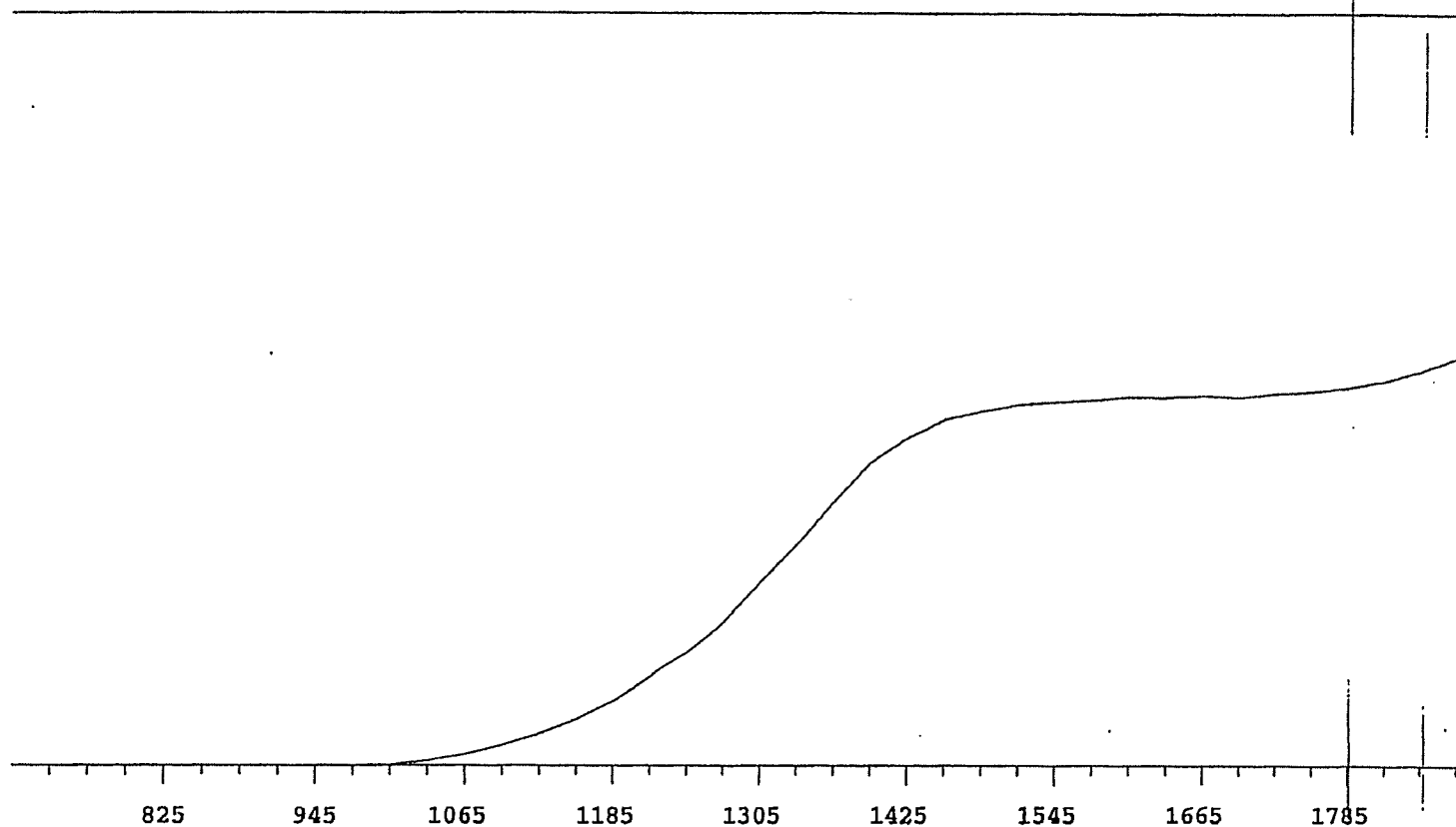
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	20094	+68.67
735	0		1335	24665	+59.40
765	0		1365	29591	+47.86
795	0	>100	1395	33376	+34.51
825	1	+83.33	1425	36440	+22.50
855	1	-83.33	1455	38024	+13.58
885	0	>100	1485	39187	+7.04
915	0	>100	1515	39608	+3.63
945	5	>100	1545	39722	+2.10
975	18	>100	1575	39894	+2.32
1005	125	>100	1605	40298	+2.09
1035	482	>100	1635	40711	+1.41
1065	1255	>100	1665	40574	+0.80
1095	2318	>100	1695	40608	+1.02
1125	3540	>100	1725	40839	+1.28
1155	5288	>100	1755	41201	+1.97
1185	7168	+98.51	1785	41065	+3.74
1215	9760	+88.48	1815	41711	+5.42
1245	12656	+81.52	1845	42917	
1275	16065	+74.58	1875	43699	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17350	+67.80
735	0		1335	21371	+60.27
765	1	+0.00	1365	25084	+49.32
795	0	>100	1395	29177	+36.15
825	0	+0.00	1425	31927	+24.86
855	0	>100	1455	33217	+14.70
885	1	>100	1485	34545	+7.74
915	1	>100	1515	35097	+4.64
945	2	>100	1545	34927	+2.96
975	8	>100	1575	35439	+2.21
1005	70	>100	1605	35939	+2.41
1035	353	>100	1635	35763	+0.94
1065	990	>100	1665	36053	+0.35
1095	1956	>100	1695	35886	+1.15
1125	3024	>100	1725	36066	+1.77
1155	4400	>100	1755	36379	+3.03
1185	6173	+99.75	1785	36768	+4.80
1215	8230	+89.85	1815	37193	+6.14
1245	10904	+82.36	1845	38320	
1275	13747	+76.18	1875	39061	

MPC 9600 Plateau Instrument 6 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



.VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	17954	+65.82
735	0		1335	21482	+57.64
765	0		1365	25373	+45.78
795	1	+0.00	1395	29042	+34.80
825	0	>100	1425	31373	+23.29
855	0	+0.00	1455	33143	+14.25
885	0	>100	1485	34006	+8.49
915	1	>100	1515	34662	+4.71
945	0	>100	1545	34892	+3.14
975	14	>100	1575	35129	+1.86
1005	109	>100	1605	35411	+1.49
1035	481	>100	1635	35380	+0.62
1065	1177	>100	1665	35554	+0.65
1095	2133	>100	1695	35385	+1.18
1125	3243	>100	1725	35755	+1.89
1155	4554	>100	1755	35907	+3.26
1185	6285	+98.38	1785	36305	+4.62
1215	8468	+89.75	1815	36870	+6.98
1245	11266	+83.13	1845	37807	
1275	14088	+74.43	1875	39047	

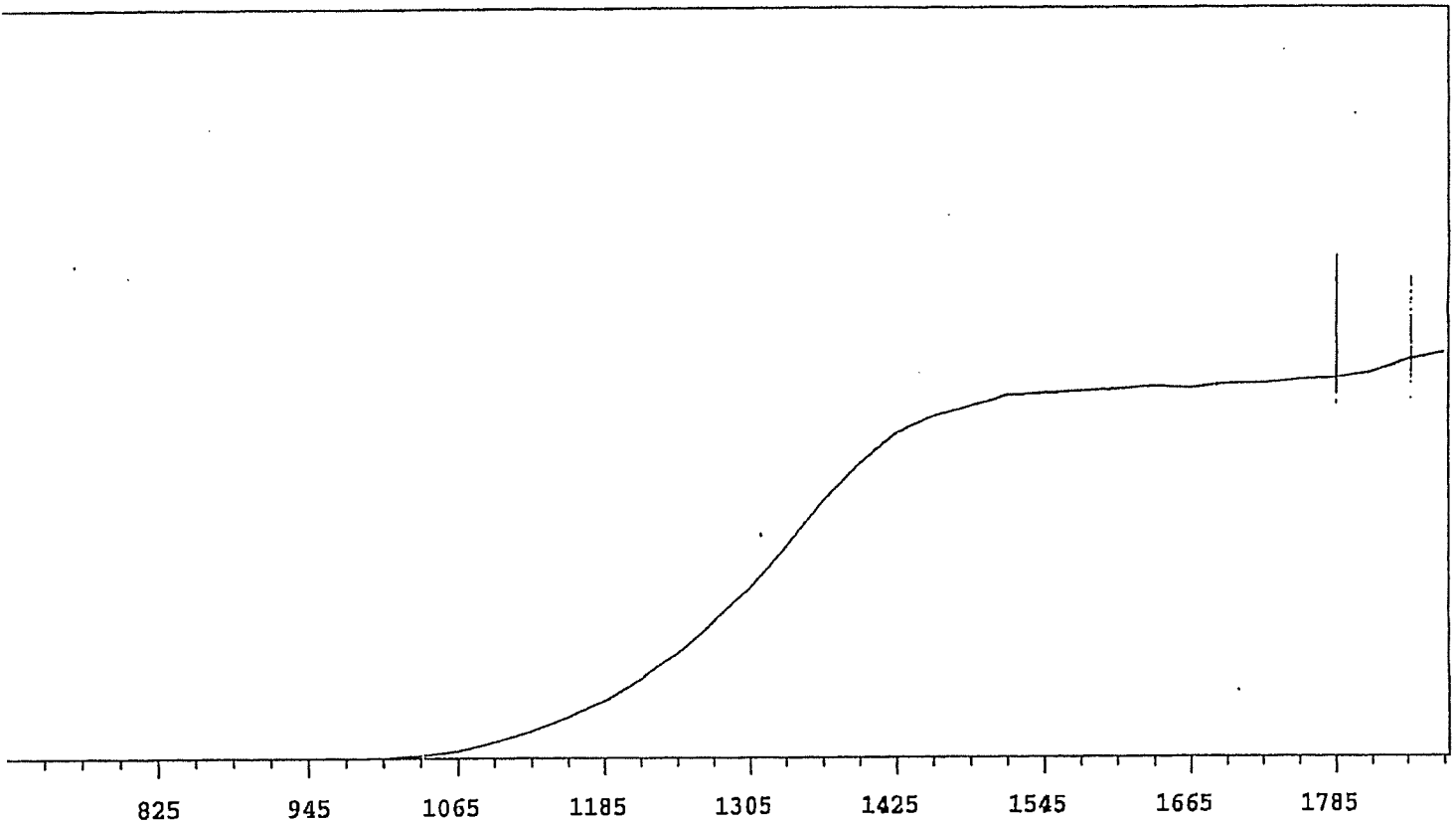
MPC 9600 Plateau

Instrument 7 MPC 9604 Detector A

7/1/2009

Alpha Volts: 705

Beta Volts: 1575



VOLTS COUNTS %/100 Volts

VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	1	+83.33
855	1	-83.33
885	0	-55.56
915	0	>100
945	1	>100
975	3	>100
1005	42	>100
1035	242	>100
1065	613	>100
1095	1353	>100
1125	2213	>100
1155	3256	>100
1185	4474	>100
1215	5932	+94.10
1245	8072	+87.32
1275	10579	+79.61

1305	13228	+70.36
1335	16271	+60.12
1365	19506	+49.19
1395	22188	+36.46
1425	24373	+24.43
1455	25649	+15.99
1485	26433	+9.58
1515	27195	+5.74
1545	27367	+3.24
1575	27490	+1.86
1605	27608	+1.22
1635	27841	+1.33
1665	27695	+1.11
1695	27999	+1.42
1725	27992	+2.04
1755	28289	+2.52
1785	28408	+4.56
1815	28863	+5.70
1845	29664	
1875	30148	

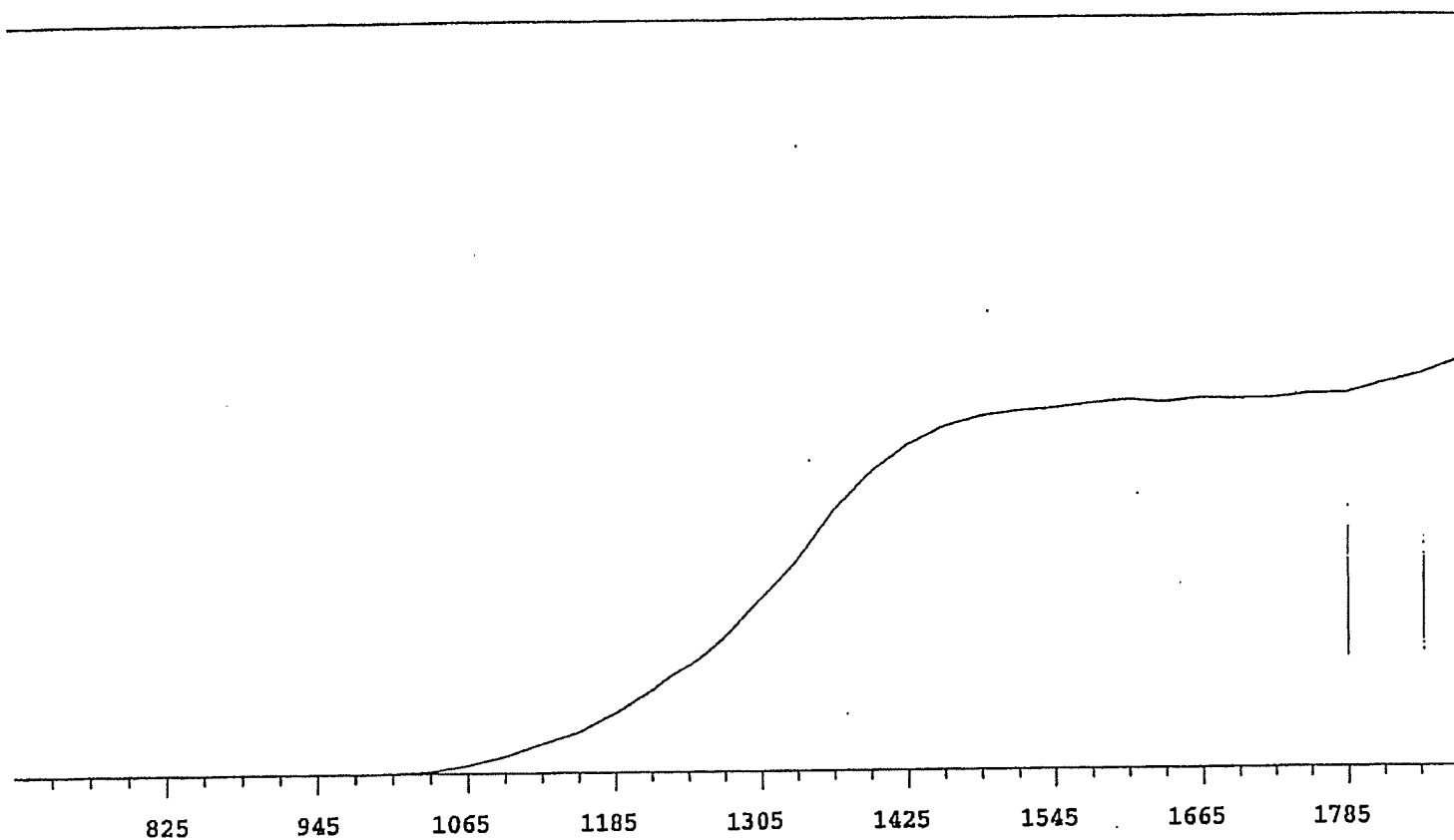
MPC 9600 Plateau

Instrument 7 MPC 9604 Detector B

7/1/2009

Alpha Volts: 705

Beta Volts: 1575



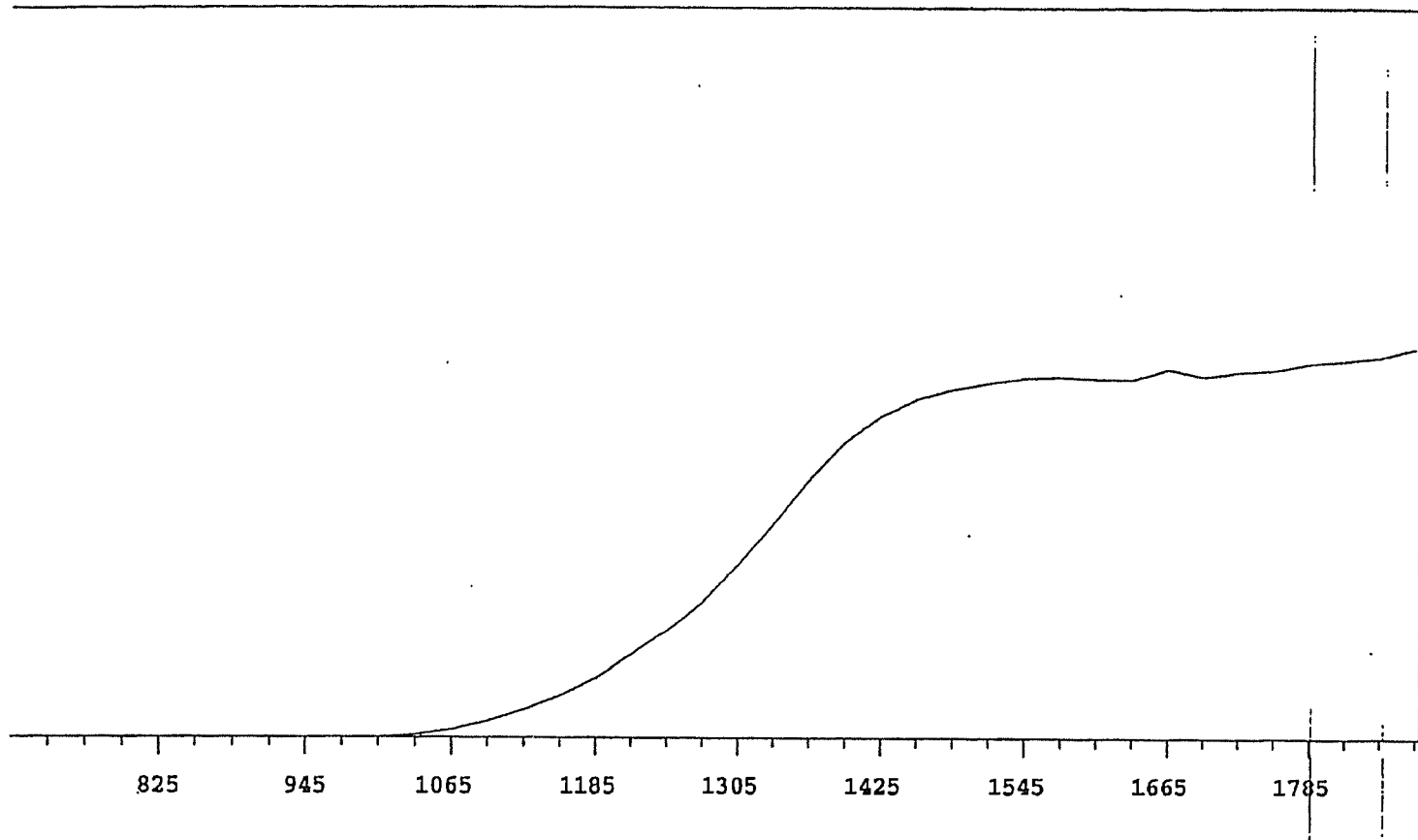
VOLTS COUNTS %/100 Volts

VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	1	>100
975	3	>100
1005	34	>100
1035	221	>100
1065	825	>100
1095	1709	>100
1125	2873	>100
1155	4078	>100
1185	5858	>100
1215	7809	+91.82
1245	10336	+85.02
1275	13215	+77.79

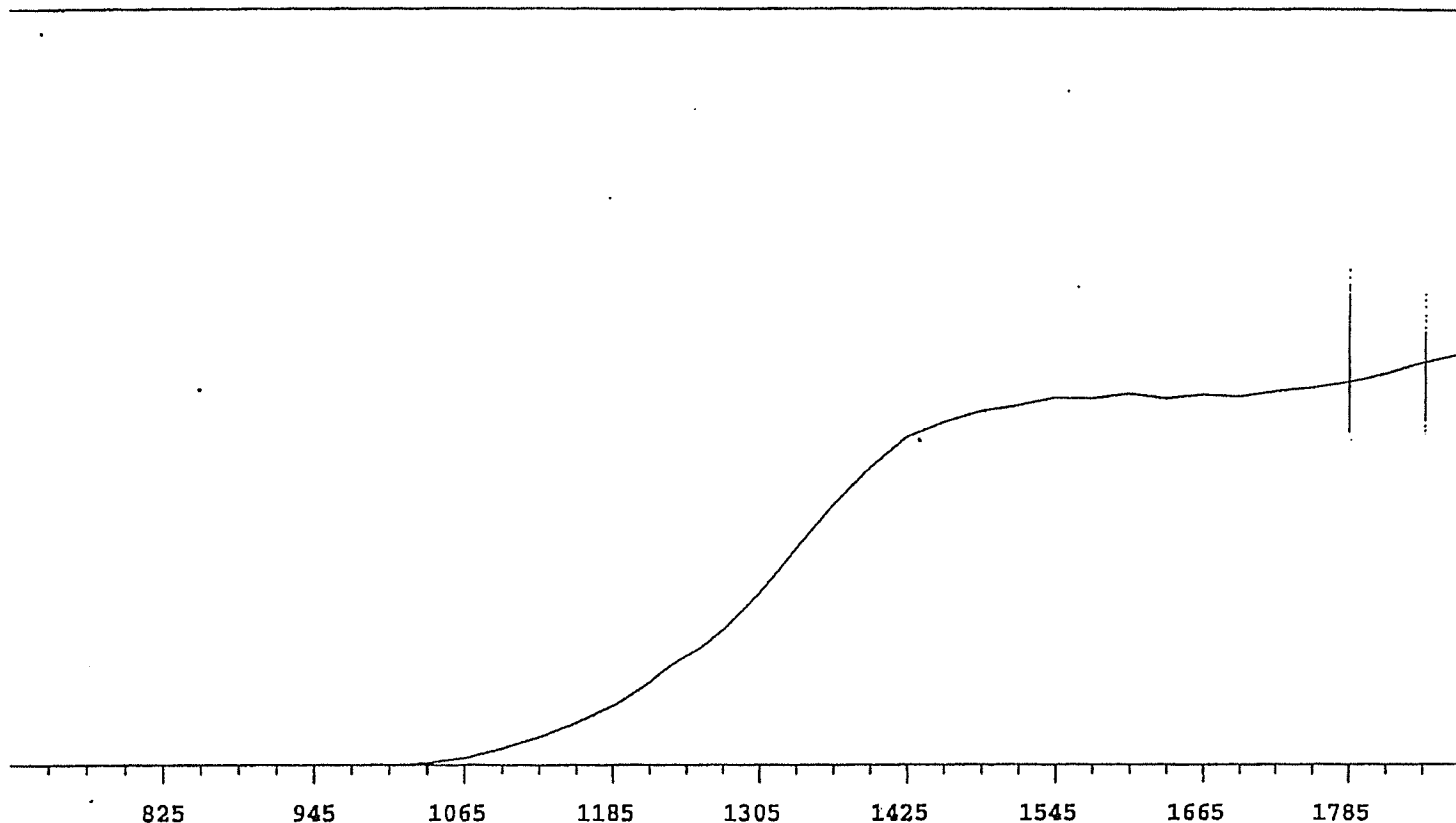
1305	16978	+70.97
1335	20569	+61.39
1365	24989	+48.97
1395	28389	+36.69
1425	30977	+24.05
1455	32727	+14.93
1485	33697	+8.42
1515	34195	+4.89
1545	34437	+3.49
1575	34850	+2.11
1605	35174	+1.62
1635	34923	+0.68
1665	35250	+0.35
1695	35171	+1.24
1725	35237	+1.02
1755	35584	+2.79
1785	35587	+4.59
1815	36485	+6.74
1845	37270	
1875	38453	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



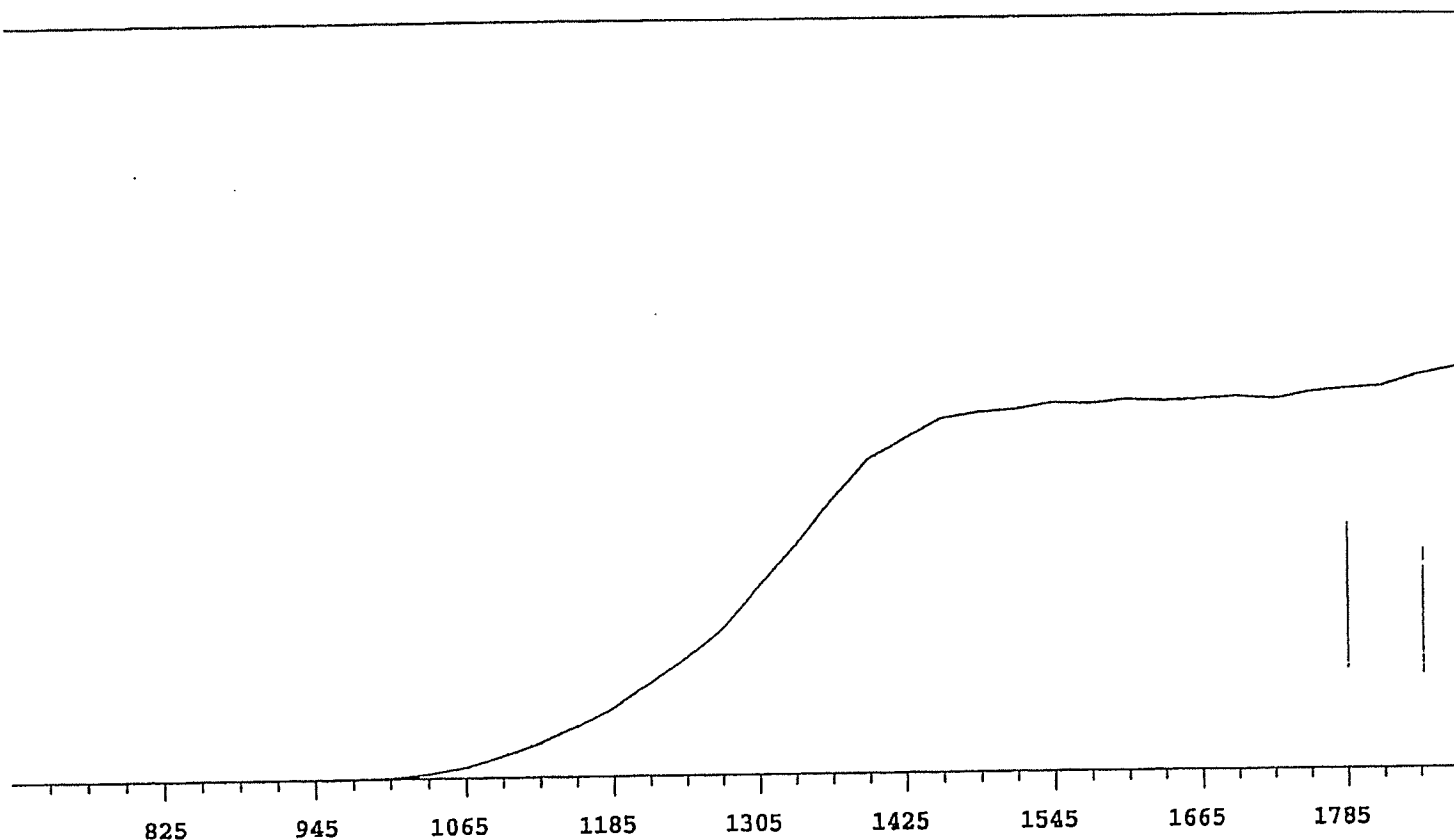
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16543	+70.03
735	0		1335	20257	+60.71
765	0		1365	24245	+48.17
795	0	>100	1395	27602	+35.50
825	0	>100	1425	30019	+23.48
855	0	>100	1455	31614	+14.53
885	0	>100	1485	32522	+8.91
915	0	>100	1515	33103	+5.28
945	0	>100	1545	33572	+2.60
975	4	>100	1575	33695	+0.70
1005	57	>100	1605	33525	+1.48
1035	277	>100	1635	33477	+0.99
1065	817	>100	1665	34432	+1.49
1095	1666	>100	1695	33745	+1.43
1125	2766	>100	1725	34149	+1.60
1155	4077	>100	1755	34350	+3.69
1185	5667	>100	1785	34955	+3.62
1215	7694	+91.50	1815	35251	+4.44
1245	10209	+84.83	1845	35592	
1275	12950	+77.50	1875	36382	

MPC 9600 Plateau Instrument 7 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



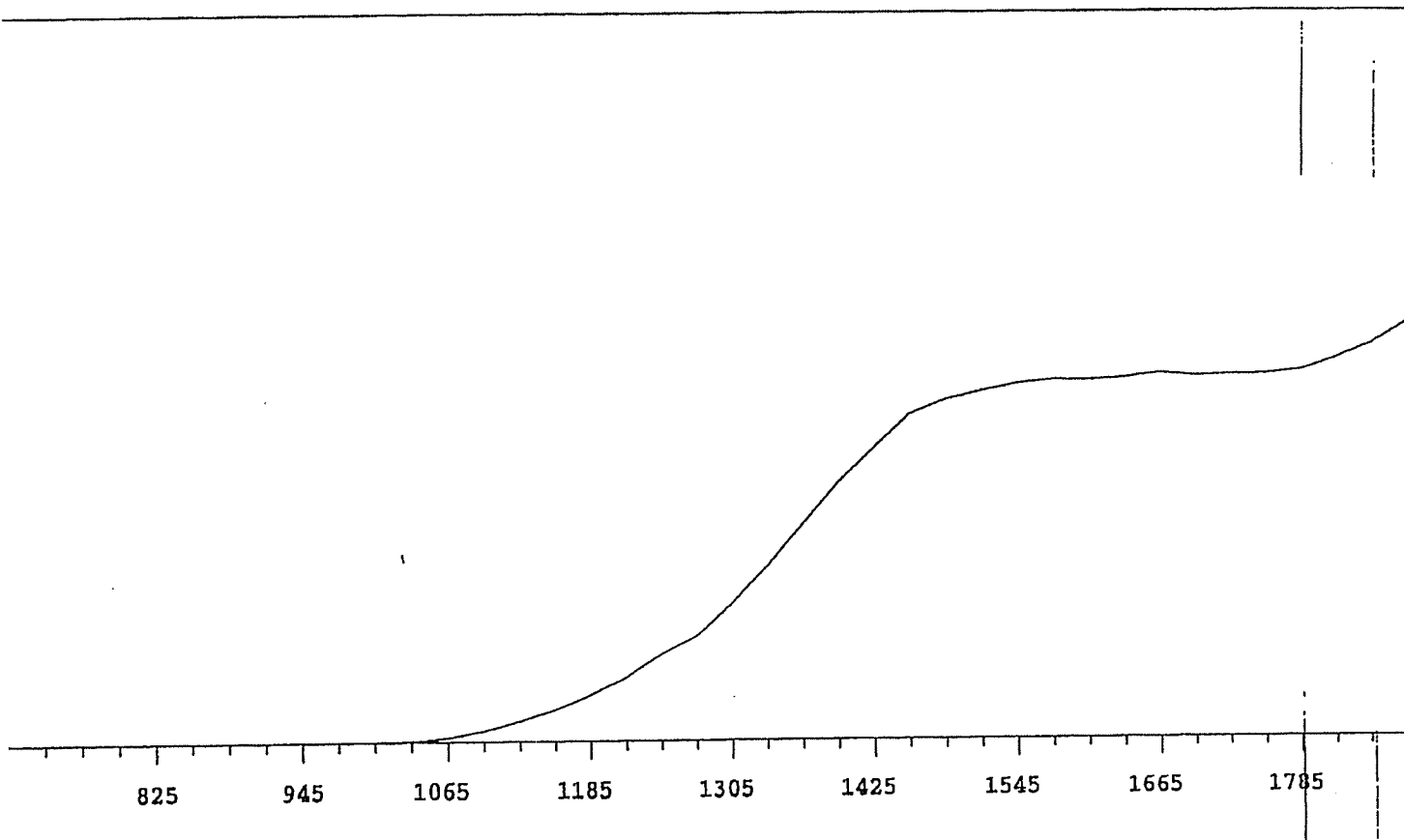
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14016	+71.42
735	0		1335	17436	+62.21
765	0		1365	20814	+50.32
795	0	>100	1395	23760	+36.91
825	0	>100	1425	26302	+24.91
855	0	>100	1455	27519	+15.17
885	0	>100	1485	28410	+8.91
915	0	>100	1515	28843	+5.41
945	0	>100	1545	29396	+3.58
975	5	>100	1575	29357	+1.54
1005	29	>100	1605	29719	+0.51
1035	204	>100	1635	29358	+0.23
1065	609	>100	1665	29623	+0.57
1095	1354	>100	1695	29509	+2.12
1125	2316	>100	1725	29896	+2.84
1155	3418	>100	1755	30165	+4.42
1185	4654	>100	1785	30570	+5.65
1215	6455	+92.99	1815	31180	+6.95
1245	8669	+86.45	1845	31995	
1275	10931	+79.15	1875	32717	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	19482	+67.45
735	0		1335	23344	+59.35
765	0		1365	27793	+45.86
795	0	>100	1395	31916	+34.29
825	0	>100	1425	33979	+21.61
855	0	>100	1455	35993	+11.71
885	0	>100	1485	36530	+7.04
915	0	>100	1515	36796	+3.11
945	1	>100	1545	37393	+2.44
975	9	>100	1575	37279	+1.41
1005	96	>100	1605	37650	+0.49
1035	468	>100	1635	37458	+0.91
1065	1084	>100	1665	37579	+0.12
1095	2286	>100	1695	37828	+1.10
1125	3479	>100	1725	37535	+1.72
1155	4912	>100	1755	38104	+2.18
1185	6819	+98.23	1785	38416	+4.12
1215	9153	+89.05	1815	38633	+4.92
1245	12105	+83.21	1845	39649	
1275	15122	+75.24	1875	40366	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector B 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



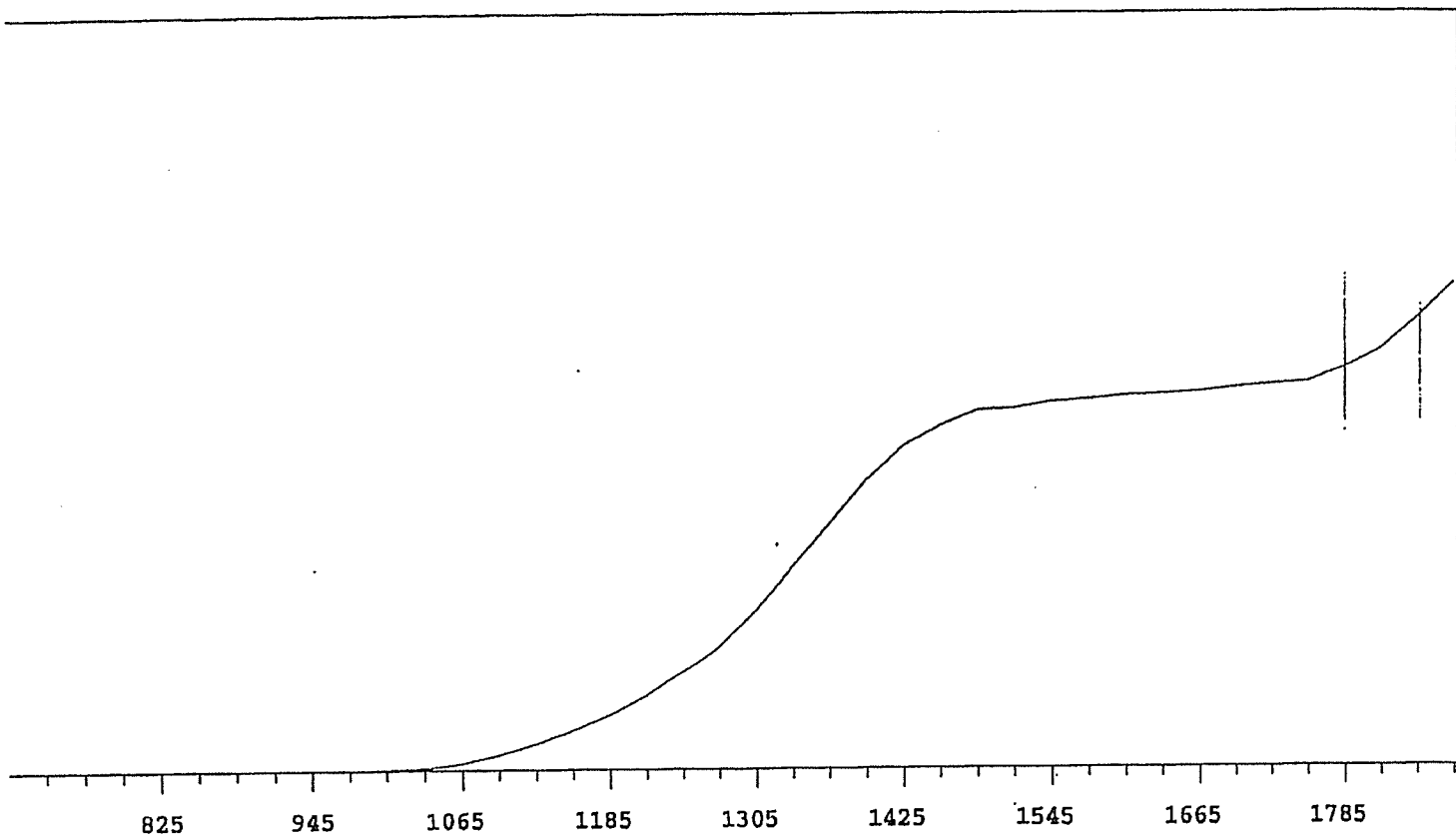
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	0	>100
1005	20	>100
1035	122	>100
1065	511	>100
1095	1263	>100
1125	2390	>100
1155	3641	>100
1185	5246	>100
1215	7212	+98.32
1245	9897	+89.80
1275	12742	+82.40

VOLTS COUNTS %/100 Volts

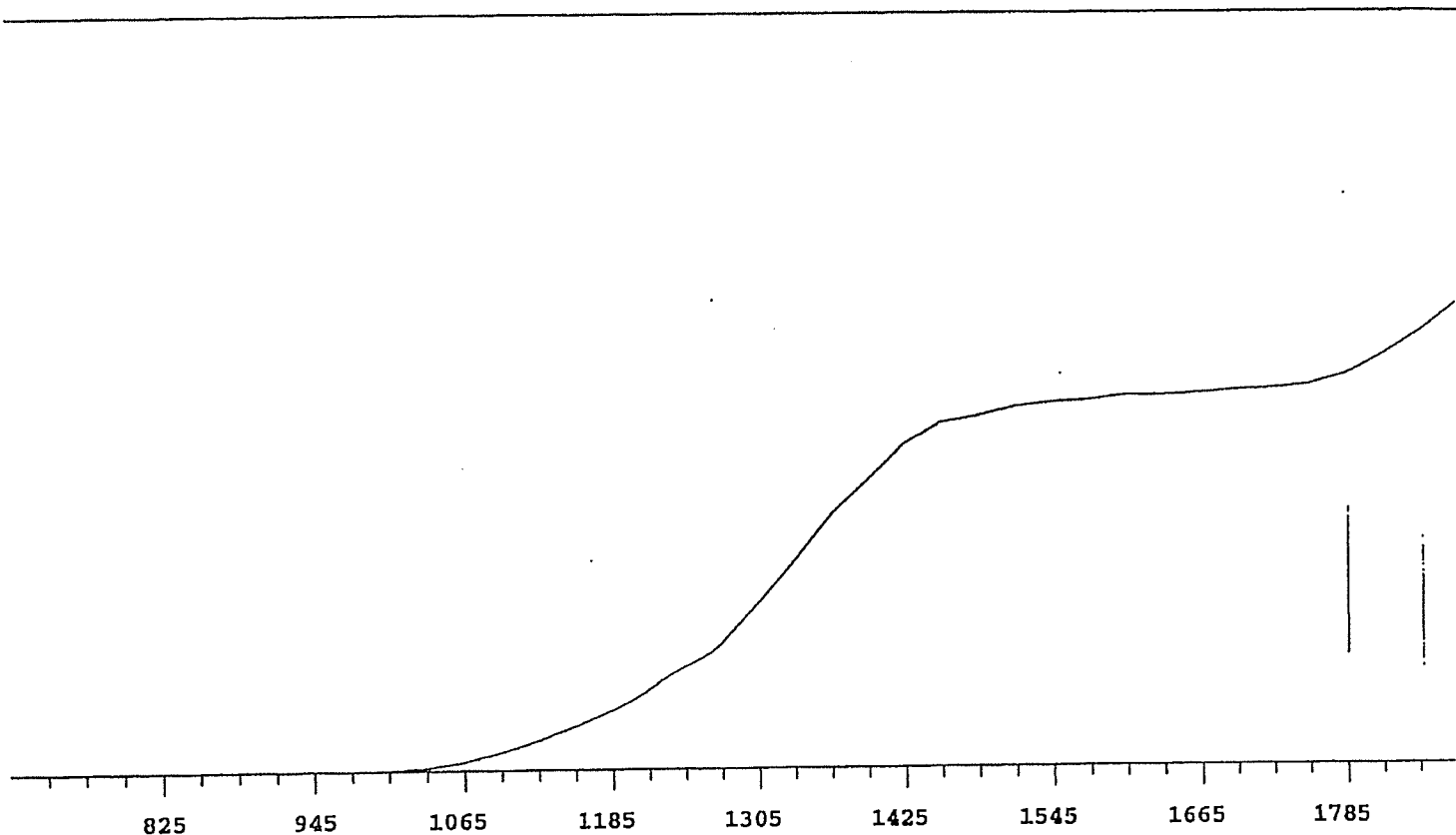
1305	16337	+74.91
1335	20471	+68.07
1365	25012	+57.86
1395	29694	+47.48
1425	33409	+35.17
1455	37013	+23.27
1485	38629	+14.35
1515	39529	+7.69
1545	40284	+4.34
1575	40711	+2.52
1605	40642	+1.97
1635	40879	+1.11
1665	41405	+0.98
1695	41011	+0.30
1725	41182	+0.41
1755	41178	+3.28
1785	41573	+6.47
1815	42858	+10.82
1845	44440	
1875	46780	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector C 7/1/2009 .
Alpha Volts: 705 Beta Volts: 1575



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	16303	+72.82
735	0		1335	20309	+64.32
765	0		1365	24364	+53.82
795	0	>100	1395	28527	+40.95
825	0	>100	1425	31774	+28.74
855	0	>100	1455	33631	+16.87
885	0	>100	1485	35030	+9.25
915	0	>100	1515	35208	+5.21
945	0	>100	1545	35741	+3.27
975	4	>100	1575	36019	+2.95
1005	46	>100	1605	36373	+2.21
1035	202	>100	1635	36484	+2.27
1065	697	>100	1665	36713	+2.28
1095	1532	>100	1695	37093	+2.46
1125	2614	>100	1725	37325	+4.17
1155	3953	>100	1755	37543	+7.52
1185	5474	>100	1785	38833	+13.43
1215	7466	+93.09	1815	40656	+19.49
1245	9842	+86.73	1845	43753	
1275	12814	+80.29	1875	47246	

MPC 9600 Plateau Instrument 8 MPC 9604 Detector D 7/1/2009
Alpha Volts: 705 Beta Volts: 1575



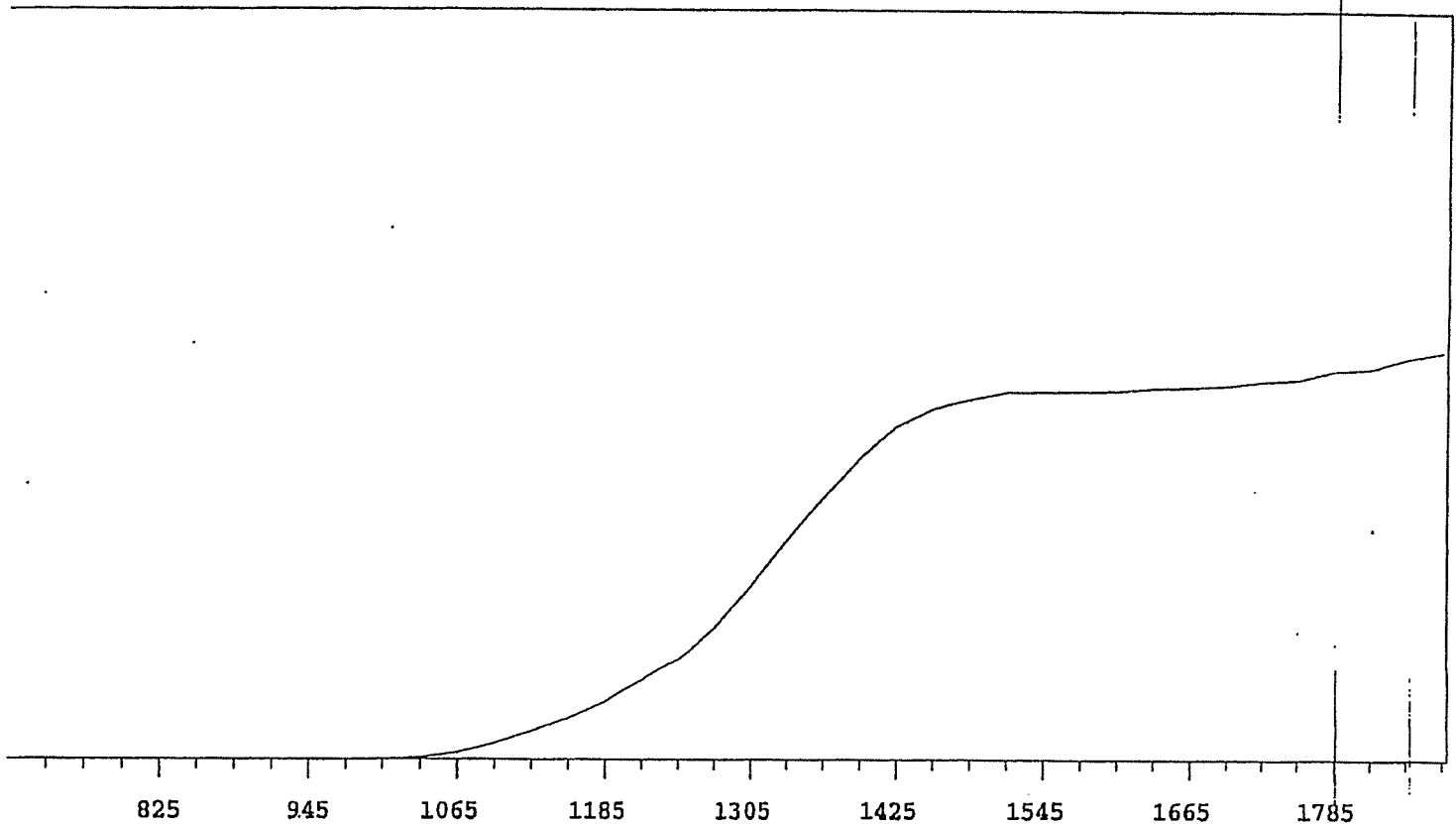
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	5	>100
1005	47	>100
1035	243	>100
1065	792	>100
1095	1744	>100
1125	2933	>100
1155	4123	>100
1185	5780	>100
1215	7791	+91.58
1245	10478	+84.93
1275	13118	+77.50

VOLTS COUNTS %/100 Volts

1305	16889	+70.18
1335	20600	+61.29
1365	24824	+50.40
1395	28208	+38.85
1425	31539	+25.79
1455	33391	+16.06
1485	33991	+8.60
1515	34782	+5.01
1545	35201	+4.10
1575	35380	+2.50
1605	35849	+1.87
1635	35784	+1.79
1665	36000	+1.43
1695	36269	+2.10
1725	36381	+3.46
1755	36733	+6.86
1785	37669	+11.78
1815	39465	+16.64
1845	41803	
1875	44665	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector A 7/1/2009
Alpha Volts: 870 Beta Volts: 1530



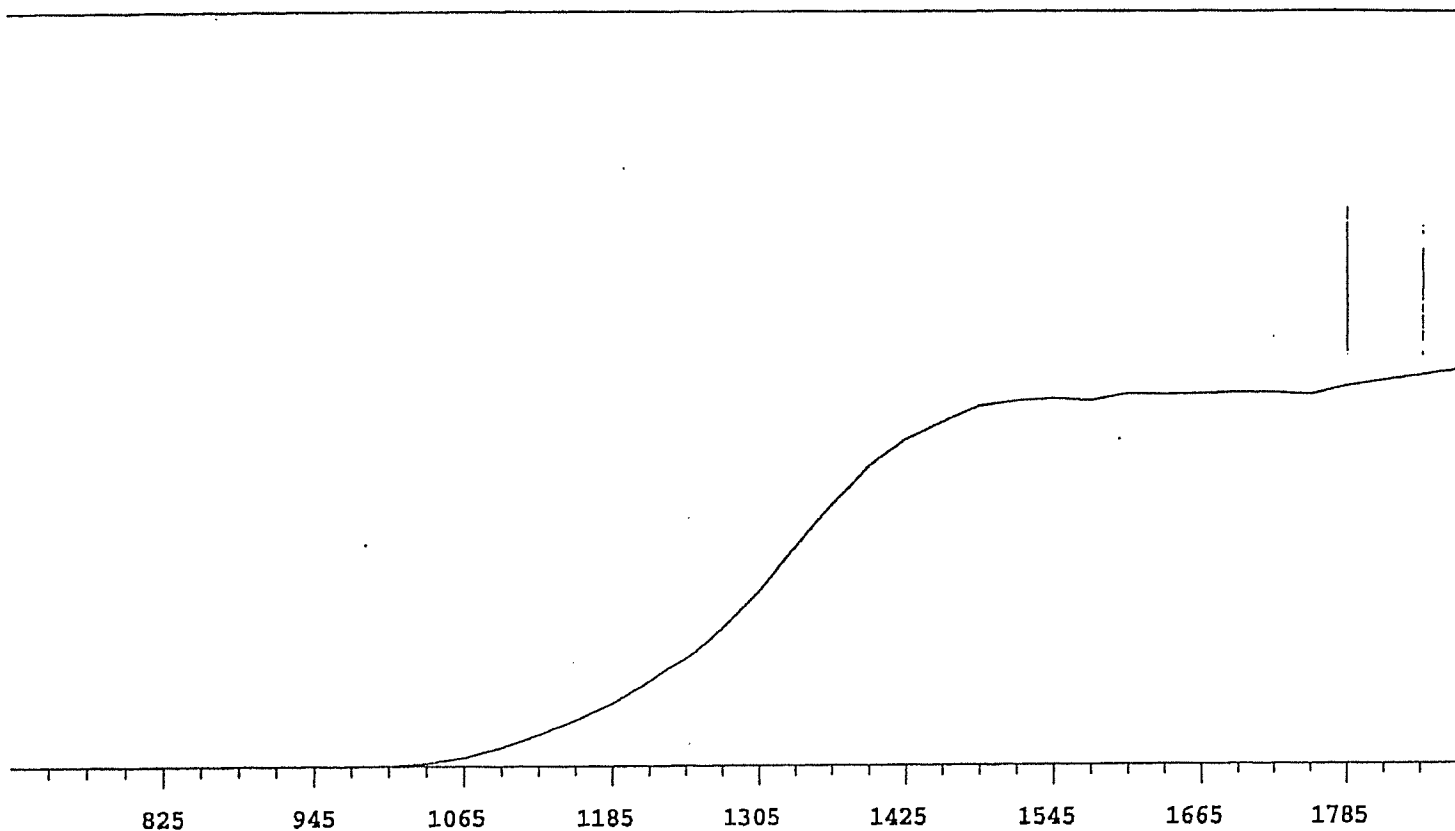
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	1	+0.00
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	2	>100
1005	33	>100
1035	203	>100
1065	668	>100
1095	1403	>100
1125	2545	>100
1155	3800	>100
1185	5363	>100
1215	7355	+95.00
1245	9807	+87.69
1275	12700	+80.28

VOLTS COUNTS %/100 Volts

1305	16226	+71.71
1335	20083	+61.95
1365	23913	+49.99
1395	27526	+36.97
1425	30193	+24.54
1455	31747	+14.71
1485	32544	+7.71
1515	33198	+3.66
1545	33188	+1.51
1575	33227	+0.73
1605	33278	+1.04
1635	33518	+1.38
1665	33565	+1.95
1695	33774	+1.99
1725	34135	+3.30
1755	34244	+3.67
1785	35022	+4.84
1815	35229	+5.93
1845	36179	
1875	36821	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 870 Beta Volts: 1530



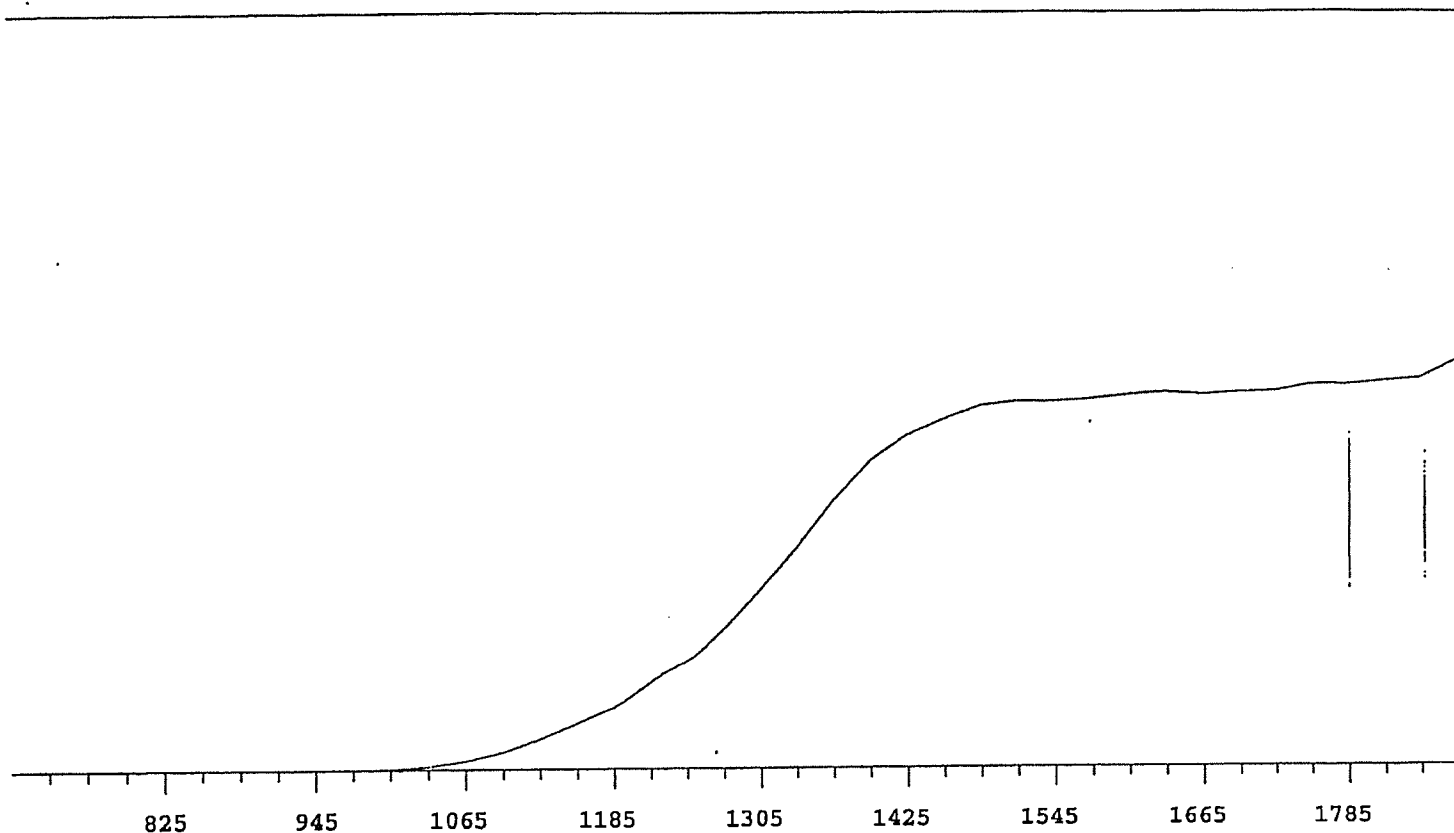
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	45	>100
1035	300	>100
1065	836	>100
1095	1742	>100
1125	2896	>100
1155	4198	>100
1185	5849	>100
1215	7887	+92.20
1245	10561	+83.55
1275	13442	+76.62

VOLTS COUNTS %/100 Volts

1305	16723	+68.78
1335	20749	+60.55
1365	24686	+48.78
1395	28343	+35.24
1425	30657	+24.31
1455	32208	+15.22
1485	33662	+9.32
1515	34098	+4.47
1545	34326	+2.17
1575	34133	+1.60
1605	34758	+1.41
1635	34706	+1.35
1665	34769	+0.30
1695	34830	-0.10
1725	34850	+0.90
1755	34613	+2.41
1785	35351	+3.87
1815	35849	+4.97
1845	36285	
1875	36814	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector C 7/1/2009
Alpha Volts: 870 Beta Volts: 1530



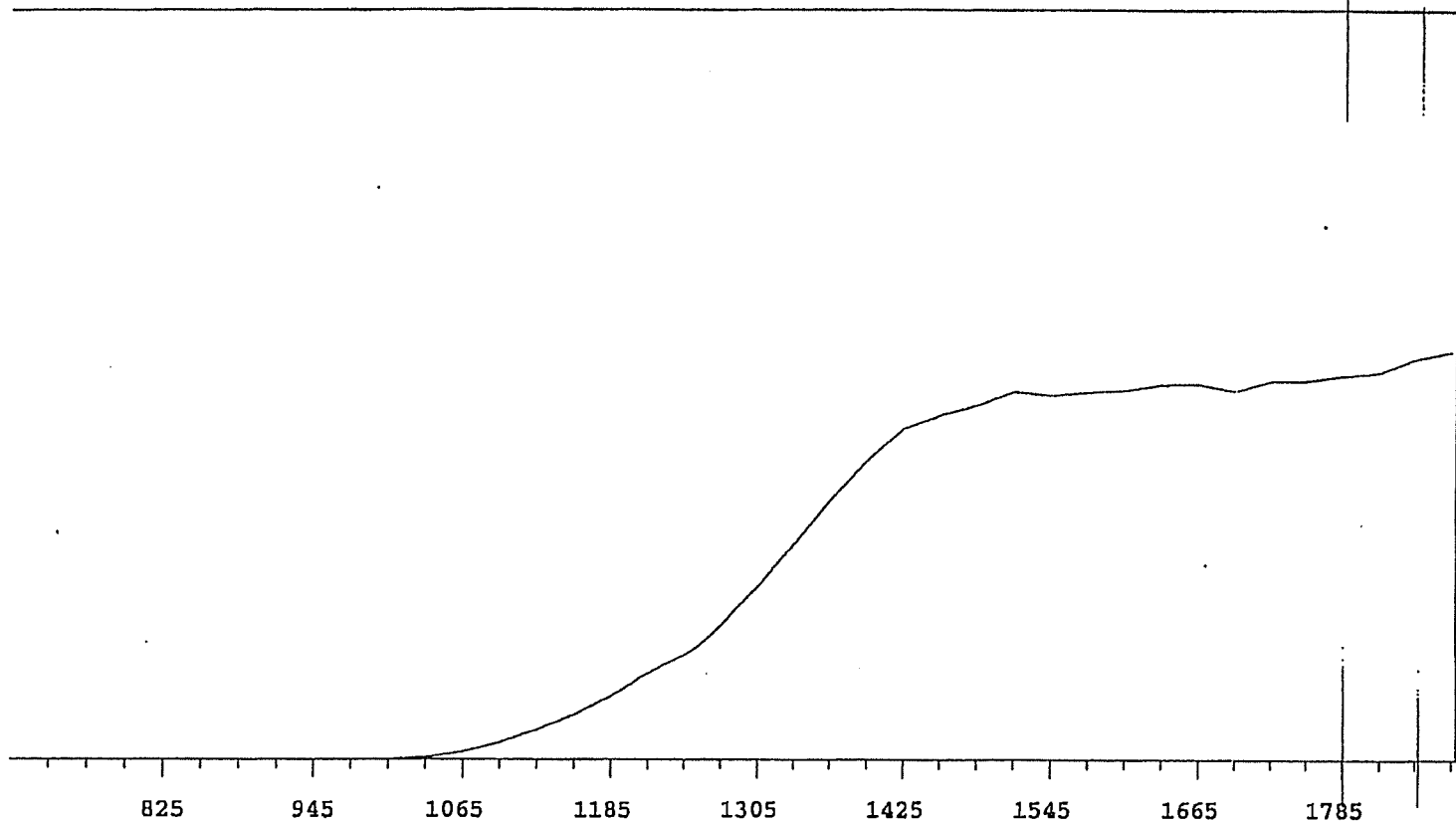
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	1	>100
915	1	>100
945	2	>100
975	3	>100
1005	64	>100
1035	349	>100
1065	970	>100
1095	1982	>100
1125	3328	>100
1155	5012	>100
1185	6669	>100
1215	9448	+92.67
1245	12293	+86.58
1275	15917	+76.99

VOLTS COUNTS %/100 Volts

1305	20192	+70.39
1335	24524	+60.97
1365	29650	+48.44
1395	33904	+35.09
1425	36549	+22.73
1455	38217	+13.58
1485	39628	+7.51
1515	40035	+3.73
1545	40020	+1.92
1575	40236	+2.06
1605	40680	+1.62
1635	40953	+1.03
1665	40643	+0.43
1695	40882	+1.41
1725	40979	+2.18
1755	41654	+2.20
1785	41602	+2.27
1815	41935	+4.50
1845	42259	
1875	44183	

MPC 9600 Plateau Instrument 9 MPC 9604 Detector D 7/1/2009
Alpha Volts: 870 Beta Volts: 1530



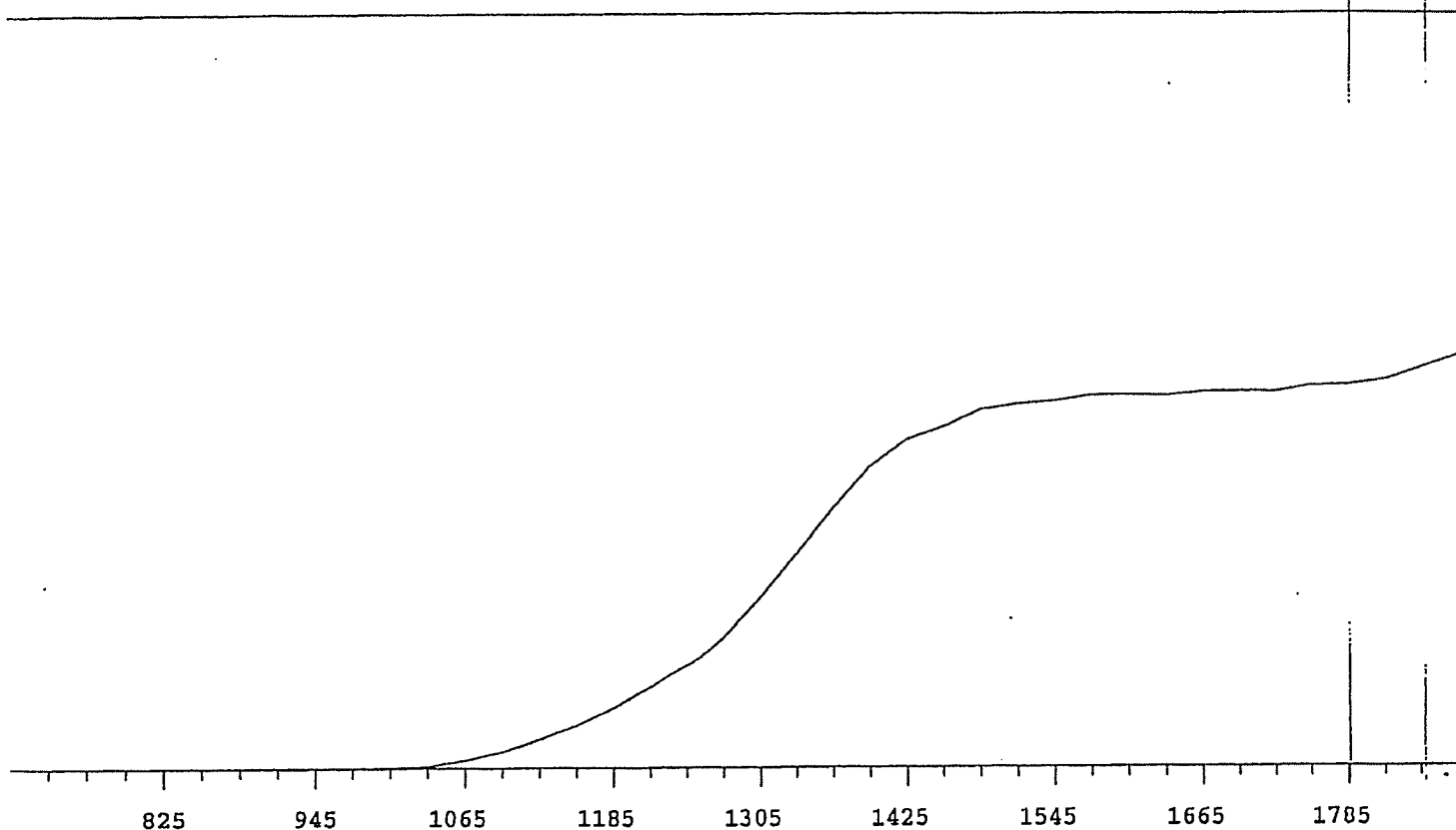
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	5	>100
1005	35	>100
1035	186	>100
1065	618	>100
1095	1280	>100
1125	2141	>100
1155	3268	>100
1185	4659	>100
1215	6343	+90.68
1245	8064	+83.46
1275	10497	+77.03

VOLTS COUNTS %/100 Volts

1305	13319	+70.94
1335	16319	+61.35
1365	19577	+50.27
1395	22498	+36.85
1425	24782	+23.90
1455	25761	+15.37
1485	26486	+8.38
1515	27503	+5.11
1545	27223	+2.67
1575	27453	+1.71
1605	27604	+2.70
1635	28021	+0.78
1665	28059	+1.05
1695	27548	+0.90
1725	28280	+2.16
1755	28290	+3.51
1785	28600	+4.46
1815	28879	+6.35
1845	29913	
1875	30417	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector A 7/1/2009
Alpha Volts: 870 Beta Volts: 1552



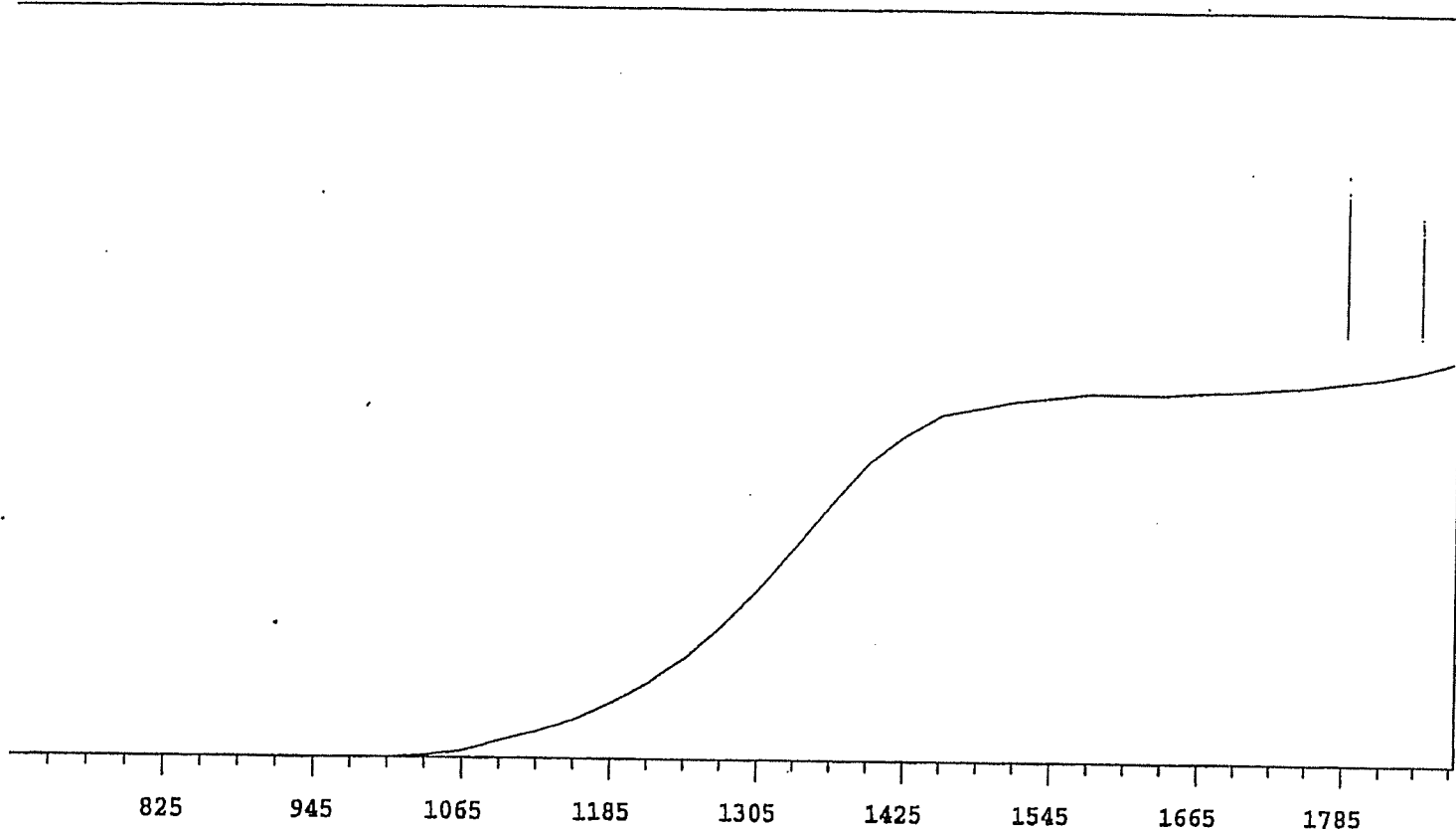
VOLTS COUNTS %/100.Volts

705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	1	>100
1005	37	>100
1035	198	>100
1065	687	>100
1095	1491	>100
1125	2580	>100
1155	3920	>100
1185	5588	>100
1215	7384	+91.32
1245	9794	+84.81
1275	12572	+79.73

VOLTS COUNTS %/100.Volts

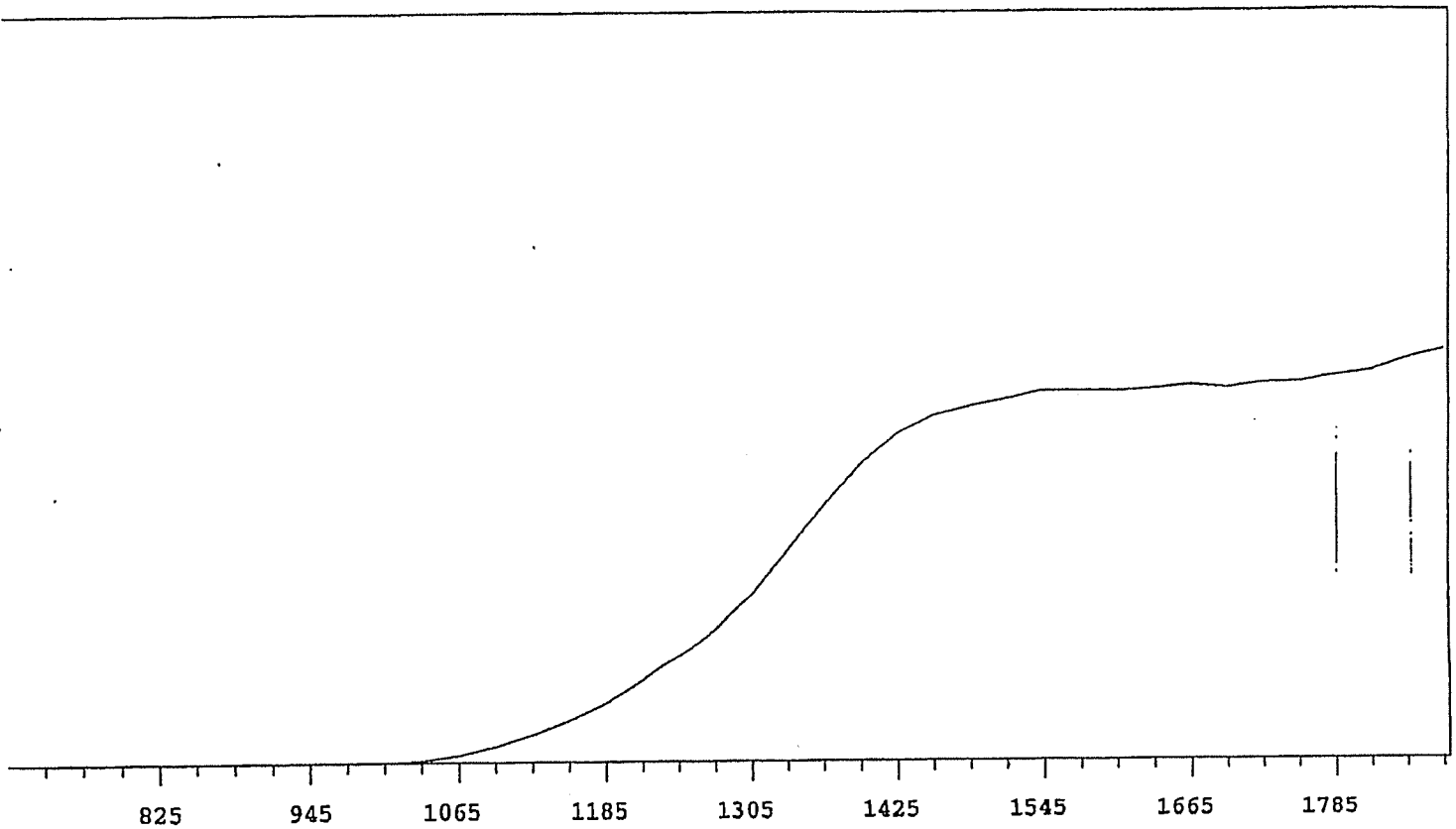
1305	16076	+72.76
1335	19985	+63.85
1365	24102	+50.95
1395	27819	+36.01
1425	30228	+23.86
1455	31343	+14.40
1485	32811	+8.77
1515	33243	+6.10
1545	33518	+3.25
1575	34010	+1.98
1605	34061	+1.59
1635	33973	+0.97
1665	34346	+0.93
1695	34366	+1.72
1725	34341	+1.54
1755	34860	+2.47
1785	34897	+4.50
1815	35377	+6.60
1845	36458	
1875	37630	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector B 7/1/2009
Alpha Volts: 870 Beta Volts: 1552



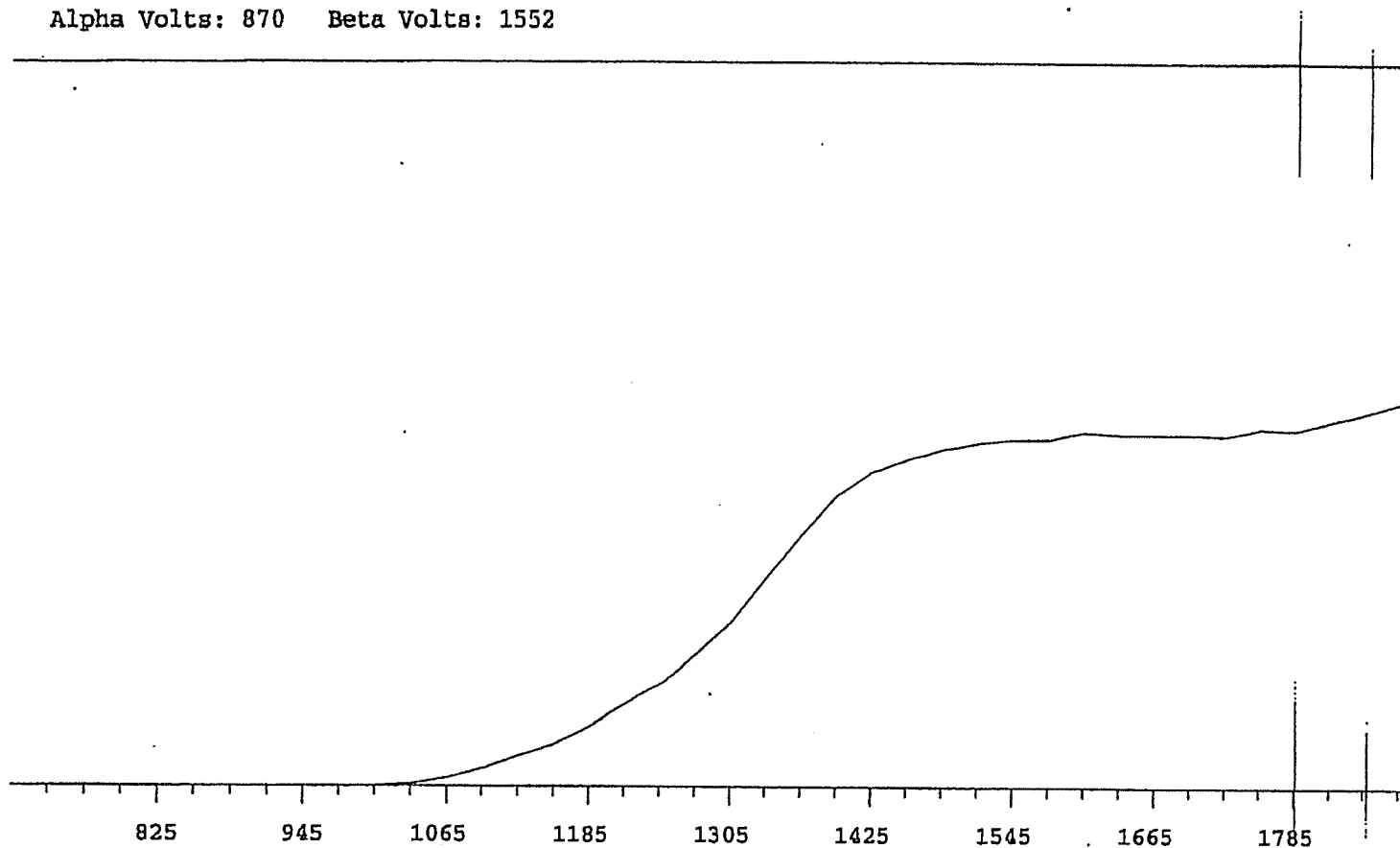
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	14469	+71.08
735	0		1335	17904	+63.07
765	0		1365	21677	+51.20
795	0	>100	1395	25027	+38.06
825	0	>100	1425	27237	+24.55
855	0	>100	1455	28914	+14.61
885	0	>100	1485	29480	+8.48
915	0	>100	1515	30075	+5.06
945	1	>100	1545	30374	+3.42
975	7	>100	1575	30738	+1.68
1005	28	>100	1605	30703	+1.08
1035	190	>100	1635	30679	+0.77
1065	597	>100	1665	30902	+1.46
1095	1474	>100	1695	30992	+1.89
1125	2383	>100	1725	31224	+2.40
1155	3680	>100	1755	31397	+3.27
1185	5131	>100	1785	31826	+4.13
1215	6808	+89.95	1815	32236	+5.59
1245	8990	+83.03	1845	32782	
1275	11493	+77.30	1875	33632	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 870 Beta Volts: 1552



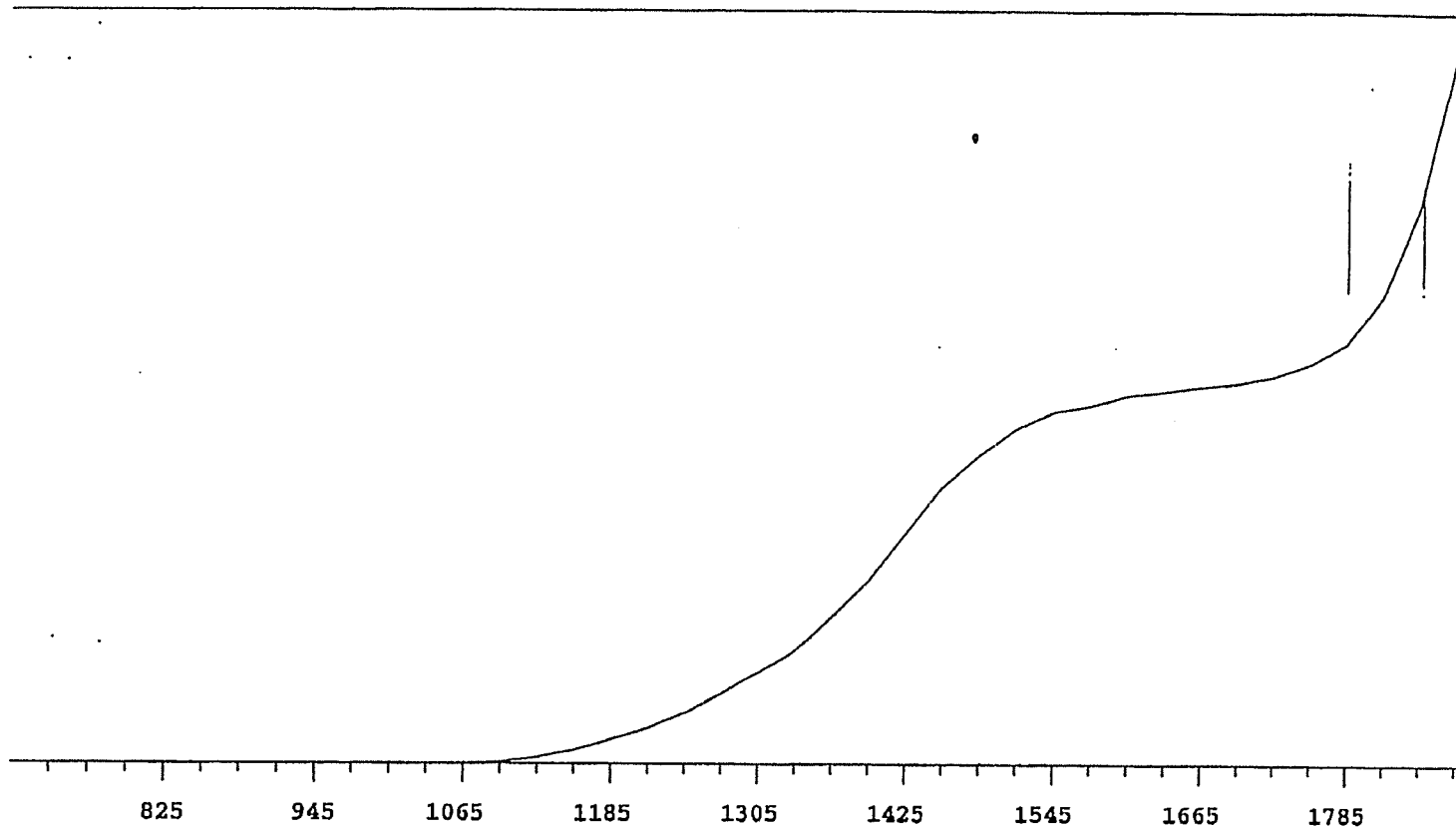
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	18051	+71.16
735	0		1335	22586	+62.34
765	0		1365	26973	+51.47
795	0	>100	1395	31137	+38.24
825	0	>100	1425	34321	+25.70
855	0	>100	1455	36267	+15.37
885	1	>100	1485	37197	+9.21
915	0	>100	1515	37851	+5.38
945	2	>100	1545	38622	+3.00
975	2	>100	1575	38600	+1.55
1005	36	>100	1605	38538	+1.03
1035	220	>100	1635	38786	+0.91
1065	780	>100	1665	39129	+1.38
1095	1712	>100	1695	38832	+1.20
1125	2926	>100	1725	39323	+2.00
1155	4297	>100	1755	39390	+3.35
1185	6097	>100	1785	40031	+4.86
1215	8397	+95.11	1815	40466	+6.64
1245	11155	+85.84	1845	41713	
1275	14430	+78.79	1875	42620	

MPC 9600 Plateau Instrument 10 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 870 Beta Volts: 1552



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	15430	+69.87
735	0		1335	19258	+61.49
765	0		1365	23018	+50.06
795	0	>100	1395	26562	+35.34
825	0	>100	1425	28750	+22.67
855	0	>100	1455	29911	+13.20
885	0	>100	1485	30798	+8.01
915	0	>100	1515	31375	+4.83
945	0	>100	1545	31684	+3.74
975	3	>100	1575	31721	+2.38
1005	49	>100	1605	32398	+1.44
1035	244	>100	1635	32154	+0.64
1065	764	>100	1665	32157	-0.77
1095	1584	>100	1695	32152	+0.99
1125	2677	>100	1725	32029	+1.41
1155	3763	>100	1755	32699	+3.00
1185	5395	>100	1785	32566	+4.71
1215	7350	+93.71	1815	33351	+5.92
1245	8655	+83.52	1845	34031	
1275	12504	+76.82	1875	34941	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 1515 Beta Volts: 1515



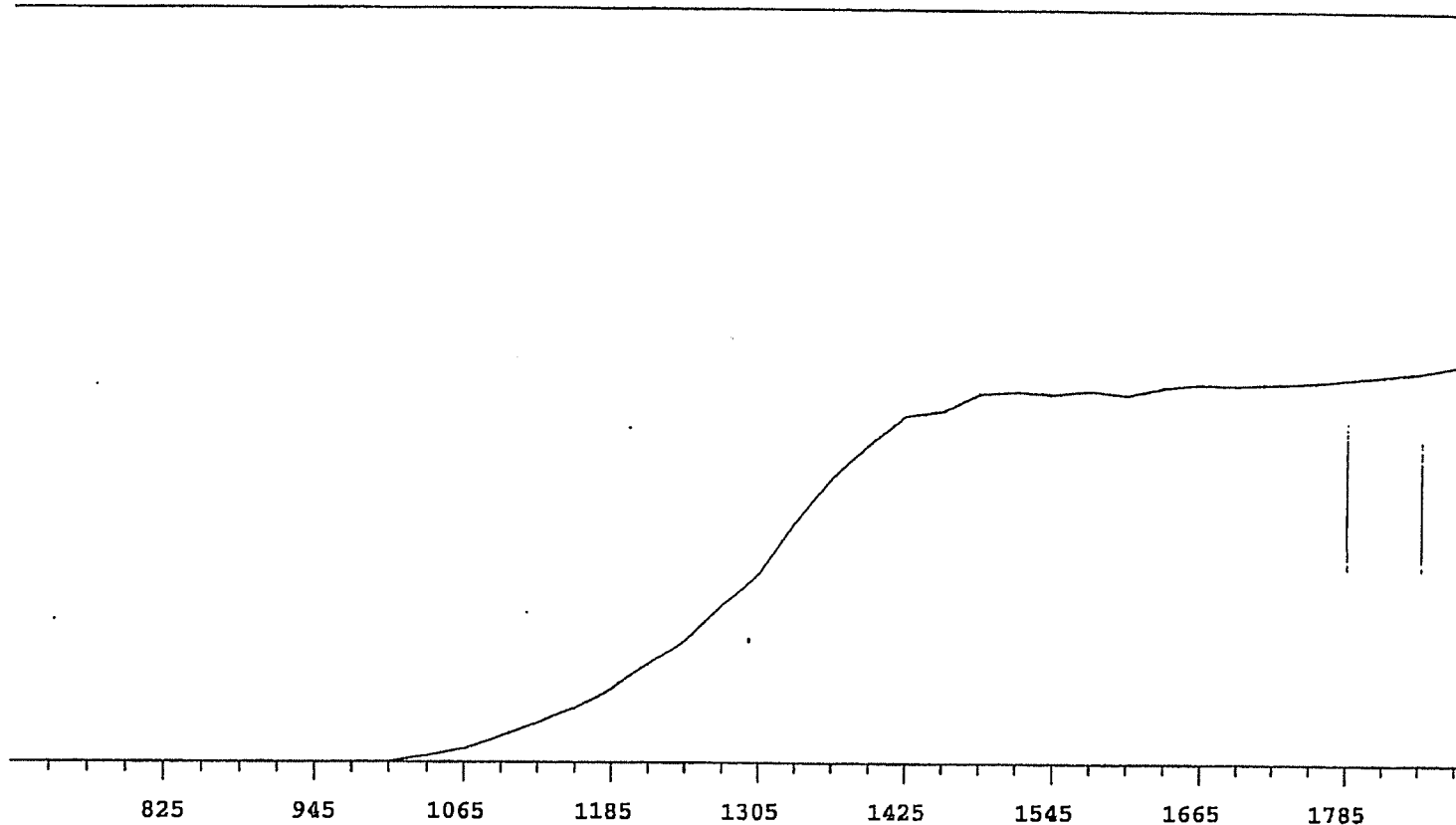
VOLTS COUNTS %/100 Volts

705	0	
735	1	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	1	+0.00
975	0	>100
1005	0	>100
1035	2	>100
1065	9	>100
1095	61	>100
1125	248	>100
1155	528	>100
1185	882	>100
1215	1270	>100
1245	1786	>100
1275	2478	+93.67

VOLTS COUNTS %/100 Volts

1305	3225	+87.64
1335	4189	+80.15
1365	5428	+75.12
1395	6662	+68.60
1425	8241	+58.14
1455	9857	+46.65
1485	11018	+33.24
1515	11953	+21.01
1545	12538	+13.57
1575	12760	+8.35
1605	13114	+5.84
1635	13258	+4.78
1665	13430	+3.99
1695	13551	+5.46
1725	13771	+8.65
1755	14204	+16.44
1785	14916	+30.03
1815	16579	+48.74
1845	19717	
1875	25029	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector B 7/1/2009
Alpha Volts: 1515 Beta Volts: 1515



VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	1	>100
945	0	>100
975	11	>100
1005	47	>100
1035	280	>100
1065	610	>100
1095	1192	>100
1125	1789	>100
1155	2466	>100
1185	3337	+94.91
1215	4526	+88.85
1245	5885	+78.40
1275	7518	+72.09

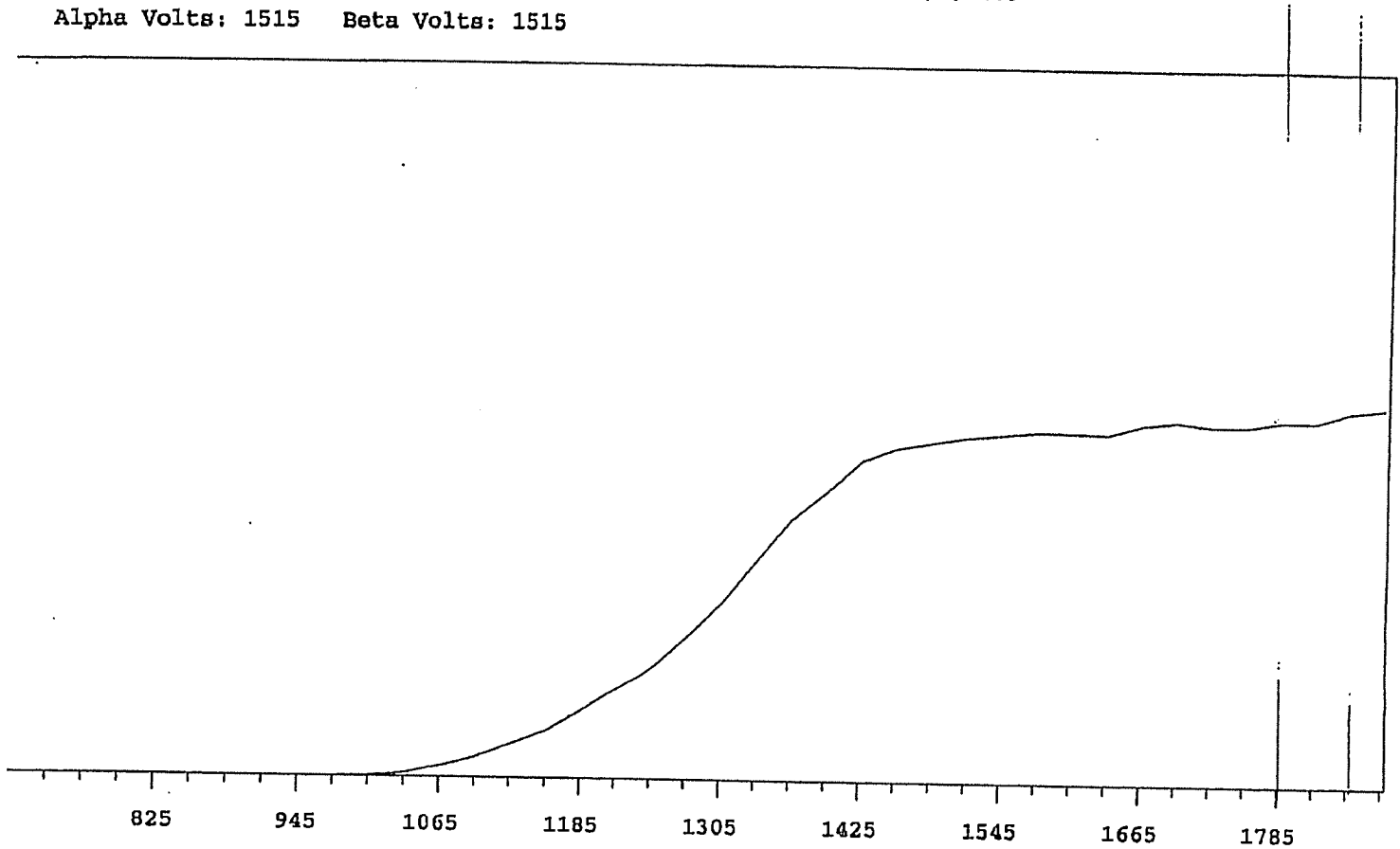
VOLTS COUNTS %/100 Volts

1305	8947	+65.63
1335	11238	+56.58
1365	13246	+46.66
1395	14838	+30.69
1425	16166	+20.11
1455	16396	+11.95
1485	17161	+5.61
1515	17274	+3.59
1545	17144	-0.00
1575	17323	+0.80
1605	17136	+2.21
1635	17484	+1.94
1665	17638	+2.16
1695	17580	+0.85
1725	17655	+1.05
1755	17700	+1.98
1785	17857	+2.38
1815	18006	+3.36
1845	18140	
1875	18468	

Plateau 7/1/09

Instrument 11 MPC 9604 Detector C 7/1/2009

Alpha Volts: 1515 Beta Volts: 1515



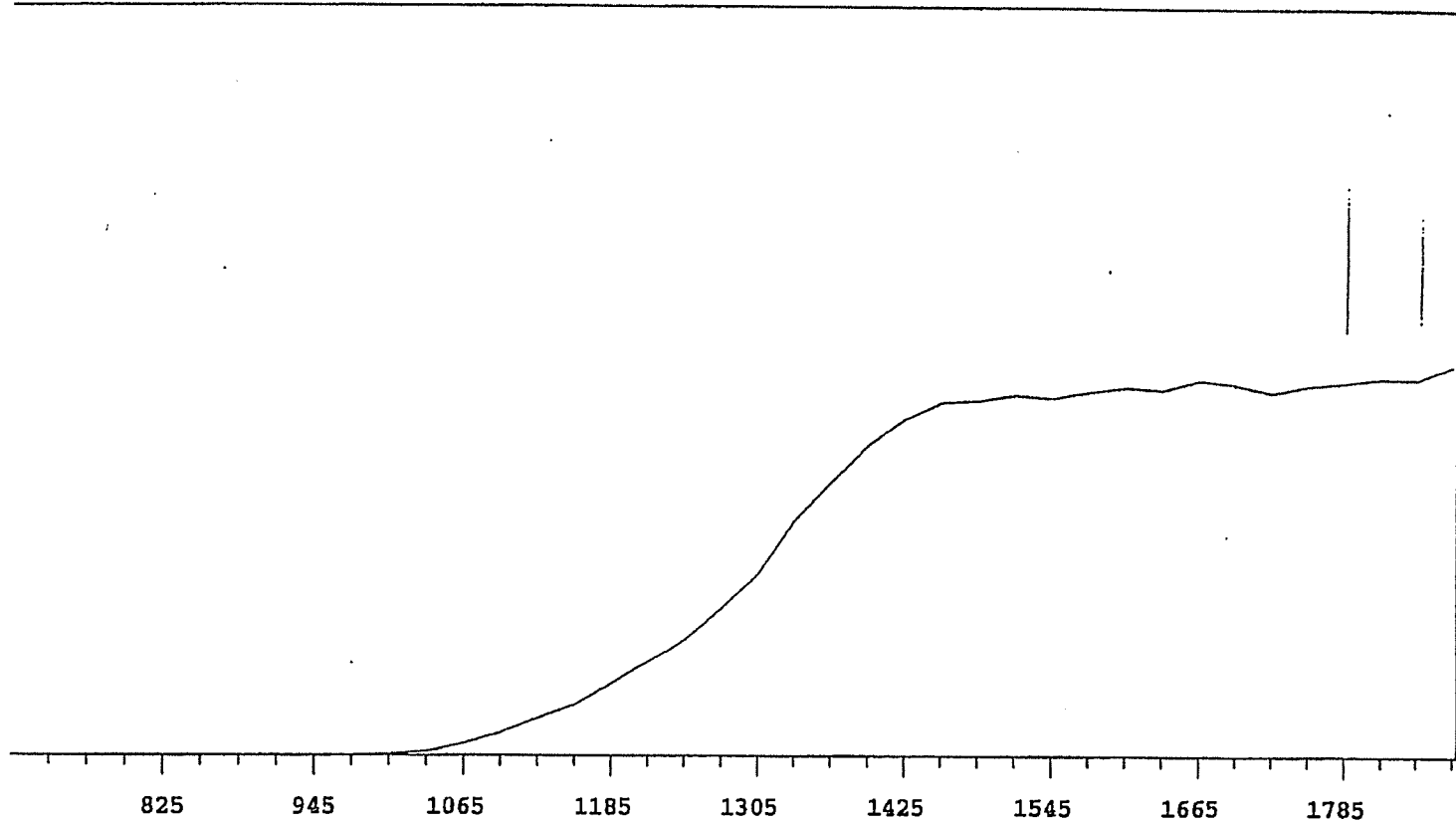
VOLTS COUNTS %/100 Volts

705	1	
735	0	
765	0	+0.00
795	0	>100
825	1	+0.00
855	0	>100
885	0	+0.00
915	0	>100
945	1	>100
975	7	>100
1005	46	>100
1035	191	>100
1065	540	>100
1095	957	>100
1125	1597	>100
1155	2217	>100
1185	3154	+98.74
1215	4239	+89.75
1245	5550	+79.98
1275	6980	+73.12

VOLTS COUNTS %/100 Volts

1305	8636	+66.44
1335	10593	+56.56
1365	12582	+46.23
1395	13957	+33.45
1425	15443	+21.49
1455	16048	+13.14
1485	16331	+6.45
1515	16603	+4.19
1545	16736	+2.73
1575	16884	+1.11
1605	16875	+1.91
1635	16813	+2.86
1665	17257	+2.60
1695	17425	+1.58
1725	17238	+0.49
1755	17230	+0.63
1785	17482	+3.27
1815	17468	+4.46
1845	17977	
1875	18163	

Plateau 7/1/09 Instrument 11 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 1515 Beta Volts: 1515



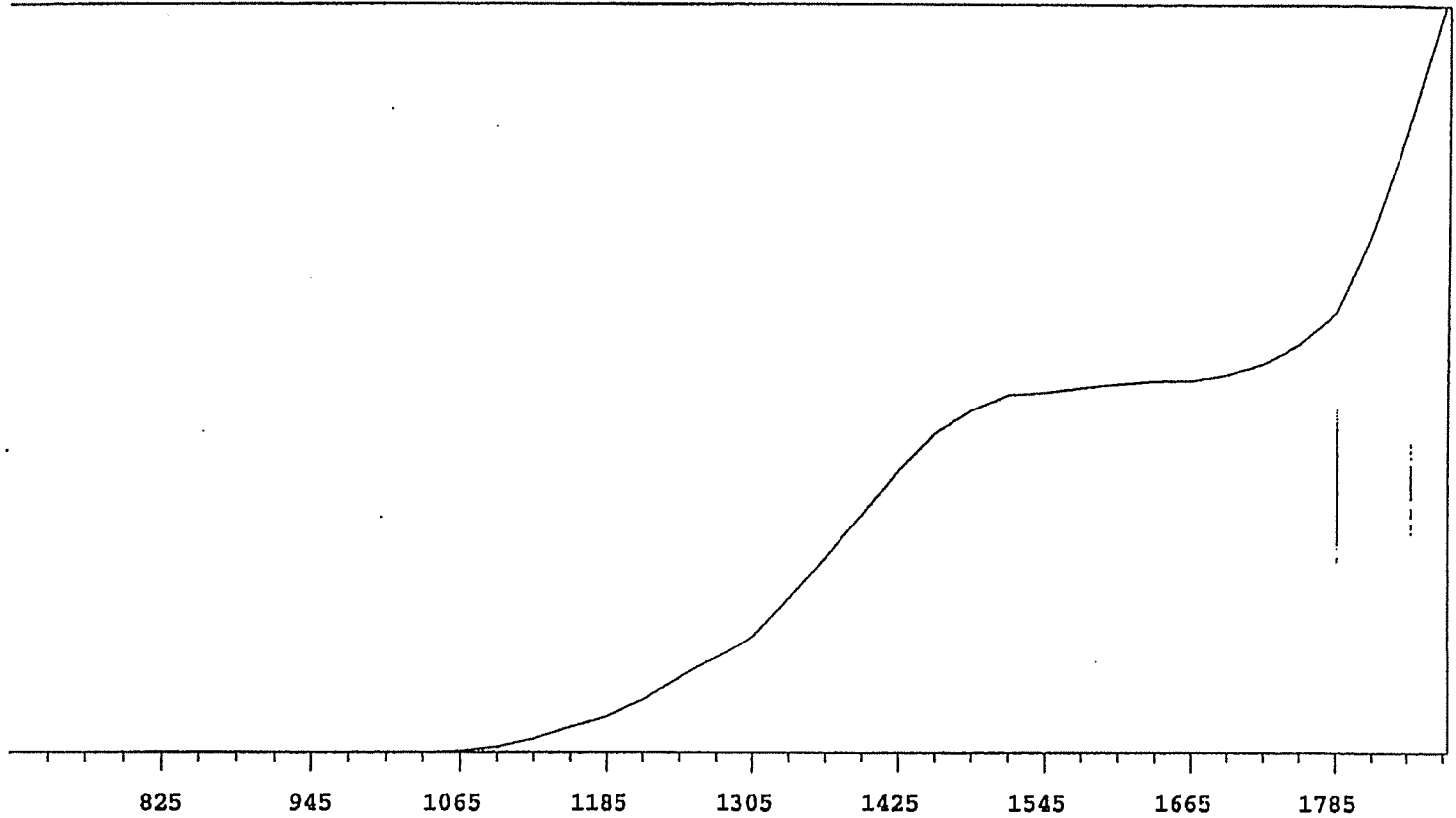
VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	+83.33
885	1	+55.56
915	0	>100
945	1	>100
975	9	>100
1005	60	>100
1035	173	>100
1065	480	>100
1095	911	>100
1125	1508	>100
1155	2024	>100
1185	2872	+97.38
1215	3858	+89.30
1245	5070	+78.02
1275	6322	+73.30

VOLTS COUNTS %/100 Volts

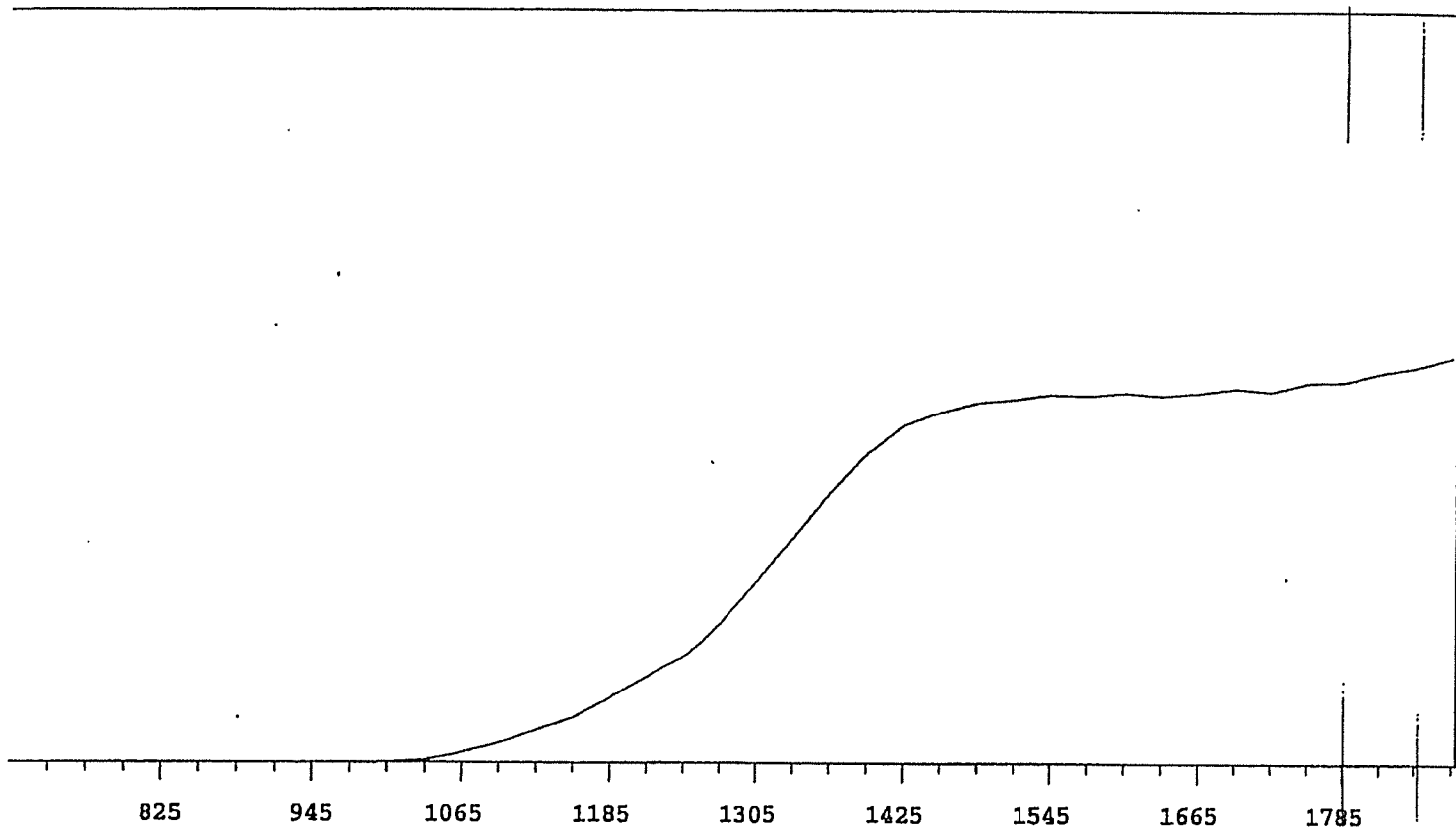
1305	7679	+65.97
1335	9737	+57.57
1365	11301	+45.87
1395	12767	+31.71
1425	13767	+19.90
1455	14399	+10.72
1485	14467	+4.38
1515	14671	+2.12
1545	14576	+2.61
1575	14808	+1.80
1605	14974	+3.15
1635	14872	+1.76
1665	15248	-0.41
1695	15067	-0.27
1725	14784	-0.43
1755	15044	+2.01
1785	15163	+2.82
1815	15333	+3.61
1845	15278	
1875	15817	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



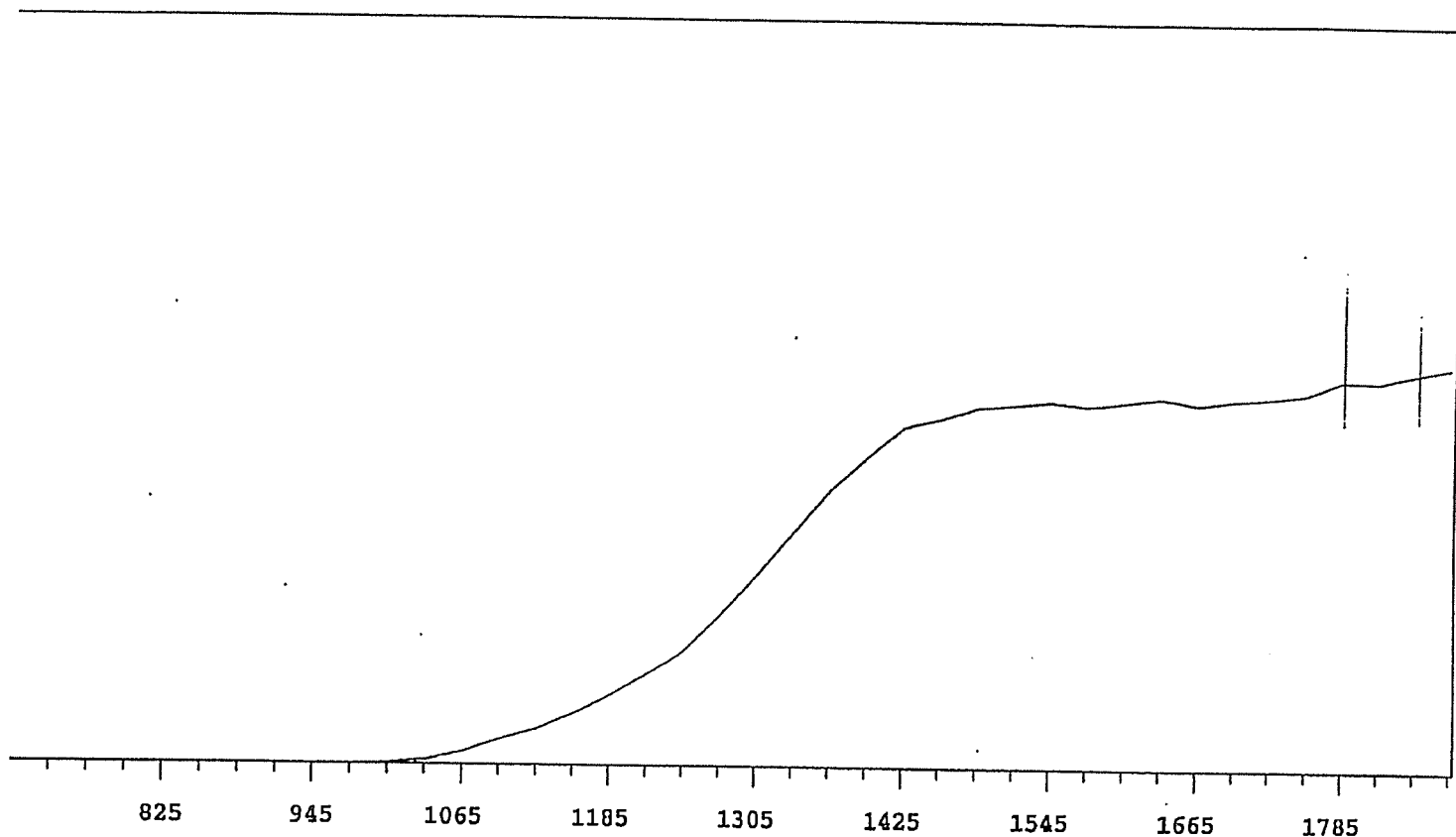
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	6302	+80.03
735	1		1335	8191	+73.78
765	0		1365	10140	+66.18
795	0	>100	1395	12247	+55.83
825	0	>100	1425	14468	+43.92
855	0	>100	1455	16303	+31.28
885	0	>100	1485	17411	+18.64
915	0	>100	1515	18150	+9.87
945	0	>100	1545	18275	+5.30
975	1	>100	1575	18496	+3.16
1005	3	>100	1605	18685	+2.66
1035	17	>100	1635	18820	+2.63
1065	84	>100	1665	18855	+4.16
1095	267	>100	1695	19152	+7.70
1125	709	>100	1725	19706	+13.90
1155	1299	>100	1755	20640	+26.51
1185	1813	>100	1785	22308	+40.92
1215	2638	>100	1815	26460	+51.46
1245	3777	+96.47	1845	31616	
1275	4915	+87.98	1875	37348	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	1	+83.33
885	1	-83.33
915	0	-55.56
945	0	>100
975	1	>100
1005	43	>100
1035	165	>100
1065	557	>100
1095	1055	>100
1125	1775	>100
1155	2470	>100
1185	3617	+98.46
1215	4757	+90.95
1245	6186	+83.59
1275	8021	+77.85
1305	10207	+70.42
1335	12473	+60.75
1365	14900	+48.87
1395	17101	+35.36
1425	18643	+22.53
1455	19350	+12.34
1485	19848	+6.68
1515	20014	+3.51
1545	20278	+2.03
1575	20186	+0.80
1605	20375	+0.32
1635	20209	+1.36
1665	20364	+0.83
1695	20607	+2.43
1725	20429	+2.51
1755	20924	+3.64
1785	20984	+5.11
1815	21470	+5.63
1845	21773	
1875	22346	

Plateau 7/1/09 Instrument 12 MPC 9604 Detector C 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515

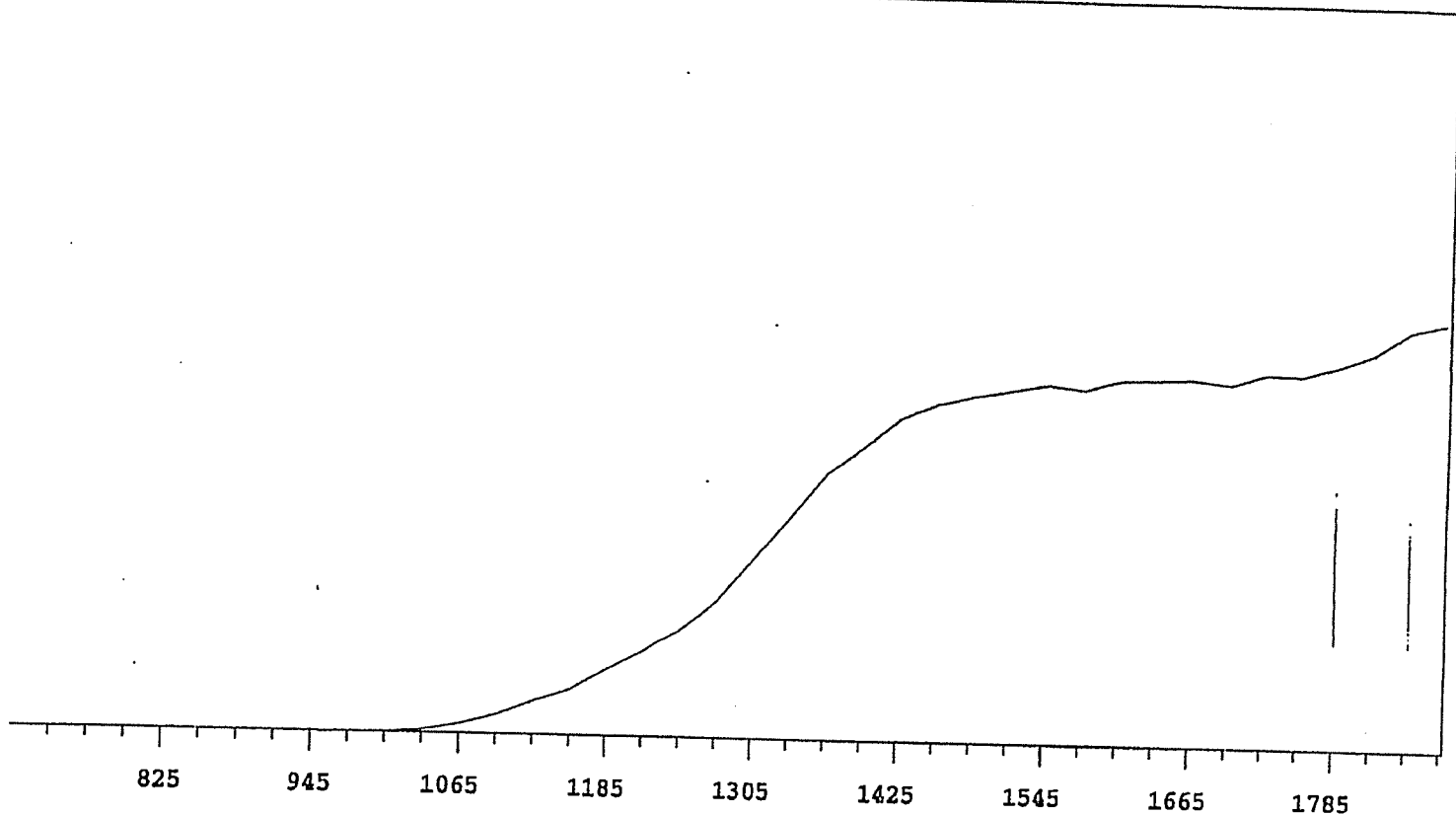


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	9543	+67.01
735	0		1335	11617	+56.47
765	0		1365	13791	+45.47
795	0	>100	1395	15387	+31.66
825	0	>100	1425	16819	+20.02
855	0	>100	1455	17210	+11.63
885	1	+0.00	1485	17742	+6.05
915	0	>100	1515	17892	+3.04
945	0	>100	1545	18070	+1.09
975	7	>100	1575	17856	+1.43
1005	52	>100	1605	18054	+0.42
1035	214	>100	1635	18287	+1.06
1065	590	>100	1665	17969	+0.78
1095	1201	>100	1695	18187	+1.48
1125	1759	>100	1725	18317	+4.89
1155	2569	>100	1755	18518	+4.76
1185	3440	+95.13	1785	19156	+5.18
1215	4583	+87.74	1815	19100	+5.18
1245	5985	+81.67	1845	19496	
1275	7682	+74.54	1875	19842	

Plateau 7/1/09

Instrument 12 MPC 9604 Detector D 7/1/2009

Alpha Volts: 705 Beta Volts: 1515



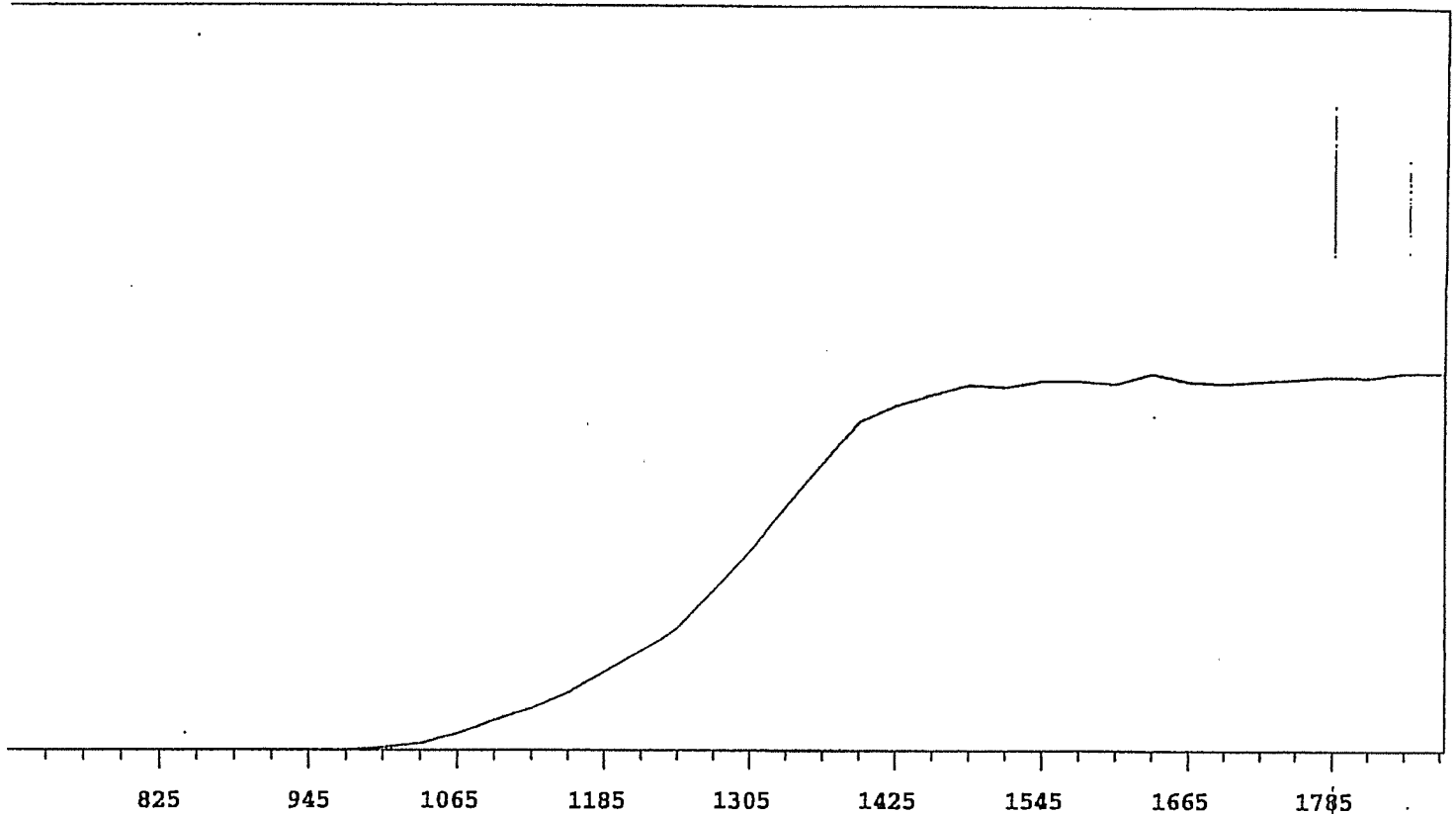
VOLTS COUNTS %/100 Volts

VOLTS COUNTS %/100 Volts

705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	4	>100
1005	26	>100
1035	169	>100
1065	483	>100
1095	955	>100
1125	1639	>100
1155	2233	>100
1185	3262	+98.61
1215	4306	+89.77
1245	5662	+82.36
1275	7113	+76.36

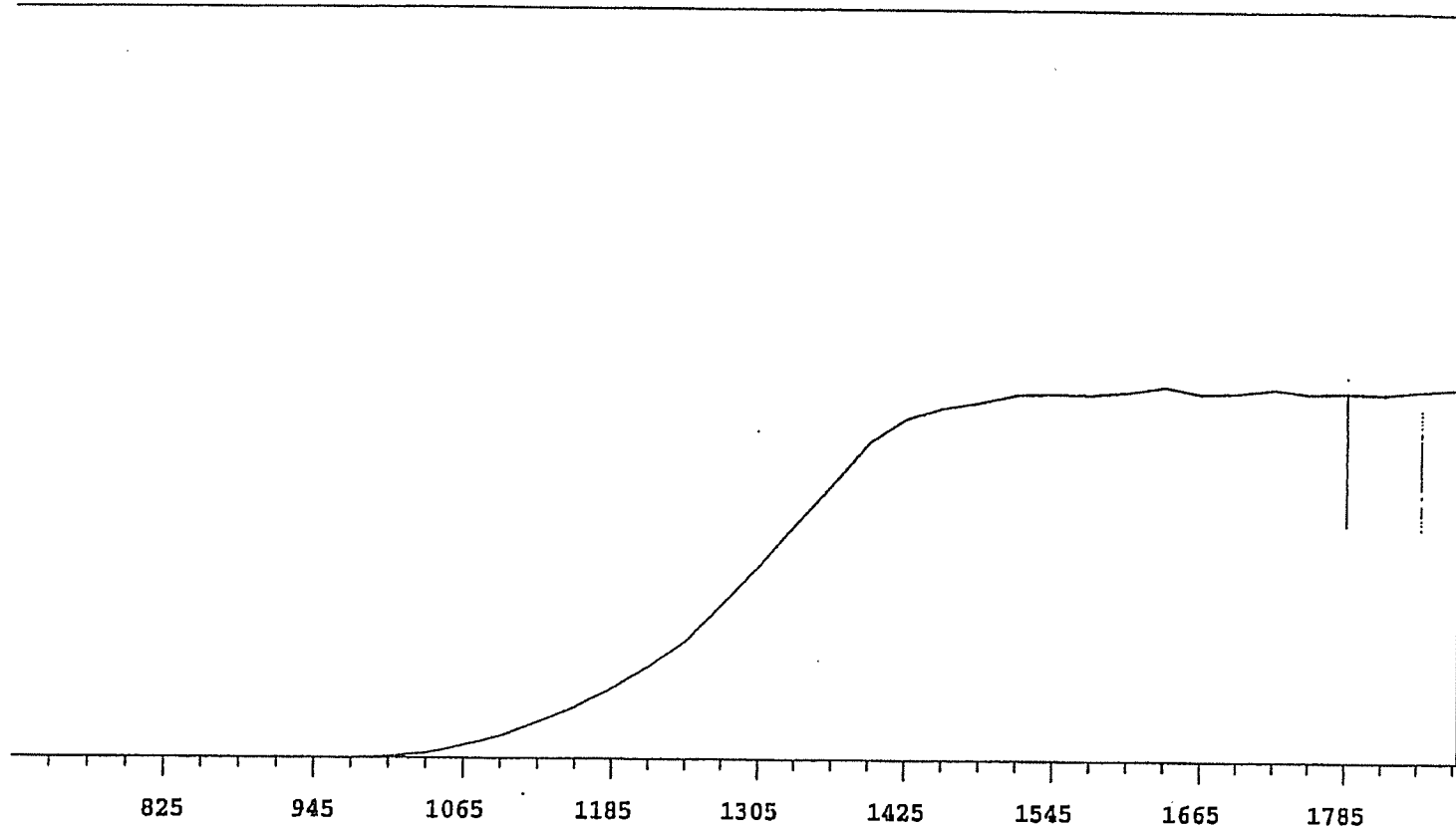
1305	9144	+69.92
1335	11120	+58.43
1365	13399	+45.40
1395	14711	+32.57
1425	16134	+20.69
1455	16805	+13.46
1485	17209	+7.90
1515	17500	+4.31
1545	17812	+3.48
1575	17629	+2.80
1605	18066	+2.23
1635	18122	+1.44
1665	18166	+1.20
1695	17967	+1.60
1725	18469	+3.41
1755	18409	+6.35
1785	18884	+9.47
1815	19535	+11.98
1845	20630	
1875	21076	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9209	+64.55
735	1		1335	11200	+55.94
765	0	+55.56	1365	13123	+43.27
795	2	>100	1395	14957	+29.04
825	0	+0.00	1425	15658	+17.41
855	0	>100	1455	16123	+8.01
885	1	>100	1485	16530	+4.92
915	0	>100	1515	16437	+2.71
945	1	>100	1545	16704	+0.83
975	14	>100	1575	16707	+2.14
1005	104	>100	1605	16602	+0.55
1035	281	>100	1635	17024	-0.28
1065	720	>100	1665	16684	-0.42
1095	1302	>100	1695	16597	-0.85
1125	1834	>100	1725	16711	+1.27
1155	2544	>100	1755	16796	+1.51
1185	3485	+92.28	1785	16903	+1.57
1215	4624	+85.50	1815	16880	+1.46
1245	5878	+77.82	1845	17066	
1275	7515	+71.49	1875	17085	

Plateau 7/1/09 Instrument 13 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515

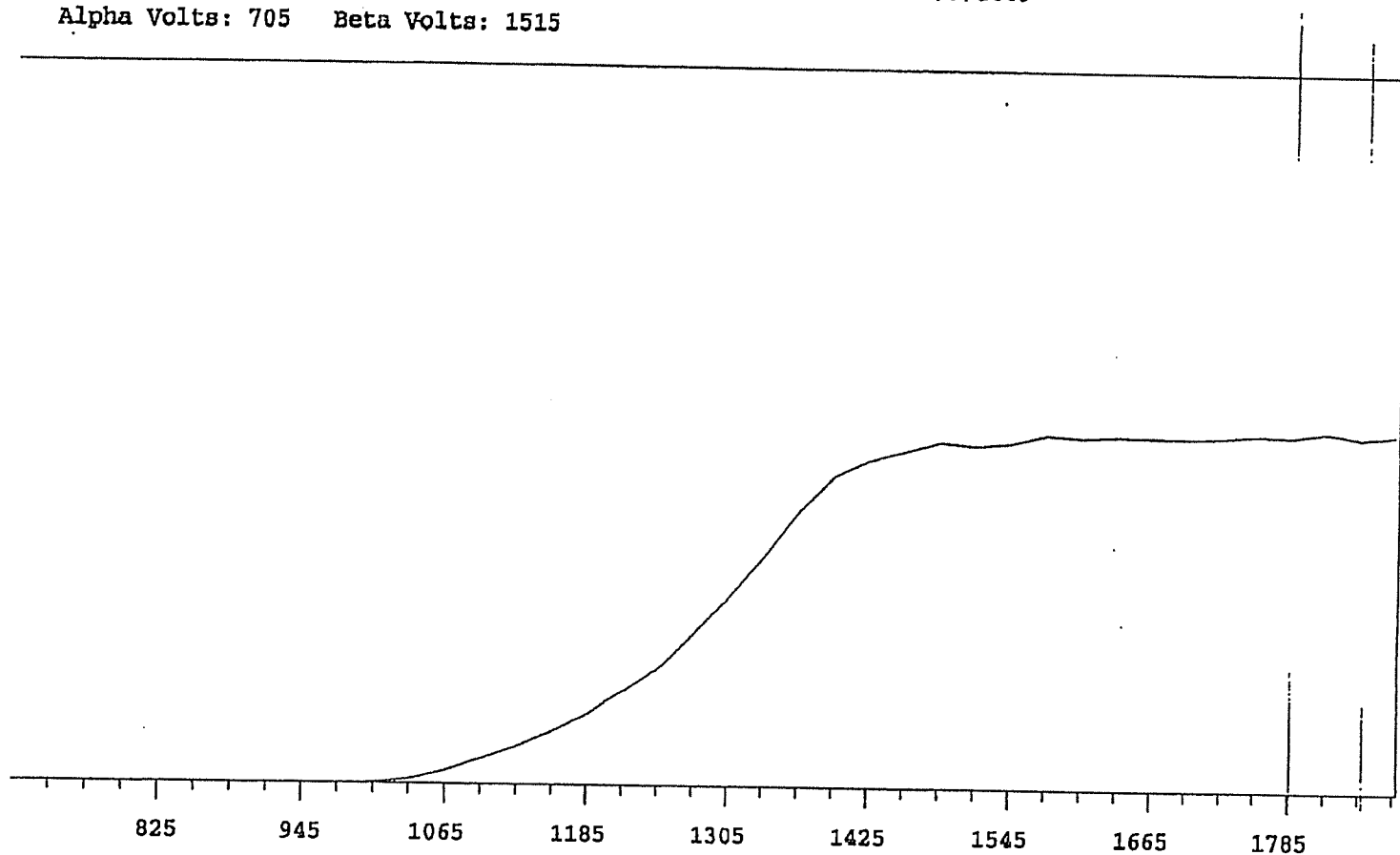


VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	9666	+64.39
735	0		1335	11722	+55.91
765	0		1365	13680	+44.91
795	0	>100	1395	15677	+31.56
825	0	>100	1425	16786	+19.46
855	0	>100	1455	17283	+10.57
885	0	>100	1485	17608	+5.95
915	1	>100	1515	17972	+3.32
945	0	>100	1545	18006	+1.84
975	4	>100	1575	17970	+1.58
1005	70	>100	1605	18104	+0.74
1035	257	>100	1635	18351	+0.24
1065	648	>100	1665	18016	+0.16
1095	1116	>100	1695	18080	-0.63
1125	1784	>100	1725	18283	+0.29
1155	2560	>100	1755	18047	-0.47
1185	3531	+96.11	1785	18110	-0.32
1215	4568	+89.22	1815	18040	+1.17
1245	6137	+81.65	1845	18200	
1275	7855	+74.42	1875	18320	

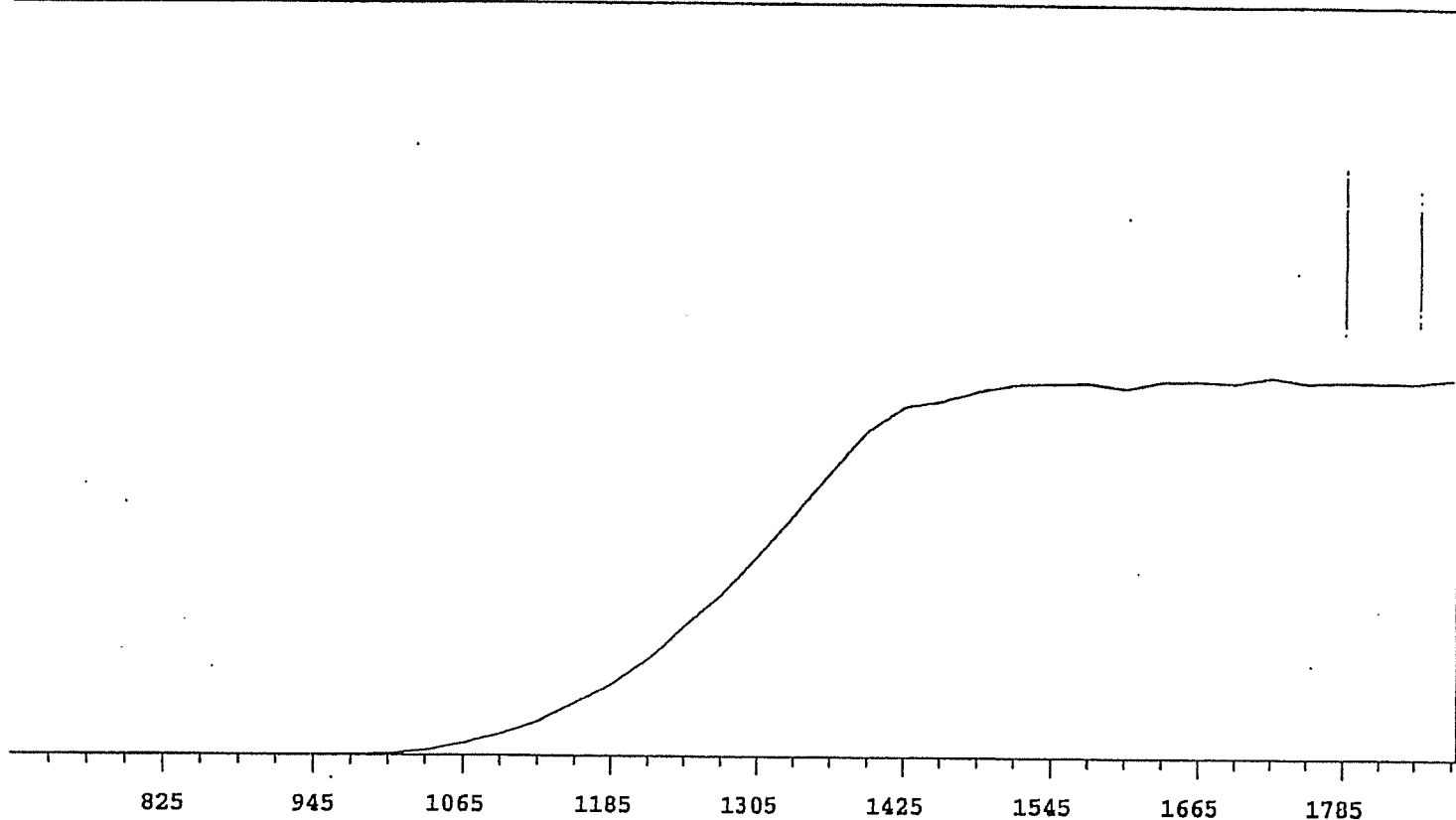
Plateau 7/1/09

Instrument 13 MPC 9604 Detector C 7/1/2009

Alpha Volts: 705 Beta Volts: 1515

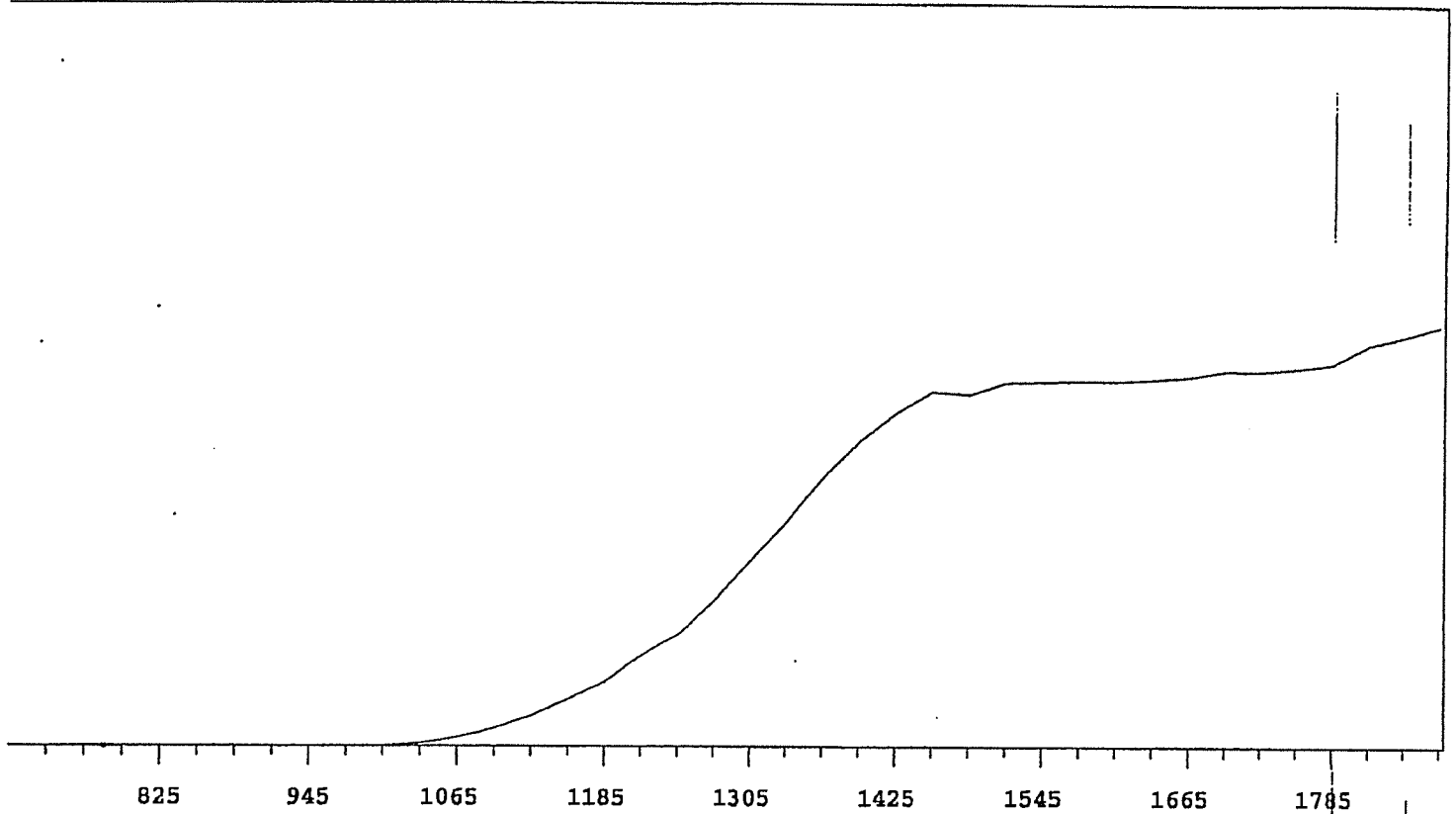


VOLTS	COUNTS	%/100 Volts
705	0	
735	0	
765	0	
795	0	>100
825	0	>100
855	0	>100
885	0	>100
915	0	>100
945	0	>100
975	9	>100
1005	93	>100
1035	325	>100
1065	834	>100
1095	1525	>100
1125	2318	>100
1155	3233	>100
1185	4357	+92.07
1215	5755	+85.64
1245	7438	+78.35
1275	9463	+70.89
1305	11573	+64.95
1335	13929	+56.47
1365	16726	+43.82
1395	18834	+29.38
1425	19743	+16.84
1455	20314	+7.95
1485	20860	+4.16
1515	20670	+3.23
1545	20844	+2.09
1575	21330	+2.48
1605	21188	+1.16
1635	21280	-0.32
1665	21237	+0.08
1695	21202	+0.42
1725	21254	+0.60
1755	21406	+1.41
1785	21326	+0.42
1815	21619	+0.16
1845	21282	
1875	21478	



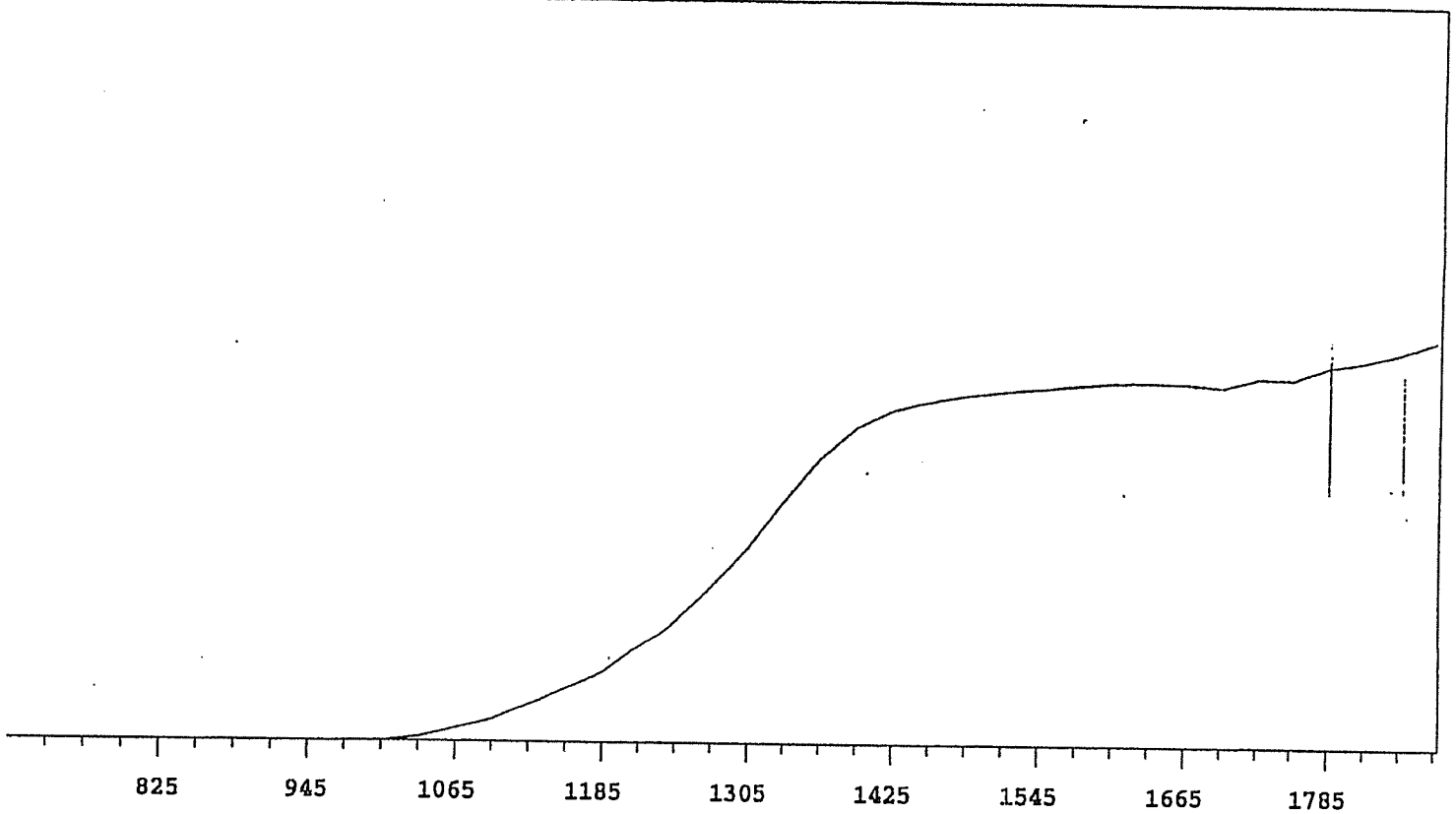
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	1		1305	7524	+61.93
735	0		1335	9002	+55.36
765	0		1365	10542	+44.70
795	0	>100	1395	12064	+31.21
825	0	>100	1425	12981	+19.20
855	0	>100	1455	13192	+10.41
885	0	>100	1485	13570	+5.93
915	0	>100	1515	13820	+4.08
945	0	>100	1545	13866	+0.75
975	9	>100	1575	13880	+0.21
1005	58	>100	1605	13695	+0.59
1035	228	>100	1635	13950	+0.77
1065	544	>100	1665	13954	+1.92
1095	936	>100	1695	13911	+0.19
1125	1468	>100	1725	14116	+0.02
1155	2110	>100	1755	13908	-0.24
1185	2770	+94.71	1785	13960	-0.81
1215	3670	+85.91	1815	13939	+0.71
1245	4937	+79.46	1845	13931	
1275	6066	+70.79	1875	14071	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector A 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



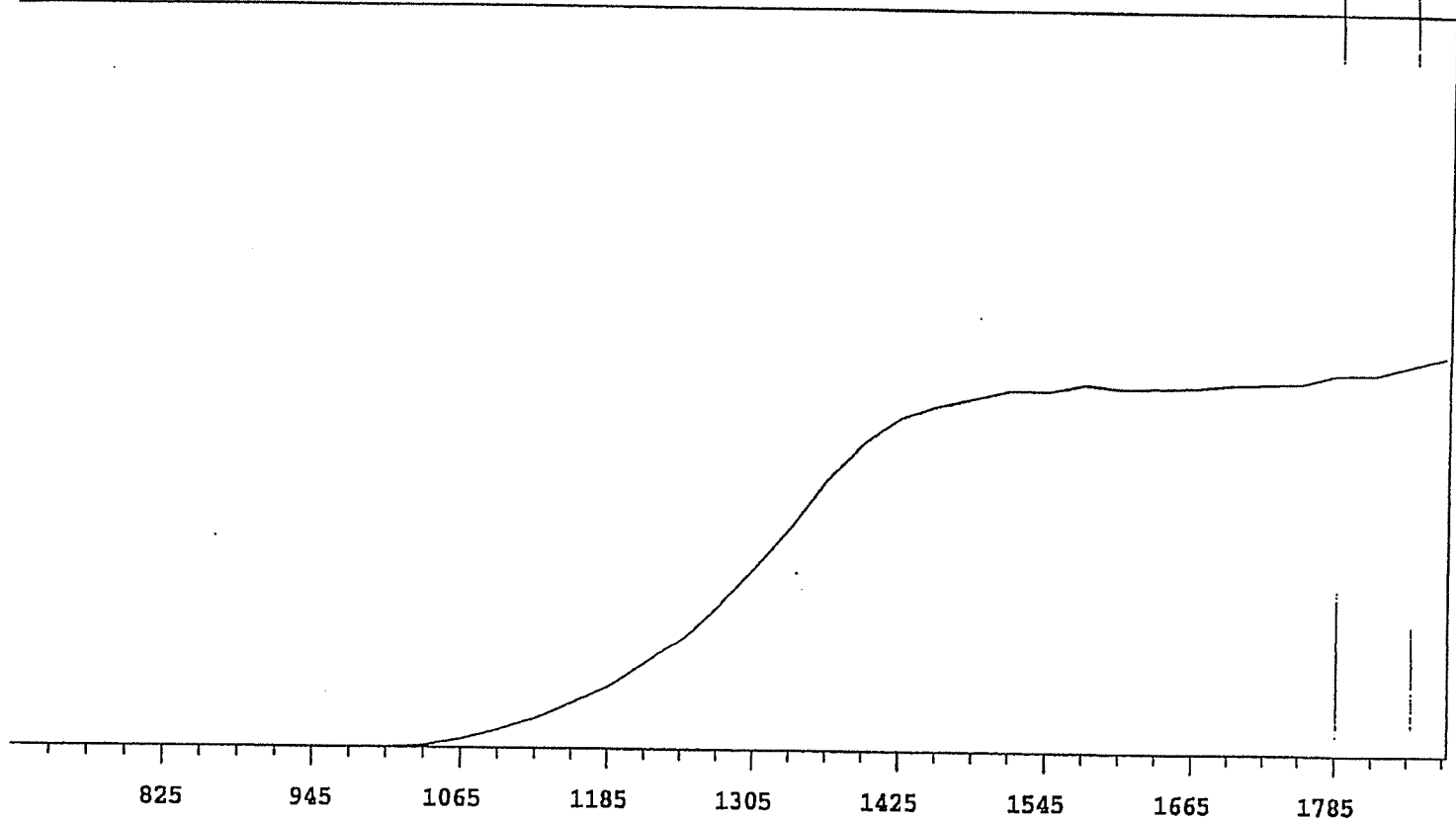
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8778	+67.49
735	0		1335	10502	+57.68
765	0		1365	12516	+46.36
795	0	>100	1395	14215	+35.88
825	0	>100	1425	15472	+22.01
855	0	>100	1455	16469	+12.99
885	1	+0.00	1485	16342	+6.70
915	0	>100	1515	16874	+3.07
945	0	>100	1545	16918	+2.53
975	0	>100	1575	16950	+0.58
1005	18	>100	1605	16943	+0.95
1035	137	>100	1635	17008	+2.13
1065	430	>100	1665	17130	+2.45
1095	865	>100	1695	17403	+2.43
1125	1444	>100	1725	17377	+2.43
1155	2151	>100	1755	17515	+4.88
1185	2981	>100	1785	17710	+7.54
1215	4168	+92.14	1815	18533	+9.04
1245	5377	+84.73	1845	18905	
1275	6924	+74.92	1875	19415	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector B 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



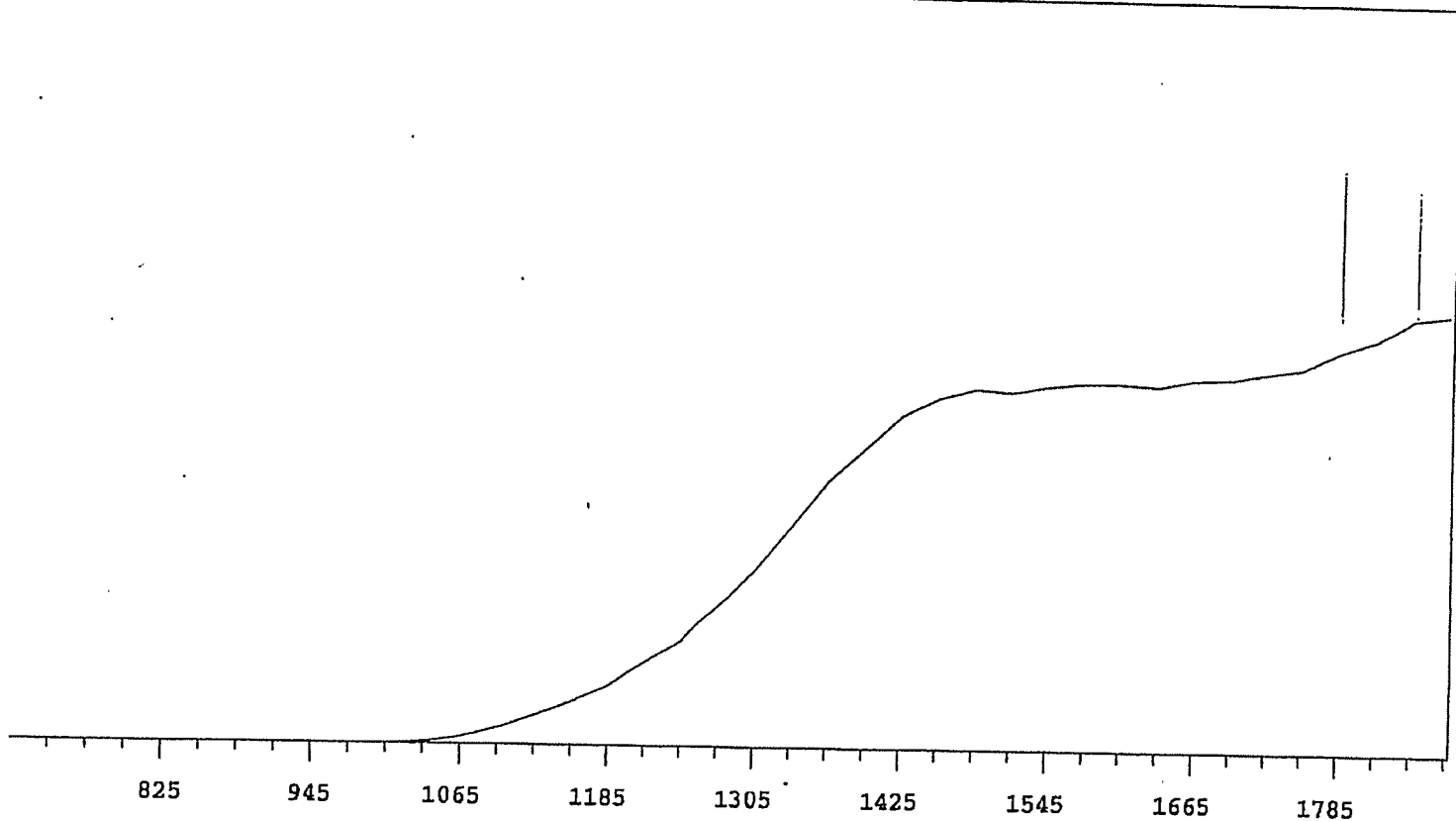
VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8797	+65.44
735	0		1335	10726	+54.47
765	0		1365	12570	+41.11
795	0	>100	1395	13917	+26.79
825	0	>100	1425	14687	+15.44
855	1	+0.00	1455	15048	+8.47
885	0	>100	1485	15318	+5.00
915	0	>100	1515	15494	+3.76
945	0	>100	1545	15606	+3.04
975	3	>100	1575	15776	+2.35
1005	40	>100	1605	15889	+1.44
1035	210	>100	1635	15907	-0.16
1065	590	>100	1665	15881	+0.64
1095	983	>100	1695	15741	+1.21
1125	1645	>100	1725	16124	+3.63
1155	2342	>100	1755	16076	+5.41
1185	3045	+96.43	1785	16588	+5.79
1215	4201	+90.42	1815	16830	+7.53
1245	5579	+83.64	1845	17185	
1275	7121	+74.44	1875	17682	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector C 7/1/2009
Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	10118	+69.76
735	0		1335	12269	+59.65
765	0		1365	14810	+47.35
795	0	>100	1395	16773	+33.46
825	0	>100	1425	18104	+20.13
855	0	>100	1455	18720	+11.98
885	1	+0.00	1485	19122	+6.50
915	0	>100	1515	19580	+4.77
945	0	>100	1545	19527	+2.48
975	2	>100	1575	19902	+0.81
1005	21	>100	1605	19690	+0.53
1035	132	>100	1635	19739	+0.23
1065	491	>100	1665	19765	+1.29
1095	1036	>100	1695	19932	+1.40
1125	1698	>100	1725	19976	+2.72
1155	2517	>100	1755	20051	+2.92
1185	3468	>100	1785	20523	+4.26
1215	4721	+91.83	1815	20542	+5.57
1245	6175	+85.13	1845	21035	
1275	8025	+76.82	1875	21528	

Plateau 7/1/09 Instrument 14 MPC 9604 Detector D 7/1/2009
 Alpha Volts: 705 Beta Volts: 1515



VOLTS	COUNTS	%/100 Volts	VOLTS	COUNTS	%/100 Volts
705	0		1305	8095	+71.16
735	0		1335	10052	+58.38
765	0		1365	11990	+47.92
795	0	>100	1395	13400	+35.01
825	0	>100	1425	14808	+23.58
855	0	>100	1455	15554	+13.45
885	0	>100	1485	15987	+6.39
915	0	>100	1515	15861	+3.45
945	0	>100	1545	16156	+2.18
975	1	>100	1575	16297	+1.72
1005	14	>100	1605	16297	+1.33
1035	130	>100	1635	16208	+1.62
1065	363	>100	1665	16526	+2.92
1095	785	>100	1695	16581	+3.94
1125	1357	>100	1725	16832	+5.91
1155	1996	>100	1755	17039	+8.68
1185	2735	+99.45	1785	17800	+11.53
1215	3785	+94.20	1815	18351	+11.46
1245	4857	+86.43	1845	19265	
1275	6571	+78.80	1875	19468	

Standardization of Strontium Carrier 2338630

v1.2.1

Analyst	BXF1

Standard Information	
Isotope	Strontium
Serial Number	2338630
Amount of Std. (mL)	1.0
Standard Prepared	11/25/2015

Parent Information	
Parent Serial #	2130145.4
Parent Exp. Date	11/25/2017

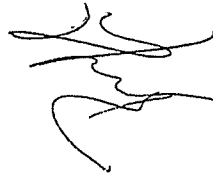
Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0200	0.0290	0.0478	0.0188	18.80	18.43
2	1.0500	0.0287	0.0474	0.0187	18.70	17.81
3	1.0200	0.0286	0.0472	0.0186	18.60	18.24
4	1.0100	0.0268	0.0454	0.0186	18.60	18.42

Mean Value (mg/mL) = 18.68
 Stdev (mg/mL) = ± 0.10
 1.0% of Mean Value = 0.186750
 Expiration Date 11/25/2016
 Pass
 Mean Value (mg/1.0mL) = 18.68

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

11-25-15



12.1.15

Standardization of Strontium Carrier 2370334

v1.2.1

Analyst	TC1

Standard Information	
Isotope	Strontium
Serial Number	2370334
Amount of Std. (mL)	1.0
Standard Prepared	2/23/2016

Parent Information	
Parent Serial #	2130145.4
Parent Exp. Date	11/25/2017

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0153	19.1705	19.1859	0.0154	15.40	15.17
2	1.0183	19.4966	19.5122	0.0156	15.60	15.32
3	1.0166	19.4284	19.4438	0.0154	15.40	15.15
4	1.0175	20.0355	20.0512	0.0157	15.70	15.43

Mean Value (mg/mL) = 15.53
 Stdev (mg/mL) = ± 0.15
 1.0% of Mean Value = 0.155250
 Pass

Expiration Date 2/23/2017

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

Mean Value (mg/1.0mL) = 15.53

Mean Value (mg/0.5 mL) = 7.76

Standardization Rule

Standardization of Yttrium Carrier 2354207

v1.2.1

Analyst	KSD1

Standard Information	
Isotope	Yttrium
Serial Number	2354207
Amount of Std. (mL)	1.0
Standard Prepared	1/12/2016

Parent Information	
Parent Serial #	2247023.2
Parent Exp. Date	9/18/2017

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Yttrium/mL	mg Yttrium/g
1	1.0334	0.0243	0.0561	0.0318	31.80	30.77
2	1.0327	0.0292	0.0610	0.0318	31.80	30.79
3	1.0322	0.0242	0.0559	0.0317	31.70	30.71
4	1.0311	0.0244	0.0562	0.0318	31.80	30.84

Mean Value (mg/mL) = 31.78
 Stdev (mg/mL) = ± 0.05
 1.0% of Mean Value = 0.317750
Pass
 Expiration Date 1/12/2017
 Mean Value (mg/1.0mL) = 31.78

Handwritten signature and date:
 1/12/16



Eckert & Ziegler
Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.ezag.com

CERTIFICATE OF CALIBRATION
Standard Reference Source

1758

101299

Sr-89 5 mL Liquid in Flame Sealed Vial

RECEIVED
R 9 11 15 D

Customer: GEL Laboratories, LLC
P.O. No.: GEL1511998, Item 9 Product Code: 8089

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
Sr-89	5.056E+01	2.042E+05	0.1	1.0	2.0	09/01/2015

*Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1%.
5.00976 g 0.1M HCl solution with approximately 30 $\mu\text{g/g}$ Sr carrier.

Source Prepared by:

Z. Dimitrova, Radiochemist

QC Approved:

J. S. Loh, Spectroscopist

Date: 28 April 15



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1758	Isotope:	Strontium-89 SPIKE
Prepared By:	Elizabeth Krouse	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCl	Prep Date:	11/18/2015
Reference Date:	09/01/2015	Verification Date:	11/18/2015
Ampoule Mass (g):	5.00976 g	Expiration Date:	05/10/2016
Uncertainty:	+/- 1 %	Primary Code:	1758-A
LogBook No:	GL-CED-297-051	Dilution(mL):	200 mL
		Mass of Parent(g):	4.9652 g
		Density(g/mL):	0.9999
		Balance ID:	C31514

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60715.1145 \text{ dpm/mL}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9999 \text{ g/mL}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60724.2231 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC

Version 1.0 9/18/2000

Verification for Sr-89 Standard 1758-A

v1.0.2

Instrument	Silver
Analyst	GXR1
Verification Prep Date	11/18/2015

Standard Information	
Isotope	Sr-89
Serial Number	1758-A
Isotope Half-life	50.5300 D
Reference Date	9/1/2015
Ref. Act. (DPM/mL)	60715.1145
Amount of Std. (mL)	0.1
Standard Prep Date	11/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	11/18/2015	91.00	2124.42	40.30
2	11/18/2015	92.00	2111.58	40.30
3	11/18/2015	91.90	2086.88	40.30

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2084.12	0.996898	20906.05	2090.60
2	2071.28	0.996898	20777.25	2077.72
3	2046.58	0.996898	20529.48	2052.95

Mean Value = 20737.59
 Stdev = 191.3905549
 Certificate Value* = 20826.5
 Two sigma = 382.781
 10 % of Mean = 2073.759
 Rule A (Pass/Fail) Pass
 % Recovery 99.57%
 Rule B (Pass/Fail) Pass
 Expiration Date 5/10/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-89 source 1758-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Sr-89 source standard verification. The Sr-89 efficiency calibration which was used for verification calculations was performed on 11/18/2015 using Sr-89 source 1733-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

11/19/15
 F. H. M. and C. D. H. 11/23/15

**General Engineering Laboratories
GFC Calibration Source Preparation Sheet**

Applicable SOP Number GL-RAD-A-004

Isotope Sr-89

Date Standards Prepared 2-11-16

Standard ID 1758-A

Matrix of Planchet/Filter Sr Carbonate on 25mm
0.45 mm filter

Amount Used (g or ml) 2.0

Standard Activity (DPM/g or mL) 60715.1145 *

Residue/Carrier Agent Sr Carrier 2338630

Reference Date 9/1/15

Pipette ID Used 1795419 / 2154115 / 1608465 DATE 2-11-16

Expiration Date 5/10/16

Balance ID Used 1113021618

* Not Decay Corrected

Separation Date/Time: AP 2/9/16

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	C ₁	0.1	0.0281	0.0298	1.7
	C ₂	0.2	0.0278	0.0314	3.6
	C ₃	0.3	0.0293	0.0342	4.9
	C ₄	0.4	0.0278	0.0348	7.0
	C ₅	0.5	0.0277	0.0366	8.9
	C ₆	0.6	0.0281	0.0389	10.8
	C ₇	0.7	0.0280	0.0402	12.2
	C ₈	0.8	0.0280	0.0420	14.0

Wt ✓

Prepared By: [Signature] Date 2-11-16

Reviewed By: [Signature] Date 3/29/16

Eckert & Ziegler

Analytics

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Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analyticsinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

1244

78351-278

Sr-90 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 2

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.691 E4
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
5.01862 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved: D. M. Montgomery QA Manager

Date: 10/3/08

End of Certificate

Corporate Office

Laboratory

RECEIVED
10/7/08

RC-S-048-125



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1244	Isotope:	Strontium-90
Prepared By:	Daniel Roy	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCL	Prep Date:	02/12/2013
Reference Date:	10/01/2008	Verification Date:	12/18/2015
Ampoule Mass (g):	5.01862 g	Expiration Date:	12/18/2016
Uncertainty:	+/- 1.7 %	Primary Code:	1244-A
LogBook No:	RC-S-048-125	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8346 g
		Density(g/mL):	0.9984
		Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21333.9626 \text{ dpm/mL}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9984 \text{ g/mL}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21367.7236 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1244-A

v1.0.2

Instrument	BLUE
Analyst	BXF1
Verification Prep Date	12/18/2015

Standard Information	
Isotope	Sr-90
Serial Number	1244-A
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	21333.9626
Amount of Std. (mL)	0.1
Standard Prep Date	12/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	12/30/2015	89.50	3662.91	39.80
2	12/30/2015	88.90	3722.59	39.80
3	12/30/2015	87.80	3696.36	39.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	3623.11	2.056010	17622.05	1762.20
2	3682.79	2.056010	17912.32	1791.23
3	3656.56	2.056010	17784.74	1778.47

dpm/mL
 17773.03
 145.489087
 Mean Value =
 Stdev =
 Certificate Value* = 17931.3
 Two sigma = 290.978
 10 % of Mean = 1777.303
 Rule A (Pass/Fail) Pass
 % Recovery 99.12%
 Rule B (Pass/Fail) Pass
 Expiration Date 12/18/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1244-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 12/18/2015 using Sr-90 source 1243-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

A = Ver. source cpm,
 B = BKG cpm,
 C = System efficiency (cpm/dpm), and
 D = volume used for standard verification.

RAD-M-001

12-30-15
 [Signature]
 11/5/16
 [Signature]

General Engineering Laboratories
GFC Calibration Source Preparation Sheet
Sr portion

Applicable SOP Number GL-RAD-A-004

Isotope Sr-90

Date Standards Prepared 2/19/16

Standard ID 1244-A

Matrix of Planchet/Filter Sr Carb. ppt on 25 mm 0.45 µm filter

Amount Used (g or ml) 0.5

Standard Activity (DPM/g or mL) 21333.9626 *

Residue/Carrier Agent Sr carrier 2338620 ^{0.5m = 9.2m}

Reference Date 10/1/08

Pipette ID Used 2154115

Expiration Date 12/18/16

Balance ID Used F30560

** Not Decay Corrected*

Separation Date/Time: 2/19/16 1415

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	S ₁	0.1	0.0271	0.0291	2.0
	S ₂	0.2	0.0276	0.0318	4.2
	S ₃	0.3	0.0276	0.0333	5.7
	S ₄	0.4	0.0276	0.0352	7.6
	S ₅	0.5	0.0280	0.0374	9.5
	S ₆	0.6	0.0286	0.0399	11.3
	S ₇	0.7	0.0287	0.0425	13.8
	AF 2/19/16 S ₈	0.8	0.0287	0.0441	15.4

9.4

wt ✓

ANL 2/25/16

Prepared By: [Signature] Date 2-18-16

Reviewed By: [Signature] Date 3/29/16

Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION

Standard Radionuclide Source

1244

78351-278

Sr-90 5 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 2

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.691 E4
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
5.01862 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved: D. M. Montgomery QA MGT
D. M. Montgomery, QA Manager

Date: 10/3/08

End of Certificate

Corporate Office

Laboratory

24937 Avenue Tibbitts, Valencia, California 91355

1380 Seaboard Industrial Blvd, Atlanta, Georgia 30318

RECEIVED
10/7/08

RC-5-048-125



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1244	Isotope:	Strontium-90
Prepared By:	Daniel Roy	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCL	Prep Date:	02/12/2013
Reference Date:	10/01/2008	Verification Date:	12/18/2015
Ampoule Mass (g):	5.01862 g	Expiration Date:	12/18/2016
Uncertainty:	+/- 1.7 %	Primary Code:	1244-A
LogBook No:	RC-S-048-125	Dilution(mL):	100 mL
		Mass of Parent(g):	4.8346 g
		Density(g/mL):	0.9984
		Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21333.9626 \text{ dpm/mL}$
$(4.8346 \text{ g}) * (36910 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9984 \text{ g/mL}) / (5.01862 \text{ g} * 100 \text{ mL}) = 21367.7236 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1244-A

v1.0.2

Instrument	BLUE
Analyst	BXF1
Verification Prep Date	12/18/2015

Isotope	Sr-90
Serial Number	1244-A
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	21333.9626
Amount of Std. (mL)	0.1
Standard Prep Date	12/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	12/30/2015	89.50	3662.91	39.80
2	12/30/2015	88.90	3722.59	39.80
3	12/30/2015	87.80	3696.36	39.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	3623.11	2.056010	17622.05	1762.20
2	3682.79	2.056010	17912.32	1791.23
3	3656.56	2.056010	17784.74	1778.47

dpm/mL
17773.03
145.489087

Mean Value =
Stddev =

Certificate Value* = 17931.3
Two sigma = 290.978
10 % of Mean = 1777.303
Rule A (Pass/Fail) Pass
% Recovery 99.12%
Rule B (Pass/Fail) Pass
Expiration Date 12/18/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1244-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 12/18/2015 using Sr-90 source 1243-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

5-15-12
12-21
Rett
Amenda-Fish 11/5/16

General Engineering Laboratories
GFC Calibration Source Preparation Sheet
YH portion

Applicable SOP Number GL-RAD-A-004

Isotope Sr-90 (Y-90)

Date Standards Prepared 2/19/16

Standard ID 1244-A

Matrix of Planchet/Filter Yttrium oxalate
Sr Carb ppt. on
25 mm 0.45 µm filter

Amount Used (g or ml) 0.5

Standard Activity (DPM/g or mL) 21333.9626 *

Residue/Carrier Agent 2354207 0.5 mL
Sr YH carrier = 15.89
mg

Reference Date 10/1/08

Pipette ID Used 2154115

Expiration Date 12/18/16

Balance ID Used F30560

*Not Decay Corrected

Separation Date/Time: 2/19/16 1325

	Standard Number	Residue Volume(mL)	Initial Wt. (g)	Final Wt. (g)	Net Wt. (mg)
	Y1	0.5	0.0288	0.0447	15.9
	Y2	0.5	0.0290	0.0454	16.4
	Y3	0.5	0.0290	0.0453	~~16.2~~ 16.3
	Y4	0.5	0.0294	0.0458	16.4
	Y5	0.5	0.0295	0.0453	~~15.7~~ 15.8
	Y6	0.5	0.0296	0.0453	~~15.8~~ 15.7
	Y7	0.5	0.0296	0.0457	16.1
	Y8	0.5	0.0296	0.0459	16.3

16.3

15.8

15.7

Δ 2/25/16

Prepared By: [Signature] Date 2-18-16

Reviewed By: [Signature] Date 3/29/16



Eckert & Ziegler
Analytics

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www.ezag.com

CERTIFICATE OF CALIBRATION
Standard Reference Source

1758

101299

Sr-89 5 mL Liquid in Flame Sealed Vial

RECEIVED
9/1/15

Customer: GEL Laboratories, LLC
P.O. No.: GEL1511998, Item 9 Product Code: 8089

This standard radionuclide source was prepared gravimetrically from a master solution, calibrated by Eckert & Ziegler Analytics. The master solution was calibrated by liquid scintillation counting. Radionuclide calibration and purity were checked by germanium gamma-ray spectrometry, liquid scintillation counting, and/or alpha spectrometry, as applicable. The nuclear decay rate and reference date for this source are given below. Eckert & Ziegler Analytics (EZA) maintains traceability to the National Institute of Standards and Technology through a Measurements Assurance Program as described in USNRC Regulatory Guide 4.15, Revision 2, July 2007, and compliance with ANSI N42.22-1995, "Traceability of Radioactive Sources to NIST."

Isotope	Half-Life, Days	Activity (Bq)	Uncertainty*, %			Reference Date (12:00 PM EST)
			u_A	u_B	U	
Sr-89	5.056E+01	2.042E+05	0.1	1.0	2.0	09/01/2015

*Uncertainty: U - Relative expanded uncertainty, $k = 2$. See NIST Technical Note 1297, "Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurement Results."

Comments:

Impurities: γ -impurities < 0.1%.
5.00976 g 0.1M HCl solution with approximately 30 $\mu\text{g/g}$ Sr carrier.

Source Prepared by:

Z. Dimitrova, Radiochemist

QC Approved:

J. S. Loh, Spectroscopist

Date: 28 April 15



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1758	Isotope:	Strontium-89 SPIKE
Prepared By:	Elizabeth Krouse	Prepared By:	Gregory Ramsay
Carrier Conc:	0.1M HCl	Prep Date:	11/18/2015
Reference Date:	09/01/2015	Verification Date:	11/18/2015
Ampoule Mass (g):	5.00976 g	Expiration Date:	05/10/2016
Uncertainty:	+/- 1 %	Primary Code:	1758-A
LogBook No:	GL-CED-297-051	Dilution(mL):	200 mL
		Mass of Parent(g):	4.9652 g
		Density(g/mL):	0.9999
		Balance ID:	C31514

Calculations Converting parent activity to dpm/mL/dpm/g

$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60715.1145 \text{ dpm/mL}$
$(4.9652 \text{ g}) * (204200 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9999 \text{ g/mL}) / (5.00976 \text{ g} * 200 \text{ mL}) = 60724.2231 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date

GEL Laboratories LLC

Version 1.0 9/18/2000

Verification for Sr-89 Standard 1758-A

v1.0.2

Instrument	Silver
Analyst	GXR1
Verification Prep Date	11/18/2015

Standard Information	
Isotope	Sr-89
Serial Number	1758-A
Isotope Half-life	50.5300 D
Reference Date	9/1/2015
Ref. Act. (DPM/mL)	60715.1145
Amount of Std. (mL)	0.1
Standard Prep Date	11/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	11/18/2015	91.00	2124.42	40.30
2	11/18/2015	92.00	2111.58	40.30
3	11/18/2015	91.90	2086.88	40.30

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	2084.12	0.996898	20906.05	2090.60
2	2071.28	0.996898	20777.25	2077.72
3	2046.58	0.996898	20529.48	2052.95

Mean Value = 20737.59
Stddev = 191.3905549

Certificate Value* = 20826.5
Two sigma = 382.781
10 % of Mean = 2073.759
Rule A (Pass/Fail) Pass
% Recovery 99.57%
Rule B (Pass/Fail) Pass
Expiration Date 5/10/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-89 source 1758-A by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCSilver for Sr-89 source standard verification. The Sr-89 efficiency calibration which was used for verification calculations was performed on 11/18/2015 using Sr-89 source 1733-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

11/19/15
F. Annand
11/23/15



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.
Atlanta, Georgia 30318
Tel 404-352-8677
Fax 404-352-2837
www.analytiscinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC
P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%
10.41484 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date:

10/3/08

RECEIVED



Standard Traceability Log Rad

Source Material Info		A Solution Material Info	
Parent Code:	1243	Isotope:	Strontium-90
Prepared By:	Daniel Roy	Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL	Prep Date:	12/19/2008
Reference Date:	10/01/2008	Verification Date:	12/18/2015
Ampoule Mass (g):	10.41484 g	Expiration Date:	12/18/2016
Uncertainty:	+/- .85 %	Primary Code:	1243-A
LogBook No:	RC-S-048-124	Dilution(mL):	100 mL
		Mass of Parent(g):	10.2164 g
		Density(g/mL):	0.9991
		Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)} * (\text{Parm Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (10.41484 \text{ g} * 100 \text{ mL}) = 226951.7634 \text{ dpm/mL}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9991 \text{ g/mL}) / (10.41484 \text{ g} * 100 \text{ mL}) = 227146.2010 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	03/26/2014	03/25/2015
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	03/26/2014	03/25/2015
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	03/19/2014	06/20/2014
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012

01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013
08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	01/15/2014	01/15/2015
12/04/2013	Gregory Ramsay	2.5347	1000	1243-L	575.747476 dpm/ml	12/04/2013	12/04/2014
08/11/2014	Gregory Ramsay	2.7006	1000	1243-M	613.431 dpm/mL	08/12/2014	08/12/2015
05/06/2015	Gregory Ramsay	2.5102	1000	1243-N	570.1824 dpm/mL	05/06/2015	05/06/2016
12/18/2015	Gregory Ramsay	2.5762	1000	1243-O	585.174 dpm/mL	12/18/2015	12/18/2016

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-N

v1.0.2

Instrument	Red
Analyst	BXF1
Verification Prep Date	5/6/2015

Standard Information	
Isotope	Sr-90
Serial Number	1243-N
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	570.1824
Amount of Std. (mL)	0.1
Standard Prep Date	5/6/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	5/6/2015	56.90	146.00	46.80
2	5/6/2015	56.20	142.60	46.80
3	5/6/2015	56.00	145.00	46.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	99.20	2.002163	495.46	49.55
2	95.80	2.002163	478.48	47.85
3	98.20	2.002163	490.47	49.05

dpm/mL
 488.14
 8.727454329
 Mean Value =
 Stdev =
 Certificate Value* = 486.8
 Two sigma = 17.455
 10 % of Mean = 48.814
 Rule A (Pass/Fail) Pass
 % Recovery 100.28%
 Rule B (Pass/Fail) Pass
 Expiration Date 5/6/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1243-N by transferring 0.1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecoscint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecoscint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCRed for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 5/6/2015 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

- A = Ver. source cpm,
- B = BKG cpm,
- C = System efficiency (cpm/dpm), and
- D = volume used for standard verification.

RAD-M-001

mms 6/16/15
 Amanda Jahn 5/26/15

Strontium 89/90 Queue Sheet

Instrument Ver.

02/26/16

Batch #: 1548017 Analyst: KSD1 First Client Due Date: Internal Due Date: 03/13/2016 2/26/16 Comments

Sr-89/90 Spike Code(s): 1753-A / 1243-A Expiration Date: 5-10-16/5-10-16 Vol(s): 0.2 / 0.5

Sr-89/90 LCS Code(s): 2370334 Exp Date: 2-23-17 Vol: 0.5 Sdt Wt: 7.76 Y Carrier Code: 13542207 Exp Date: 11/17/14 Vol: 0.5 Sdt Wt: 11.84

Prep Date: 2-26-16 Initials: AMF Pipet ID: 1785419 / 2154015 Balance #: 51204863 Analytical Scale #: 530500 Witness: NA

Sample ID	Client Description	Type	RDL	Date Collected	Matrix	Client	Rad	Pos #	Wet/Dry Aliquot (mL) or (g)	Det # 1 & 2	Initial Sr wt (g)	Final Sr wt (g)	Net Sr wt (mg)	Initial Y wt (g)	Final Y wt (g)	Net Y wt (mg)
1203497468-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			1	300	11A	0.0241	0.0347	7.6	0.0241	0.0347	15.9
1203497469-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			2	300	11B	0.0286	0.0300	7.4	0.0286	0.0300	15.2
1203497470-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			3	300	11C	0.0281	0.0357	7.0	0.0281	0.0357	15.2
1203497471-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			4	300	11D	0.0274	0.0318	7.4	0.0274	0.0318	15.5
1203497472-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			5	300	11A	0.0280	0.0300	7.4	0.0280	0.0300	15.8
1203497473-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			6	300	11B	0.0288	0.0316	4.8	0.0288	0.0316	16.2
1203497474-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			7	300	11C	0.0280	0.0314	4.8	0.0280	0.0314	14.5
1203497475-1	LCS for batch 1548017	LCS	2 pCi/L		GROUND WATEQC ACCOUNT			8	300	11D	0.0285	0.0320	4.5	0.0285	0.0320	15.4

11-3/26/16

GEL Laboratories LLC, Radiochemistry Division

Solid Sample Dissolution by: LEACH or DIGESTION

Data Reviewed By:

Circle One

Continuing Calibration Data

Gas Flow Proportional Counter Checks for 29-Jun-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100C1	Above	Alpha bkg	29-Jun 06:21	60	0.417	0.149	0.367	+4.35
LB4100C2	Above	Alpha bkg	29-Jun 07:25	60	0.317	-4.14E-2	0.367	+2.26
LB4100C4	Above	Beta bkg	29-Jun 07:25	60	2.050	0.686	2.113	+2.74
LB4100E3	Above	Beta bkg	29-Jun 06:02	60	2.883	0.401	2.311	+4.80
LB4100F1	Above	Alpha bkg	29-Jun 07:40	60	0.317	0.059	0.384	+1.76
LB4100F3	Above	Alpha bkg	29-Jun 06:02	60	0.383	-8.91E-2	0.322	+3.90
LB4100F3	Below	Alpha eff	29-Jun 07:25	5	18499	19270	21960	-4.72
LB4100F3	need 2nd	Beta bkg	29-Jun 06:02	60	1.500	0.579	1.652	+2.15
LB4100F4	need 2nd	Alpha bkg	29-Jun 06:02	60	0.233	0.013	0.357	+0.84
LB4100F4	Above	Beta bkg	29-Jun 06:02	60	2.350	1.327	2.176	+4.23
LB4100F4	Below	Beta eff	29-Jun 07:18	5	36959	37500	39290	-4.81
LB4100G1	Below	Alpha eff	29-Jun 07:18	5	6816	8145	10050	-7.19
LB4100G4	Above	Beta XTalk	29-Jun 07:48	5	2.57E-4	1.94E-5	2.50E-4	+3.17
LB4100H4	Below	Alpha eff	29-Jun 07:18	5	11450	11490	13890	-3.10
LB4100H4	Above	Alpha XTalk	29-Jun 07:18	5	0.383	0.307	0.379	+3.34
LB4100H4	Below	Beta eff	29-Jun 07:24	5	34895	35210	36600	-4.36
LB4100I2	Above	Beta bkg	29-Jun 06:02	60	2.067	0.408	2.304	+2.25
LB4100I3	need 2nd	Alpha bkg	29-Jun 06:02	60	0.167	-4.11E-2	0.337	+0.30
LB4100I3	Above	Beta bkg	29-Jun 06:02	60	2.500	0.091	2.093	+4.22
LB4100J2	Below	Alpha eff	29-Jun 07:32	5	9625	9684	10310	-3.57
LB4100J2	Above	Alpha XTalk	29-Jun 07:32	5	0.170	0.134	0.168	+3.31
LB4100J3	Below	Beta eff	29-Jun 07:11	5	19951	20130	22000	-3.57
PIC1A	Above	Alpha bkg	29-Jun 06:29	60	0.417	-3.73E-2	0.349	+4.04
PIC1A	Below	Alpha eff	29-Jun 06:15	5	10411	10450	10850	-3.58
PIC1A	need 2nd	Beta XTalk	29-Jun 06:22	5	8.13E-4	1.90E-4	9.28E-4	+2.07
PIC1C	Above	Alpha bkg	29-Jun 07:44	60	0.417	0.013	0.373	+3.72
PIC1C	need 2nd	Beta bkg	29-Jun 07:44	60	1.450	-1.72E-1	2.166	+1.16
PIC3A	Above	Beta bkg	29-Jun 06:30	60	5.433	-1.30E-1	1.970	+12.89

PIC4A	Below	Alpha eff	29-Jun 07:46	5	10400	10430	11040	-3.29
PIC5A	Below	Beta eff	29-Jun 10:51	5	16781	16810	17690	-3.20
PIC5B	Above	Alpha bkg	29-Jun 06:42	60	0.817	-3.15E-2	0.362	+9.94
PIC6C	Above	Alpha bkg	29-Jun 06:45	60	0.583	-1.21E-2	0.376	+6.20
PIC7A	Above	Alpha bkg	29-Jun 07:49	60	0.317	0.020	0.372	+2.06
PIC8A	Above	Alpha bkg	29-Jun 09:47	60	0.333	0.050	0.372	+2.28
PIC8C	Above	Alpha bkg	29-Jun 07:50	60	0.317	0.079	0.379	+1.76
PIC9A	Above	Alpha bkg	29-Jun 08:08	60	0.317	-3.92E-2	0.376	+2.14
PIC10D	Above	Alpha eff	29-Jun 06:44	5	15874	12350	14940	+5.16
PIC11D	Above	Alpha bkg	29-Jun 08:12	60	0.433	-6.39E-2	0.347	+4.26
PIC11D	Above	Beta bkg	29-Jun 08:12	60	1.867	-2.09E-1	1.714	+3.48
PIC12A	Above	Alpha bkg	29-Jun 07:06	60	0.417	0.069	0.375	+3.81
PIC12B	need 2nd	Alpha bkg	29-Jun 07:06	60	0.283	0.015	0.358	+1.69
PIC12C	Above	Alpha bkg	29-Jun 08:12	60	0.417	-8.91E-2	0.437	+2.76
PIC13A	Above	Alpha bkg	29-Jun 07:28	60	0.467	-4.45E-2	0.391	+4.04
PIC13B	Above	Alpha bkg	29-Jun 07:28	60	0.350	-5.05E-2	0.410	+2.21
PIC14B	Below	Alpha eff	29-Jun 06:06	5	8525	8786	10030	-4.26
PIC14B	Above	Alpha XTalk	29-Jun 06:06	5	0.406	0.242	0.396	+3.39
PIC14B	Below	Beta eff	29-Jun 06:13	5	19402	21030	22930	-8.14
PIC14D	Above	Alpha bkg	29-Jun 06:21	60	0.433	-3.96E-2	0.348	+4.32

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by R. Brink Haunver

Date 6/29/14

GEL Laboratories LLC

Gas Flow Proportional Counter Checks for 02-Jul-2016

Detectors LB4100 A1 through J4 and PIC 1A through 14D

Short Name	Status	Parmname	Run Time	Count Time	CPM or dec	Low Limit	High Limit	Stdev
LB4100A1	need 2nd	Beta eff	02-Jul 11:30	5	20086	20070	22530	-2.96
LB4100A2	Above	Beta XTalk	02-Jul 11:30	5	4.67E-4	8.92E-5	4.42E-4	+3.43
LB4100A3	need 2nd	Beta eff	02-Jul 11:30	5	21132	20160	23380	-1.19
LB4100B1	need 2nd	Beta eff	02-Jul 11:30	5	54602	52540	59460	-1.21
LB4100B1	need 2nd	Beta XTalk	02-Jul 11:30	5	1.39E-4	4.07E-5	2.74E-4	-0.47
LB4100B3	need 2nd	Beta eff	02-Jul 11:30	5	27755	24000	30030	+0.74
LB4100B4	need 2nd	Beta eff	02-Jul 11:30	5	39927	37790	41960	+0.07
LB4100C1	Above	Alpha bkg	02-Jul 11:40	60	0.400	0.149	0.367	+3.89
LB4100C1	Above	Beta bkg	02-Jul 11:40	60	2.033	0.933	2.060	+2.86
LB4100C2	need 2nd	Alpha eff	02-Jul 11:30	5	12500	11140	13710	+0.17
LB4100C3	need 2nd	Alpha eff	02-Jul 11:30	5	7457	6624	9128	-1.00
LB4100C4	Above	Alpha bkg	02-Jul 11:40	60	0.317	4.08E-6	0.304	+3.25
LB4100C4	need 2nd	Alpha eff	02-Jul 11:30	5	6774	5350	8599	-0.37
LB4100C4	Above	Beta bkg	02-Jul 11:40	60	2.083	0.686	2.113	+2.88
LB4100E1	need 2nd	Beta eff	02-Jul 11:10	5	17349	16610	18550	-0.71
LB4100E1	need 2nd	Beta XTalk	02-Jul 11:10	5	3.69E-4	1.60E-4	6.05E-4	-0.18
LB4100E2	need 2nd	Alpha eff	02-Jul 11:01	5	7827	7596	9779	-2.37
LB4100E3	need 2nd	Alpha eff	02-Jul 11:01	5	9414	8692	10210	-0.14
LB4100E3	Above	Beta bkg	01-Jul 16:22	500	2.250	0.401	2.311	+2.81
LB4100E3	need 2nd	Beta eff	02-Jul 11:10	5	17962	17150	18300	+1.24
LB4100E4	need 2nd	Alpha eff	02-Jul 11:01	5	10742	9787	11560	+0.23
LB4100E4	need 2nd	Beta eff	02-Jul 11:10	5	20860	19140	21790	+0.89
LB4100F1	need 2nd	Beta eff	02-Jul 11:10	5	46843	45650	49940	-1.33
LB4100F1	need 2nd	Beta XTalk	02-Jul 11:10	5	1.41E-4	6.29E-5	2.21E-4	-0.04
LB4100F2	need 2nd	Alpha bkg	01-Jul 16:22	500	0.298	-2.07E-2	0.377	+1.81
LB4100F2	need 2nd	Alpha eff	02-Jul 11:01	5	6699	5801	7273	+0.66
LB4100F2	need 2nd	Beta XTalk	02-Jul 11:10	5	5.24E-4	1.84E-4	5.94E-4	+1.98
LB4100F3	need 2nd	Alpha bkg	01-Jul 16:22	500	0.300	-8.91E-2	0.322	+2.68
LB4100F3	Below	Alpha eff	02-Jul 11:01	5	18191	19270	21960	-5.41
LB4100F3	need 2nd	Beta bkg	01-Jul 16:22	500	1.642	0.579	1.652	+2.94

LB4100F3	need 2nd	Beta eff	02-Jul 11:10	5	28038	26950	30280	-1.04
LB4100F3	need 2nd	Beta XTalk	02-Jul 11:10	5	2.61E-4	4.67E-5	3.10E-4	+1.89
LB4100F4	Above	Alpha bkg	01-Jul 16:22	500	0.342	0.013	0.357	+2.74
LB4100F4	need 2nd	Alpha eff	02-Jul 11:01	5	9852	9205	11850	-1.53
LB4100F4	Above	Beta bkg	01-Jul 16:22	500	2.172	1.327	2.176	+2.97
LB4100F4	Below	Beta eff	02-Jul 11:10	5	36924	37500	39290	-4.93
LB4100G1	Below	Alpha eff	02-Jul 11:10	5	6410	8145	10050	-8.46
LB4100G1	need 2nd	Beta eff	02-Jul 11:02	5	16678	15800	18390	-0.97
LB4100G2	need 2nd	Alpha eff	02-Jul 11:10	5	10335	8561	11120	+1.16
LB4100G2	need 2nd	Beta eff	02-Jul 11:02	5	18413	18100	19640	-1.78
LB4100G3	need 2nd	Alpha eff	02-Jul 11:10	5	8153	7198	8415	+1.71
LB4100G3	need 2nd	Beta eff	02-Jul 11:02	5	22645	22070	24390	-1.51
LB4100G4	need 2nd	Alpha eff	02-Jul 11:10	5	10274	9650	11250	-0.66
LB4100G4	need 2nd	Beta eff	02-Jul 11:02	5	19907	19900	22500	-2.98
LB4100H1	need 2nd	Beta eff	02-Jul 11:02	5	44133	43300	45640	-0.86
LB4100H1	need 2nd	Beta XTalk	02-Jul 11:02	5	1.45E-4	7.04E-5	2.26E-4	-0.13
LB4100H2	need 2nd	Alpha eff	02-Jul 11:10	5	9103	9015	9809	-2.34
LB4100H3	need 2nd	Alpha eff	02-Jul 11:10	5	19912	18430	20870	+0.64
LB4100H3	need 2nd	Beta eff	02-Jul 11:02	5	22107	21460	22580	+0.46
LB4100H4	need 2nd	Alpha eff	02-Jul 11:10	5	11695	11490	13890	-2.49
LB4100H4	Below	Beta eff	02-Jul 11:02	5	34957	35210	36600	-4.09
LB4100I1	Above	Beta eff	02-Jul 10:50	5	42661	15940	16950	+155.74
LB4100I1	need 2nd	Beta XTalk	02-Jul 10:50	5	1.59E-4	1.30E-4	6.09E-4	-2.63
LB4100I2	need 2nd	Alpha eff	02-Jul 10:32	5	14485	13970	15220	-0.53
LB4100I3	need 2nd	Alpha eff	02-Jul 10:32	5	10728	10360	11260	-0.55
LB4100I3	need 2nd	Alpha XTalk	02-Jul 10:32	5	0.189	0.143	0.193	+2.49
LB4100I3	Above	Beta eff	02-Jul 10:50	5	20970	17160	17920	+27.08
LB4100I4	need 2nd	Alpha eff	02-Jul 10:32	5	11818	11220	11930	+2.05
LB4100I4	Above	Beta eff	02-Jul 10:50	5	35183	19960	21350	+62.71
LB4100J1	Below	Beta eff	02-Jul 10:50	5	16605	41970	44720	-58.34
LB4100J1	Above	Beta XTalk	02-Jul 10:50	5	3.37E-4	4.49E-5	2.75E-4	+4.62
LB4100J2	need 2nd	Alpha eff	02-Jul 10:32	5	9696	9684	10310	-2.89
LB4100J2	Above	Alpha XTalk	02-Jul 10:32	5	0.170	0.134	0.168	+3.31
LB4100J3	need 2nd	Alpha eff	02-Jul 10:32	5	21887	21310	22650	-0.42
LB4100J3	Below	Beta eff	02-Jul 10:50	5	16551	20130	22000	-14.48
LB4100J3	need 2nd	Beta XTalk	02-Jul 10:50	5	2.42E-4	5.85E-5	3.40E-4	+0.90

LB4100J4	need 2nd	Alpha eff	02-Jul 10:32	5	17939	17450	18830	-0.87
LB4100J4	Below	Beta eff	02-Jul 10:50	5	19710	33170	35930	-32.26
PIC1A	Above	Beta XTalk	02-Jul 09:04	5	0.001	1.90E-4	9.28E-4	+3.96
PIC1C	Above	Alpha bkg	02-Jul 09:14	60	0.367	0.013	0.373	+2.89
PIC1C	Above	Beta bkg	02-Jul 09:14	60	2.667	-1.72E-1	2.166	+4.29
PIC1D	Above	Alpha XTalk	02-Jul 08:44	5	0.266	0.250	0.266	+3.19
PIC2C	Above	Alpha eff	02-Jul 08:45	5	22258	19710	21880	+4.04
PIC3A	Above	Beta bkg	01-Jul 16:59	500	4.202	-1.30E-1	1.970	+9.38
PIC3C	Below	Alpha eff	02-Jul 09:05	5	9755	9769	10410	-3.13
PIC4A	Below	Alpha eff	02-Jul 09:05	5	10388	10430	11040	-3.42
PIC5A	Below	Beta eff	02-Jul 09:19	5	16713	16810	17690	-3.66
PIC5B	Above	Alpha bkg	01-Jul 16:21	500	0.312	-3.15E-2	0.362	+2.24
PIC5C	Below	Alpha eff	02-Jul 09:11	5	10206	10250	10610	-3.74
PIC5D	Below	Alpha eff	02-Jul 09:11	5	10818	10870	11550	-3.46
PIC5D	need 2nd	Alpha XTalk	02-Jul 09:11	5	0.263	0.251	0.269	+1.11
PIC6B	Above	Beta bkg	01-Jul 16:21	500	3.618	-3.24E-2	2.184	+6.88
PIC6C	Above	Alpha bkg	01-Jul 16:21	500	0.304	-1.21E-2	0.376	+1.88
PIC10D	Above	Alpha eff	02-Jul 09:29	5	15874	12350	14940	+5.16
PIC12A	need 2nd	Alpha bkg	02-Jul 09:52	60	0.267	0.069	0.375	+0.87
PIC12A	need 2nd	Alpha eff	02-Jul 09:40	5	10594	10520	11150	-2.30
PIC12B	Above	Alpha bkg	01-Jul 16:23	500	0.414	0.015	0.358	+3.98
PIC12C	Above	Alpha bkg	02-Jul 09:52	60	0.333	-8.91E-2	0.437	+1.82
PIC13B	Above	Alpha bkg	02-Jul 10:15	60	0.400	-5.05E-2	0.410	+2.87
PIC14B	Below	Alpha eff	02-Jul 09:49	5	8685	8786	10030	-3.49
PIC14B	Below	Beta eff	02-Jul 09:57	5	20243	21030	22930	-5.48
PIC14C	Below	Beta eff	02-Jul 09:57	5	26335	26380	27180	-3.34
PIC14D	Above	Alpha bkg	01-Jul 16:23	1000	0.336	-3.96E-2	0.348	+2.81

INSTRUMENTS NOT LISTED HAVE PASSED ALL QUALITY ASSURANCE PARAMETERS

The following detectors may not have properly transferred to the LIMS system

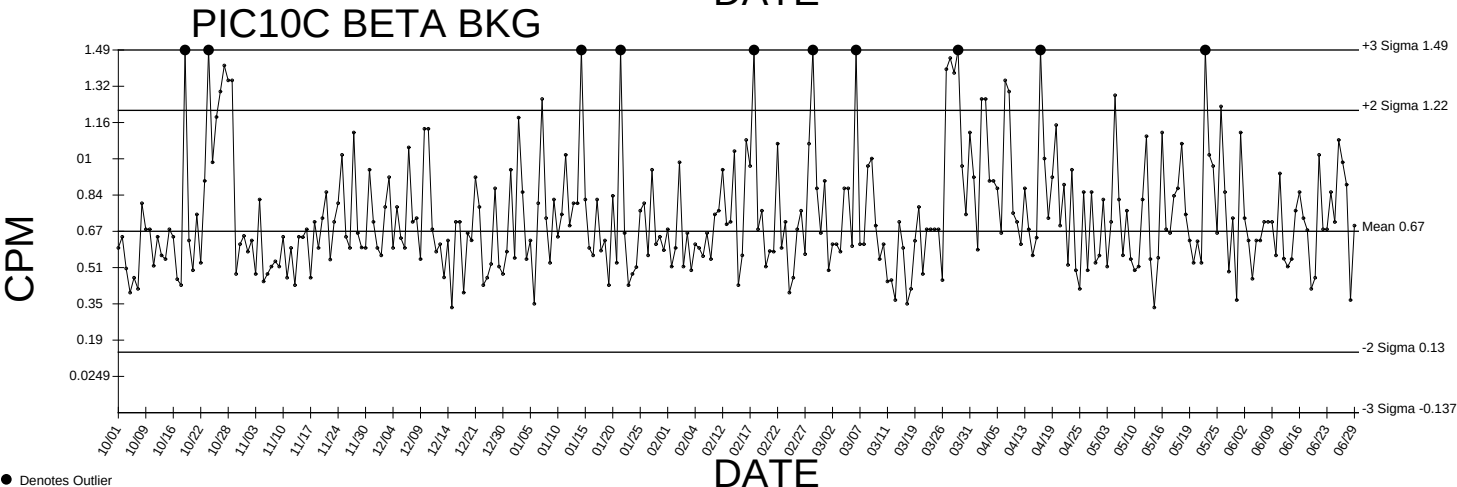
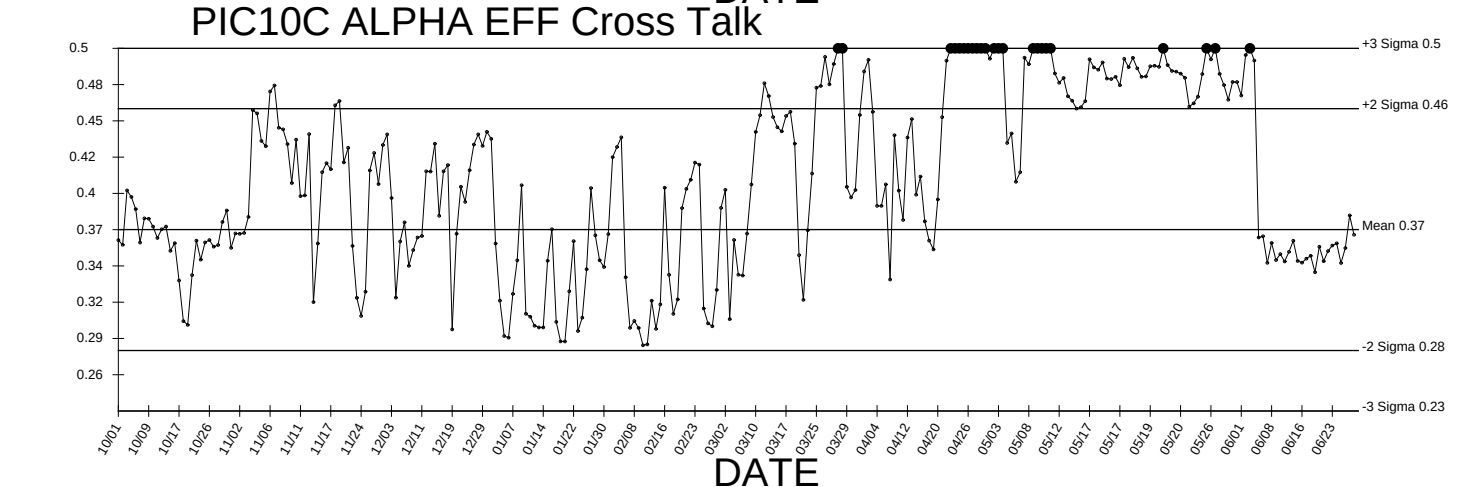
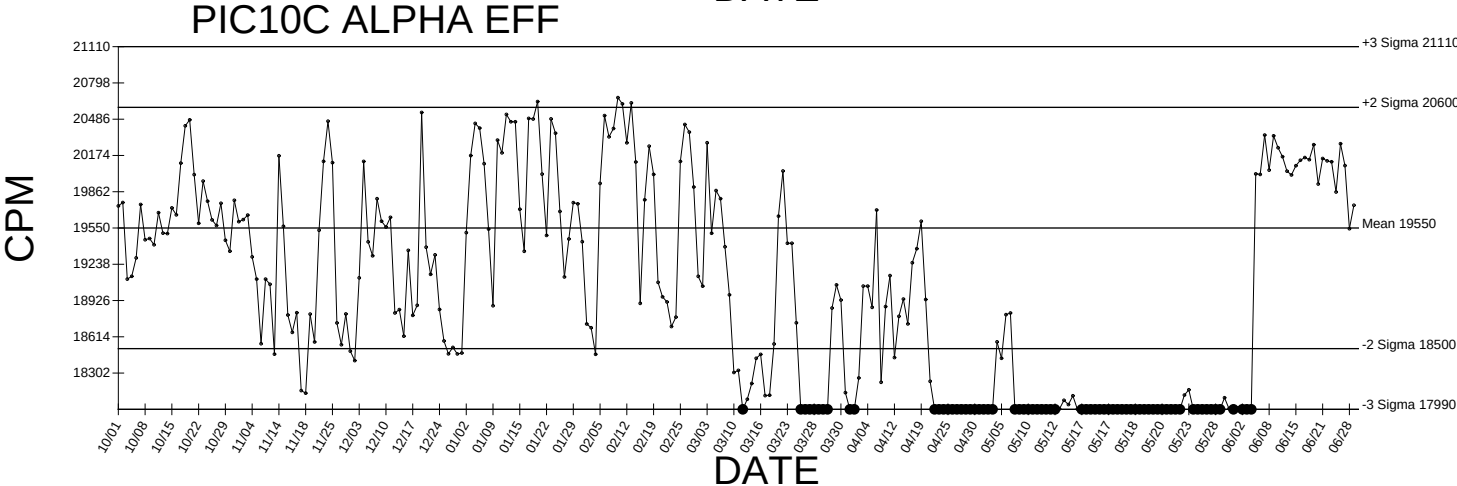
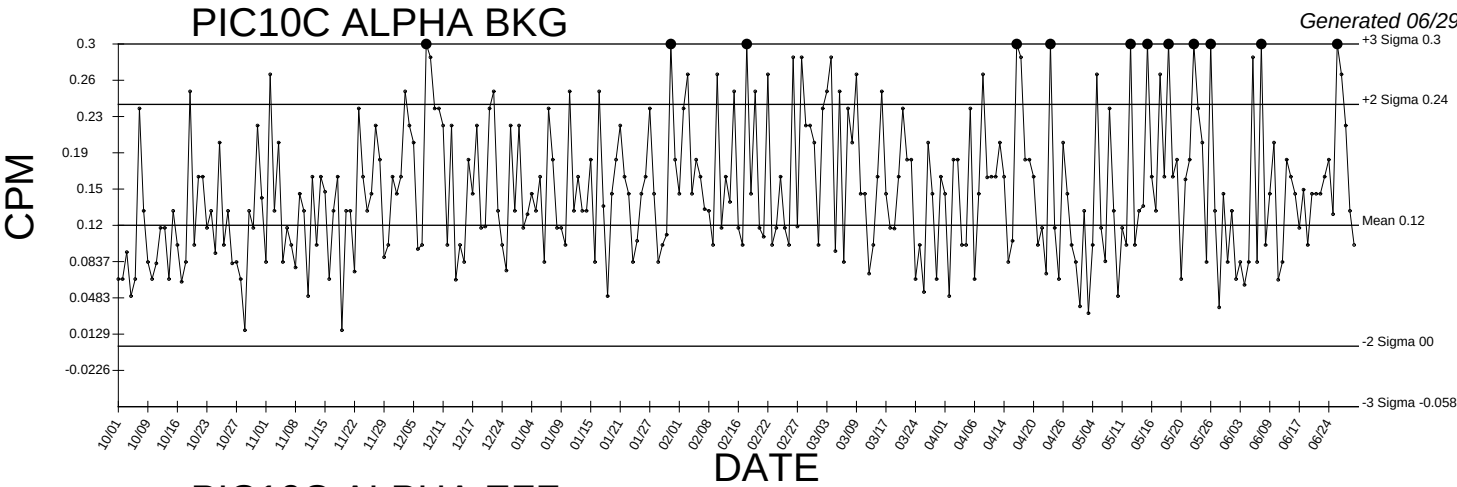
LB4100D1	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D2	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D3	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
LB4100D4	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC6D	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk
PIC13C	Alpha bkg, Alpha eff, Alpha XTalk, Beta bkg, Beta eff, Beta XTalk

Reviewed by KWet

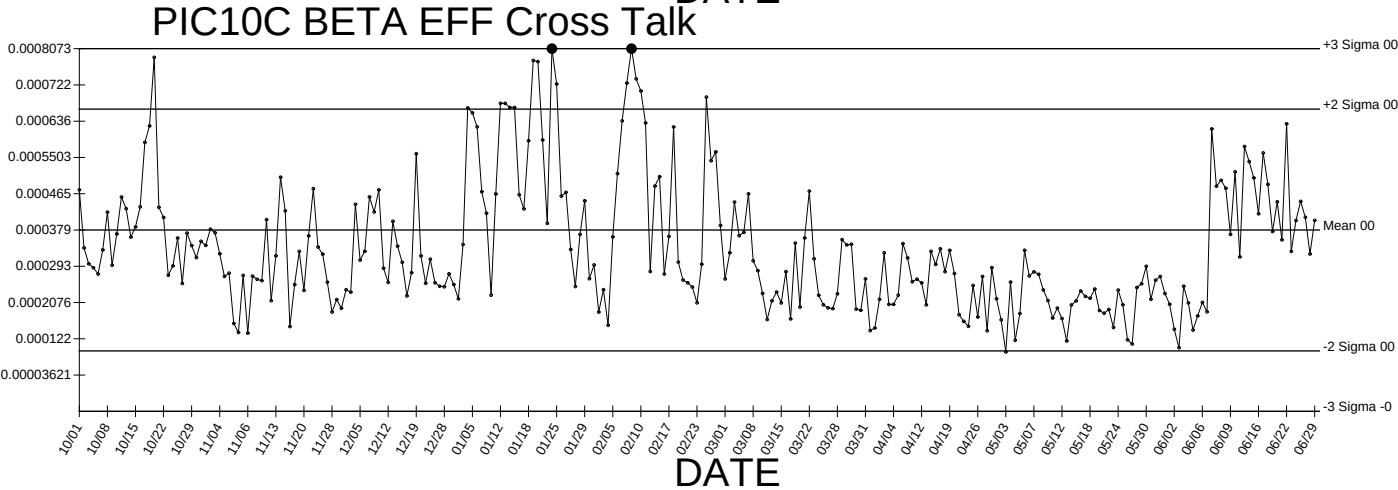
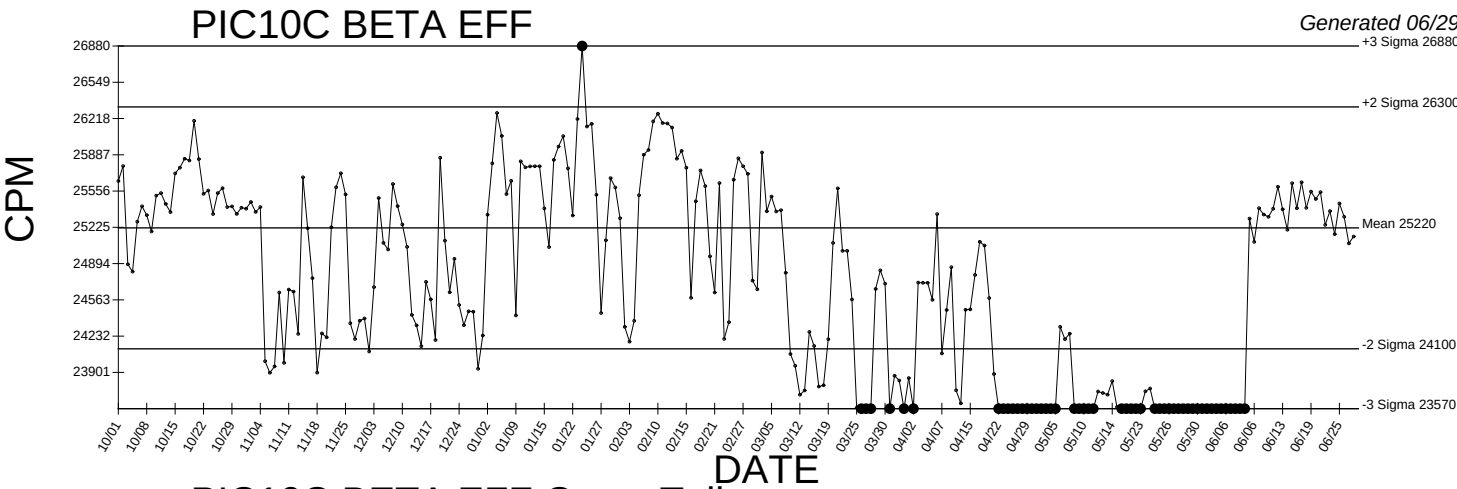
Date 7/5/16

GEL Laboratories LLC

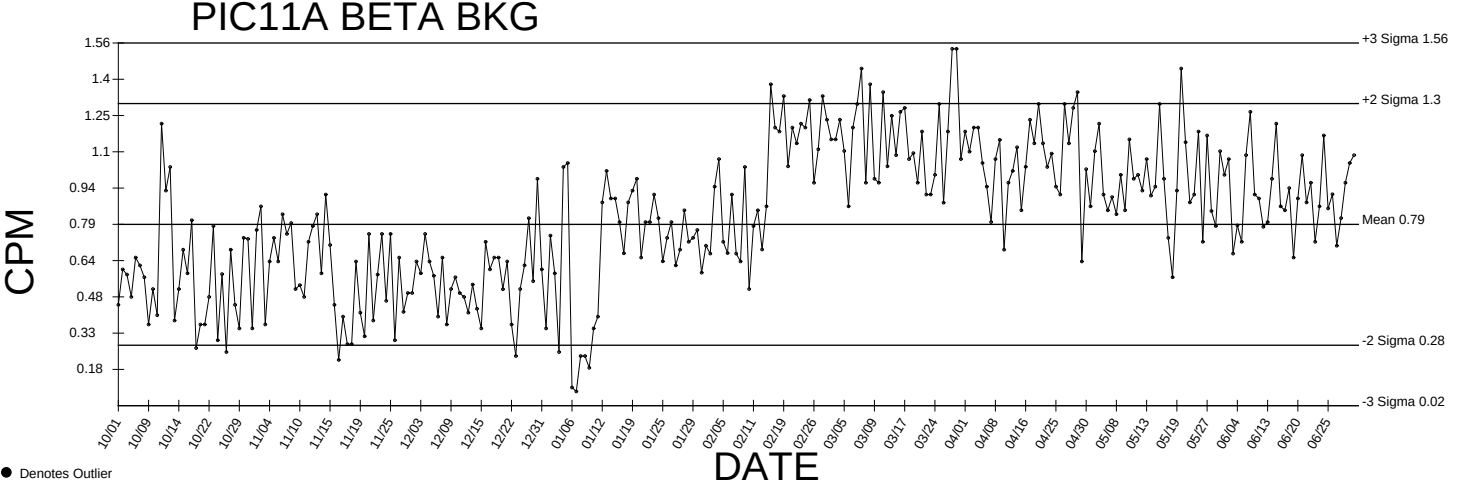
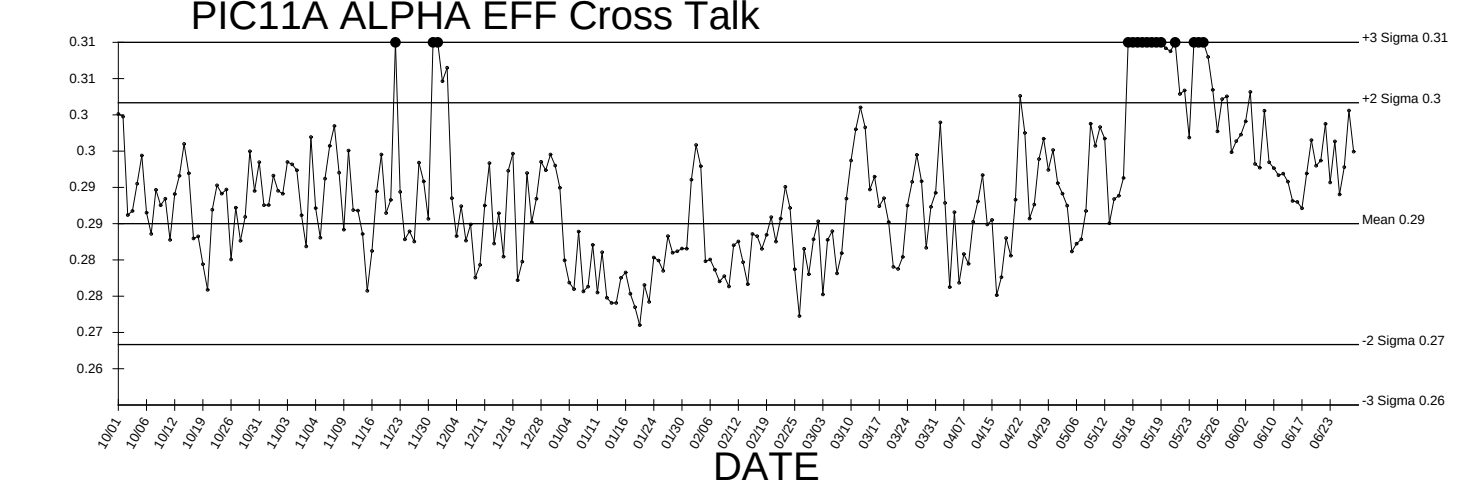
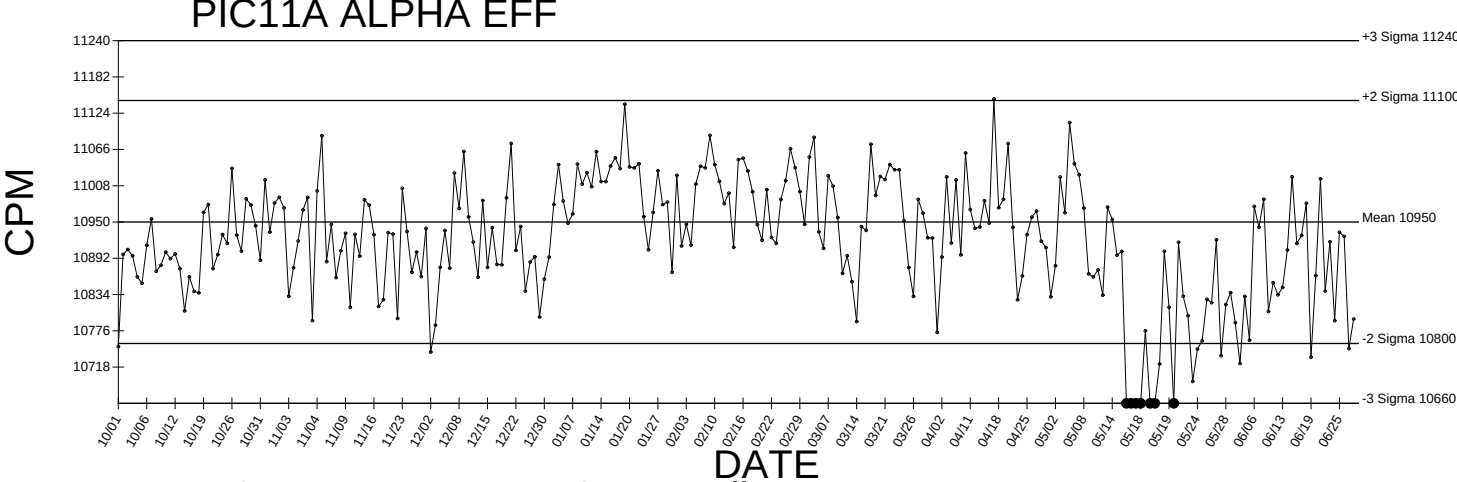
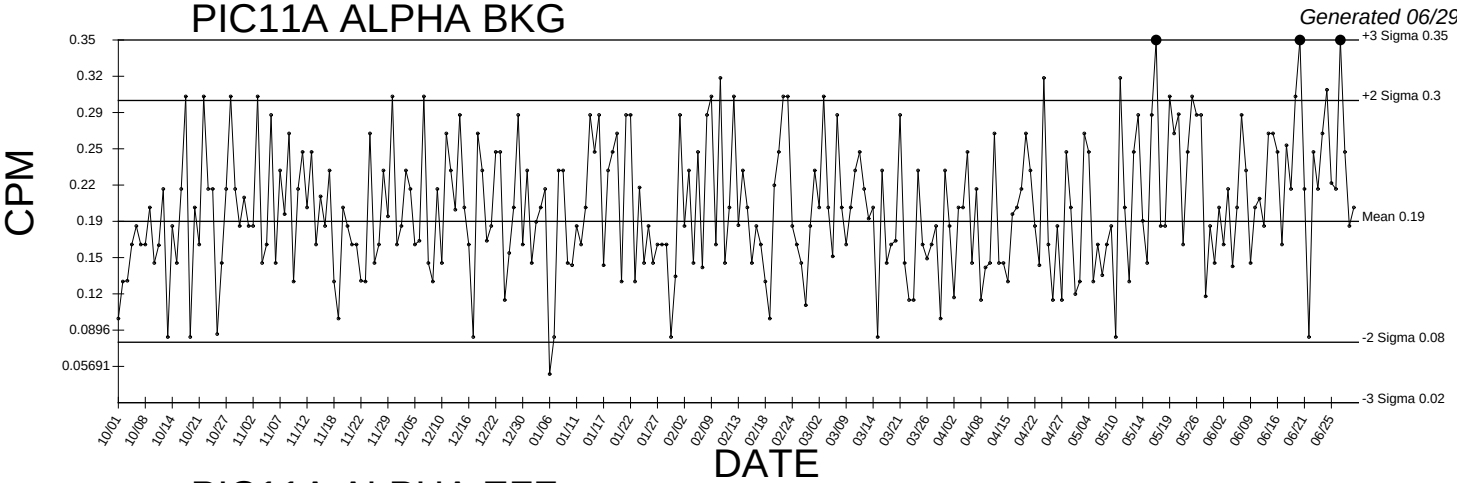
Background and Efficiency Data



● Denotes Outlier



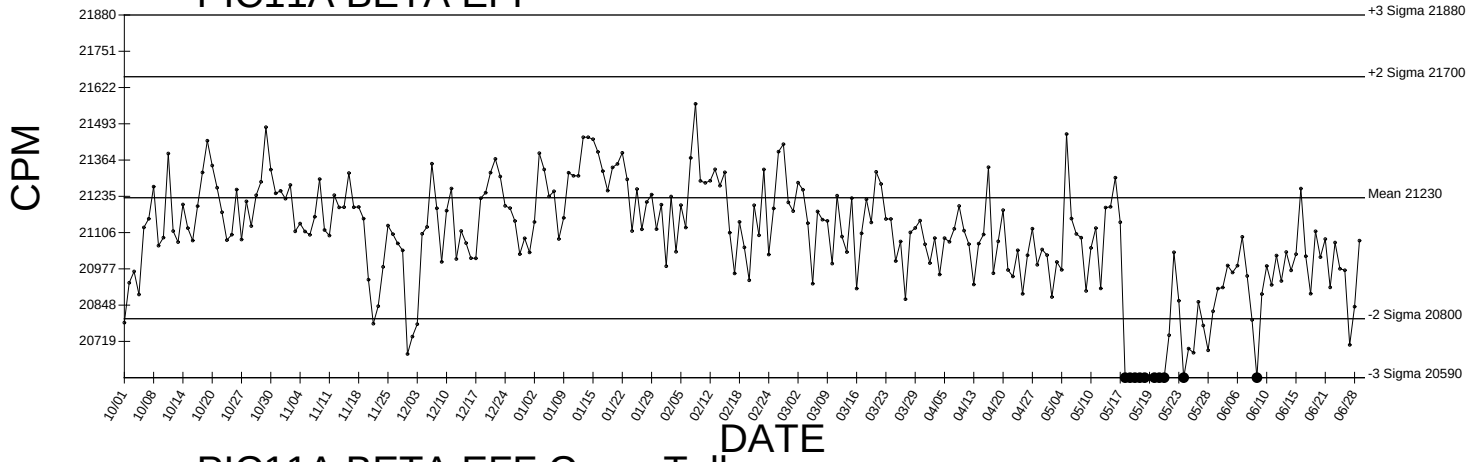
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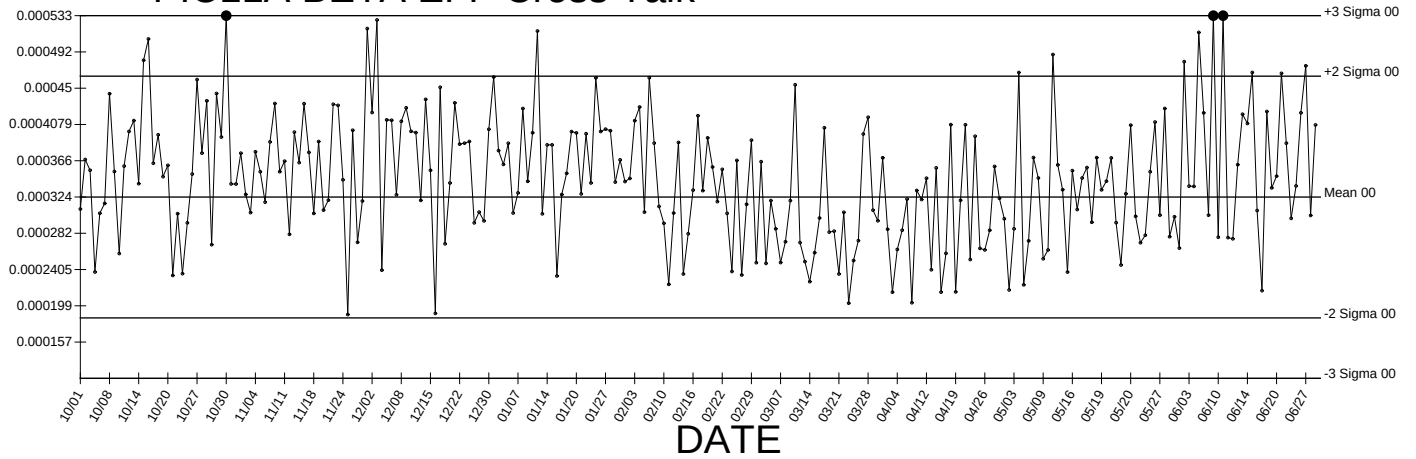
● Denotes Outlier

PIC11A BETA EFF

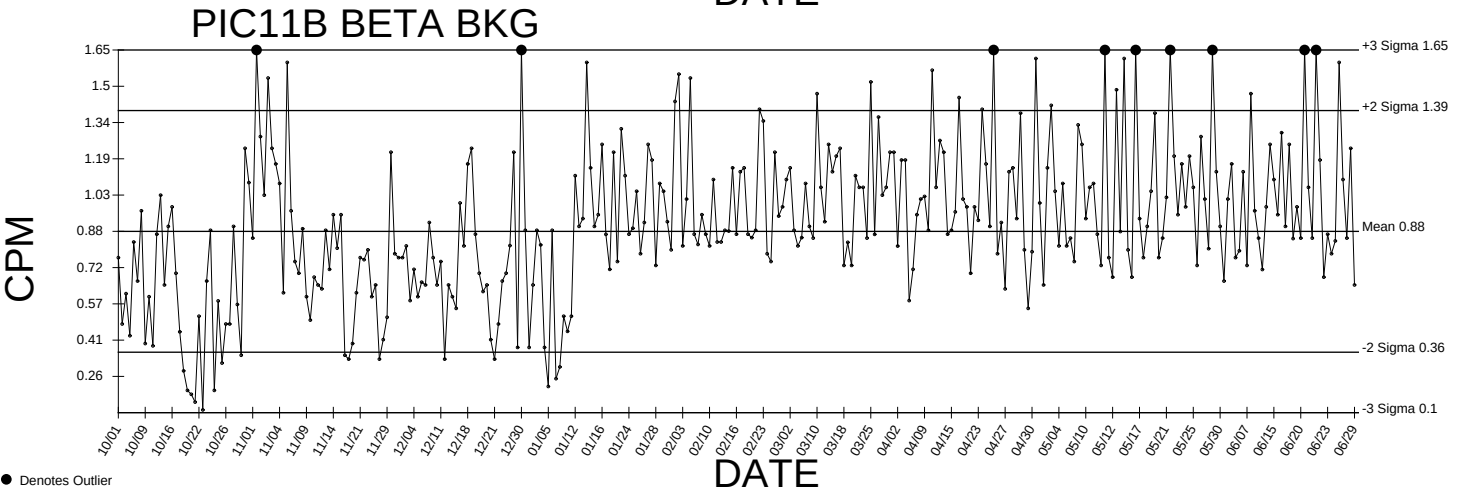
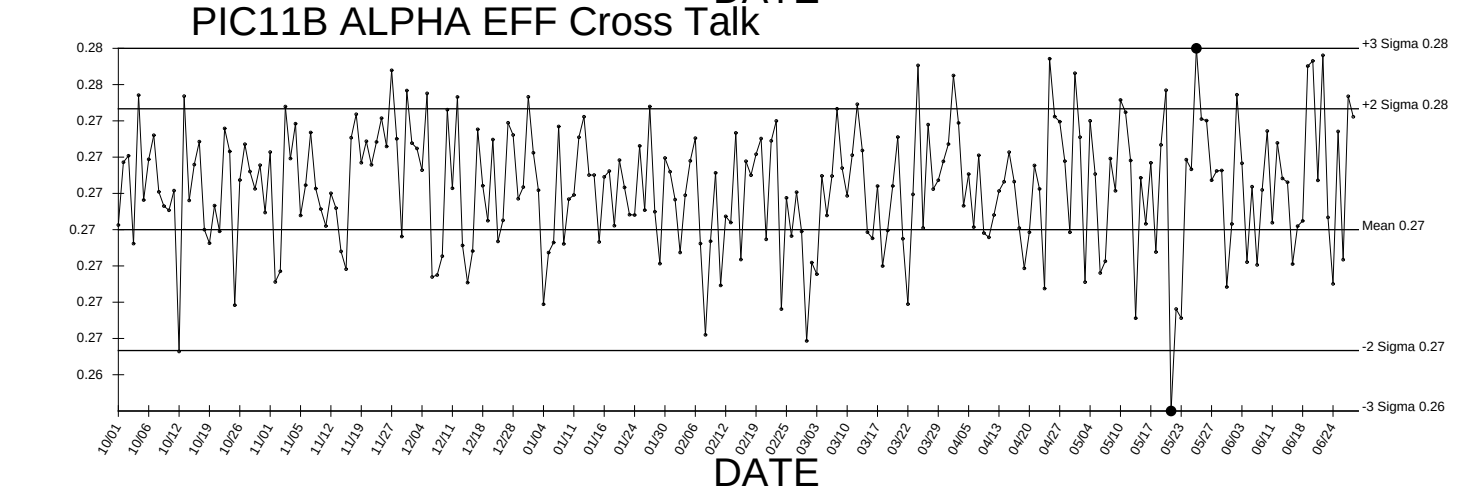
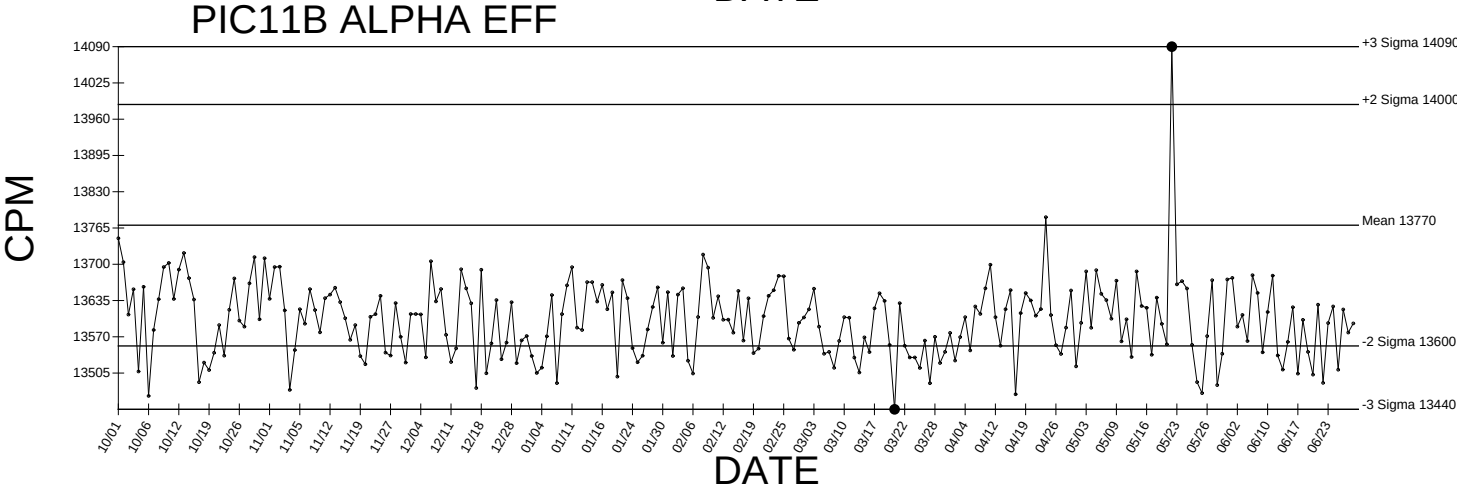
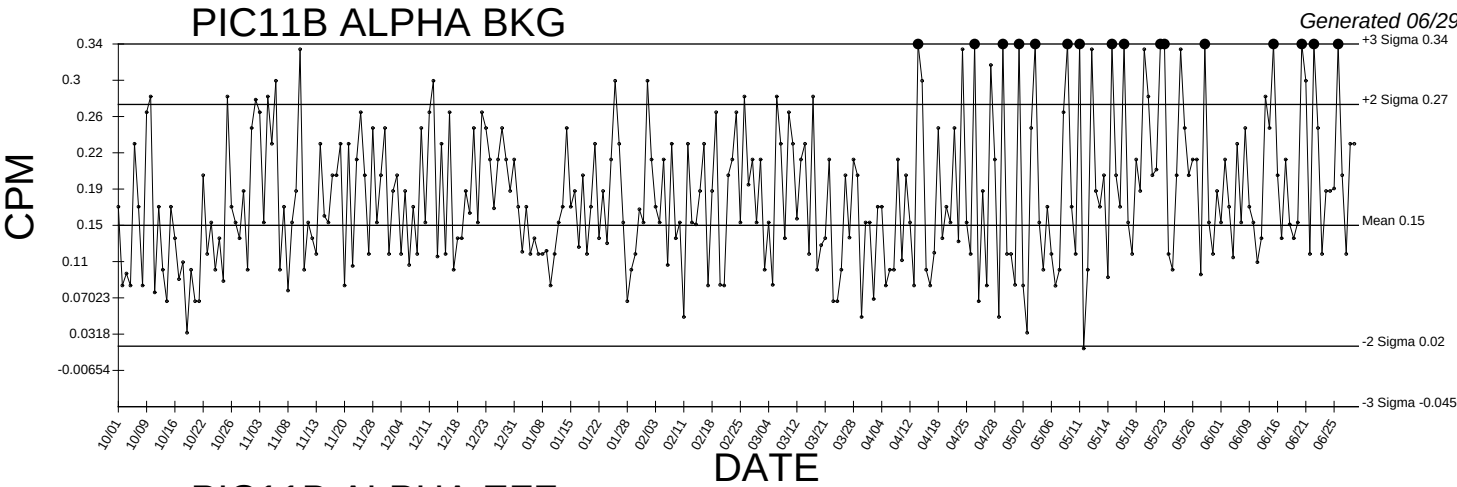
Generated 06/29/2016
+3 Sigma 21880



PIC11A BETA EFF Cross Talk

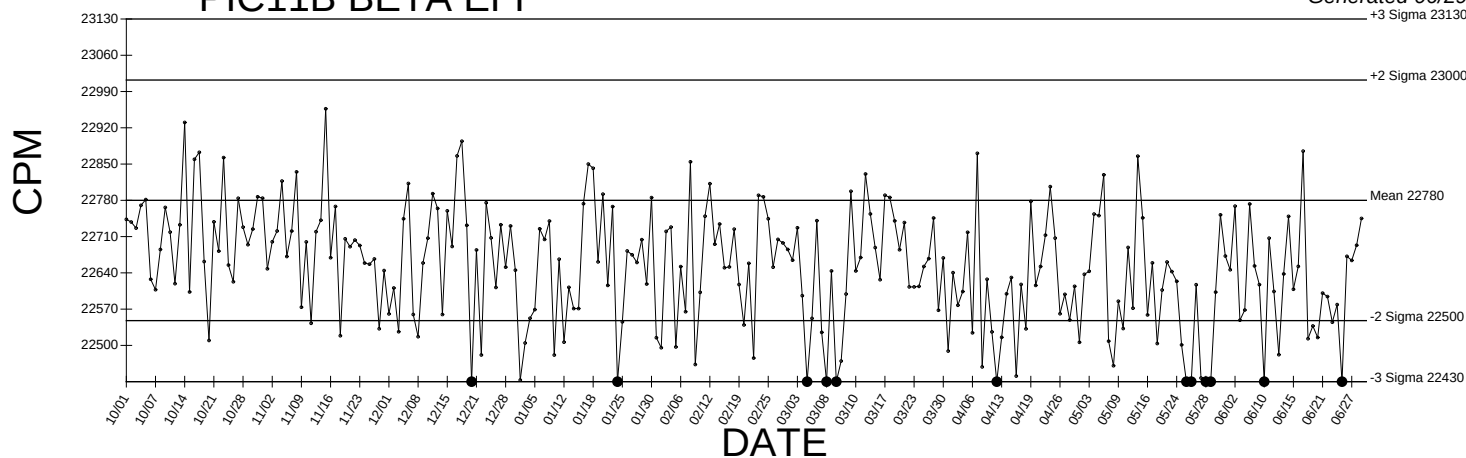


● Denotes Outlier

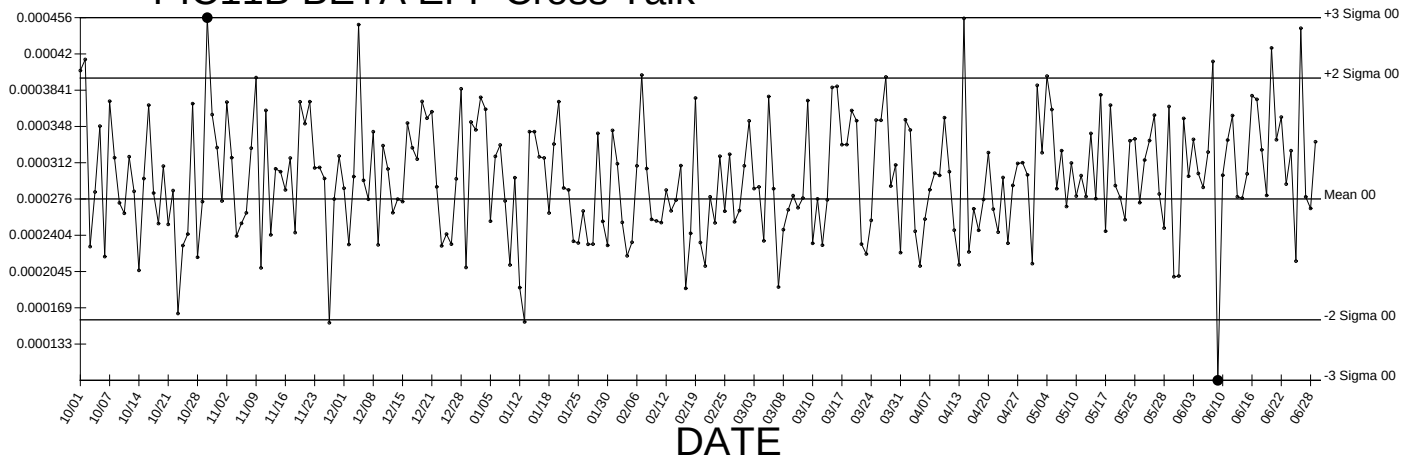


PIC11B BETA EFF

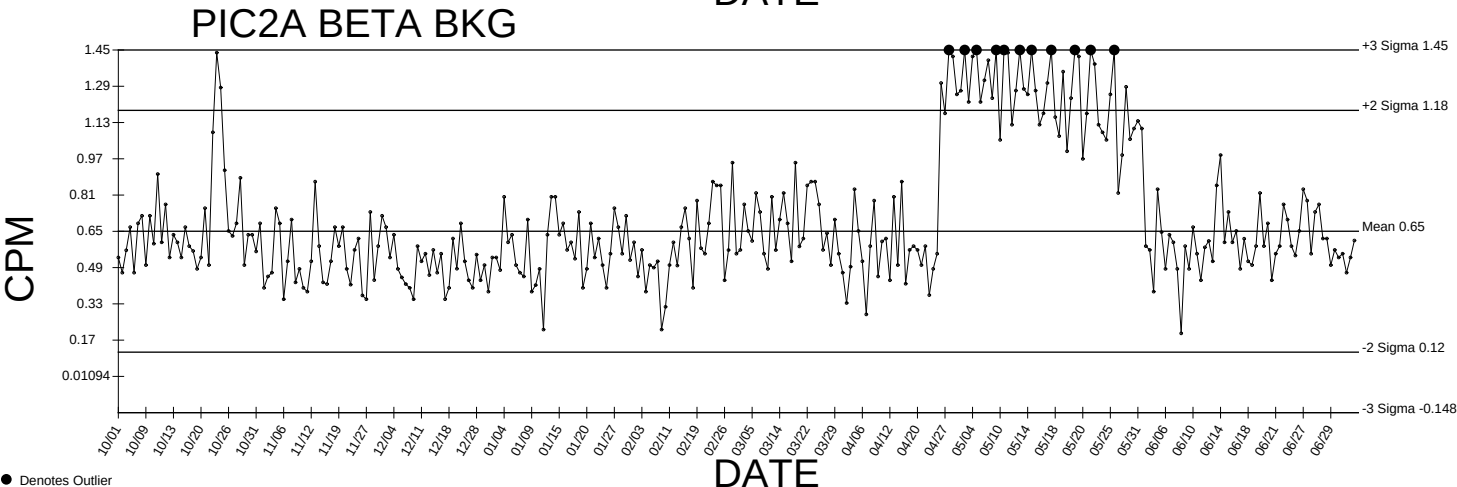
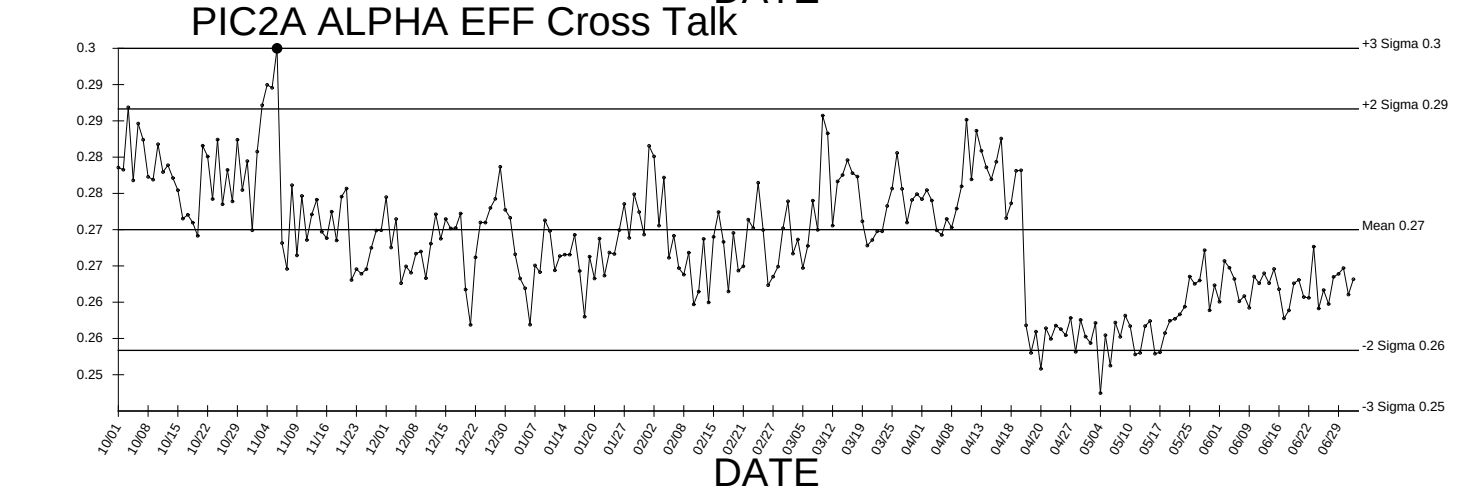
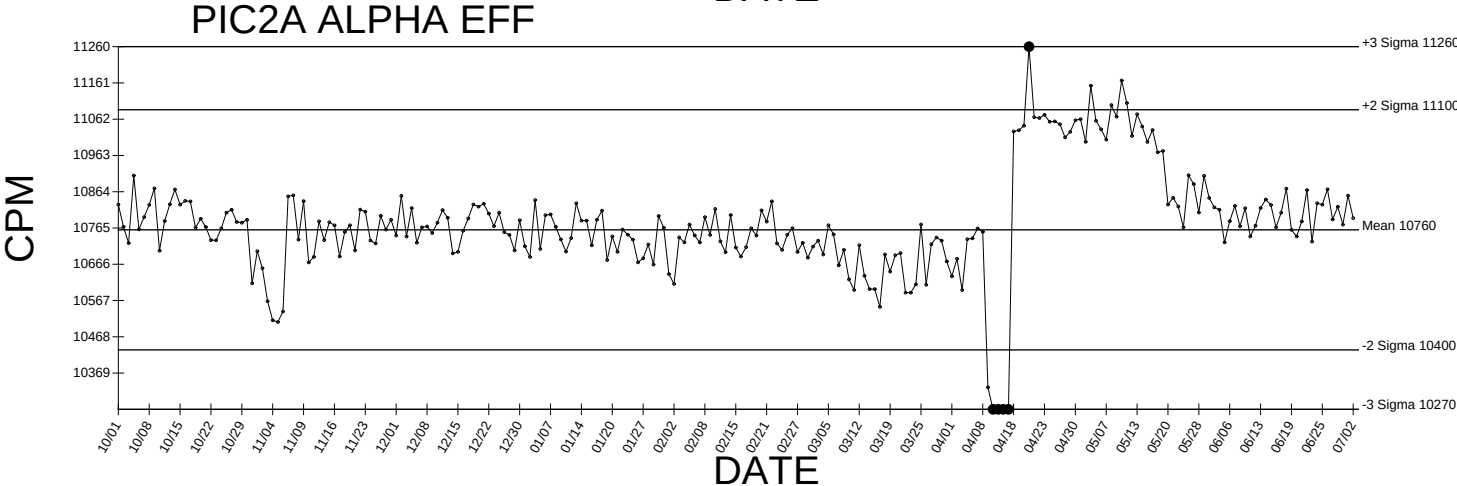
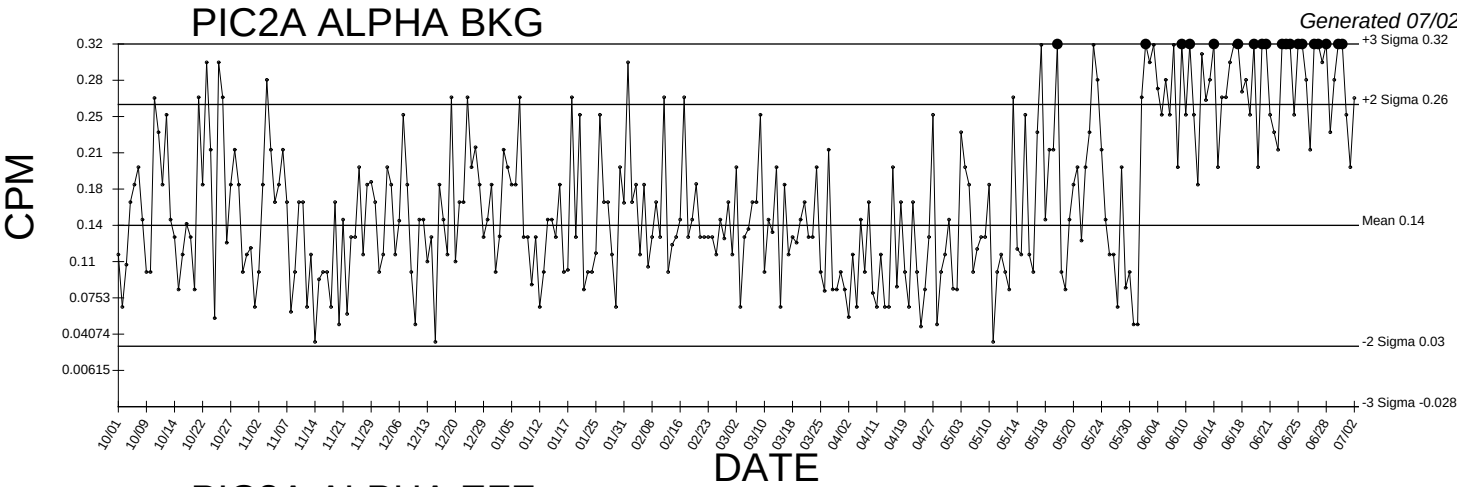
Generated 06/29/2016
+3 Sigma 23130



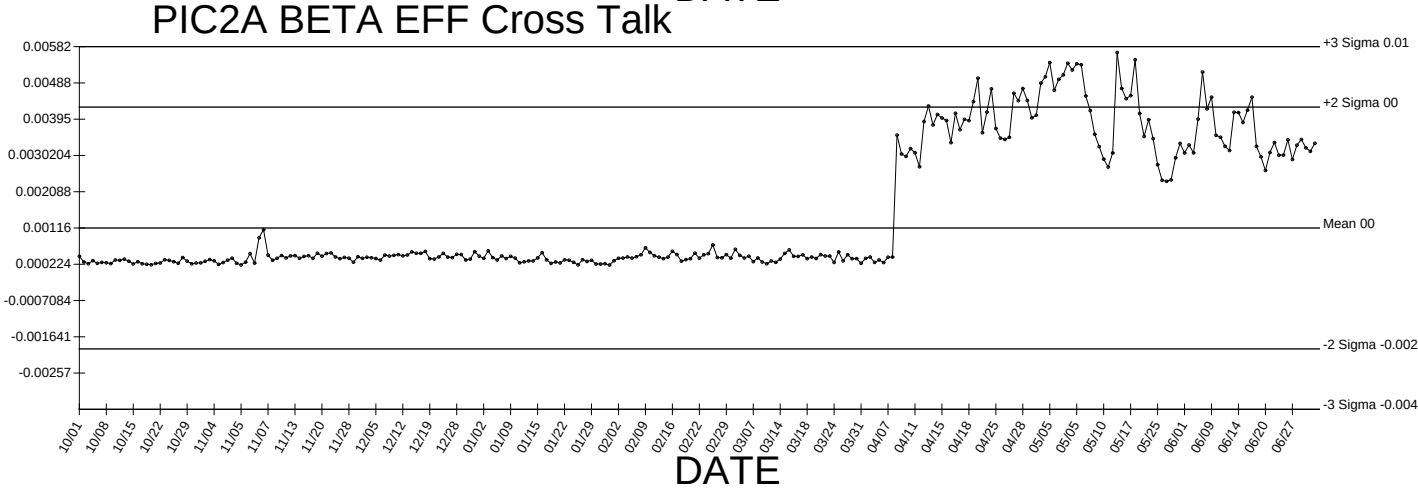
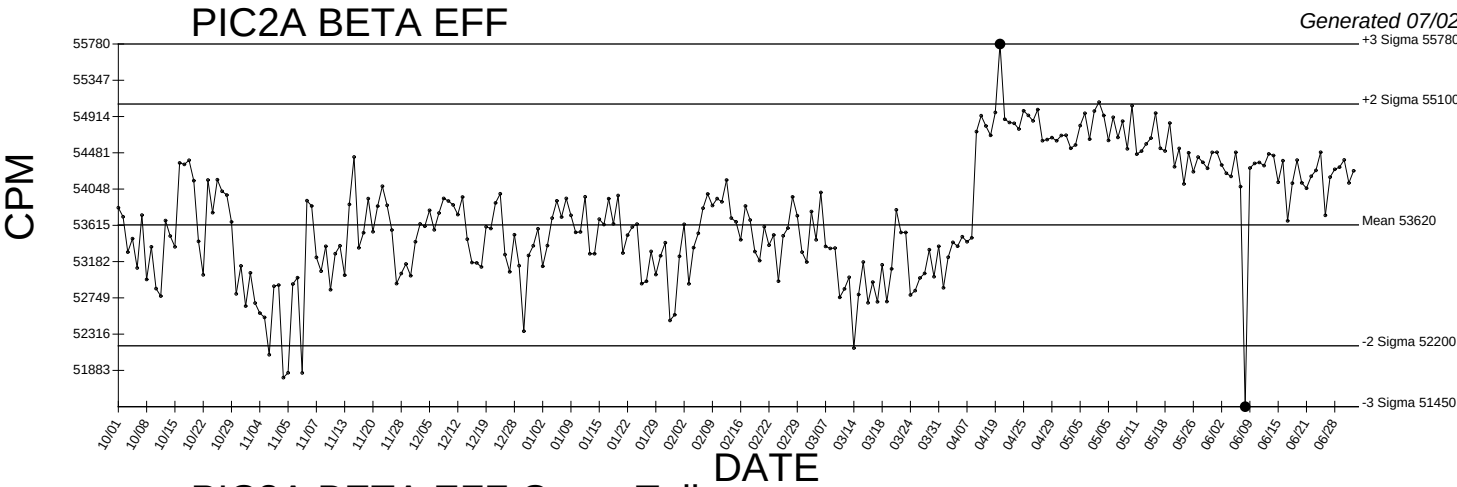
PIC11B BETA EFF Cross Talk

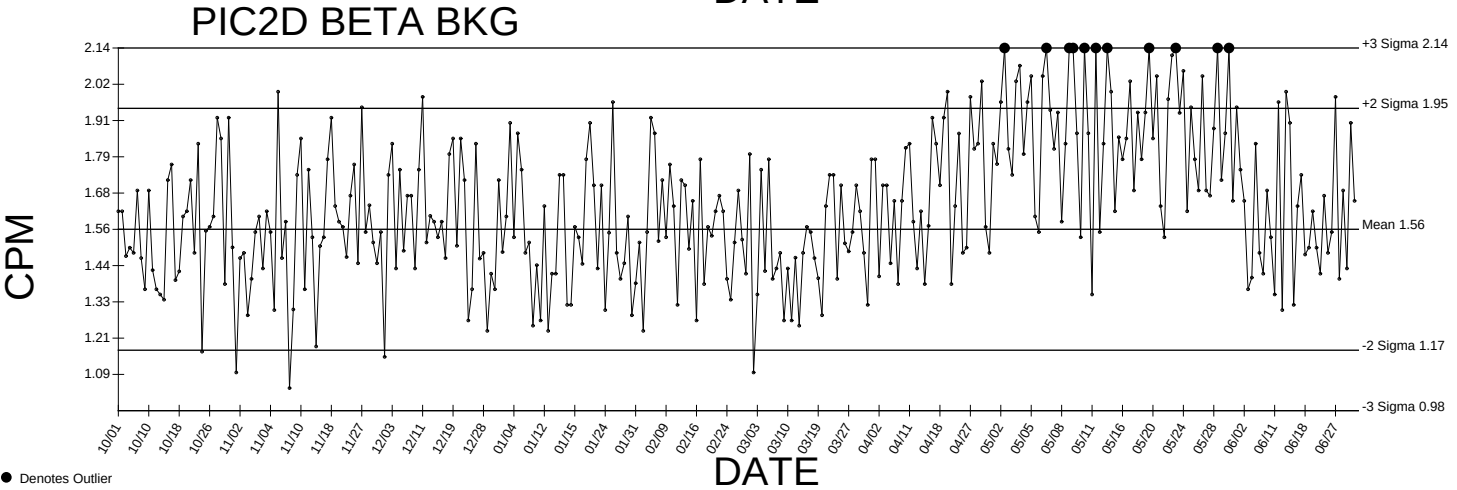
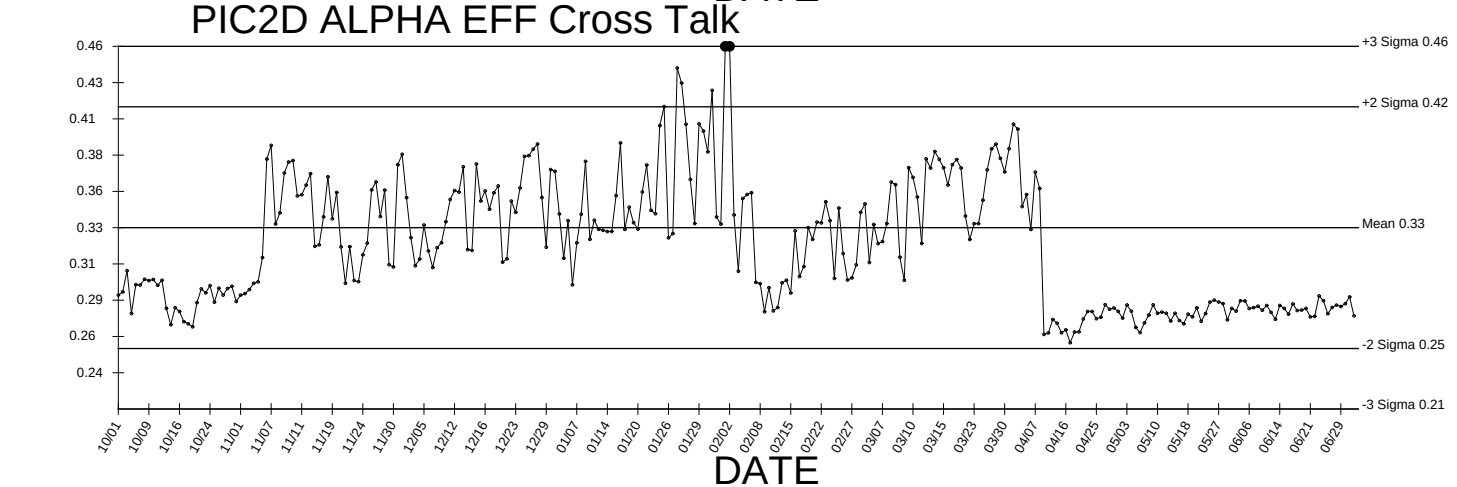
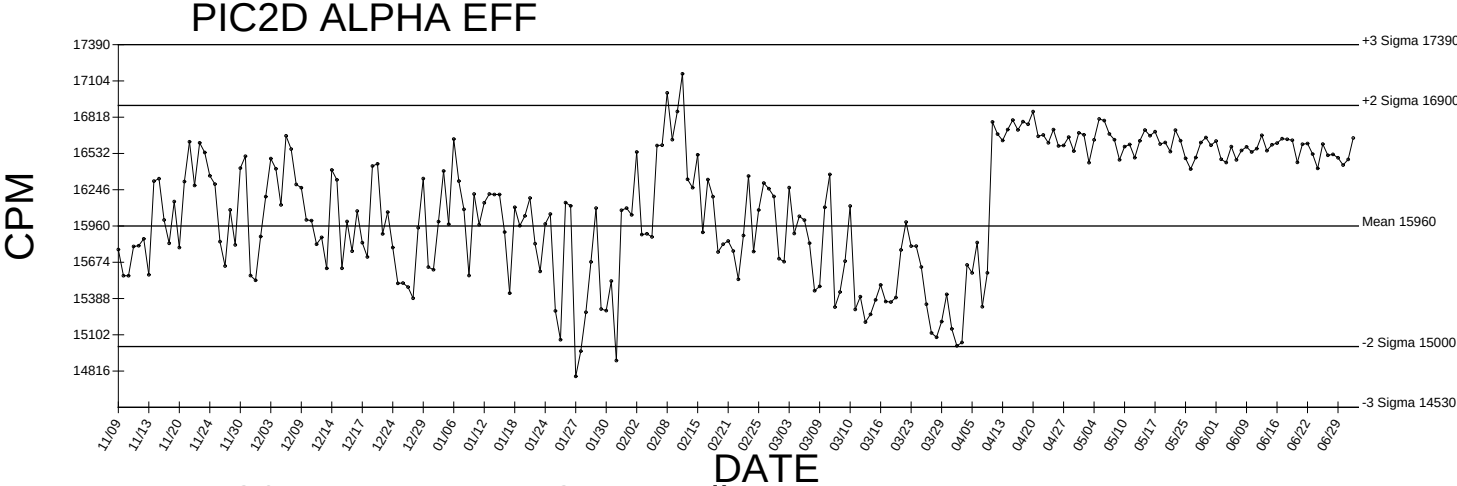
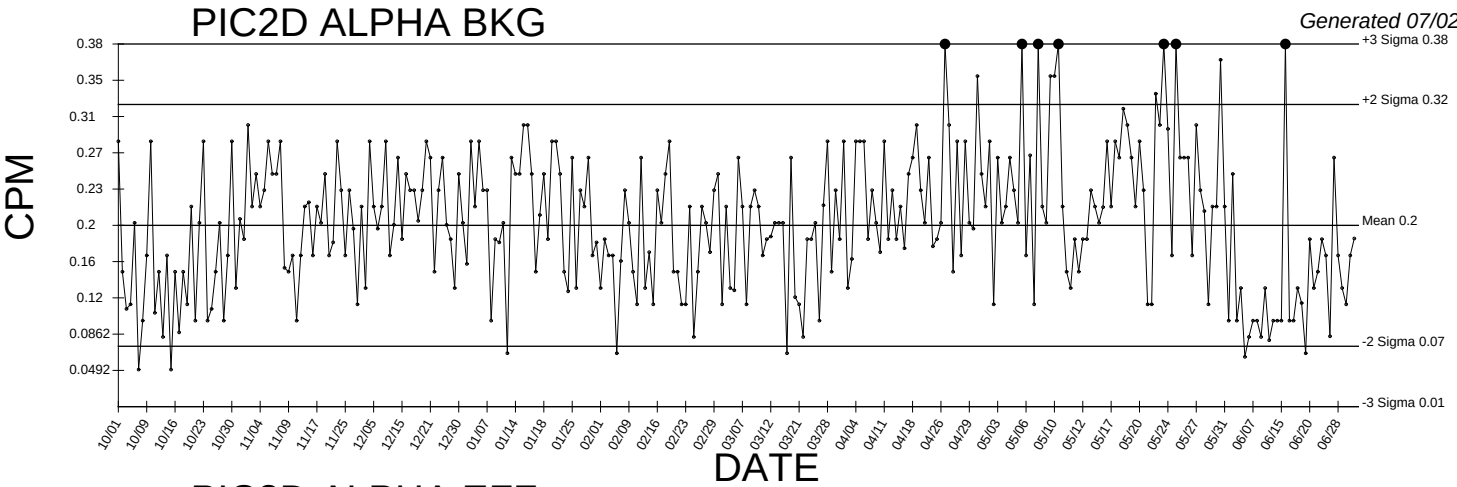


● Denotes Outlier



● Denotes Outlier

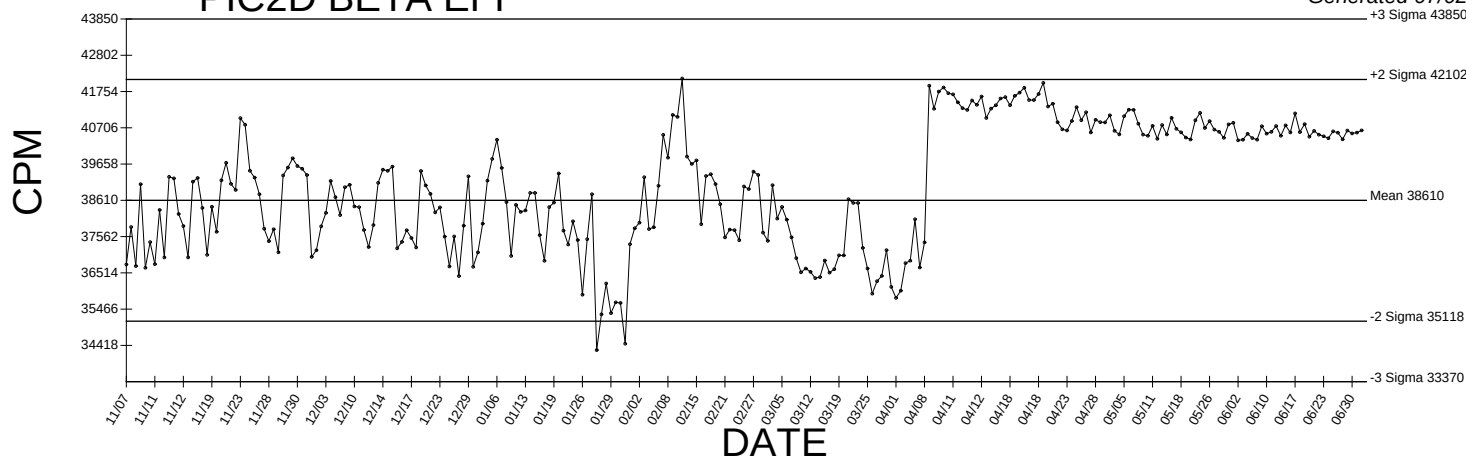




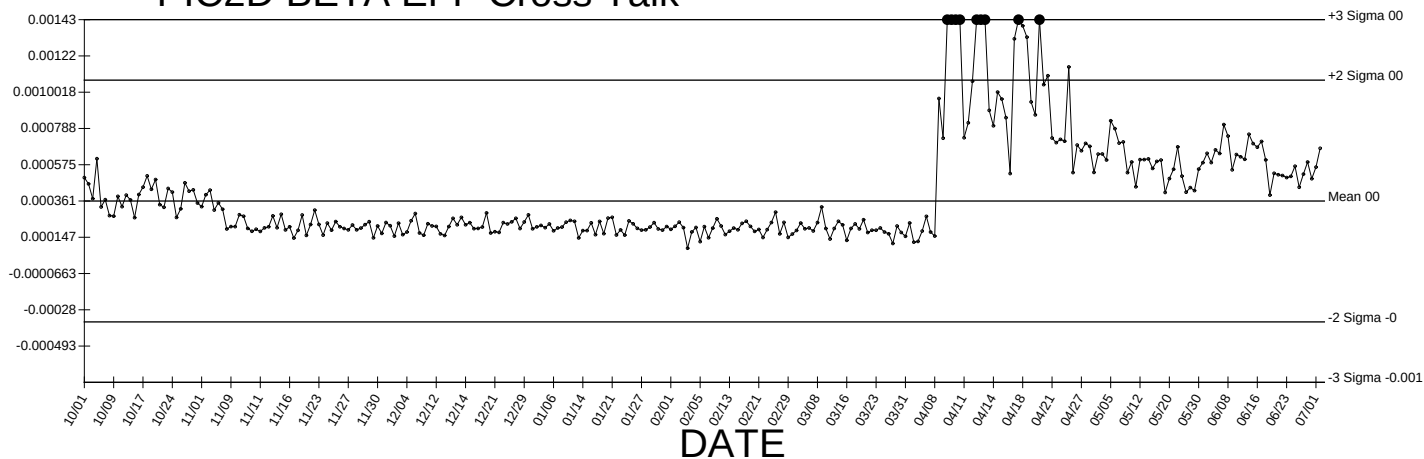
● Denotes Outlier

PIC2D BETA EFF

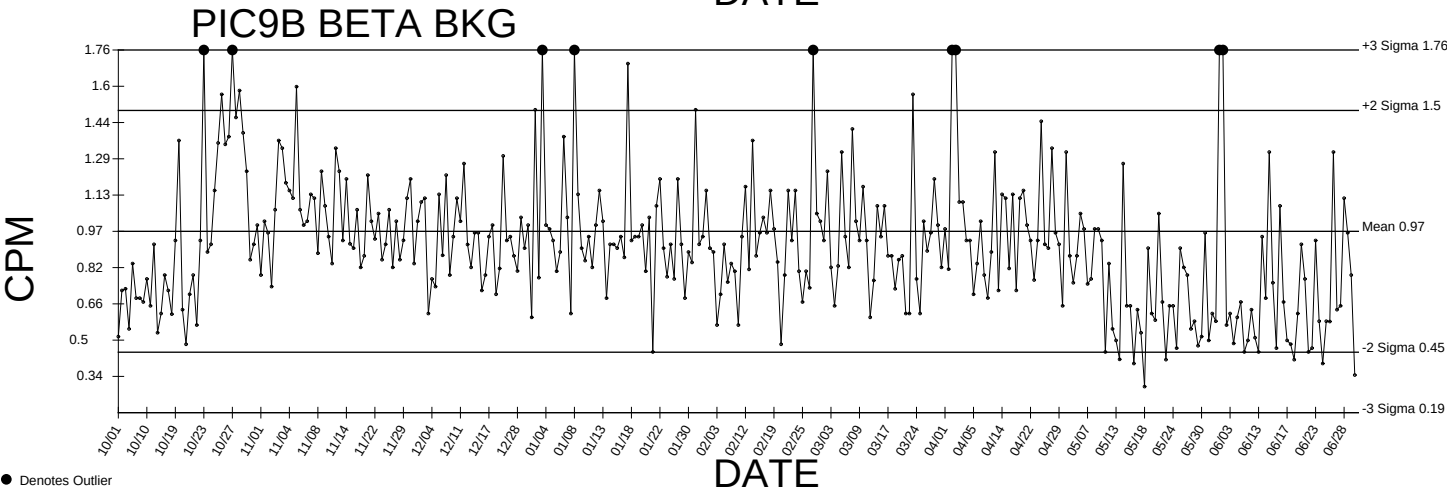
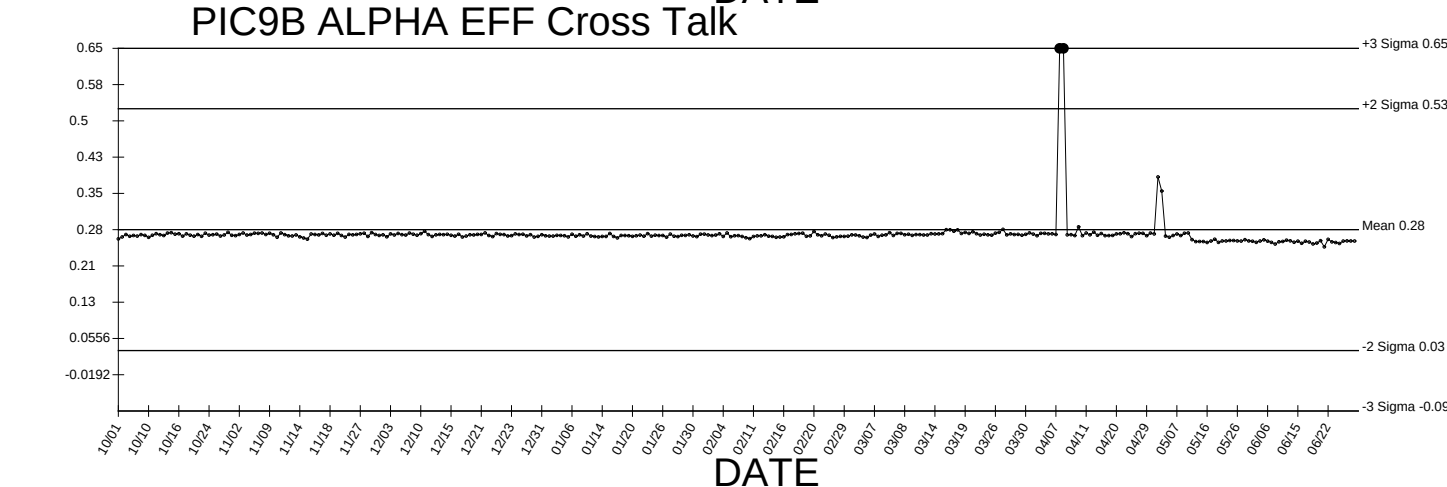
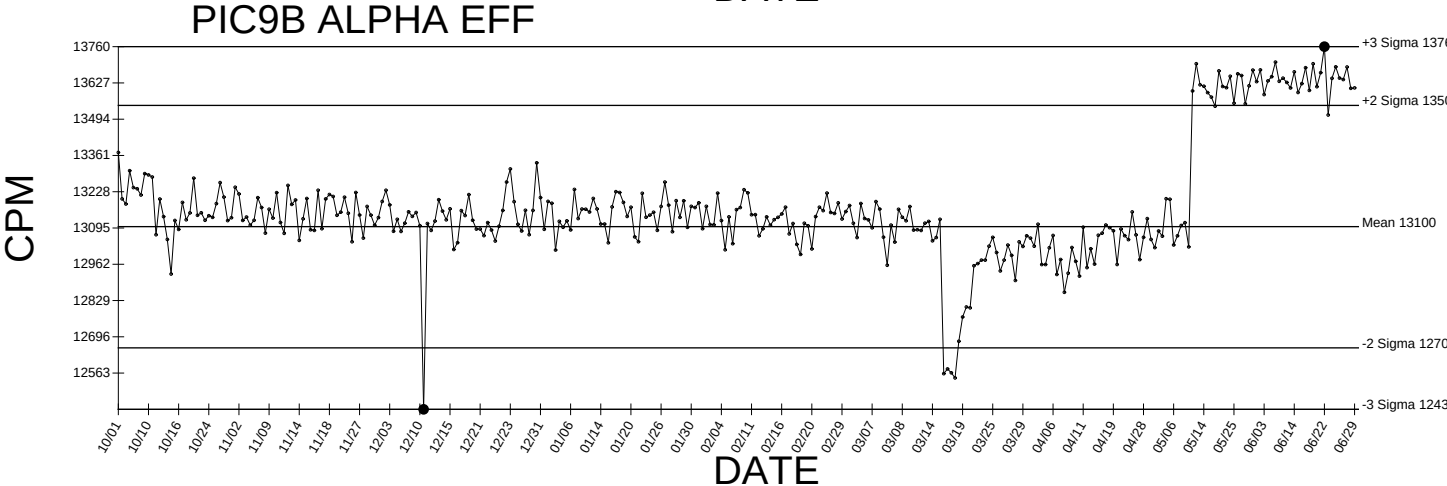
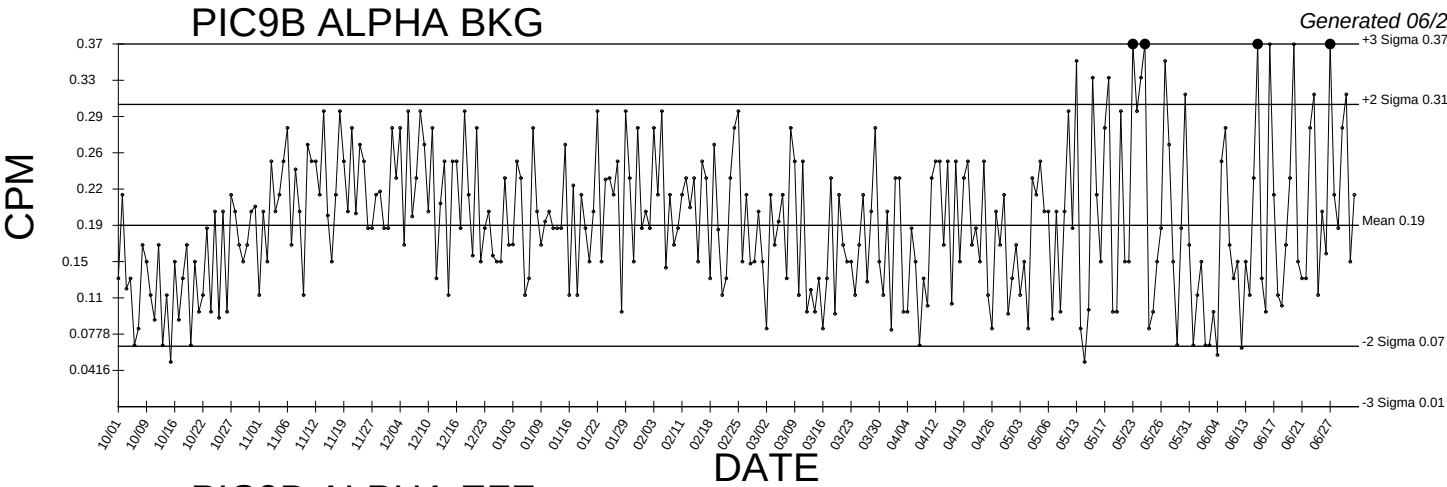
Generated 07/02/2016
+3 Sigma 43850



PIC2D BETA EFF Cross Talk



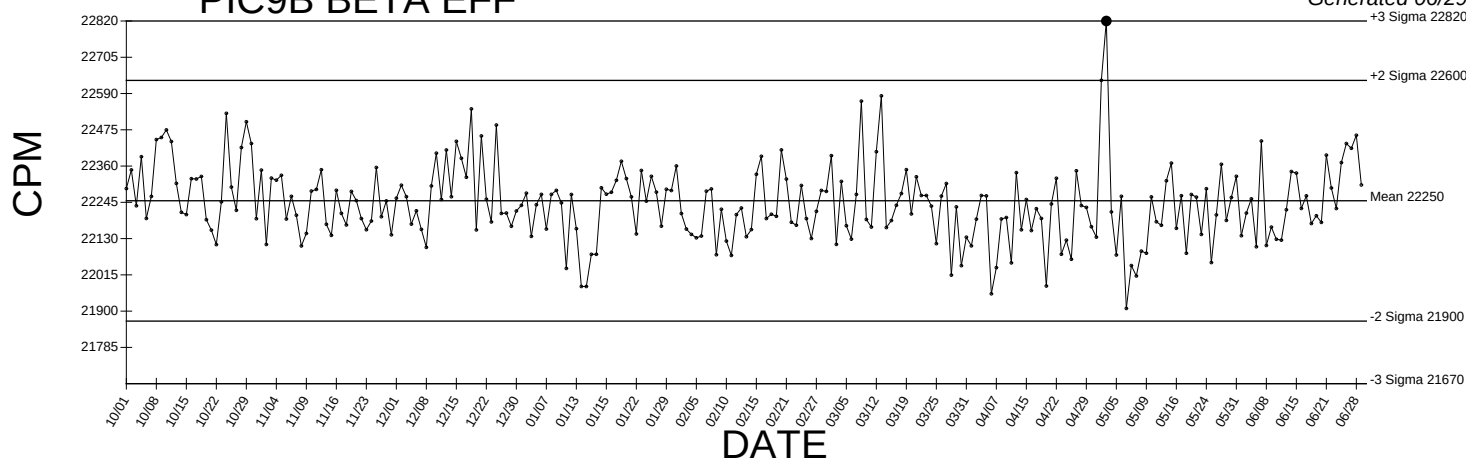
● Denotes Outlier



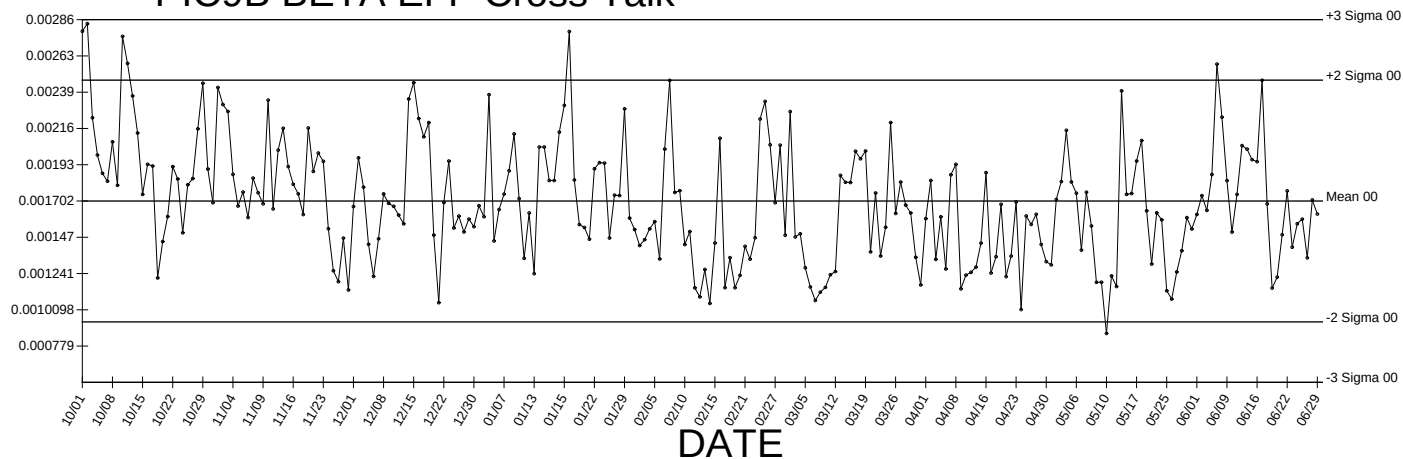
● Denotes Outlier

PIC9B BETA EFF

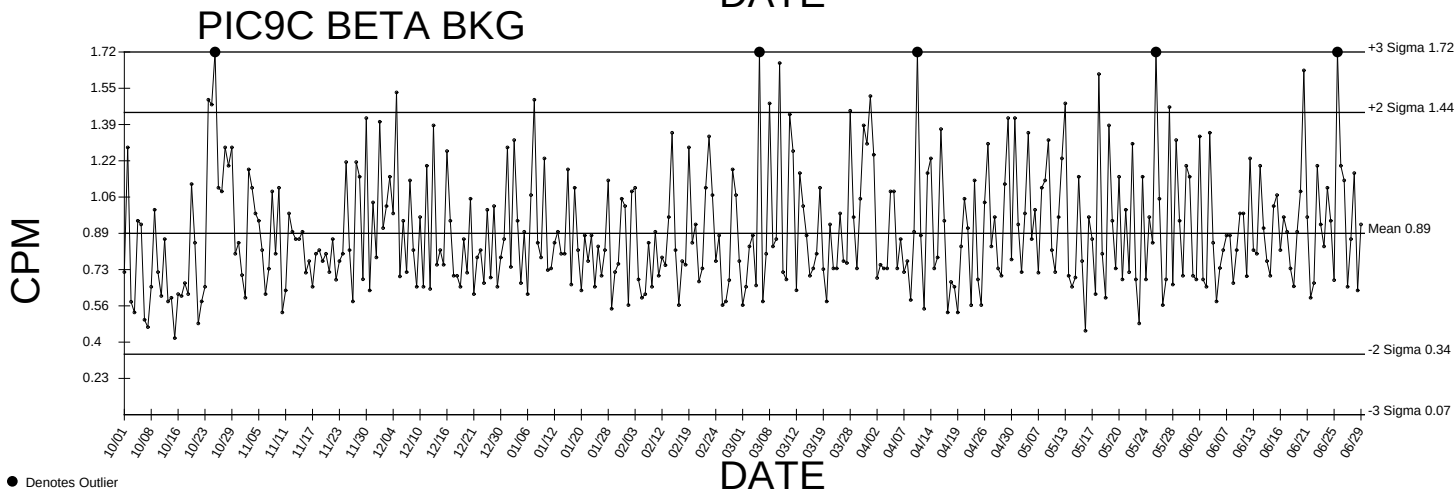
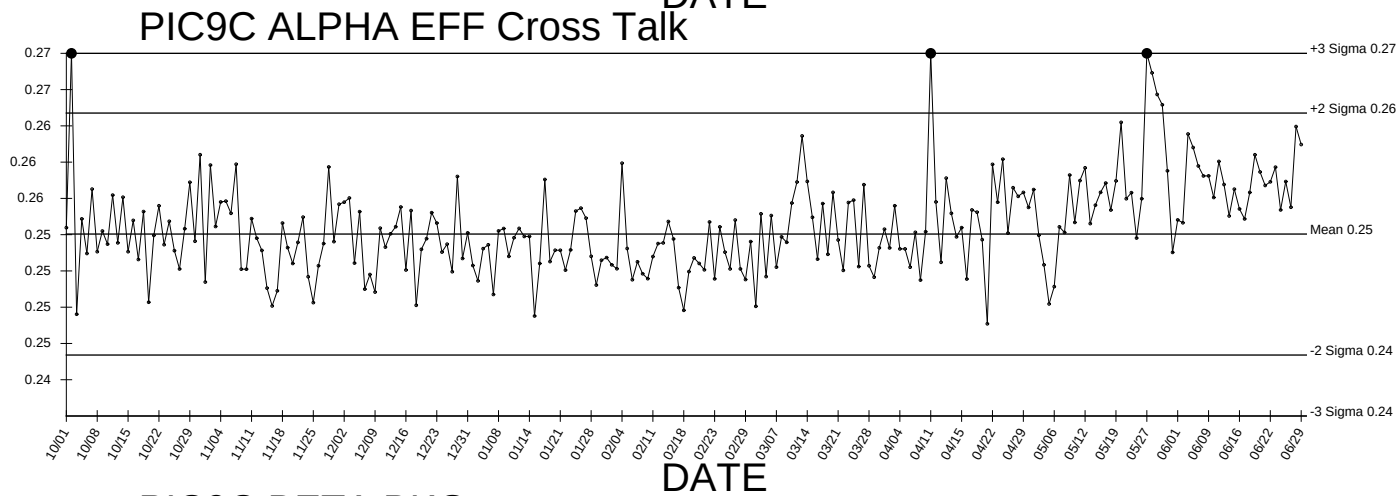
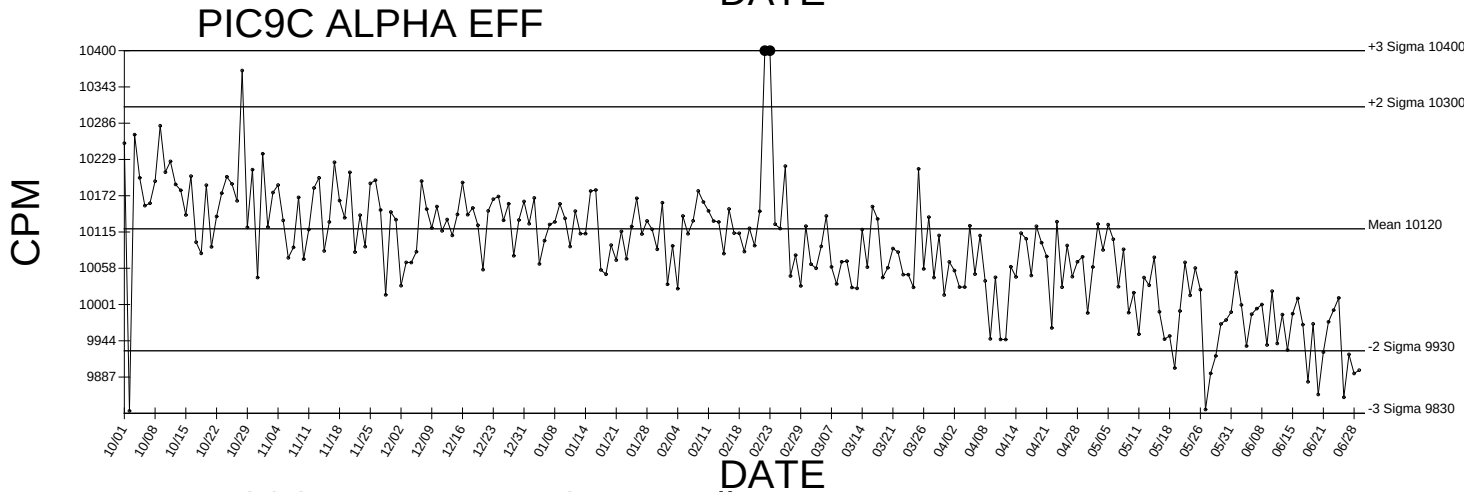
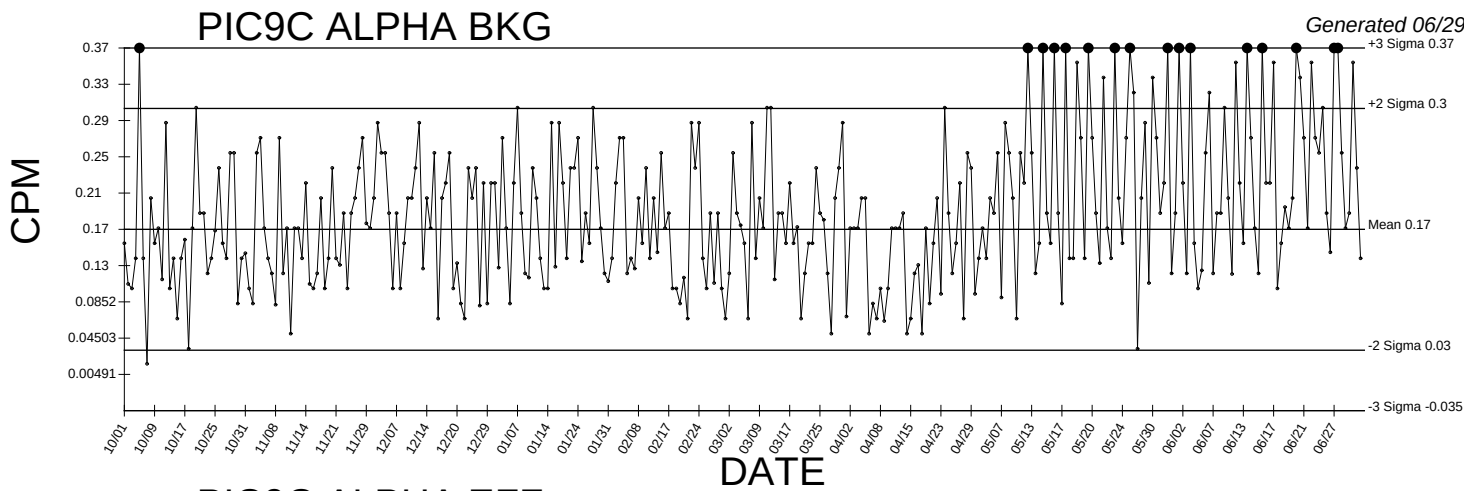
Generated 06/29/2016



PIC9B BETA EFF Cross Talk

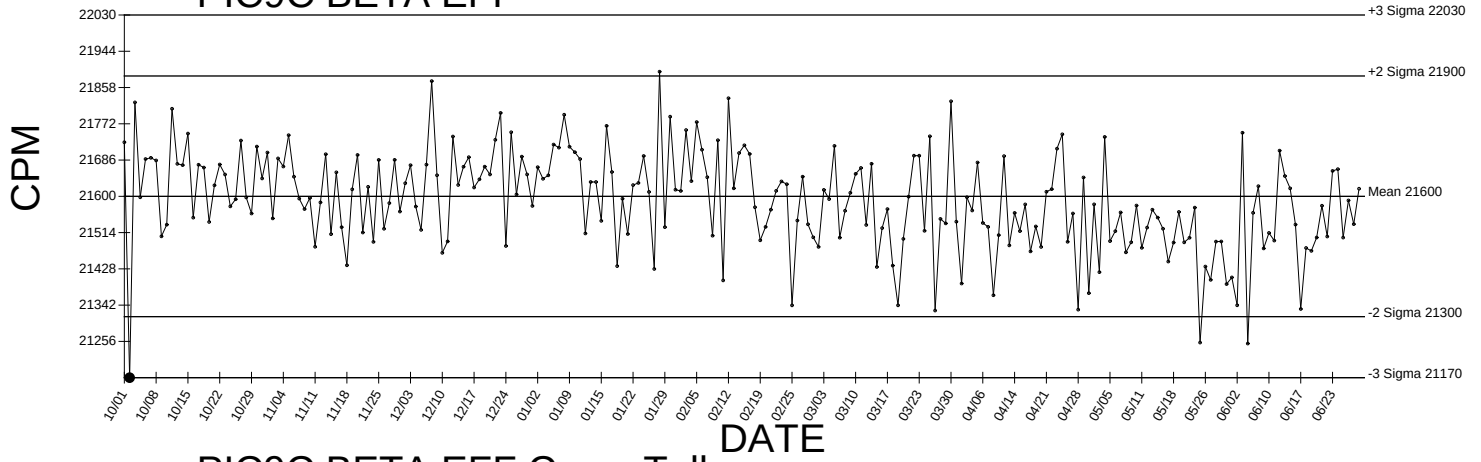


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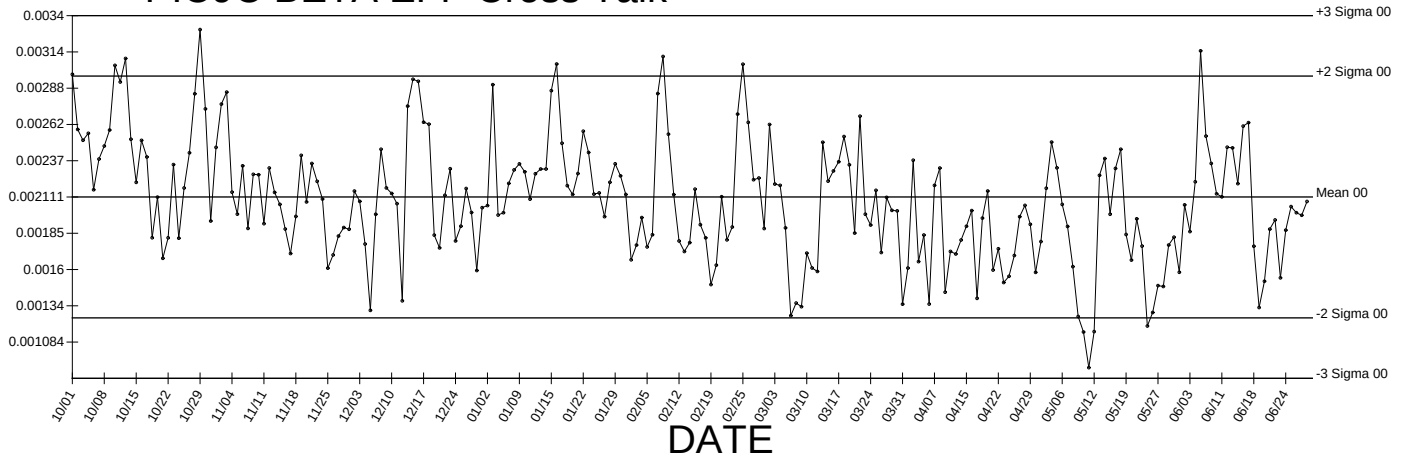


PIC9C BETA EFF

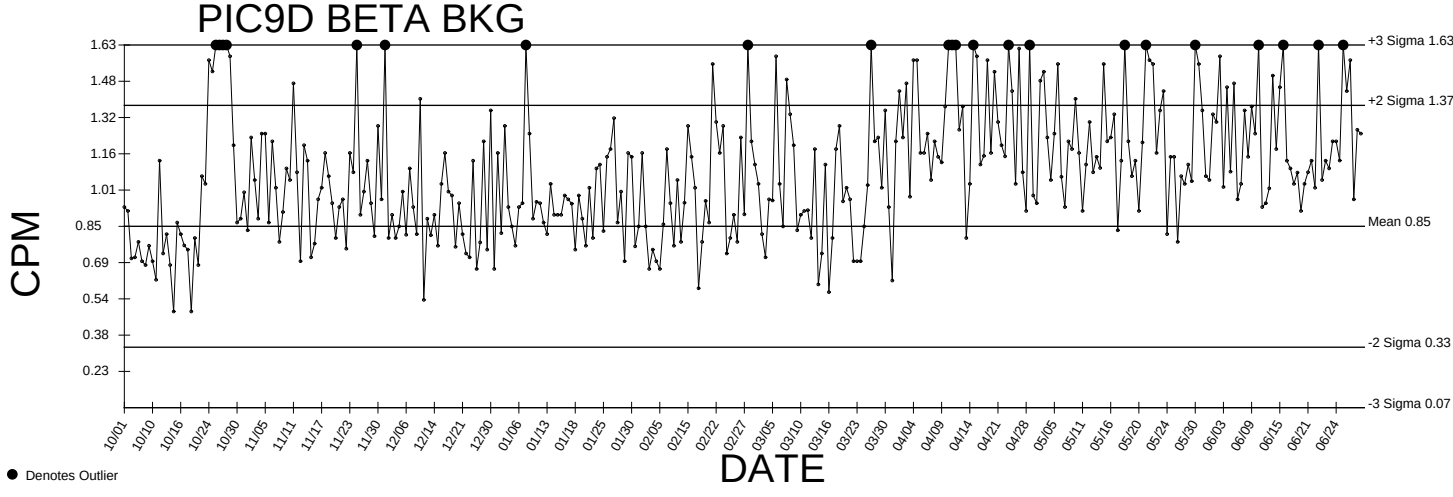
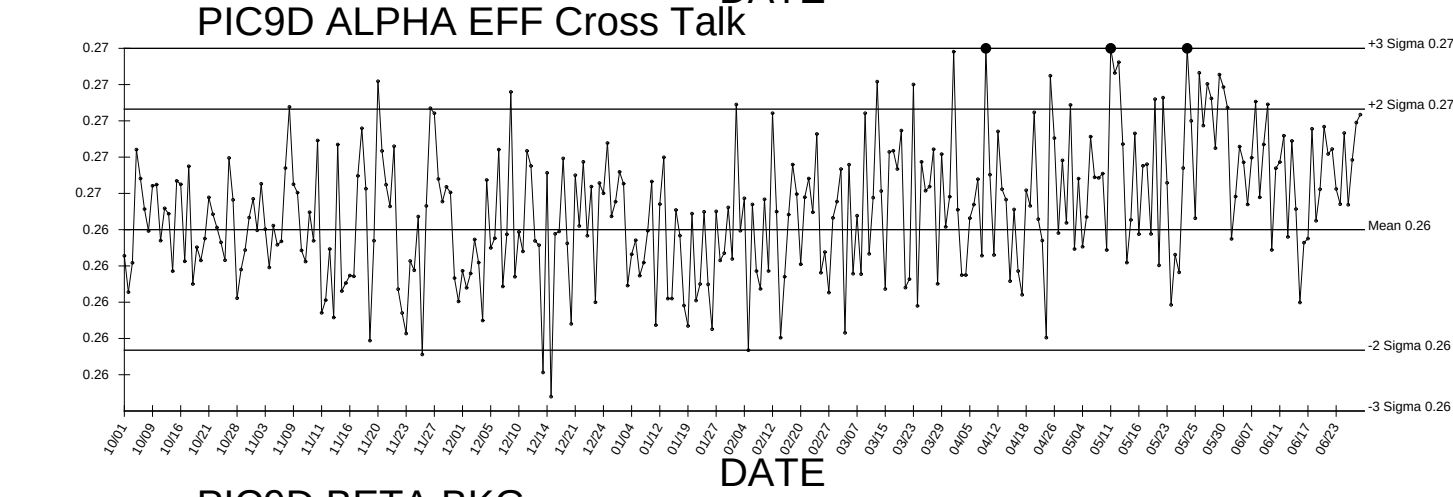
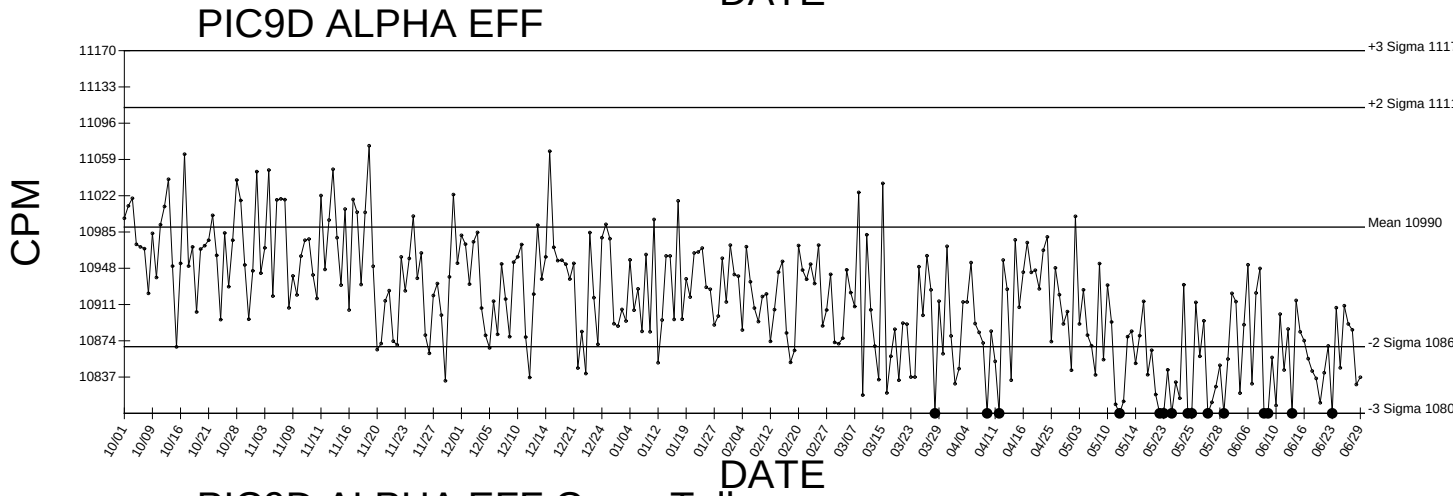
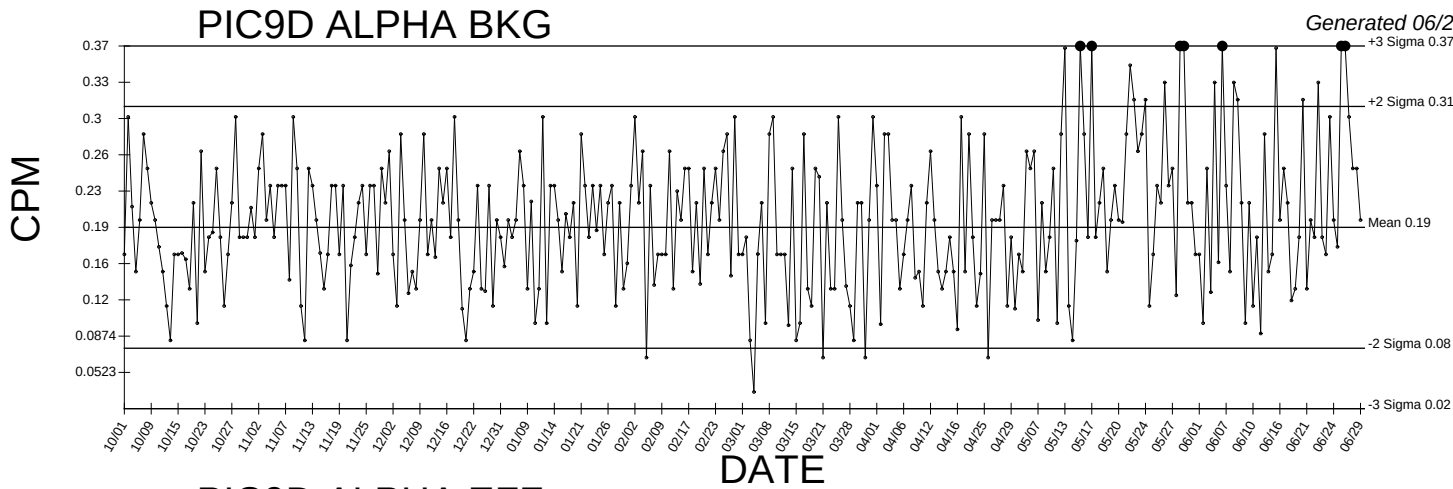
Generated 06/29/2016



PIC9C BETA EFF Cross Talk



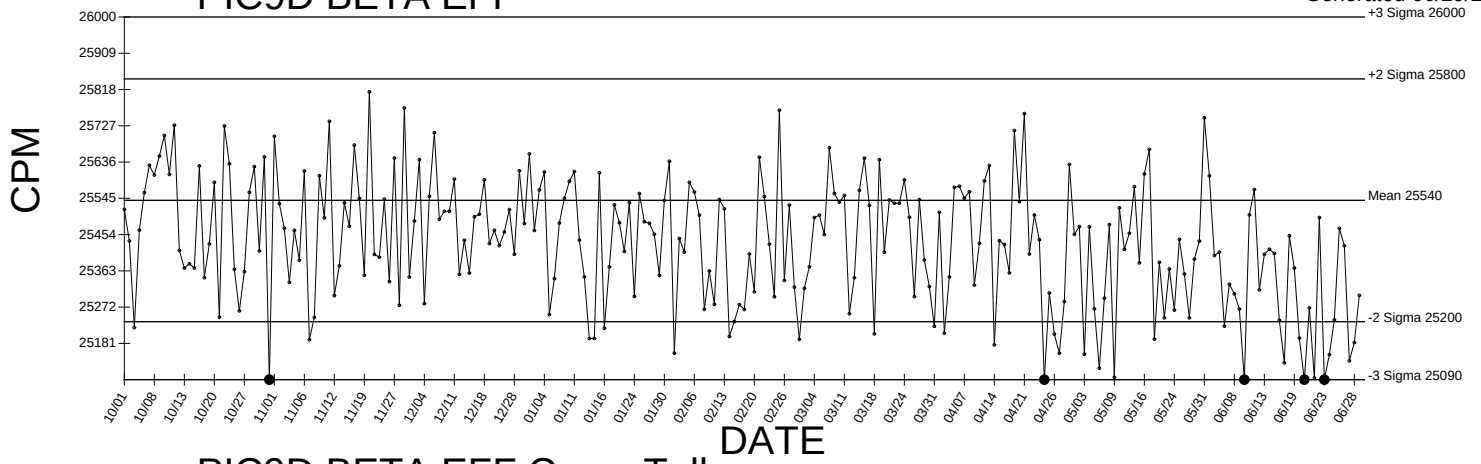
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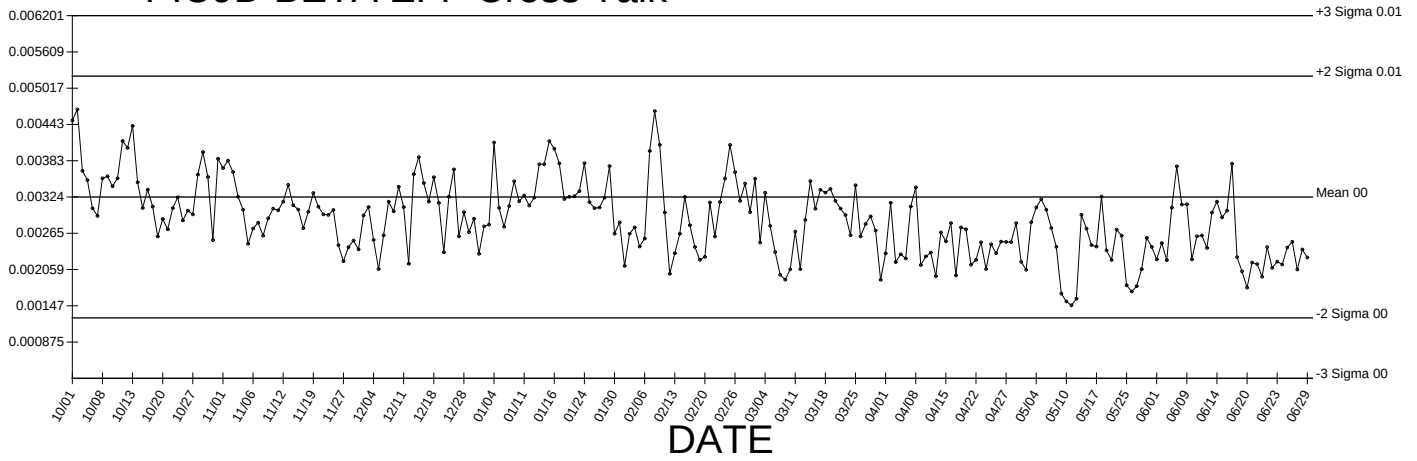
● Denotes Outlier

PIC9D BETA EFF

Generated 06/29/2016



PIC9D BETA EFF Cross Talk



Quality Control Charts

Data used for Gas Flow Solids 05-JUL-2016

Strontium-90 BLANK: Limits LCL = -20 UCL = 18.5

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1560440	1203530041	27-APR-2016 07:13	DONE	-1.2	-0.07	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1562483	1203535554	27-APR-2016 07:42	DONE	-0.119	0.1	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1562714	1203536194	27-APR-2016 17:06	DONE	-0.921	-0.03	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1561490	1203532893	29-APR-2016 14:15	DONE	-0.503	0.04	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1561499	1203532929	29-APR-2016 17:17	DONE	-0.35	0.06	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1561682	1203533340	02-MAY-2016 15:10	DONE	0.2	0.14	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1561671	1203533308	02-MAY-2016 16:11	DONE	-0.055	0.11	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1562290	1203534981	06-MAY-2016 07:22	DONE	0.33	0.17	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1562336	1203535140	09-MAY-2016 15:05	DONE	-0.217	0.08	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1565737	1203544460	10-MAY-2016 16:48	DONE	0.04	0.12	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1562377	1203535283	11-MAY-2016 13:32	DONE	-0.215	0.08	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1566672	1203547017	12-MAY-2016 16:34	DONE	0.62	0.21	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1565397	1203543501	13-MAY-2016 13:10	DONE	1.78	0.39	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1567491	1203549283	19-MAY-2016 13:56	DONE	0.5	0.19	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1563969	1203539657	23-MAY-2016 16:09	DONE	0.09	0.13	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1568232	1203551077	24-MAY-2016 17:29	DONE	-0.056	0.11	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1569603	1203554575	25-MAY-2016 11:14	DONE	0.25	0.15	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1569605	1203554578	25-MAY-2016 12:52	DONE	-2	-0.21	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1568289	1203551271	28-MAY-2016 16:00	DONE	-0.001	0.11	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1570185	1203556047	01-JUN-2016 14:45	DONE	1.2	0.3	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1570509	1203556920	01-JUN-2016 14:49	DONE	11.9	2	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1570978	1203558138	06-JUN-2016 17:18	DONE	0.45	0.18	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1568342	1203551425	06-JUN-2016 17:29	DONE	0.14	0.14	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1568348	1203551441	08-JUN-2016 13:13	DONE	-0.025	0.11	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1570976	1203558132	09-JUN-2016 11:35	DONE	0.23	0.15	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1573314	1203564286	16-JUN-2016 15:25	DONE	-0.194	0.08	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1574019	1203566028	20-JUN-2016 13:32	DONE	-0.943	-0.03	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1574103	1203566313	24-JUN-2016 10:52	DONE	-0.038	0.11	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1574082	1203566250	24-JUN-2016 11:08	DONE	-0.354	0.06	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1574105	1203566316	24-JUN-2016 13:30	DONE	0.52	0.2	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1577155	1203574226	24-JUN-2016 16:14	DONE	-38	-6	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1575872	1203570890	27-JUN-2016 17:22	DONE	0.13	0.13	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1575827	1203570747	29-JUN-2016 08:05	DONE	-0.375	0.06	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1575826	1203570739	29-JUN-2016 09:57	DONE	-0.234	0.08	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1575874	1203570898	29-JUN-2016 11:21	DONE	-0.817	-0.01	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1575804	1203570669	29-JUN-2016 13:10	DONE	-0.294	0.07	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1575881	1203570914	29-JUN-2016 13:25	DONE	-0.103	0.1	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1576660	1203572857	30-JUN-2016 07:24	DONE	-0.014	0.11	pCi/g	-0.728	-20	-14	12.1	18.5	6.4
1577394	1203574679	30-JUN-2016 14:38	DONE	-0.051	0.11	pCi/g	-0.728	-20	-14	12.1	18.5	6.4

Strontium-90 DUP: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1562714	1203536195	27-APR-2016 17:06	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1555383	1203516507	28-APR-2016 15:25	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1555383	1203516508	28-APR-2016 15:25	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1561490	1203532894	29-APR-2016 14:15	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1561499	1203532930	29-APR-2016 17:17	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1561682	1203533341	02-MAY-2016 15:10	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1561671	1203533309	03-MAY-2016 12:16	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1562290	1203534982	06-MAY-2016 07:22	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1562336	1203535141	09-MAY-2016 15:05	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1565737	1203544461	10-MAY-2016 16:48	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1563969	1203539658	11-MAY-2016 16:10	DONE	11.9	1.7	percent	1.99	0	-9.8	13.8	20.0	5.89
1562377	1203535284	12-MAY-2016 08:48	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1566672	1203547018	12-MAY-2016 16:34	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1565397	1203543502	17-MAY-2016 11:52	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1567491	1203549284	19-MAY-2016 13:57	DONE	8.26	1.1	percent	1.99	0	-9.8	13.8	20.0	5.89
1569605	1203554579	25-MAY-2016 10:30	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1569603	1203554576	25-MAY-2016 11:14	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1568232	1203551078	25-MAY-2016 12:38	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1568289	1203551272	31-MAY-2016 12:55	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1570185	1203556048	01-JUN-2016 14:48	DONE	27.7	4.4	percent	1.99	0	-9.8	13.8	20.0	5.89
1570509	1203556922	01-JUN-2016 14:49	DONE	1.33	-0.11	percent	1.99	0	-9.8	13.8	20.0	5.89
1568342	1203551426	06-JUN-2016 17:29	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1570978	1203558139	07-JUN-2016 16:13	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1568348	1203551442	08-JUN-2016 16:27	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1570976	1203558133	09-JUN-2016 09:13	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1573314	1203564287	16-JUN-2016 15:28	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1574019	1203566029	20-JUN-2016 13:32	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1574103	1203566314	24-JUN-2016 10:52	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1574082	1203566251	24-JUN-2016 11:13	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1574105	1203566317	24-JUN-2016 13:30	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1577155	1203574227	24-JUN-2016 16:14	DONE	7.7	0.97	percent	1.99	0	-9.8	13.8	20.0	5.89
1575872	1203570891	27-JUN-2016 17:22	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1575827	1203570748	29-JUN-2016 08:05	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1575826	1203570740	29-JUN-2016 09:57	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1575804	1203570670	29-JUN-2016 13:10	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1575881	1203570915	29-JUN-2016 13:25	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1576660	1203572858	30-JUN-2016 07:24	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1577394	1203574680	30-JUN-2016 14:39	DONE	0	-0.34	percent	1.99	0	-9.8	13.8	20.0	5.89
1575874	1203570899	02-JUL-2016 12:05	DONE	20.9	3.2	percent	1.99	0	-9.8	13.8	20.0	5.89

Strontium-90 LCS: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1560440	1203530043	27-APR-2016 07:13	DONE	97.8	-0.26	percent	100	75.0	83.3	117	125	8.33
1562483	1203535556	27-APR-2016 07:44	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1562714	1203536196	27-APR-2016 17:06	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33
1561490	1203532895	29-APR-2016 14:16	DONE	92.9	-0.85	percent	100	75.0	83.3	117	125	8.33
1561499	1203532931	29-APR-2016 17:17	DONE	92.4	-0.91	percent	100	75.0	83.3	117	125	8.33
1561682	1203533342	02-MAY-2016 15:07	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
1561671	1203533310	02-MAY-2016 16:11	DONE	121	2.6	percent	100	75.0	83.3	117	125	8.33
1562290	1203534983	06-MAY-2016 07:23	DONE	105	0.54	percent	100	75.0	83.3	117	125	8.33
1562336	1203535142	09-MAY-2016 15:05	DONE	111	1.3	percent	100	75.0	83.3	117	125	8.33
1565737	1203544462	10-MAY-2016 16:48	DONE	119	2.2	percent	100	75.0	83.3	117	125	8.33
1562377	1203535285	11-MAY-2016 13:32	DONE	107	0.81	percent	100	75.0	83.3	117	125	8.33
1563969	1203539659	11-MAY-2016 16:10	DONE	101	0.15	percent	100	75.0	83.3	117	125	8.33
1565397	1203543504	12-MAY-2016 13:30	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
1566672	1203547019	12-MAY-2016 16:34	DONE	105	0.55	percent	100	75.0	83.3	117	125	8.33
1567491	1203549286	19-MAY-2016 13:56	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
1568232	1203551080	24-MAY-2016 17:29	DONE	108	0.96	percent	100	75.0	83.3	117	125	8.33
1569605	1203554580	25-MAY-2016 11:08	DONE	101	0.1	percent	100	75.0	83.3	117	125	8.33
1569603	1203554577	25-MAY-2016 11:14	DONE	106	0.68	percent	100	75.0	83.3	117	125	8.33
1568289	1203551274	28-MAY-2016 16:00	DONE	98.7	-0.15	percent	100	75.0	83.3	117	125	8.33
1570185	1203556050	01-JUN-2016 14:48	DONE	114	1.7	percent	100	75.0	83.3	117	125	8.33
1570509	1203556921	01-JUN-2016 14:49	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1570978	1203558140	06-JUN-2016 17:18	DONE	103	0.42	percent	100	75.0	83.3	117	125	8.33
1568342	1203551427	06-JUN-2016 17:29	DONE	86.9	-2	percent	100	75.0	83.3	117	125	8.33
1568348	1203551443	08-JUN-2016 13:13	DONE	124	2.9	percent	100	75.0	83.3	117	125	8.33
1570976	1203558134	09-JUN-2016 09:16	DONE	102	0.26	percent	100	75.0	83.3	117	125	8.33
1573314	1203564288	16-JUN-2016 15:28	DONE	96.7	-0.39	percent	100	75.0	83.3	117	125	8.33
1574019	1203566030	20-JUN-2016 13:32	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
1574103	1203566315	24-JUN-2016 10:52	DONE	97	-0.36	percent	100	75.0	83.3	117	125	8.33
1574082	1203566252	24-JUN-2016 11:08	DONE	111	1.4	percent	100	75.0	83.3	117	125	8.33
1574105	1203566318	24-JUN-2016 12:27	DONE	99.2	-0.1	percent	100	75.0	83.3	117	125	8.33
1577155	1203574228	24-JUN-2016 16:16	DONE	98.1	-0.23	percent	100	75.0	83.3	117	125	8.33
1575872	1203570894	27-JUN-2016 17:26	DONE	97.3	-0.32	percent	100	75.0	83.3	117	125	8.33
1575827	1203570751	29-JUN-2016 08:07	DONE	104	0.51	percent	100	75.0	83.3	117	125	8.33
1575826	1203570743	29-JUN-2016 09:58	DONE	91.3	-1	percent	100	75.0	83.3	117	125	8.33
1575874	1203570902	29-JUN-2016 11:26	DONE	103	0.38	percent	100	75.0	83.3	117	125	8.33
1575804	1203570672	29-JUN-2016 13:10	DONE	103	0.39	percent	100	75.0	83.3	117	125	8.33
1575881	1203570917	29-JUN-2016 13:28	DONE	103	0.31	percent	100	75.0	83.3	117	125	8.33
1576660	1203572859	30-JUN-2016 07:23	DONE	96.2	-0.46	percent	100	75.0	83.3	117	125	8.33
1577394	1203574681	30-JUN-2016 14:39	DONE	97.7	-0.28	percent	100	75.0	83.3	117	125	8.33

Strontium-90 LCSRPD: Limits LCL = 0 UCL = 20.0

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1552563	1203509079	21-MAR-2016 13:58	DONE	11.4		percent	11.4	0	11.4	11.4	20.0	0

Strontium-90 RER: Limits LCL = 0 UCL = 3.00

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1531222	1203453171	23-DEC-2015 13:38	DONE	0.3	-1	dec	0.85	0	-0.192	1.89	3.00	0.52
1533767	1203459991	29-DEC-2015 15:40	DONE	1.32	0.92	dec	0.85	0	-0.192	1.89	3.00	0.52
1532745	1203457345	29-DEC-2015 17:07	DONE	0.3	-1	dec	0.85	0	-0.192	1.89	3.00	0.52
1534786	1203462642	07-JAN-2016 14:05	DONE	0.39	-0.89	dec	0.85	0	-0.192	1.89	3.00	0.52
1537995	1203470305	28-JAN-2016 15:57	DONE	0.79	-0.12	dec	0.85	0	-0.192	1.89	3.00	0.52
1540383	1203476505	02-FEB-2016 16:28	DONE	0.79	-0.12	dec	0.85	0	-0.192	1.89	3.00	0.52
1541822	1203480573	03-FEB-2016 12:43	DONE	0.54	-0.6	dec	0.85	0	-0.192	1.89	3.00	0.52
1539834	1203475119	04-FEB-2016 13:57	DONE	0.44	-0.78	dec	0.85	0	-0.192	1.89	3.00	0.52
1540713	1203477471	06-FEB-2016 11:46	DONE	1.09	0.47	dec	0.85	0	-0.192	1.89	3.00	0.52
1543275	1203484964	19-FEB-2016 13:07	DONE	0.49	-0.7	dec	0.85	0	-0.192	1.89	3.00	0.52
1550587	1203504000	10-MAR-2016 12:53	DONE	1.25	0.77	dec	0.85	0	-0.192	1.89	3.00	0.52
1551156	1203505347	10-MAR-2016 18:16	DONE	0.65	-0.38	dec	0.85	0	-0.192	1.89	3.00	0.52
1551915	1203507474	17-MAR-2016 15:37	DONE	1.16	0.61	dec	0.85	0	-0.192	1.89	3.00	0.52
1556714	1203520027	05-APR-2016 15:14	DONE	1.99	2.2	dec	0.85	0	-0.192	1.89	3.00	0.52
1555431	1203516631	06-APR-2016 15:54	DONE	1.16	0.61	dec	0.85	0	-0.192	1.89	3.00	0.52
1555978	1203518002	06-APR-2016 18:04	DONE	0.44	-0.78	dec	0.85	0	-0.192	1.89	3.00	0.52
1557885	1203523066	13-APR-2016 15:11	DONE	0.83	-0.03	dec	0.85	0	-0.192	1.89	3.00	0.52
1558700	1203525265	21-APR-2016 12:00	DONE	0.47	-0.73	dec	0.85	0	-0.192	1.89	3.00	0.52
1561011	1203531593	21-APR-2016 19:03	DONE	0.02	-2	dec	0.85	0	-0.192	1.89	3.00	0.52
1561011	1203531594	21-APR-2016 19:03	DONE	0.91	0.13	dec	0.85	0	-0.192	1.89	3.00	0.52
1561012	1203531598	21-APR-2016 19:13	DONE	0.4	-0.86	dec	0.85	0	-0.192	1.89	3.00	0.52
1561012	1203531597	21-APR-2016 19:13	DONE	1.06	0.41	dec	0.85	0	-0.192	1.89	3.00	0.52
1561018	1203531621	22-APR-2016 14:05	DONE	0.45	-0.76	dec	0.85	0	-0.192	1.89	3.00	0.52
1555383	1203516507	28-APR-2016 15:25	DONE	0.33	-1	dec	0.85	0	-0.192	1.89	3.00	0.52
1555383	1203516508	28-APR-2016 15:25	DONE	1.14	0.56	dec	0.85	0	-0.192	1.89	3.00	0.52
1563969	1203539658	11-MAY-2016 16:10	DONE	0.86	0.02	dec	0.85	0	-0.192	1.89	3.00	0.52
1565397	1203543502	17-MAY-2016 11:52	DONE	0.92	0.15	dec	0.85	0	-0.192	1.89	3.00	0.52
1569605	1203554579	25-MAY-2016 10:30	DONE	1.06	0.4	dec	0.85	0	-0.192	1.89	3.00	0.52
1568232	1203551078	25-MAY-2016 12:38	DONE	0.61	-0.45	dec	0.85	0	-0.192	1.89	3.00	0.52
1568289	1203551272	31-MAY-2016 12:55	DONE	1.63	1.5	dec	0.85	0	-0.192	1.89	3.00	0.52
1570185	1203556048	01-JUN-2016 14:48	DONE	1.68	1.6	dec	0.85	0	-0.192	1.89	3.00	0.52
1570509	1203556922	01-JUN-2016 14:49	DONE	0.1	-1	dec	0.85	0	-0.192	1.89	3.00	0.52
1573314	1203564287	16-JUN-2016 15:28	DONE	0.58	-0.51	dec	0.85	0	-0.192	1.89	3.00	0.52
1574082	1203566251	24-JUN-2016 11:13	DONE	1.47	1.2	dec	0.85	0	-0.192	1.89	3.00	0.52
1575804	1203570670	29-JUN-2016 13:10	DONE	0.08	-1	dec	0.85	0	-0.192	1.89	3.00	0.52
1575881	1203570915	29-JUN-2016 13:25	DONE	0.66	-0.36	dec	0.85	0	-0.192	1.89	3.00	0.52
1576660	1203572858	30-JUN-2016 07:24	DONE	1.06	0.41	dec	0.85	0	-0.192	1.89	3.00	0.52

1577394	1203574680	30-JUN-2016 14:39	DONE	2.22	2.7	dec	0.85	0	-0.192	1.89	3.00	0.52
1575874	1203570899	02-JUL-2016 12:05	DONE	1.42	1.1	dec	0.85	0	-0.192	1.89	3.00	0.52

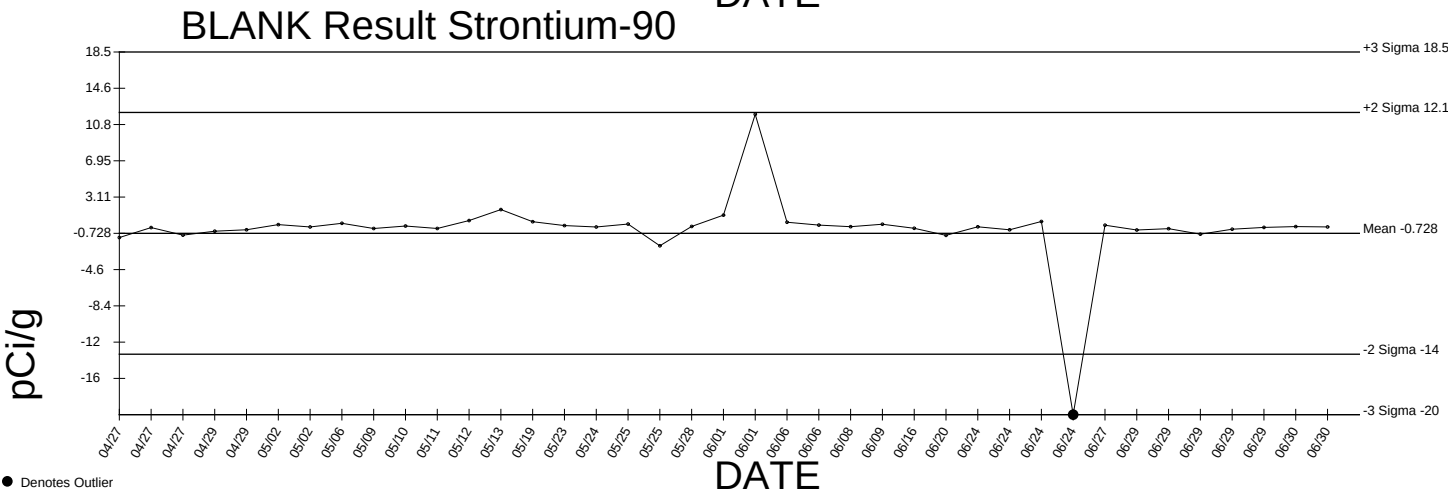
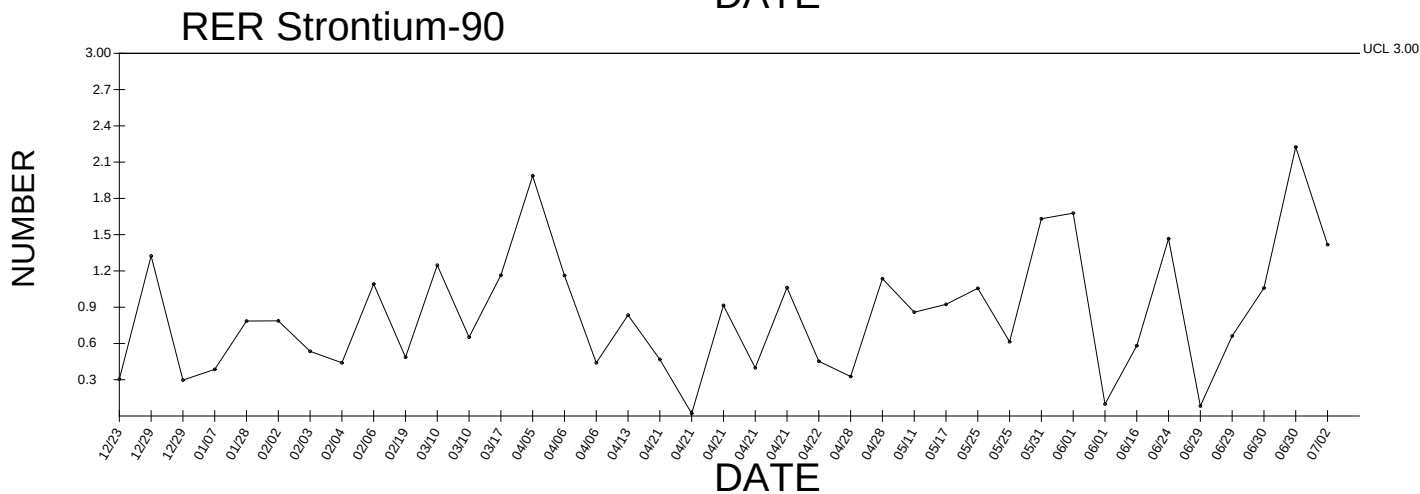
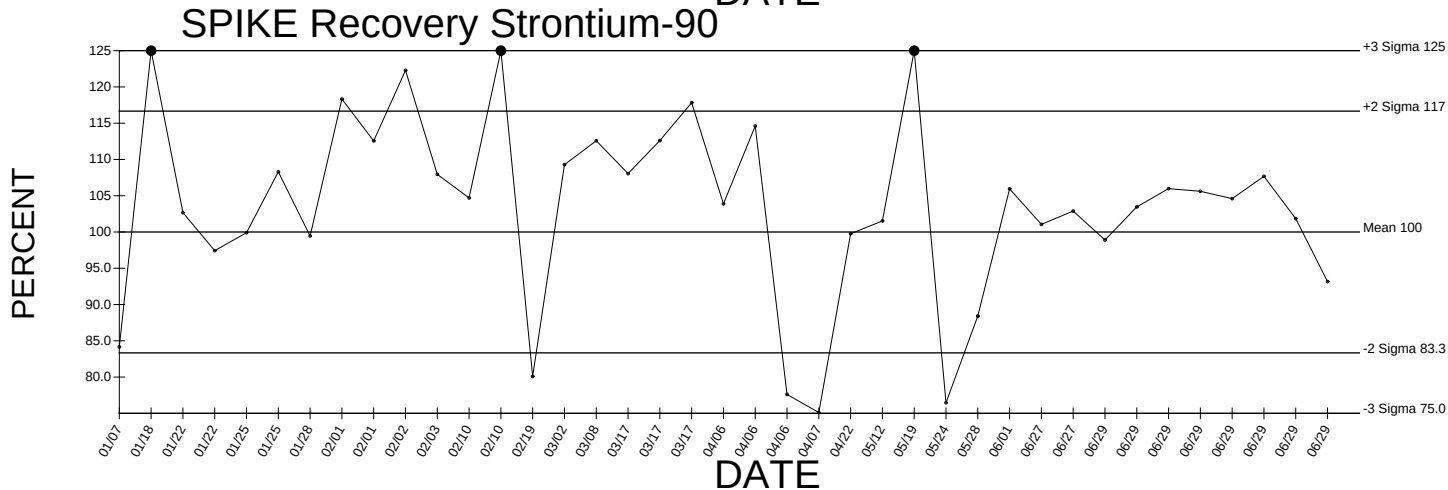
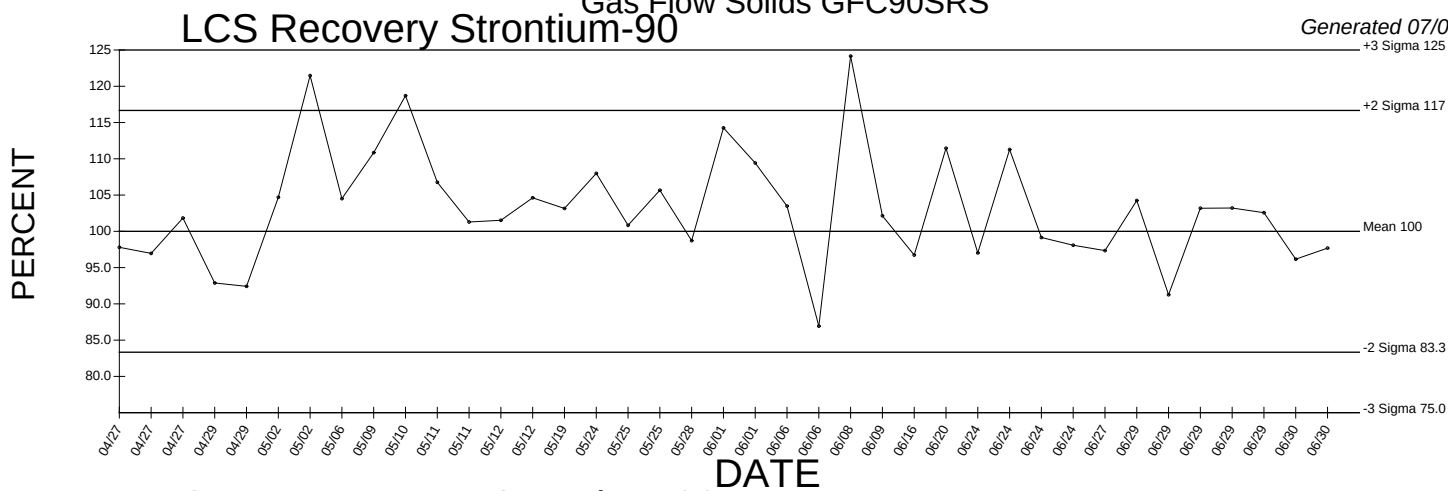
Strontium-90 SPIKE: Limits LCL = 75.0 UCL = 125

Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1534786	1203462643	07-JAN-2016 14:05	DONE	84.2	-2	percent	100	75.0	83.3	117	125	8.33
1536047	1203465564	18-JAN-2016 14:11	DONE	272	21	percent	100	75.0	83.3	117	125	8.33
1537959	1203470152	22-JAN-2016 16:28	DONE	103	0.32	percent	100	75.0	83.3	117	125	8.33
1537959	1203470153	22-JAN-2016 16:28	DONE	97.4	-0.31	percent	100	75.0	83.3	117	125	8.33
1537958	1203470147	25-JAN-2016 15:21	DONE	99.9	-0.01	percent	100	75.0	83.3	117	125	8.33
1537958	1203470148	25-JAN-2016 15:21	DONE	108	01	percent	100	75.0	83.3	117	125	8.33
1537995	1203470306	28-JAN-2016 15:57	DONE	99.5	-0.07	percent	100	75.0	83.3	117	125	8.33
1540713	1203477472	01-FEB-2016 16:29	DONE	118	2.2	percent	100	75.0	83.3	117	125	8.33
1540713	1203477473	01-FEB-2016 16:29	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1540383	1203476506	02-FEB-2016 16:28	DONE	122	2.7	percent	100	75.0	83.3	117	125	8.33
1541822	1203480574	03-FEB-2016 12:43	DONE	108	0.95	percent	100	75.0	83.3	117	125	8.33
1542894	1203483864	10-FEB-2016 16:32	DONE	105	0.56	percent	100	75.0	83.3	117	125	8.33
1543092	1203484398	10-FEB-2016 17:43	DONE	128	3.3	percent	100	75.0	83.3	117	125	8.33
1543275	1203484965	19-FEB-2016 13:07	DONE	80.1	-2	percent	100	75.0	83.3	117	125	8.33
1544629	1203488555	02-MAR-2016 14:05	DONE	109	1.1	percent	100	75.0	83.3	117	125	8.33
1550587	1203504001	08-MAR-2016 19:13	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1551393	1203505995	17-MAR-2016 13:23	DONE	108	0.97	percent	100	75.0	83.3	117	125	8.33
1551393	1203505996	17-MAR-2016 13:23	DONE	113	1.5	percent	100	75.0	83.3	117	125	8.33
1551915	1203507475	17-MAR-2016 15:28	DONE	118	2.1	percent	100	75.0	83.3	117	125	8.33
1555431	1203516632	06-APR-2016 15:54	DONE	104	0.47	percent	100	75.0	83.3	117	125	8.33
1556163	1203518586	06-APR-2016 16:23	DONE	115	1.8	percent	100	75.0	83.3	117	125	8.33
1556163	1203518587	06-APR-2016 16:23	DONE	77.6	-3	percent	100	75.0	83.3	117	125	8.33
1555978	1203518003	07-APR-2016 10:15	DONE	75.1	-3	percent	100	75.0	83.3	117	125	8.33
1561018	1203531622	22-APR-2016 14:05	DONE	99.8	-0.03	percent	100	75.0	83.3	117	125	8.33
1565397	1203543503	12-MAY-2016 13:30	DONE	102	0.18	percent	100	75.0	83.3	117	125	8.33
1567491	1203549285	19-MAY-2016 13:57	DONE	2020	230	percent	100	75.0	83.3	117	125	8.33
1568232	1203551079	24-MAY-2016 17:29	DONE	76.5	-3	percent	100	75.0	83.3	117	125	8.33
1568289	1203551273	28-MAY-2016 16:00	DONE	88.4	-1	percent	100	75.0	83.3	117	125	8.33
1570185	1203556049	01-JUN-2016 14:48	DONE	106	0.71	percent	100	75.0	83.3	117	125	8.33
1575872	1203570892	27-JUN-2016 17:26	DONE	101	0.13	percent	100	75.0	83.3	117	125	8.33
1575872	1203570893	27-JUN-2016 17:26	DONE	103	0.35	percent	100	75.0	83.3	117	125	8.33
1575827	1203570749	29-JUN-2016 08:05	DONE	98.9	-0.13	percent	100	75.0	83.3	117	125	8.33
1575827	1203570750	29-JUN-2016 08:05	DONE	103	0.41	percent	100	75.0	83.3	117	125	8.33
1575826	1203570741	29-JUN-2016 09:58	DONE	106	0.72	percent	100	75.0	83.3	117	125	8.33
1575826	1203570742	29-JUN-2016 09:58	DONE	106	0.67	percent	100	75.0	83.3	117	125	8.33
1575874	1203570900	29-JUN-2016 11:22	DONE	105	0.55	percent	100	75.0	83.3	117	125	8.33
1575874	1203570901	29-JUN-2016 11:26	DONE	108	0.92	percent	100	75.0	83.3	117	125	8.33
1575804	1203570671	29-JUN-2016 13:10	DONE	102	0.22	percent	100	75.0	83.3	117	125	8.33

1575881	1203570916	29-JUN-2016 13:25	DONE	93.2	-0.82	percent	100	75.0	83.3	117	125	8.33

Strontium-90 SPRPD: Limits LCL = 0 UCL = 35.0

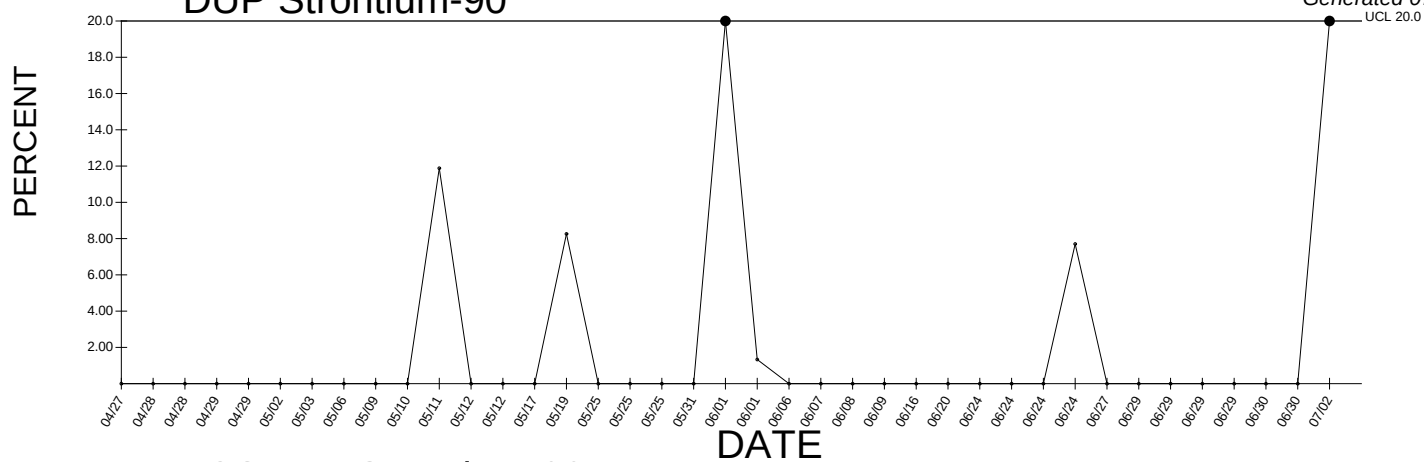
Batch ID	Samp ID	Run Date	Status	Value	Deviation	Units	Mean	LCL	LWL	UWL	UCL	Stdev
1519651	1203423811	06-NOV-2015 17:00	DONE	1.3	-1	percent	9.38	0	-6.4	25.2	35.0	7.91
1522004	1203430142	13-NOV-2015 17:45	DONE	6.06	-0.42	percent	9.38	0	-6.4	25.2	35.0	7.91
1523532	1203433957	19-NOV-2015 07:55	DONE	11	0.21	percent	9.38	0	-6.4	25.2	35.0	7.91
1524556	1203436607	20-NOV-2015 17:12	DONE	8.41	-0.12	percent	9.38	0	-6.4	25.2	35.0	7.91
1523587	1203434138	23-NOV-2015 14:48	DONE	15.4	0.77	percent	9.38	0	-6.4	25.2	35.0	7.91
1523588	1203434143	23-NOV-2015 16:36	DONE	9.47	0.01	percent	9.38	0	-6.4	25.2	35.0	7.91
1524825	1203437293	25-NOV-2015 13:31	DONE	17.2	0.99	percent	9.38	0	-6.4	25.2	35.0	7.91
1525644	1203439314	25-NOV-2015 17:51	DONE	2.71	-0.84	percent	9.38	0	-6.4	25.2	35.0	7.91
1525637	1203439298	02-DEC-2015 07:01	DONE	9.6	0.03	percent	9.38	0	-6.4	25.2	35.0	7.91
1525787	1203439713	02-DEC-2015 17:44	DONE	24.5	1.9	percent	9.38	0	-6.4	25.2	35.0	7.91
1526924	1203442555	03-DEC-2015 14:16	DONE	3.68	-0.72	percent	9.38	0	-6.4	25.2	35.0	7.91
1529734	1203449357	12-DEC-2015 15:58	DONE	3.42	-0.75	percent	9.38	0	-6.4	25.2	35.0	7.91
1529146	1203447940	14-DEC-2015 13:00	DONE	13.4	0.51	percent	9.38	0	-6.4	25.2	35.0	7.91
1529143	1203447925	14-DEC-2015 14:22	DONE	22.5	1.7	percent	9.38	0	-6.4	25.2	35.0	7.91
1530410	1203450997	15-DEC-2015 16:40	DONE	10.7	0.17	percent	9.38	0	-6.4	25.2	35.0	7.91
1531317	1203453478	22-DEC-2015 17:45	DONE	1.47	-0.1	percent	9.38	0	-6.4	25.2	35.0	7.91
1532250	1203456032	24-DEC-2015 08:24	DONE	1.88	-0.95	percent	9.38	0	-6.4	25.2	35.0	7.91
1537959	1203470153	22-JAN-2016 16:28	DONE	1.85	-0.95	percent	9.38	0	-6.4	25.2	35.0	7.91
1537958	1203470148	25-JAN-2016 15:21	DONE	3.87	-0.7	percent	9.38	0	-6.4	25.2	35.0	7.91
1540713	1203477473	01-FEB-2016 16:29	DONE	4.88	-0.57	percent	9.38	0	-6.4	25.2	35.0	7.91
1551393	1203505996	17-MAR-2016 13:23	DONE	3.46	-0.75	percent	9.38	0	-6.4	25.2	35.0	7.91
1556163	1203518587	06-APR-2016 16:23	DONE	33.6	3.1	percent	9.38	0	-6.4	25.2	35.0	7.91
1575872	1203570893	27-JUN-2016 17:26	DONE	7.41	-0.25	percent	9.38	0	-6.4	25.2	35.0	7.91
1575827	1203570750	29-JUN-2016 08:05	DONE	9.26	-0.02	percent	9.38	0	-6.4	25.2	35.0	7.91
1575826	1203570742	29-JUN-2016 09:58	DONE	8.37	-0.13	percent	9.38	0	-6.4	25.2	35.0	7.91
1575874	1203570901	29-JUN-2016 11:26	DONE	8.24	-0.14	percent	9.38	0	-6.4	25.2	35.0	7.91



● Denotes Outlier

DUP Strontium-90

UCL 20.0



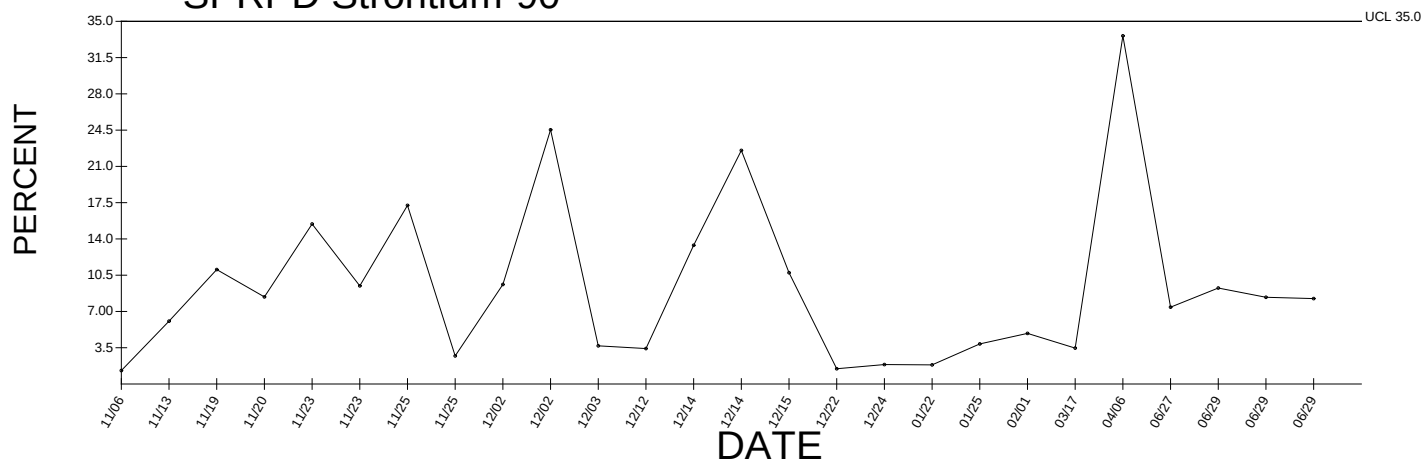
LCSRPD Strontium-90

UCL 20.0



SPRPD Strontium-90

UCL 35.0



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RAD Standards Traceability

Standardization of Strontium Carrier 2414995

v1.2.1

Analyst	KSD1

Standard Information	
Isotope	Strontium
Serial Number	2414995
Amount of Std. (mL)	1.0
Standard Prepared	6/3/2016

Parent Information	
Parent Serial #	2130147.5
Parent Exp. Date	6/3/2018

Std #	Weight of carrier added (g)	Weight of crucible or filter (g)	Weight of crucible or filter + ppt. (g)	Weight of ppt. (g)	mg Strontium/mL	mg Strontium/g
1	1.0104	0.0242	0.0388	0.0146	14.60	14.45
2	1.0136	0.0244	0.0392	0.0148	14.80	14.60
3	1.0191	0.0242	0.0390	0.0148	14.80	14.52
4	1.0214	0.0244	0.0391	0.0147	14.70	14.39

Mean Value (mg/mL) = 14.73
 Stdev (mg/mL) = ± 0.10
 1.0% of Mean Value = 0.147250
Pass
 Expiration Date 6/3/2017
 Mean Value (mg/1.0mL) = 14.73

Standardization Rule

A satisfactory standardization is obtained when results give a standard deviation of less than 1.0% of the mean value.

2/4/2016
 14.6
 14.73



Eckert & Ziegler

Analytics

1380 Seaboard Industrial Blvd.

Atlanta, Georgia 30318

Tel 404-352-8677

Fax 404-352-2837

www.analyticsinc.com

CERTIFICATE OF CALIBRATION
Standard Radionuclide Source

1243

78352-278

Sr-90 10 mL Liquid in Flame Sealed Vial

Customer: General Engineering Labs/Charleston, SC

P.O. No.: 7312 RD, Item 3

This standard radionuclide source was prepared gravimetrically from a calibrated master solution. The master solution was calibrated by liquid scintillation counting.

Radionuclide purity and calibration were checked by germanium gamma-ray spectrometry and liquid scintillation counting. The nuclear decay rate and assay date for this source are given below.

ANALYTICS maintains traceability to the National Institute of Standards and Technology through Measurements Assurance Programs as described in USNRC Reg. Guide 4.15, Revision 1.

Isotope:	Sr-90
Activity (Bq):	3.856 E5
Half-Life:	28.79 years
Calibration Date:	October 1, 2008 12:00 EST
Relative Expanded Uncertainty (k=2):	1.7%

Comments:

Impurities: γ -impurities <0.1%

10.41484 grams 0.1M HCl solution with 30 $\mu\text{g/g}$ Sr carrier.

NOTE: This source also contains Y-90 in secular equilibrium with Sr-90. The Y-90 activity is equal to the Sr-90 activity. Since Sr-90 and Y-90 both decay 100% by beta emission, the total beta emission rate for the source is twice the certified Sr-90 activity. The half-life for Y-90 is 64.08 hours.

Source Prepared By: W. Mao
W. Mao, Radiochemist

QA Approved:

D. M. Montgomery
D. M. Montgomery, QA Manager

Date: 10/3/08

RECEIVED



Standard Traceability Log Rad

Source Material Info	
Parent Code:	1243
Prepared By:	Daniel Roy
Carrier Conc:	0.1M HCL
Reference Date:	10/01/2008
Ampoule Mass (g):	10.41484 g
Uncertainty:	+/- .85 %
LogBook No:	RC-S-048-124

A Solution Material Info			
Isotope:	Strontium-90		
Prepared By:	Daniel Roy		
Prep Date:	12/19/2008		
Verification Date:	12/18/2015		
Expiration Date:	12/18/2016		
Primary Code:	1243-A		
Dilution(mL):	100 mL		
Mass of Parent(g):	10.2164 g		
Density(g/mL):	0.9991	Balance ID:	38080204

Calculations Converting parent activity to dpm/mL|dpm/g

$(\text{Mass of parent(g)}) * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / (\text{Ampoule Mass(g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/mL)}$
$(\text{Mass of parent(g)}) * (\text{Parent Activity (Bq)}) * (\text{conversion dpm to Bq}) / \text{Density} / (\text{Ampoule Mass (g)} * (\text{Dilution Vol})) = \text{Parent Activity (dpm/g)}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (10.41484 \text{ g} * 100 \text{ mL}) = 226951.7634 \text{ dpm/mL}$
$(10.2164 \text{ g}) * (385600 \text{ Bq}) * (60 \text{ dpm/Bq}) / (0.9991 \text{ g/mL}) / (10.41484 \text{ g} * 100 \text{ mL}) = 227146.2010 \text{ dpm/g}$

Secondary Standards

Prep Date	Preparer	Mass Primary	Dilution (mL)	Code	Conc dpm/mL	Verification Date	Expiration Date
01/21/2010	Bethany Fiem	2.2467	1000	1243-B	510.329369 dpm/mL	01/21/2010	01/21/2011
08/03/2010	Bethany Fiem	2.5604	1000	1243-C	581.5851 dpm/mL	08/03/2010	08/03/2011
01/12/2011	Bethany Fiem	2.4946	1000	1243-D	566.6389 dpm/mL	01/12/2011	01/12/2012
08/12/2011	Tim Chandler	3.3115	100	1243-G	18.7877 dpm/mL	03/26/2014	03/25/2015
08/17/2011	Tim Chandler	2.5541	100	1243-H	14.49064 dpm/mL	03/26/2014	03/25/2015
06/21/2011	Tim Chandler	.0235	100	1243-E	53.37936 dpm/mL	03/19/2014	06/20/2014
07/05/2011	Bethany Fiem	2.6072	1000	1243-F	592.2156 dpm/mL	07/05/2011	07/05/2012
01/31/2012	Gregory Ramsay	2.6792	1000	1243-I	608.5701 dpm/ml	01/31/2012	01/31/2013

08/29/2012	Bethany Fiem	2.6799	1000	1243-J	608.729104 dpm/mL	09/14/2012	09/11/2013
02/12/2013	Gregory Ramsay	2.6526	1000	1243-K	602.528 dpm/ml	01/15/2014	01/15/2015
12/04/2013	Gregory Ramsay	2.5347	1000	1243-L	575.747476 dpm/ml	12/04/2013	12/04/2014
08/11/2014	Gregory Ramsay	2.7006	1000	1243-M	613.431 dpm/mL	08/12/2014	08/12/2015
05/06/2015	Gregory Ramsay	2.5102	1000	1243-N	570.1824 dpm/mL	05/06/2015	05/06/2016
12/18/2015	Gregory Ramsay	2.5762	1000	1243-O	585.174 dpm/mL	12/18/2015	12/18/2016

GEL Laboratories LLC
Version 1.0 9/18/2000

Verification for Sr-90 Standard 1243-O

v1.0.2

Instrument	BLUE
Analyst	BOXF1
Verification Prep Date	12/18/2015

Standard Information	
Isotope	Sr-90
Serial Number	1243-O
Isotope Half-life	28.9000 Y
Reference Date	10/1/2008
Ref. Act. (DPM/mL)	585,174
Amount of Std. (mL)	1.0
Standard Prep Date	12/18/2015

Std #	Count Date	Quench Number	Gross cpm	Bkg cpm
1	12/30/2015	88.50	1073.20	39.80
2	12/30/2015	90.20	1062.80	39.80
3	12/30/2015	89.60	1064.60	39.80

Std #	Net cpm	Calculated Avg. Eff.	Standard dpm/mL	Measured dpm
1	1033.40	2.017144	512.31	512.31
2	1023.00	2.017144	507.15	507.15
3	1024.80	2.017144	508.04	508.04

dpm/mL
509.17
2,755,468,033

Mean Value =
Stddev =

Certificate Value* = 491.8
Two sigma = 5.511
10 % of Mean = 50.917
Rule A (Pass/Fail) Pass
% Recovery 103.52%
Rule B (Pass/Fail) Pass
Expiration Date 12/18/2016

Verification Rules

Rule A = The two sigma value used for the 95% confidence interval shall not exceed 10% of the mean value of the three verification measurements.

Rule B = The determined mean value shall be within 5% of the certificate value.

* Certificate Value is decay corrected to Count Date.

The analyst prepared three standard verification sources for Sr-90 source 1243-O by transferring 1 mL portions of the standard into glass liquid scintillation vials. 10 mL of Ecocint Ultra liquid scintillation cocktail was added to each vial and the vials were shaken to mix. A Blank vial was prepared in a similar fashion using 10 mL of Ecocint Ultra liquid scintillation cocktail. The standard verification vials and background source were dark adapted for at least two hours and counted on LSCBLUE for Sr-90 source standard verification. The Sr-90 efficiency calibration which was used for verification calculations was performed on 12/18/2015 using Sr-90 source 1244-A.

Standard results for each verification source was calculated as follows:

$$\text{Source dpm/mL} = (A - B)/(C)(D)$$

where:

A = Ver. source cpm,
B = BKG cpm,
C = System efficiency (cpm/dpm), and
D = volume used for standard verification.

RAD-M-001

12-30-15
[Signature]

Amanda Fehr

Runlogs

Instrument Run Log

Instrument Type: GFPC

Batch ID: 1575874

Sample ID	Sample Type	Analyst	Instrument	Run Date	Status	Geometry	Calibration Date
398732001	SAMPLE	KSD1	PIC9B	JUN-29-16 11:17:09	DONE	Tuffryn Filter	01-APR-16 00:00
398732003	SAMPLE	KSD1	PIC9C	JUN-29-16 11:21:52	DONE	Tuffryn Filter	01-APR-16 00:00
1203570898	MB	KSD1	PIC9D	JUN-29-16 11:21:58	DONE	Tuffryn Filter	01-APR-16 00:00
1203570900	MS	KSD1	PIC10C	JUN-29-16 11:22:10	DONE	Tuffryn Filter	01-APR-16 00:00
1203570901	MSD	KSD1	PIC11A	JUN-29-16 11:26:01	DONE	Tuffryn Filter	01-APR-16 00:00
1203570902	LCS	KSD1	PIC11B	JUN-29-16 11:26:05	DONE	Tuffryn Filter	01-APR-16 00:00
1203570899	DUP	KSD1	PIC2D	JUL-02-16 12:05:34	DONE	Tuffryn Filter	01-APR-16 00:00
398732002	SAMPLE	KSD1	PIC2A	JUL-02-16 12:05:40	DONE	Tuffryn Filter	01-APR-16 00:00

Attachment 1

BROOKHAVEN NATIONAL LABORATORY

Data Usability Summary Report

Project:	Bldg 811 Excavation
Sampling Contractor:	PW Grosser
Analytical Laboratory:	General Engineering Labs
Analytical Method:	DOE HASL 300 / EPA 905
Sample Delivery Group:	37206 (387177)
COC No. / Sample IDs:	37206 / 001-002
Date Sampled:	12/4/15
Parameter(s):	Gamma Scans, Sr-90

SAMPLE ID	DATA USABILITY QUALIFIERS	EXPLANATION FOR QUALIFIERS
37206- 001-002	No Qualifiers	N/A

Summary:

Data useable as reported by GEL.

Reviewed by:

C. A. L. For
Project Manager
A. Lockwood

Date:

8/25/16

Attachment 1

BROOKHAVEN NATIONAL LABORATORY

Data Usability Summary Report

Project:	Bldg 811 Excavation
Sampling Contractor:	PW Grosser
Analytical Laboratory:	General Engineering Labs
Analytical Method:	DOE HASL 300 / EPA 905
Sample Delivery Group:	37205 (387066)
COC No. / Sample IDs:	37205 / 001-007
Date Sampled:	12/1/15
Parameter(s):	Gamma Scans, Sr-90

SAMPLE ID	DATA USABILITY QUALIFIERS	EXPLANATION FOR QUALIFIERS
37205- 001-007	No Qualifiers	N/A

Summary: Data useable as reported by GEL.

Reviewed by: C. L. Lockwood for
Project Manager
A. Lockwood

Date: 8/25/16