

**RADIATION CONTROL DIVISION
PROCEDURE**

BROOKHAVEN NATIONAL LABORATORY

Procedure No. **RM-SOP-62A**

Revision No. 0

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DISPOSAL OF RADIOACTIVE WASTE

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1.0 PURPOSE/SCOPE

1.1 Principle

This procedure describes the administrative controls on the preparation of hazardous waste (generated from chemical analyses) for disposal. This procedure applies to all personnel generating or disposing of hazardous waste in the Analytical Services Laboratory. Samples remaining after chemical analysis are not considered as waste and are returned to the customer.

1.2 Summary

It is the policy of the Analytical Services Laboratory, ASL, to minimize the amount of radioactive waste generated, and to segregate, package, store, and document radioactive waste in accordance with ES&H Standard 3.6.0. It is also the policy of the ASL to prepare radioactive waste to be disposed of at the Hanford Burial Site according to the stringent controls set by that facility. An inventory of articles placed in each radioactive waste package must be documented on the Radioactive Waste Inventory Sheet. See Attachment 8.1

2.0 RESPONSIBILITIES

2.1 It is the responsibility of each generator to:

- 2.1.1 Comply with the training prerequisites. See section: 4.1
- 2.1.2 Consult and comply with the [SBMS Radiological Waste Management](#) subject area. This subject area contains printable forms.
- 2.1.3 Consult with the ECR (Environmental Compliance Representative) for sample types not described in this procedure.
- 2.1.2 Maintain his/her own individual waste.
- 2.1.3 Minimize the production of radioactive waste.
- 2.1.1 Dispose of radioactive waste into designated containers.
- 2.1.2 Characterize the types and quantities of articles in Analytical Services Laboratory Waste Streams.
- 2.1.3 Process all paperwork for analysis and disposal of radioactive waste.
- 2.1.4 Prevent radioactive waste containers from exceeding 90% capacity.
- 2.1.5 Forward necessary forms to the Waste Management Group.

3.0 DEFINITIONS

- 3.1 Compactable Waste Material - items such as: paper; rags; clothing; empty glassware; empty vials; pipette tips; gloves; easily crushable, lightweight metal lab-ware.
- 3.2 Radioactive Waste Control Form(RWCF) – A waste-tracking document that is completed by waste generators for each container/package of radioactive waste and used by the Waste Management Division to track radioactive waste from pickup to final disposition. RWCF's are identified with unique, sequential serial numbers.
- 3.3 Radioactive Waste Inventory Form (RWIF) – A form used by the waste generator to record the activity level of radioactive waste added to each package at the point of

generation.

- 3.3 Hazardous Substance - a chemical substance that is listed in 49CFR172.101, Appendix to Hazardous Materials Table, and exceeds its listed reportable quantity when packaged in a single container.
- 3.4 Hazardous Materials - waste containing a hazardous substance.
- 3.5 Mixed Waste - waste that is both radioactive and contains a hazardous substance.
- 3.6 Radioactive Waste - any material, equipment, or system component determined by analysis or process knowledge to be contaminated or suspected of being contaminated by a radionuclide. Radioactive waste also includes activated material, sealed and unsealed sources, and material that emits radiation.
- 3.7 Waste Characterization - the process of identifying the physical and isotopic content of a quantity of radioactive waste.
- 3.8 Waste Stream - a source of radioactive waste of consistent physical and isotopic content.
- 3.9 Generator - any individual responsible for the production of radioactive or mixed waste.

4.0 PREREQUISITES

4.1 Training

- 4.1.1 Refer to [Environment, Safety, and Health Services Training Database](#) .
- 4.1.2 Radiological Worker I (HP-RWT-002) – for mixed waste generation
- 4.1.3 Radioactive Waste Generator (HP-RADIGEN) – for mixed waste generation
- 4.1.4 90 Day Area Managers - RCRA 90 Day (HP-RCRA90DAY) – for 90 Day Accumulation Area Managers

4.2 Materials

- 4.2.1 Radioactive waste container - either bag, bottle or jug.
- 4.2.2 Analytical Services Laboratory Chain of Custody Form. See Attachment
- 4.2.3 Sample preparation materials, if appropriate.
- 4.2.4 [Radioactive Waste Inventory Sheet](#) (RWIS)
- 4.2.5 [Radioactive Waste Control Form](#) (RWCF)
- 4.2.6 Radioactive waste tag, if sample collection is not in a Rad waste bag.
See [Radioactive Waste Label](#) sample

4.3 Sample Collection

- 4.3.1 Water Sample Collection
 - 4.3.1.1 Review all analytical data.
 - 4.3.1.2 Acquire all aliquots and original sample.
 - 4.3.1.3 Dispose of non-radioactive, chemically neutral samples via the Laboratory sink.
 - 4.3.1.4 Composite into mixed waste jug any sample classified as both hazardous and radioactive waste.

- 4.3.1.5 Composite radioactive water samples into a 5-gallon radioactive waste jug.
- 4.3.1.6 Seal jug when water level reaches fill line.
- 4.3.1.7 Follow Procedure 6.0
- 4.3.2 Oil, soil, vegetation, gloves, rocks, metal, animal and any other non-water samples.
 - 4.3.2.1 Acquire all aliquots and original sample.
 - 4.3.2.2 Return to requestor or sampler.
- 4.3.3 Scintillation Cocktail Collection
 - 4.3.3.1 Review all analytical data.
 - 4.3.3.2 Segregate radioactive from non-radioactive samples.
 - 4.3.3.3 Drain scintillation liquid from the vial so the no more than 1% of the liquid (by volume of vial) remains.
 - 4.3.3.4 Deposit empty sample vials and caps into a yellow Rad waste bag.
 - 4.3.3.5 Seal all containers, with a J-seal, when 60% capacity has been reached. Make sure the bag can fit in the gamma detector.
 - 4.3.3.6 Complete a separate Radioactive Waste Inventory Form and a Radioactive Waste Control Form for liquids and vials
 - 4.3.1.8 Follow Procedure 6.0
- 4.3.4 Compactible Waste Collection
 - 4.3.4.1 Discard oil sample preparation waste into a mixed waste bag.
 - 4.3.4.2 Discard all other sample preparation waste into a yellow rad waste bag.
 - 4.3.4.3 Note all bag additions on the accompanying Radioactive Waste Inventory Sheet.
 - 4.3.4.4 Seal bags when 90% capacity has been reached.
 - 4.3.4.5 Follow Procedure 6.0
- 4.3.5 Particulate Filters and Charcoal Canisters
 - 4.3.5.1 Composite all particulate filters and charcoal canisters into a yellow rad bag. Enter the activity of the sample onto the inventory sheet and tally or when the bag is full, recount this composite sample.
 - 4.3.5.2 Follow Procedure 6.0
- 4.3.6 Bioassay Samples
 - 4.3.6.1 Empty the containers into the sink and rinse the bottles well, at least 3 times.
 - 4.3.6.2 Place into industrial waste.

5.0 PRECAUTIONS

5.1 Interference's

See appropriate analytical method to determine possible interference's.

5.2 Safety

- 5.2.1 Wear personal protective clothing including lab coat, disposable plastic gloves, and safety glasses.
- 5.2.2 Protect all surfaces from radioactive waste with either an absorbent pad or plastic backed paper.
- 5.2.3 Materials containing hazardous substances shall only be placed into mixed waste containers.

6.0 PROCEDURE

- 6.1 Composite waste, refer to section 4.3.
- 6.2 Initiate new waste container, with paperwork if necessary.
- 6.3 Complete Analytical Services Laboratory (ASL) Chain of Custody (COC) Form.
- 6.4 Submit to Analytical Services Laboratory.
- 6.5 Review analyses.
- 6.6 Dispose of all non-contaminated, non-radioactive and non-hazardous waste into industrial waste receptacle.
- 6.7 Complete Radioactive Waste Control Form (RWCF) for all composite waste determined to be contaminated.
- 6.8 Complete Radioactive waste Tag for all composite samples contained in either a bottle or jug with the following information:
 - 6.9.1 Date
 - 6.9.2 Experimenter
 - 6.9.3 For disposal
 - 6.9.4 Isotopes
 - 6.9.5 Total Curies
 - 6.9.6 ASL COC and Sample ID #
- 6.9 Complete label on front of yellow Radioactive Waste Bag with the following information:
 - 6.9.1 Generator
 - 6.9.2 Extension
 - 6.9.3 Building
 - 6.9.4 RWCF #
 - 6.9.5 ASL COC and Sample ID #
- 6.10 Copy RWCF, Radioactive Waste Inventory Sheet and Analytical results.
- 6.11 Store copies in Radioactive Waste Pending Disposal notebook.
- 6.12 Submit original paperwork to Facility Support personnel.
- 6.13 Obtain survey of waste container from Facility Support personnel
- 6.14 Move radioactive waste to Radioactive Waste Accumulation Area.
- 6.15 Move mixed waste to Hazardous Waste 90-day Accumulation Area.

7.0 REFERENCES

- 7.1 SBMS [Hazardous Waste Management](#) subject area.
- 7.2 SBMS [Radioactive Waste Management](#) subject area.

8.0 ATTACHMENTS

- 8.1 [Radioactive Waste Inventory Sheet](#) (RWIS)
- 8.2 Analytical Services Laboratory (ASL) Chain Of Custody (COC) Form
- 8.3 [Radioactive Waste Control Form](#) sample (RWCF)
- 8.4 [Radioactive Waste Label](#) sample

9.0 DOCUMENTATION

- 9.1 The RCD Analytical Services Laboratory as described in DH-ADM-002, Management, Retrieval and Retention of RCD Records maintains the following documents:

- 9.1.1 Analytical Services Laboratory Chain of Custody Form
- 9.1.2 Radioactive Waste Control Form, working copy
- 9.1.3 Radioactive Waste Pending Disposal (RWPD) Log Book

- 9.2 The following file codes will be used to maintain all noted records:

Refer to ESHQ Records Management Procedures Key to Filing Codes; Attachment 6.2 of SOP DH-ADM-002.

- 9.2.1 ASL COC
- 9.2.2 RWCF working copy
- 9.2.3 RWPD log book

ASL COC Form

